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SAR EVALUATION REPORT

Applicant Name:
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Date of Testing:
05/30/16 - 06/13/16
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1606091053.A3L

FCC ID:	**A3L-EFNN930**
Cell Phone FCC ID:	**A3LSMN930U**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD.**

DUT Type:	LED View Cover
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093
Model(s):	EF-NN930

The host device (FCC: A3LSMN930U) when operating with this accessory has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.3 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Randy Ortanez
President

The SAR Tick is an initiative of the Mobile Manufacturers Forum (MMF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MMF. Further details can be obtained by emailing: sartick@mmfai.info.

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
NFC	Data	13.56 MHz

Note: This sleeve device was evaluated to determine that the host device will remain complaint when operating with this accessory. There are no changes made to the host device – all transmission modes/bands, output power levels, antenna locations, and simultaneous transmission scenarios remain identical to the original certification.

1.2 Accessory Cover

This DUT may be used with the host device with FCC ID: A3LSMN930U. Per FCC KDB Publication 648474 D04v01r04, SAR for the host device with the additional accessory cover was measured for the configurations with the highest SAR reported for each wireless technology (1xRTT, EVDO, WCDMA, GSM, Wi-Fi etc.), frequency band, operating mode (different modes/configurations within each wireless technology), and exposure condition (head, body-worn accessory, hotspot mode, etc.). SAR tests were additionally performed for any test configurations in the original equipment authorization of the host device with 1g SAR >1.2 W/kg or 10g SAR >3.0 W/kg. SAR measurements without the accessory were repeated to confirm the host test samples produced same range of SAR as in the original filing. Head and Phablet SAR tests were performed with the accessory cover open and closed. Body-worn and Hotspot tests were performed with the accessory cover closed only because operations near the body with the accessory cover open are not expected.

1.3 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r04 (Additional Accessory Cover)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

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1.4 Host Device Serial Numbers

Several samples of the host device with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Phablet Max Serial Number	Phablet Red Serial Number
GSM/GPRS/EDGE 850	05BCE	05BCE	05BCE	-	-
GSM/GPRS/EDGE 1900	05BD6	05BD6	04E44	-	04E28
UMTS 850	05BF6	05BCE	05BCE	-	-
UMTS 1750	05BD6	05BD6	04E44	05BD6	04E28
UMTS 1900	05BD6	05BD6	04E44	05BD6	-
CDMA/EVDO BC10 (§90S)	05BF6	05BCE	05BCE	-	-
CDMA/EVDO BC0 (§22H)	05BF6	05BCE	05BCE	-	-
PCS CDMA/EVDO	05BD6	05BD6	04E44	05BD6	-
LTE Band 12	05BF6	05B9D	05B9D	-	-
LTE Band 17	05862	05862	05862	-	-
LTE Band 13	05BF6	05862	05862	-	-
LTE Band 26 (Cell)	05BF6	05C13	05C13	-	-
LTE Band 4 (AWS)	05BD6	05BD6	04E44	05BD6	04E28
LTE Band 25 (PCS)	05BD6	05BD6	04E44	05BD6	-
LTE Band 30	05BD6	05BD6	05BD6	-	-
LTE Band 41	05BD6	05BD6	05BD6	-	-
2.4 GHz WLAN	05B7E	05B7E	05B7E	-	-
5 GHz WLAN	05B7E	05B7E	05B7E	05B7E	-
Bluetooth	-	-	-	05B7E	-

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2 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

2.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 2-1).

Equation 2-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

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

where:

σ = conductivity of the tissue-simulating material (S/m)
ρ = mass density of the tissue-simulating material (kg/m^3)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

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3 DOSIMETRIC ASSESSMENT

3.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

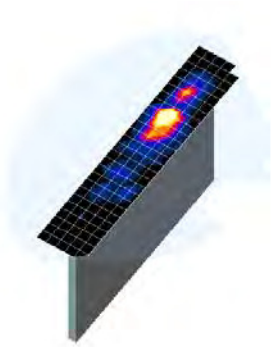

Figure 3-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 3-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 3-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 3-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

   b. 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. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 3-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

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)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

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4 DEFINITION OF REFERENCE POINTS

4.1 EAR REFERENCE POINT

Figure 4-2 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 4-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 4-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

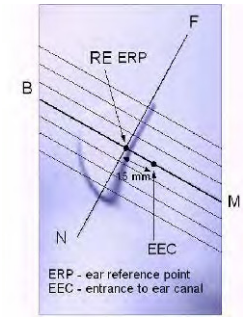

Figure 4-1
Close-Up Side view of ERP

4.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 4-3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

Figure 4-2
Front, back and side view of SAM Twin Phantom

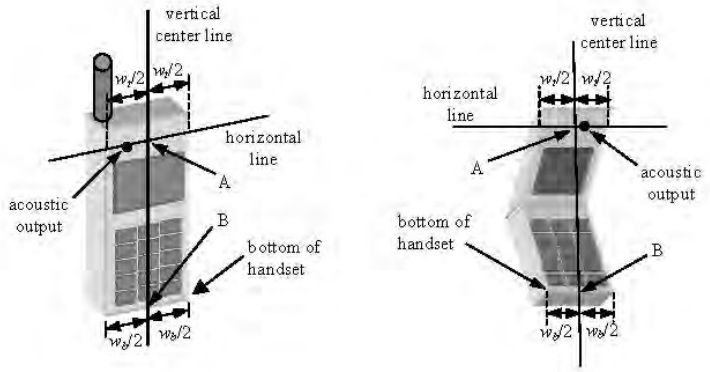

Figure 4-3
Handset Vertical Center & Horizontal Line Reference Points

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5 TEST CONFIGURATION POSITIONS

5.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

5.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 5-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

Figure 5-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 5-2).

5.3 Positioning for Ear / 15º Tilt

With the test device aligned in the "Cheek Position":

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 5-2).

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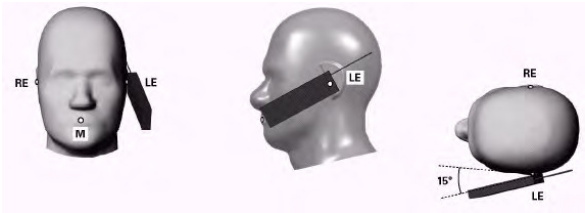

Figure 5-2 Front, Side and Top View of Ear/15º Tilt Position

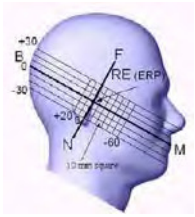

Figure 5-3 Side view w/ relevant markings

5.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

5.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 5-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

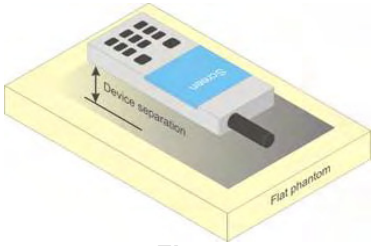

Figure 5-4 Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

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

5.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

5.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

5.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

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6 RF EXPOSURE LIMITS

6.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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7 SYSTEM VERIFICATION

7.1 Tissue Verification

Table 7-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
05/31/2016	750H	21.9	700	0.851	41.995	0.889	42.201	-4.27%	-0.49%
			710	0.859	41.886	0.890	42.149	-3.48%	-0.62%
			740	0.884	41.506	0.893	41.994	-1.01%	-1.16%
			755	0.898	41.278	0.894	41.916	0.45%	-1.52%
			770	0.912	41.057	0.895	41.838	1.90%	-1.87%
			785	0.925	40.855	0.896	41.760	3.24%	-2.17%
06/04/2016	835H	23.0	820	0.911	43.217	0.899	41.578	1.33%	3.94%
			835	0.925	43.050	0.900	41.500	2.78%	3.73%
			850	0.939	42.878	0.916	41.500	2.51%	3.32%
06/06/2016	1750H	21.7	1710	1.321	39.255	1.348	40.142	-2.00%	-2.21%
			1750	1.359	39.049	1.371	40.079	-0.88%	-2.57%
			1790	1.402	38.875	1.394	40.016	0.57%	-2.85%
06/03/2016	1900H	22.2	1850	1.368	39.219	1.400	40.000	-2.29%	-1.95%
			1880	1.398	39.087	1.400	40.000	-0.14%	-2.28%
			1910	1.435	39.002	1.400	40.000	2.50%	-2.49%
06/08/2016	1900H	22.3	1850	1.376	38.868	1.400	40.000	-1.71%	-2.83%
			1880	1.409	38.681	1.400	40.000	0.64%	-3.30%
			1910	1.441	38.578	1.400	40.000	2.93%	-3.55%
05/31/2016	2300H	24.6	2300	1.655	41.438	1.670	39.500	-0.90%	4.91%
			2310	1.667	41.363	1.679	39.480	-0.71%	4.77%
			2320	1.679	41.340	1.687	39.460	-0.47%	4.76%
05/31/2016	2450H	24.6	2400	1.776	41.040	1.756	39.289	1.14%	4.46%
			2450	1.829	40.801	1.800	39.200	1.61%	4.08%
			2500	1.888	40.633	1.855	39.136	1.78%	3.83%
05/31/2016	2600H	24.6	2600	2.001	40.227	1.964	39.009	1.88%	3.12%
			2650	2.064	40.046	2.018	38.945	2.28%	2.83%
			2700	2.127	39.855	2.073	38.882	2.60%	2.50%
06/06/2016	5800H	21.0	5745	5.141	34.401	5.214	35.363	-1.40%	-2.72%
			5765	5.162	34.365	5.234	35.340	-1.38%	-2.76%

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Table 7-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
05/31/2016	750B	23.1	710	0.926	54.150	0.960	55.687	-3.54%	-2.76%
			740	0.956	53.892	0.963	55.570	-0.73%	-3.02%
			755	0.969	53.721	0.964	55.512	0.52%	-3.23%
			770	0.984	53.534	0.965	55.453	1.97%	-3.46%
			785	0.998	53.373	0.966	55.395	3.31%	-3.65%
06/13/2016	750B	22.1	700	0.917	54.398	0.959	55.726	-4.38%	-2.38%
			710	0.925	54.242	0.960	55.687	-3.65%	-2.59%
			740	0.953	53.889	0.963	55.570	-1.04%	-3.03%
			755	0.968	53.742	0.964	55.512	0.41%	-3.19%
05/31/2016	835B	21.3	820	0.984	53.237	0.969	55.258	1.55%	-3.66%
			835	0.999	53.063	0.970	55.200	2.99%	-3.87%
			850	1.013	52.892	0.988	55.154	2.53%	-4.10%
05/30/2016	1750B	21.8	1710	1.453	52.469	1.463	53.537	-0.68%	-1.99%
			1750	1.498	52.341	1.488	53.432	0.67%	-2.04%
			1790	1.539	52.144	1.514	53.326	1.65%	-2.22%
06/09/2016	1750B	21.8	1710	1.422	52.799	1.463	53.537	-2.80%	-1.38%
			1750	1.463	52.556	1.488	53.432	-1.68%	-1.64%
			1790	1.513	52.560	1.514	53.326	-0.07%	-1.44%
05/30/2016	1900B	22.5	1850	1.515	52.341	1.520	53.300	-0.33%	-1.80%
			1880	1.543	52.215	1.520	53.300	1.51%	-2.04%
			1910	1.584	52.107	1.520	53.300	4.21%	-2.24%
06/06/2016	1900B	23.0	1850	1.494	52.701	1.520	53.300	-1.71%	-1.12%
			1880	1.526	52.626	1.520	53.300	0.39%	-1.26%
			1910	1.559	52.536	1.520	53.300	2.57%	-1.43%
06/09/2016	1900B	23.2	1850	1.490	51.930	1.520	53.300	-1.97%	-2.57%
			1880	1.525	51.870	1.520	53.300	0.33%	-2.68%
			1910	1.557	51.782	1.520	53.300	2.43%	-2.85%
05/31/2016	2300B	22.2	2300	1.808	52.000	1.809	52.900	-0.06%	-1.70%
			2310	1.821	51.963	1.816	52.887	0.28%	-1.75%
			2320	1.835	51.930	1.826	52.873	0.49%	-1.78%
06/04/2016	2450B	23.5	2400	1.938	51.273	1.902	52.767	1.89%	-2.83%
			2450	2.004	51.048	1.950	52.700	2.77%	-3.13%
			2500	2.075	50.870	2.021	52.636	2.67%	-3.36%
06/04/2016	2600B	24.5	2600	2.066	51.953	2.163	52.509	-4.48%	-1.06%
			2650	2.133	51.783	2.234	52.445	-4.52%	-1.26%
			2700	2.202	51.616	2.305	52.382	-4.47%	-1.46%
05/30/2016	5200B-5800B	21.6	5240	5.503	47.084	5.346	48.960	2.94%	-3.83%
			5260	5.535	47.087	5.369	48.933	3.09%	-3.77%
			5280	5.555	47.102	5.393	48.906	3.00%	-3.69%
			5745	6.134	46.295	5.936	48.275	3.34%	-4.10%
			5765	6.199	46.254	5.959	48.248	4.03%	-4.13%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

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7.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix E.

Table 7-3
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
K	750	HEAD	05/31/2016	22.0	21.9	0.200	1046	3022	1.620	8.200	8.100	-1.22%
K	835	HEAD	06/04/2016	23.5	23.0	0.200	4d119	3022	1.740	9.140	8.700	-4.81%
E	1750	HEAD	06/06/2016	23.2	21.7	0.100	1008	7406	3.400	36.700	34.000	-7.36%
I	1900	HEAD	06/03/2016	23.0	22.2	0.100	5d141	3333	4.150	38.500	41.500	7.79%
E	1900	HEAD	06/08/2016	22.8	22.3	0.100	5d141	7406	3.970	38.500	39.700	3.12%
K	2300	HEAD	05/31/2016	23.8	22.8	0.100	1064	3022	4.690	47.600	46.900	-1.47%
K	2450	HEAD	05/31/2016	23.8	22.8	0.100	882	3022	5.340	50.500	53.400	5.74%
K	2600	HEAD	05/31/2016	23.8	22.8	0.100	1071	3022	5.810	55.900	58.100	3.94%
J	5750	HEAD	06/06/2016	20.5	20.8	0.050	1120	7357	3.880	79.100	77.600	-1.90%
H	750	BODY	05/31/2016	23.5	23.1	0.200	1046	3319	1.770	8.770	8.850	0.91%
H	750	BODY	06/13/2016	22.0	22.1	0.200	1054	3319	1.770	8.560	8.850	3.39%
J	835	BODY	05/31/2016	20.6	21.2	0.200	4d119	3318	1.810	9.140	9.050	-0.98%
E	1750	BODY	05/30/2016	22.2	21.8	0.100	1008	7406	3.740	37.300	37.400	0.27%
H	1900	BODY	05/30/2016	22.0	22.5	0.100	5d141	3319	4.230	39.600	42.300	6.82%
H	1900	BODY	06/06/2016	22.3	22.8	0.100	5d141	3319	4.100	39.600	41.000	3.54%
G	2300	BODY	05/31/2016	22.0	22.0	0.100	1008	3334	4.940	48.400	49.400	2.07%
G	2450	BODY	06/04/2016	23.0	23.5	0.100	882	3334	5.280	49.400	52.800	6.88%
J	2600	BODY	06/04/2016	23.0	23.0	0.100	1071	3318	5.040	54.900	50.400	-8.20%
D	5750	BODY	05/30/2016	22.8	21.6	0.050	1120	3914	3.700	76.500	74.000	-3.27%

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Table 7-4
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
E	1750	BODY	05/30/2016	22.2	21.8	0.100	1008	7406	1.980	19.800	19.800	0.00%
E	1750	BODY	06/09/2016	23.0	21.8	0.100	1008	7406	1.950	19.800	19.500	-1.52%
H	1900	BODY	05/30/2016	22.0	22.5	0.100	5d141	3319	2.190	20.900	21.900	4.78%
H	1900	BODY	06/09/2016	22.3	23.0	0.100	5d149	3319	2.210	21.800	22.100	1.38%
G	2450	BODY	06/04/2016	23.0	23.5	0.100	882	3334	2.420	23.100	24.200	4.76%
D	5250	BODY	05/30/2016	22.8	21.6	0.050	1120	3914	1.070	21.200	21.400	0.94%

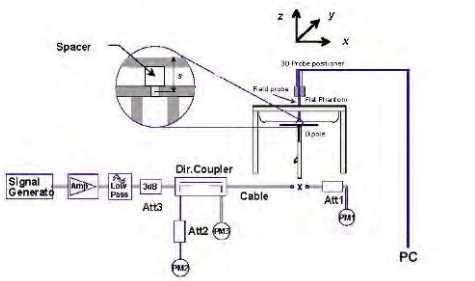

Figure 7-1
System Verification Setup Diagram

Figure 7-2
System Verification Setup Photo

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8 SAR DATA SUMMARY

8.1 Standalone Head SAR Data

Table 8-1
GSM/UMTS/CDMA Head SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Cover Config.	Host Device Serial Number	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GSM	33.5	33.19	0.10	Right	Cheek	Ant A	Open	05BCE	1:8.3	0.132	1.074	0.142	0.163	0.158	A1
836.60	190	GSM 850	GSM	33.5	33.19	0.03	Right	Cheek	Ant A	Closed	05BCE	1:8.3	0.121	1.074	0.130	0.163	0.158	
1880.00	661	GSM 1900	GSM	31.0	30.21	0.15	Right	Cheek	Ant A	Open	05BD6	1:8.3	0.056	1.199	0.067	0.068	0.074	A2
1880.00	661	GSM 1900	GSM	31.0	30.21	0.15	Right	Cheek	Ant A	Closed	05BD6	1:8.3	0.042	1.199	0.050	0.068	0.074	
836.60	4183	UMTS 850	RMC	20.5	19.52	0.01	Left	Cheek	Ant B	Open	05BF6	1:1	0.349	1.253	0.437	0.563	0.526	A3
836.60	4183	UMTS 850	RMC	20.5	19.52	0.00	Left	Cheek	Ant B	Closed	05BF6	1:1	0.205	1.253	0.257	0.563	0.526	
1732.40	1412	UMTS 1750	RMC	25.0	24.05	0.07	Left	Cheek	Ant A	Open	05BD6	1:1	0.135	1.245	0.168	0.228	0.183	A4
1732.40	1412	UMTS 1750	RMC	25.0	24.05	0.04	Left	Cheek	Ant A	Closed	05BD6	1:1	0.117	1.245	0.146	0.228	0.183	
1880.00	9400	UMTS 1900	RMC	25.0	24.38	0.07	Right	Cheek	Ant A	Open	05BD6	1:1	0.120	1.153	0.138	0.176	0.189	A5
1880.00	9400	UMTS 1900	RMC	25.0	24.38	0.02	Right	Cheek	Ant A	Closed	05BD6	1:1	0.097	1.153	0.112	0.176	0.189	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	20.5	19.88	0.00	Left	Cheek	Ant B	Open	05BF6	1:1	0.414	1.153	0.477	0.586	0.540	A6
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	20.5	19.88	0.05	Left	Cheek	Ant B	Closed	05BF6	1:1	0.247	1.153	0.285	0.586	0.540	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	20.5	19.81	-0.07	Right	Cheek	Ant B	Open	05BF6	1:1	0.404	1.172	0.473	0.543	0.546	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	20.5	19.81	-0.04	Right	Cheek	Ant B	Closed	05BF6	1:1	0.237	1.172	0.278	0.543	0.546	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	20.5	19.69	0.00	Left	Cheek	Ant B	Open	05BF6	1:1	0.374	1.205	0.451	0.587	0.539	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	20.5	19.69	0.03	Left	Cheek	Ant B	Closed	05BF6	1:1	0.221	1.205	0.266	0.587	0.539	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	20.5	19.74	0.01	Left	Cheek	Ant B	Open	05BF6	1:1	0.383	1.191	0.456	0.519	0.530	A7
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	20.5	19.74	0.02	Left	Cheek	Ant B	Closed	05BF6	1:1	0.226	1.191	0.269	0.519	0.530	
1908.75	1175	PCS CDMA	RC3 / SO55	25.0	24.75	0.03	Right	Cheek	Ant A	Open	05BD6	1:1	0.126	1.059	0.133	0.200	0.199	
1908.75	1175	PCS CDMA	RC3 / SO55	25.0	24.75	0.00	Right	Cheek	Ant A	Closed	05BD6	1:1	0.111	1.059	0.118	0.200	0.199	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.13	0.01	Right	Cheek	Ant A	Open	05BD6	1:1	0.137	1.222	0.167	0.229	0.227	A8
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.13	-0.09	Right	Cheek	Ant A	Closed	05BD6	1:1	0.110	1.222	0.134	0.229	0.227	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 8-2
LTE Head SAR Data

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Cover Config.	Modulation	RB Size	RB Offset	Cover Config-uration	Host Device Serial Number	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	20.5	19.83	0.01	0	Left	Cheek	Ant B	QPSK	25	12	Open	05BF6	1:1	0.360	1.167	0.420	0.609	0.589	A9
707.50	23095	Mid	LTE Band 12	10	20.5	19.83	0.00	0	Left	Cheek	Ant B	QPSK	25	12	Closed	05BF6	1:1	0.277	1.167	0.323	0.609	0.589	
710.00	23790	Mid	LTE Band 17	10	25.0	24.27	0.01	0	Right	Cheek	Ant A	QPSK	1	25	Open	05862	1:1	0.125	1.183	0.148	0.159	0.155	A10
710.00	23790	Mid	LTE Band 17	10	25.0	24.27	0.04	0	Right	Cheek	Ant A	QPSK	1	25	Closed	05862	1:1	0.122	1.183	0.144	0.159	0.155	
782.00	23230	Mid	LTE Band 13	10	20.5	19.86	0.00	0	Left	Cheek	Ant B	QPSK	25	0	Open	05BF6	1:1	0.348	1.159	0.403	0.491	0.484	A11
782.00	23230	Mid	LTE Band 13	10	20.5	19.86	0.06	0	Left	Cheek	Ant B	QPSK	25	0	Closed	05BF6	1:1	0.205	1.159	0.238	0.491	0.484	
831.50	26865	Mid	LTE Band 26 (Cell)	15	20.5	19.98	0.01	0	Left	Cheek	Ant B	QPSK	1	36	Open	05BF6	1:1	0.418	1.127	0.471	0.575	0.520	A12
831.50	26865	Mid	LTE Band 26 (Cell)	15	20.5	19.98	0.05	0	Left	Cheek	Ant B	QPSK	1	36	Closed	05BF6	1:1	0.230	1.127	0.259	0.575	0.520	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.36	-0.01	0	Left	Cheek	Ant A	QPSK	1	0	Open	05BD6	1:1	0.160	1.159	0.185	0.247	0.204	A13
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.36	0.03	0	Left	Cheek	Ant A	QPSK	1	0	Closed	05BD6	1:1	0.120	1.159	0.139	0.247	0.204	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.99	-0.08	0	Right	Cheek	Ant A	QPSK	1	0	Open	05BD6	1:1	0.143	1.002	0.143	0.174	0.178	A14
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.99	0.01	0	Right	Cheek	Ant A	QPSK	1	0	Closed	05BD6	1:1	0.110	1.002	0.110	0.174	0.178	
2310.00	27710	Mid	LTE Band 30	10	23.5	23.48	-0.21	0	Left	Cheek	Ant A	QPSK	1	0	Open	05BD6	1:1	0.163	1.005	0.164	0.133	0.136	A15
2310.00	27710	Mid	LTE Band 30	10	23.5	23.48	0.03	0	Left	Cheek	Ant A	QPSK	1	0	Closed	05BD6	1:1	0.132	1.005	0.133	0.133	0.136	
2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.96	-0.12	0	Left	Cheek	Ant A	QPSK	1	0	Open	05BD6	1:1.58	0.066	1.009	0.067	0.078	0.066	A16
2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.96	0.07	0	Left	Cheek	Ant A	QPSK	1	0	Closed	05BD6	1:1.58	0.037	1.009	0.037	0.078	0.066	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 8-3
WLAN Head SAR Data

MEASUREMENT RESULTS																							
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Cover Config.	Host Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	Accessory SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	15.5	15.44	-0.13	Right	Tilt	2	Open	05B7E	1	99.9	0.793	0.567	1.014	1.001	0.576	0.651	0.626	A17
2412	1	802.11b	DSSS	22	15.5	15.44	-0.03	Right	Tilt	2	Closed	05B7E	1	99.9	0.265	0.258	1.014	1.001	0.262	0.651	0.626	
5745	149	802.11a	OFDM	20	9.5	8.80	0.15	Left	Cheek	1	Open	05B7E	6	98.6	0.716	0.235	1.175	1.014	0.280	0.291	0.301	A18
5745	149	802.11a	OFDM	20	9.5	8.80	0.16	Left	Cheek	1	Closed	05B7E	6	98.6	0.283	0.097	1.175	1.014	0.116	0.291	0.301	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram											

8.2 Standalone Body-Worn SAR Data

Table 8-4
GSM/UMTS/CDMA Body-Worn SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	# of Time Slots	Duty Cycle	Spacing	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.													(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GSM	33.5	33.19	-0.01	Ant A	Closed	05BCE	1	1:8.3	15 mm	back	0.266	1.074	0.286	0.365	0.377	A19
1880.00	661	GSM 1900	GSM	31.0	30.21	0.02	Ant A	Closed	05BD6	1	1:8.3	15 mm	back	0.142	1.199	0.170	0.211	0.212	A21
836.60	4183	UMTS 850	RMC	25.0	24.55	0.00	Ant A	Closed	05BCE	N/A	1:1	15 mm	back	0.332	1.109	0.368	0.440	0.486	A23
1732.40	1412	UMTS 1750	RMC	25.0	24.05	0.00	Ant A	Closed	05BD6	N/A	1:1	15 mm	back	0.256	1.245	0.319	0.386	0.395	A25
1880.00	9400	UMTS 1900	RMC	25.0	24.38	0.00	Ant A	Closed	05BD6	N/A	1:1	15 mm	back	0.360	1.153	0.415	0.536	0.598	A27
820.10	564	CDMA BC10 (§90S)	TDSO / SO32	25.0	24.81	0.00	Ant A	Closed	05BCE	N/A	1:1	15 mm	back	0.338	1.045	0.353	0.401	0.410	A29
836.52	384	CDMA BC0 (§22H)	TDSO / SO32	25.0	24.69	0.01	Ant A	Closed	05BCE	N/A	1:1	15 mm	back	0.338	1.074	0.363	0.445	0.475	A31
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.26	0.21	Ant A	Closed	05BD6	N/A	1:1	15 mm	back	0.390	1.186	0.463	0.580	0.616	A33
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 8-5
LTE Body-Worn SAR Data

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Modulation	RB Size	RB Offset	Cover Config.	Host Device Serial Number	Duty Cycle	Spacing	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.3	24.50	0.01	0	Ant B	QPSK	1	25	Closed	05B9D	1:1	15 mm	back	0.274	1.202	0.329	0.426	0.474	A35
710.00	23790	Mid	LTE Band 17	10	25.0	24.27	0.00	0	Ant A	QPSK	1	25	Closed	05862	1:1	15 mm	back	0.187	1.183	0.221	0.283	0.316	A37
782.00	23230	Mid	LTE Band 13	10	25.0	24.47	0.00	0	Ant A	QPSK	1	0	Closed	05862	1:1	15 mm	back	0.280	1.130	0.316	0.450	0.415	A39
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.50	-0.02	0	Ant A	QPSK	1	0	Closed	05C13	1:1	15 mm	back	0.283	1.122	0.318	0.395	0.414	A41
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.36	-0.06	0	Ant A	QPSK	1	0	Closed	05BD6	1:1	15 mm	back	0.307	1.159	0.356	0.428	0.432	A43
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.99	-0.02	0	Ant A	QPSK	1	0	Closed	05BD6	1:1	15 mm	back	0.406	1.002	0.407	0.505	0.531	A45
2310.00	27710	Mid	LTE Band 30	10	23.5	23.48	0.04	0	Ant A	QPSK	1	0	Closed	05BD6	1:1	15 mm	back	0.316	1.005	0.318	0.345	0.324	A47
2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.96	-0.01	0	Ant A	QPSK	1	0	Closed	05BD6	1:1.58	15 mm	back	0.272	1.009	0.274	0.231	0.254	A49
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 8-6
WLAN Body-Worn SAR Data

MEASUREMENT RESULTS																							
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Spacing	Side	Peak SAR of Area Scan	Accessory SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	20.5	20.01	0.16	2	Closed	05B7E	1	99.9	15 mm	back	0.093	0.081	1.119	1.001	0.091	0.119	0.128	A51
5755	151	802.11n	OFDM	40	15.5	15.10	0.14	2	Closed	05B7E	13.5	97.1	15 mm	back	0.658	0.343	1.096	1.030	0.387	0.277	0.240	A53
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram									

8.3 Standalone Hotspot SAR Data

Table 8-7
GPRS/UMTS/CDMA Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	# of GPRS Slots	Duty Cycle	Spacing	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.													(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GPRS	30.0	29.20	0.13	Ant A	Closed	05BCE	3	1:2.76	10 mm	front	0.513	1.202	0.617	0.793	0.868	A20
1880.00	661	GSM 1900	GPRS	24.5	23.72	-0.05	Ant A	Closed	04E44	3	1:2.76	10 mm	bottom	0.253	1.197	0.303	0.339	0.320	A22
846.60	4233	UMTS 850	RMC	25.0	24.68	-0.01	Ant A	Closed	05BCE	N/A	1:1	10 mm	front	0.522	1.076	0.562	0.817	0.848	A24
1732.40	1412	UMTS 1750	RMC	22.0	21.22	-0.01	Ant A	Closed	04E44	N/A	1:1	10 mm	bottom	0.487	1.197	0.583	0.649	0.645	A26
1880.00	9400	UMTS 1900	RMC	22.0	21.42	-0.01	Ant A	Closed	04E44	N/A	1:1	10 mm	bottom	0.507	1.143	0.580	0.717	0.685	A28
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.0	24.76	0.01	Ant A	Closed	05BCE	N/A	1:1	10 mm	front	0.511	1.057	0.540	0.808	0.821	A30
848.31	777	CDMA BC0 (§22H)	EVDO Rev. 0	25.0	24.85	0.01	Ant A	Closed	05BCE	N/A	1:1	10 mm	front	0.560	1.035	0.580	0.838	0.881	A32
1880.00	600	PCS CDMA	EVDO Rev. 0	22.0	21.33	-0.01	Ant A	Closed	04E44	N/A	1:1	10 mm	bottom	0.498	1.167	0.581	0.724	0.696	A34
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram					

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Table 8-8
LTE Hotspot SAR Data

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Modulation	RB Size	RB Offset	Cover Config.	Host Device Serial Number	Duty Cycle	Spacing	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.3	24.50	0.01	0	Ant B	QPSK	1	25	Closed	05B9D	1:1	10 mm	front	0.444	1.202	0.534	0.838	0.912	A36
710.00	23790	Mid	LTE Band 17	10	25.0	24.27	-0.01	0	Ant A	QPSK	1	25	Closed	05862	1:1	10 mm	front	0.280	1.183	0.331	0.442	0.480	A38
782.00	23230	Mid	LTE Band 13	10	25.0	24.47	0.01	0	Ant A	QPSK	1	0	Closed	05862	1:1	10 mm	front	0.468	1.130	0.529	0.771	0.767	A40
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.50	-0.01	0	Ant A	QPSK	1	0	Closed	05C13	1:1	10 mm	front	0.487	1.122	0.546	0.774	0.800	A42
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.0	21.77	-0.03	0	Ant A	QPSK	1	0	Closed	04E44	1:1	10 mm	bottom	0.558	1.054	0.588	0.642	0.671	A44
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.50	0.06	0	Ant A	QPSK	1	0	Closed	04E44	1:1	10 mm	bottom	0.541	1.122	0.649	0.767	0.728	A46
2310.00	27710	Mid	LTE Band 30	10	23.5	23.48	-0.02	0	Ant A	QPSK	1	0	Closed	05BD6	1:1	10 mm	bottom	1.010	1.005	1.015	0.972	0.972	A48
2310.00	27710	Mid	LTE Band 30	10	23.5	23.48	0.01	0	Ant A	QPSK	1	0	Closed	05BD6	1:1	10 mm	bottom	1.010	1.005	1.015	0.972	0.972	
2680.00	41490	High	LTE Band 41	20	25.0	24.54	-0.02	0	Ant A	QPSK	1	0	Closed	05BD6	1:1.58	10 mm	bottom	0.676	1.112	0.752	1.021	1.009	A50
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entry represents variability measurement.

Table 8-9
WLAN Hotspot SAR Data

MEASUREMENT RESULTS																							
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Spacing	Side	Peak SAR of Area Scan	Accessory SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (1g)	Original Host Scaled SAR (1g)	Scaled Host SAR Check (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	20.5	20.01	-0.01	2	Closed	05B7E	1	99.9	10 mm	top	0.316	0.261	1.119	1.001	0.292	0.453	0.442	A52
5755	151	802.11n	OFDM	40	15.5	15.10	0.16	2	Closed	05B7E	13.5	97.1	10 mm	back	0.861	0.382	1.096	1.030	0.431	0.453	0.423	A54
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram								

8.4 Standalone Phablet SAR Data

Table 8-10
GPRS/UMTS/CDMA Phablet SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	# of GPRS Slots	Duty Cycle	Spacing	Side	Accessory SAR (10g)	Scaling Factor	Accessory Scaled SAR (10g)	Original Host Scaled SAR (10g)	Scaled Host SAR Check (10g)	Plot #
MHz	Ch.													(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1880.00	661	GSM 1900	GPRS	25.5	24.13	-0.02	Ant A	Open	04E28	3	1:2.76	0 mm	bottom	0.978	1.371	1.341	1.673	1.631	
1880.00	661	GSM 1900	GPRS	25.5	24.13	0.02	Ant A	Closed	04E28	3	1:2.76	0 mm	bottom	1.040	1.371	1.426	1.673	1.631	A55
1712.40	1312	UMTS 1750	RMC	25.0	23.96	-0.04	Ant A	Open	05BD6	N/A	1:1	3 mm	bottom	1.730	1.271	2.199	3.101	2.834	
1712.40	1312	UMTS 1750	RMC	25.0	23.96	-0.01	Ant A	Closed	05BD6	N/A	1:1	3 mm	bottom	1.860	1.271	2.364	3.101	2.834	
1712.40	1312	UMTS 1750	RMC	23.0	22.87	-0.02	Ant A	Closed	04E28	N/A	1:1	0 mm	bottom	2.530	1.030	2.606	3.008	2.966	
1732.40	1412	UMTS 1750	RMC	23.0	22.82	-0.02	Ant A	Closed	04E28	N/A	1:1	0 mm	bottom	2.530	1.042	2.636	3.043	2.970	
1752.60	1513	UMTS 1750	RMC	23.0	22.83	-0.02	Ant A	Open	04E28	N/A	1:1	0 mm	bottom	2.700	1.040	2.808	3.130	3.182	
1752.60	1513	UMTS 1750	RMC	23.0	22.83	-0.08	Ant A	Closed	04E28	N/A	1:1	0 mm	bottom	2.740	1.040	2.850	3.130	3.182	
1752.60	1513	UMTS 1750	RMC	23.0	22.83	-0.08	Ant A	Closed	04E28	N/A	1:1	0 mm	bottom	2.760	1.040	2.870	3.130	3.182	A56
1880.00	9400	UMTS 1900	RMC	25.0	24.38	-0.06	Ant A	Open	05BD6	N/A	1:1	3 mm	bottom	1.770	1.153	2.041	2.560	2.917	
1880.00	9400	UMTS 1900	RMC	25.0	24.38	-0.03	Ant A	Closed	05BD6	N/A	1:1	3 mm	bottom	1.900	1.153	2.191	2.560	2.917	A57
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	24.54	-0.03	Ant A	Open	05BD6	N/A	1:1	3 mm	bottom	1.950	1.112	2.168	2.880	2.691	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	24.54	-0.02	Ant A	Closed	05BD6	N/A	1:1	3 mm	bottom	2.060	1.112	2.291	2.880	2.691	A58
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	24.54	-0.03	Ant A	Closed	05BD6	N/A	1:1	3 mm	bottom	2.010	1.112	2.235	2.880	2.691	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams					

Note: Blue entries indicate variability measurements.

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Table 8-11
LTE Phablet SAR Data

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Modulation	RB Size	RB Offset	Cover Config.	Host Device Serial Number	Duty Cycle	Spacing	Side	Accessory SAR (10g)	Scaling Factor	Accessory Scaled SAR (10g)	Original Host Scaled SAR (10g)	Scaled Host SAR Check (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.36	-0.04	0	QPSK	1	0	Open	05BD6	1:1	3 mm	bottom	1.900	1.159	2.202	3.037	2.608	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.36	-0.03	0	QPSK	1	0	Closed	05BD6	1:1	3 mm	bottom	1.990	1.159	2.306	3.037	2.608	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.89	-0.08	0	QPSK	1	0	Open	04E28	1:1	0 mm	bottom	2.640	1.026	2.709	3.170	3.211	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.89	-0.03	0	QPSK	1	0	Closed	04E28	1:1	0 mm	bottom	2.670	1.026	2.739	3.170	3.211	A59
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.67	-0.02	0	QPSK	1	0	Open	05BD6	1:1	3 mm	bottom	1.750	1.079	1.888	2.762	2.449	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.67	-0.04	0	QPSK	1	0	Closed	05BD6	1:1	3 mm	bottom	1.880	1.079	2.029	2.762	2.449	A60
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams											

Table 8-12
WLAN Phablet SAR Data

MEASUREMENT RESULTS																							
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Antenna Config.	Cover Config.	Host Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Spacing	Side	Peak SAR of Area Scan	Accessory SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (10g)	Original Host Scaled SAR (10g)	Scaled Host SAR Check (10g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
5270	54	802.11n	OFDM	40	15.5	15.43	-0.17	2	Open	05B7E	13.5	97.1	0 mm	back	6.666	0.890	1.016	1.030	0.931	1.926	2.051	A61
5270	54	802.11n	OFDM	40	15.5	15.43	-0.12	2	Closed	05B7E	13.5	97.1	0 mm	back	8.195	0.880	1.016	1.030	0.921	1.926	2.051	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams											

Table 8-13
Bluetooth Phablet SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Cover Config.	Host Device Serial Number	Data Rate (Mbps)	Duty Cycle	Spacing	Side	Accessory SAR (10g)	Scaling Factor	Accessory Scaled SAR (10g)	Original Host Scaled SAR (10g)	Scaled Host SAR Check (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
2441	39	Bluetooth	FHSS	11.5	10.77	0.13	Open	05B7E	1	1:1	0 mm	back	0.016	1.183	0.019	0.075	0.075	
2441	39	Bluetooth	FHSS	11.5	10.77	-0.16	Closed	05B7E	1	1:1	0 mm	back	0.034	1.183	0.040	0.075	0.075	A62
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

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8.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Liquid tissue depth was at least 15.0 cm for all frequencies.
3. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
4. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
5. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
6. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
7. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured 1g SAR results for a frequency band were greater than or equal to 0.8 W/kg and the measured 10g SAR results for a frequency band were greater than or equal to 2.0 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 10 for variability analysis.
8. Per FCC KDB Publication 648474 D04v01r04, SAR with the additional accessory cover was measured for the configuration with the highest SAR reported for each wireless technology, frequency band, operating mode, and exposure condition. SAR tests were additionally performed for any test configurations in the original equipment authorization with 1g SAR >1.2 W/kg and 10g SAR >3.0 W/kg.
9. Prior to measurement with the accessory, the SAR values and conducted powers of the host device were verified against the results in the original filing.
10. To confirm any SAR variation was solely due to additional accessory cover, the SAR results of the host device were re-verified against the results in the original filing. There were no noticeable changes in the SAR distributions between the host measured with accessory cover attached and without the accessory cover.
11. The worst case configuration was additionally evaluated for all channels.

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9 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

9.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

9.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤1.6 W/kg. For 10-g SAR, test exclusion applies when all the simultaneous transmitting antennas in a specific physical test configuration is ≤4.0 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

Note: Only configurations with the accessory cover attached that increased in SAR from the original filing of the host device were evaluated for simultaneous transmission scenarios. Please see the original compliance evaluation of the host device n in RF Exposure Technical Report S/N: 0Y1605180939.A3L for the standalone reported SAR for the most conservative simultaneous use conditions for modes and bands not evaluated for this test report.

9.3 Head SAR Simultaneous Transmission Analysis

Table 9-1
Simultaneous Transmission Scenario with LTE B30 and WLAN (Held to Ear)

Exposure Condition	Mode	4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	LTE Band 30	0.164	0.228	0.266	0.392	0.430	**0.658**

Exposure Condition	Mode	4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	LTE Band 30	0.164	0.291	0.249	0.455	0.413	**0.704**

Exposure Condition	Mode	4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 30	0.164	0.228	0.249	**0.641**

Exposure Condition	Mode	4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 30	0.164	0.266	0.291	**0.721**

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9.4 Body-Worn Simultaneous Transmission Analysis

Table 9-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	LTE Band 41	0.274	0.088	0.119	0.362	0.393	0.481

Table 9-3
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.365	0.244	0.387	0.609	0.752	0.996
	GSM 1900	0.211	0.244	0.387	0.455	0.598	0.842
	UMTS 850	0.440	0.244	0.387	0.684	0.827	1.071
	UMTS 1750	0.386	0.244	0.387	0.630	0.773	1.017
	UMTS 1900	0.536	0.244	0.387	0.780	0.923	1.167
	CDMA BC10 (§90S)	0.401	0.244	0.387	0.645	0.788	1.032
	CDMA BC0 (§22H)	0.445	0.244	0.387	0.689	0.832	1.076
	PCS CDMA	0.580	0.244	0.387	0.824	0.967	**1.211**
	LTE Band 12	0.426	0.244	0.387	0.670	0.813	1.057
	LTE Band 17	0.283	0.244	0.387	0.527	0.670	0.914
	LTE Band 13	0.450	0.244	0.387	0.694	0.837	1.081
	LTE Band 26 (Cell)	0.395	0.244	0.387	0.639	0.782	1.026
	LTE Band 4 (AWS)	0.428	0.244	0.387	0.672	0.815	1.059
	LTE Band 25 (PCS)	0.505	0.244	0.387	0.749	0.892	1.136
	LTE Band 30	0.345	0.244	0.387	0.589	0.732	0.976
	LTE Band 41	0.274	0.244	0.387	0.518	0.661	0.905

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Table 9-4
Simultaneous Transmission Scenario with 2.4 GHz Ant 1 and 5 GHz Ant 2 (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body-Worn	GSM 850	0.365	0.088	0.387	0.840
	GSM 1900	0.211	0.088	0.387	0.686
	UMTS 850	0.440	0.088	0.387	0.915
	UMTS 1750	0.386	0.088	0.387	0.861
	UMTS 1900	0.536	0.088	0.387	1.011
	CDMA BC10 (§90S)	0.401	0.088	0.387	0.876
	CDMA BC0 (§22H)	0.445	0.088	0.387	0.920
	PCS CDMA	0.580	0.088	0.387	**1.055**
	LTE Band 12	0.426	0.088	0.387	0.901
	LTE Band 17	0.283	0.088	0.387	0.758
	LTE Band 13	0.450	0.088	0.387	0.925
	LTE Band 26 (Cell)	0.395	0.088	0.387	0.870
	LTE Band 4 (AWS)	0.428	0.088	0.387	0.903
	LTE Band 25 (PCS)	0.505	0.088	0.387	0.980
	LTE Band 30	0.345	0.088	0.387	0.820
	LTE Band 41	0.274	0.088	0.387	0.749

Table 9-5
Simultaneous Transmission Scenario with 2.4 GHz Ant 2 and 5 GHz Ant 1 (Body-Worn at 1.5 cm)

Exposure Condition	Mode	4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body-Worn	LTE Band 41	0.274	0.119	0.244	0.637

Table 9-6
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	LTE Band 41	0.274	0.196	0.470

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9.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 9-7
Simultaneous Transmission Scenario with LTE B30 and WLAN (Hotspot at 1.0 cm)

Simult Tx	Configuration	LTE Band 30 Ant A SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Bottom	1.015	-	-	1.015	1.015	1.015

Simult Tx	Configuration	LTE Band 30 Ant A SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Bottom	1.015	-	-	1.015	1.015	1.015

Simult Tx	Configuration	LTE Band 30 Ant A SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Bottom	1.015	-	-	1.015

Simult Tx	Configuration	LTE Band 30 Ant A SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Bottom	1.015	-	-	1.015

9.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

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10 SAR MEASUREMENT VARIABILITY

10.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, 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
5) When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Table 10-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Cover Config-uration	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2310	2310.00	27710	LTE Band 30, 10 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	Closed	bottom	10 mm	1.010	1.010	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 10-2
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Cover Config-uration	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1752.60	1513	UMTS 1750	RMC	Open	bottom	0 mm	2.740	2.760	1.01	N/A	N/A	N/A	N/A
1900	1851.25	25	PCS CDMA	EVDO Rev. 0	Closed	bottom	3 mm	2.060	2.010	1.02	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

10.2 Measurement Uncertainty

The measured 1g SAR was <1.5 W/kg and 10-g SAR was <3.75 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

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11 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/2/2016	Annual	3/2/2017	MY45470194
Agilent	8753E	(30kHz-6GHz) Network Analyzer	3/2/2016	Annual	3/2/2017	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	E4438C	ESG Vector Signal Generator	3/13/2015	Biennial	3/13/2017	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	3/13/2015	Biennial	3/13/2017	MY42082659
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Agilent	N5182A	MXG Vector Signal Generator	11/6/2015	Annual	11/6/2016	MY47420603
Agilent	8753ES	S-Parameter Network Analyzer	11/4/2015	Annual	11/4/2016	US39170118
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41450275
Agilent	E5515C	Wireless Communications Test Set	5/16/2015	Biennial	5/16/2017	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	CBT	N/A	CBT	GB46170464
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	ML2438A	Power Meter	3/3/2016	Annual	3/3/2017	1070030
Anritsu	ML2496A	Power Meter	2/28/2016	Annual	2/28/2017	1306009
Anritsu	MA2481A	Power Sensor	3/3/2016	Annual	3/3/2017	2400
Anritsu	MA2481A	Power Sensor	3/3/2016	Annual	3/3/2017	5318
Anritsu	MA2411B	Pulse Power Sensor	8/3/2015	Annual	8/3/2016	1126066
Anritsu	MA2411B	Pulse Power Sensor	12/7/2015	Annual	12/7/2016	1207364
Anritsu	MT8820C	Radio Communication Analyzer	7/24/2015	Annual	7/24/2016	6200901190
Anritsu	MT8820C	Radio Communication Analyzer	12/4/2015	Annual	12/4/2016	6201300731
Anritsu	MA24106A	USB Power Sensor	2/28/2016	Annual	2/28/2017	1344545
Anritsu	MA24106A	USB Power Sensor	3/28/2016	Annual	3/28/2017	1344554
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M15SA00-009
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194895
Control Company	4353	Long Stem Thermometer	1/22/2015	Biennial	1/22/2017	150053029
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261694
Gigatronics	80701A	(0.05-18GHz) Power Sensor	11/4/2015	Annual	11/4/2016	1833460
Gigatronics	8651A	Universal Power Meter	11/4/2015	Annual	11/4/2016	8650319
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	6/2/2016	Annual	6/2/2017	109892
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2015	Annual	10/13/2016	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	4/27/2016	Annual	4/27/2017	101699
Rohde & Schwarz	CMW500	Radio Communication Tester	10/21/2015	Annual	10/21/2016	102060
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
SPEAG	D750V3	750 MHz SAR Dipole	2/16/2016	Annual	2/16/2017	1046
SPEAG	D750V3	750 MHz SAR Dipole	3/16/2016	Annual	3/16/2017	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/14/2016	Annual	4/14/2017	4d119
SPEAG	D1765V2	1765 MHz SAR Dipole	5/11/2016	Annual	5/11/2017	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	4/12/2016	Annual	4/12/2017	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/14/2015	Annual	7/14/2016	5d149
SPEAG	D2300V2	2300 MHz SAR Dipole	1/14/2016	Annual	1/14/2017	1008
SPEAG	D2300V2	2300 MHz SAR Dipole	12/8/2015	Annual	12/8/2016	1064
SPEAG	D2450V2	2450 MHz SAR Dipole	2/18/2016	Annual	2/18/2017	882
SPEAG	D2600V2	2600 MHz SAR Dipole	10/21/2015	Annual	10/21/2016	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/25/2016	Annual	2/25/2017	1120
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/19/2016	Annual	2/19/2017	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2016	Annual	2/18/2017	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/16/2015	Annual	9/16/2016	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/27/2015	Annual	10/27/2016	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/14/2016	Annual	3/14/2017	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/14/2016	Annual	4/14/2017	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2015	Annual	11/11/2016	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/15/2016	Annual	1/15/2017	1466
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2016	Annual	5/10/2017	1070
SPEAG	ES3DV2	SAR Probe	8/26/2015	Annual	8/26/2016	3022
SPEAG	ES3DV3	SAR Probe	2/19/2016	Annual	2/19/2017	3318
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3319
SPEAG	ES3DV3	SAR Probe	10/29/2015	Annual	10/29/2016	3333
SPEAG	ES3DV3	SAR Probe	11/17/2015	Annual	11/17/2016	3334
SPEAG	EX3DV4	SAR Probe	2/22/2016	Annual	2/22/2017	3914
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7357
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7406

Note:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
2. Each equipment was used solely within its calibration period.

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12 MEASUREMENT UNCERTAINTIES

a	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System								
Probe Calibration	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	2.0	R	1.73	1.0	1.0	1.2	1.2	∞
Linearity	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	0.25	R	1.73	1.0	1.0	0.1	0.1	∞
Readout Electronics	0.3	N	1	1.0	1.0	0.3	0.3	∞
Response Time	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	6.7	R	1.73	1.0	1.0	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	2.7	N	1	1.0	1.0	2.7	2.7	35
Device Holder Uncertainty	1.67	N	1	1.0	1.0	1.7	1.7	5
Output Power Variation - SAR drift measurement	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
SAR Scaling	0.0	R	1.73	1.0	1.0	0.0	0.0	∞
Phantom & Tissue Parameters								
Phantom Uncertainty (Shape & Thickness tolerances)	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	4.2	N	1	0.78	0.71	3.3	3.0	10
Liquid Permittivity - measurement uncertainty	4.1	N	1	0.23	0.26	1.0	1.1	10
Liquid Conductivity - Temperature Uncertainty	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)		RSS				11.5	11.3	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				23.0	22.6	

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13 CONCLUSION

13.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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APPENDIX A: SAR TEST DATA

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PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

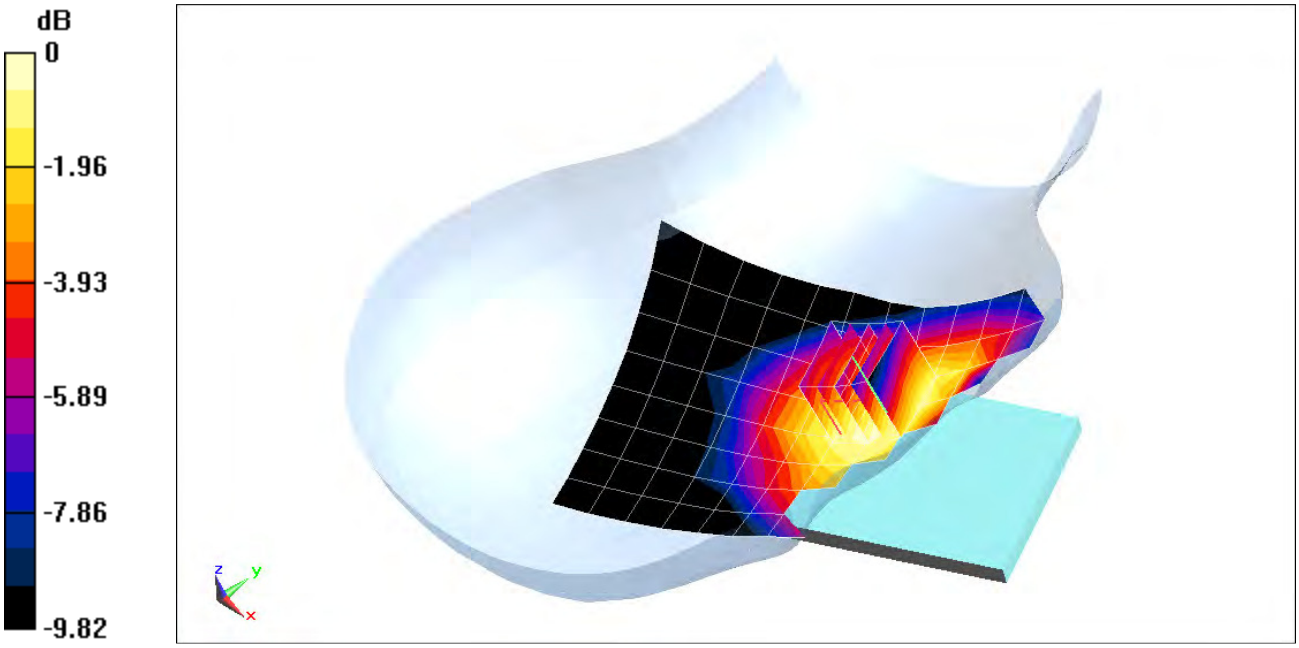
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.926 S/m; ε_r = 43.032; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 850, Right Head, Cheek, Mid.ch,
Cover Open

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.32 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.157 W/kg
SAR(1 g) = 0.132 W/kg



0 dB = 0.141 W/kg = -8.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

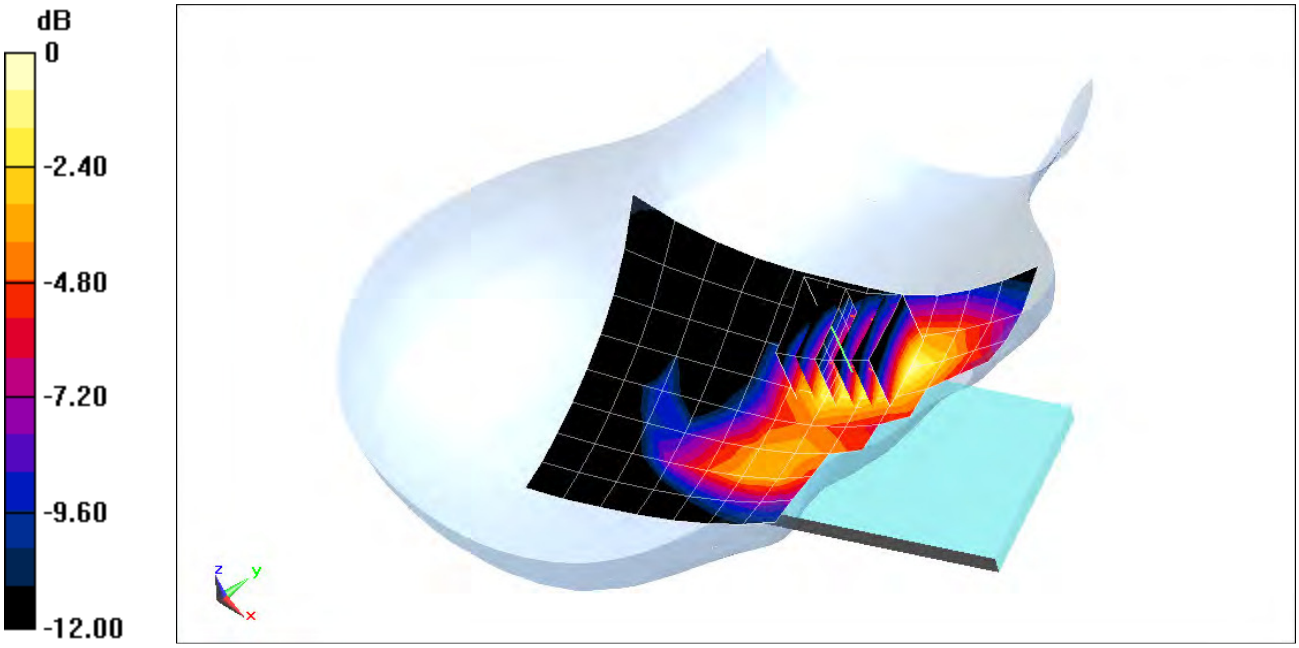
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.398 S/m; ε_r = 39.087; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-03-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 1900, Right Head, Cheek, Mid.ch,
Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.624 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.0880 W/kg
SAR(1 g) = 0.056 W/kg



0 dB = 0.0651 W/kg = -11.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

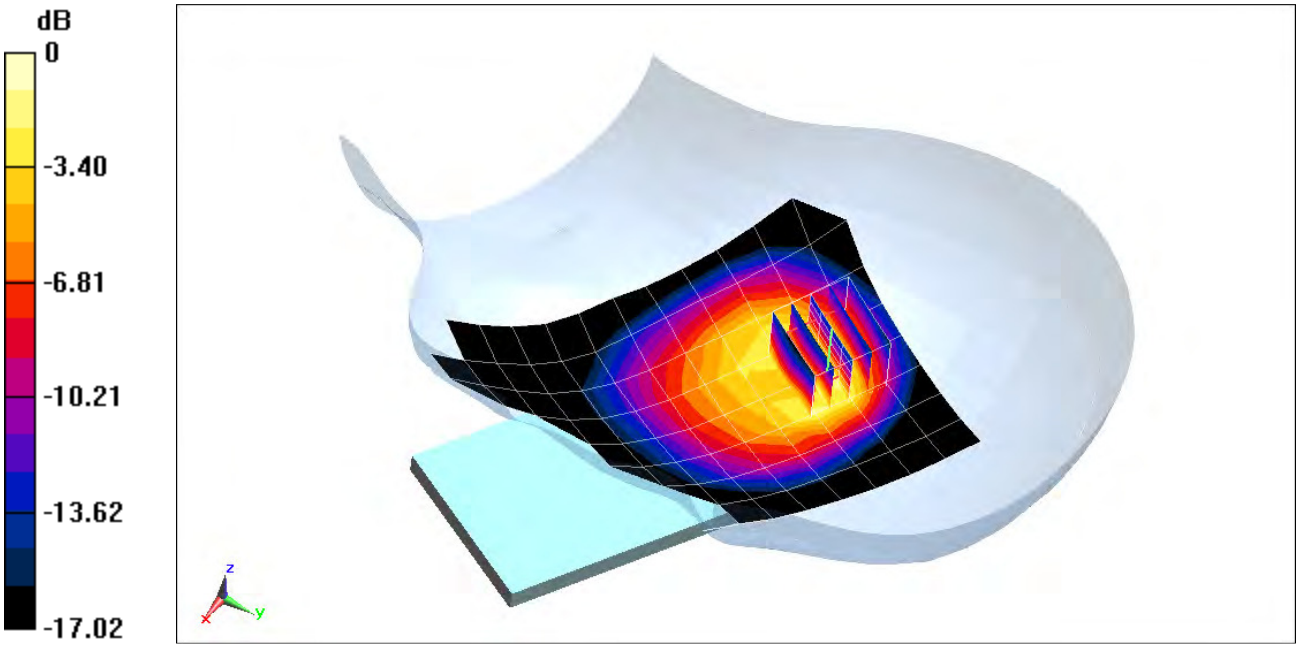
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.926 S/m; ε_r = 43.032; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Ant B, Left Head, Cheek, Mid.ch,
Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.95 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.705 W/kg
SAR(1 g) = 0.349 W/kg



0 dB = 0.452 W/kg = -3.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

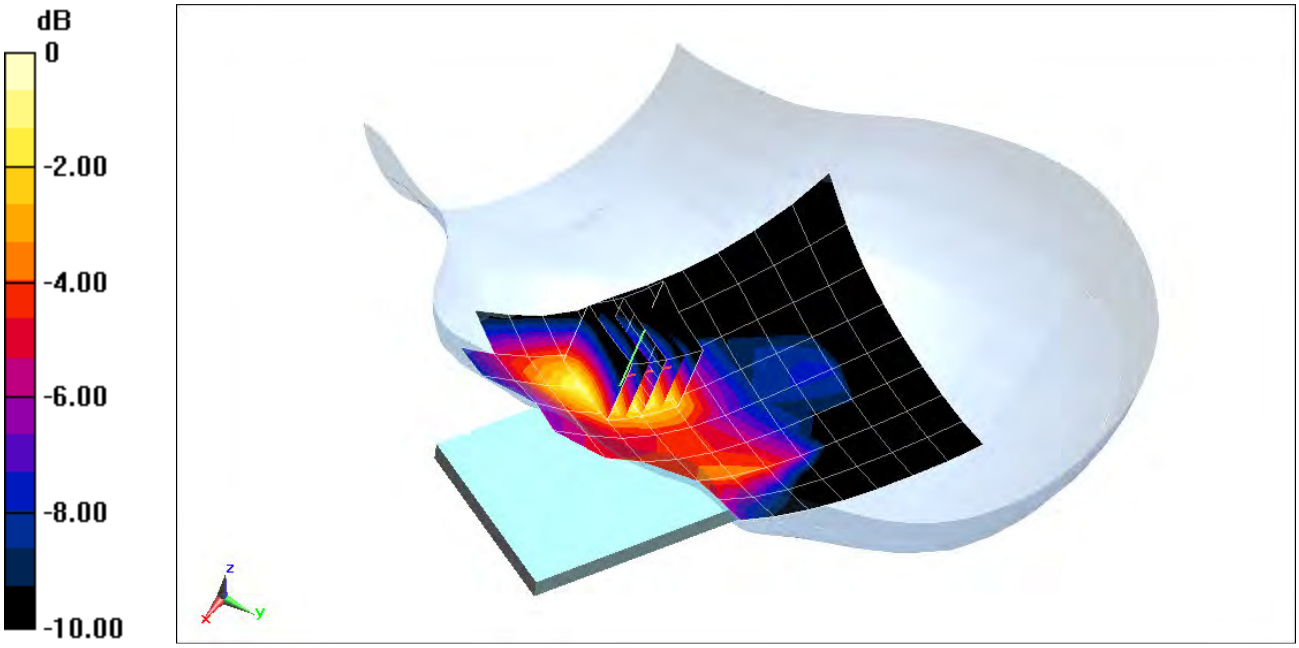
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.342 S/m; ε_r = 39.14; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-06-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Left Head, Cheek, Mid.ch,
Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.54 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.203 W/kg
SAR(1 g) = 0.135 W/kg



0 dB = 0.181 W/kg = -7.42 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

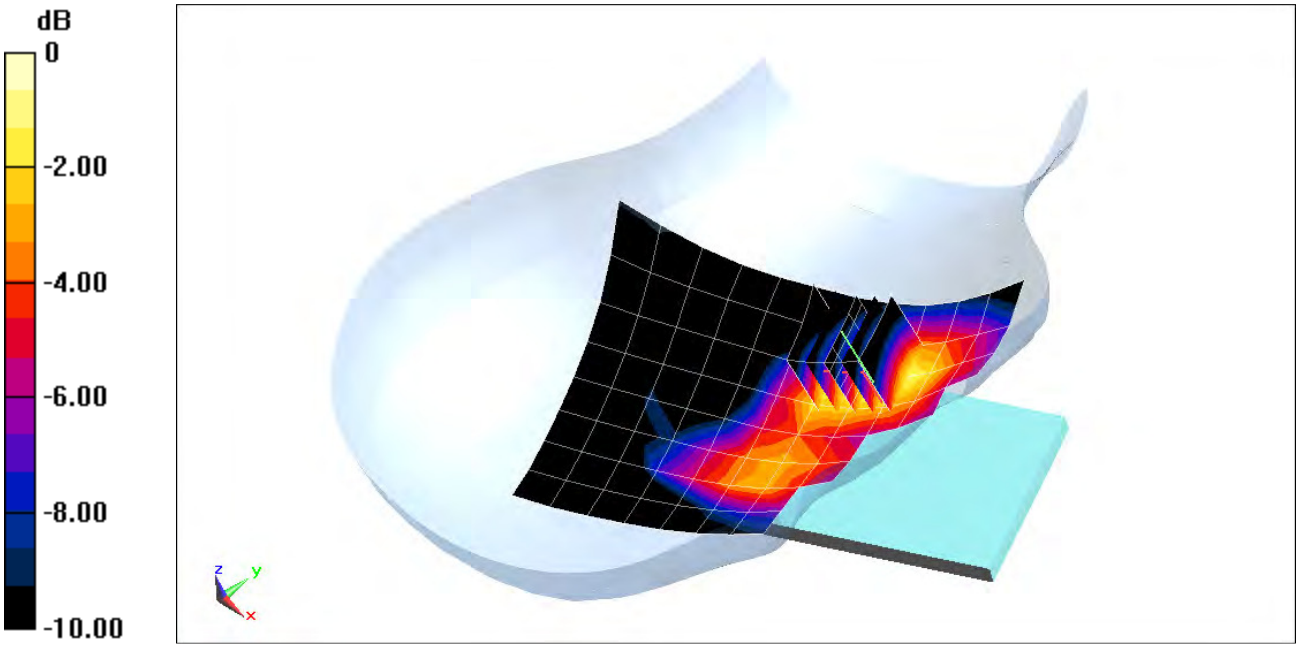
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.398 S/m; ε_r = 39.087; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-03-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Right Head, Cheek, Mid.ch,
Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.793 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.120 W/kg



0 dB = 0.140 W/kg = -8.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

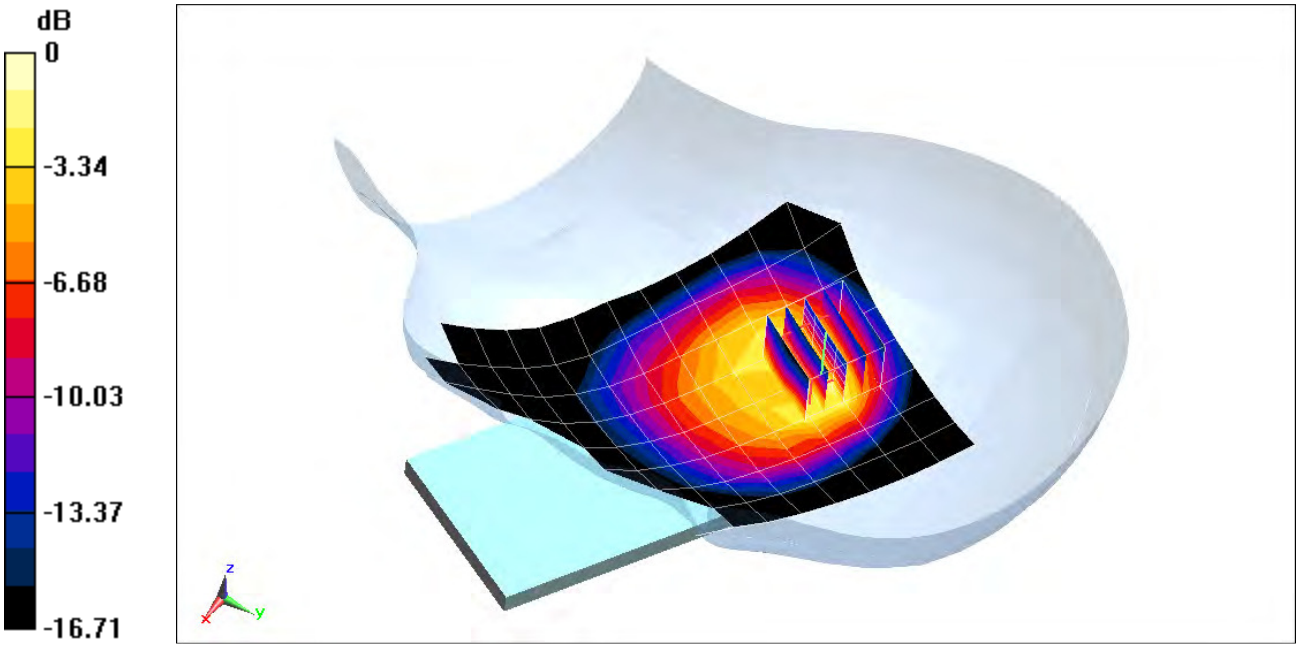
Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.911 S/m; ε_r = 43.216; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA BC10, Rule Part 90S, Ant B, Left Head, Cheek, Mid.ch, Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.06 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.822 W/kg
SAR(1 g) = 0.414 W/kg



0 dB = 0.538 W/kg = -2.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

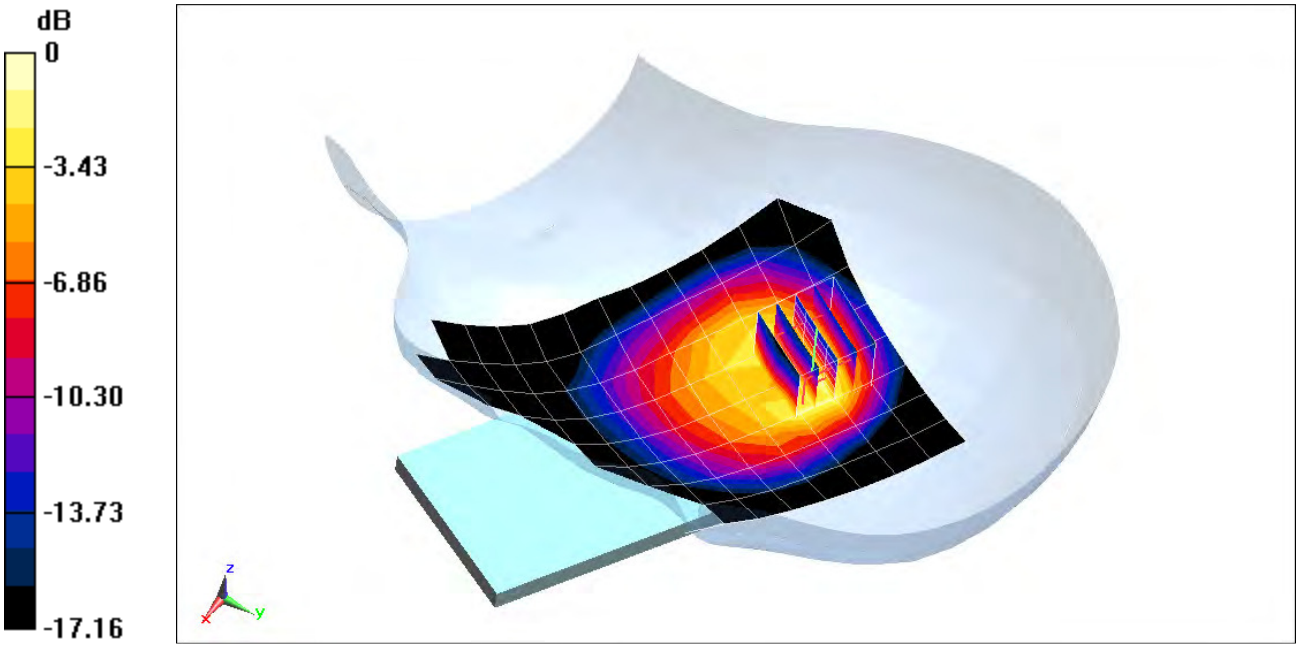
Communication System: UID 0, Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.926 S/m; ε_r = 43.033; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO Rev A BC0, Rule Part 22H, Ant B, Left Head, Cheek, Mid.ch, Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.98 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.773 W/kg
SAR(1 g) = 0.383 W/kg



0 dB = 0.499 W/kg = -3.02 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

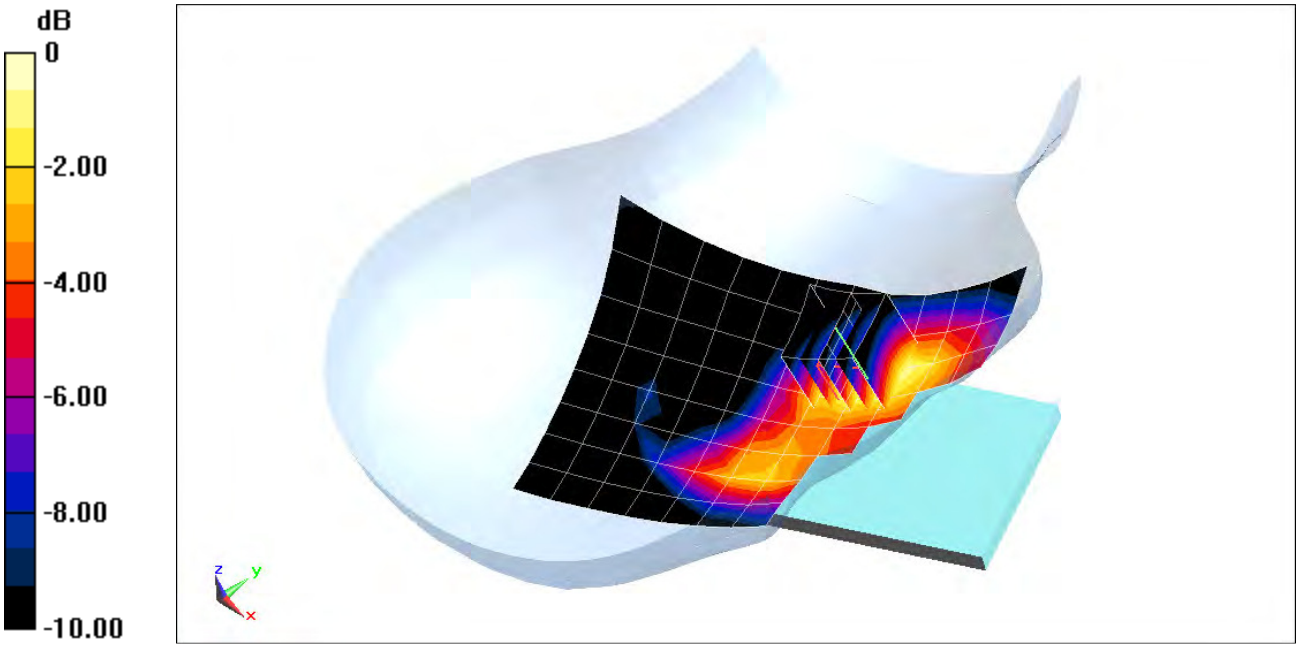
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.409 S/m; ε_r = 38.681; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-08-2016; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7406; ConvF(8.22, 8.22, 8.22); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO Rev A, Right Head, Cheek, Mid.ch, Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.35 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.137 W/kg



0 dB = 0.183 W/kg = -7.38 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

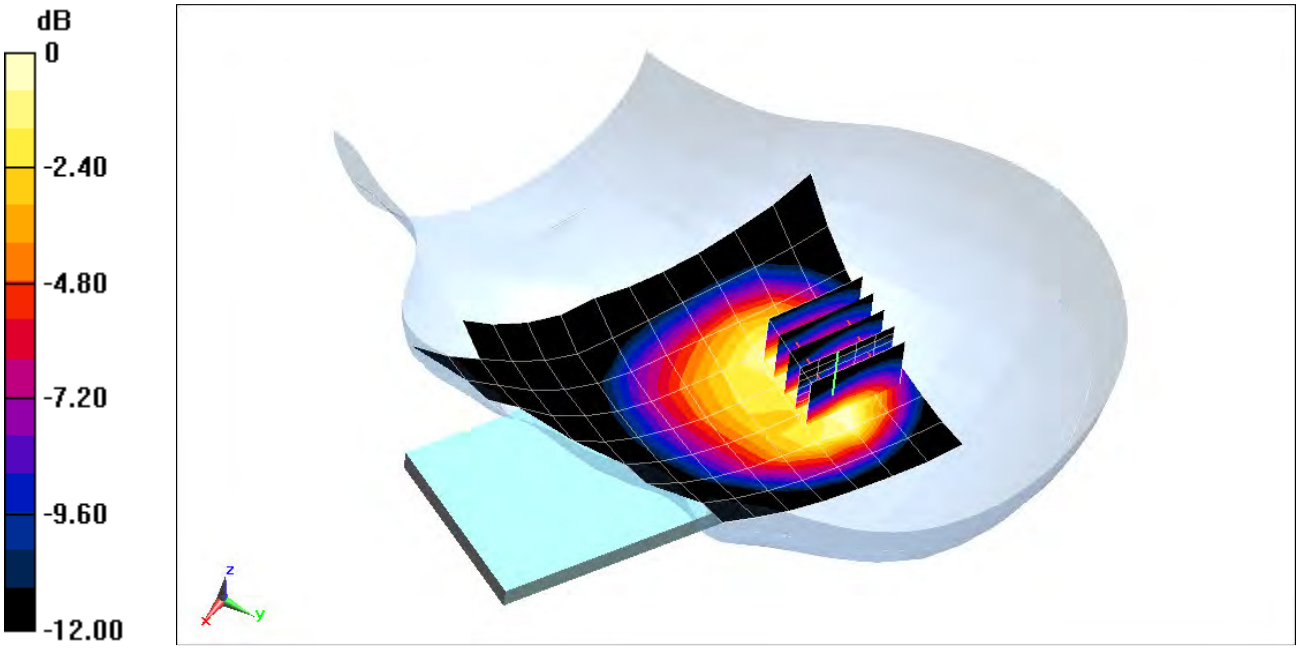
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.857 S/m; ε_r = 41.913; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant B, Left Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 25 RB, 12 RB Offset, Cover Open

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.36 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.665 W/kg
SAR(1 g) = 0.360 W/kg



0 dB = 0.452 W/kg = -3.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05862

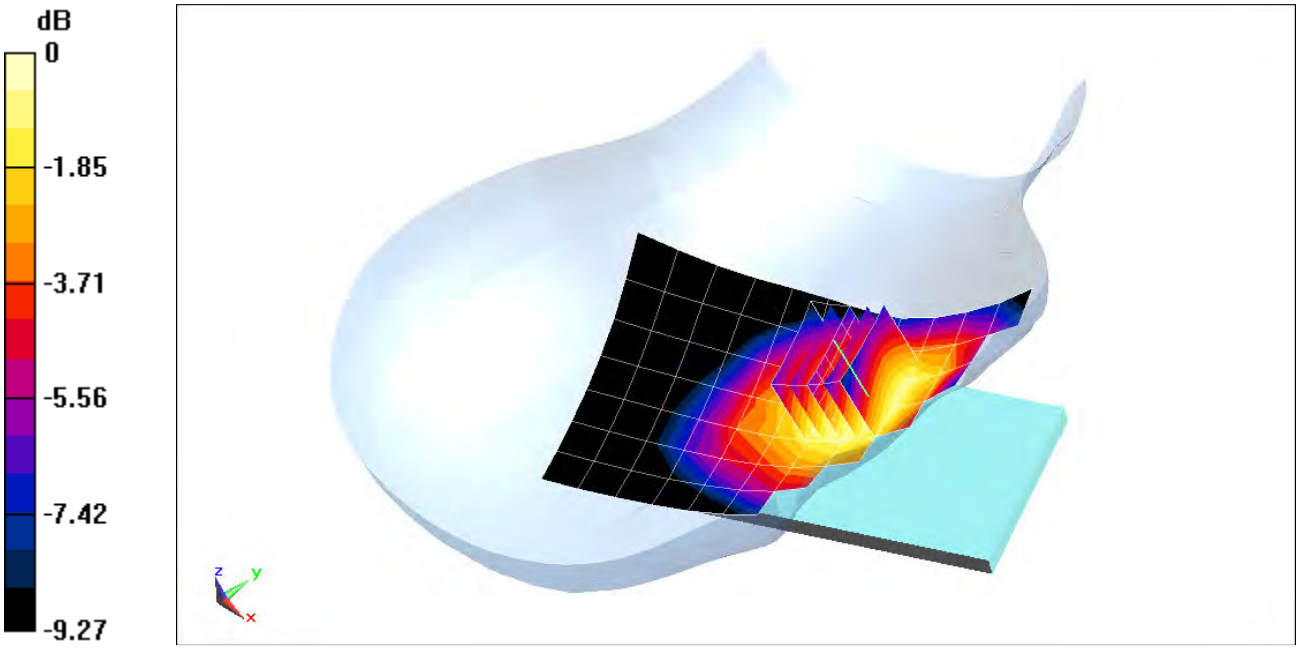
Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used:
f = 710 MHz; σ = 0.859 S/m; ε_r = 41.886; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 17, Right Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset, Cover Open

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.88 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.152 W/kg
SAR(1 g) = 0.125 W/kg



0 dB = 0.134 W/kg = -8.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

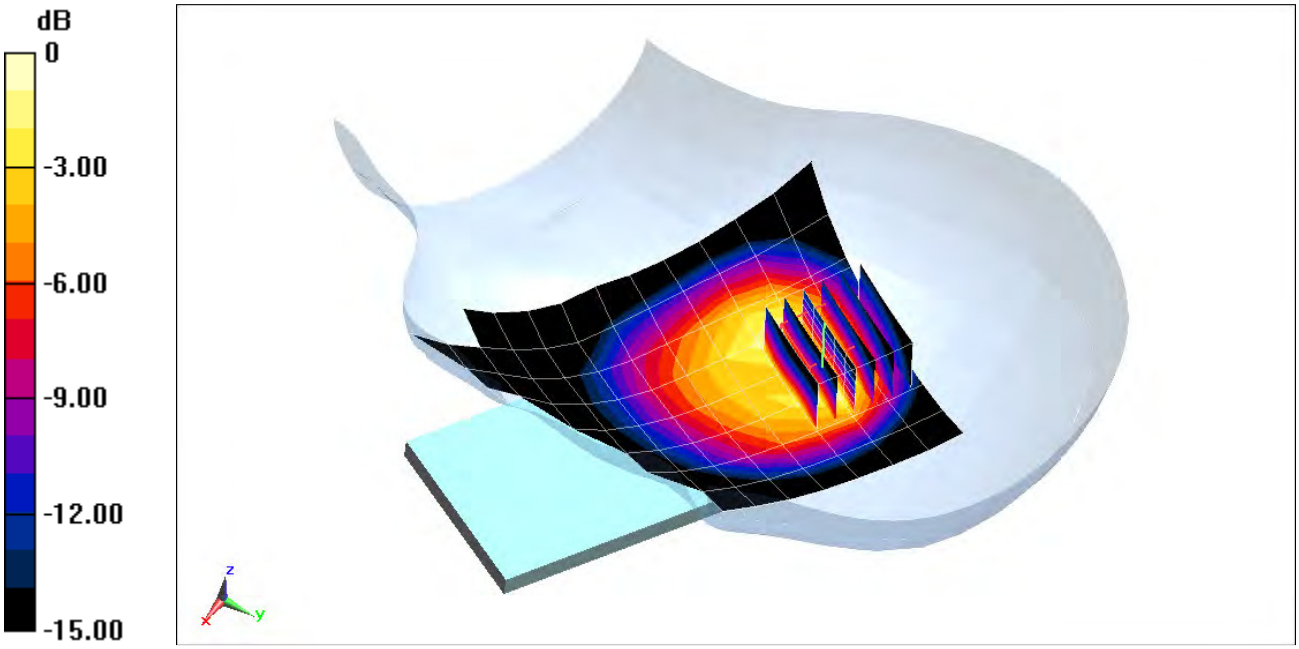
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.922 S/m; ε_r = 40.895; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Ant B, Left Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset, Cover Open

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.96 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.684 W/kg
SAR(1 g) = 0.348 W/kg



0 dB = 0.458 W/kg = -3.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BF6

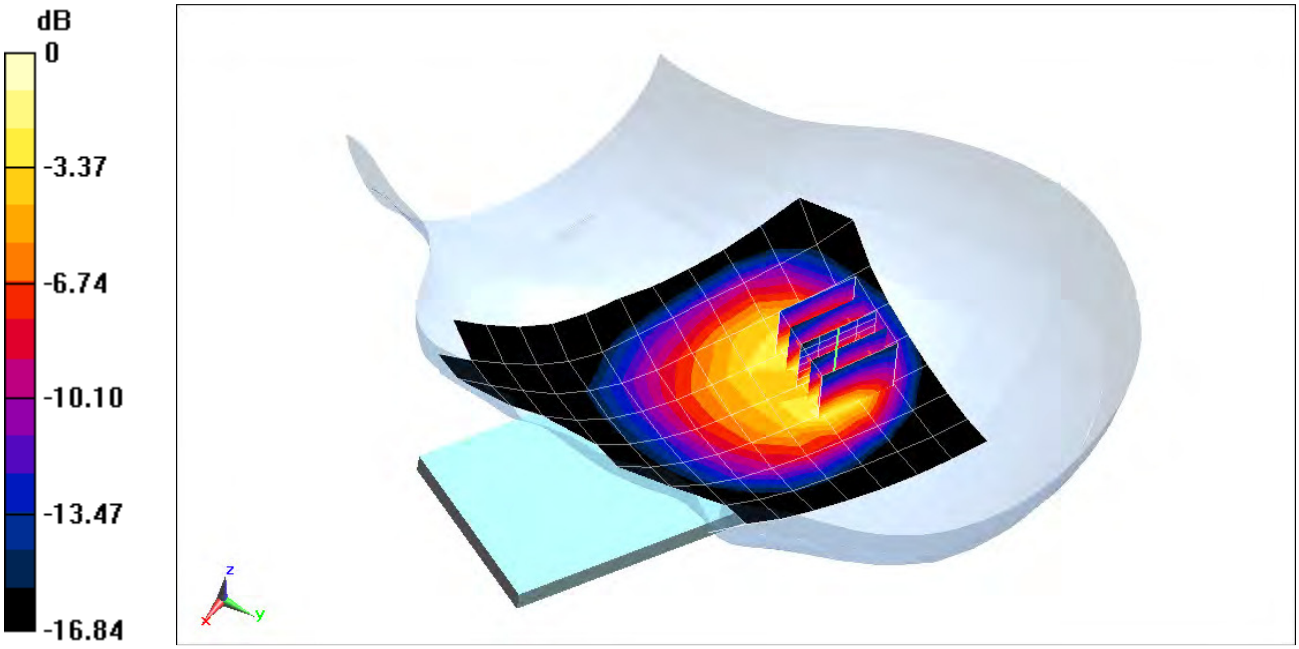
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.922 S/m; ε_r = 43.089; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Ant B, Left Head, Cheek, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset, Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.76 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.846 W/kg
SAR(1 g) = 0.418 W/kg



0 dB = 0.533 W/kg = -2.73 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

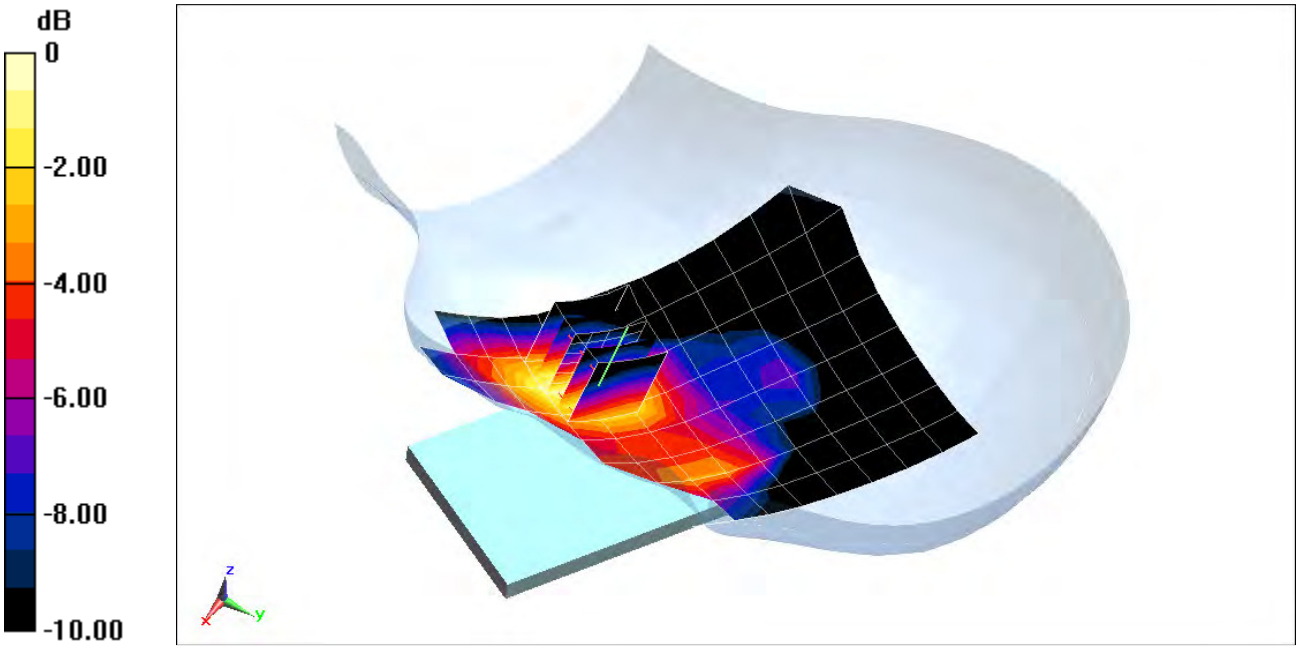
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.342 S/m; ε_r = 39.139; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-06-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Open

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.87 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.160 W/kg



0 dB = 0.209 W/kg = -6.80 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

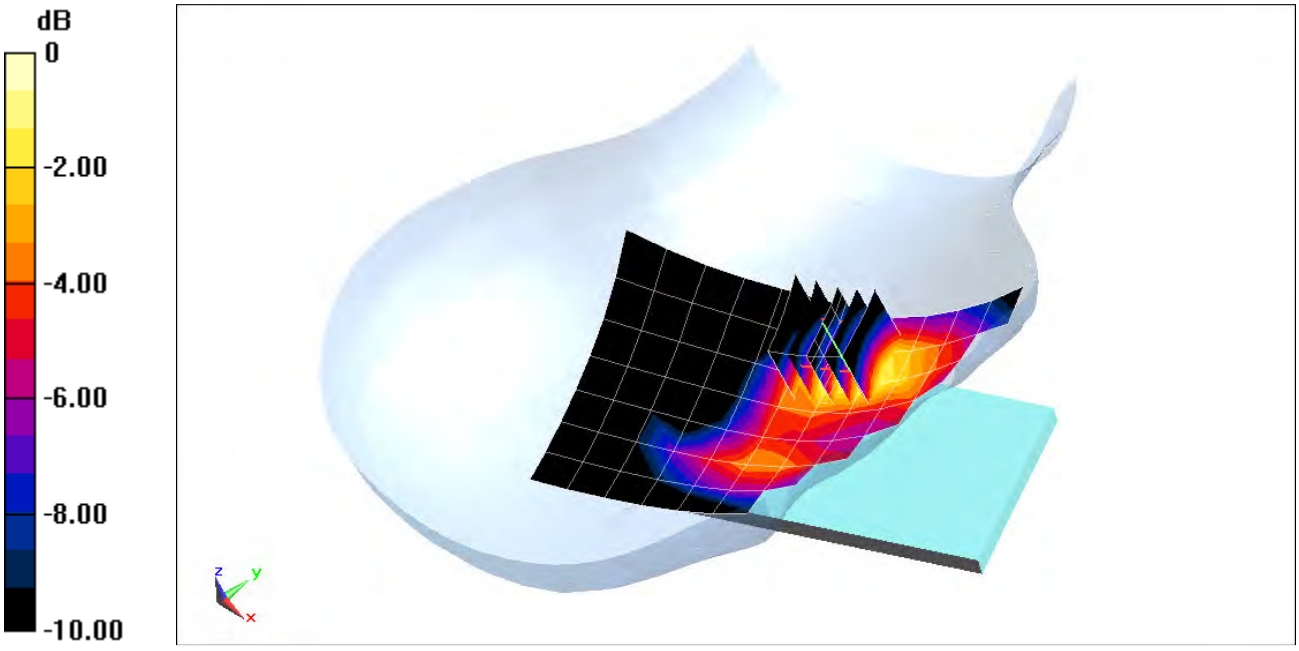
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.429 S/m; ε_r = 39.016; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-03-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Right Head, Cheek, High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Open

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.43 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.143 W/kg



0 dB = 0.173 W/kg = -7.62 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

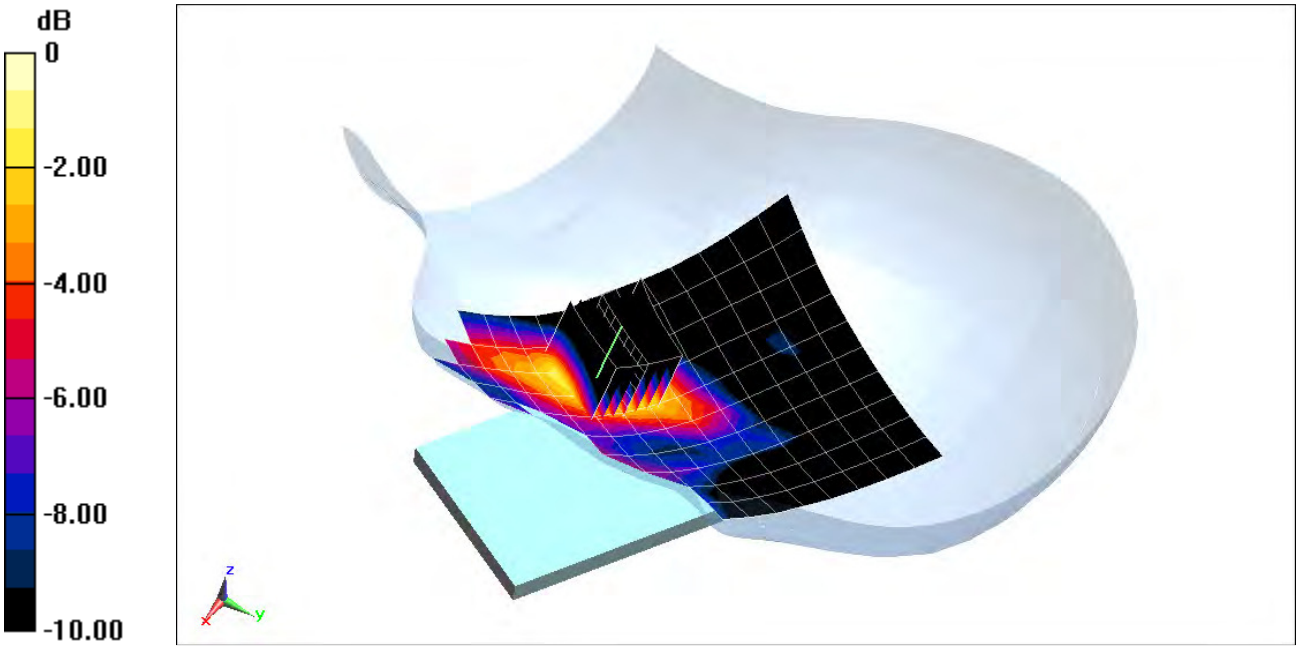
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Head Medium parameters used:
f = 2310 MHz; σ = 1.667 S/m; ε_r = 41.363; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.63, 4.63, 4.63); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 30, Left Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Open

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.42 V/m; Power Drift = -0.21 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.163 W/kg



0 dB = 0.198 W/kg = -7.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

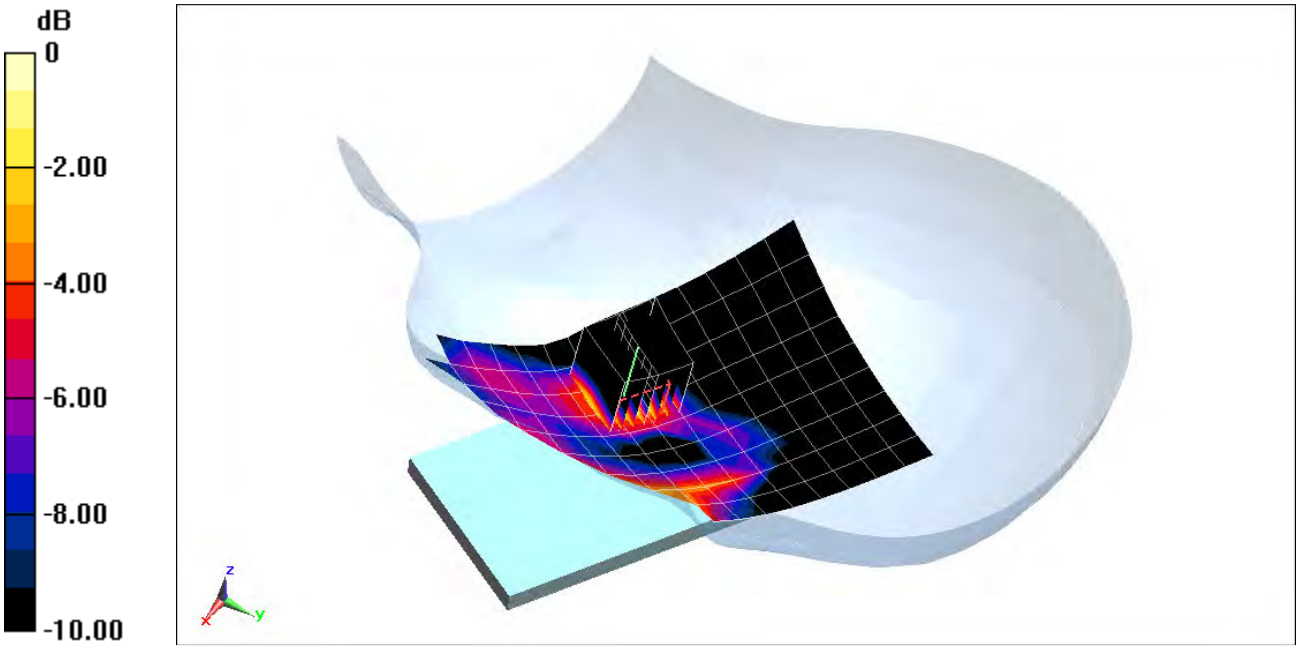
Communication System: UID 0, LTE Band 41; Frequency: 2636.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Head Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 2.047 S/m; ε_r = 40.095; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.12, 4.12, 4.12); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Left Head, Cheek, Mid-High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Open

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.751 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.123 W/kg
SAR(1 g) = 0.066 W/kg



0 dB = 0.0848 W/kg = -10.72 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

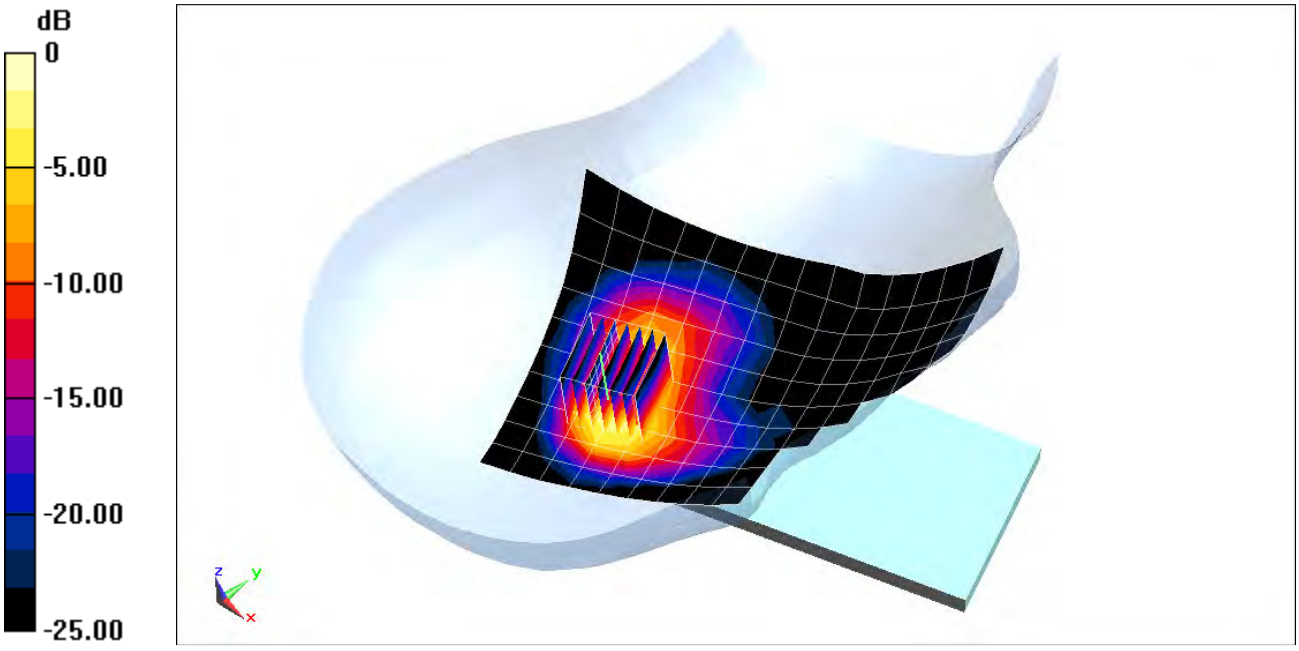
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.789 S/m; ε_r = 40.983; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Antenna 2, 22 MHz Bandwidth, Right Head, Tilt, Ch 01, 1 Mbps, Cover Open

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.42 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.567 W/kg



0 dB = 0.792 W/kg = -1.01 dBW/kg

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

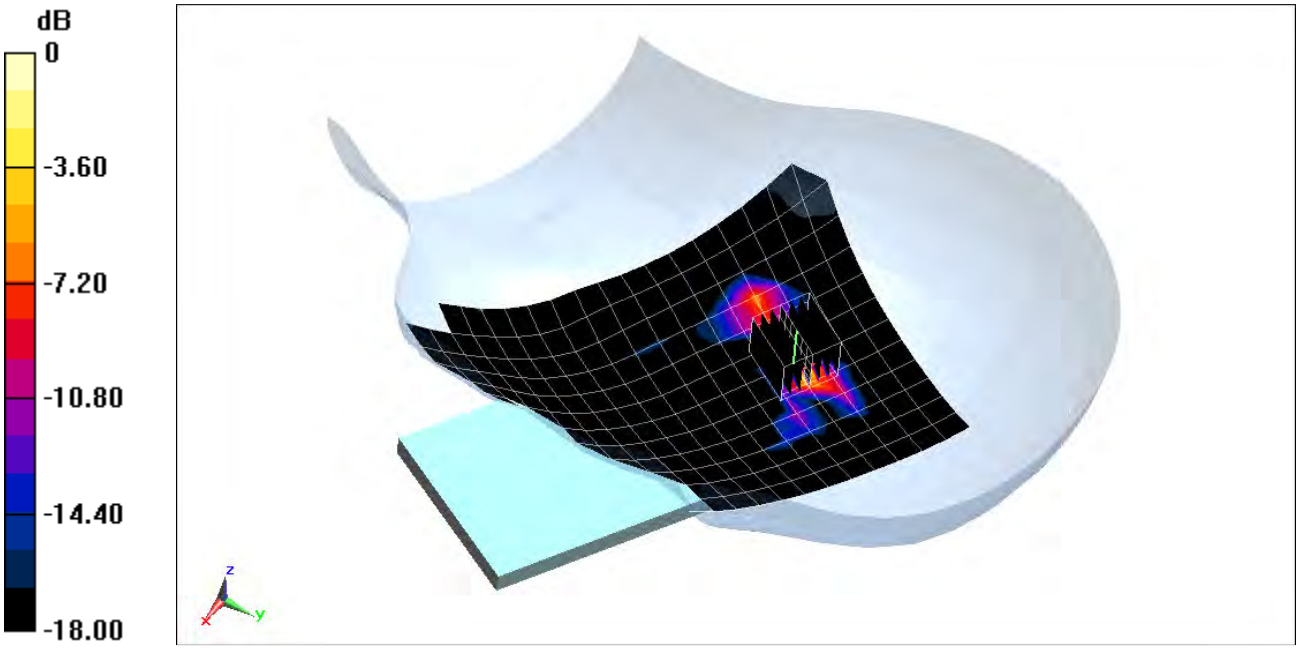
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5745 MHz; σ = 5.141 S/m; ε_r = 34.401; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-06-2016; Ambient Temp: 20.5°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7357; ConvF(4.65, 4.65, 4.65); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, U-NII-3, Antenna 1, 20 MHz Bandwidth, Left Head, Cheek, Ch 149, 6 Mbps, Cover Open

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 7.608 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.235 W/kg



0 dB = 0.730 W/kg = -1.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

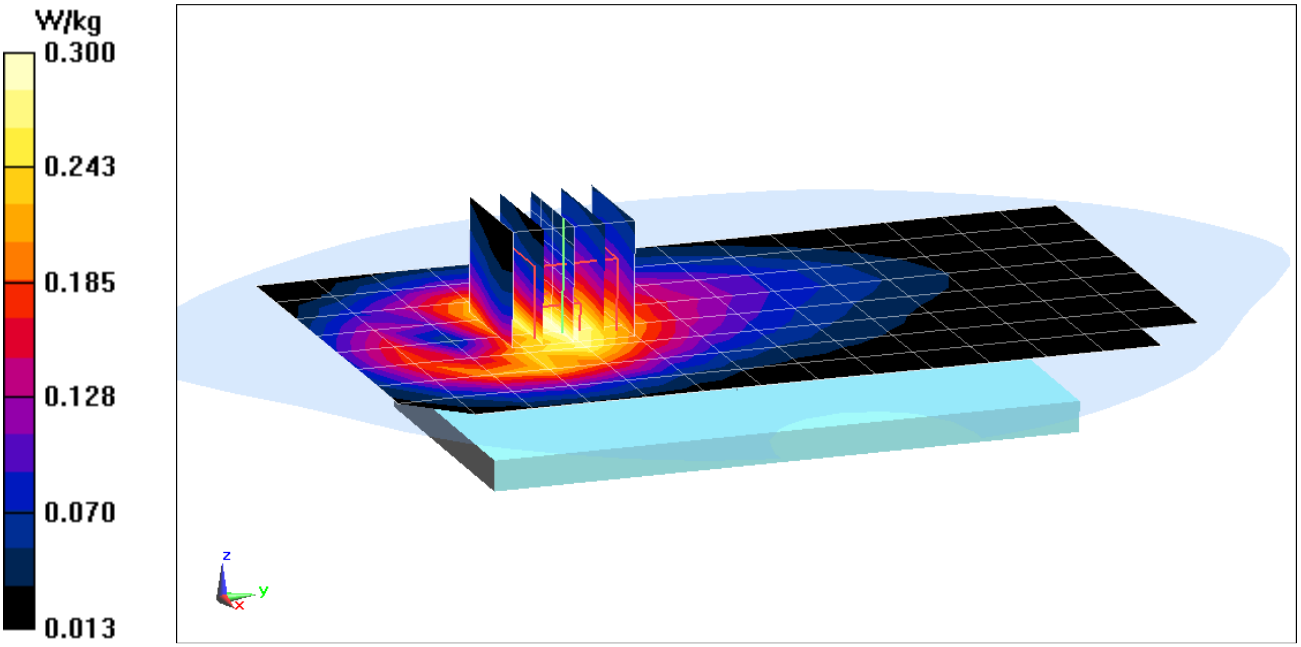
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1 S/m; ε_r = 53.045; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 850, Body SAR, Back Side, Mid.ch,
Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.06 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.368 W/kg
SAR(1 g) = 0.266 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

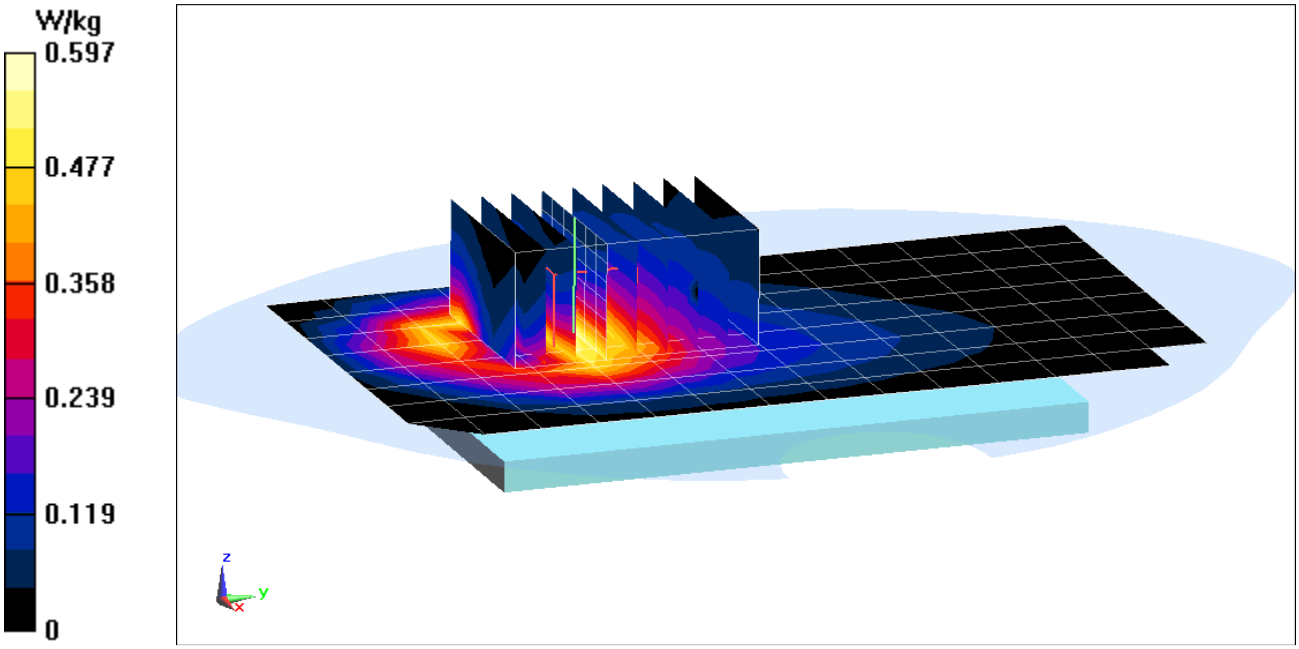
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1 S/m; ε_r = 53.045; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Body SAR, Front Side, Mid.ch, 3 Tx Slots, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.18 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.778 W/kg
SAR(1 g) = 0.513 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

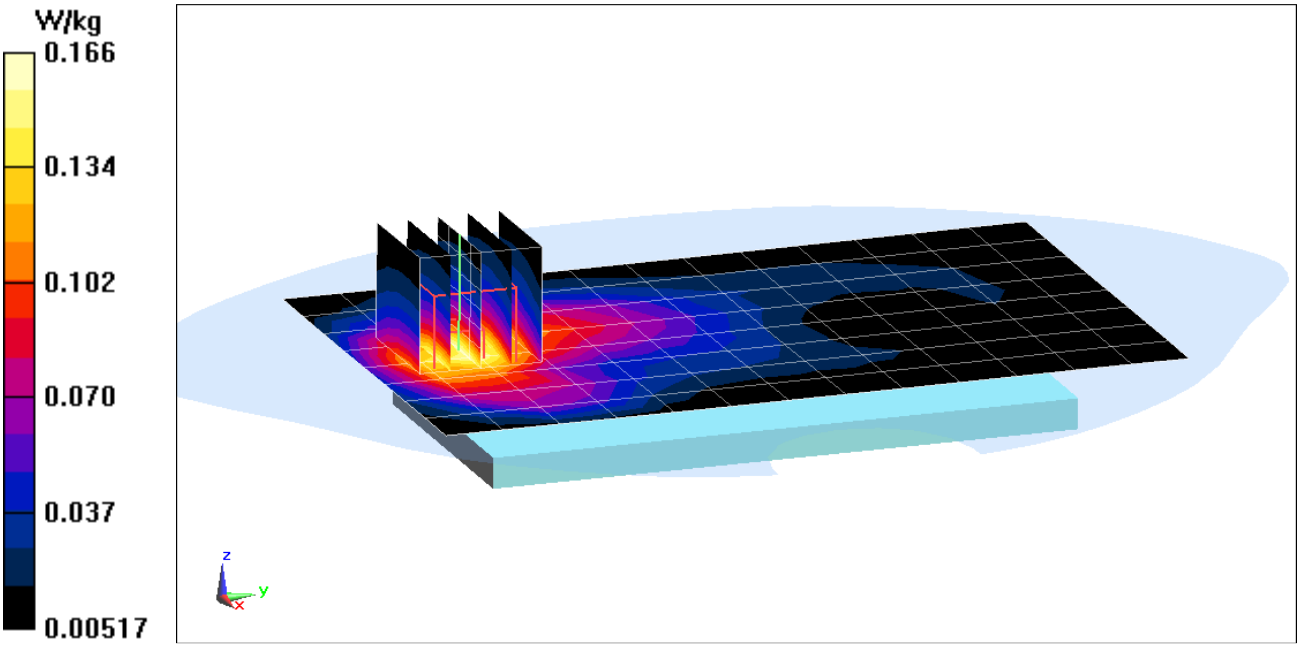
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 1900, Body SAR, Back Side, Mid.ch,
Cover Closed

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.12 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.220 W/kg
SAR(1 g) = 0.142 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

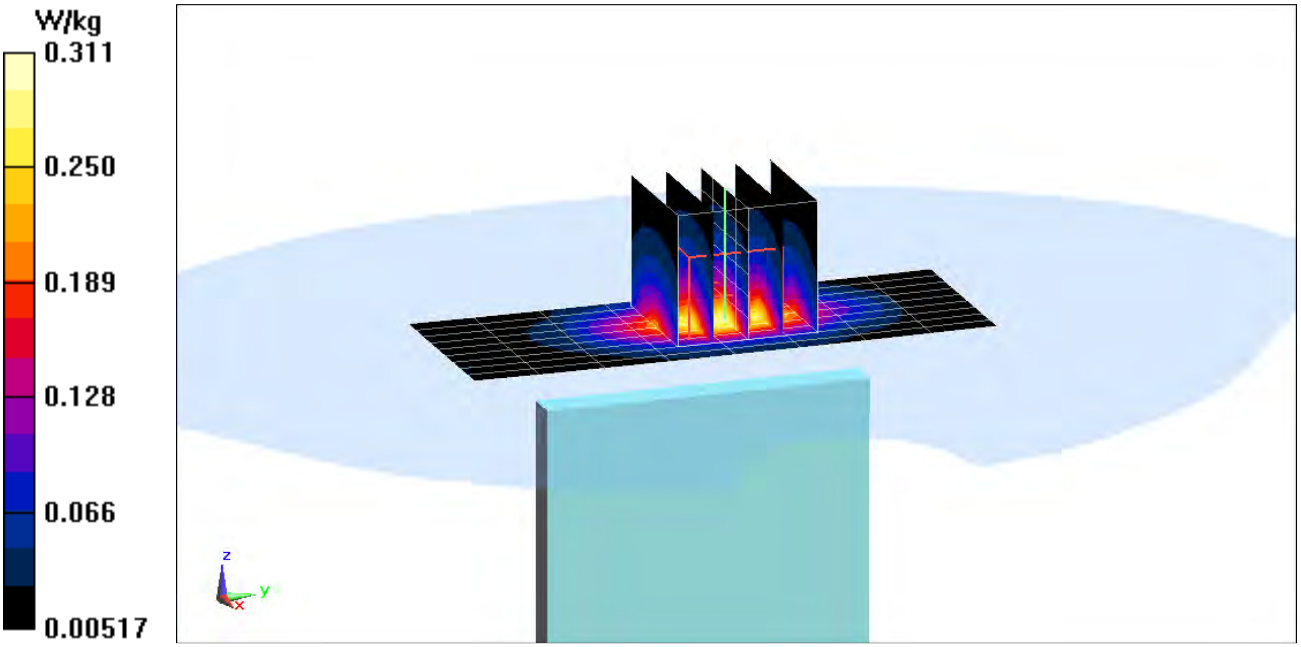
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Body SAR, Bottom Edge, Mid.ch, 3 Tx Slots, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.79 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.425 W/kg
SAR(1 g) = 0.253 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

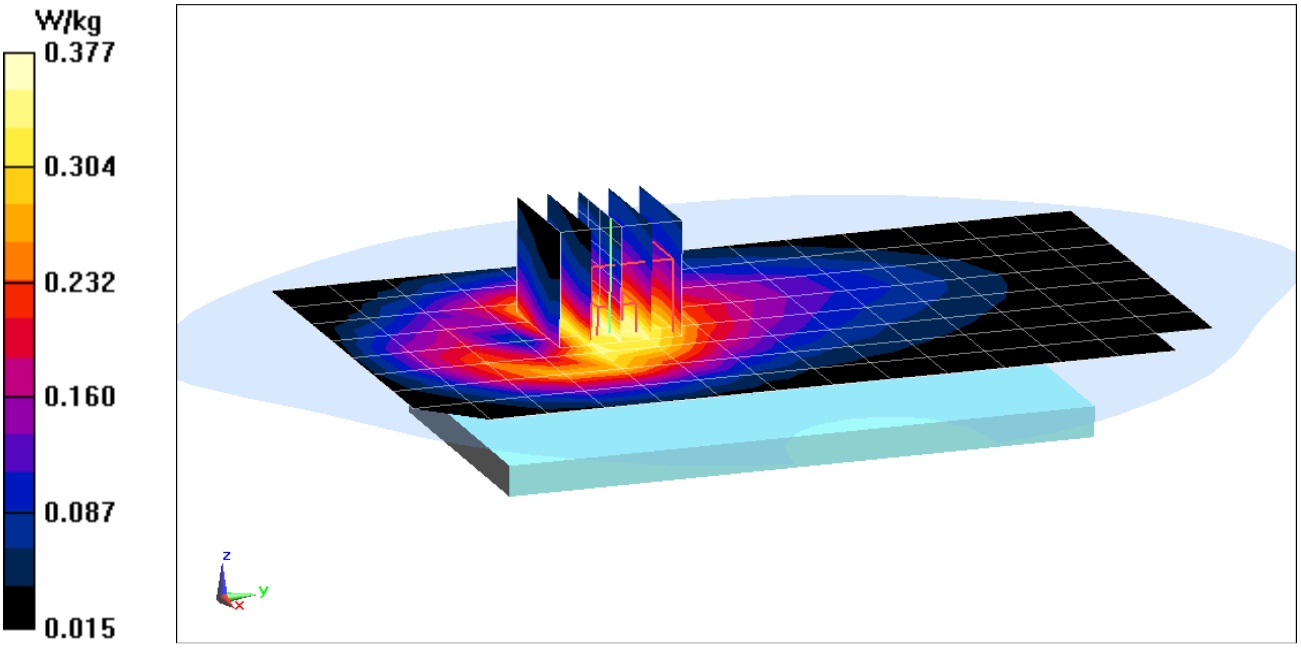
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1 S/m; ε_r = 53.045; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Ant A, Body SAR, Back Side, Mid.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.08 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.464 W/kg
SAR(1 g) = 0.332 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

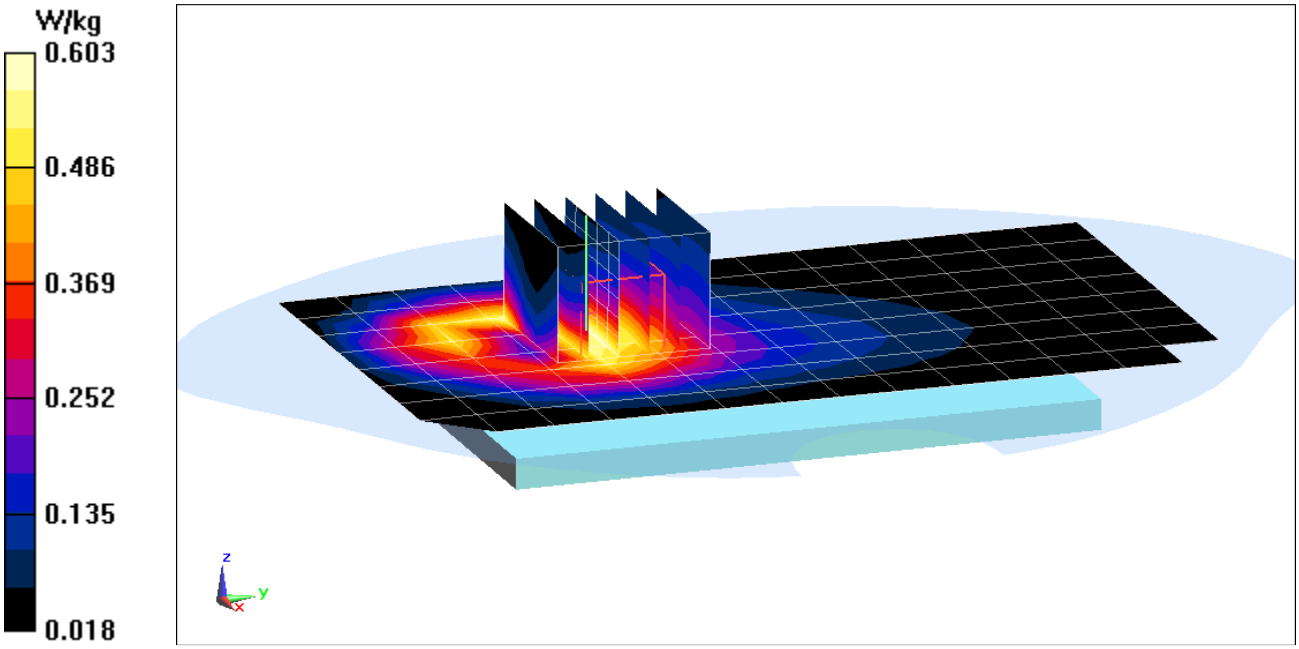
Communication System: UID 0, UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 846.6 MHz; σ = 1.01 S/m; ε_r = 52.931; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Ant A, Body SAR, Front Side, High.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.88 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.780 W/kg
SAR(1 g) = 0.522 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

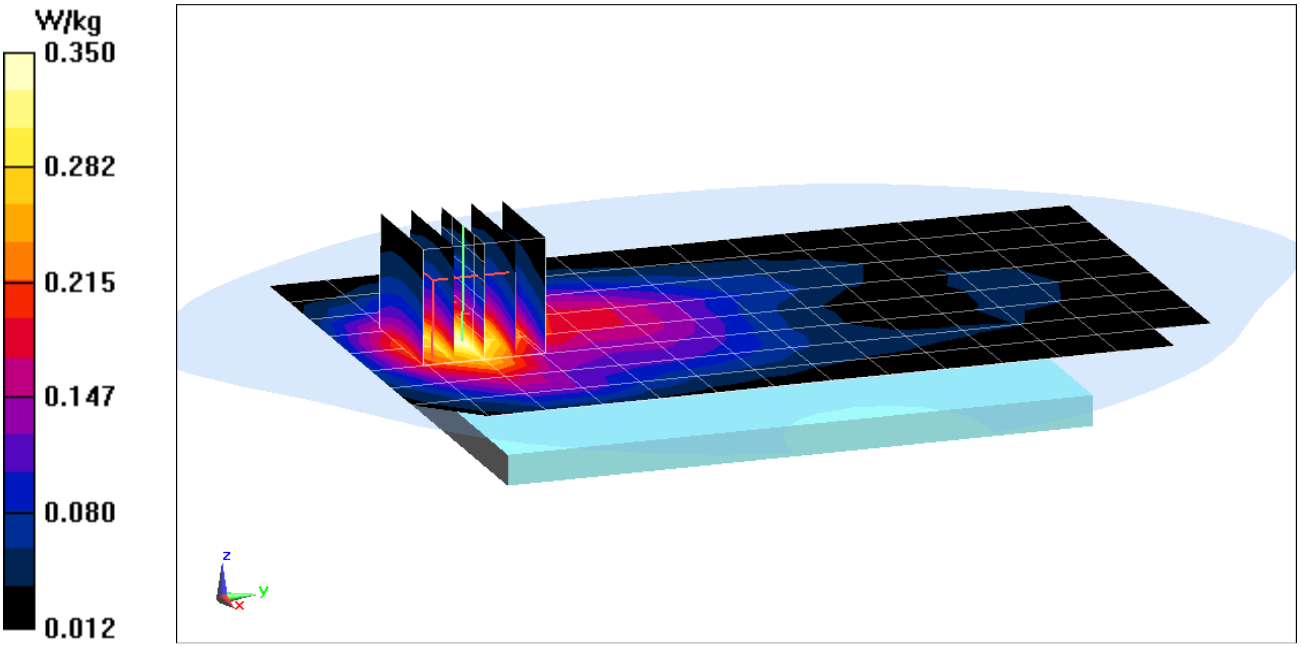
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.478 S/m; ε_r = 52.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Back Side, Mid.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.89 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.401 W/kg
SAR(1 g) = 0.256 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

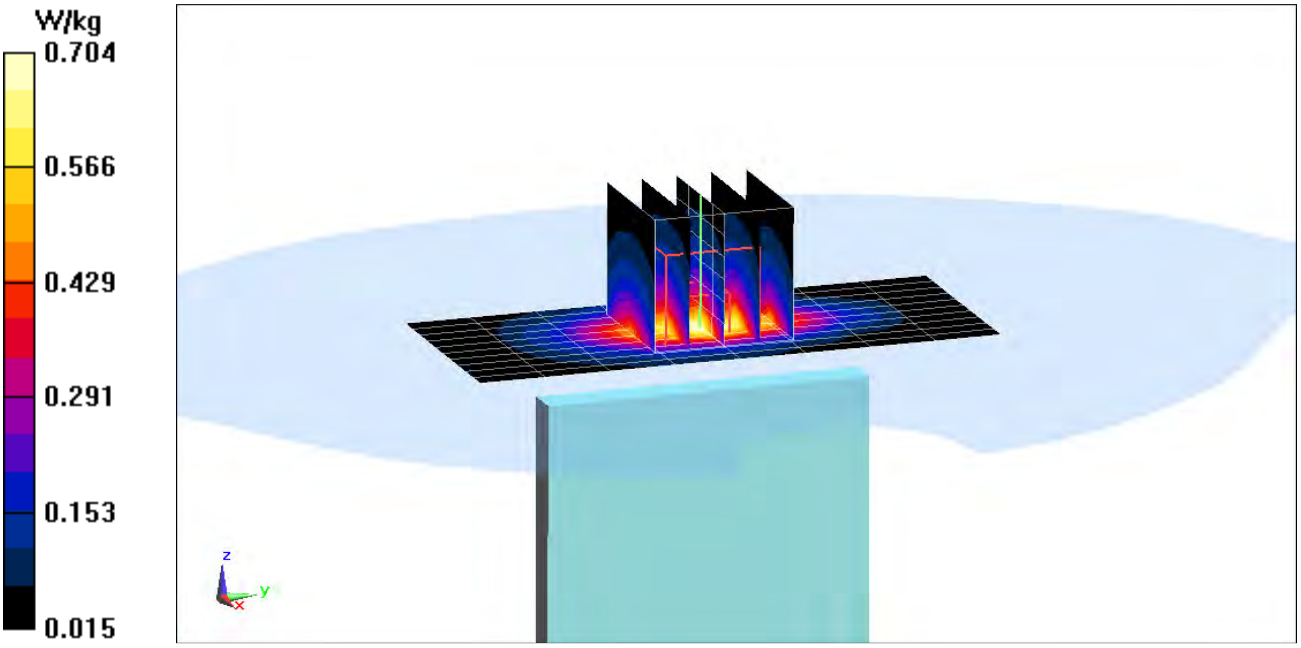
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.478 S/m; ε_r = 52.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Bottom Edge, Mid.ch, Cover Closed

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.64 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.820 W/kg
SAR(1 g) = 0.487 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

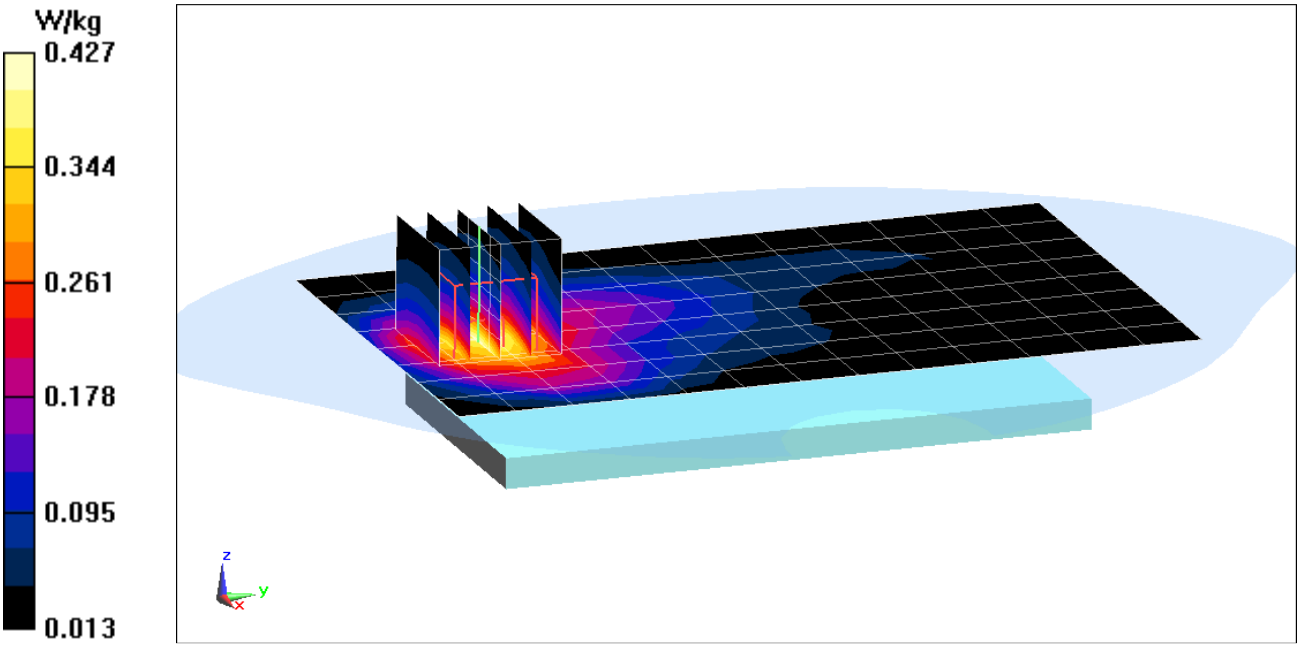
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Body SAR, Back Side, Mid.ch, Cover Closed

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.21 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.565 W/kg
SAR(1 g) = 0.360 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

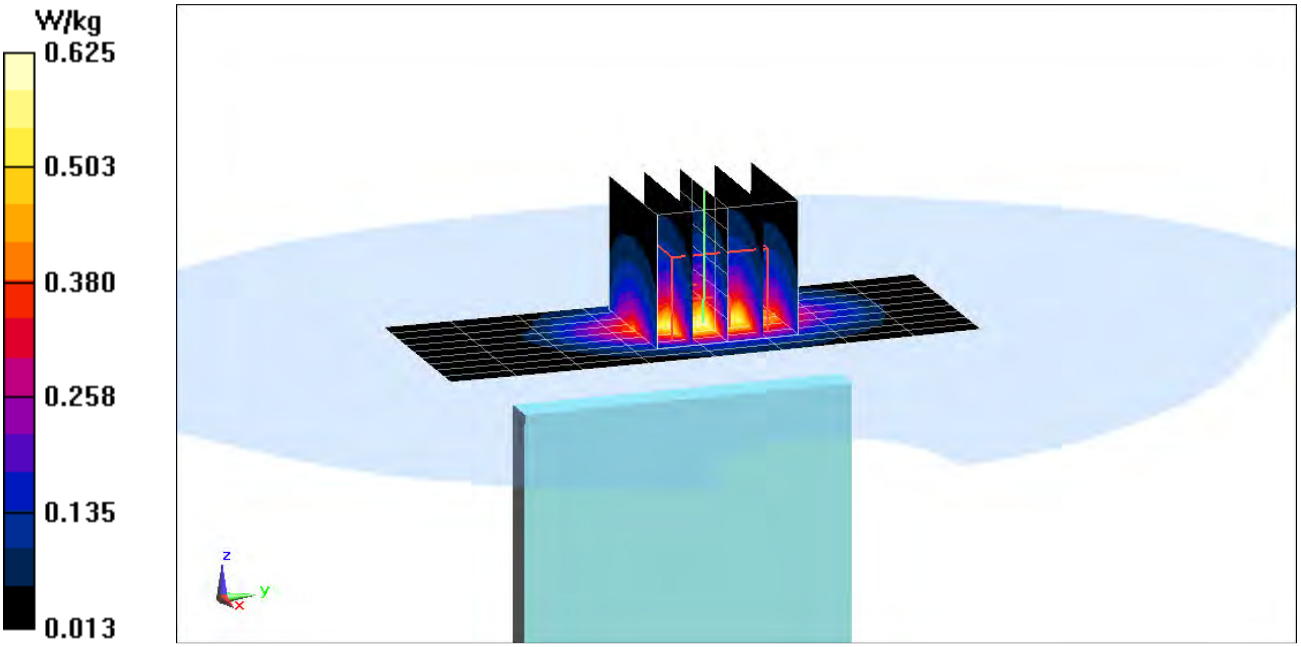
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Body SAR, Bottom Edge, Mid.ch, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.44 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.856 W/kg
SAR(1 g) = 0.507 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

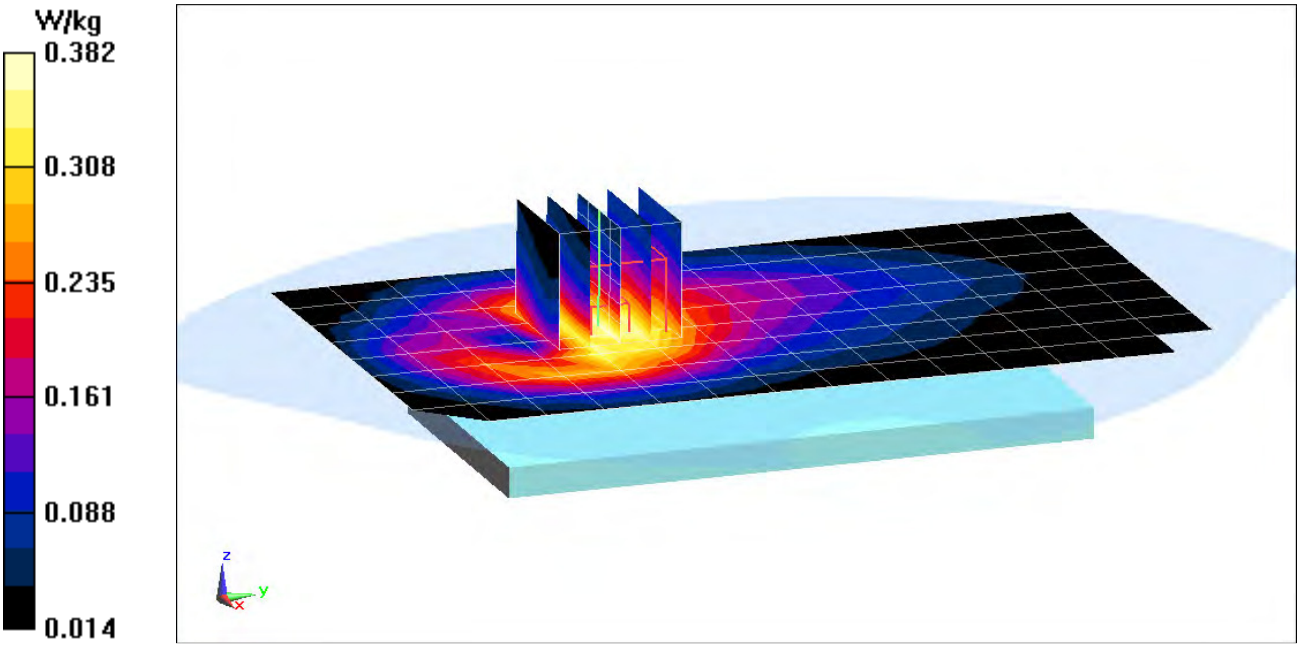
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 S/m; ε_r = 53.236; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA BC10, Rule Part 90S, Ant A, Body SAR, Back Side, Mid.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.36 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.467 W/kg
SAR(1 g) = 0.338 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

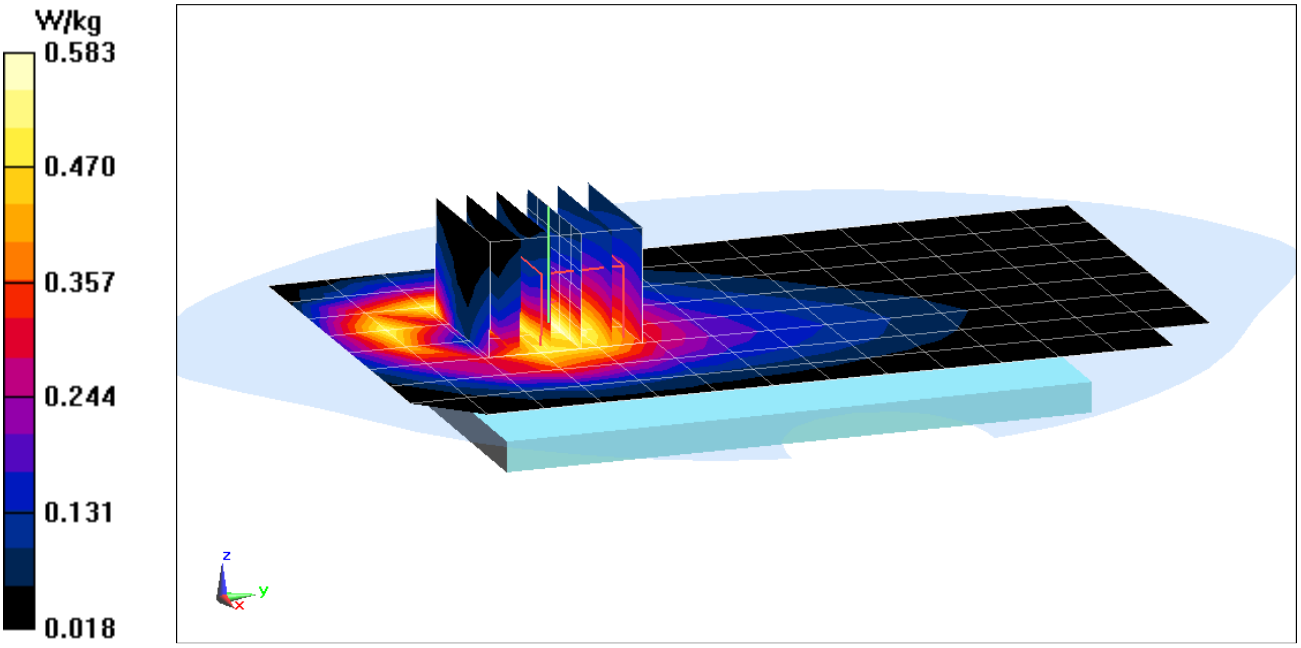
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 S/m; ε_r = 53.236; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO BC10, Rule Part 90S, Ant A, Body SAR, Front Side, Mid.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.80 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.763 W/kg
SAR(1 g) = 0.511 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

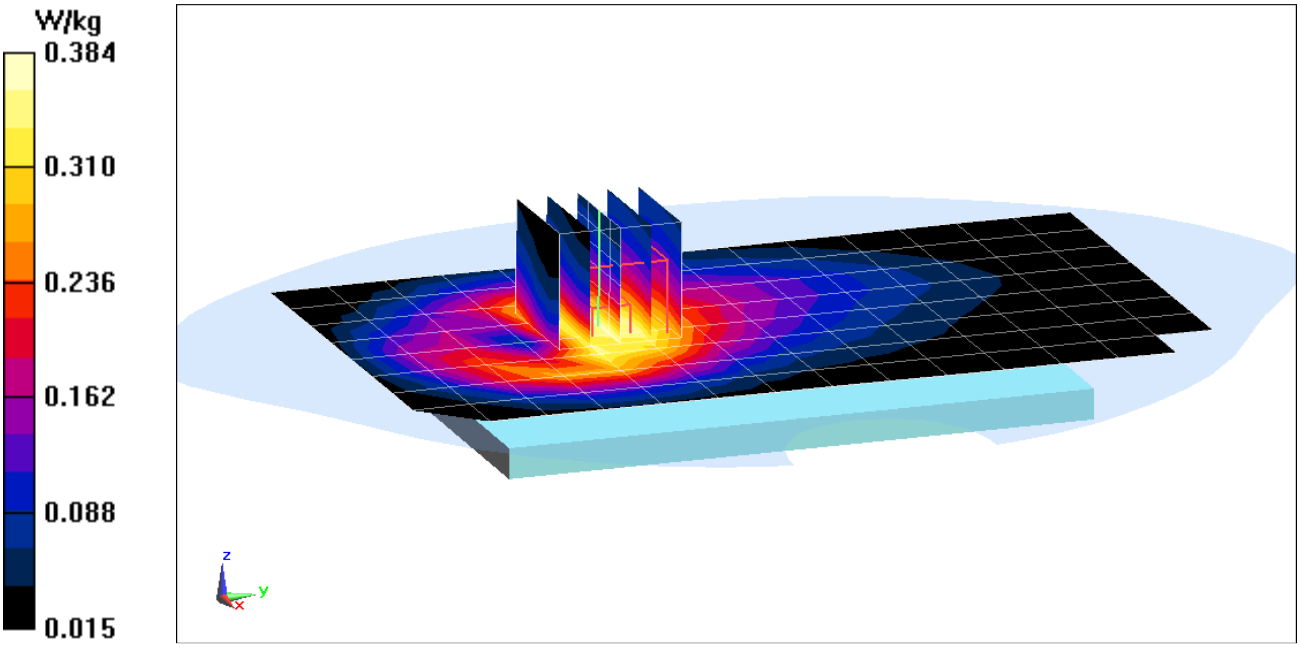
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 1 S/m; ε_r = 53.046; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA BC0, Rule Part 22H, Ant A, Body SAR, Back Side, Mid.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.18 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.472 W/kg
SAR(1 g) = 0.338 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BCE

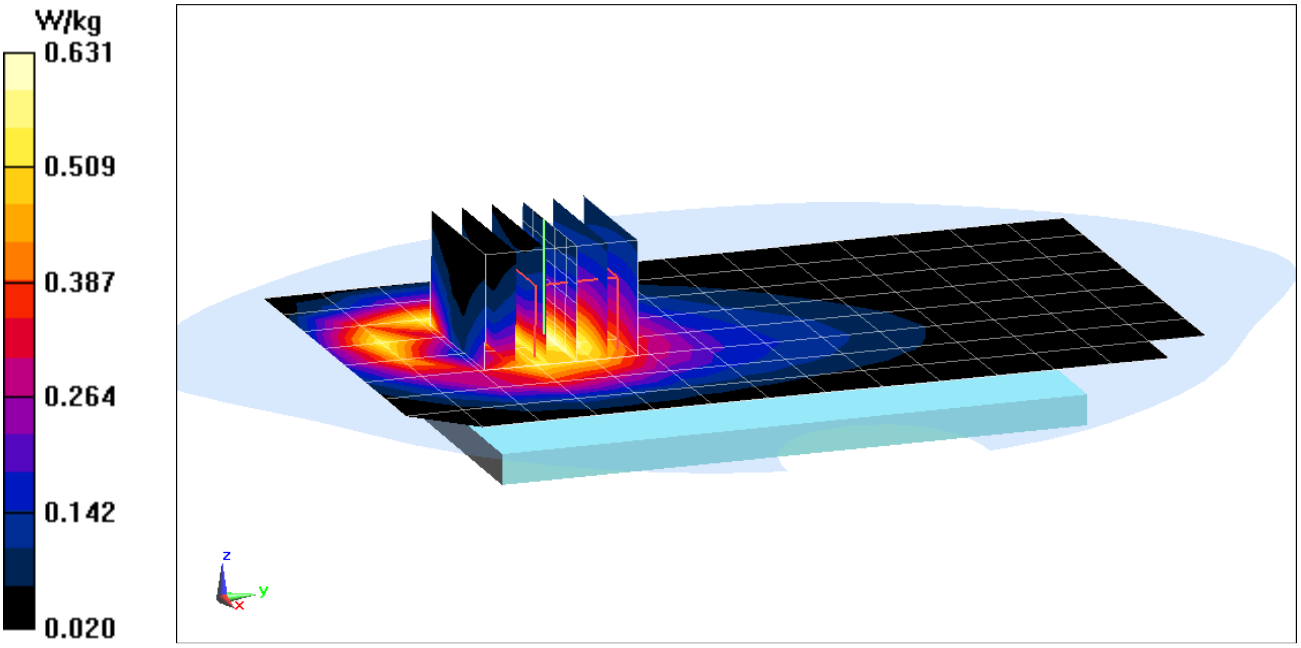
Communication System: UID 0, CDMA; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 848.31 MHz; σ = 1.011 S/m; ε_r = 52.911; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO BC0, Rule Part 22H, Ant A, Body SAR, Front Side, High.ch, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.64 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.560 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

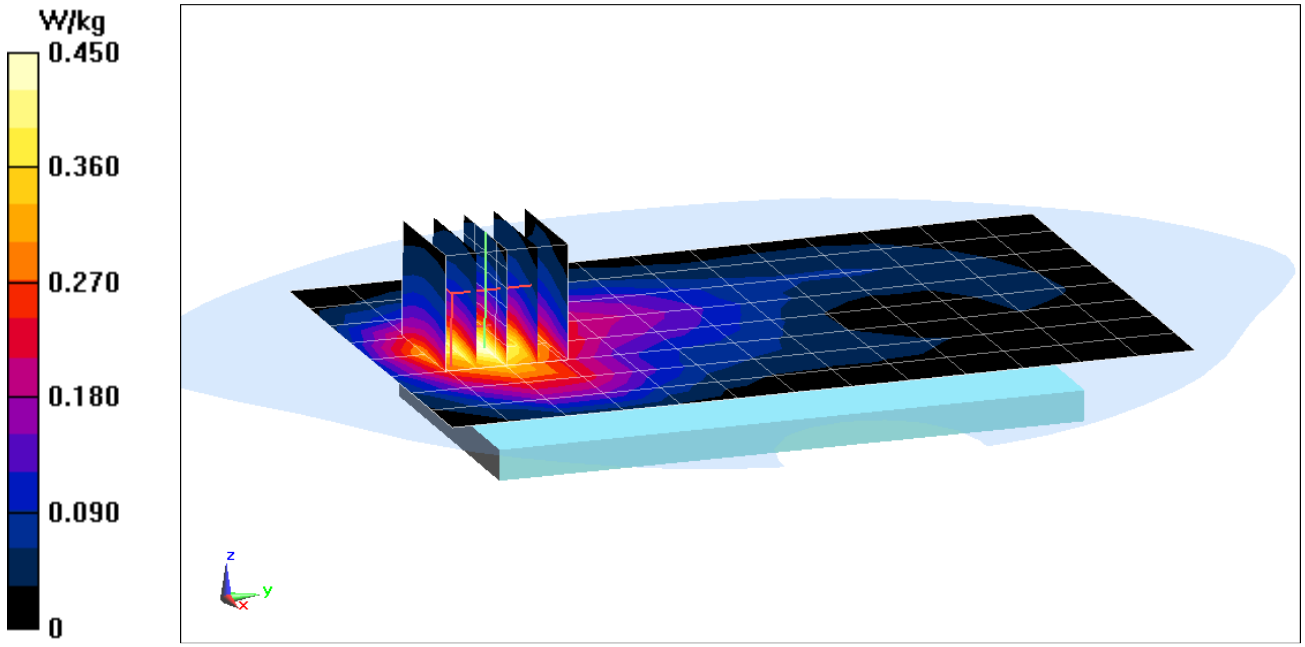
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS CDMA, Body SAR, Back Side, Mid.ch,
Cover Closed

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.92 V/m; Power Drift = 0.21 dB
Peak SAR (extrapolated) = 0.610 W/kg
SAR(1 g) = 0.390 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

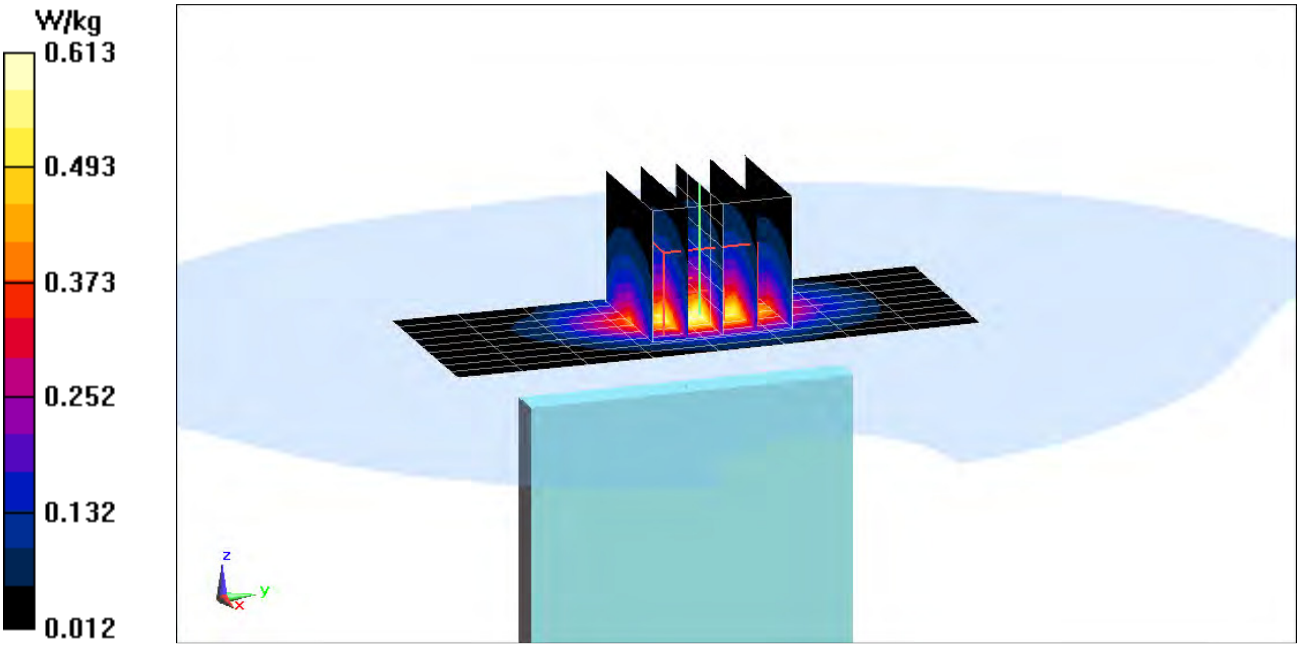
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO, Body SAR, Bottom Edge, Mid.ch, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.31 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.839 W/kg
SAR(1 g) = 0.498 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B9D

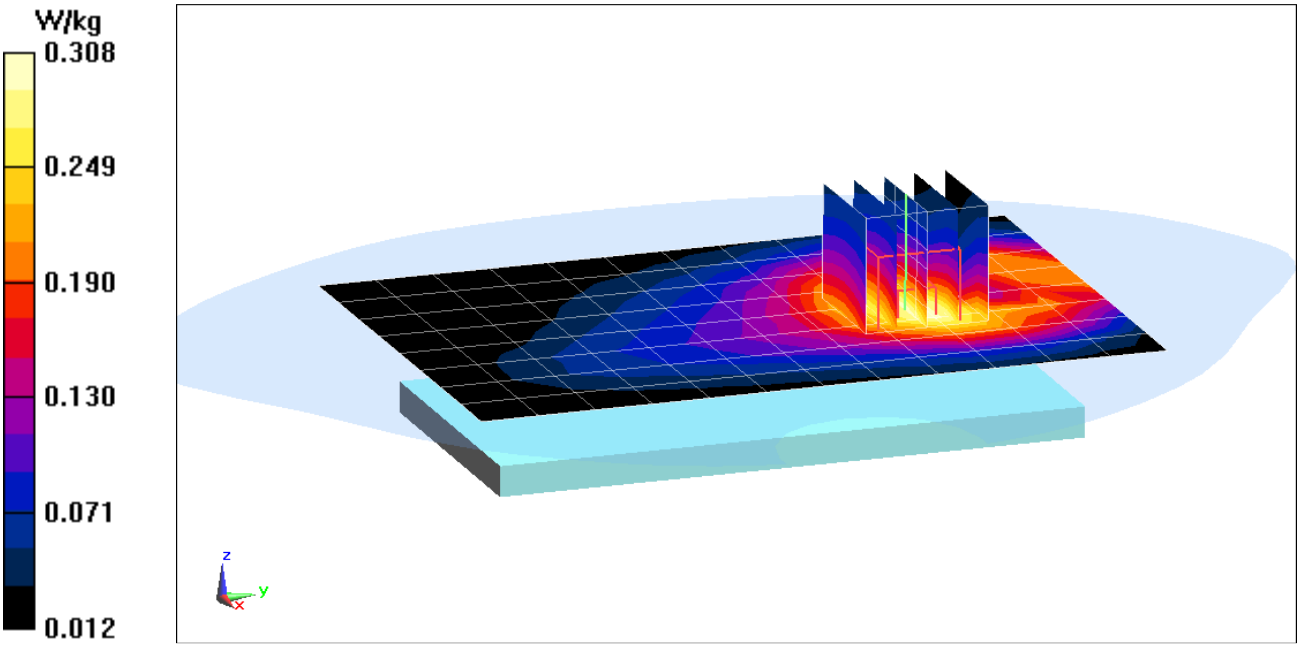
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.923 S/m; ε_r = 54.281; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-13-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant B, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset, Cover Closed

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.95 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.373 W/kg
SAR(1 g) = 0.274 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B9D

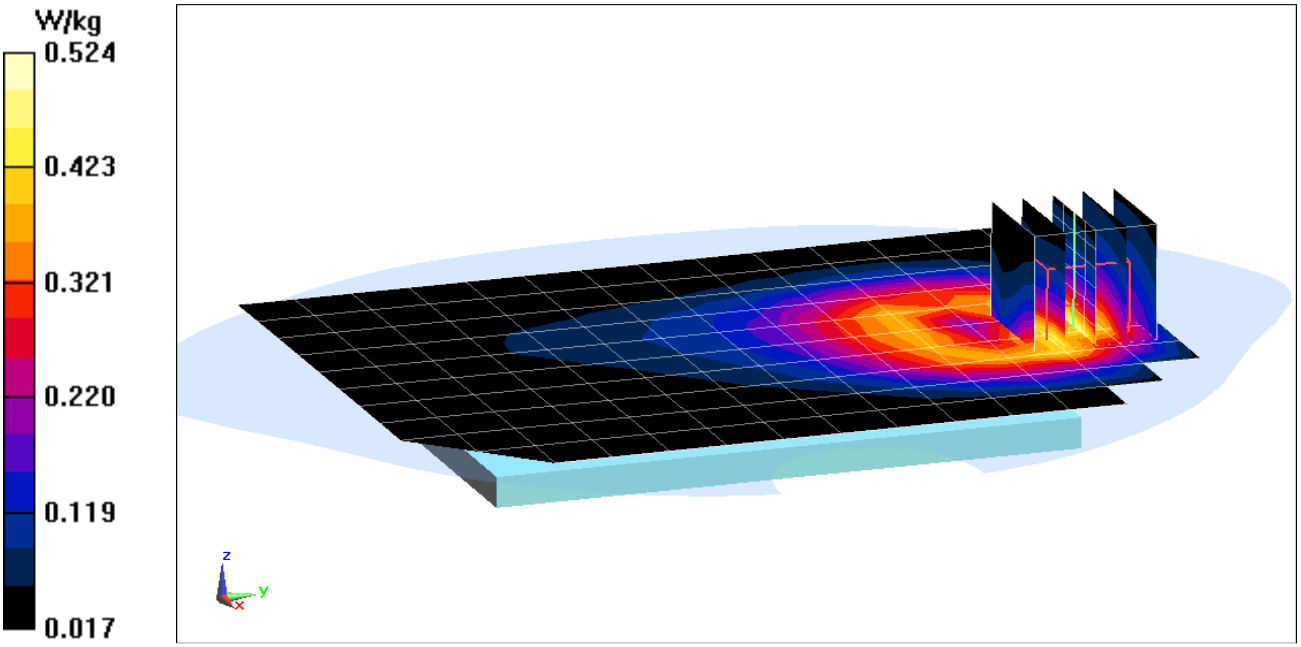
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.923 S/m; ε_r = 54.281; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant B, Body SAR, Front Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset, Cover Closed

Area Scan (11x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.08 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.720 W/kg
SAR(1 g) = 0.444 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05862

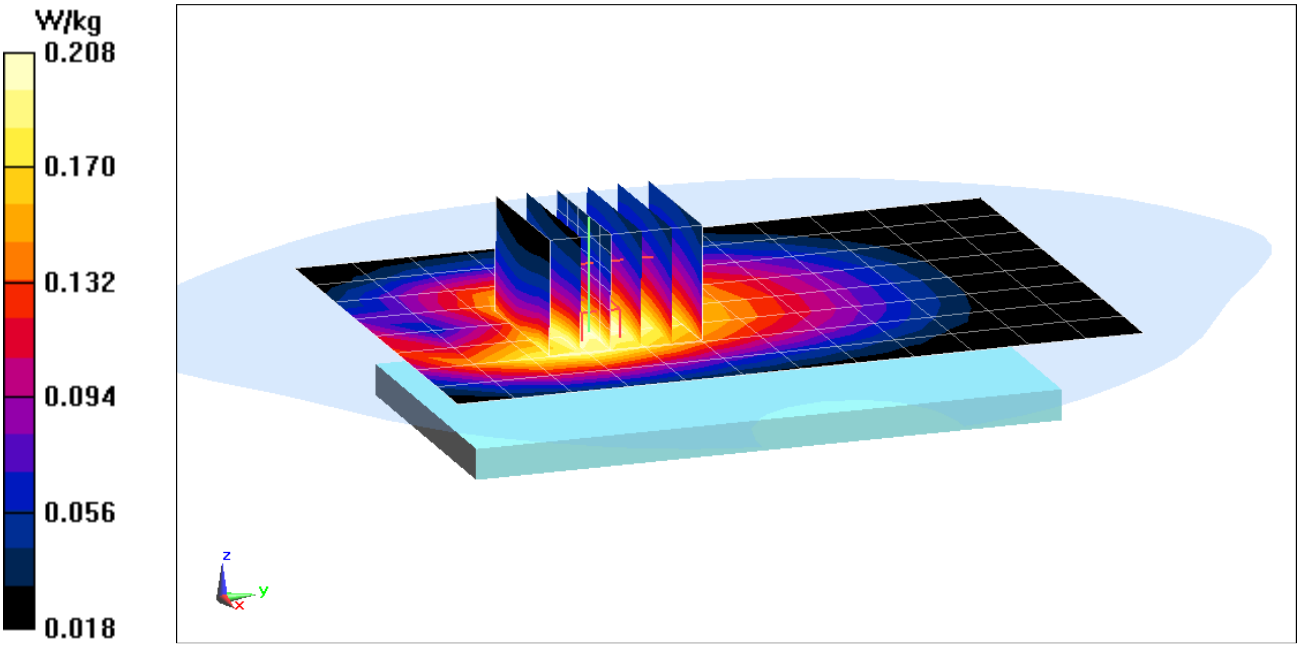
Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used:
f = 710 MHz; σ = 0.926 S/m; ε_r = 54.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 17, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset, Cover Closed

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.72 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.187 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05862

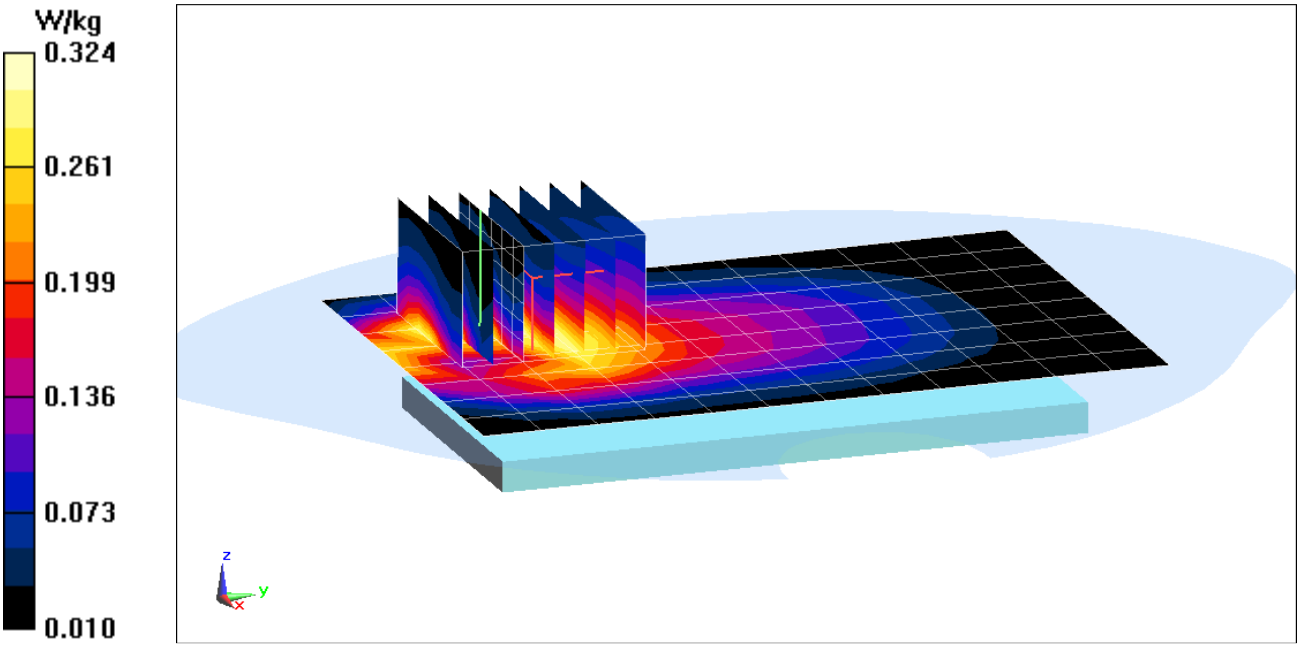
Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used:
f = 710 MHz; σ = 0.926 S/m; ε_r = 54.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 17, Body SAR, Front Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset, Cover Closed

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.13 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.280 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05862

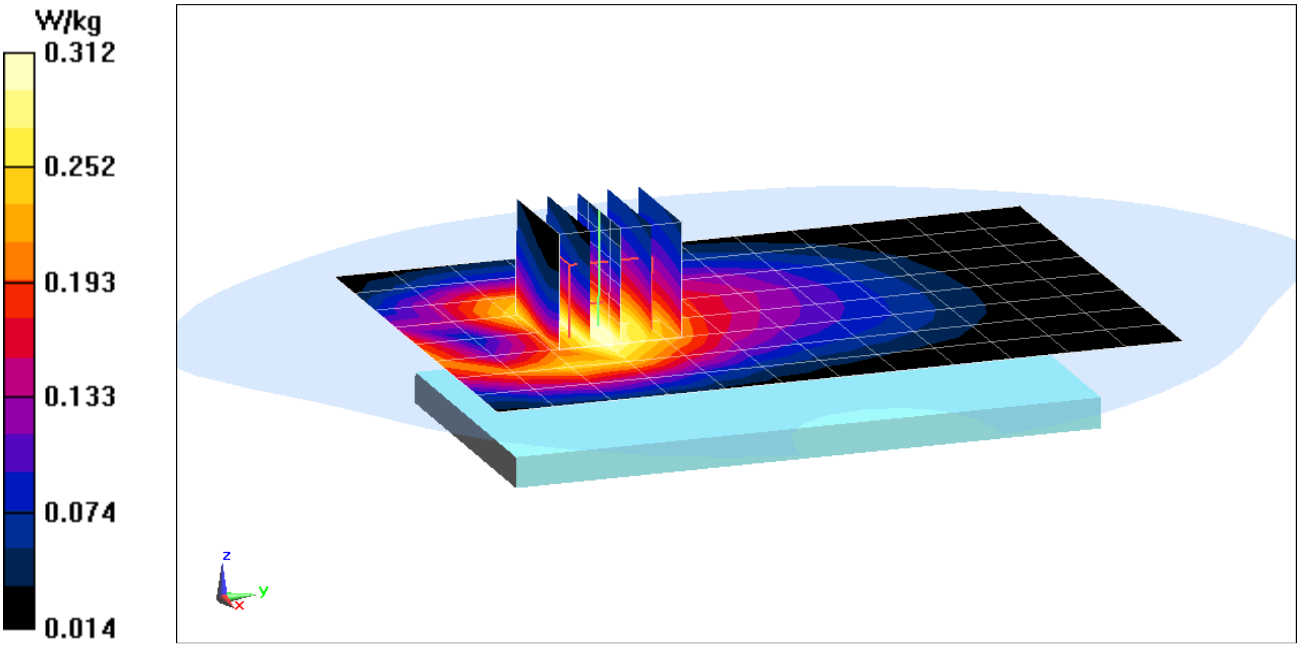
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.995 S/m; ε_r = 53.405; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Ant A, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.39 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.386 W/kg
SAR(1 g) = 0.280 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05862

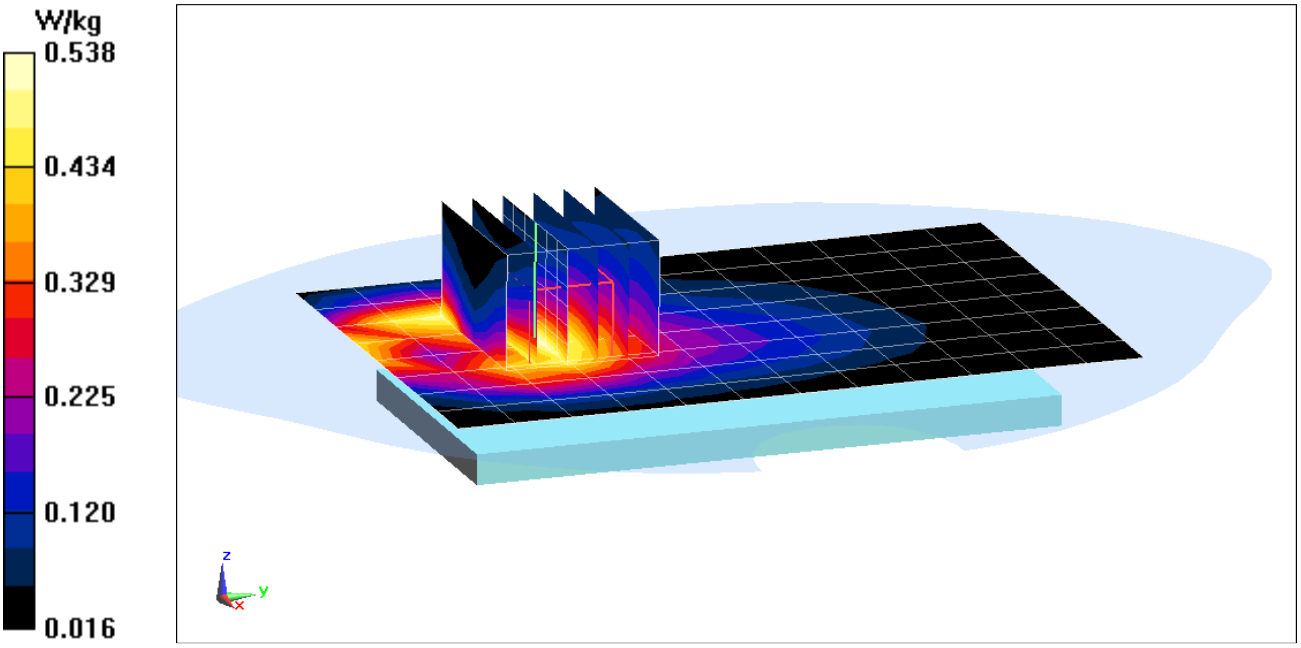
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.995 S/m; ε_r = 53.405; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Ant A, Body SAR, Front Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.58 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.702 W/kg
SAR(1 g) = 0.468 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05C13

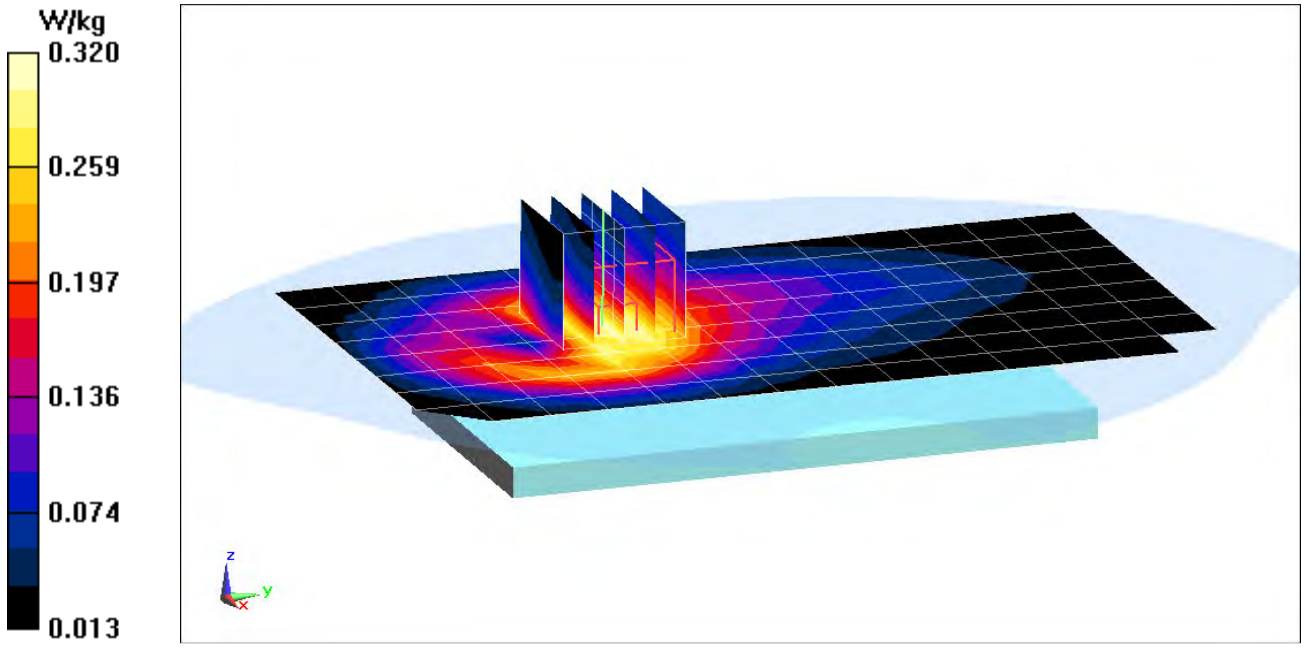
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.996 S/m; ε_r = 53.104; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Ant A, Body SAR, Back Side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.60 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.283 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05C13

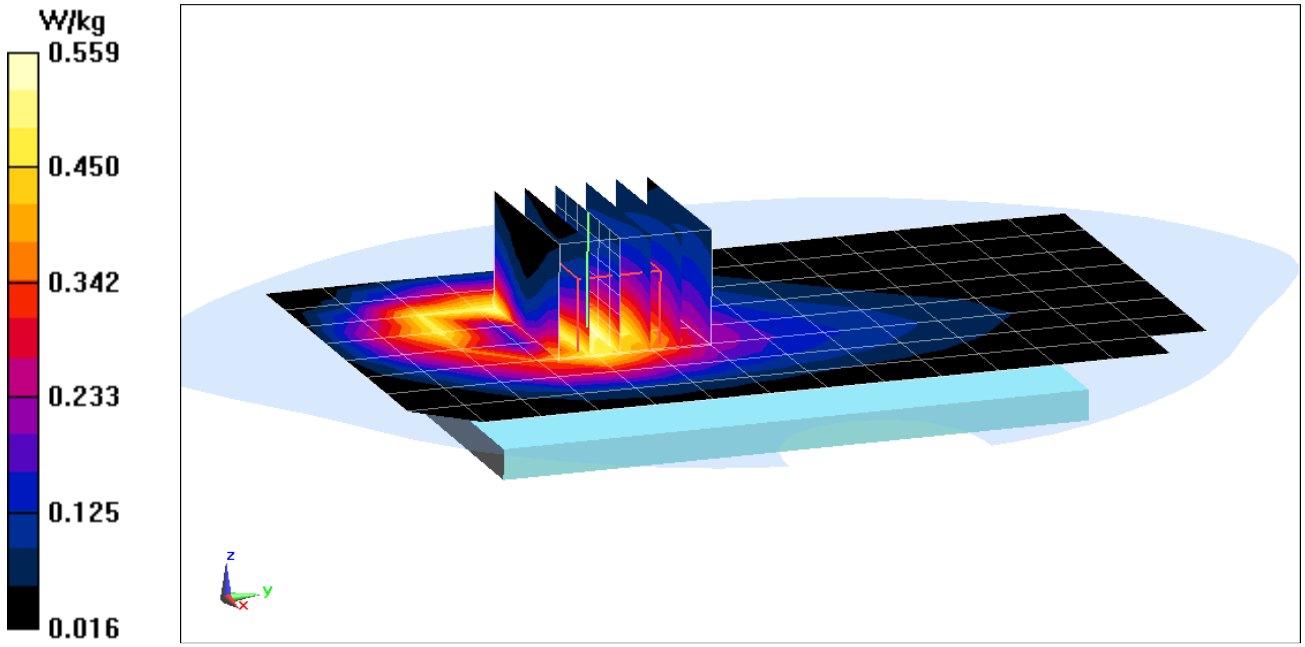
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.996 S/m; ε_r = 53.104; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Ant A, Body SAR, Front Side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.21 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.727 W/kg
SAR(1 g) = 0.487 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

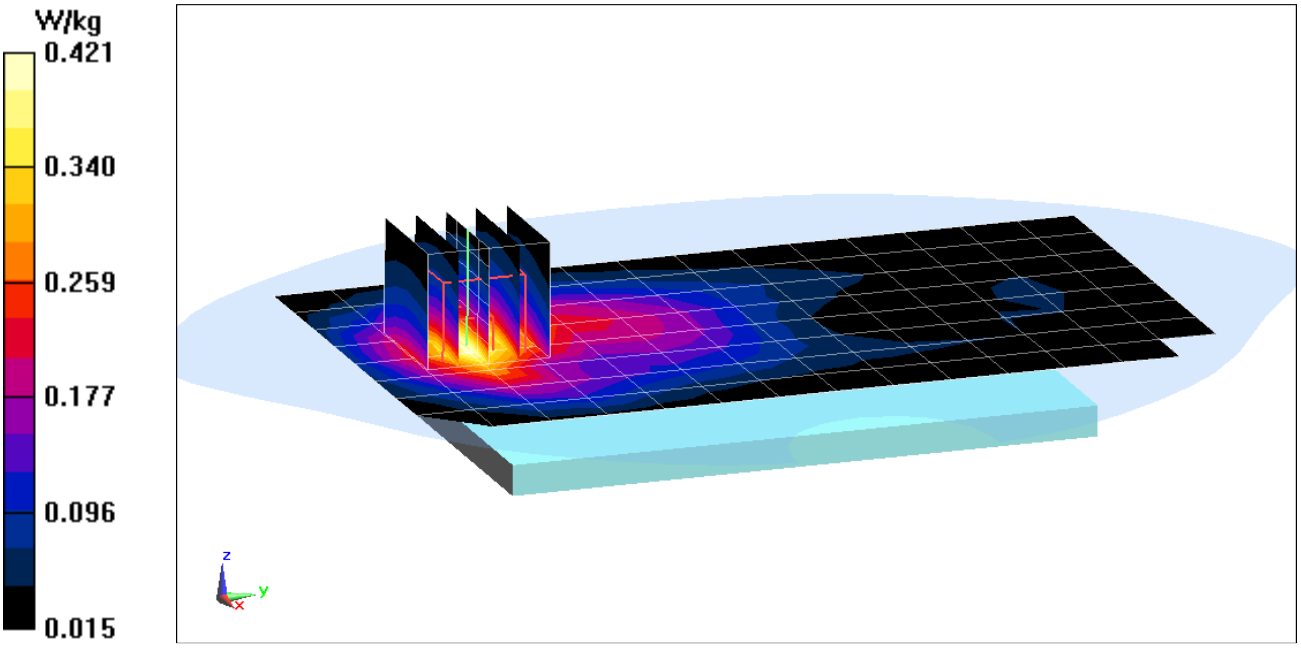
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.478 S/m; ε_r = 52.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Body SAR, Back Side, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.55 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.481 W/kg
SAR(1 g) = 0.307 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

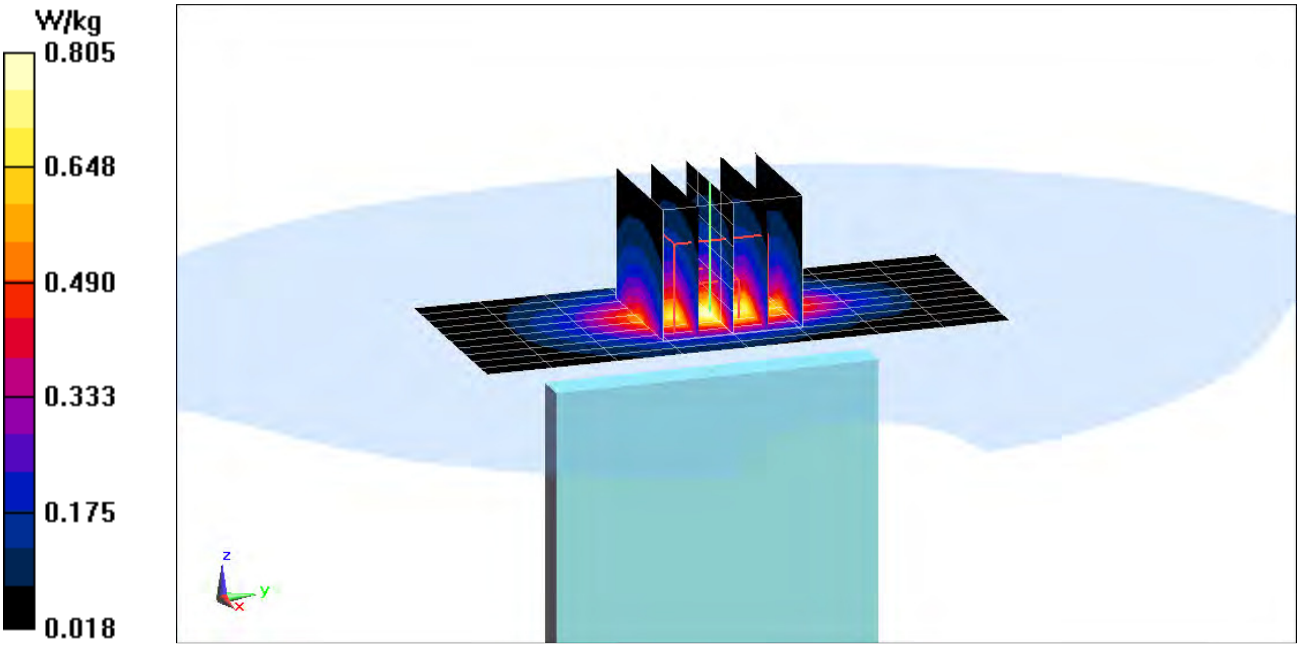
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.478 S/m; ε_r = 52.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.17 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.936 W/kg
SAR(1 g) = 0.558 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

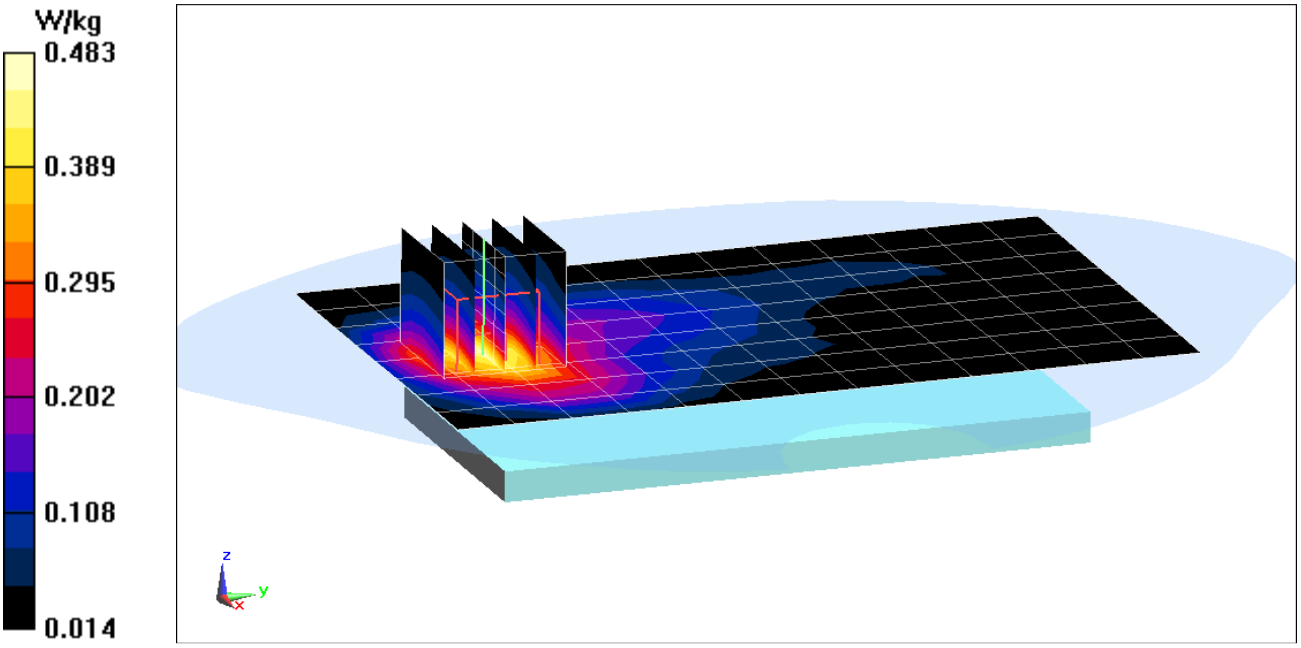
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.577 S/m; ε_r = 52.125; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Back Side, High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.11 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.640 W/kg
SAR(1 g) = 0.406 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E44

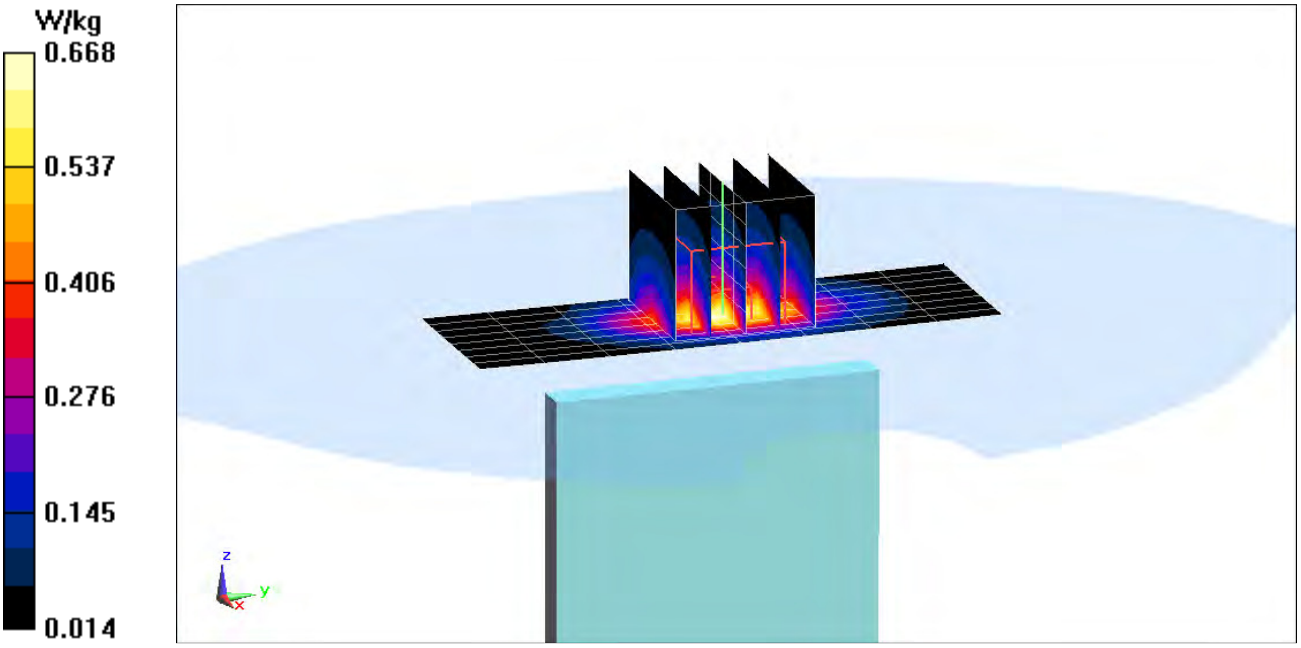
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.529 S/m; ε_r = 52.618; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.24 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.908 W/kg
SAR(1 g) = 0.541 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

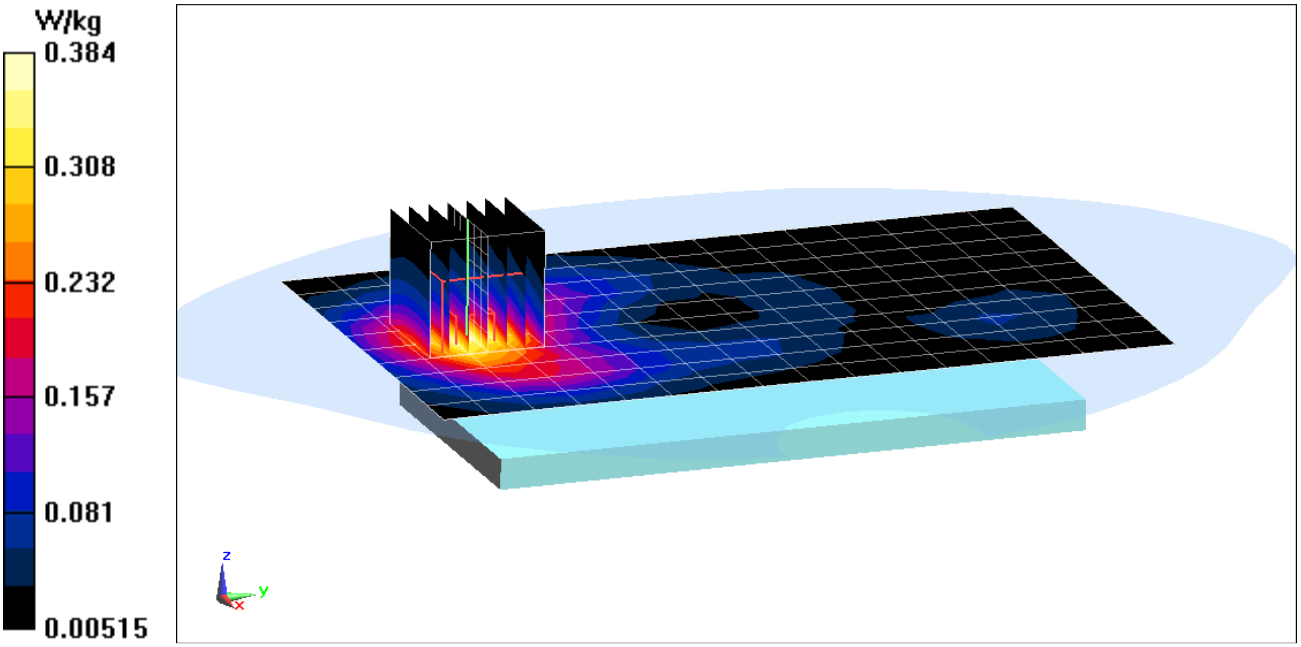
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2310 MHz; σ = 1.821 S/m; ε_r = 51.963; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 30, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.75 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.554 W/kg
SAR(1 g) = 0.316 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

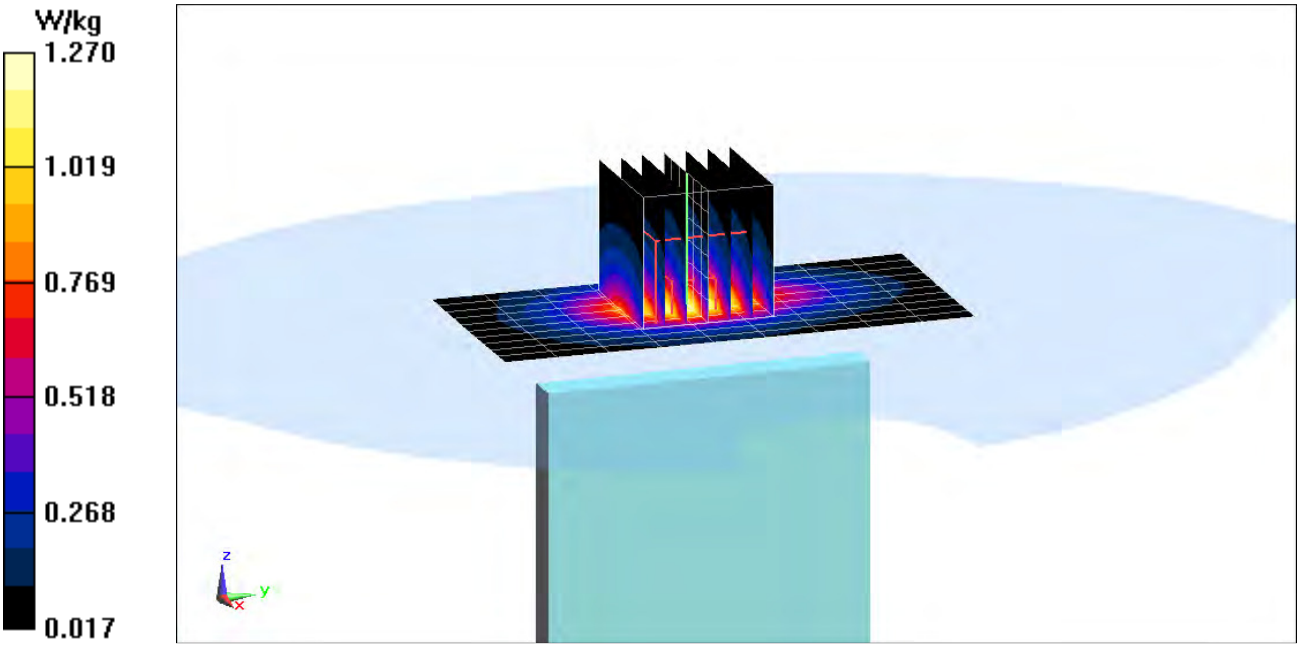
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2310 MHz; σ = 1.821 S/m; ε_r = 51.963; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 30, Body SAR, Bottom Edge, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (11x10x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.27 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.01 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

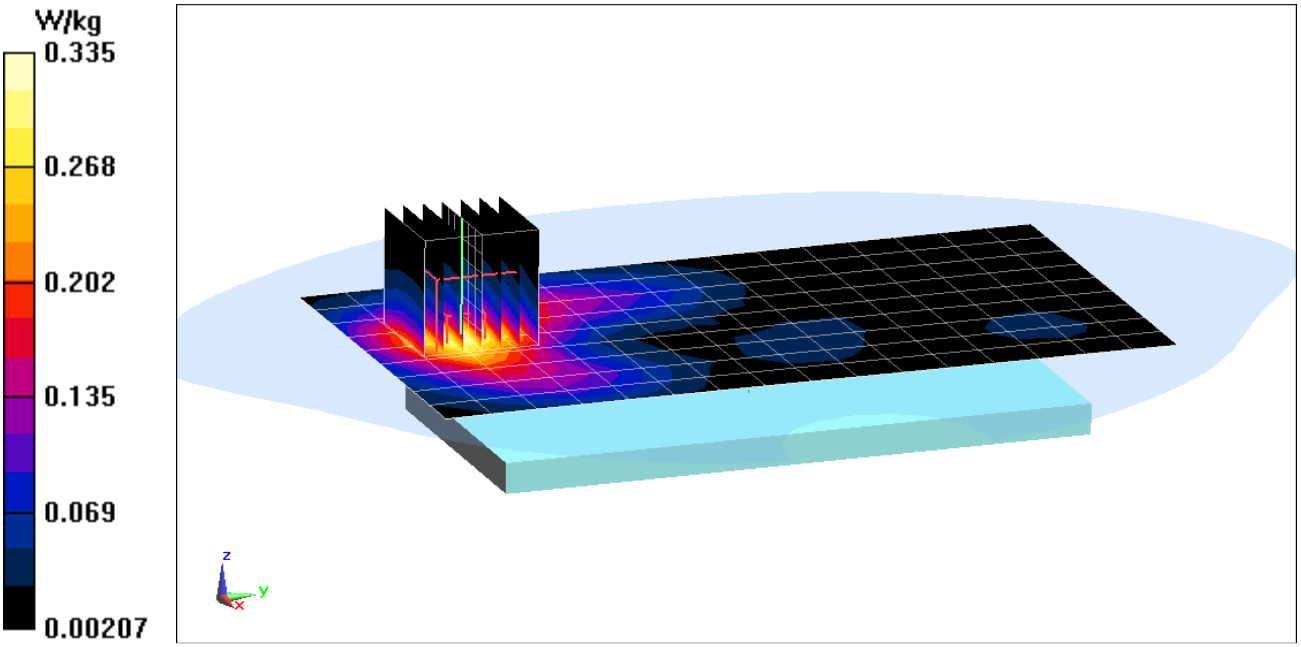
Communication System: UID 0, LTE Band 41; Frequency: 2636.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 2.115 S/m; ε_r = 51.829; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3318; ConvF(4.18, 4.18, 4.18); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Body SAR, Back Side, Mid-High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.86 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.532 W/kg
SAR(1 g) = 0.272 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

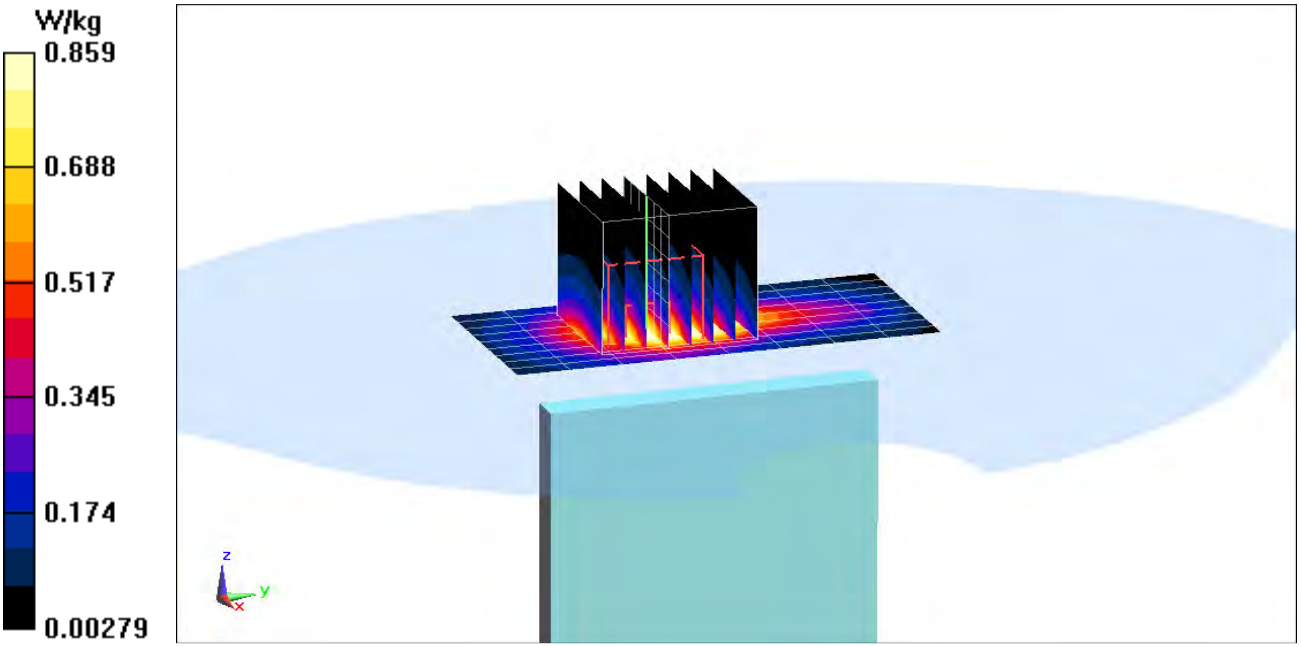
Communication System: UID 0, LTE Band 41; Frequency: 2680 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2680 MHz; σ = 2.174 S/m; ε_r = 51.683; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3318; ConvF(4.18, 4.18, 4.18); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Body SAR, Bottom Edge, High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.06 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.676 W/kg



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DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

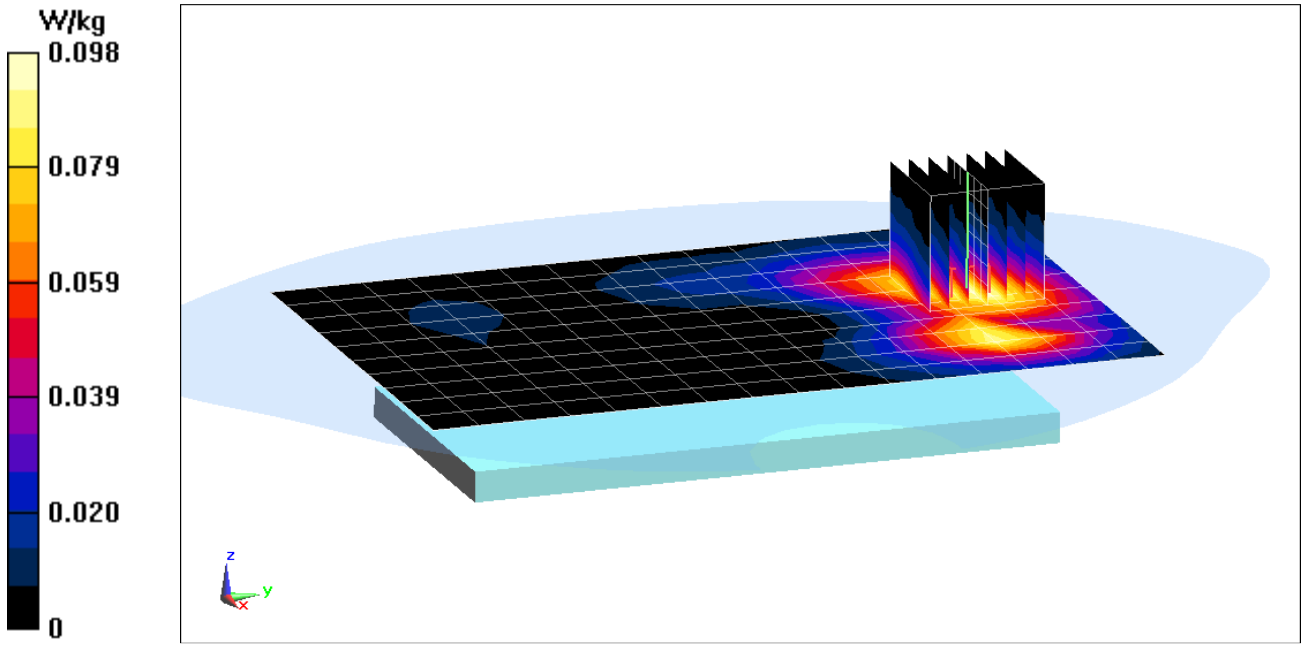
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.954 S/m; ε_r = 51.219; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Antenna 2, 22 MHz Bandwidth, Body SAR, Back Side, Ch 01, 1 Mbps, Cover Closed

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.768 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.144 W/kg
SAR(1 g) = 0.081 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

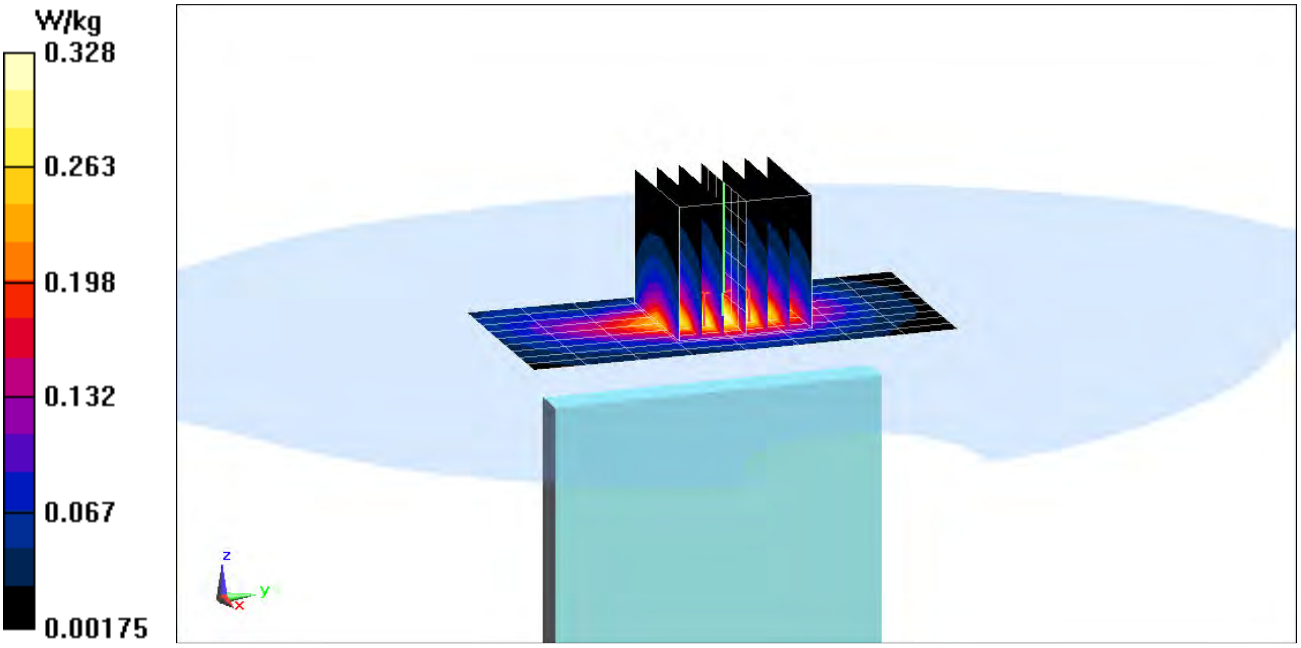
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.954 S/m; ε_r = 51.219; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Antenna 2, 22 MHz Bandwidth, Body SAR, Top Edge, Ch 01, 1 Mbps, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.30 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.496 W/kg
SAR(1 g) = 0.261 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

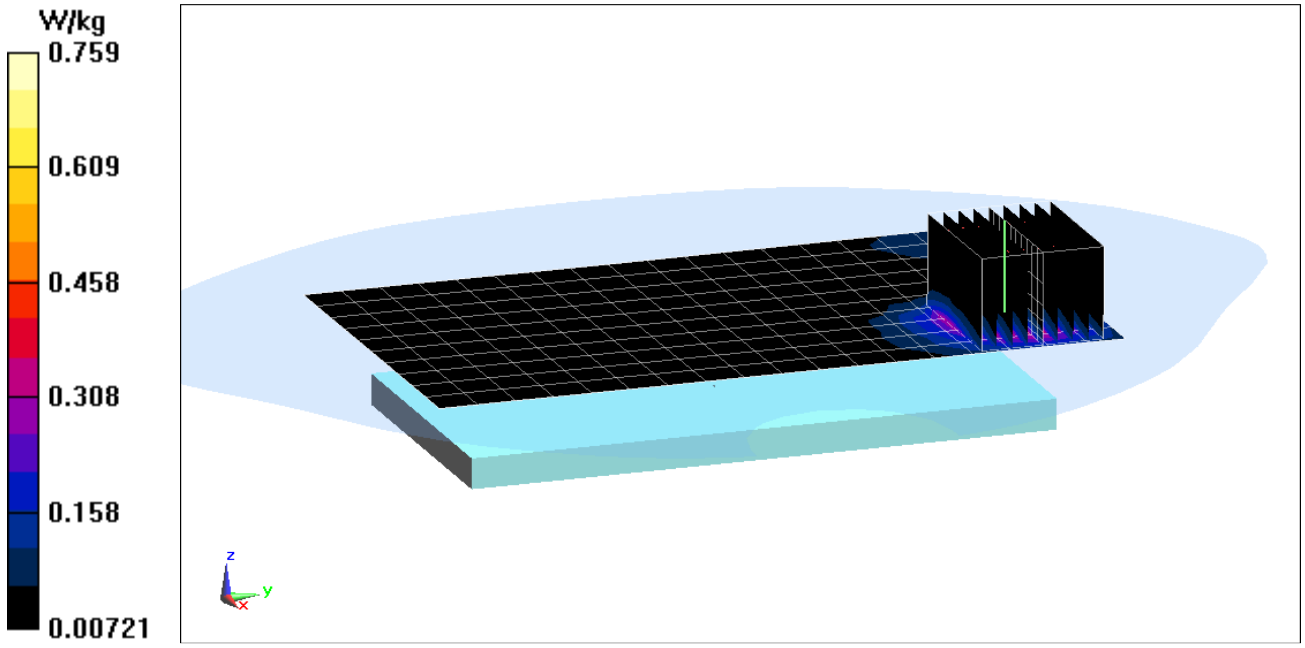
Communication System: UID 0, IEEE 802.11n; Frequency: 5755 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5755 MHz; σ = 6.167 S/m; ε_r = 46.275; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode; IEEE 802.11n, UNII-3, Antenna 2, 40 MHz Bandwidth, Body SAR, Back Side, Ch 151, 13.5 Mbps, Cover Closed

Area Scan (11x19x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (11x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 7.155 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.343 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

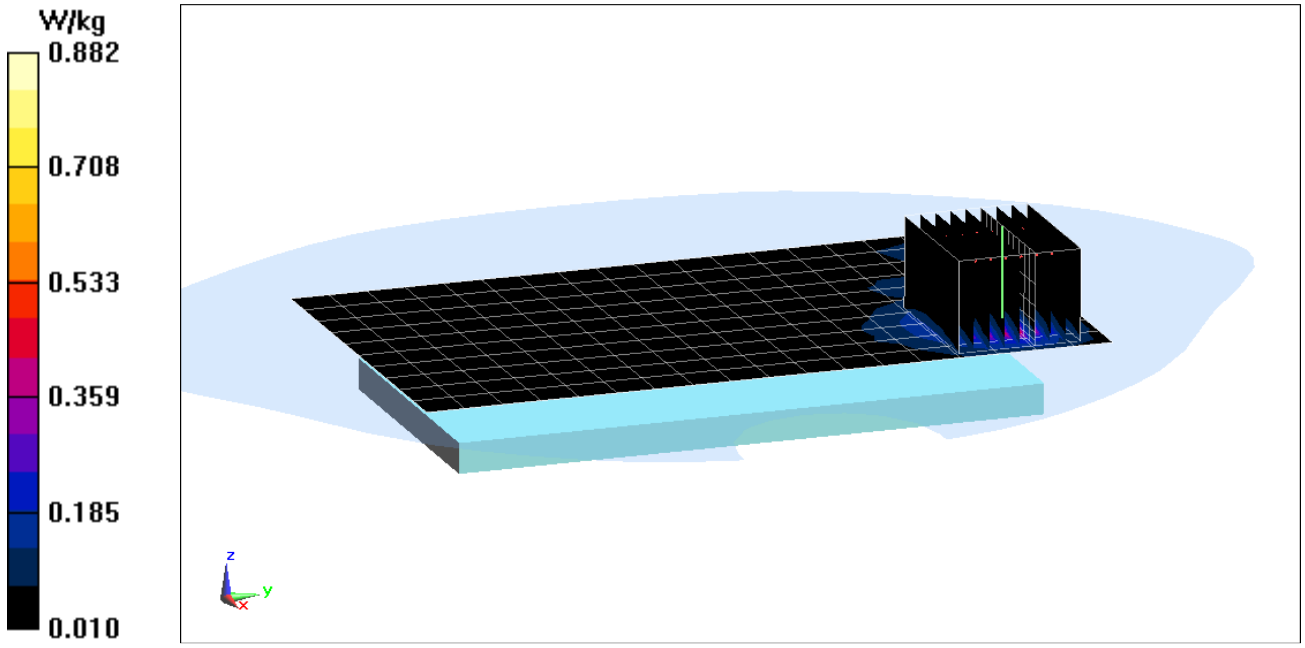
Communication System: UID 0, IEEE 802.11n; Frequency: 5755 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5755 MHz; σ = 6.167 S/m; ε_r = 46.275; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11n, UNII-3, Antenna 2, 40 MHz Bandwidth, Body SAR, Back Side, Ch 151, 13.5 Mbps, Cover Closed

Area Scan (11x19x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (11x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 1.649 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.382 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E28

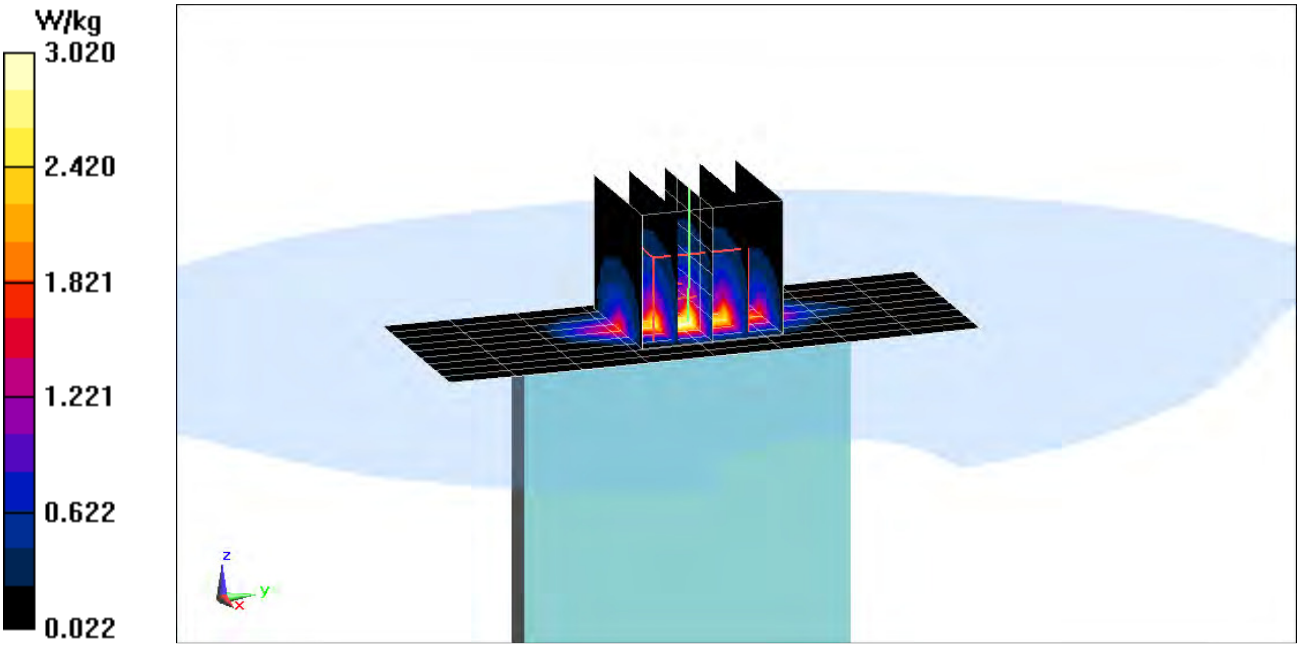
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.543 S/m; ε_r = 52.215; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Phablet SAR, Bottom Edge, Mid.ch, 3 Tx Slots, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 42.21 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 4.56 W/kg
SAR(10 g) = 1.04 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E28

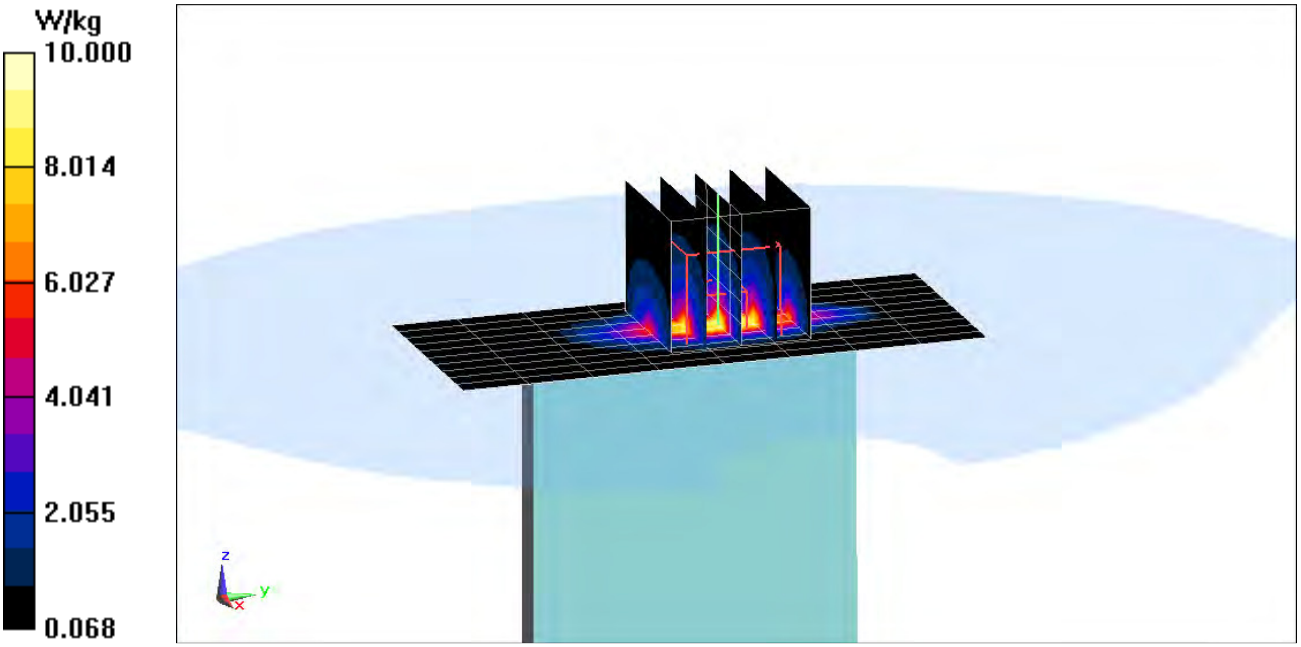
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.466 S/m; ε_r = 52.556; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-09-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Phablet SAR, Bottom Edge, High.ch, Cover Closed

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 68.52 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 11.9 W/kg
SAR(10 g) = 2.76 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

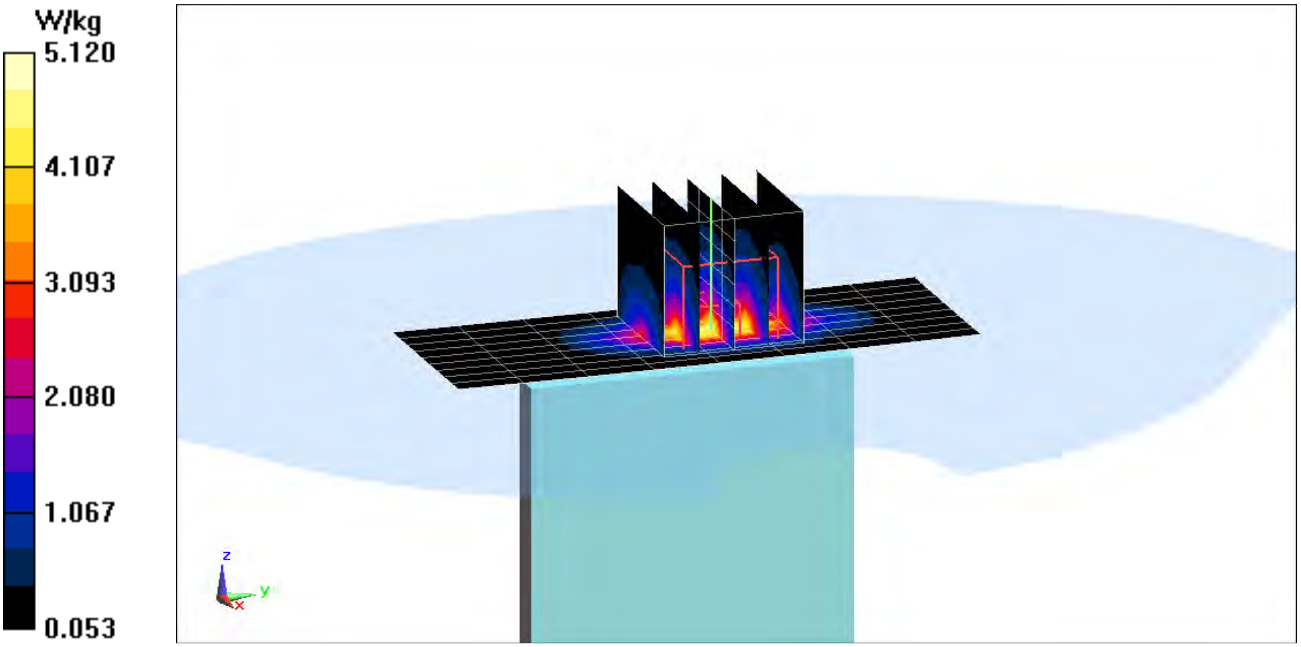
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.525 S/m; ε_r = 51.87; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.3 cm

Test Date: 06-09-2016; Ambient Temp: 22.3°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Phablet SAR, Bottom Edge, Mid.ch, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 7.40 W/kg
SAR(10 g) = 1.90 W/kg



DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

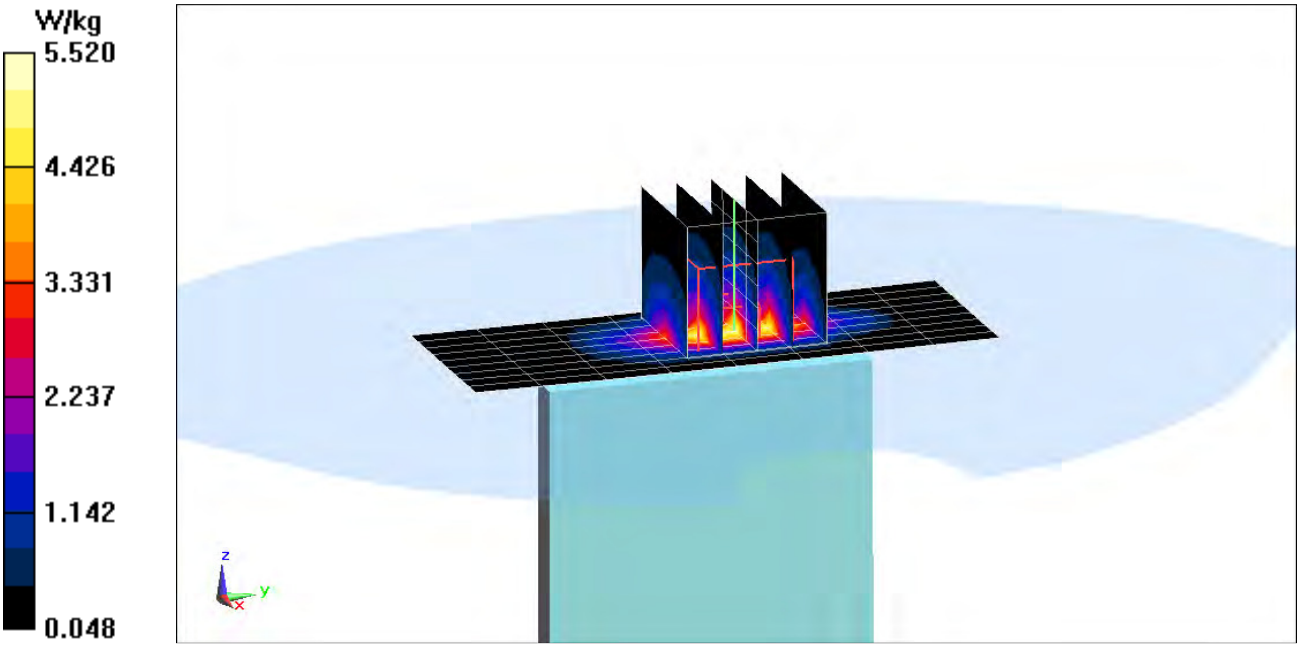
Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.491 S/m; ε_r = 51.928; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.3 cm

Test Date: 06-09-2016; Ambient Temp: 22.3°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO, Phablet SAR, Bottom Edge, Low.ch, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.20 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 7.95 W/kg
SAR(10 g) = 2.06 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 04E28

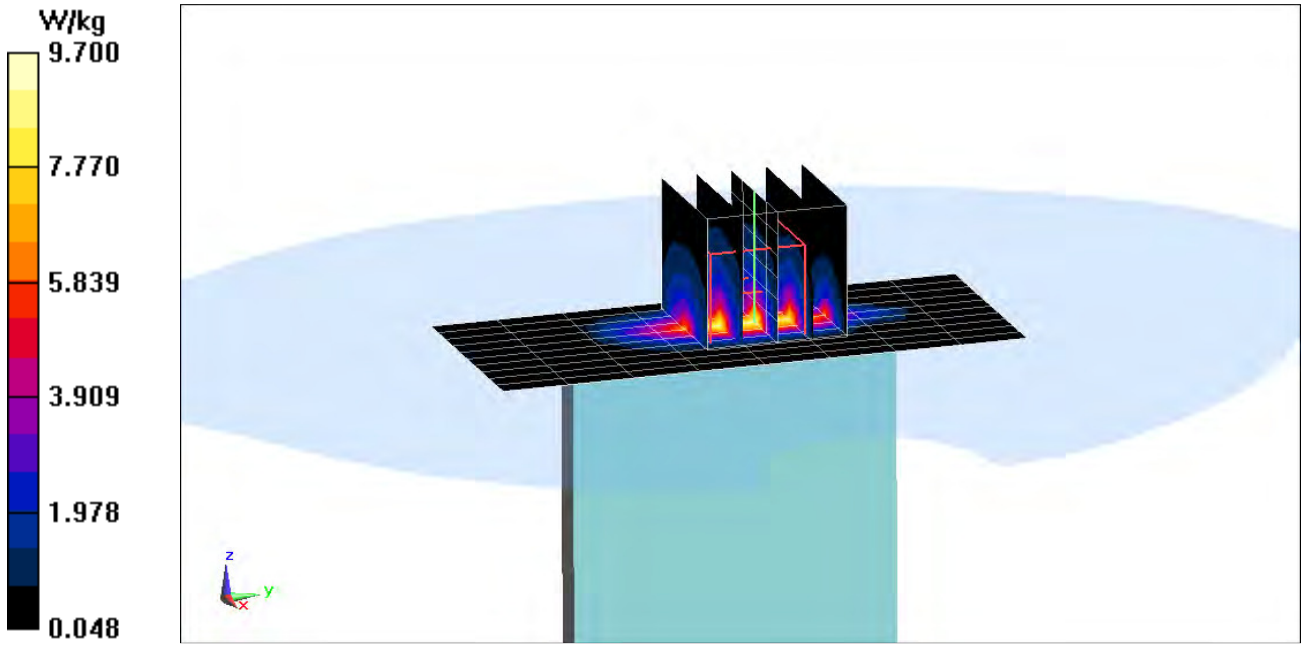
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.478 S/m; ε_r = 52.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Phablet SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 83.69 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 11.5 W/kg
SAR(10 g) = 2.67 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05BD6

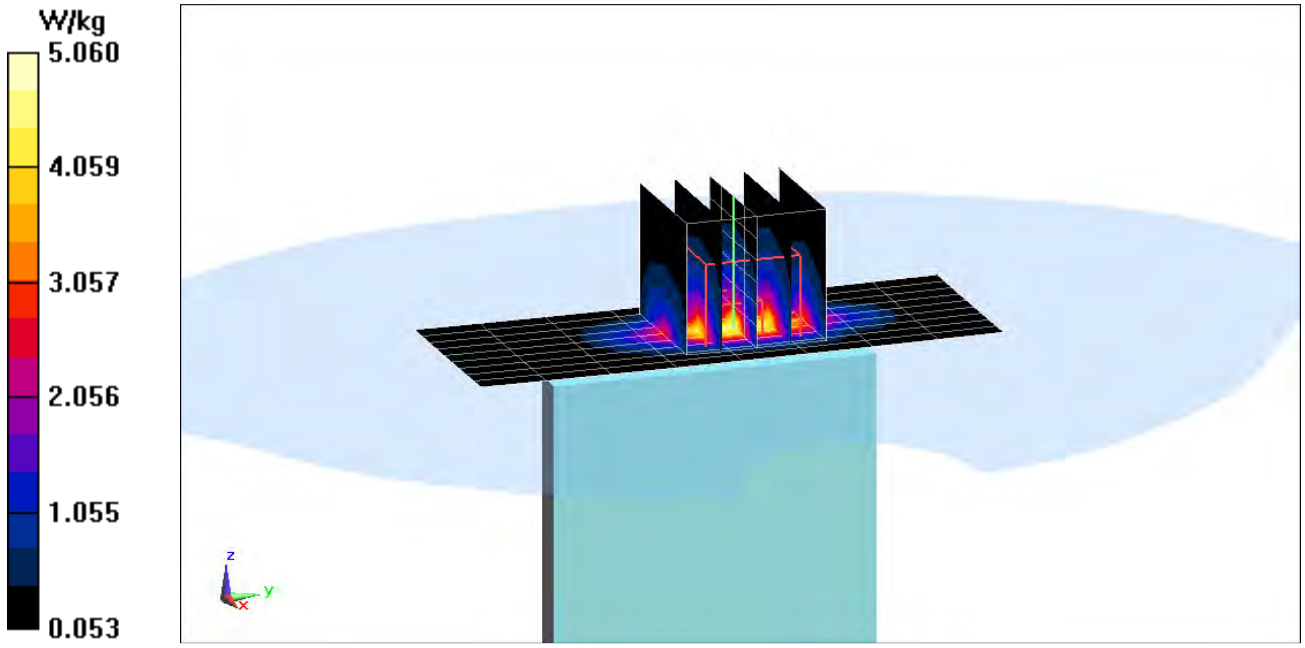
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.528 S/m; ε_r = 51.863; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.3 cm

Test Date: 06-09-2016; Ambient Temp: 22.3°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Phablet SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Cover Closed

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.14 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 7.27 W/kg
SAR(10 g) = 1.88 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

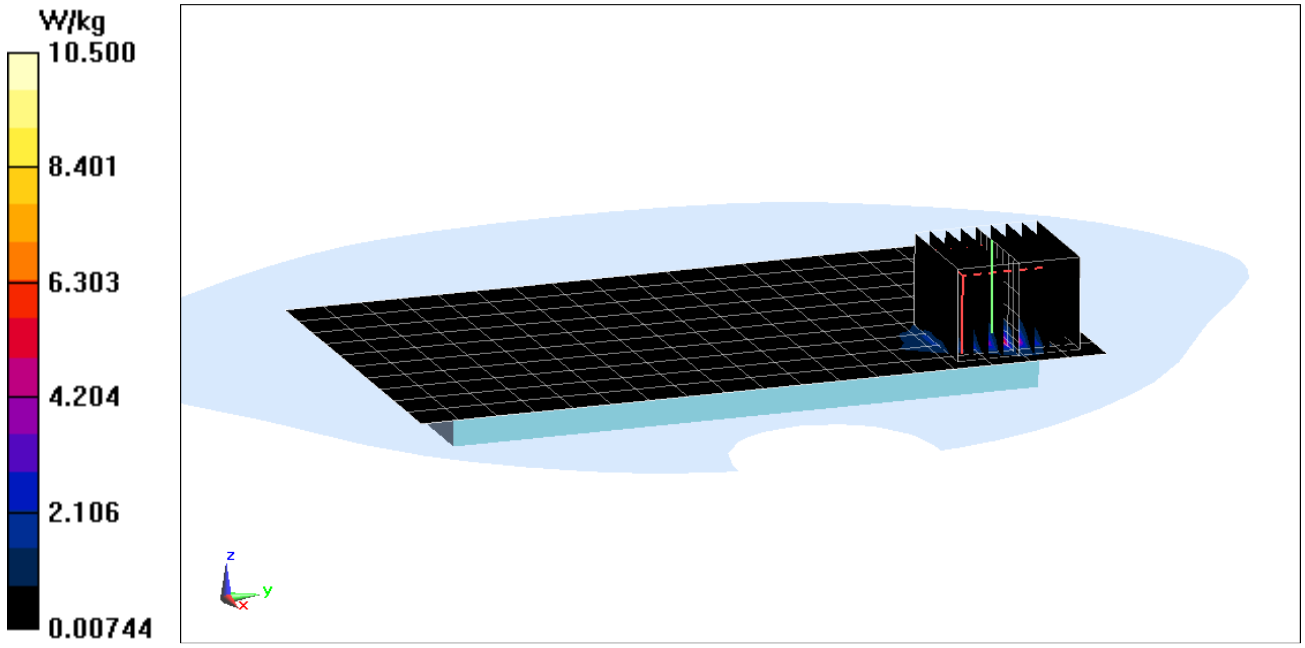
Communication System: UID 0, IEEE 802.11n; Frequency: 5270 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5270 MHz; σ = 5.545 S/m; ε_r = 47.094; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11n, UNII-2A, Antenna 2, Phablet SAR, Back Side, 40 MHz Bandwidth, Ch 54, 13.5 Mbps, Cover Open

Area Scan (11x19x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (12x11x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 1.842 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(10 g) = 0.890 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3L-EFNN930, Host: A3LSMN930U; Type: LED View Cover; Host Serial: 05B7E

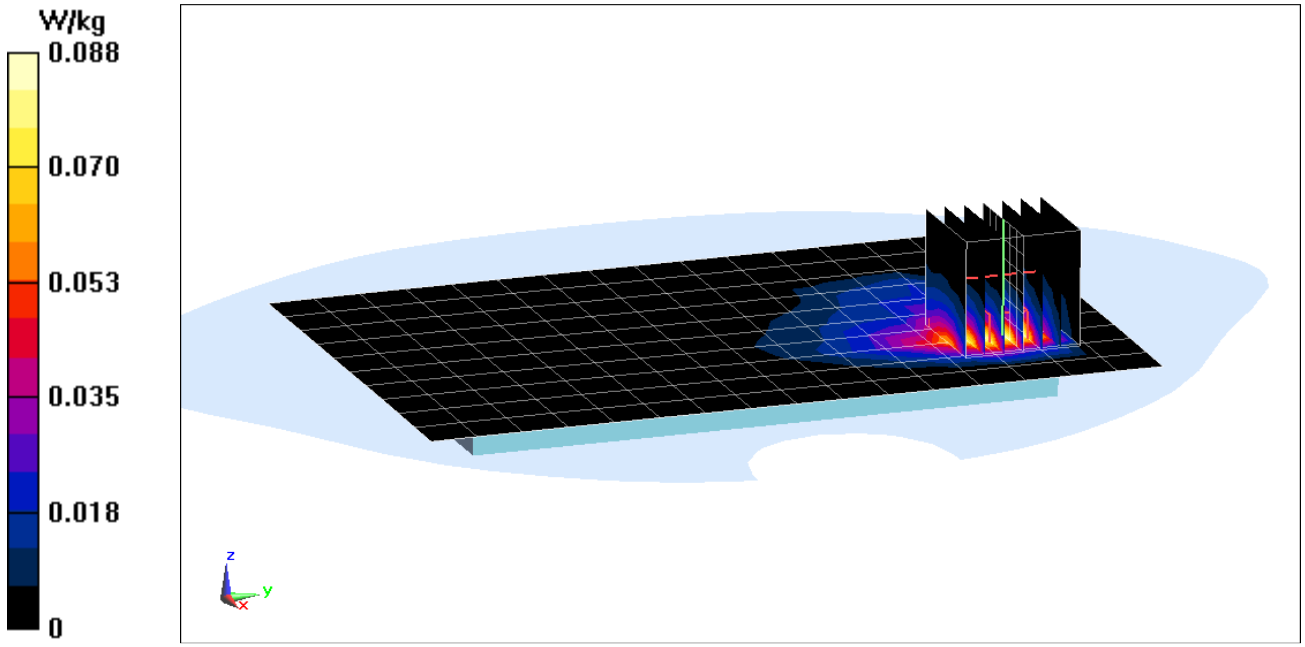
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.992 S/m; ε_r = 51.088; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Phablet SAR, Back Side, Ch 39, 1 Mbps, Cover Closed

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.337 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.158 W/kg
SAR(10 g) = 0.034 W/kg



APPENDIX B: SYSTEM VERIFICATION

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PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

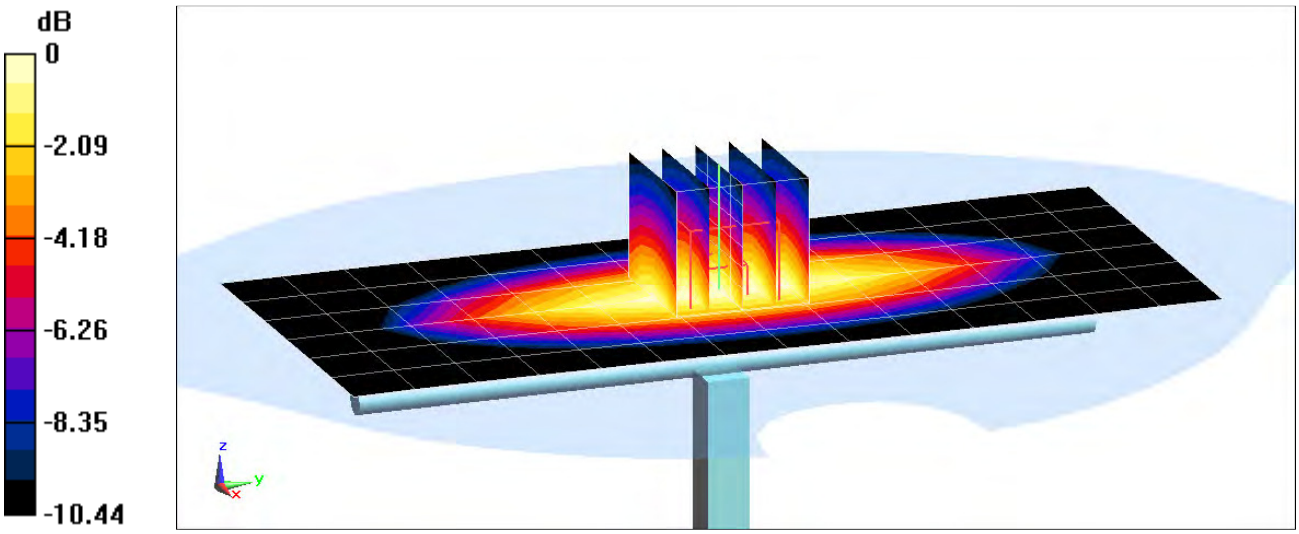
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.893 S/m; ε_r = 41.354; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 1.62 W/kg
Deviation(1 g) = -1.22%



0 dB = 1.90 W/kg = 2.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

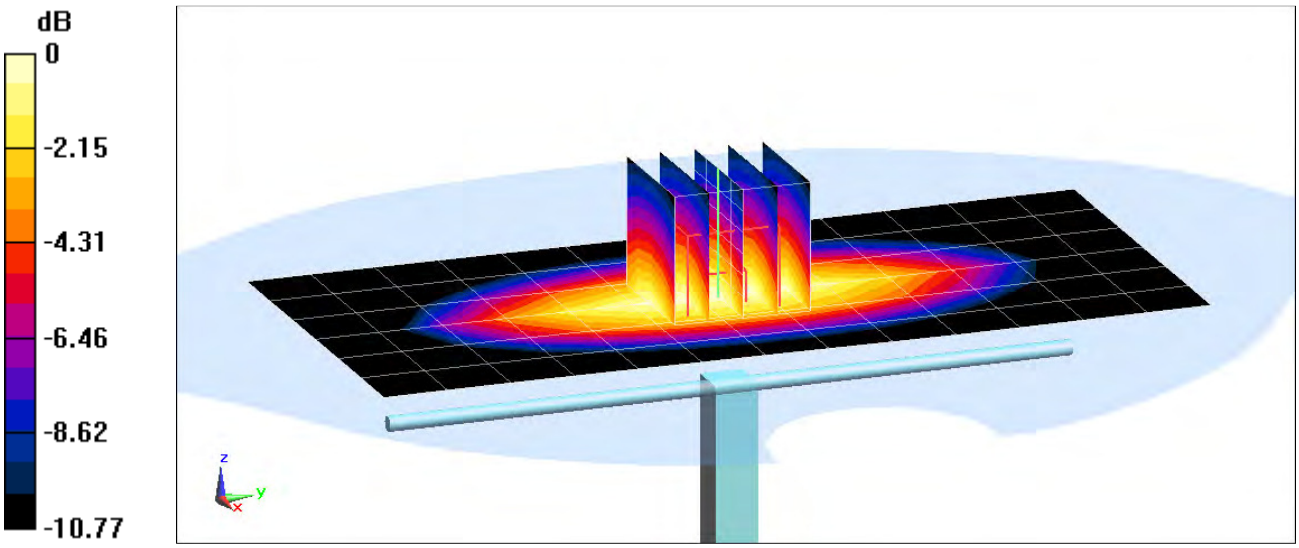
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.925 S/m; ε_r = 43.05; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-04-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(6.11, 6.11, 6.11); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.58 W/kg
SAR(1 g) = 1.74 W/kg
Deviation(1 g) = -4.81%



0 dB = 2.03 W/kg = 3.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

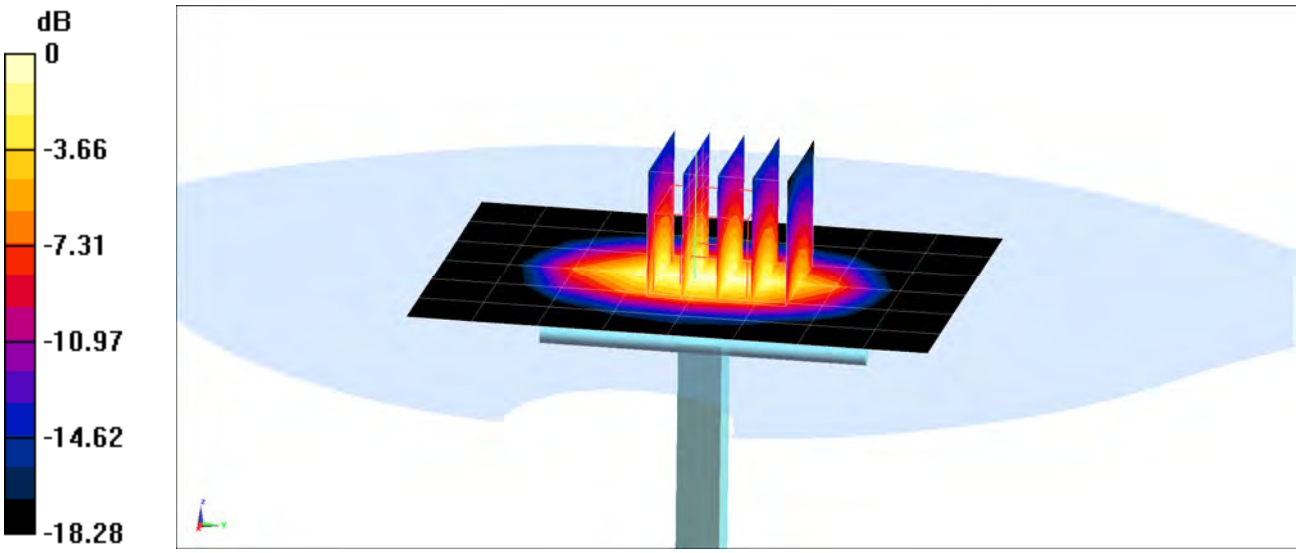
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.359 S/m; ε_r = 39.049; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.13 W/kg
SAR(1 g) = 3.40 W/kg
Deviation(1 g) = -7.36%



0 dB = 4.25 W/kg = 6.28 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

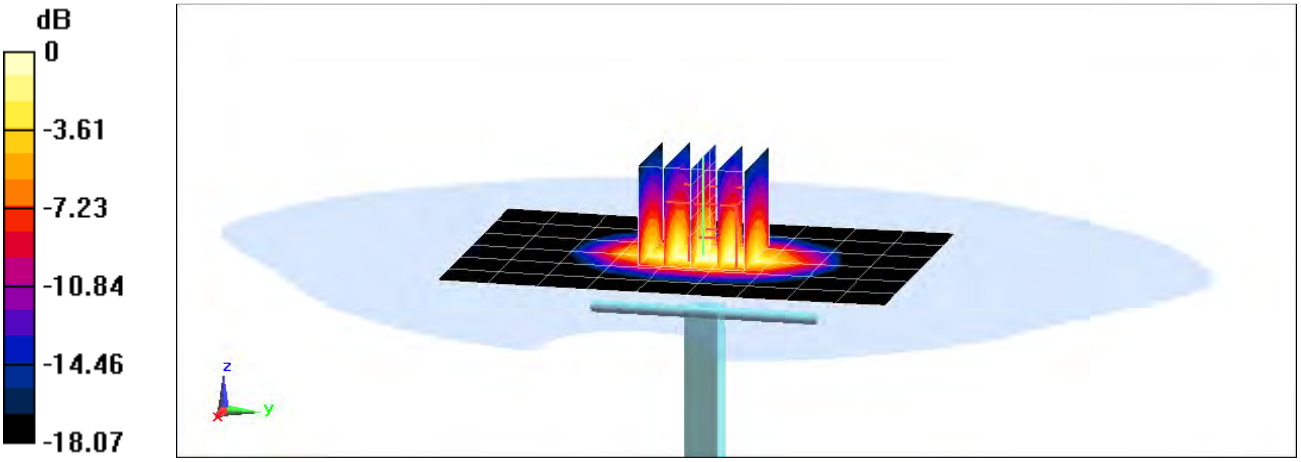
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.423 S/m; ε_r = 39.03; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Right; Type: QD000P40CD; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.53 W/kg
SAR(1 g) = 4.15 W/kg
Deviation(1 g) = 7.79%



0 dB = 5.26 W/kg = 7.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

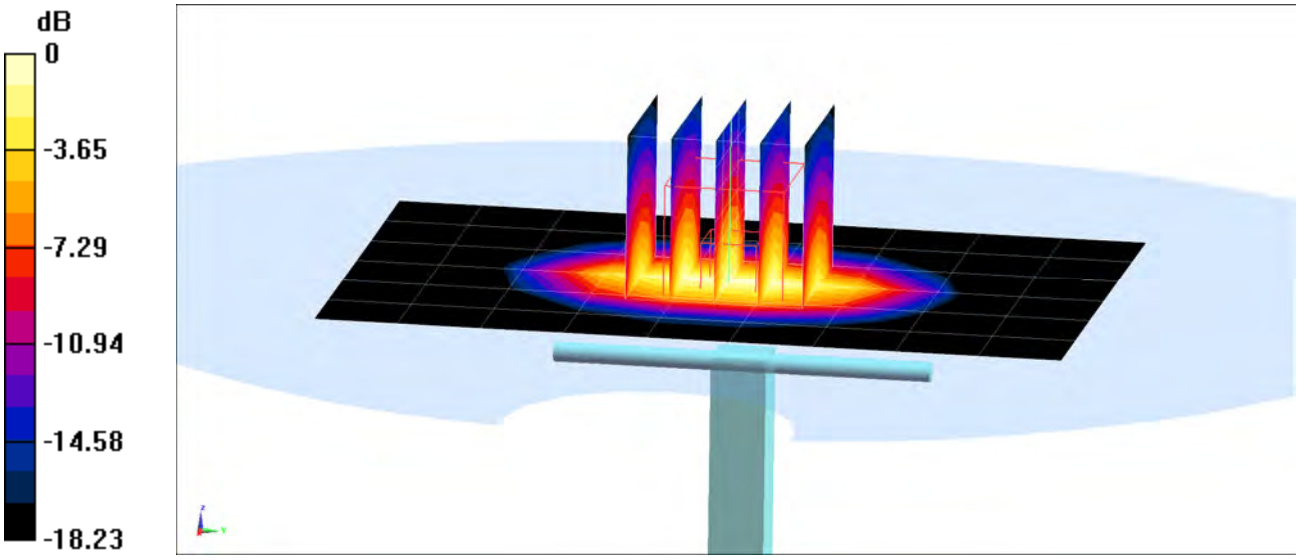
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.43 S/m; ε_r = 38.612; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-08-2016; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7406; ConvF(8.22, 8.22, 8.22); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.36 W/kg
SAR(1 g) = 3.97 W/kg
Deviation(1 g) = 3.12%



0 dB = 6.21 W/kg = 7.93 dBW/kg

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1064

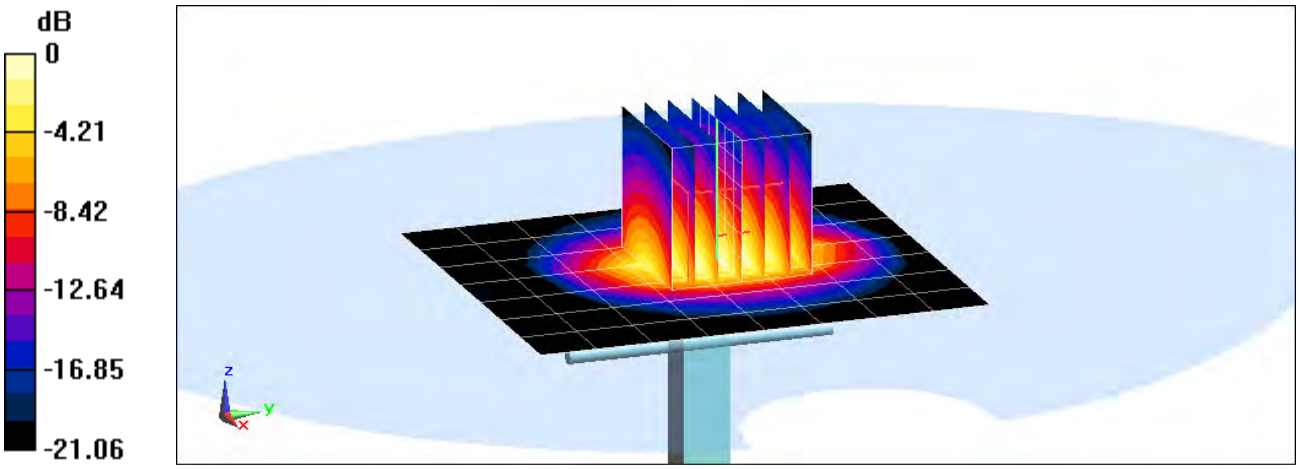
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Head Medium parameters used:
f = 2300 MHz; σ = 1.655 S/m; ε_r = 41.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.63, 4.63, 4.63); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2300 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 9.42 W/kg
SAR(1 g) = 4.69 W/kg
Deviation(1 g) = -1.47%



0 dB = 6.17 W/kg = 7.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 882

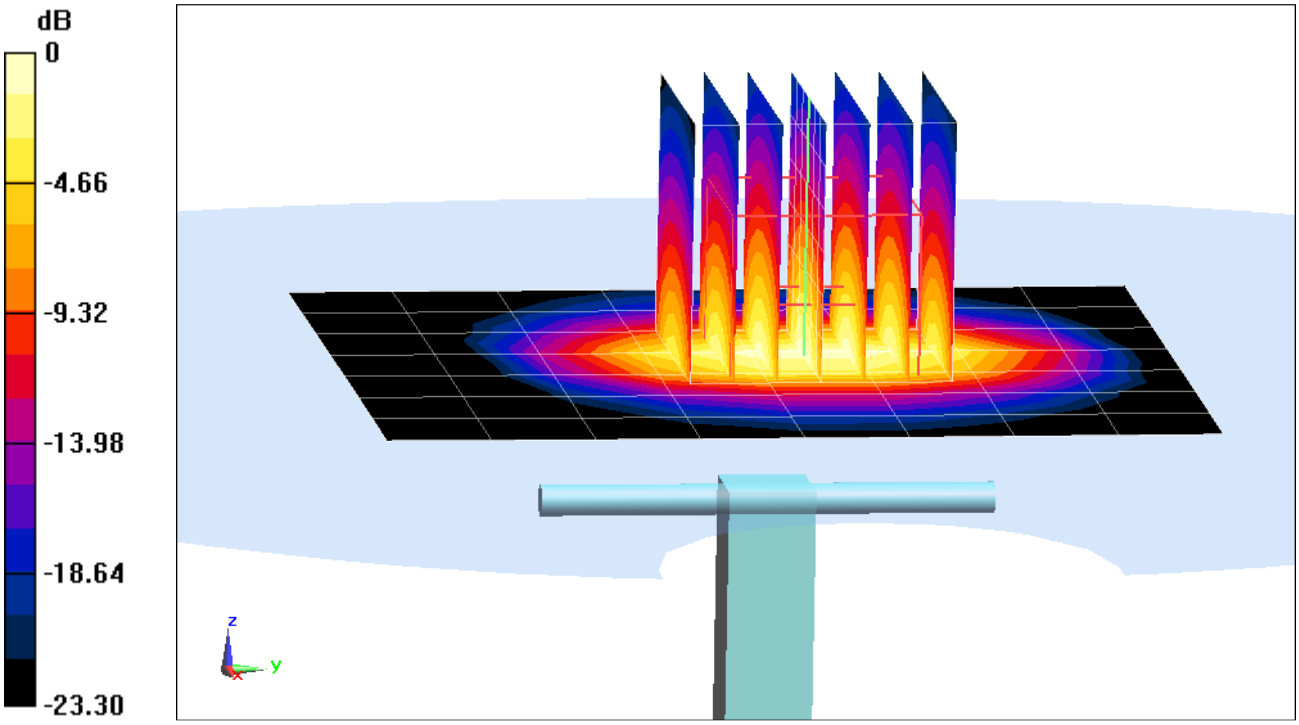
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.829 S/m; ε_r = 40.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.34 W/kg
Deviation(1 g) = 5.74%



0 dB = 7.15 W/kg = 8.54 dBW/kg

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

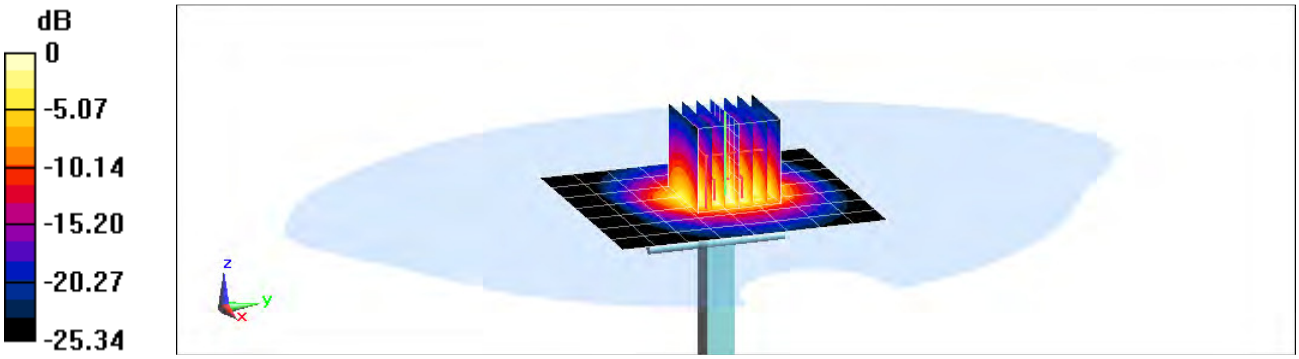
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 2.001 S/m; ε_r = 40.227; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.12, 4.12, 4.12); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/16/2015
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.9 W/kg
SAR(1 g) = 5.81 W/kg
Deviation(1 g) = 3.94%



0 dB = 7.84 W/kg = 8.94 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

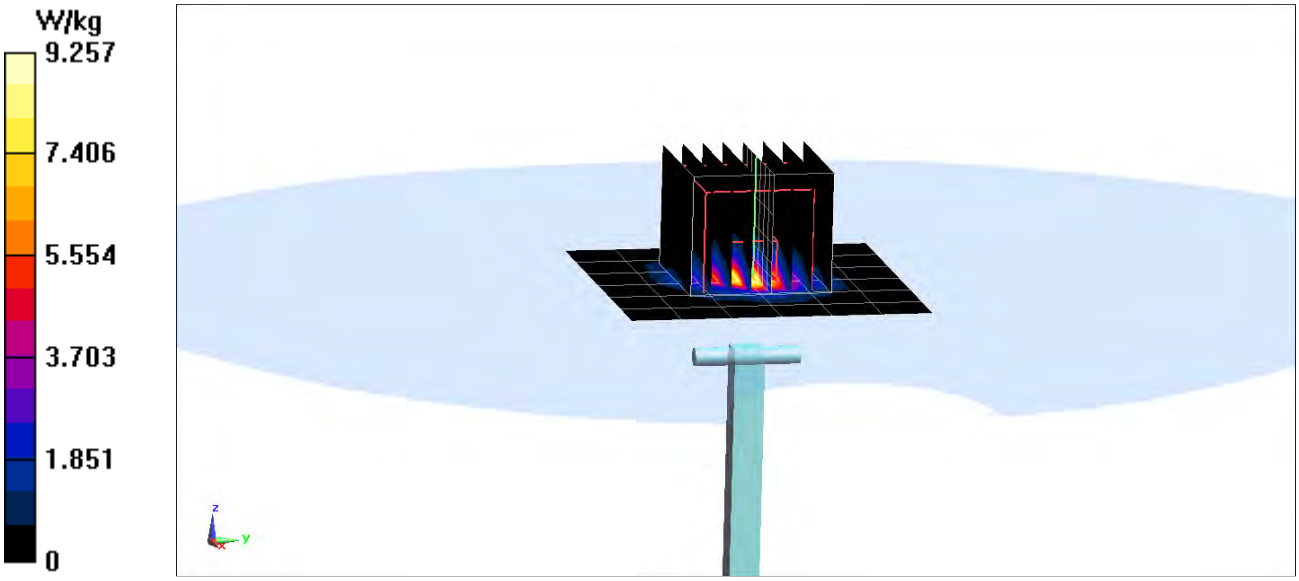
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5750 MHz; σ = 5.146 S/m; ε_r = 34.392; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2016; Ambient Temp: 20.5°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7357; ConvF(4.65, 4.65, 4.65); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 3.88 W/kg
Deviation(1 g) = -1.90%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

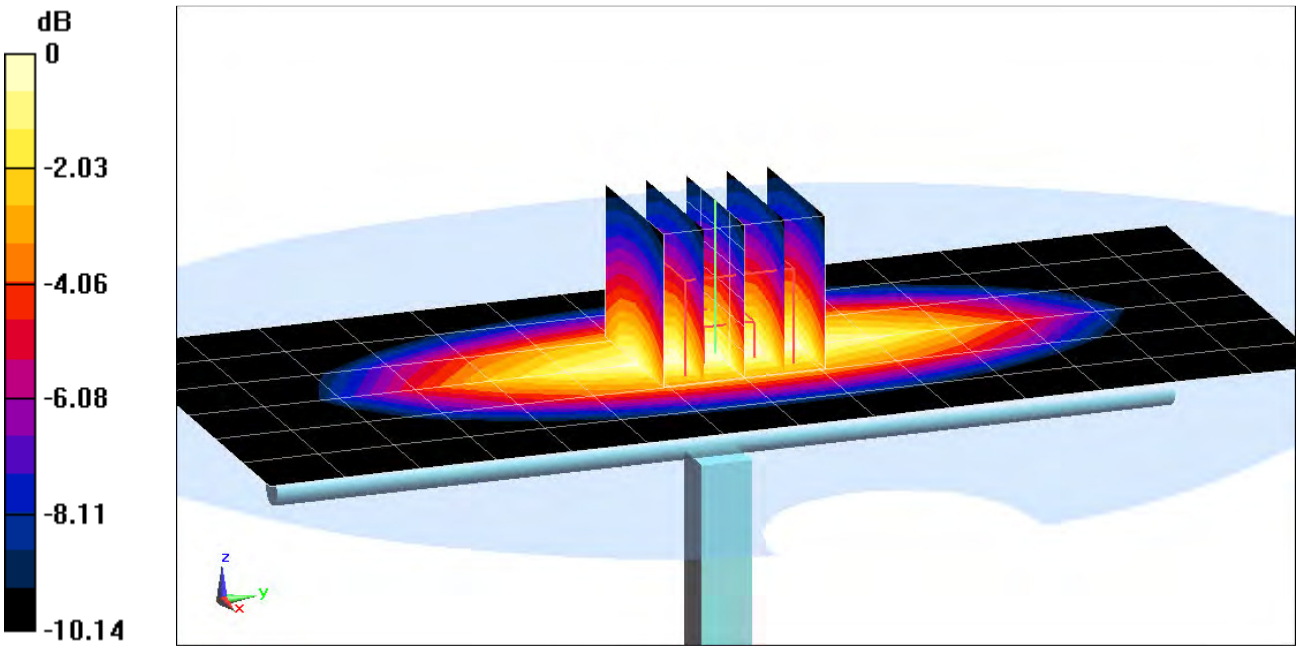
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.965 S/m; ε_r = 53.778; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.60 W/kg
SAR(1 g) = 1.77 W/kg
Deviation(1 g) = 0.91%



0 dB = 2.06 W/kg = 3.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

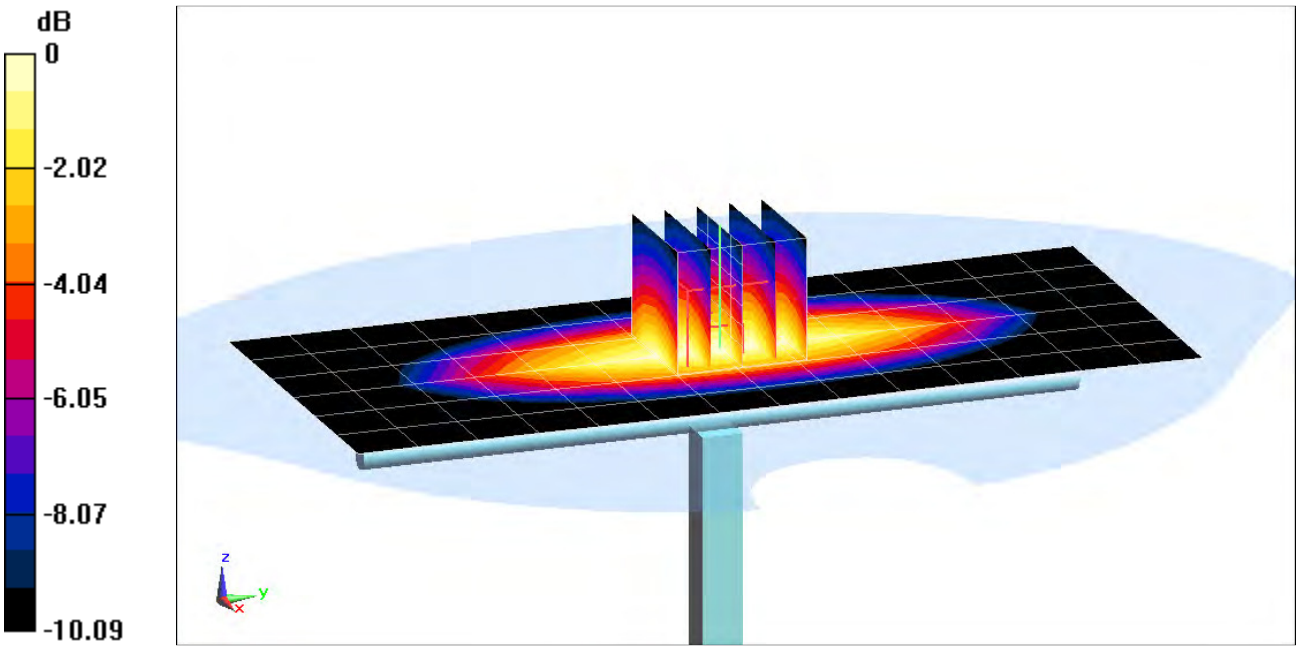
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.963 S/m; ε_r = 53.791; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-13-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(6.06, 6.06, 6.06); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.61 W/kg
SAR(1 g) = 1.77 W/kg
Deviation(1 g) = 3.39%



0 dB = 2.07 W/kg = 3.16 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

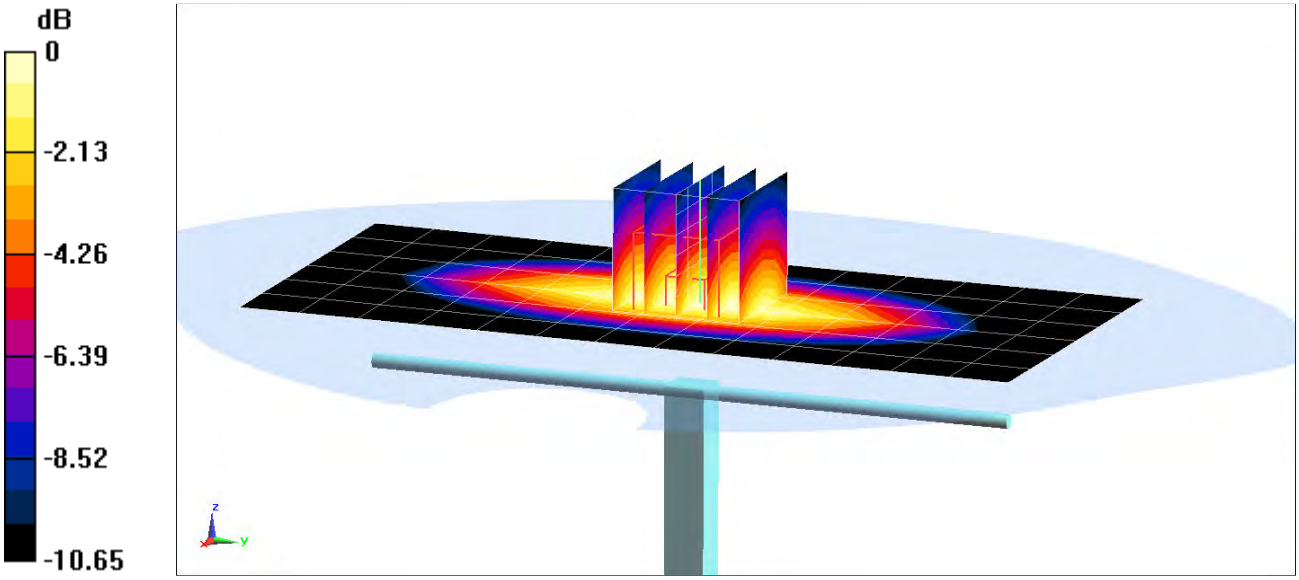
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.999 S/m; ε_r = 53.063; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-31-2016; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3318; ConvF(6.11, 6.11, 6.11); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.64 W/kg
SAR(1 g) = 1.81 W/kg
Deviation(1 g) = -0.98%



0 dB = 2.10 W/kg = 3.22 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

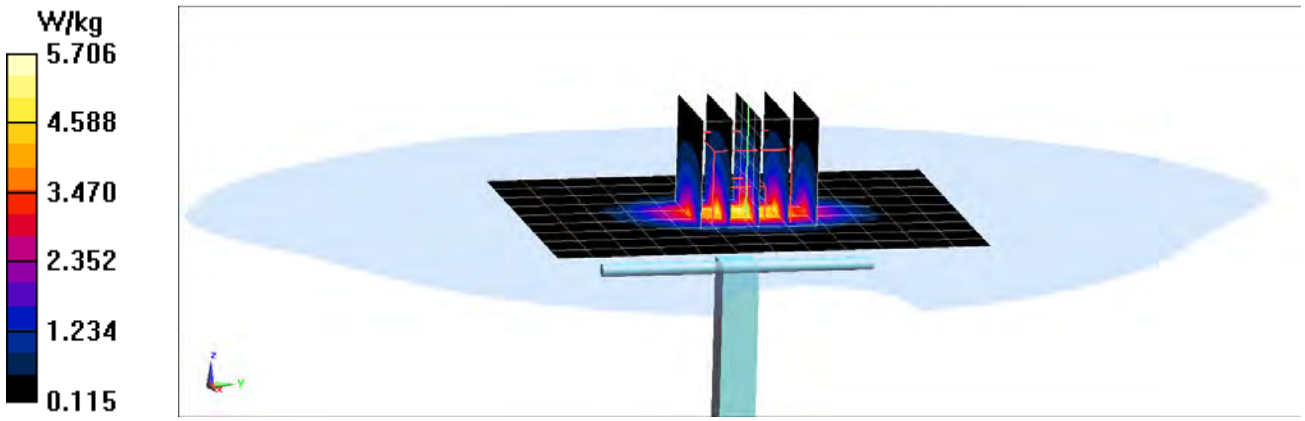
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.498 S/m; ε_r = 52.341; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.2°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (10x13x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.71 W/kg
SAR(1 g) = 3.74 W/kg; SAR(10 g) = 1.98 W/kg
Deviation(1 g) = 0.27%; Deviation(10 g) = 0.00%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

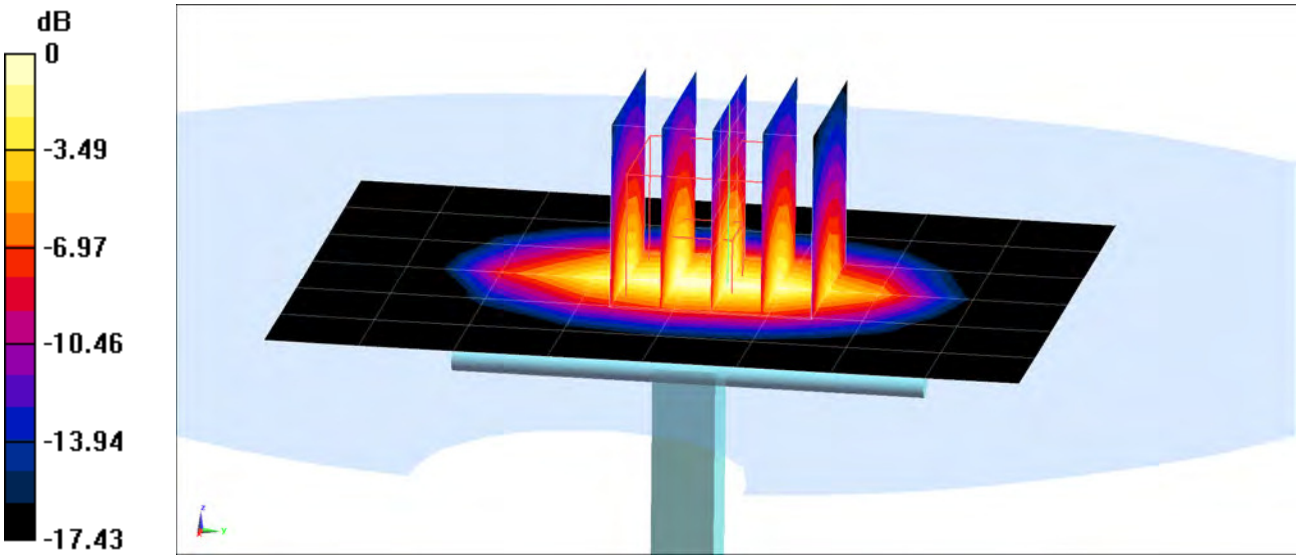
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.463 S/m; ε_r = 52.556; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-09-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.78, 7.78, 7.78); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.68 W/kg
SAR(10 g) = 1.95 W/kg
Deviation(10 g) = -1.52%



0 dB = 5.47 W/kg = 7.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

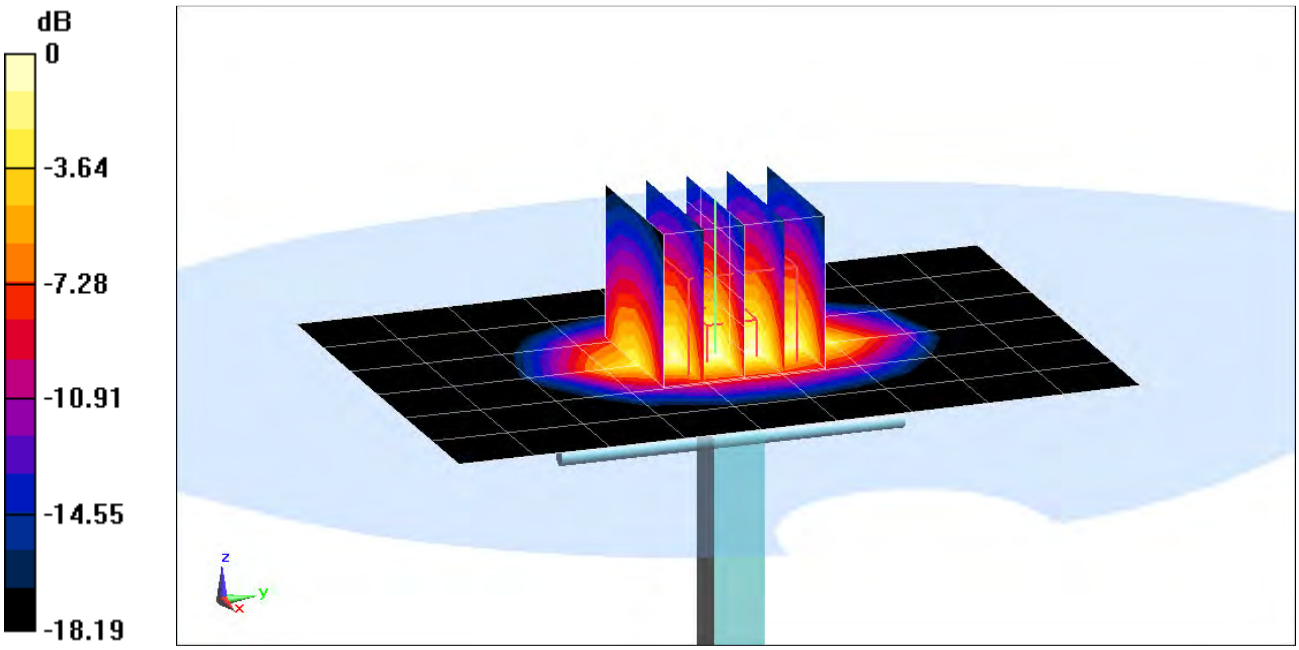
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.57 S/m; ε_r = 52.143; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.66 W/kg
SAR(1 g) = 4.23 W/kg; SAR(10 g) = 2.19 W/kg
Deviation(1 g) = 6.82%; Deviation(10 g) = 4.78%



0 dB = 5.34 W/kg = 7.28 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

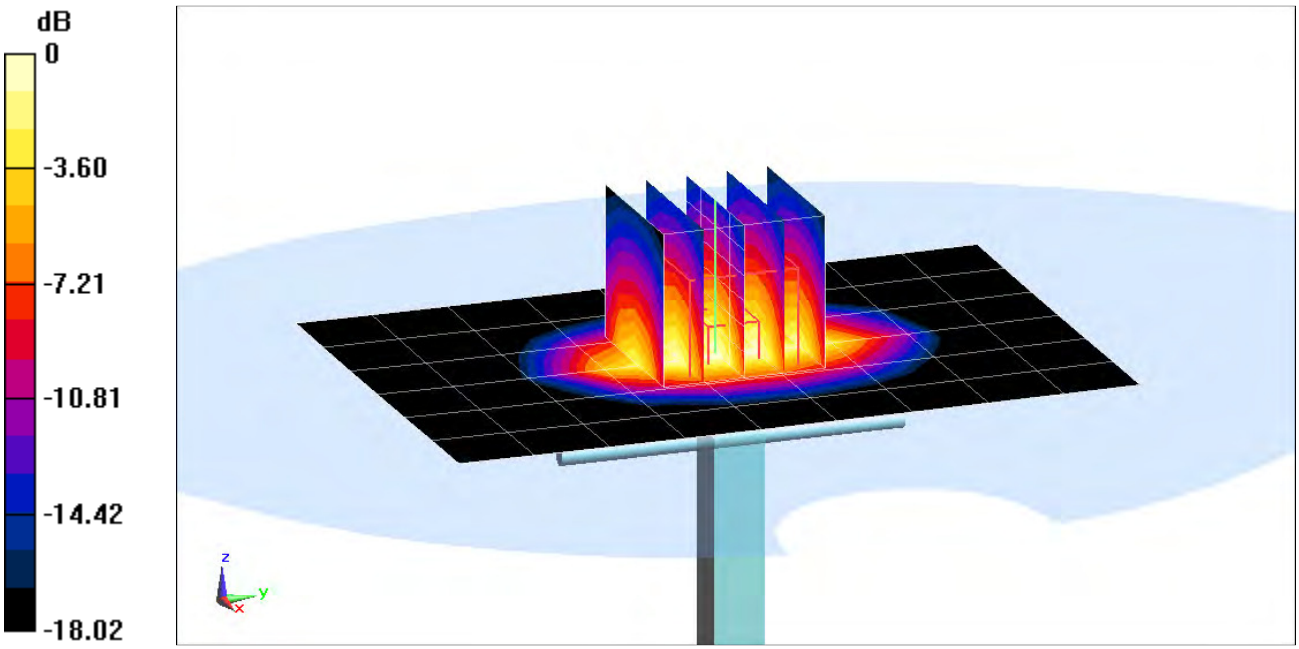
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.546 S/m; ε_r = 51.811; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-09-2016; Ambient Temp: 22.3°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.69 W/kg
SAR(10 g) = 2.21 W/kg
Deviation(10 g) = 1.38%



0 dB = 5.40 W/kg = 7.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1008

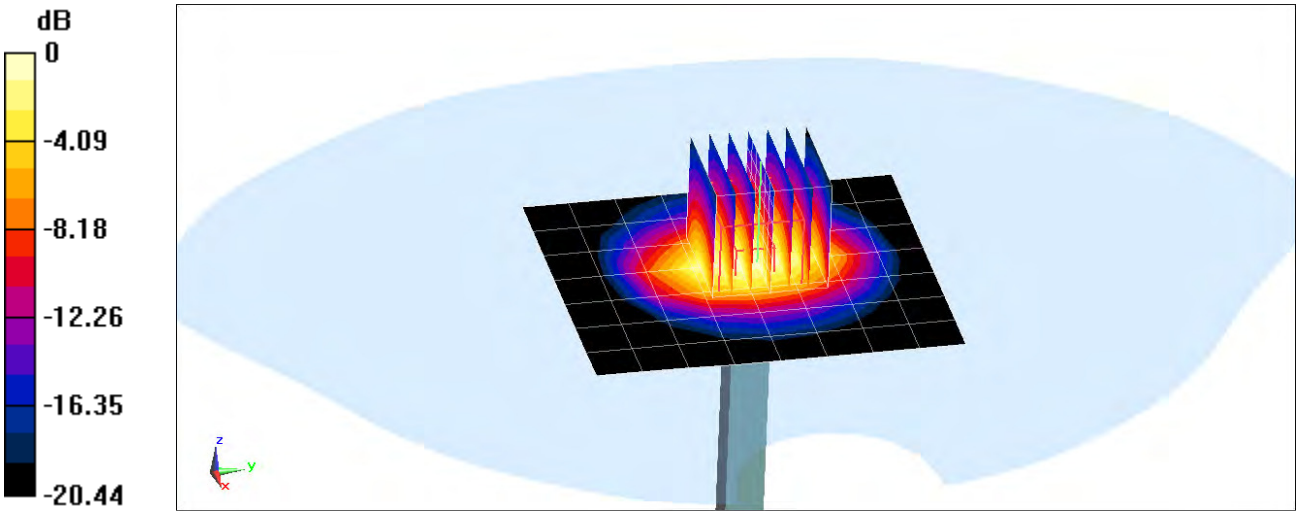
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2300 MHz; σ = 1.808 S/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-31-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2300 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 9.91 W/kg
SAR(1 g) = 4.94 W/kg
Deviation(1 g) = 2.07%



0 dB = 5.42 W/kg = 7.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 882

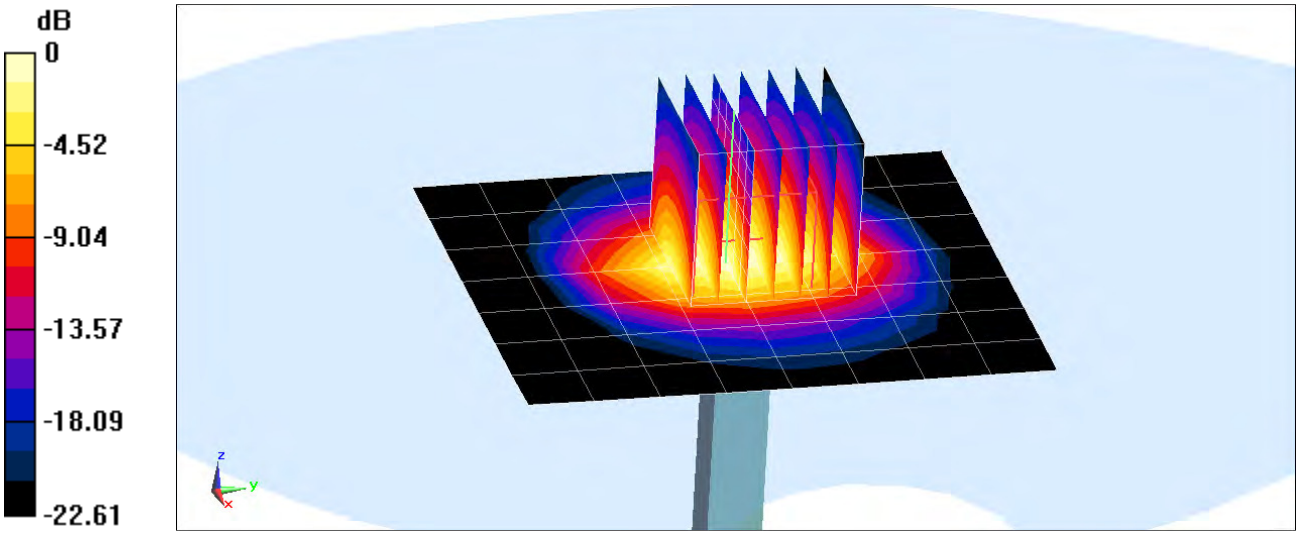
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.004 S/m; ε_r = 51.048; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 11/11/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.1 W/kg
SAR(1 g) = 5.28 W/kg; SAR(10 g)= 2.42 W/kg
Deviation(1 g) = 6.88%; Deviation(10 g)= 4.76%



0 dB = 6.93 W/kg = 8.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

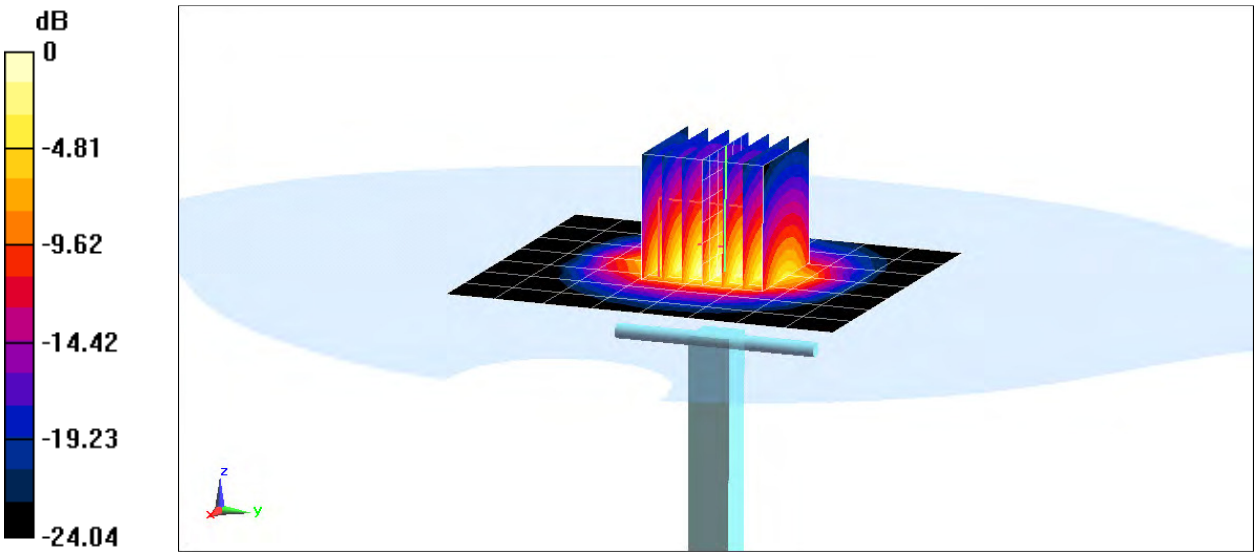
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.066 S/m; εr = 51.953; ρ = 1000 kg/m3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2016; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3318; ConvF(4.18, 4.18, 4.18); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.1 W/kg
SAR(1 g) = 5.04 W/kg
Deviation(1 g) = -8.20%



0 dB = 7.14 W/kg = 8.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

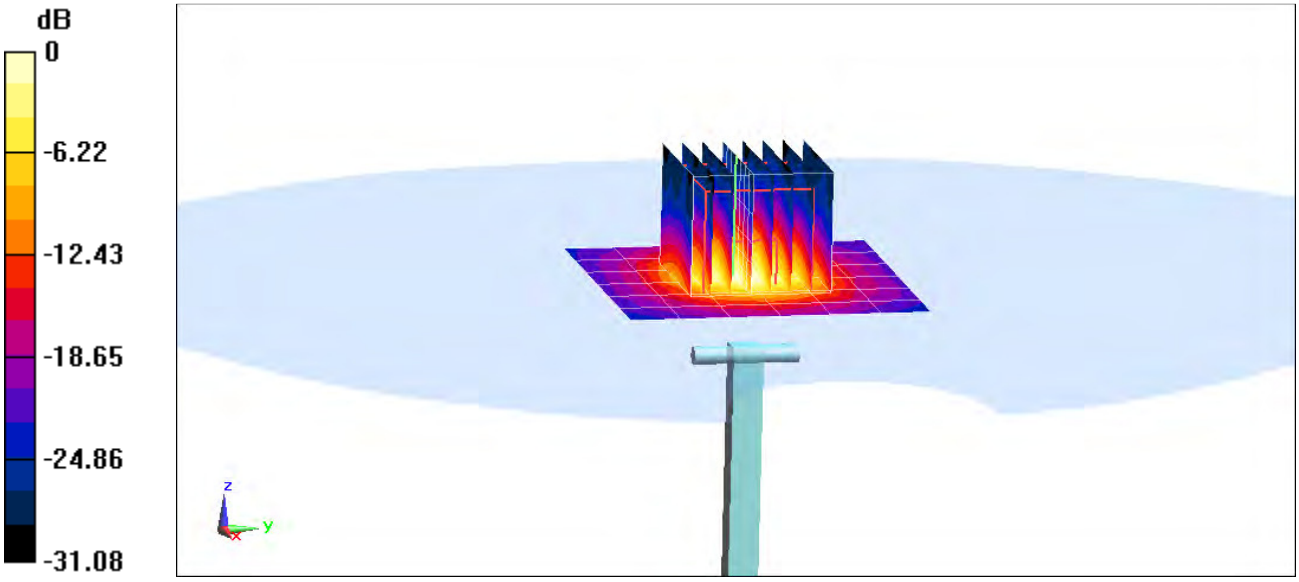
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.519 S/m; ε_r = 47.086; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.8ºC; Tissue Temp: 21.6ºC

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.3 W/kg
SAR(10 g) = 1.07 W/kg
Deviation(10 g) = 0.94%



0 dB = 8.67 W/kg = 9.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

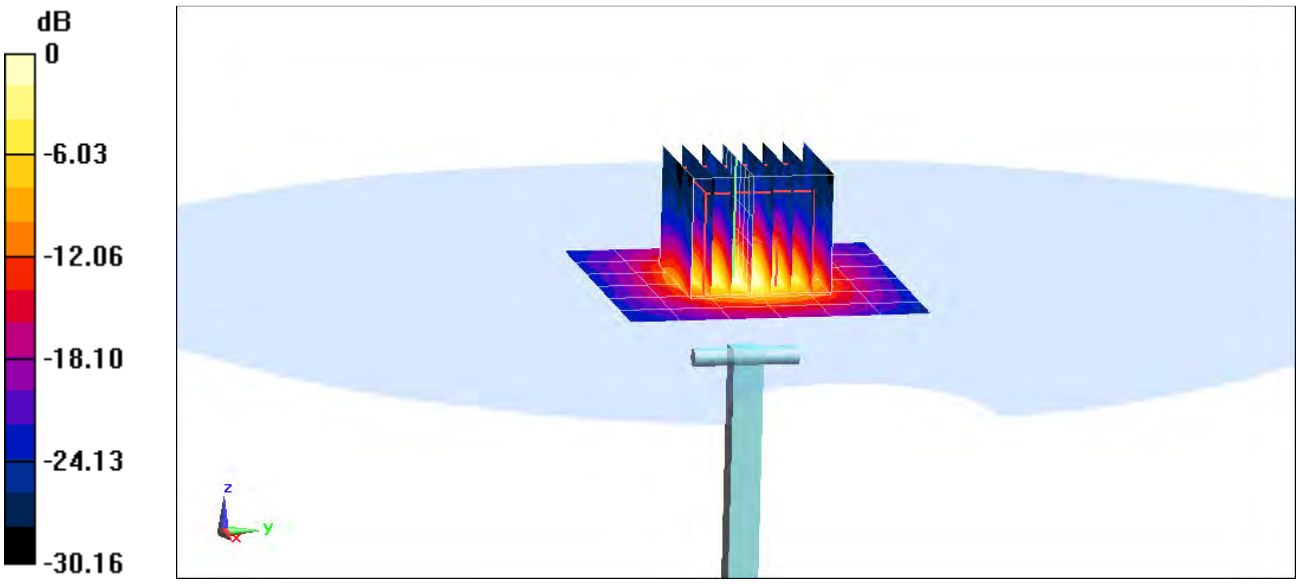
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.15 S/m; ε_r = 46.285; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2016; Ambient Temp: 22.8ºC; Tissue Temp: 21.6ºC

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 3.70 W/kg
Deviation(1 g) = -3.27%



0 dB = 8.80 W/kg = 9.44 dBW/kg

APPENDIX C: PROBE CALIBRATION

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 0108

Client **PC Test**

Certificate No: D750V3-1046_Feb16

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1046
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	February 16, 2016

BN ✓
3/1/2016

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	31-Dec-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 17, 2016

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

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 1528-2013, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
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	41.8 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.20 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.36 W/kg ± 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	55.1 ± 6 %	0.98 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.77 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.80 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56.7 Ω + 2.3 jΩ
Return Loss	- 23.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.7 Ω - 0.8 jΩ
Return Loss	- 34.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.037 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 02, 2011

DASY5 Validation Report for Head TSL

Date: 16.02.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1046

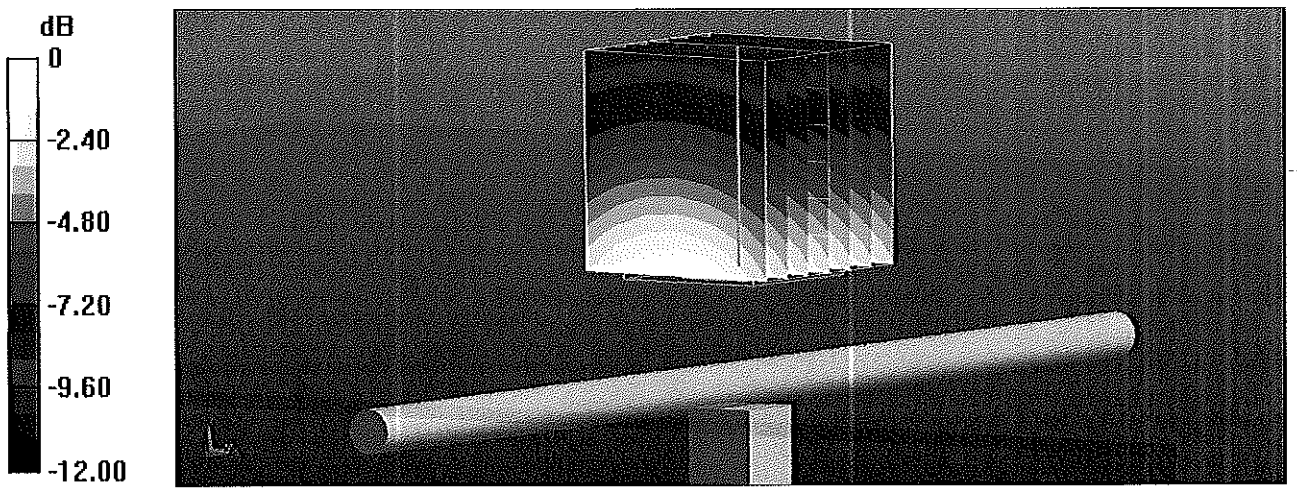
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 41.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.28, 10.28, 10.28); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

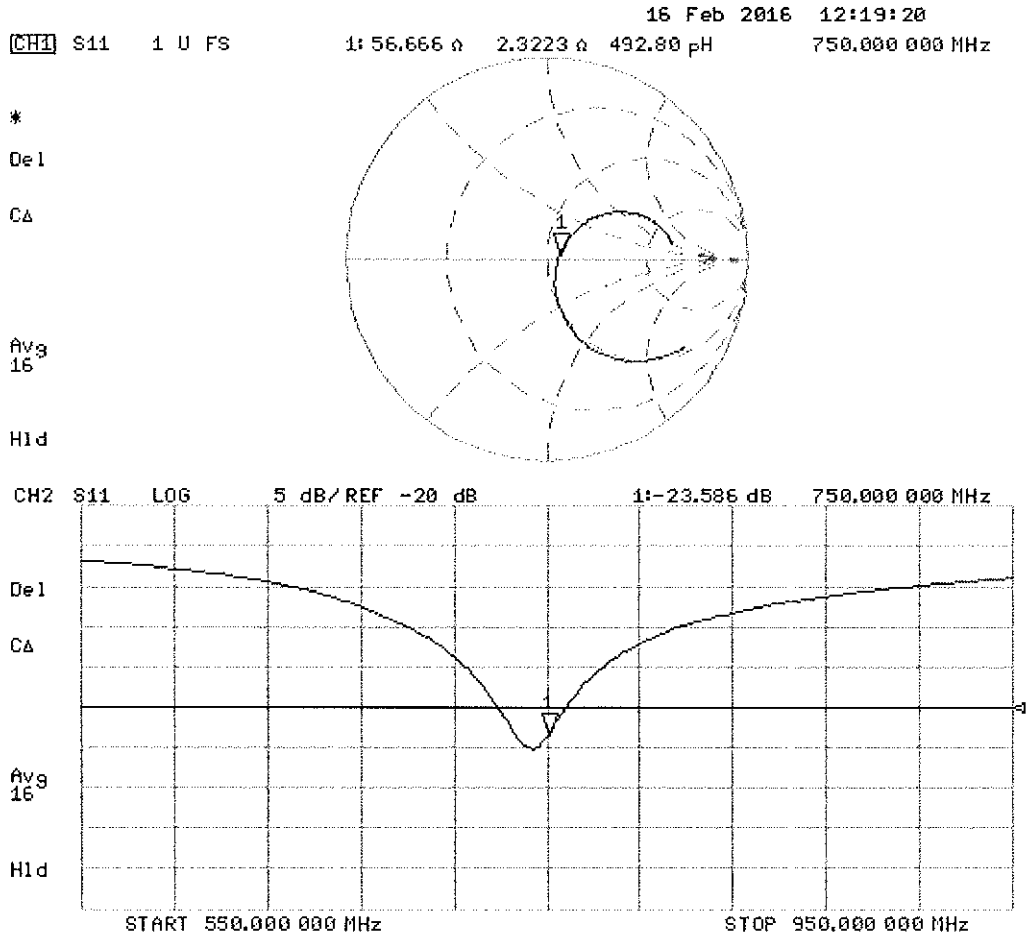
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.40 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.75 W/kg



0 dB = 2.75 W/kg = 4.39 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.02.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1046

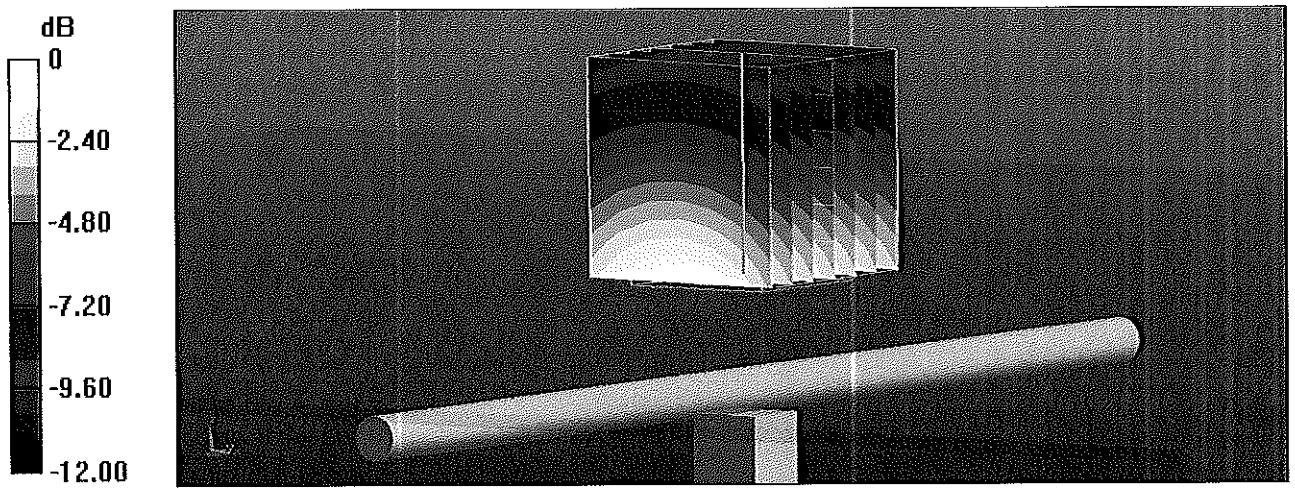
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.98 S/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

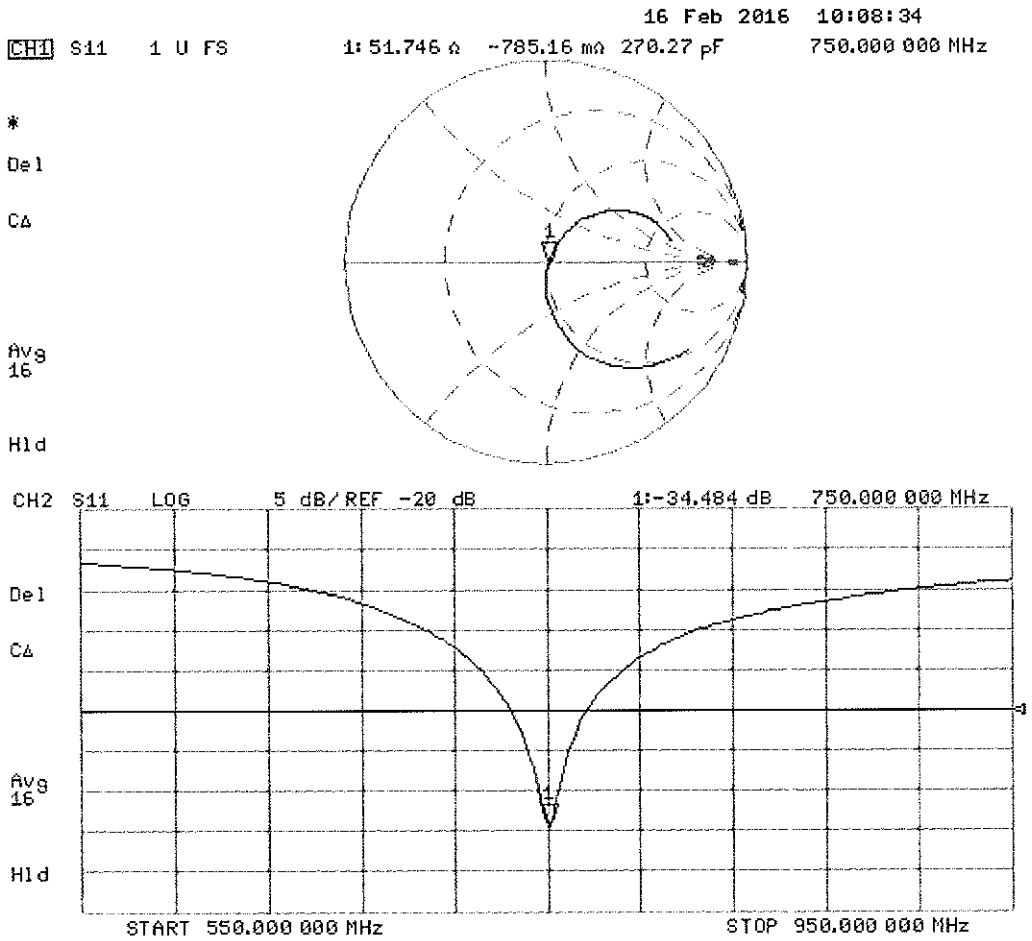
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.48 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.31 W/kg
SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.47 W/kg
Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Impedance Measurement Plot for Body TSL



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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 0108

Client **PC Test**

Certificate No: D835V2-4d119_Apr16

CALIBRATION CERTIFICATE

PM ✓
4/25/16

Object	D835V2 - SN: 4d119
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	April 14, 2016

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 NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M. Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 15, 2016

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

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 1528-2013, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.7 ± 6 %	0.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.14 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.97 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	1.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.38 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.14 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.56 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.04 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω - 4.1 jΩ
Return Loss	- 27.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.9 Ω - 6.1 jΩ
Return Loss	- 23.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 29, 2010

DASY5 Validation Report for Head TSL

Date: 14.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d119

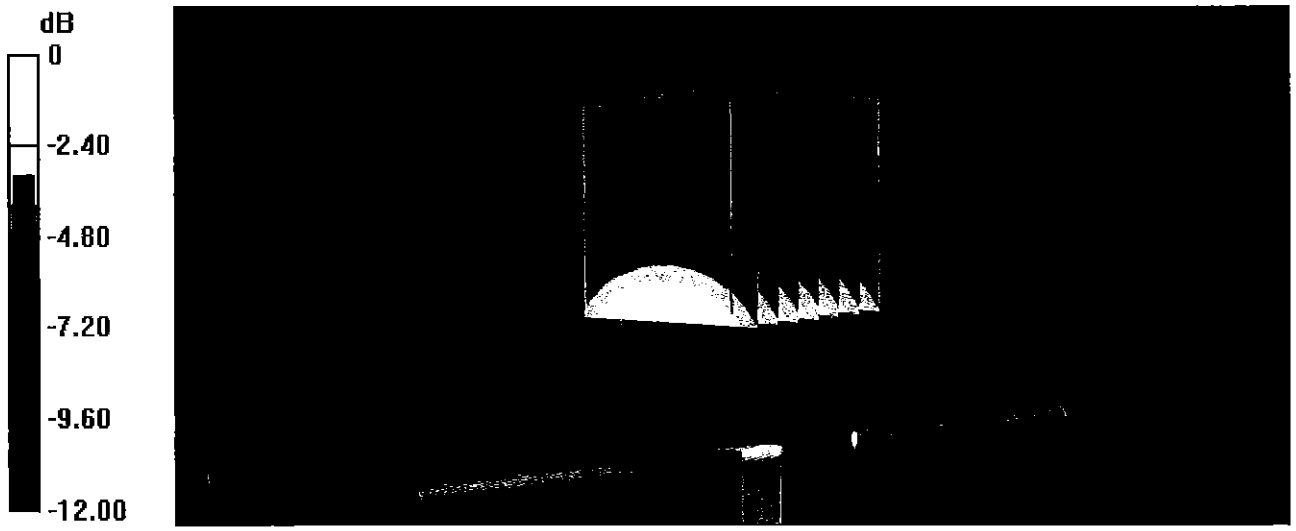
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.93 S/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.83, 9.83, 9.83); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

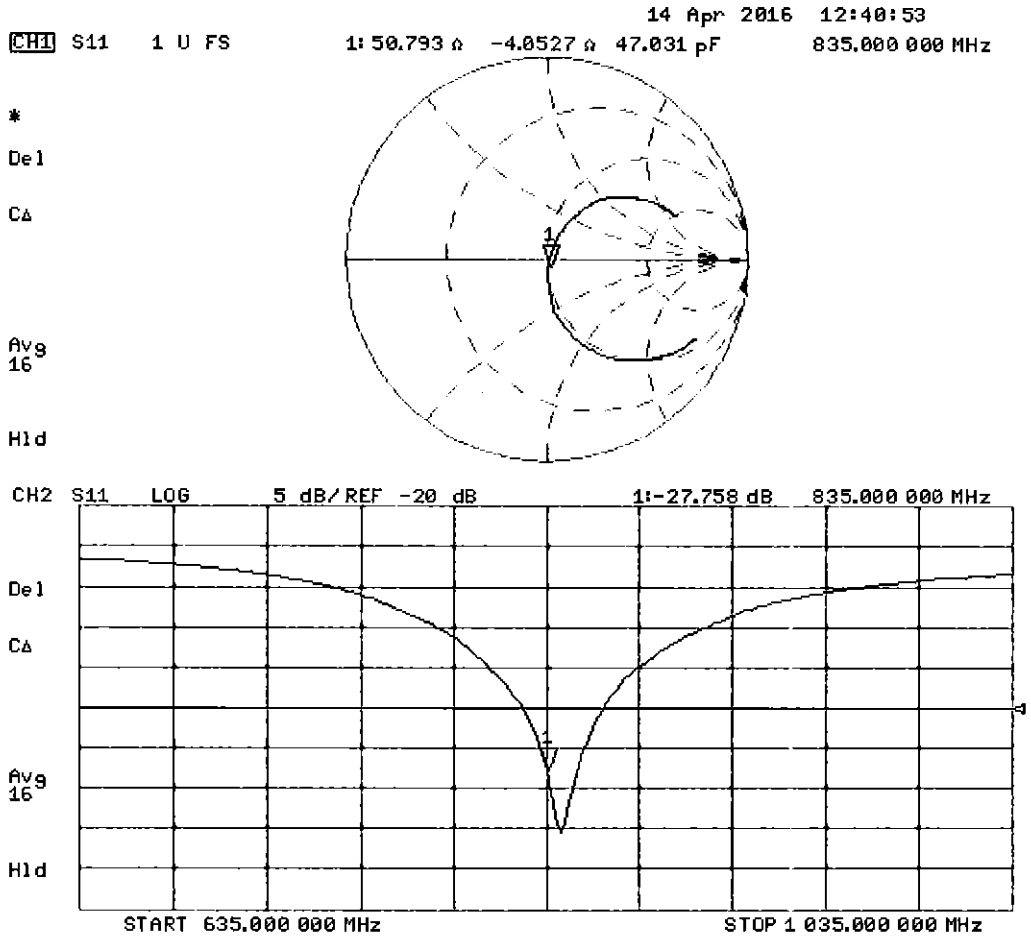
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.95 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 3.11 W/kg



0 dB = 3.11 W/kg = 4.93 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d119

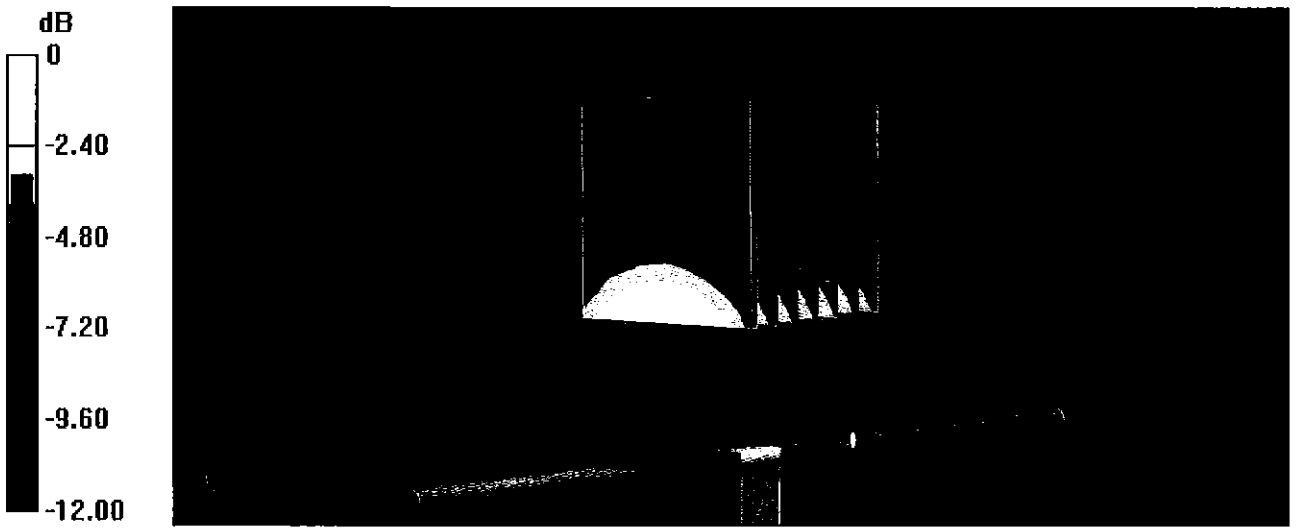
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.02 S/m; ε_r = 54.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

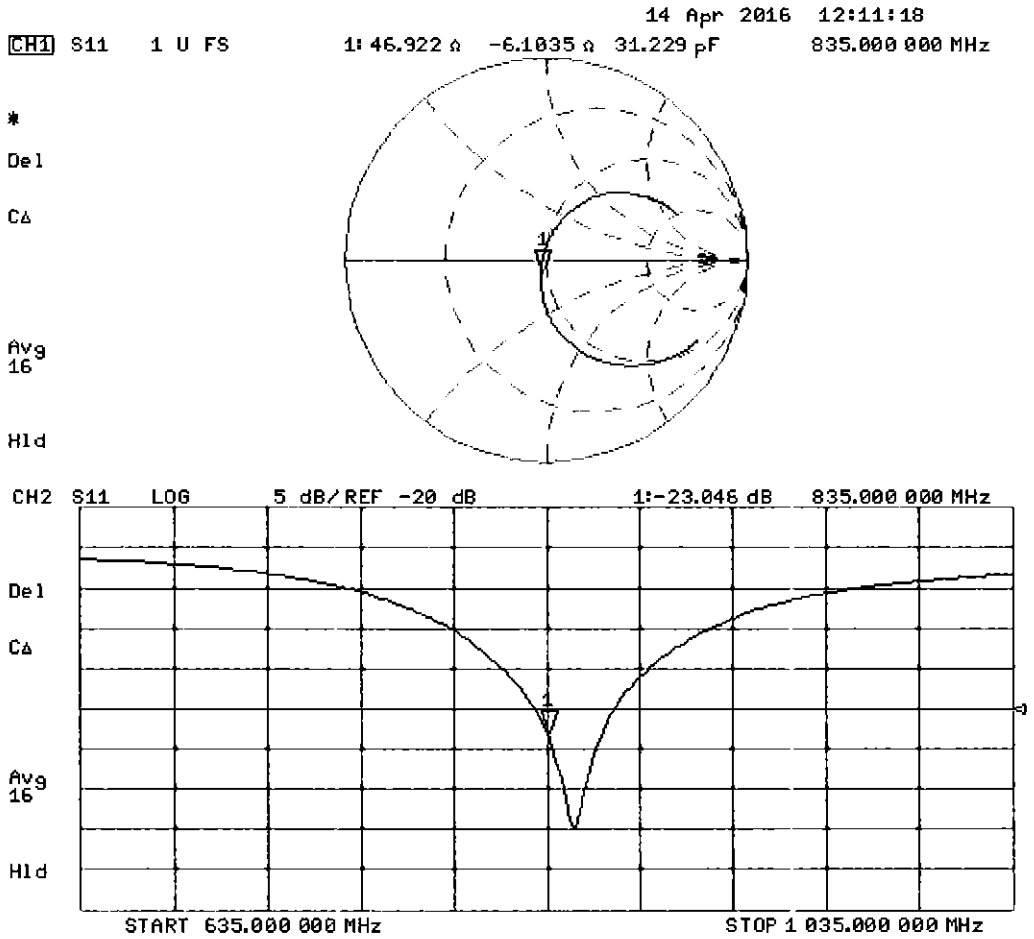
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.35 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.11 W/kg



0 dB = 3.11 W/kg = 4.93 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1765V2-1008_May16

CALIBRATION CERTIFICATE

Object	D1765V2 - SN:1008
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 11, 2016

BNV 05/23/16

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 NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M. Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 17, 2016

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

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 1528-2013, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.81 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.3 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.50 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	1.50 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.30 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.94 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.8 Ω - 6.0 jΩ
Return Loss	- 24.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 6.8 jΩ
Return Loss	- 21.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.211 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 06, 2005

DASY5 Validation Report for Head TSL

Date: 11.05.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN: 1008

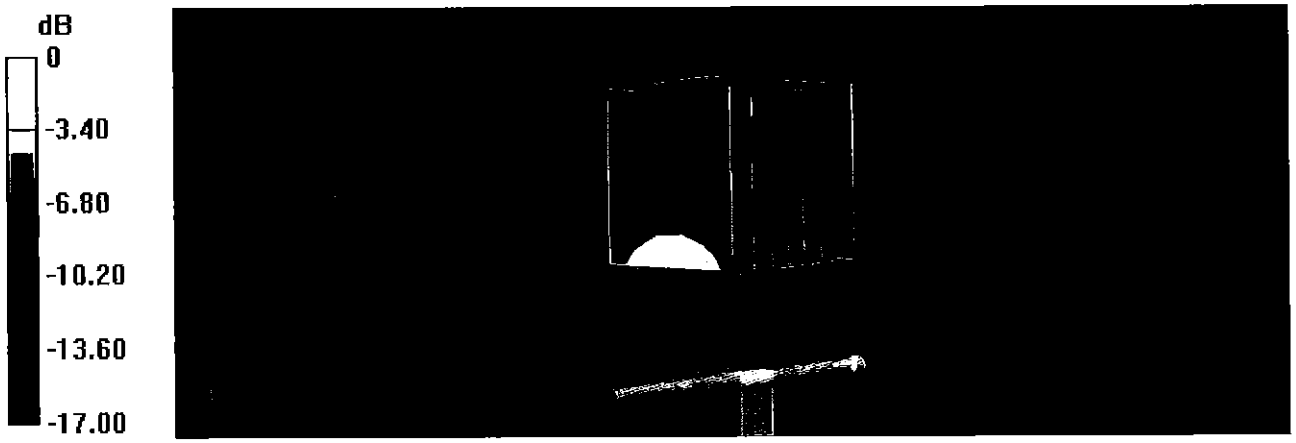
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.54, 8.54, 8.54); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

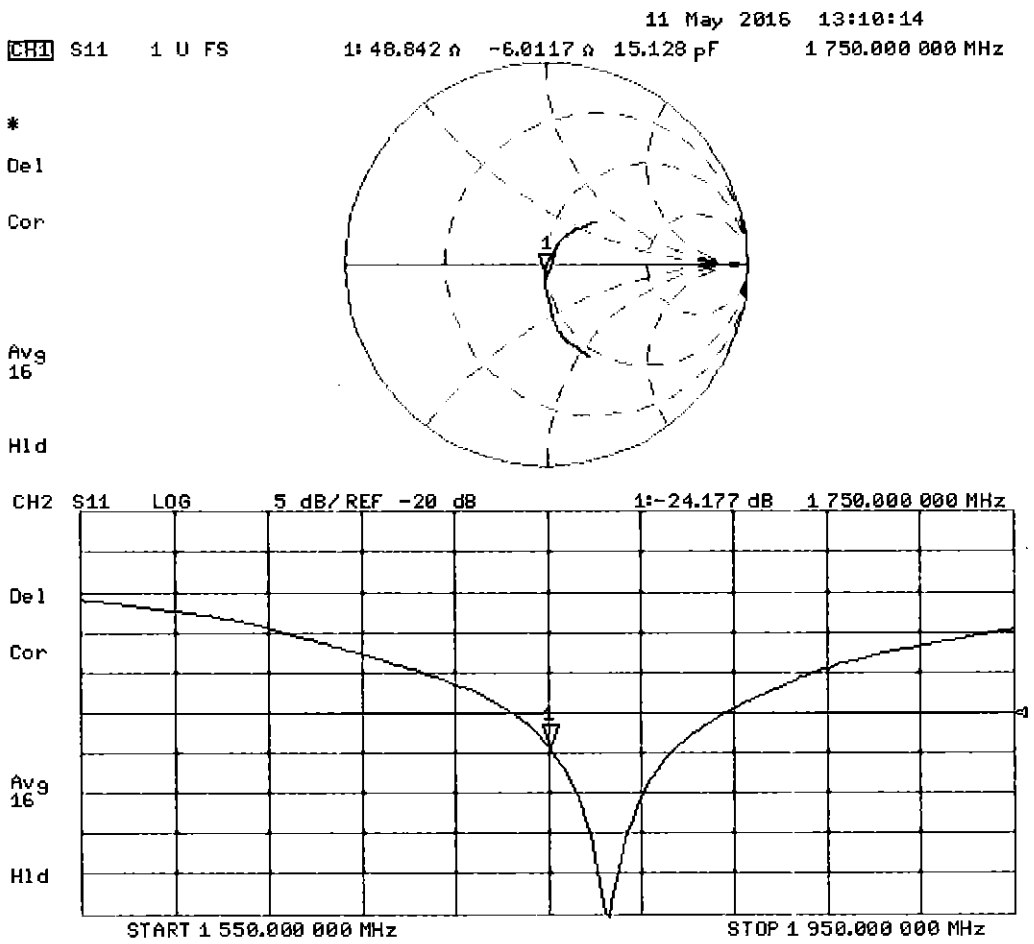
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.4 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.1 W/kg; SAR(10 g) = 4.81 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.05.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN: 1008

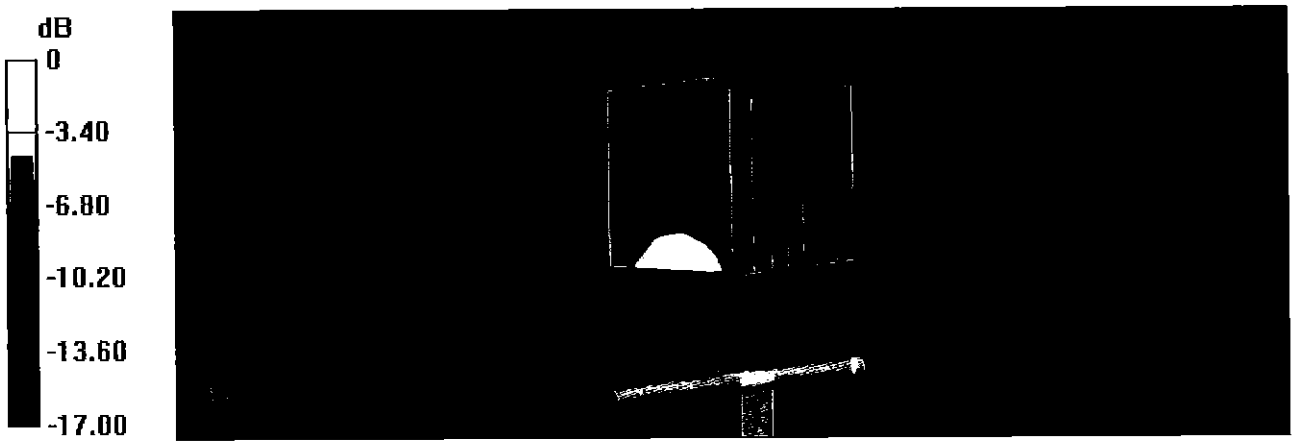
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.5 S/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

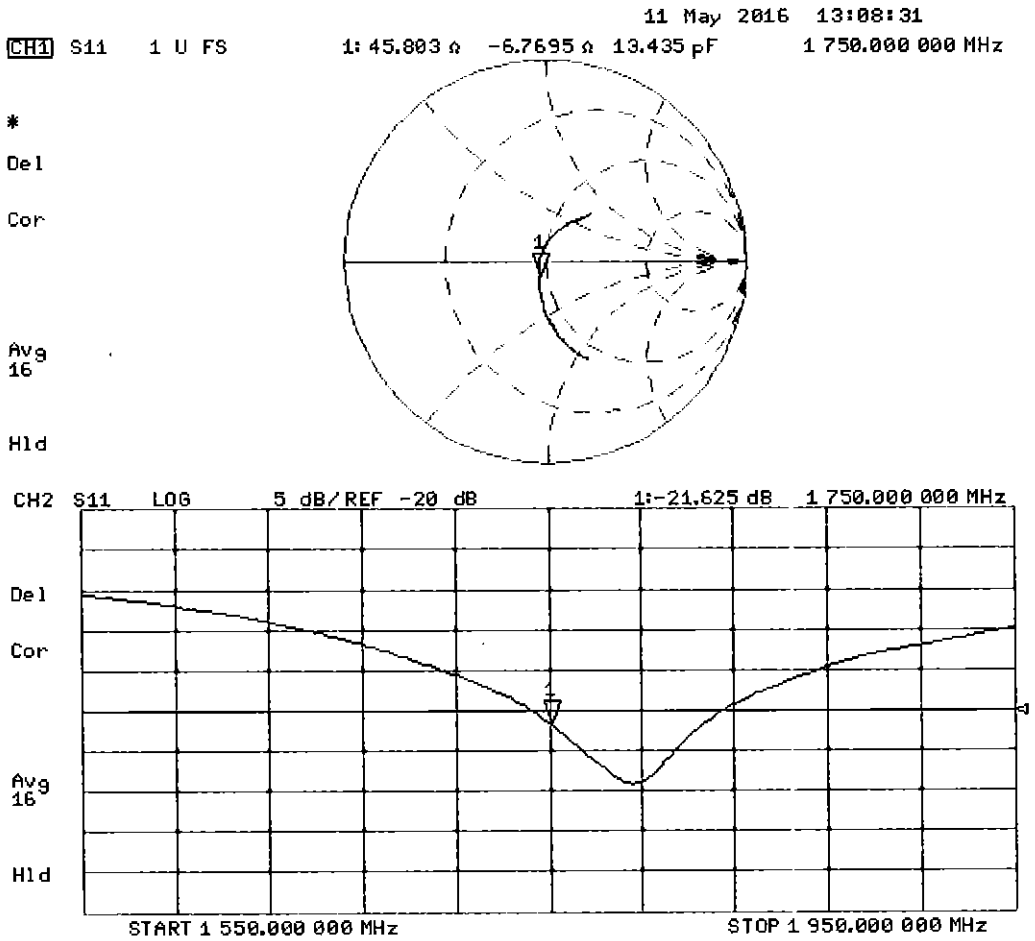
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.9 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.3 W/kg; SAR(10 g) = 4.94 W/kg
Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d141_Apr16

CALIBRATION CERTIFICATE

PM ✓
4/25/16

Object	D1900V2 - SN:5d141
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	April 12, 2016

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 NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 15, 2016

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

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 1528-2013, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.0 ± 6 %	1.37 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	9.50 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**38.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.9 ± 6 %	1.49 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	9.80 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.20 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.9 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 Ω + 6.3 jΩ
Return Loss	- 23.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.9 Ω + 7.5 jΩ
Return Loss	- 22.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 12.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d141

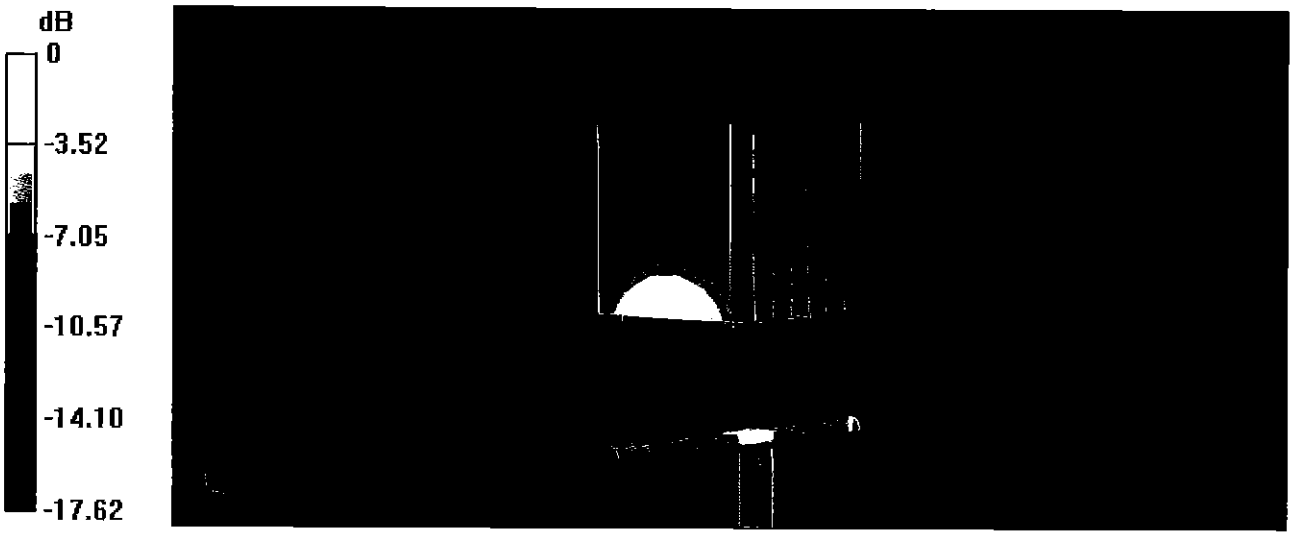
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.37 S/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.2, 8.2, 8.2); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

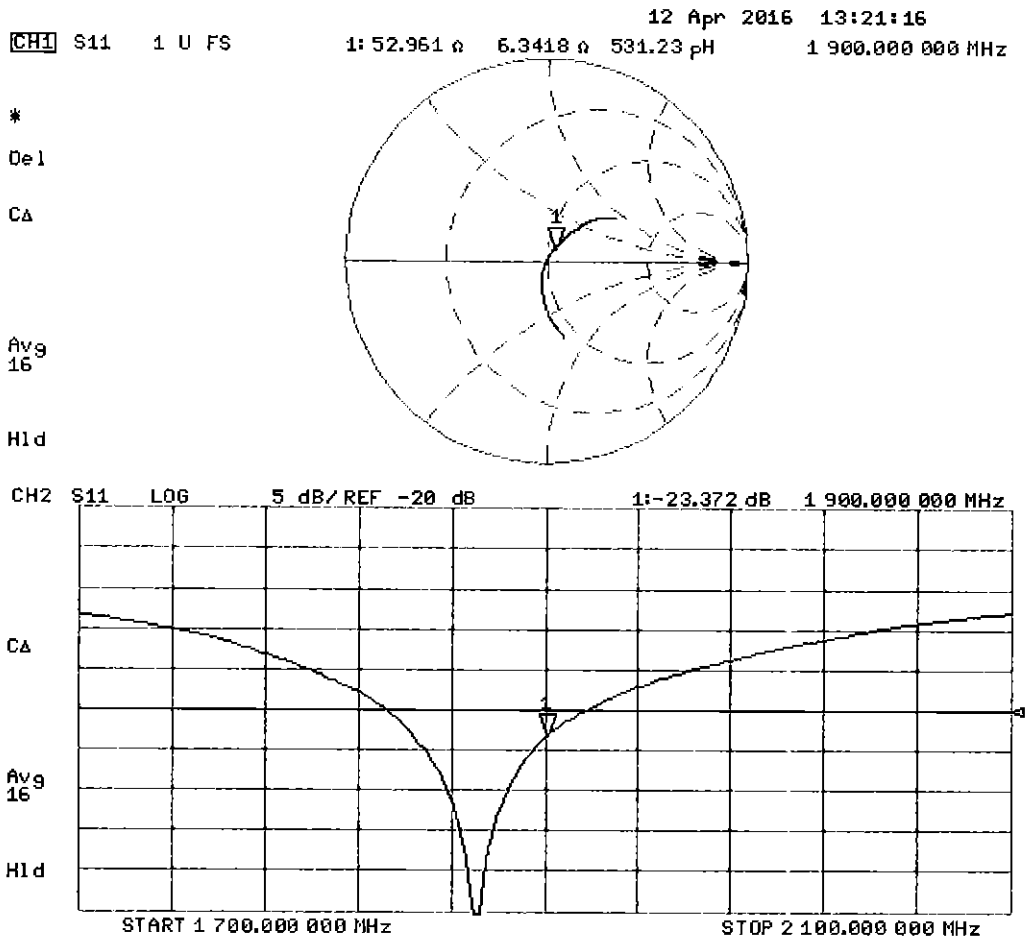
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.9 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.5 W/kg; SAR(10 g) = 4.97 W/kg
Maximum value of SAR (measured) = 14.2 W/kg



0 dB = 14.2 W/kg = 11.52 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 12.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d141

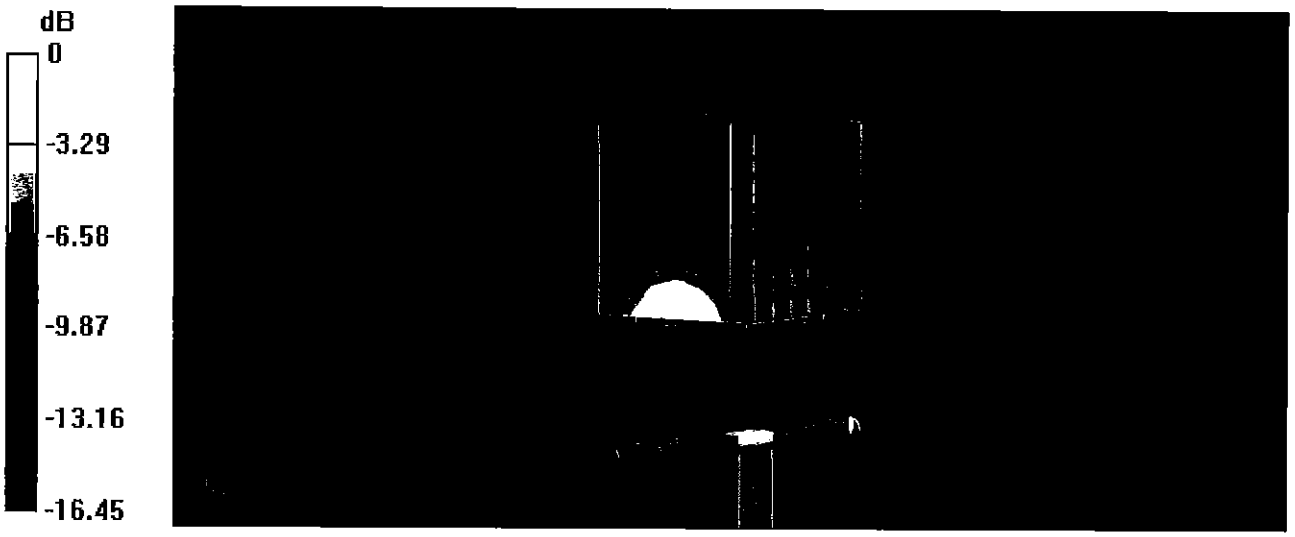
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.49 S/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

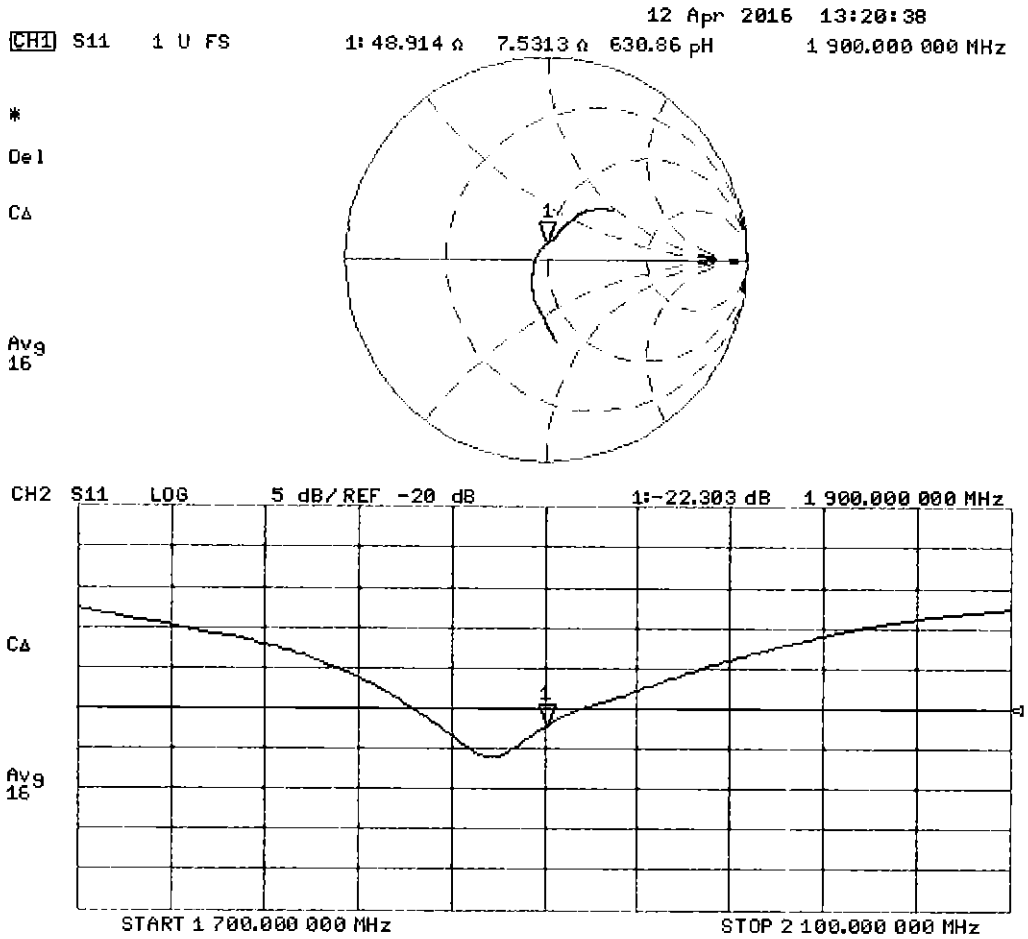
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.2 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 9.8 W/kg; SAR(10 g) = 5.2 W/kg
Maximum value of SAR (measured) = 14.8 W/kg



0 dB = 14.8 W/kg = 11.70 dBW/kg

Impedance Measurement Plot for Body TSL



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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 0108

Client **PC Test**

Certificate No: D2300V2-1064_Dec15

CALIBRATION CERTIFICATE

Object	D2300V2 - SN: 1064
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	December 08, 2015

BNV
12/16/2015

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	30-Dec-14 (No. EX3-7349_Dec14)	Dec-15
DAE4	SN: 601	17-Aug-15 (No. DAE4-601_Aug15)	Aug-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M. Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: December 8, 2015

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

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 1528-2013, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2300 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.71 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**47.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.73 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.7 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.9	1.81 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.1 ± 6 %	1.85 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	11.5 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**45.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.52 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**22.0 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.7 Ω - 5.4 jΩ
Return Loss	- 25.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 3.4 jΩ
Return Loss	- 25.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.167 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 20, 2015

DASY5 Validation Report for Head TSL

Date: 08.12.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN: 1064

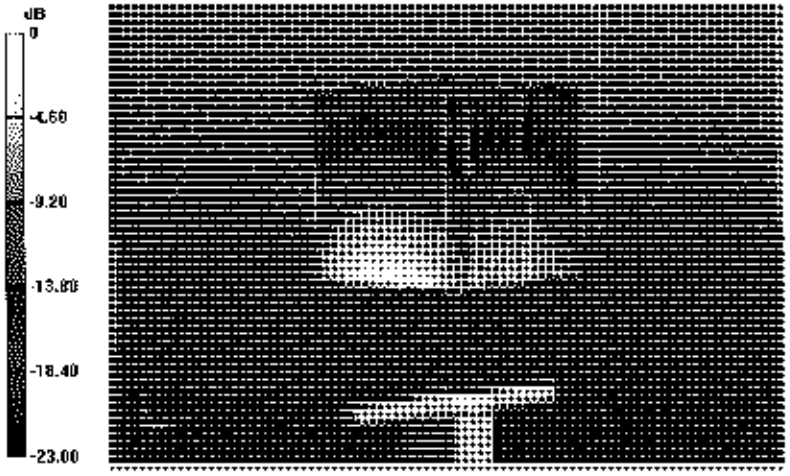
Communication System: UID 0 - CW; Frequency: 2300 MHz
Medium parameters used: f = 2300 MHz; σ = 1.71 S/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

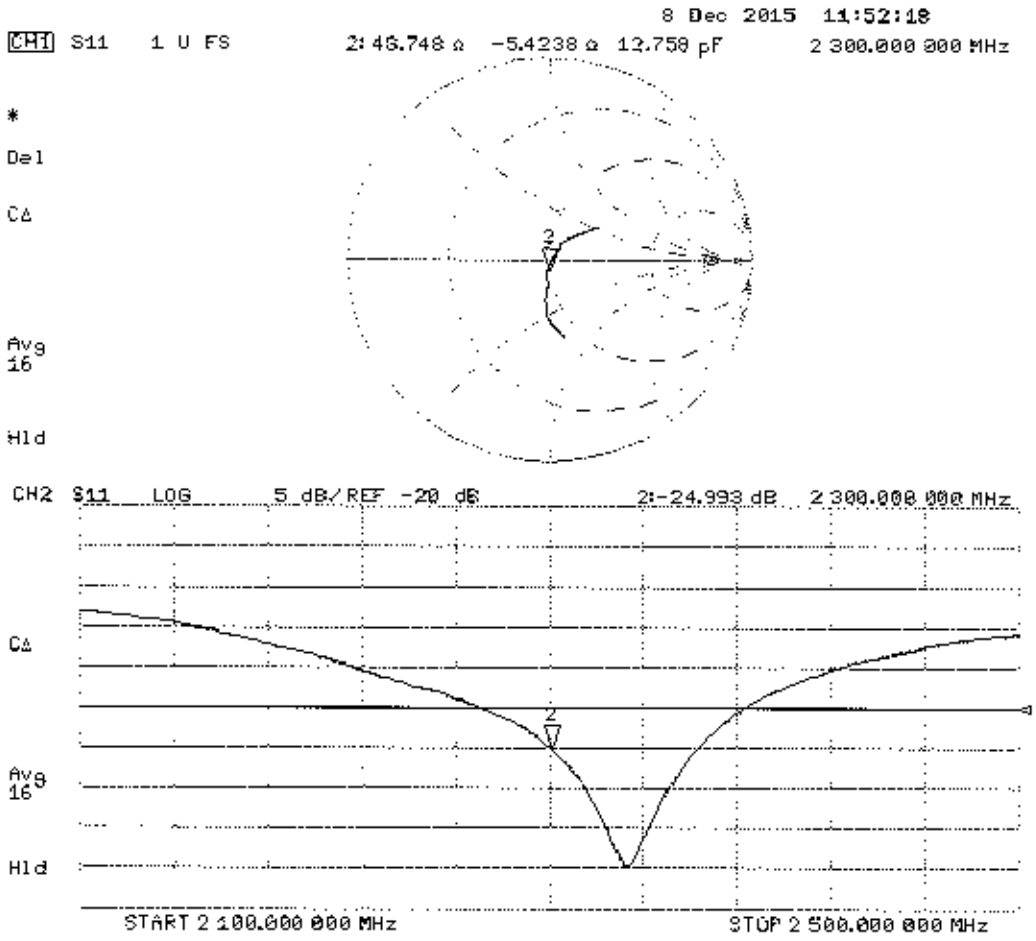
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 111.1 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 24.4 W/kg
SAR(1 g) = 12.1 W/kg; SAR(10 g) = 5.73 W/kg
Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 19.7 W/kg = 12.94 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.12.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN: 1064

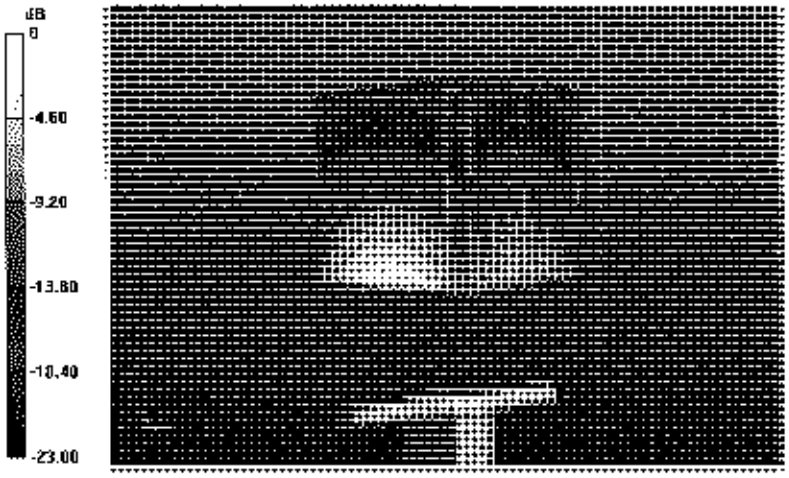
Communication System: UID 0 - CW; Frequency: 2300 MHz
Medium parameters used: f = 2300 MHz; σ = 1.85 S/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

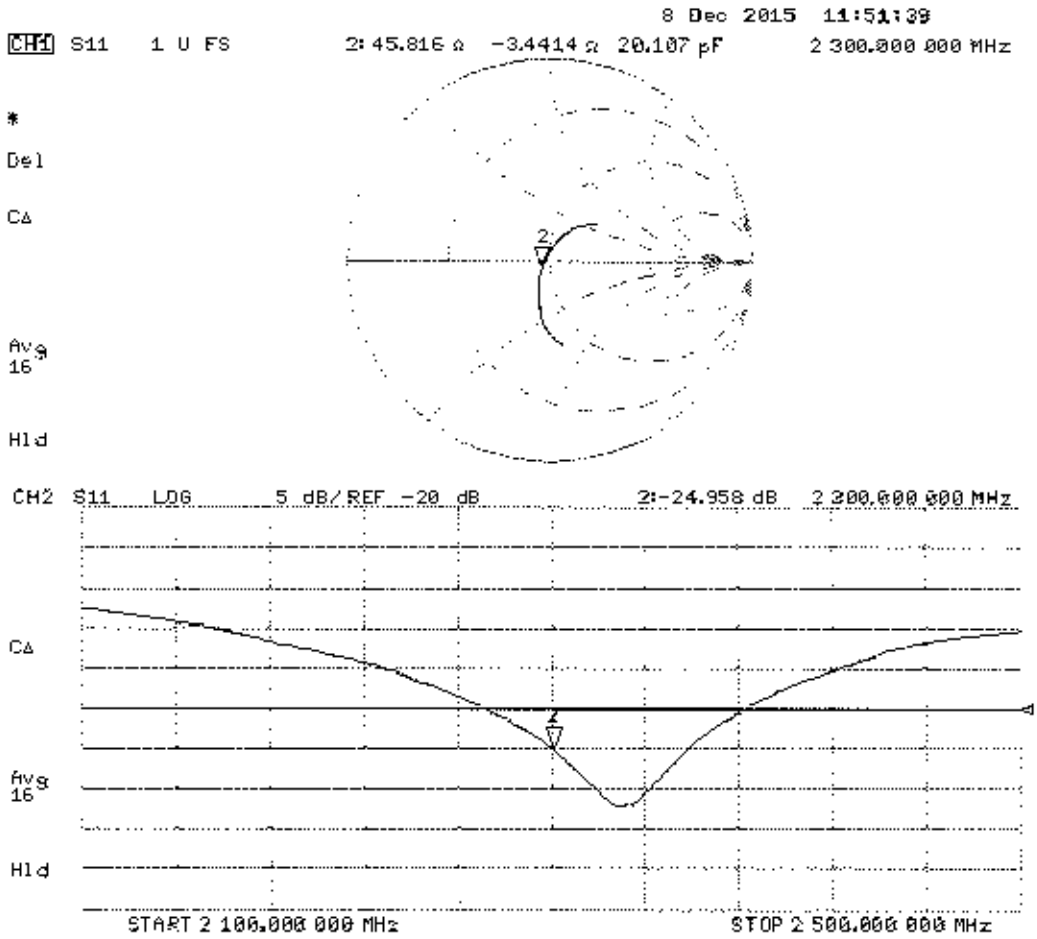
DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.74, 7.74, 7.74); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.8 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 22.5 W/kg
SAR(1 g) = 11.5 W/kg; SAR(10 g) = 5.52 W/kg
Maximum value of SAR (measured) = 18.6 W/kg



0 dB = 18.6 W/kg = 12.70 dBW/kg

Impedance Measurement Plot for Body TSL