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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
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Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
01/19/16 - 02/04/16
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1601290223-R1.A3L

FCC ID: **A3LSMG930US**

APPLICANT: **SAMSUNG ELECTRONICS CO., LTD.**

DUT Type: Portable Handset
Application Type: Class II Permissive Change
FCC Rule Part(s): CFR §2.1093
Model(s): SM-G930A, SM-G930P, SM-G930T, SM-G930V, SM-G930R4
Original Grant Date: 02/03/2016
Permissive Change(s): Adding Wireless Charging Battery Cover

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	< 0.1	< 0.1	0.13
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	< 0.1	0.10
PCE	UMTS 850	826.40 - 846.60 MHz	0.53	< 0.1	0.13
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.14	0.18	0.17
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.13	0.10	0.16
PCE	CDMA/EVDO BC10 (§90S)	817.90 - 823.10 MHz	0.35	0.12	0.18
PCE	CDMA/EVDO BC0 (§22H)	824.70 - 848.31 MHz	0.33	0.13	0.19
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.16	0.19	0.13
PCE	LTE Band 12	699.7 - 715.3 MHz	0.38	0.10	0.13
PCE	LTE Band 13	779.5 - 784.5 MHz	0.37	0.10	0.14
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.48	0.11	0.16
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz			
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.13	0.19	0.16
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz			
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	< 0.1	0.14	0.15
PCE	LTE Band 30	2307.5 - 2312.5 MHz	< 0.1	< 0.1	0.16
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.17	< 0.1	0.46
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.38	< 0.1	< 0.1
NII	U-NII-1	5180 - 5240 MHz	0.45	< 0.1	< 0.1
NII	U-NII-2A	5260 - 5320 MHz			
NII	U-NII-2C	5500 - 5720 MHz			
NII	U-NII-3	5745 - 5825 MHz			
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		

Note: The table above shows the maximum SAR data for the device evaluated with the additional accessory only and may not represent the maximum SAR values for other use conditions without the accessory. Please refer to RF Exposure Technical Report S/N 0Y1512012033-R1.A3L for original compliance evaluation.

Note: This revised Test Report (S/N: 0Y1601290223-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This wireless portable device 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 1.4 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
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz
MST	Data	1 - 8.3 kHz

Note: This permissive change is to reflect the addition of the wireless charging battery cover only. 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 Wireless Charging Battery Cover

This DUT may be used with an optional wireless charging battery cover that is used on the back of the device. Per FCC KDB Publication 648474 D04v01r04, SAR with the additional wireless charging 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 with 1g SAR >1.2 W/kg. In addition, SAR measurements without the accessory were repeated to confirm the host test samples produced same range of SAR as in the original filing.

1.3 SAR Evaluation Exclusion

Per FCC Guidance and FCC KDB Publication 680106 D01, RF exposure for the portable wireless charging operations from the cover was evaluated using E-field and H-field measurements to confirm numerical SAR evaluation exclusion. Since the field strength levels were < 25 % of the respective E-field and H-field MPE limits at ~ 10 cm, no numerical SAR analysis was required.

1.4 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 (Wireless Charging Cover)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.5 Device Serial Numbers

Several samples 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
GSM/GPRS/EDGE 850	C3D8C	C3D8C	C3D8C
GSM/GPRS/EDGE 1900	C3D11	C3D11	C3CE8
UMTS 850	C3D9A	C3D8C	C3D8C
UMTS 1750	C3D97	C3D41	C3E71
UMTS 1900	C3D97	C3D41	C3E71
CDMA/EVDO BC10 (§90S)	C3D13	C3D2E	C3D2E
CDMA/EVDO BC0 (§22H)	C3D9A	C3D2E	C3D2E
PCS CDMA/EVDO	C3D11	C3D11	C3CE8
LTE Band 12	C3E25	C35C6	C35C6
LTE Band 13	C3E25	C35C6	C35C6
LTE Band 26 (Cell)	C3E25	C3D8C	C3D8C
LTE Band 4 (AWS)	C3D41	C3D41	C3D46
LTE Band 25 (PCS)	C3D11	C3D11	C3D46
LTE Band 30	C3E59	C3E59	C3E5B
LTE Band 41	C3E5B	C3E5B	C3D13
2.4 GHz WLAN	C3D00	C3E99	C3E99
5 GHz WLAN	C3D00	C3D00	C3D00

2 INTRODUCTION

The FCC and Industry 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]

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:

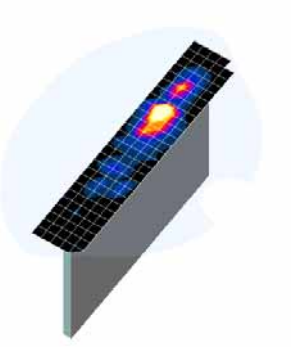

Figure 3-1
Sample SAR Area Scan

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

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 "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 B-M line is perpendicular to the N-F line passing through the two ear canals and M is defined as the Reference Plane. The 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 reference points and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

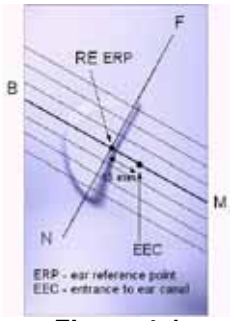

Figure 4-1
Close-Up Side view of ERP

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

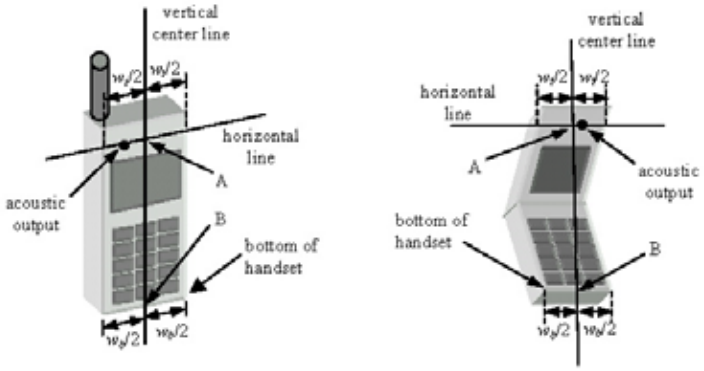

Figure 4-3
Handset Vertical Center & Horizontal Line Reference Points

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).

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

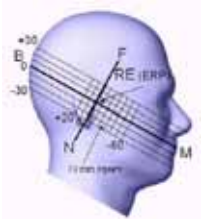

Figure 5-3
Side view w/ relevant markings

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.

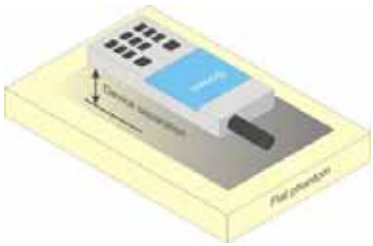

Figure 5-4
Sample Body-Worn Diagram

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.

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.

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.

7 SYSTEM VERIFICATION

7.1 Tissue Verification

Table 7-1
Measured Tissue Properties – Head

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
01/21/2016	750H	22.4	700	0.857	43.427	0.889	42.201	-3.60%	2.91%
			710	0.866	43.280	0.890	42.149	-2.70%	2.68%
			740	0.894	42.866	0.893	41.994	0.11%	2.08%
			755	0.908	42.656	0.894	41.916	1.57%	1.77%
02/04/2016	750H	22.5	740	0.898	42.063	0.893	41.994	0.56%	0.16%
			755	0.908	41.797	0.894	41.916	1.57%	-0.28%
			770	0.923	41.641	0.895	41.838	3.13%	-0.47%
			785	0.935	41.354	0.896	41.760	4.35%	-0.97%
01/20/2016	835H	21.5	820	0.882	40.261	0.899	41.578	-1.89%	-3.17%
			835	0.896	40.076	0.900	41.500	-0.44%	-3.43%
			850	0.910	39.889	0.916	41.500	-0.66%	-3.88%
01/27/2016	1750H	22.4	1710	1.312	38.639	1.348	40.142	-2.67%	-3.74%
			1750	1.353	38.344	1.371	40.079	-1.31%	-4.33%
			1790	1.388	38.122	1.394	40.016	-0.43%	-4.73%
01/25/2016	1900H	20.7	1850	1.400	38.985	1.400	40.000	0.00%	-2.54%
			1880	1.429	38.851	1.400	40.000	2.07%	-2.87%
			1910	1.458	38.673	1.400	40.000	4.14%	-3.32%
01/26/2016	2300H	24.1	2300	1.667	39.393	1.670	39.500	-0.18%	-0.27%
			2310	1.679	39.347	1.679	39.480	0.00%	-0.34%
			2320	1.690	39.309	1.687	39.460	0.18%	-0.38%
01/26/2016	2450H	24.1	2400	1.780	38.989	1.756	39.289	1.37%	-0.76%
			2450	1.836	38.748	1.800	39.200	2.00%	-1.15%
			2500	1.896	38.575	1.855	39.136	2.21%	-1.43%
01/26/2016	2600H	24.1	2600	2.016	38.141	1.964	39.009	2.65%	-2.23%
			2650	2.078	37.905	2.018	38.945	2.97%	-2.67%
			2700	2.135	37.688	2.073	38.882	2.99%	-3.07%
01/26/2016	5800H	22.0	5800	5.274	36.408	5.270	35.300	0.08%	3.14%
			5825	5.297	36.380	5.296	35.271	0.02%	3.14%

Table 7-2
Measured Tissue Properties – Body

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
01/25/2016	750B	21.1	700	0.918	57.139	0.959	55.726	-4.28%	2.54%
			710	0.923	57.029	0.960	55.687	-3.85%	2.41%
			740	0.954	56.793	0.963	55.570	-0.93%	2.20%
			755	0.969	56.575	0.964	55.512	0.52%	1.91%
02/02/2016	750B	22.7	740	0.952	53.980	0.963	55.570	-1.14%	-2.86%
			755	0.966	53.813	0.964	55.512	0.21%	-3.06%
			770	0.980	53.648	0.965	55.453	1.55%	-3.26%
			785	0.995	53.486	0.966	55.395	3.00%	-3.45%
01/25/2016	835B	21.3	820	0.989	53.615	0.969	55.258	2.06%	-2.97%
			835	1.004	53.454	0.970	55.200	3.51%	-3.16%
			850	1.020	53.300	0.988	55.154	3.24%	-3.36%
01/20/2016	1750B	23.0	1710	1.481	52.620	1.463	53.537	1.23%	-1.71%
			1750	1.526	52.462	1.488	53.432	2.55%	-1.82%
			1790	1.571	52.319	1.514	53.326	3.76%	-1.89%
01/25/2016	1750B	19.5	1710	1.495	51.548	1.463	53.537	2.19%	-3.72%
			1750	1.540	51.374	1.488	53.432	3.49%	-3.85%
			1790	1.586	51.210	1.514	53.326	4.76%	-3.97%
01/28/2016	1750B	22.5	1710	1.451	52.030	1.463	53.537	-0.82%	-2.81%
			1750	1.492	51.897	1.488	53.432	0.27%	-2.87%
			1790	1.534	51.719	1.514	53.326	1.32%	-3.01%
01/21/2016	1900B	21.6	1850	1.501	51.831	1.520	53.300	-1.25%	-2.76%
			1880	1.534	51.759	1.520	53.300	0.92%	-2.89%
			1910	1.565	51.653	1.520	53.300	2.96%	-3.09%
01/25/2016	1900B	23.5	1850	1.501	51.647	1.520	53.300	-1.25%	-3.10%
			1880	1.532	51.569	1.520	53.300	0.79%	-3.25%
			1910	1.564	51.449	1.520	53.300	2.89%	-3.47%
01/21/2016	2300B	22.5	2300	1.781	51.296	1.809	52.900	-1.55%	-3.03%
			2310	1.794	51.263	1.816	52.887	-1.21%	-3.07%
			2320	1.805	51.227	1.826	52.873	-1.15%	-3.11%
01/19/2016	2450B	21.5	2400	1.928	51.750	1.902	52.767	1.37%	-1.93%
			2450	1.992	51.567	1.950	52.700	2.15%	-2.15%
			2500	2.058	51.286	2.021	52.636	1.83%	-2.56%
01/21/2016	2450B-2600B	22.5	2450	1.974	50.764	1.950	52.700	1.23%	-3.67%
			2500	2.039	50.615	2.021	52.636	0.89%	-3.84%
			2550	2.108	50.426	2.092	52.573	0.76%	-4.08%
			2600	2.178	50.259	2.163	52.509	0.69%	-4.28%
			2650	2.251	50.063	2.234	52.445	0.76%	-4.54%
			2700	2.321	49.873	2.305	52.382	0.69%	-4.79%
01/21/2016	5600B-5800B	22.7	5600	5.932	46.770	5.766	48.471	2.88%	-3.51%
			5785	6.180	46.452	5.982	48.220	3.31%	-3.67%
			5800	6.197	46.449	6.000	48.200	3.28%	-3.63%

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.

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

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	01/21/2016	24.2	22.7	0.200	1054	3022	1.720	8.280	8.600	3.86%
I	750	HEAD	02/04/2016	23.4	22.5	0.200	1054	3333	1.670	8.280	8.350	0.85%
G	835	HEAD	01/20/2016	24.0	21.5	0.200	4d119	3334	1.770	9.380	8.850	-5.65%
G	1750	HEAD	01/27/2016	24.4	22.6	0.100	1051	3334	3.820	36.200	38.200	5.52%
G	1900	HEAD	01/25/2016	20.8	20.4	0.100	5d149	3334	4.320	40.700	43.200	6.14%
H	2300	HEAD	01/26/2016	24.5	23.1	0.100	1064	3263	4.900	47.600	49.000	2.94%
H	2450	HEAD	01/26/2016	24.3	23.1	0.100	719	3263	5.600	54.200	56.000	3.32%
H	2600	HEAD	01/26/2016	24.3	23.1	0.100	1004	3263	5.910	55.800	59.100	5.91%
D	5800	HEAD	01/26/2016	23.1	21.9	0.050	1120	7357	3.680	77.300	73.600	-4.79%
K	750	BODY	01/25/2016	23.0	21.4	0.200	1054	3022	1.760	8.530	8.800	3.17%
H	750	BODY	02/02/2016	24.1	22.7	0.200	1054	3263	1.750	8.530	8.750	2.58%
E	835	BODY	01/25/2016	21.9	21.0	0.200	4d119	3351	1.910	9.200	9.550	3.80%
K	1750	BODY	01/20/2016	24.0	23.0	0.100	1051	3022	3.960	37.100	39.600	6.74%
H	1750	BODY	01/25/2016	19.0	19.5	0.100	1051	3263	3.860	37.100	38.600	4.04%
H	1750	BODY	01/28/2016	24.3	22.9	0.100	1051	3263	3.940	37.100	39.400	6.20%
J	1900	BODY	01/21/2016	22.1	21.6	0.100	5d149	3319	3.960	40.400	39.600	-1.98%
I	1900	BODY	01/25/2016	21.5	23.5	0.100	5d141	3333	4.070	40.000	40.700	1.75%
H	2300	BODY	01/21/2016	22.3	22.1	0.100	1064	3263	4.870	45.500	48.700	7.03%
J	2450	BODY	01/19/2016	21.7	21.5	0.100	797	3319	4.990	51.500	49.900	-3.11%
H	2450	BODY	01/21/2016	22.0	22.0	0.100	719	3263	5.450	51.900	54.500	5.01%
H	2600	BODY	01/21/2016	21.9	22.0	0.100	1004	3263	5.940	56.200	59.400	5.69%
D	5600	BODY	01/21/2016	23.0	22.7	0.050	1120	7357	4.010	77.400	80.200	3.62%
D	5800	BODY	01/21/2016	23.0	22.7	0.050	1120	7357	3.870	76.300	77.400	1.44%

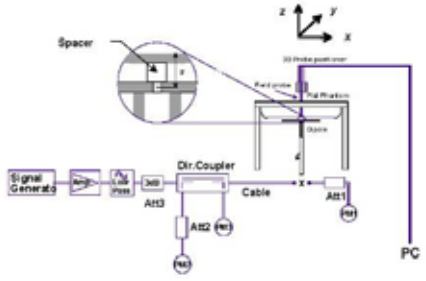

Figure 7-1
System Verification Setup Diagram

Figure 7-2
System Verification Setup Photo

8 SAR DATA SUMMARY

8.1 Standalone Head SAR Data

Table 8-1
GSM/UMTS/CDMA Head SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GSM	33.5	32.09	0.13	Right	Cheek	Ant A	C3D8C	1:8.3	0.052	1.384	0.072	0.152	0.137	A1
1880.00	661	GSM 1900	GSM	30.5	29.26	0.12	Right	Cheek	Ant A	C3D11	1:8.3	0.035	1.330	0.047	0.112	0.105	A2
836.60	4183	UMTS 850	RMC	21.5	21.45	-0.02	Left	Cheek	Ant B	C3D9A	1:1	0.522	1.012	0.528	0.617	0.637	A3
1732.40	1412	UMTS 1750	RMC	25.0	23.82	0.04	Left	Cheek	Ant A	C3D97	1:1	0.104	1.312	0.136	0.286	0.281	A4
1880.00	9400	UMTS 1900	RMC	25.0	23.88	0.12	Right	Cheek	Ant A	C3D97	1:1	0.099	1.294	0.128	0.233	0.230	A5
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	21.0	20.58	0.01	Right	Cheek	Ant B	C3D13	1:1	0.315	1.102	0.347	0.488	0.441	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	21.0	20.74	0.06	Left	Cheek	Ant B	C3D13	1:1	0.322	1.062	0.342	0.479	0.461	A6
824.70	1013	CDMA BC0 (§22H)	RC3 / SO55	21.0	21.00	0.08	Right	Cheek	Ant B	C3D9A	1:1	0.325	1.000	0.325	0.564	0.502	A7
824.70	1013	CDMA BC0 (§22H)	EVDO Rev. A	21.0	20.98	0.07	Right	Cheek	Ant B	C3D9A	1:1	0.307	1.005	0.309	0.534	0.445	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	24.50	0.00	Right	Cheek	Ant A	C3D11	1:1	0.110	1.259	0.138	0.199	0.195	A8
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	23.50	-0.11	Right	Cheek	Ant A	C3D11	1:1	0.100	1.585	0.159	0.233	0.222	
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 8-2
LTE Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	21.5	20.82	0.03	0	Right	Cheek	Ant B	QPSK	1	49	C3E25	1:1	0.325	1.169	0.380	0.559	0.456	A9
782.00	23230	Mid	LTE Band 13	10	21.5	21.20	0.00	0	Left	Cheek	Ant B	QPSK	25	0	C3E25	1:1	0.341	1.072	0.366	0.564	0.509	A10
836.50	26915	Mid	LTE Band 26 (Cell)	15	21.5	21.07	0.07	0	Left	Cheek	Ant B	QPSK	36	0	C3E25	1:1	0.433	1.104	0.478	0.555	0.593	A11
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.99	-0.13	0	Left	Cheek	Ant A	QPSK	1	0	C3D41	1:1	0.129	1.002	0.129	0.176	0.182	A12
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.93	0.11	0	Left	Cheek	Ant A	QPSK	1	0	C3D11	1:1	0.060	1.016	0.061	0.211	0.228	A13
2310.00	27710	Mid	LTE Band 30	10	22.5	22.50	0.12	0	Left	Cheek	Ant C	QPSK	1	0	C3E59	1:1	0.073	1.000	0.073	0.159	0.173	A14
2680.00	41490	High	LTE Band 41	20	24.5	24.15	0.10	0	Left	Cheek	Ant C	QPSK	1	0	C3E5B	1:1.58	0.157	1.084	0.170	0.273	0.302	A15
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

MEASUREMENT RESULTS																						
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	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 Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2437	6	802.11b	DSSS	22	17.5	17.23	-0.05	Right	Cheek	1	C3D00	1	99.8	0.464	0.357	1.064	1.002	0.381	0.848	0.811	A16
5825	165	802.11a	OFDM	20	10.5	10.49	0.18	Right	Cheek	1	C3D00	6	98.6	0.904	0.442	1.002	1.014	0.449	0.456	0.487	A17
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]	Spacing	Antenna Config.	Device Serial Number	# of Time Slots	Duty Cycle	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GSM	33.5	32.09	-0.01	15 mm	Ant A	C3D8C	1	1:8.3	back	0.067	1.384	0.093	0.491	0.352	A18
1880.00	661	GSM 1900	GSM	30.5	29.26	0.07	15 mm	Ant A	C3D11	1	1:8.3	back	0.058	1.330	0.077	0.406	0.424	A20
836.60	4183	UMTS 850	RMC	25.0	25.00	0.03	15 mm	Ant A	C3D8C	N/A	1:1	back	0.091	1.000	0.091	0.479	0.381	A22
1732.40	1412	UMTS 1750	RMC	25.0	23.82	-0.02	15 mm	Ant A	C3D41	N/A	1:1	back	0.138	1.312	0.181	0.859	0.967	A24
1880.00	9400	UMTS 1900	RMC	25.0	23.88	0.08	15 mm	Ant A	C3D41	N/A	1:1	back	0.080	1.294	0.103	0.397	0.457	A26
820.10	564	CDMA BC10 (§90S)	TDSO / SO32	25.0	24.14	-0.01	15 mm	Ant A	C3D2E	N/A	1:1	back	0.100	1.219	0.122	0.439	0.456	A28
836.52	384	CDMA BC0 (§22H)	TDSO / SO32	25.0	24.21	0.04	15 mm	Ant A	C3D2E	N/A	1:1	back	0.112	1.199	0.134	0.525	0.549	A30
1908.75	1175	PCS CDMA	TDSO / SO32	25.5	24.66	0.01	15 mm	Ant A	C3D11	N/A	1:1	back	0.160	1.213	0.194	1.072	1.149	A32
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 8-5
LTE Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.86	-0.09	0	Ant A	C35C6	QPSK	1	0	15 mm	back	1:1	0.093	1.033	0.096	0.387	0.424	A34
782.00	23230	Mid	LTE Band 13	10	25.0	24.07	0.02	0	Ant A	C35C6	QPSK	1	49	15 mm	back	1:1	0.081	1.239	0.101	0.489	0.460	A36
836.50	26915	Mid	LTE Band 26 (Cell)	15	25.0	23.89	0.02	0	Ant A	C3D8C	QPSK	1	0	15 mm	back	1:1	0.086	1.291	0.111	0.519	0.402	A38
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.99	-0.12	0	Ant A	C3D41	QPSK	1	0	15 mm	back	1:1	0.185	1.002	0.185	0.983	1.012	A40
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.77	-0.01	0	Ant A	C3D11	QPSK	1	0	15 mm	back	1:1	0.137	1.054	0.144	0.865	0.892	A42
2310.00	27710	Mid	LTE Band 30	10	22.5	22.50	0.08	0	Ant C	C3E59	QPSK	1	0	15 mm	back	1:1	0.084	1.000	0.084	0.420	0.430	A44
2680.00	41490	High	LTE Band 41	20	24.5	24.15	-0.02	0	Ant C	C3E5B	QPSK	1	0	15 mm	back	1:1.58	0.078	1.084	0.085	0.304	0.318	A46
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

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	Accessory SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2437	6	802.11b	DSSS	22	20.5	20.31	0.12	15 mm	1	C3E99	1	back	99.8	0.023	0.018	1.045	1.002	0.019	0.110	0.093	A48
5600	120	802.11a	OFDM	20	17.5	17.09	0.11	15 mm	1	C3D00	6	back	98.6	0.165	0.084	1.099	1.014	0.094	0.215	0.233	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							

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]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.60	190	GSM 850	GPRS	30.0	28.22	0.13	10 mm	Ant A	C3D8C	3	1:2.76	back	0.085	1.507	0.128	0.665	0.624	A19
1909.80	810	GSM 1900	GPRS	24.5	23.80	0.02	10 mm	Ant A	C3CE8	3	1:2.76	back	0.088	1.175	0.103	0.678	0.701	A21
836.60	4183	UMTS 850	RMC	25.0	25.00	0.02	10 mm	Ant A	C3D8C	N/A	1:1	back	0.130	1.000	0.130	0.753	0.597	A23
1752.60	1513	UMTS 1750	RMC	21.5	21.20	0.07	10 mm	Ant A	C3E71	N/A	1:1	back	0.154	1.072	0.165	1.019	1.038	A25
1880.00	9400	UMTS 1900	RMC	20.5	20.50	-0.04	10 mm	Ant A	C3E71	N/A	1:1	back	0.158	1.000	0.158	1.040	0.853	A27
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.0	24.03	0.11	10 mm	Ant A	C3D2E	N/A	1:1	back	0.142	1.250	0.178	0.843	0.920	A29
824.70	1013	CDMA BC0 (§22H)	EVDO Rev. 0	25.0	24.37	0.07	10 mm	Ant A	C3D2E	N/A	1:1	back	0.162	1.156	0.187	1.032	0.887	A31
1851.25	25	PCS CDMA	EVDO Rev. 0	21.5	21.25	-0.04	10 mm	Ant A	C3CE8	N/A	1:1	back	0.126	1.059	0.133	1.003	0.975	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					

Table 8-8
LTE Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	Accessory SAR (1g)	Scaling Factor	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.86	0.10	0	Ant A	C35C6	QPSK	1	0	10 mm	back	1:1	0.128	1.033	0.132	0.594	0.600	A35
782.00	23230	Mid	LTE Band 13	10	25.0	24.07	-0.05	0	Ant A	C35C6	QPSK	1	49	10 mm	back	1:1	0.111	1.239	0.138	0.689	0.636	A37
836.50	26915	Mid	LTE Band 26 (Cell)	15	25.0	23.89	-0.01	0	Ant A	C3D8C	QPSK	1	0	10 mm	back	1:1	0.120	1.291	0.155	0.794	0.726	A39
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.47	0.03	0	Ant A	C3D46	QPSK	100	0	10 mm	back	1:1	0.139	1.130	0.157	0.920	0.921	A41
1905.00	26590	High	LTE Band 25 (PCS)	20	21.0	20.96	0.02	0	Ant A	C3D46	QPSK	1	0	10 mm	back	1:1	0.149	1.009	0.150	0.963	0.796	A43
2310.00	27710	Mid	LTE Band 30	10	20.0	19.47	-0.04	0	Ant C	C3E5B	QPSK	1	0	10 mm	back	1:1	0.143	1.130	0.162	0.579	0.547	A45
2506.00	39750	Low	LTE Band 41	20	22.5	21.78	-0.04	0	Ant C	C3D13	QPSK	50	0	10 mm	bottom	1:1.58	0.386	1.180	0.455	0.833	0.799	A47
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 8-9
WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	Accessory SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Accessory Scaled SAR (1g)	Original Scaled SAR (1g)	Reverified Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2437	6	802.11b	DSSS	22	20.5	20.31	0.14	10 mm	1	C3E99	1	back	99.8	0.046	0.035	1.045	1.002	0.037	0.202	0.223	A49
5785	157	802.11a	OFDM	20	17.5	17.22	0.11	10 mm	1	C3D00	6	back	98.6	0.094	0.056	1.067	1.014	0.061	0.330	0.335	A51
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 SAR Test 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 D01v05.
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 D04v01r04, 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 not performed since the measured SAR results for a frequency band were not greater than or equal to 0.8 W/kg. Please see Section 10 for variability analysis.
8. Per FCC KDB Publication 648474 D04v01r04, SAR with the additional wireless charging 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.
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 wireless charging 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 wireless charging accessory attached and without the charging accessory.

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 a physical test configuration is ≤1.6 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.

9.3 Simultaneous Transmission Analysis

All SAR results with the wireless charging cover attached were less than the results without the additional accessory. Therefore, no further analysis was required to determine that the SAR limit would not be exceeded for all possible simultaneous transmission scenarios with the accessory. Please see the original compliance report for complete simultaneous transmission analysis for the device without the accessory.

10 SAR MEASUREMENT VARIABILITY

10.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, since all measured SAR values were <0.8 W/kg, no SAR measurement variability analysis was required.

10.2 Measurement Uncertainty

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

11 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	3/15/2015	Annual	3/15/2016	3629U00687
Agilent	8753ES	S-Parameter Network Analyzer	3/12/2015	Annual	3/12/2016	MY40000670
Agilent	8753ES	Network Analyzer	3/20/2015	Annual	3/20/2016	MY40001472
Agilent	E4432B	ESG-D Series Signal Generator	3/16/2015	Annual	3/16/2016	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/15/2015	Annual	3/15/2016	MY45091346
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41450275
Agilent	E5515C	Wireless Communications Test Set	4/13/2015	Annual	4/13/2016	GB43460554
Agilent	N5182A	MXG Vector Signal Generator	3/16/2015	Annual	3/16/2016	MY47420651
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	MA24106A	USB Power Sensor	5/29/2015	Annual	5/29/2016	1231535
Anritsu	MA24106A	USB Power Sensor	5/29/2015	Annual	5/29/2016	1231538
Anritsu	MA2411B	Pulse Power Sensor	8/3/2015	Annual	8/3/2016	1126066
Anritsu	MA2411B	Pulse Power Sensor	3/13/2015	Annual	3/13/2016	1207470
Anritsu	MA2481A	Power Sensor	3/10/2015	Annual	3/10/2016	2400
Anritsu	MA2481A	Power Sensor	3/10/2015	Annual	3/10/2016	5605
Anritsu	ML2496A	Power Meter	3/13/2015	Annual	3/13/2016	1306009
Anritsu	ML2496A	Power Meter	3/13/2015	Annual	3/13/2016	1351001
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
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194895
Control Company	4353	Long Stem Thermometer	3/5/2015	Biennial	3/5/2017	150149565
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	6/3/2015	Annual	6/3/2016	109892
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2015	Annual	10/13/2016	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	4/22/2015	Annual	4/22/2016	101699
Rohde & Schwarz	CMW500	Radio Communication Tester	4/8/2015	Annual	4/8/2016	140148
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	22313
SPEAG	D750V3	750 MHz SAR Dipole	3/11/2015	Annual	3/11/2016	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/13/2015	Annual	4/13/2016	4d119
SPEAG	D1750V2	1750 MHz SAR Dipole	4/15/2015	Annual	4/15/2016	1051
SPEAG	D1900V2	1900 MHz SAR Dipole	4/14/2015	Annual	4/14/2016	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/14/2015	Annual	7/14/2016	5d149
SPEAG	D2300V2	2300 MHz SAR Dipole	12/8/2015	Annual	12/8/2016	1064
SPEAG	D2450V2	2450 MHz SAR Dipole	8/20/2015	Annual	8/20/2016	719
SPEAG	D2450V2	2450 MHz SAR Dipole	10/21/2015	Annual	10/21/2016	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2015	Annual	4/14/2016	1004
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/17/2015	Annual	2/17/2016	1120
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2015	Annual	2/18/2016	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/17/2015	Annual	6/17/2016	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/24/2015	Annual	8/24/2016	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/27/2015	Annual	10/27/2016	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2015	Annual	3/13/2016	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2015	Annual	4/20/2016	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2015	Annual	11/11/2016	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2015	Annual	5/12/2016	1070
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/19/2015	Annual	8/19/2016	1041
SPEAG	ES3DV2	SAR Probe	8/26/2015	Annual	8/26/2016	3022
SPEAG	ES3DV3	SAR Probe	5/20/2015	Annual	5/20/2016	3263
SPEAG	ES3DV3	SAR Probe	3/19/2015	Annual	3/19/2016	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	ES3DV3	SAR Probe	6/22/2015	Annual	6/22/2016	3351
SPEAG	EX3DV4	SAR Probe	4/23/2015	Annual	4/23/2016	7357

Note: 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.

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	

13 CONCLUSION

13.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry 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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[20] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz), Feb. 2005.

[21] Industry Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 5, March 2015.

[22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2015

[23] FCC SAR Test Procedures for 2G-3G Devices, Mobile Hotspot and UMPC Devices KDB Publications 941225, D01-D07

[24] SAR Measurement Guidance for IEEE 802.11 Transmitters, KDB Publication 248227 D01

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D03-D04

[26] FCC SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers, FCC KDB Publication 616217 D04

[27] FCC SAR Measurement and Reporting Requirements for 100MHz – 6 GHz, KDB Publications 865664 D01-D02

[28] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D02

[29] Anexo à Resolução No. 533, de 10 de Septembro de 2009.

[30] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 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), Mar. 2010.

APPENDIX A: SAR TEST DATA

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

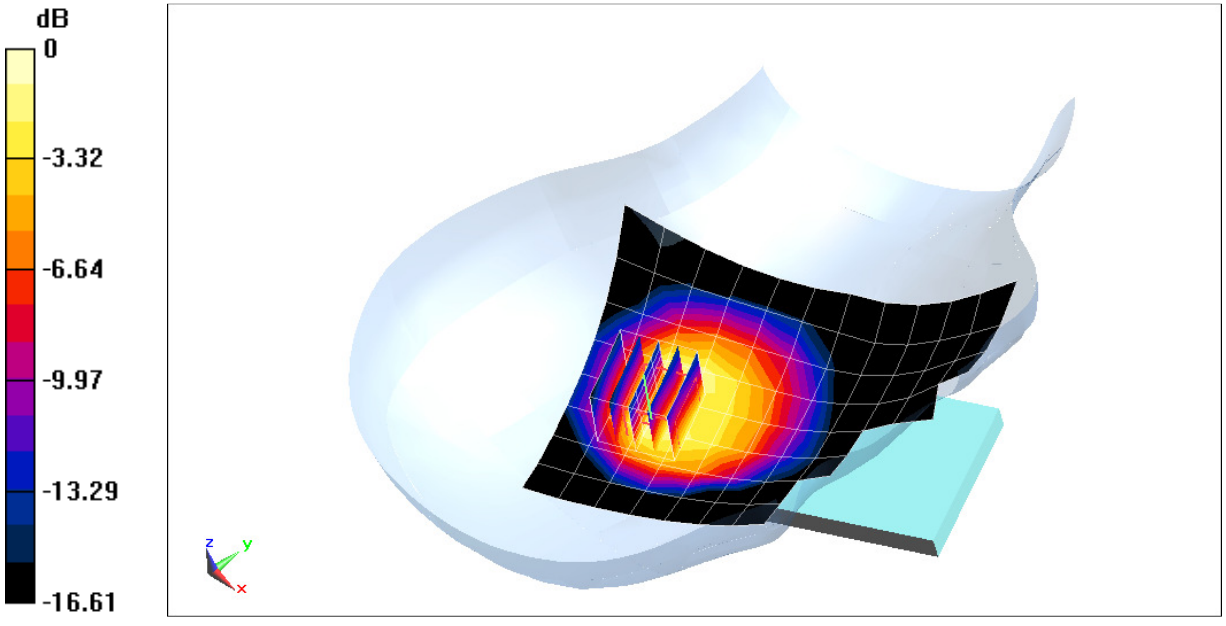
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.897 S/m; ε_r = 40.056; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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: GSM 850, Right Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.180 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.052 W/kg



0 dB = 0.0702 W/kg = -11.54 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

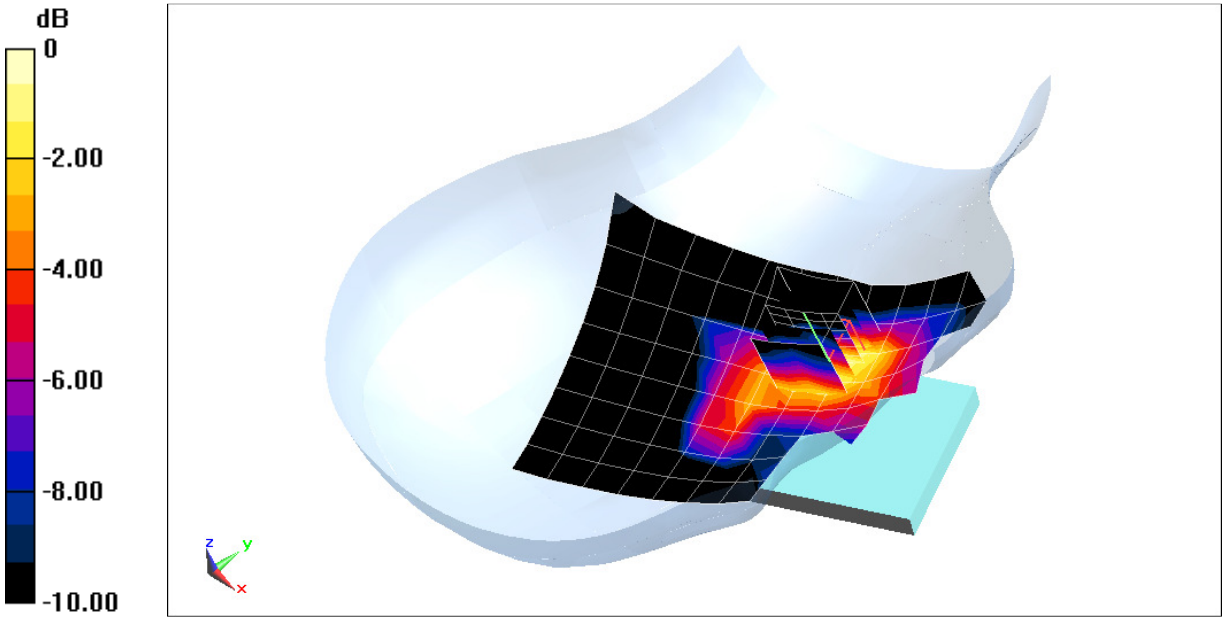
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.429 S/m; ε_r = 38.851; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-25-2016; Ambient Temp: 20.8°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3334; ConvF(5.18, 5.18, 5.18); 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: GSM 1900, Right Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.216 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0540 W/kg
SAR(1 g) = 0.035 W/kg



0 dB = 0.0413 W/kg = -13.84 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D9A

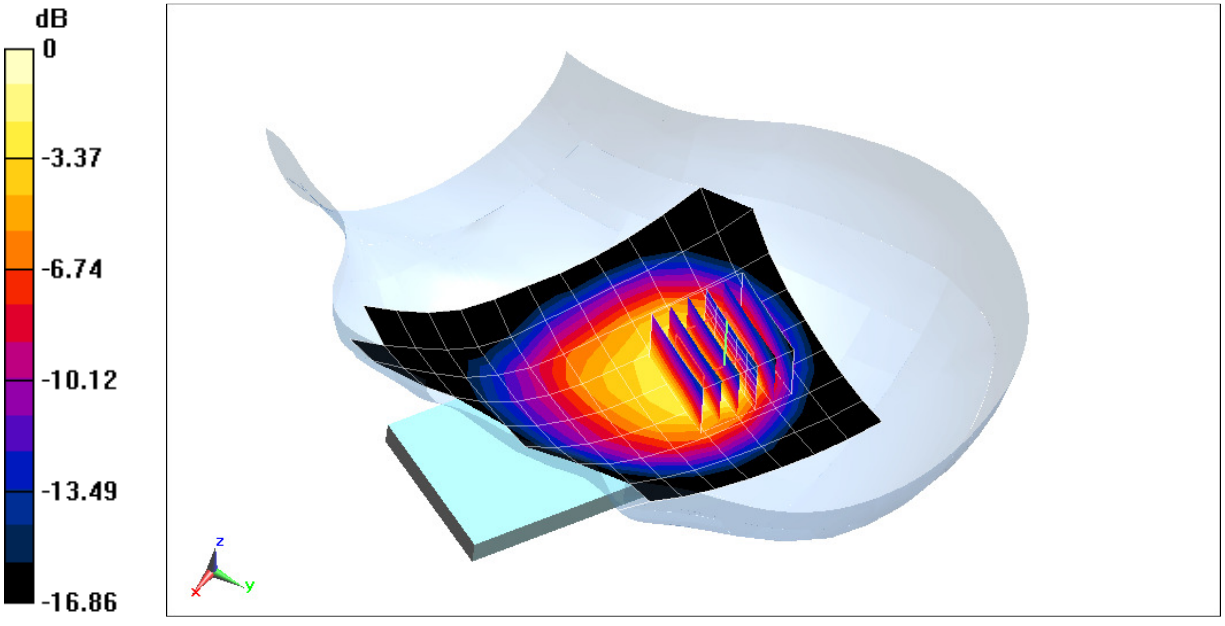
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated)
f = 836.6 MHz; σ = 0.897 S/m; ε_r = 40.056; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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: UMTS 850, Ant B, Left Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.32 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.522 W/kg



0 dB = 0.677 W/kg = -1.69 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D97

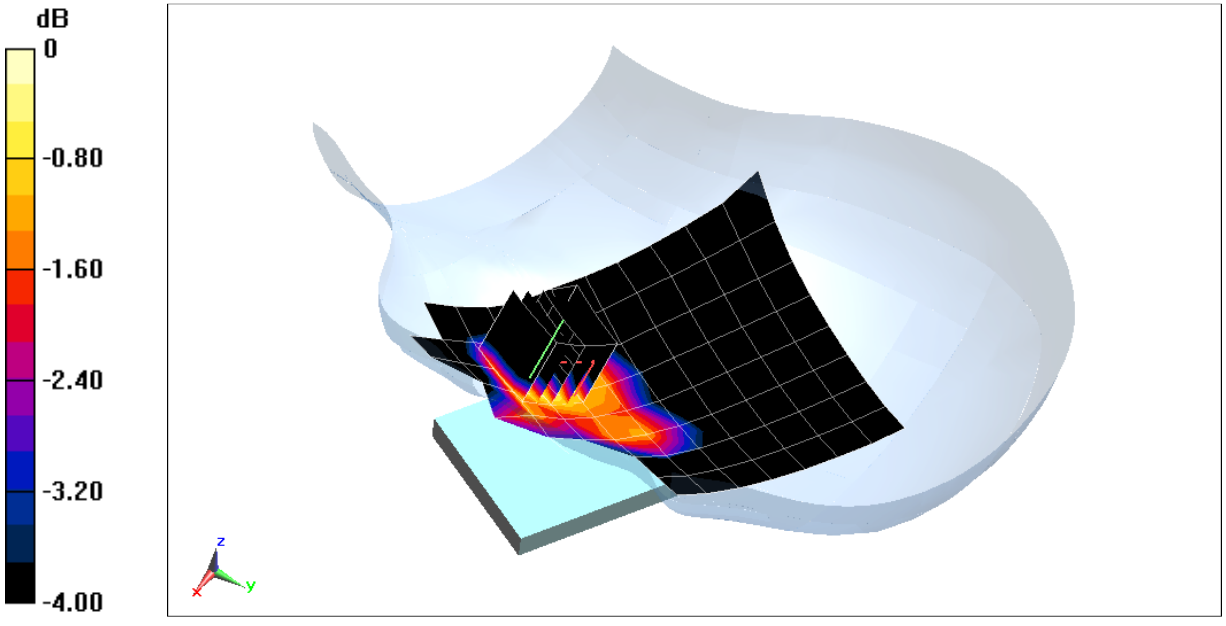
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.335 S/m; ε_r = 38.474; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-27-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3334; ConvF(5.39, 5.39, 5.39); 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: AWS UMTS, Left Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.281 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.104 W/kg



0 dB = 0.118 W/kg = -9.28 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D97

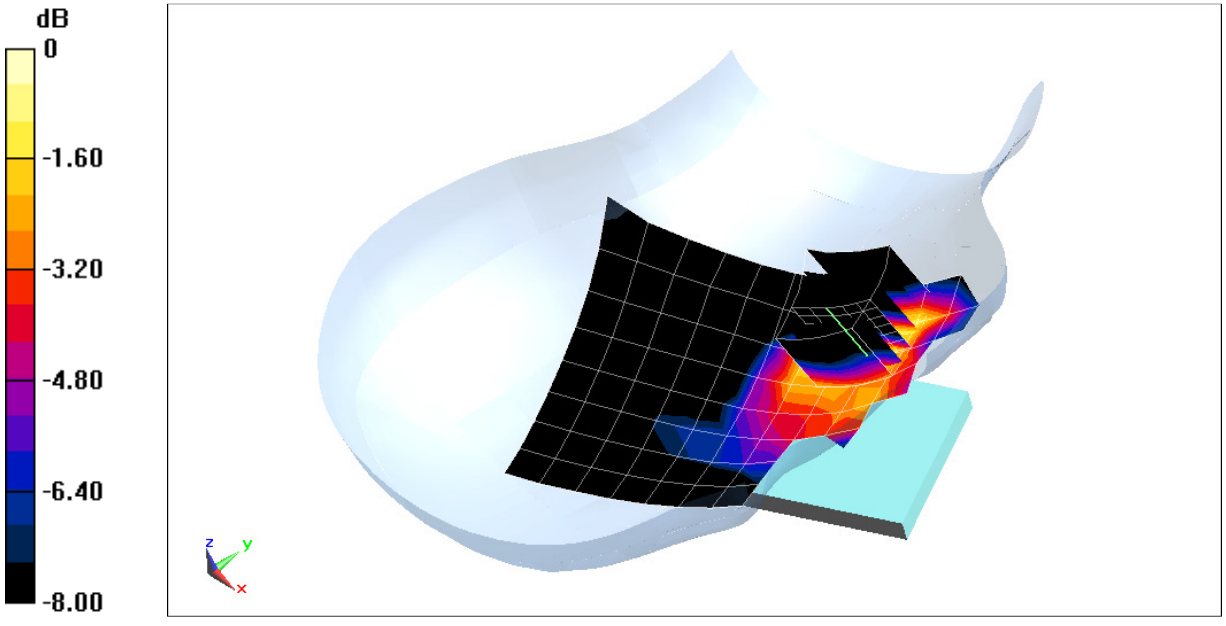
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.429 S/m; ε_r = 38.851; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-25-2016; Ambient Temp: 20.8°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3334; ConvF(5.18, 5.18, 5.18); 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: UMTS 1900, Right Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.711 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.162 W/kg
SAR(1 g) = 0.099 W/kg



0 dB = 0.115 W/kg = -9.39 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D13

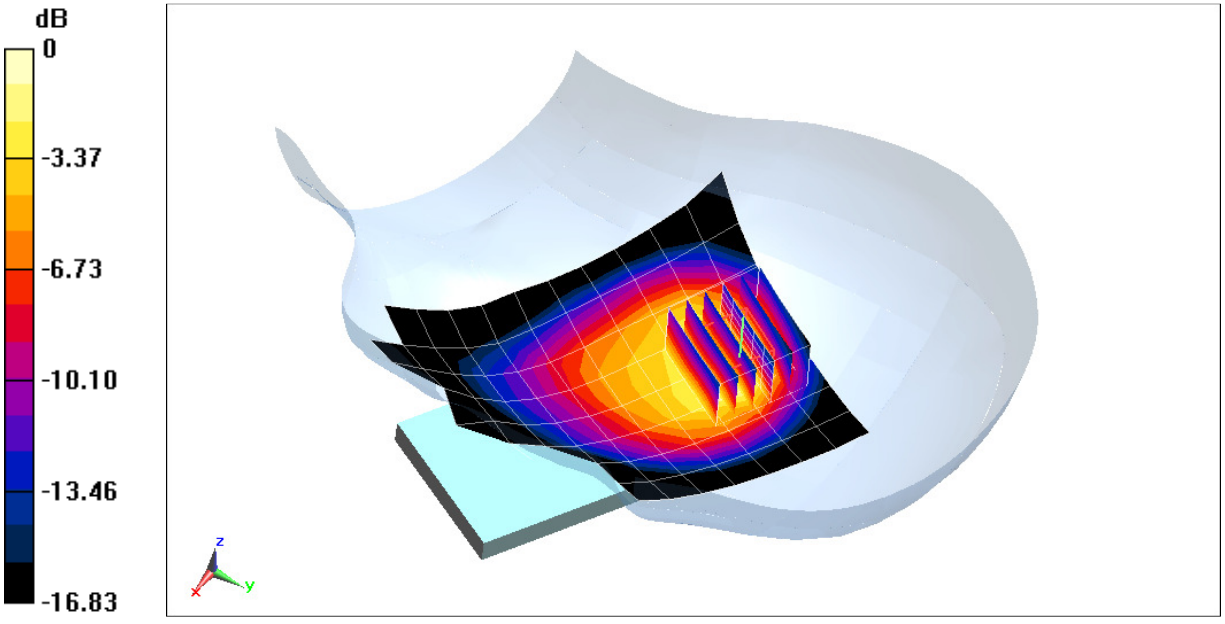
Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.882 S/m; ε_r = 40.26; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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: Cell. EVDO Rev. A BC10, Rule Part 90S, Ant B, Left Head, Cheek, Mid.ch, Wireless Charging Cover

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.75 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.664 W/kg
SAR(1 g) = 0.322 W/kg



0 dB = 0.411 W/kg = -3.86 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D9A

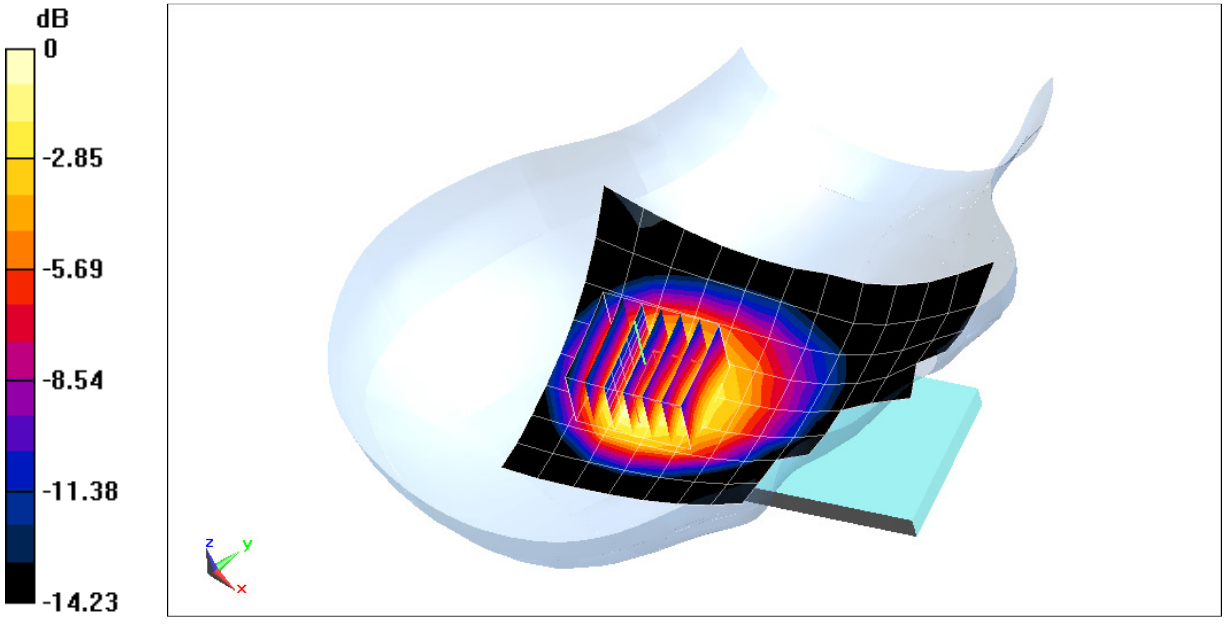
Communication System: UID 0, CDMA; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 824.7 MHz; σ = 0.886 S/m; ε_r = 40.203; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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: Cell. CDMA BC0, Rule Part 22H, Ant B, Right Head, Cheek, Low.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.76 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.325 W/kg



0 dB = 0.395 W/kg = -4.03 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

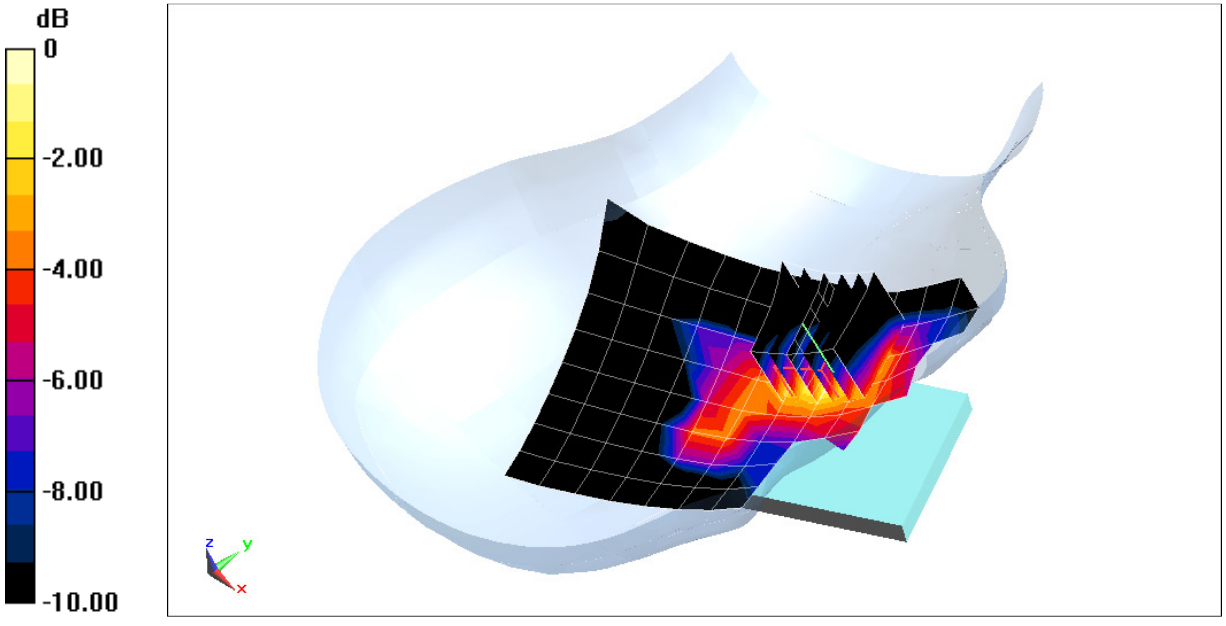
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.429 S/m; ε_r = 38.851; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-25-2016; Ambient Temp: 20.8°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3334; ConvF(5.18, 5.18, 5.18); 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: PCS CDMA, Right Head, Cheek, Mid.ch,
Wireless Charging Cover

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.706 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.110 W/kg



0 dB = 0.129 W/kg = -8.89 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E25

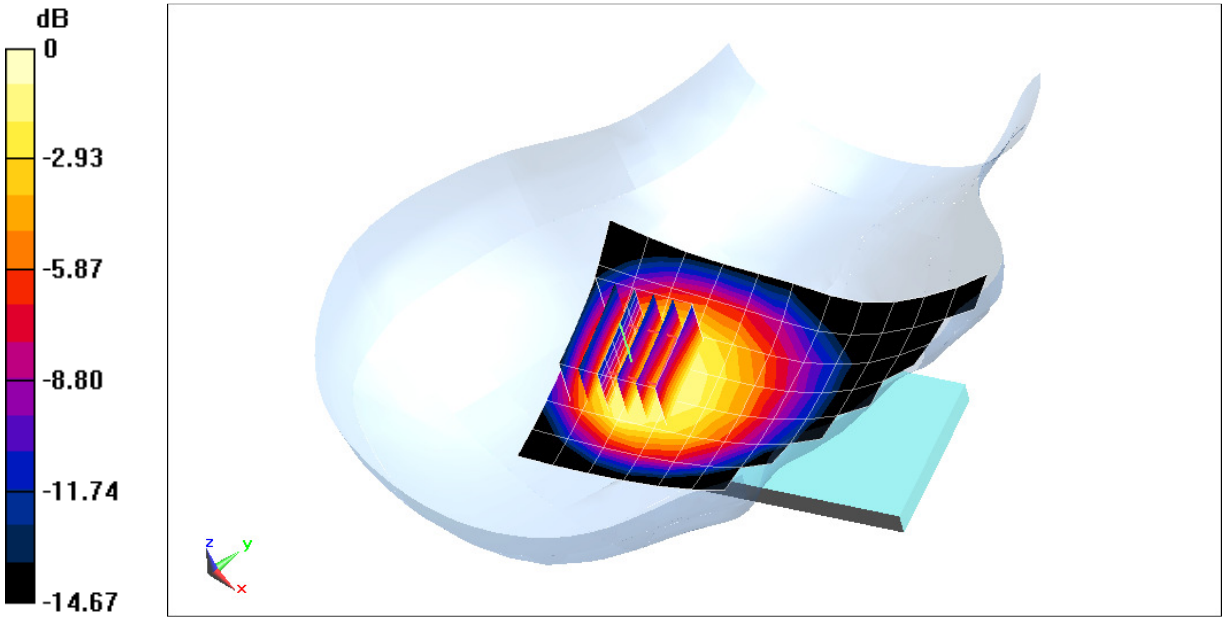
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.864 S/m; ε_r = 43.317; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-21-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant B, Right Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.26 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.630 W/kg
SAR(1 g) = 0.325 W/kg



0 dB = 0.411 W/kg = -3.86 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E25

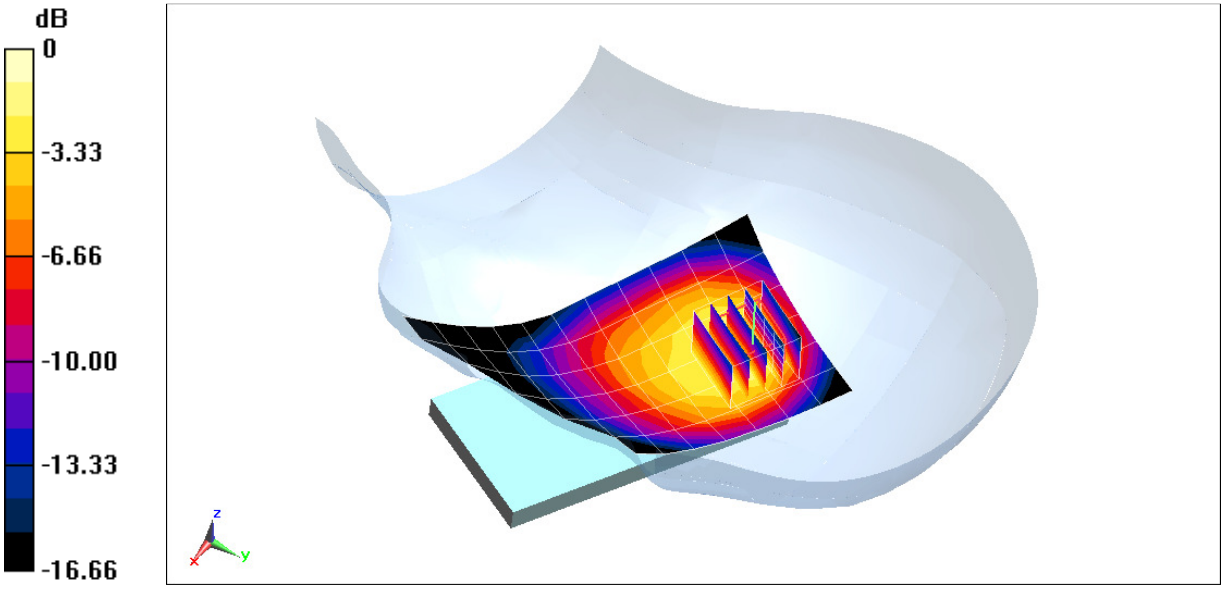
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.933 S/m; ε_r = 41.411; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-04-2016; Ambient Temp: 23.4°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3333; ConvF(6.46, 6.46, 6.46); 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 13, Ant B, Left Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.69 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.697 W/kg
SAR(1 g) = 0.341 W/kg



0 dB = 0.431 W/kg = -3.66 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E25

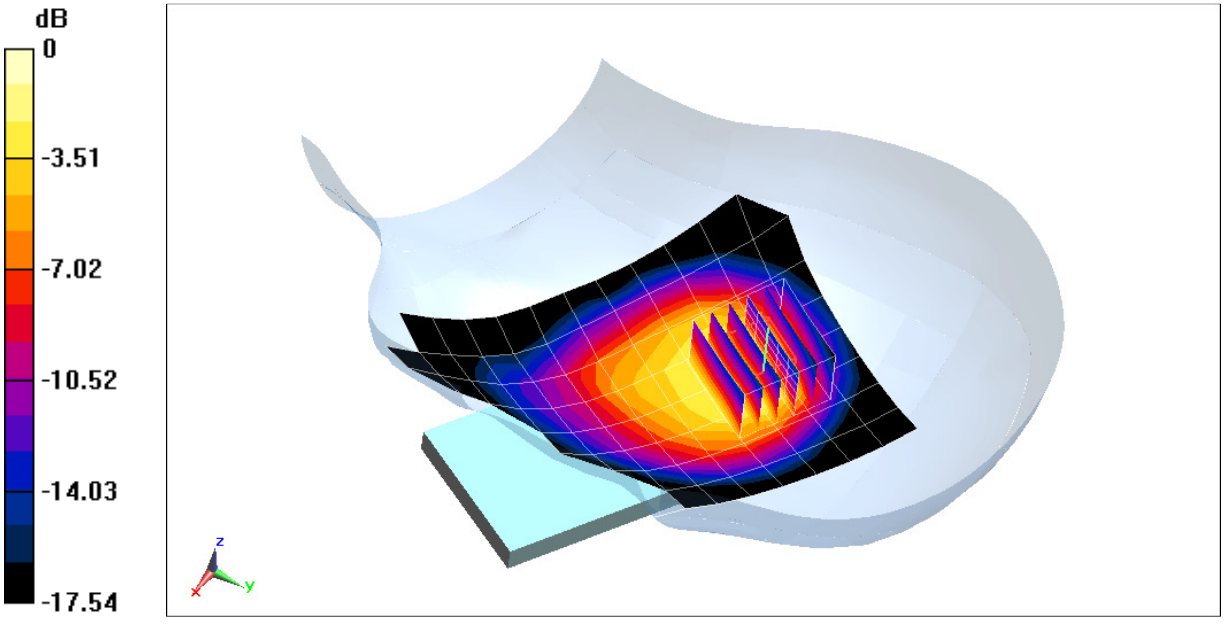
Communication System: UID 0, LTE Band 26; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.897 S/m; ε_r = 40.057; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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 26 (Cell.), Ant B, Left Head, Cheek, Mid.ch, 15 MHz Bandwidth, QPSK, 36 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.05 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.885 W/kg
SAR(1 g) = 0.433 W/kg



0 dB = 0.562 W/kg = -2.50 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D41

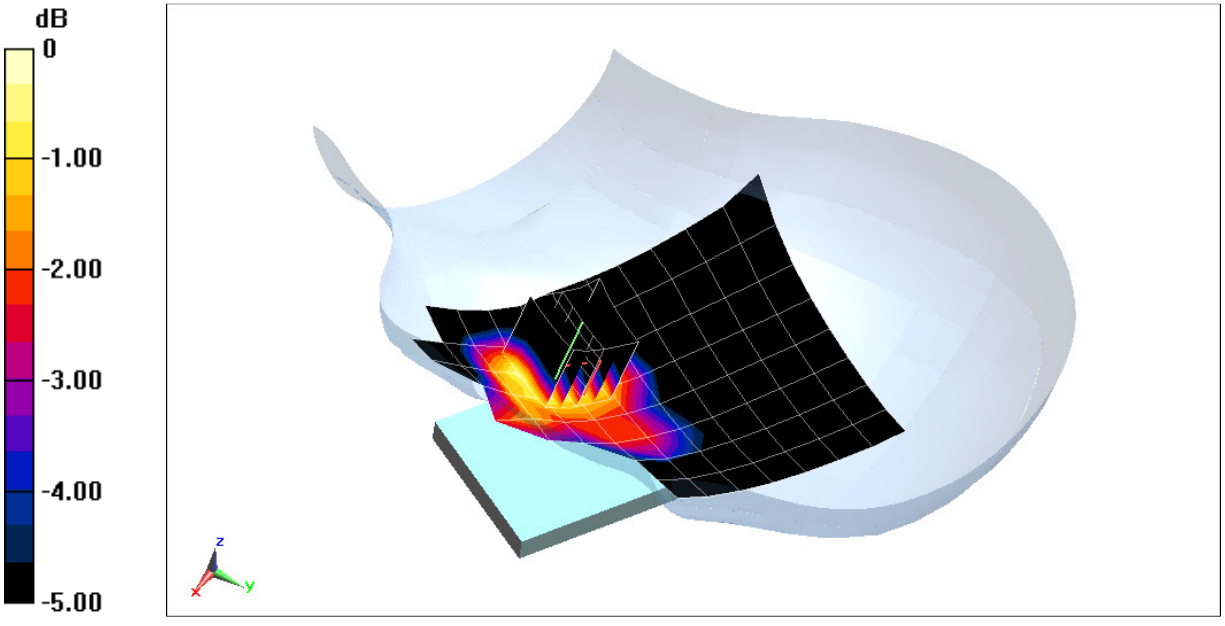
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.335 S/m; ε_r = 38.473; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-27-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3334; ConvF(5.39, 5.39, 5.39); 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 4 (AWS), Left Head, Cheek, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.79 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.129 W/kg



0 dB = 0.143 W/kg = -8.45 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

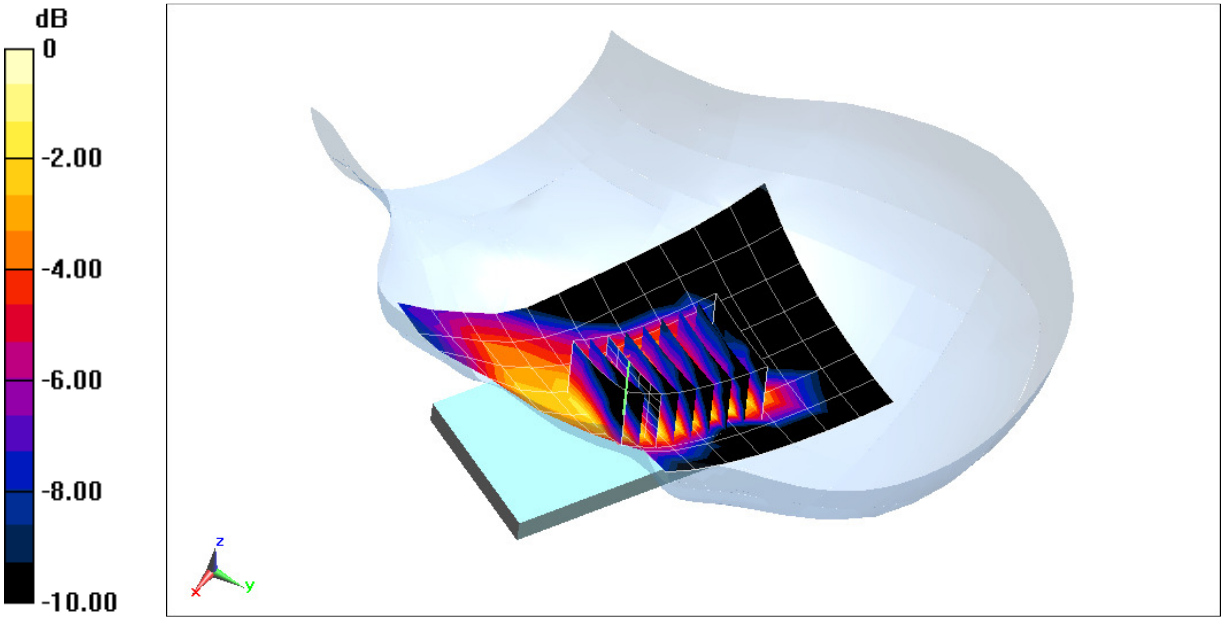
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.431 S/m; ε_r = 38.836; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-25-2016; Ambient Temp: 20.8°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3334; ConvF(5.18, 5.18, 5.18); 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 25 (PCS), Left Head, Cheek, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x9x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.585 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0870 W/kg
SAR(1 g) = 0.060 W/kg



0 dB = 0.0688 W/kg = -11.62 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E59

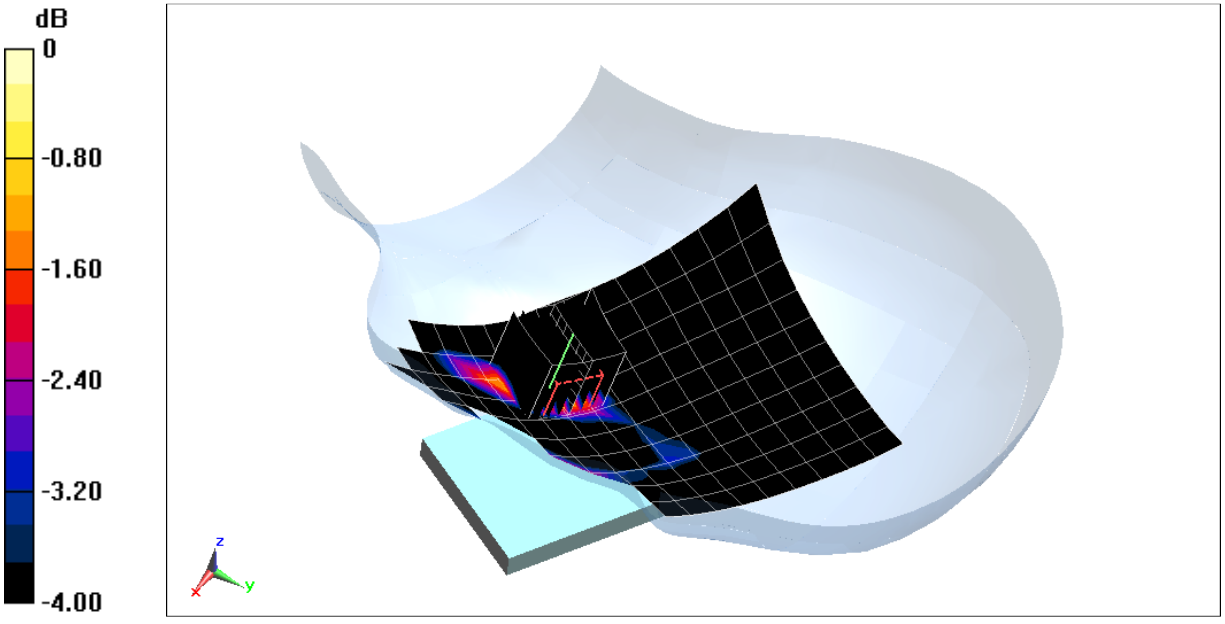
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Head Medium parameters used:
f = 2310 MHz; σ = 1.679 S/m; ε_r = 39.347; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-26-2016; Ambient Temp: 24.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.63, 4.63, 4.63); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 30, Left Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.280 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.073 W/kg



0 dB = 0.0898 W/kg = -10.47 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E5B

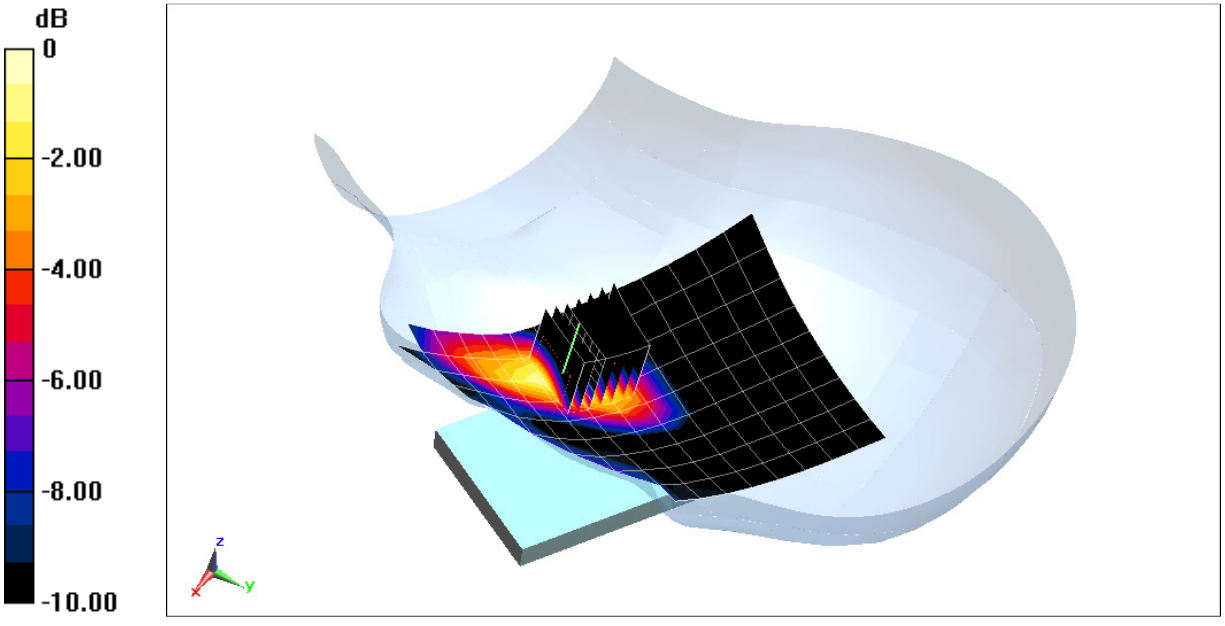
Communication System: UID 0, LTE Band 41; Frequency: 2680 MHz; Duty Cycle: 1:1.58
Medium: 2600 Head Medium parameters used (interpolated):
f = 2680 MHz; σ = 2.112 S/m; ε_r = 37.775; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-26-2016; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.25, 4.25, 4.25); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 41, Left Head, Cheek, High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.954 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.157 W/kg



0 dB = 0.197 W/kg = -7.06 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D00

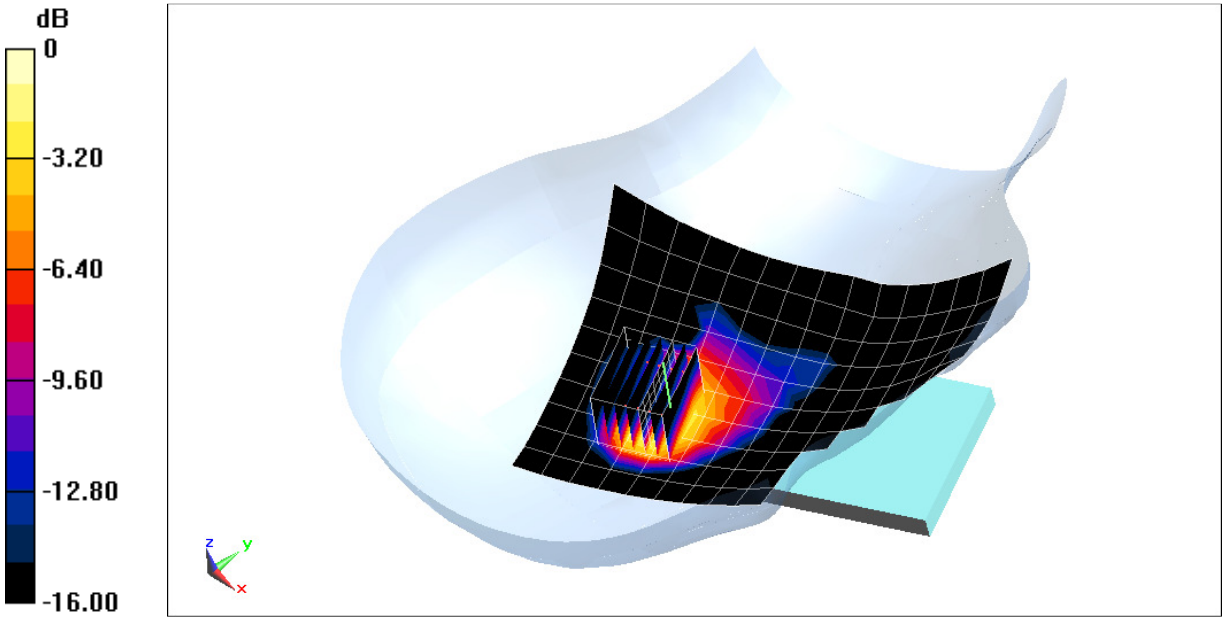
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.821 S/m; ε_r = 38.811; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-26-2016; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.4, 4.4, 4.4); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Antenna 1, 22 MHz Bandwidth, Right Head, Cheek, Ch 06, 1 Mbps, Wireless Charging Cover

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.35 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.808 W/kg
SAR(1 g) = 0.357 W/kg



0 dB = 0.469 W/kg = -3.29 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D00

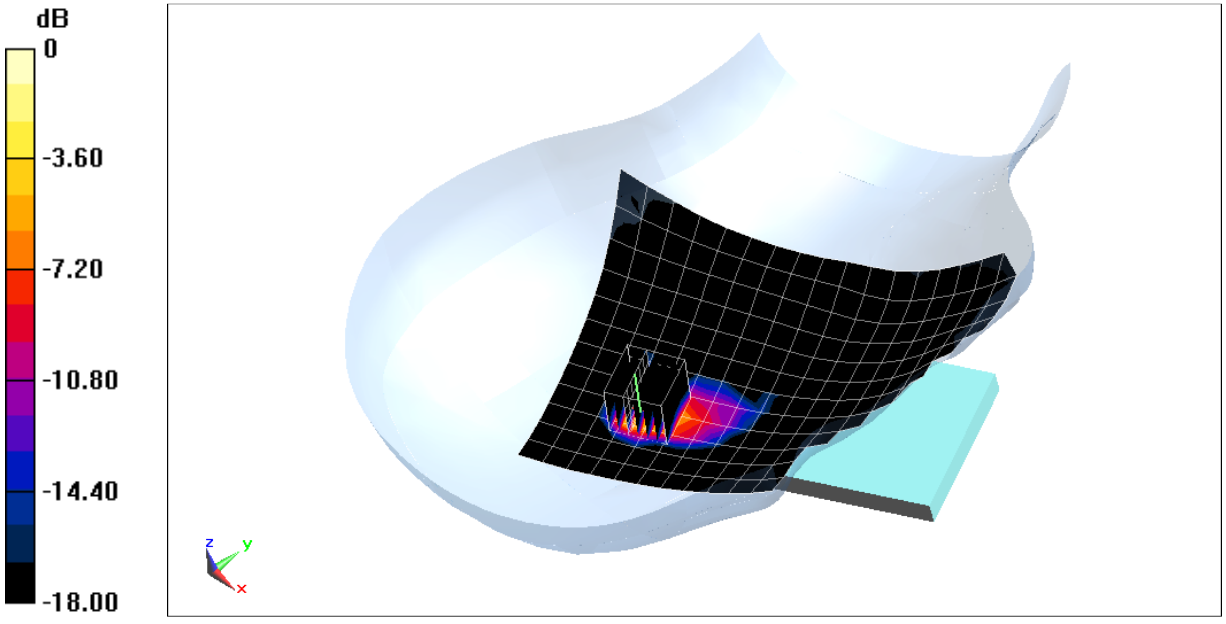
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5825 MHz; σ = 5.297 S/m; ε_r = 36.38; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-26-2016; Ambient Temp: 23.1°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7357; ConvF(4.41, 4.41, 4.41); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
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 802.11a, U-NII-3, Antenna 1, 20 MHz Bandwidth, Right Head, Cheek, Ch 165, 6 Mbps, Wireless Charging Cover

Area Scan (13x18x1): 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 = 8.919 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 2.31 W/kg
SAR(1 g) = 0.442 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

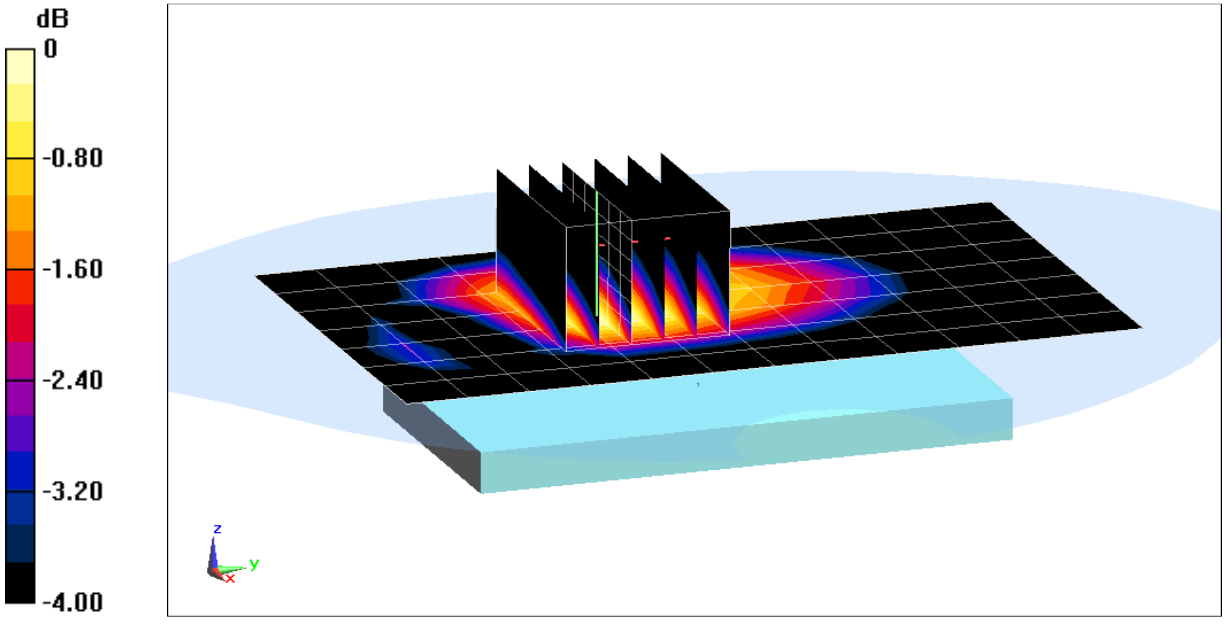
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.006 S/m; ε_r = 53.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: GSM 850, Body SAR, Back Side, Mid.ch,
Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.350 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.0840 W/kg
SAR(1 g) = 0.0665 W/kg



0 dB = 0.0731 W/kg = -11.36 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

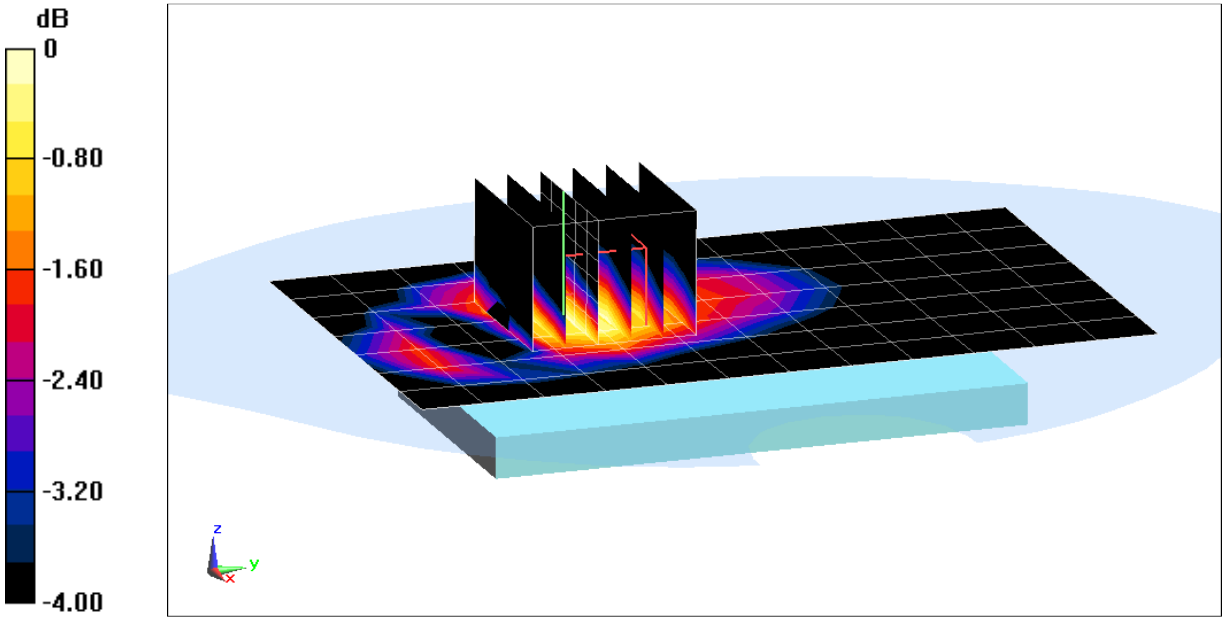
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.006 S/m; ε_r = 53.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: GPRS 850, Body SAR, Back Side, Mid.ch, 3 Tx Slots, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.111 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.115 W/kg
SAR(1 g) = 0.085 W/kg



0 dB = 0.0911 W/kg = -10.40 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

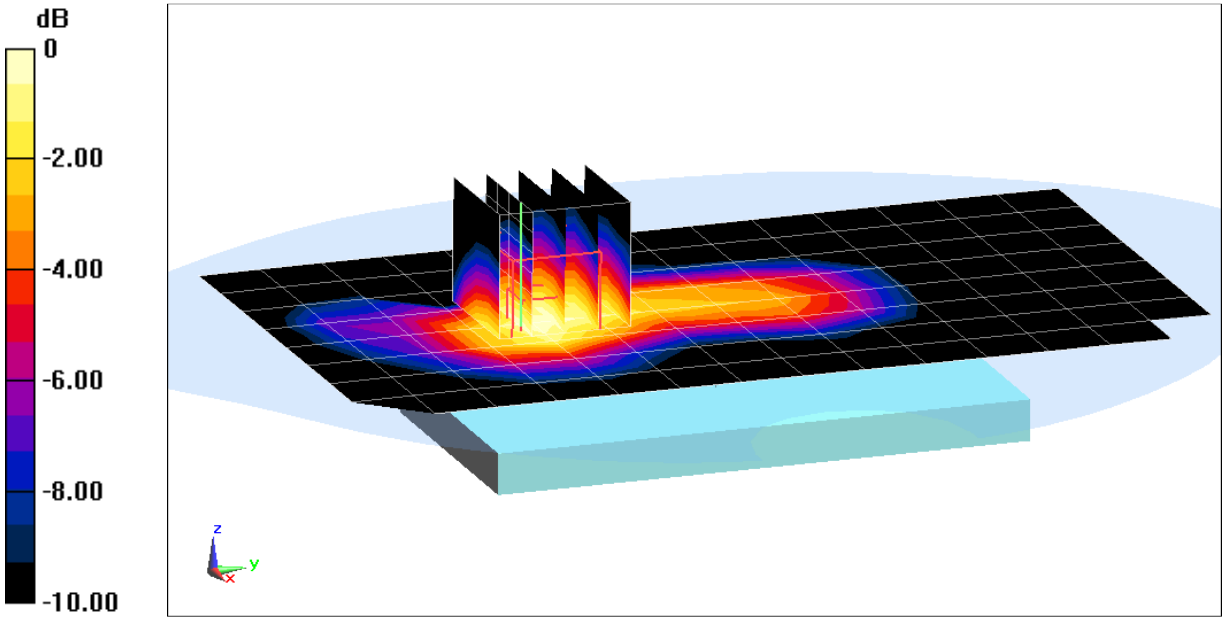
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.534 S/m; ε_r = 51.759; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2016; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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 1900, Body SAR, Back Side, Mid.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.514 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.0860 W/kg
SAR(1 g) = 0.058 W/kg



0 dB = 0.0653 W/kg = -11.85 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3CE8

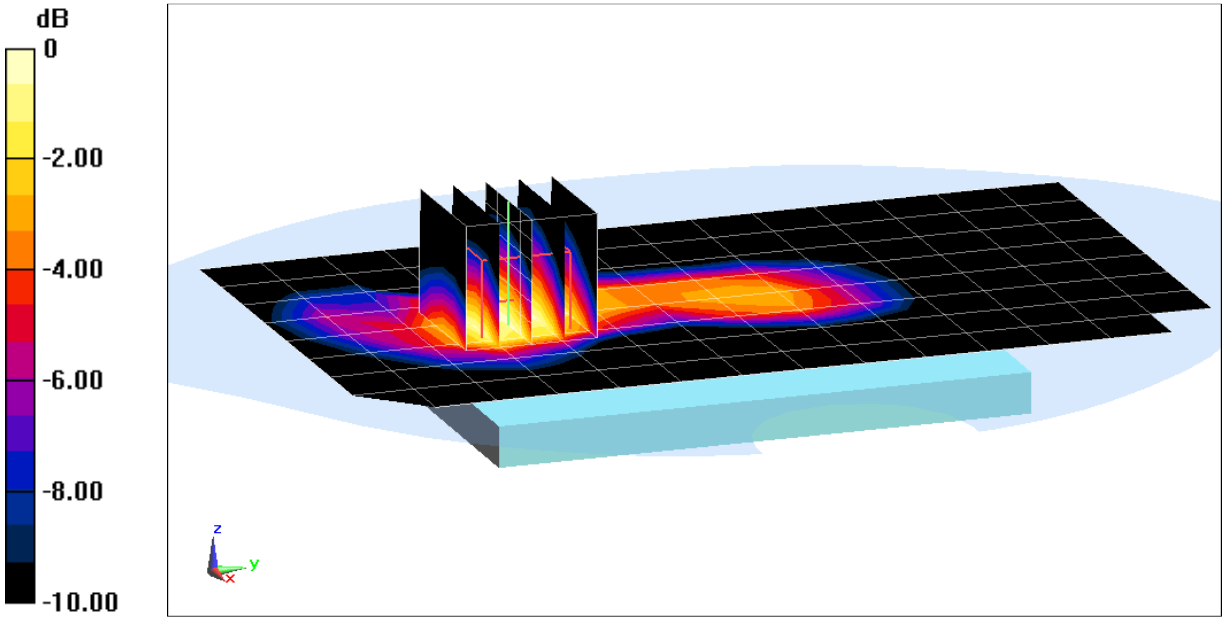
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1909.8 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.565 S/m; ε_r = 51.653; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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 1900, Body SAR, Back Side, High.ch, 3 Tx Slots, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.521 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.088 W/kg



0 dB = 0.102 W/kg = -9.91 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

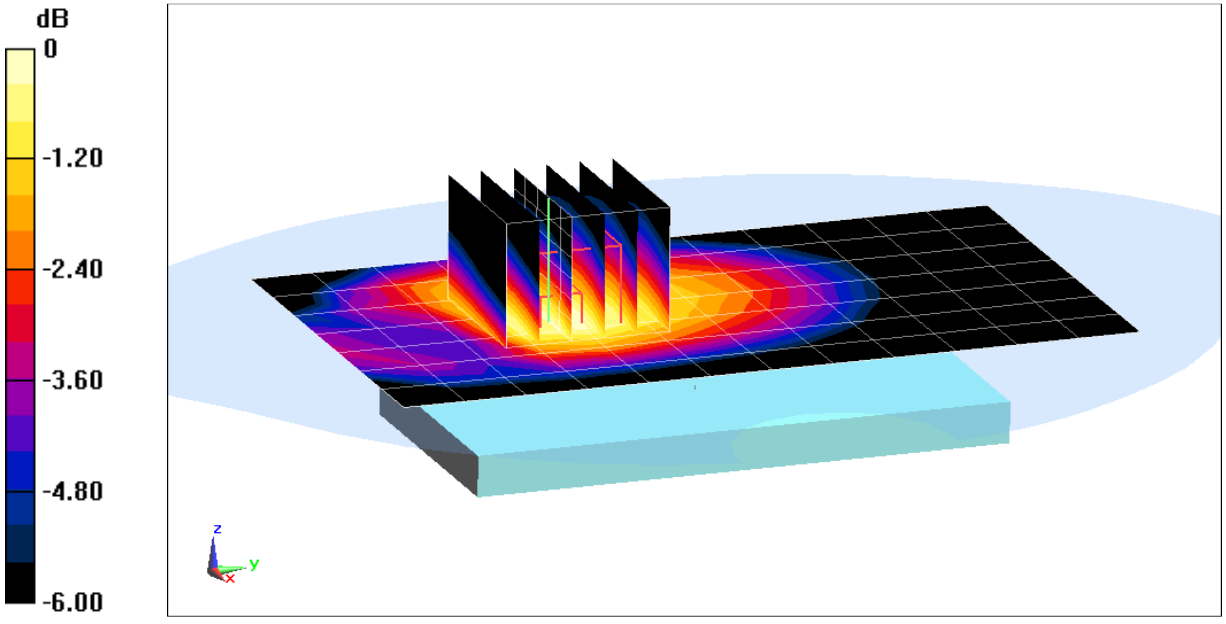
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.006 S/m; ε_r = 53.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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 850, Ant A, Body SAR, Back Side, Mid.ch, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.787 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.116 W/kg
SAR(1 g) = 0.091 W/kg



0 dB = 0.101 W/kg = -9.96 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

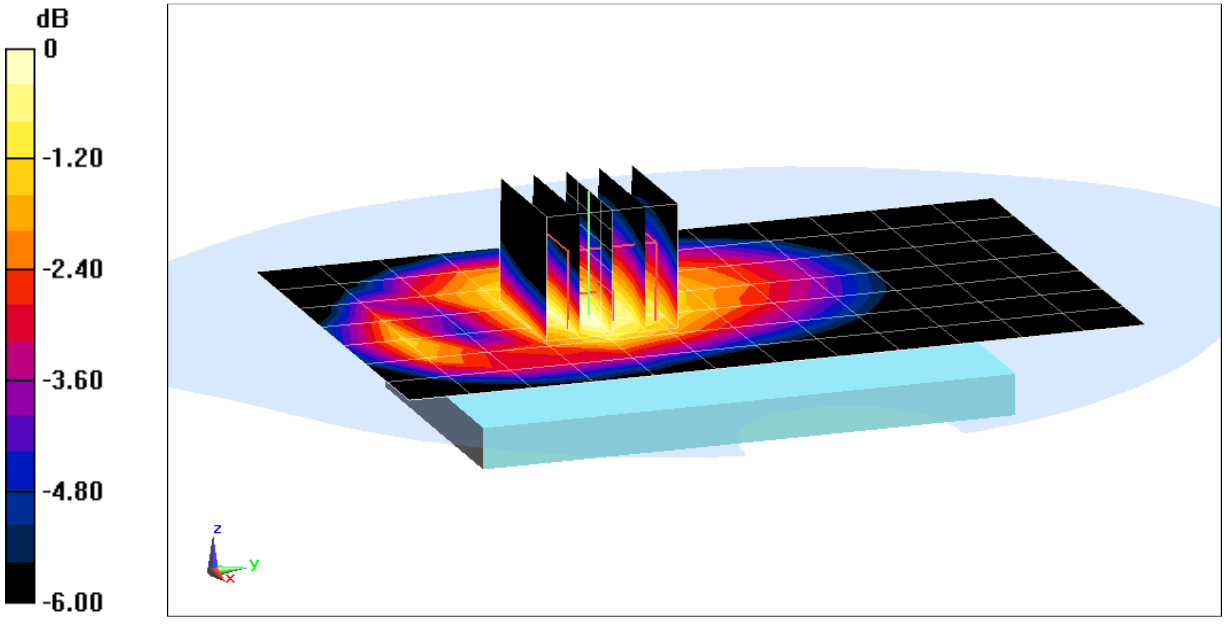
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.006 S/m; ε_r = 53.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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 850, Ant A, Body SAR, Back Side, Mid.ch, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.81 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.130 W/kg



0 dB = 0.144 W/kg = -8.42 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D41

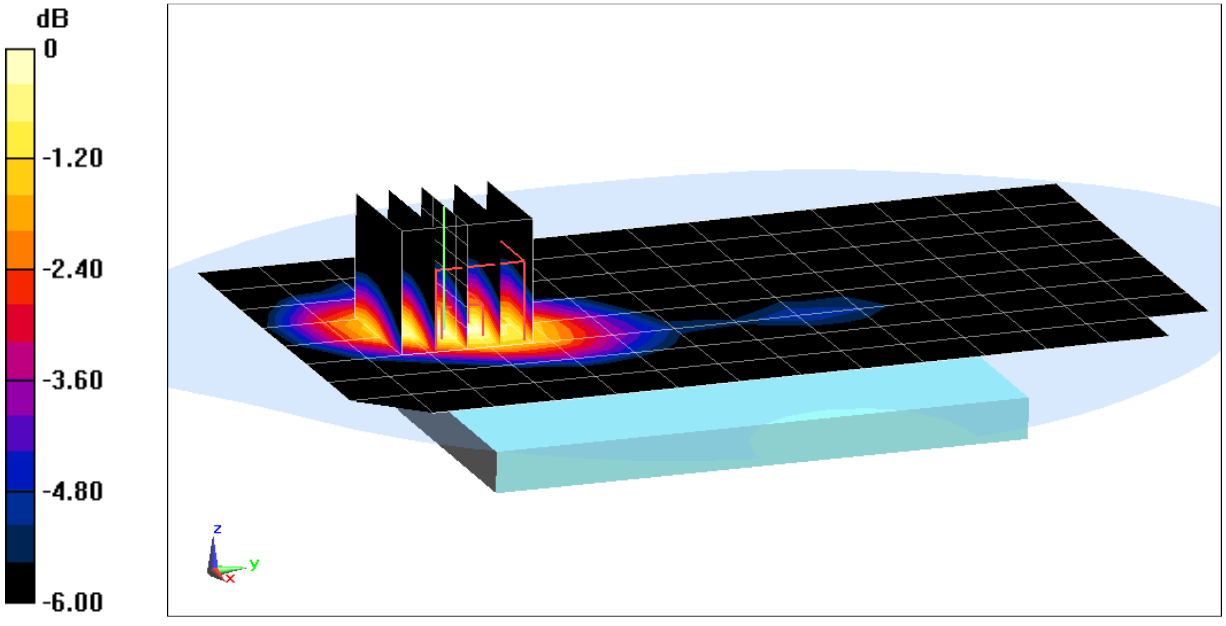
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.474 S/m; ε_r = 51.956; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-28-2016; Ambient Temp: 24.3°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.88, 4.88, 4.88); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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: AWS UMTS, Body SAR, Back Side, Mid.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.23 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.209 W/kg
SAR(1 g) = 0.138 W/kg



0 dB = 0.161 W/kg = -7.93 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E71

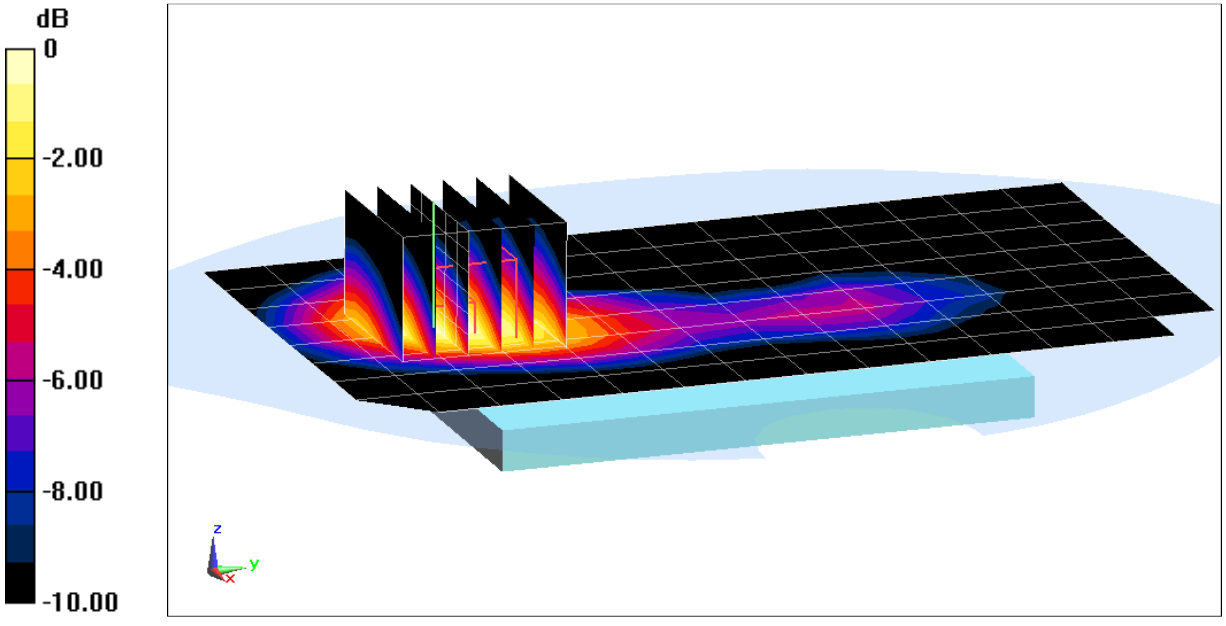
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.543 S/m; ε_r = 51.363; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 19.0°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3263; ConvF(4.88, 4.88, 4.88); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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: AWS UMTS, Body SAR, Back Side, High.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.45 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.154 W/kg



0 dB = 0.184 W/kg = -7.35 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D41

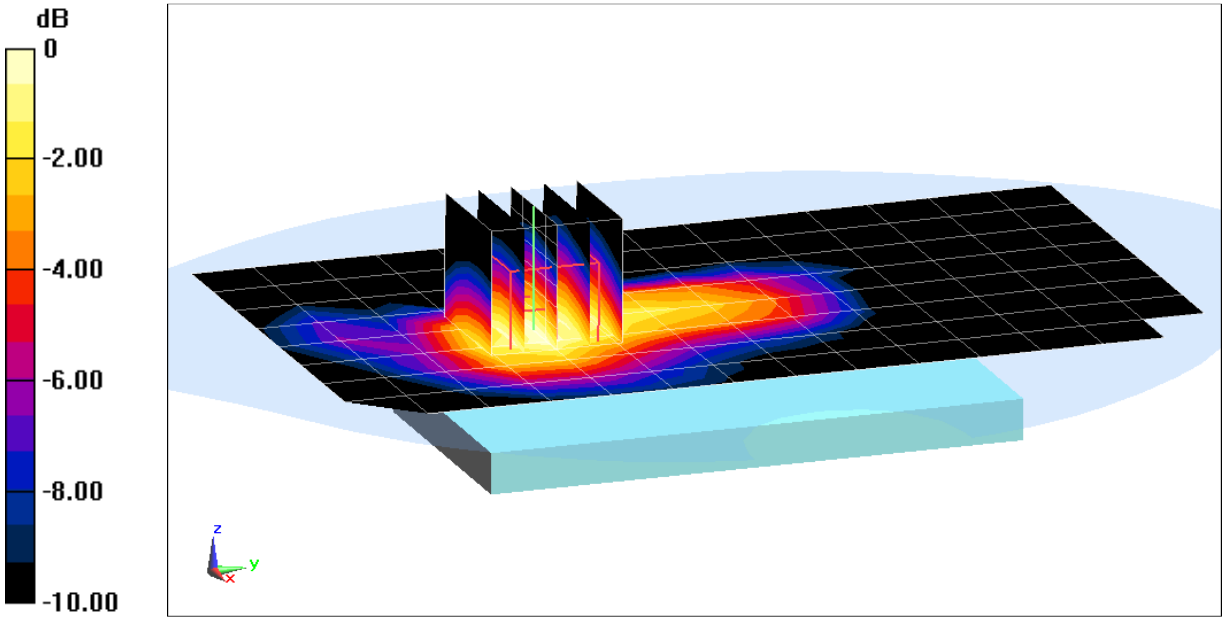
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.532 S/m; ε_r = 51.569; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.342 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.122 W/kg
SAR(1 g) = 0.080 W/kg



0 dB = 0.0925 W/kg = -10.34 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E71

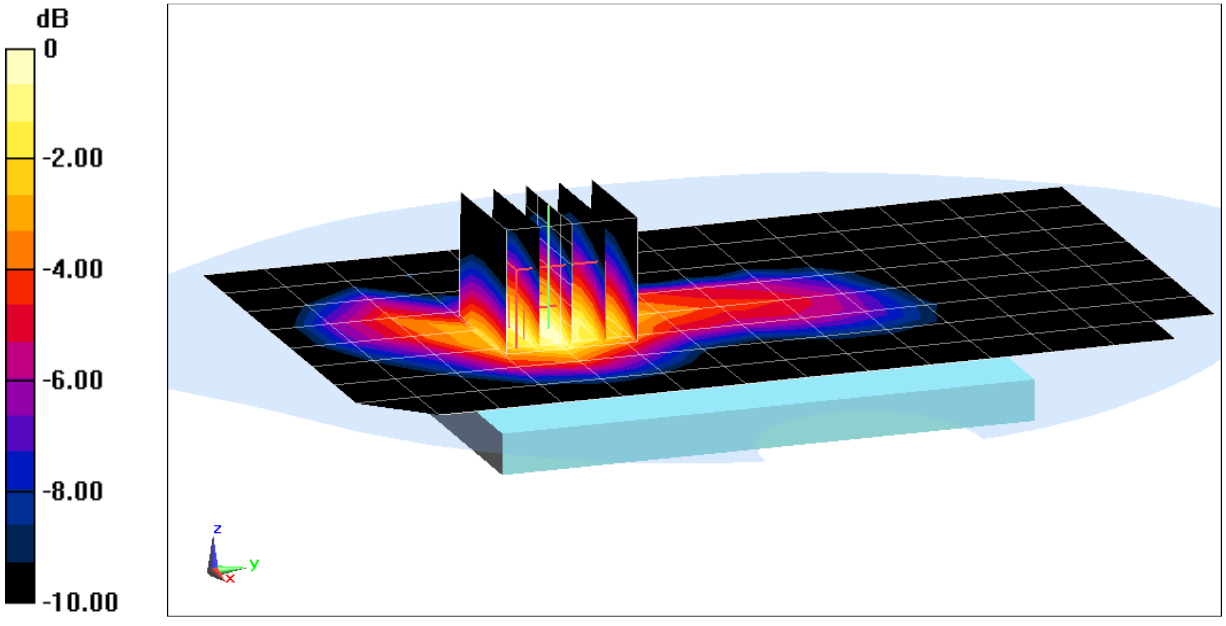
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.532 S/m; ε_r = 51.569; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.57 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.158 W/kg



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

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D2E

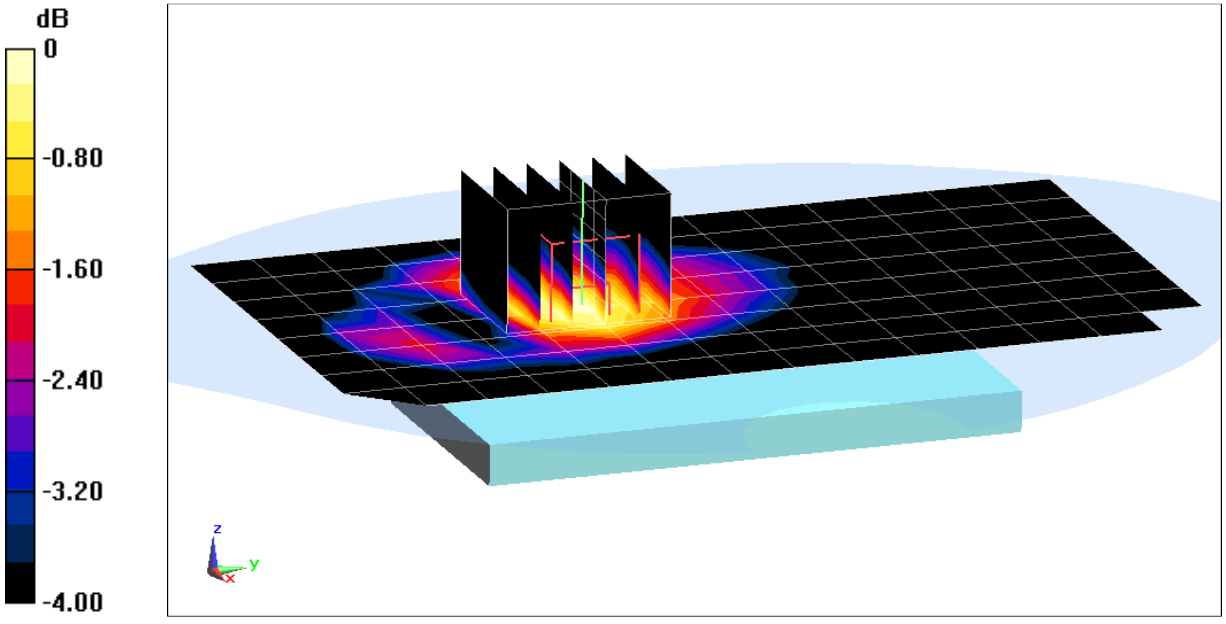
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.989 S/m; ε_r = 53.614; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: Cell. CDMA BC10, Rule Part 90S, Ant A, Body SAR, Back Side, Mid.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.41 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.126 W/kg
SAR(1 g) = 0.100 W/kg



0 dB = 0.110 W/kg = -9.59 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D2E

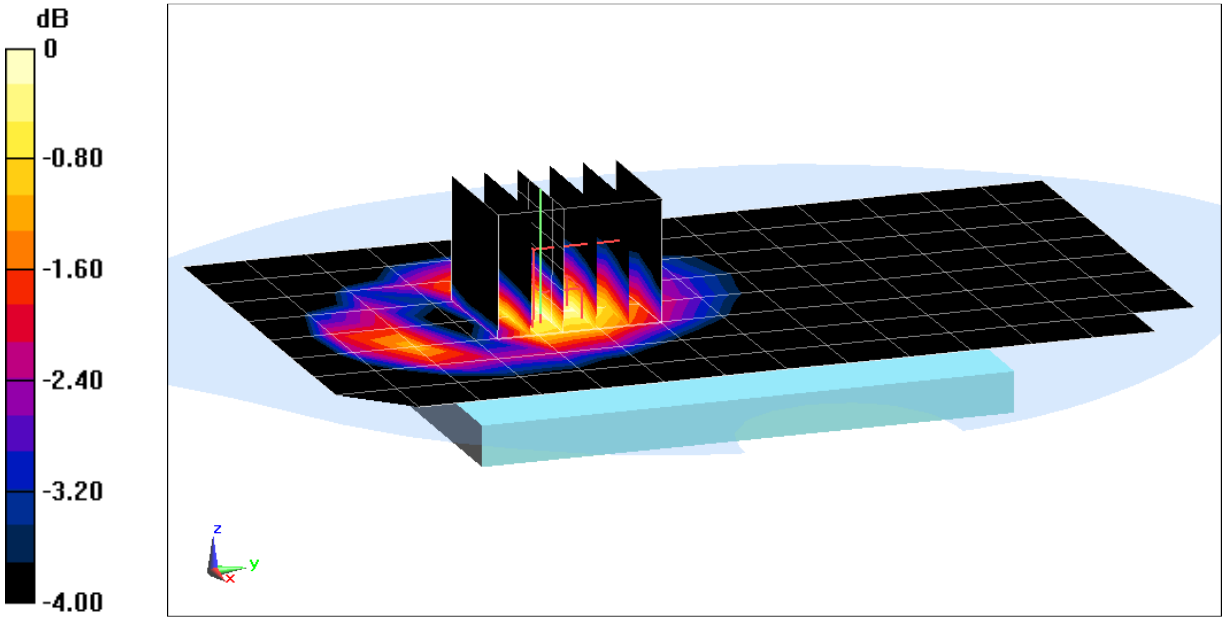
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.989 S/m; ε_r = 53.614; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: Cell. EVDO BC10, Rule Part 90S, Ant A, Body SAR, Back Side, Mid.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.02 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.142 W/kg



0 dB = 0.158 W/kg = -8.01 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D2E

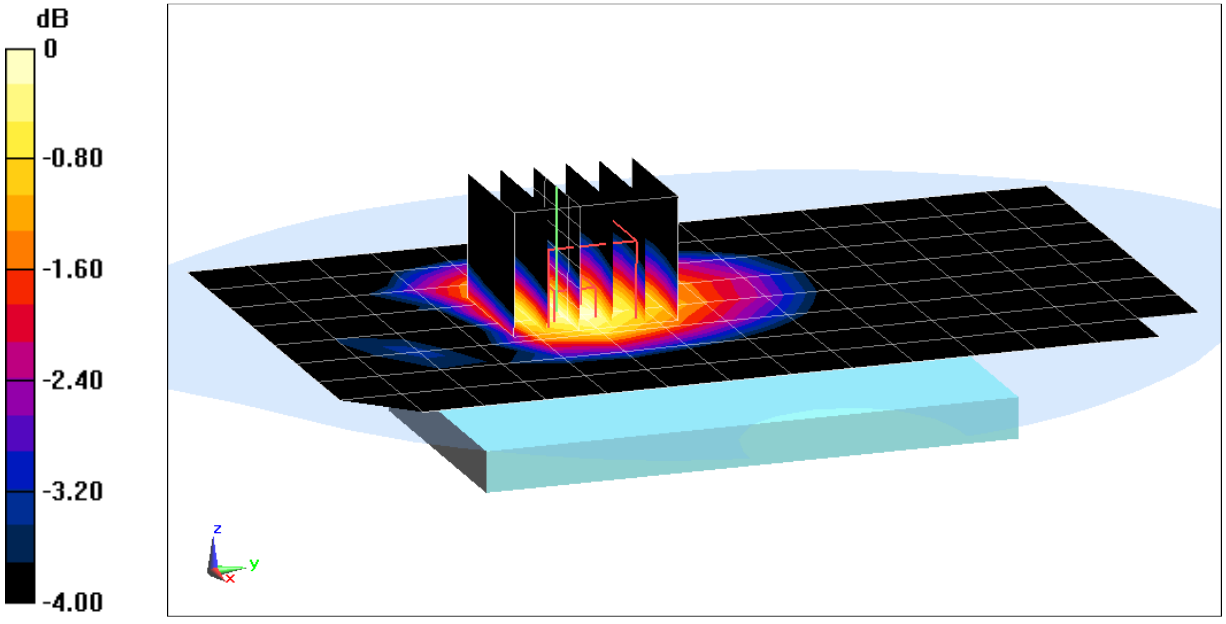
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 1.006 S/m; ε_r = 53.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: Cell. CDMA BC0, Rule Part 22H, Ant A, Body SAR, Back Side, Mid.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.95 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.143 W/kg
SAR(1 g) = 0.112 W/kg



0 dB = 0.124 W/kg = -9.07 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D2E

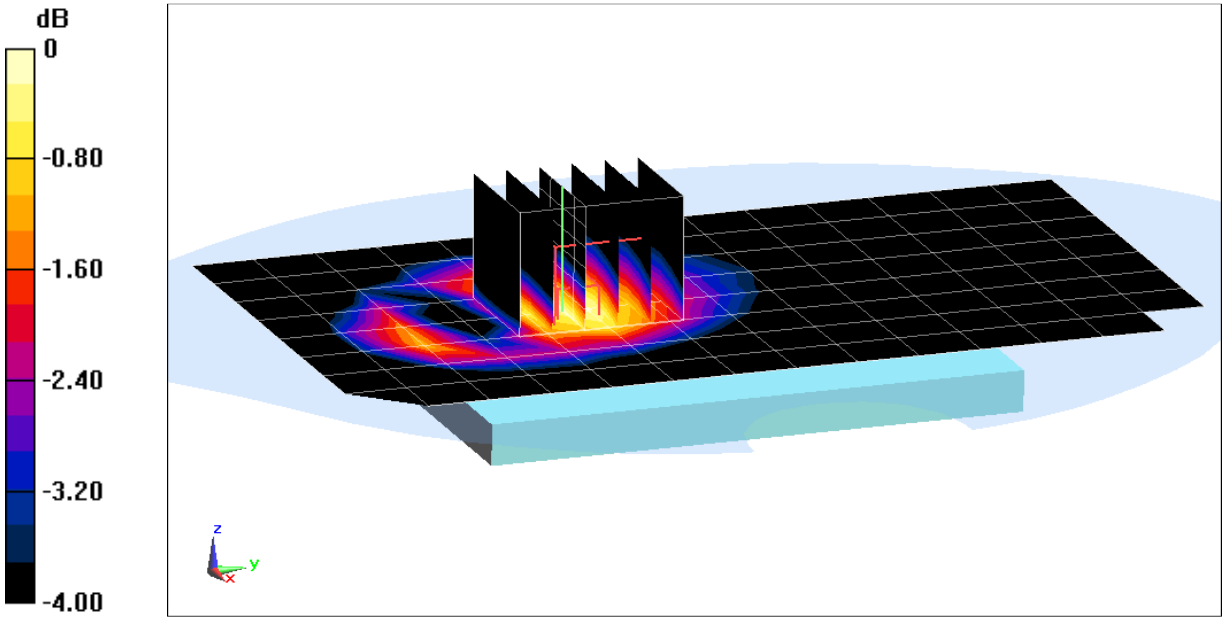
Communication System: UID 0, CDMA; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 824.7 MHz; σ = 0.994 S/m; ε_r = 53.565; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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: Cell. EVDO, BC0, Rule Part 22H, Ant A, Body SAR, Back Side, Low.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.12 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.212 W/kg
SAR(1 g) = 0.162 W/kg



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

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

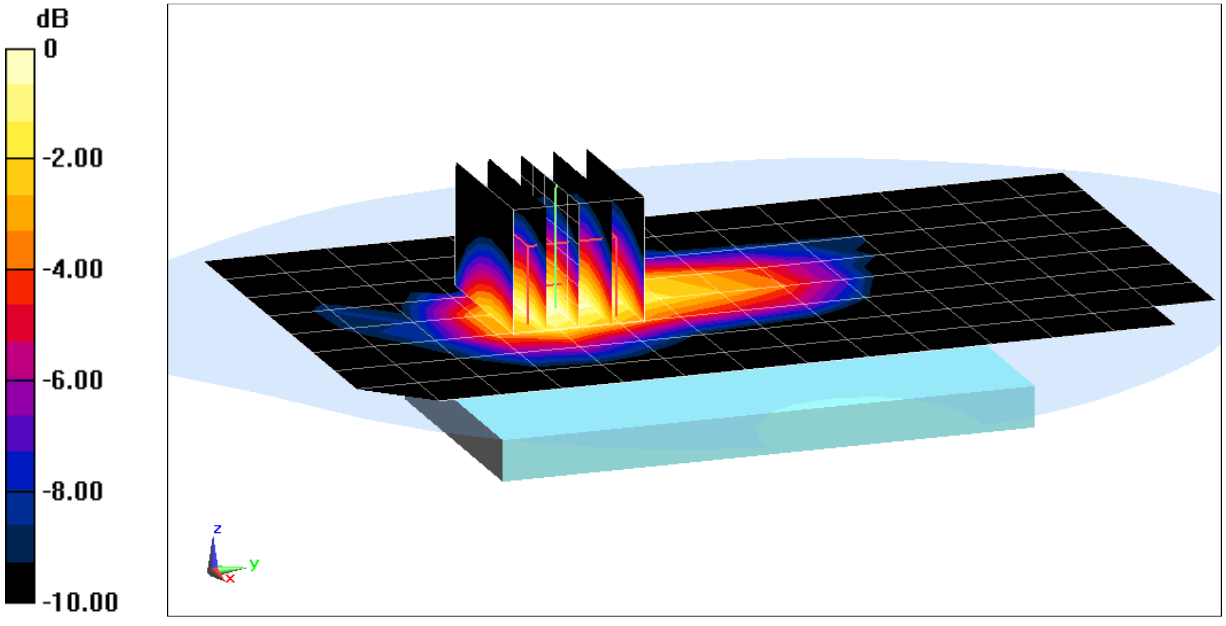
Communication System: UID 0, CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.563 S/m; ε_r = 51.454; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: PCS CDMA, Body SAR, Back Side, High.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.68 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.245 W/kg
SAR(1 g) = 0.160 W/kg



0 dB = 0.186 W/kg = -7.30 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3CE8

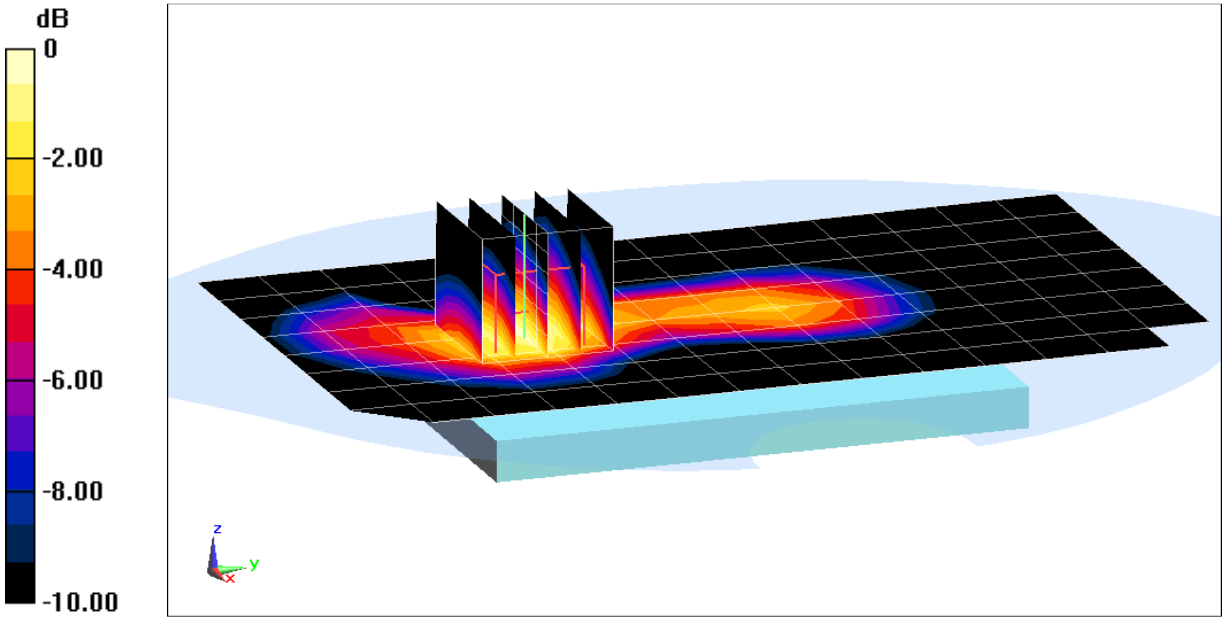
Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.502 S/m; ε_r = 51.644; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO, Body SAR, Back Side, Low.ch,
Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.521 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.193 W/kg
SAR(1 g) = 0.126 W/kg



0 dB = 0.147 W/kg = -8.33 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C35C6

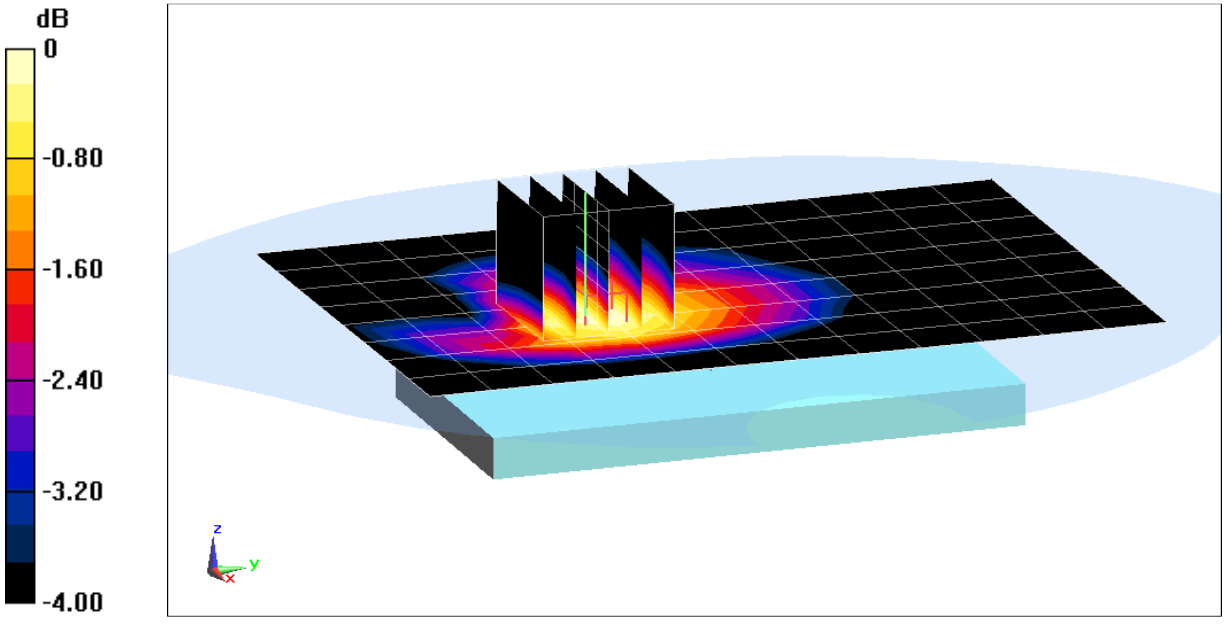
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.922 S/m; ε_r = 57.057; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant A, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.39 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.093 W/kg



0 dB = 0.103 W/kg = -9.87 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C35C6

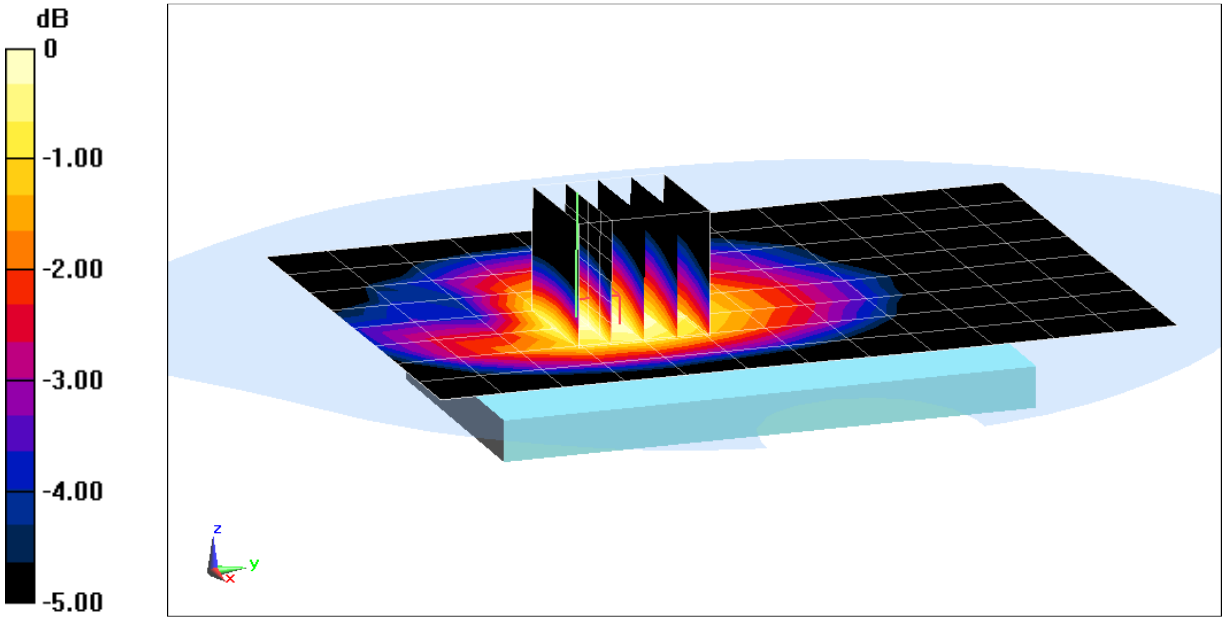
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.922 S/m; ε_r = 57.057; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Ant A, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.95 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.166 W/kg
SAR(1 g) = 0.128 W/kg



0 dB = 0.100 W/kg = -10.00 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C35C6

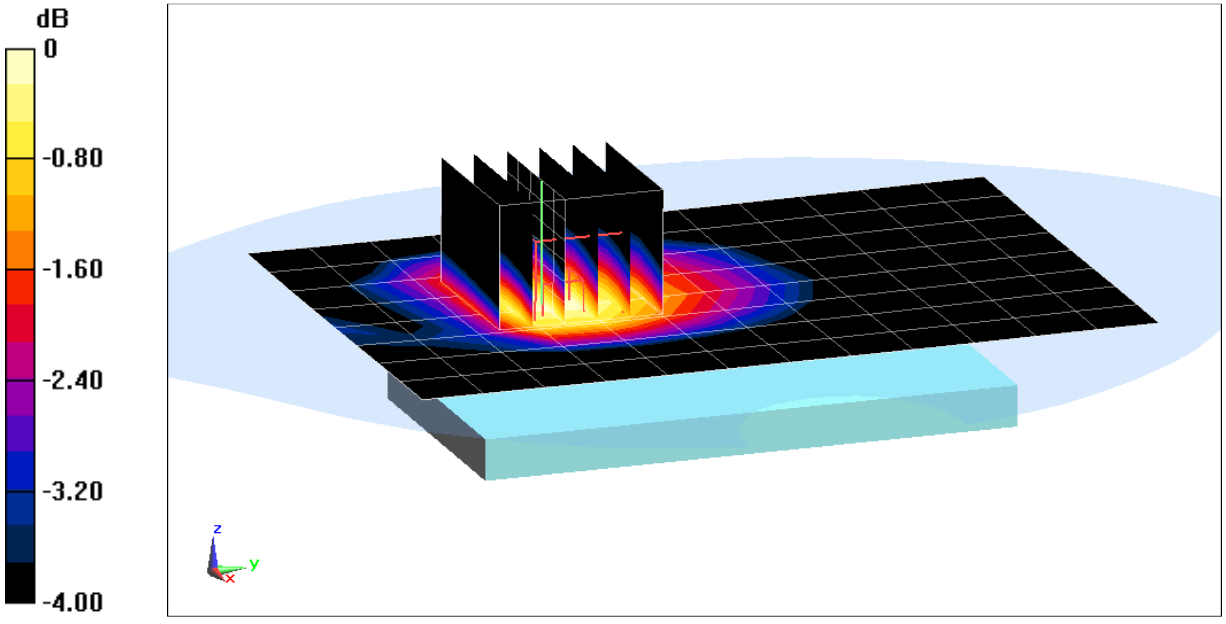
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.992 S/m; ε_r = 53.518; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-02-2016; Ambient Temp: 24.1°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3263; ConvF(6.07, 6.07, 6.07); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 13, Ant A, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset, Wireless Charging Cover

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.295 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.105 W/kg
SAR(1 g) = 0.081 W/kg



0 dB = 0.0902 W/kg = -10.45 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C35C6

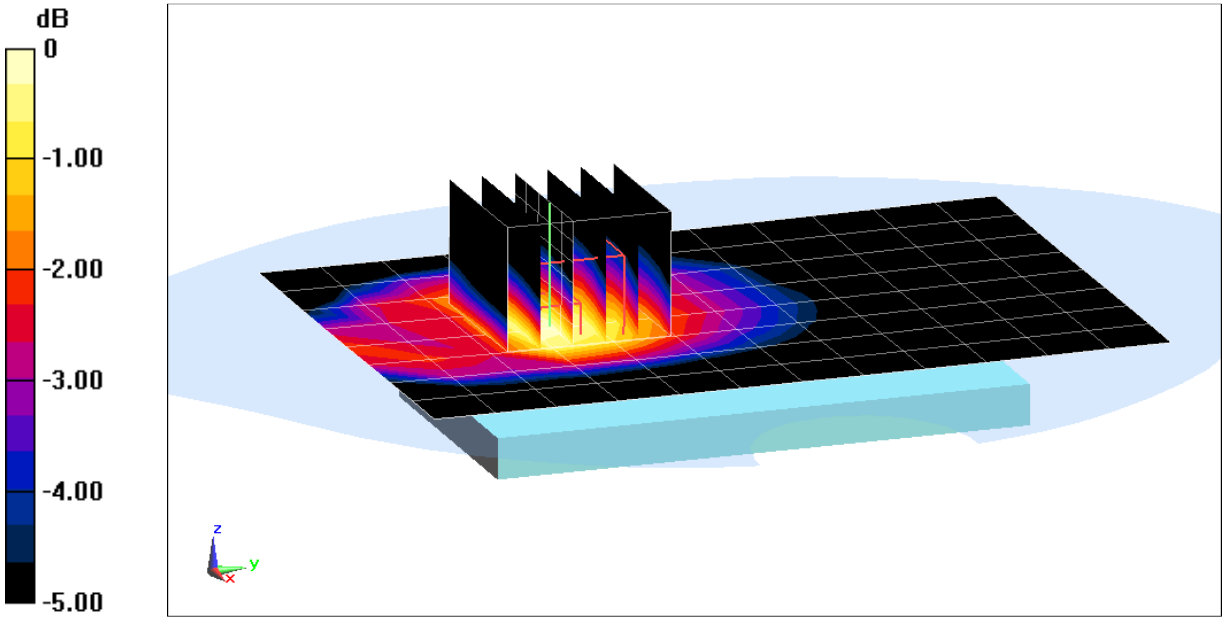
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.992 S/m; ε_r = 53.518; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-02-2016; Ambient Temp: 24.1°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3263; ConvF(6.07, 6.07, 6.07); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 13, Ant A, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset, Wireless Charging Cover

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.00 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.111 W/kg



0 dB = 0.124 W/kg = -9.07 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

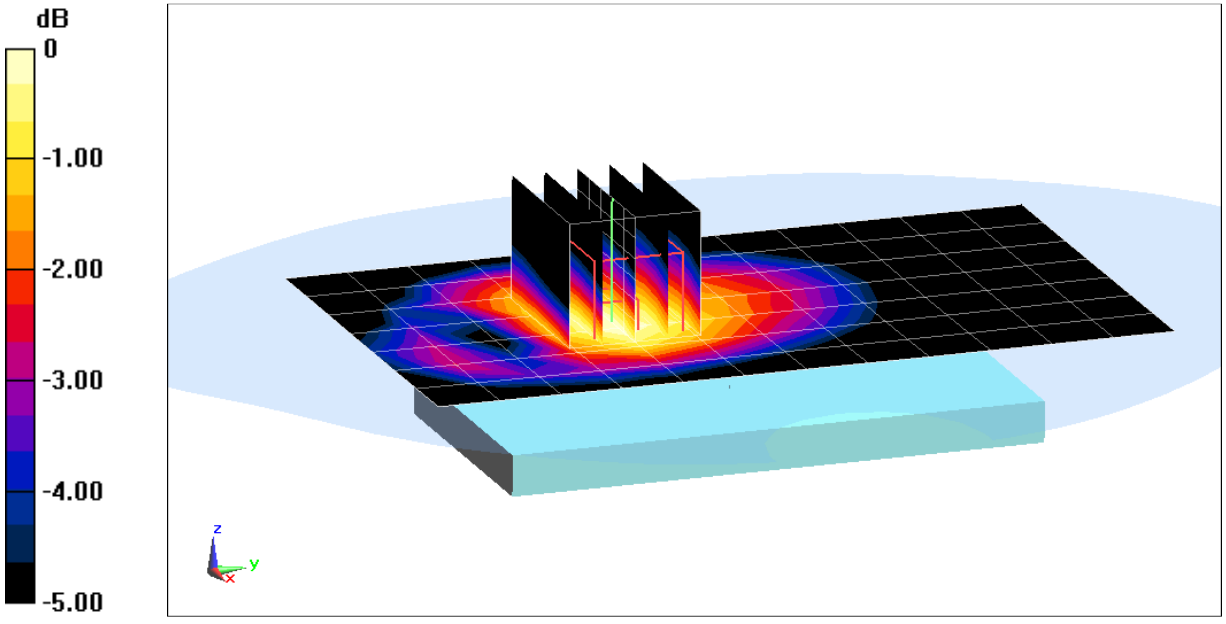
Communication System: UID 0, LTE Band 26; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.006 S/m; ε_r = 53.439; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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 26 (Cell.), Ant A, Body SAR, Back Side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.599 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.110 W/kg
SAR(1 g) = 0.086 W/kg



0 dB = 0.0946 W/kg = -10.24 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D8C

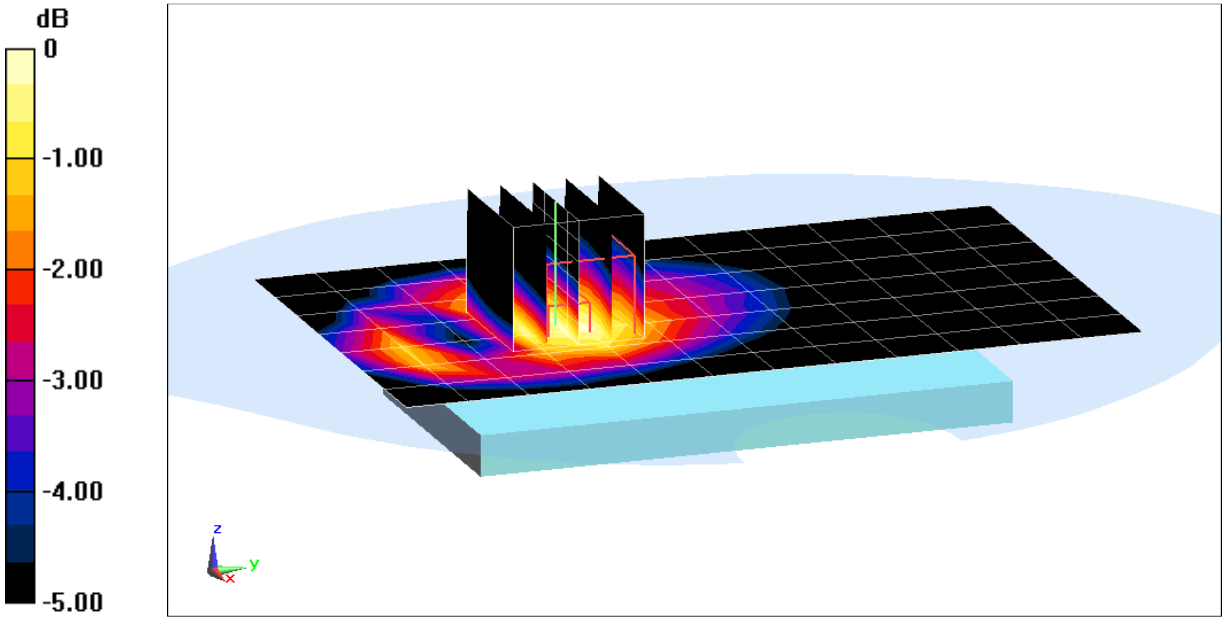
Communication System: UID 0, LTE Band 26; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.006 S/m; ε_r = 53.439; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
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 26 (Cell.), Ant A, Body SAR, Back Side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.28 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.160 W/kg
SAR(1 g) = 0.120 W/kg



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

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D41

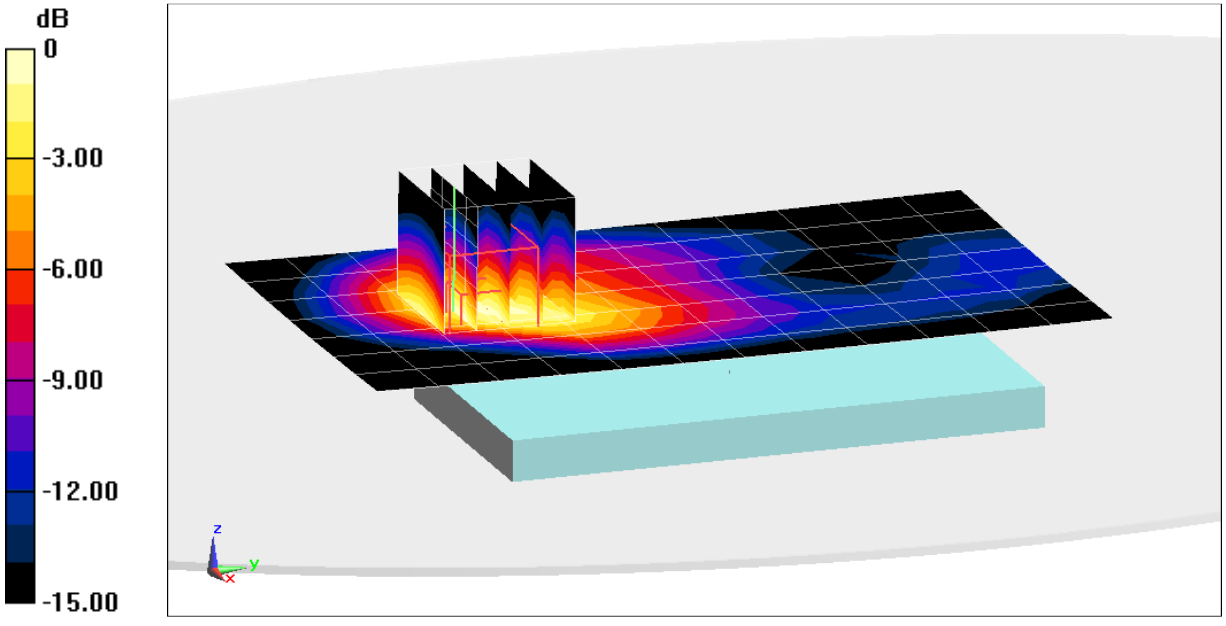
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.506 S/m; ε_r = 52.531; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(4.79, 4.79, 4.79); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
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, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.36 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.288 W/kg
SAR(1 g) = 0.185 W/kg



0 dB = 1.15 W/kg = 0.61 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D46

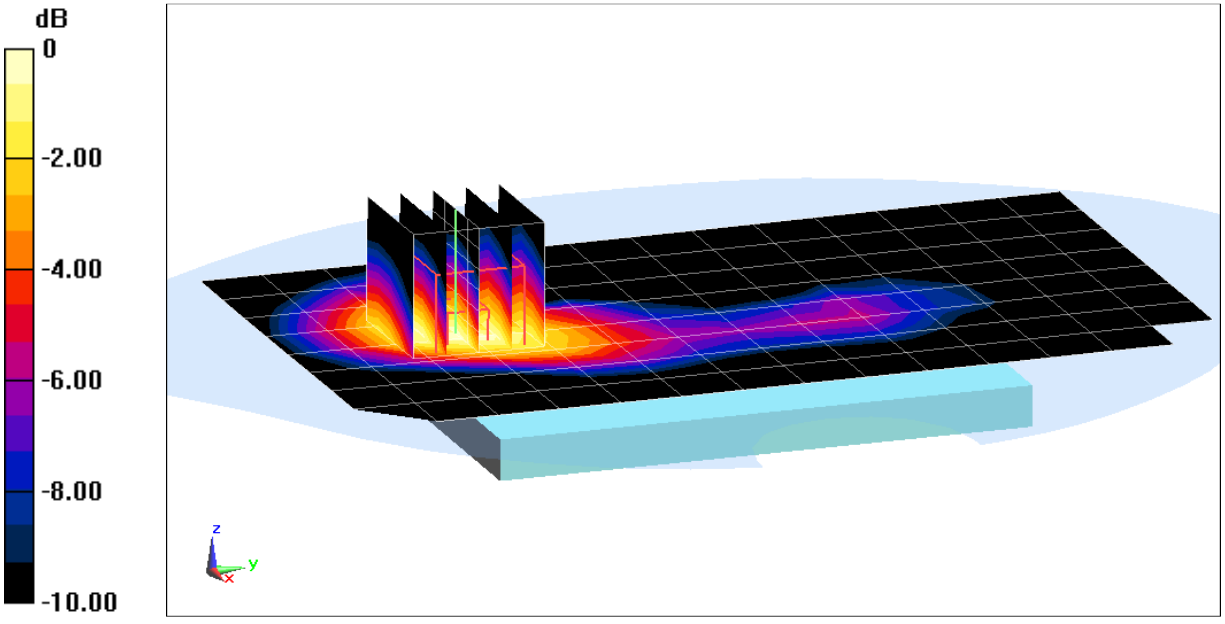
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.52 S/m; ε_r = 51.45; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 19.0°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3263; ConvF(4.88, 4.88, 4.88); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 4 (AWS), Body SAR, Back Side, Mid.ch, 20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.12 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.222 W/kg
SAR(1 g) = 0.139 W/kg



0 dB = 0.167 W/kg = -7.77 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D11

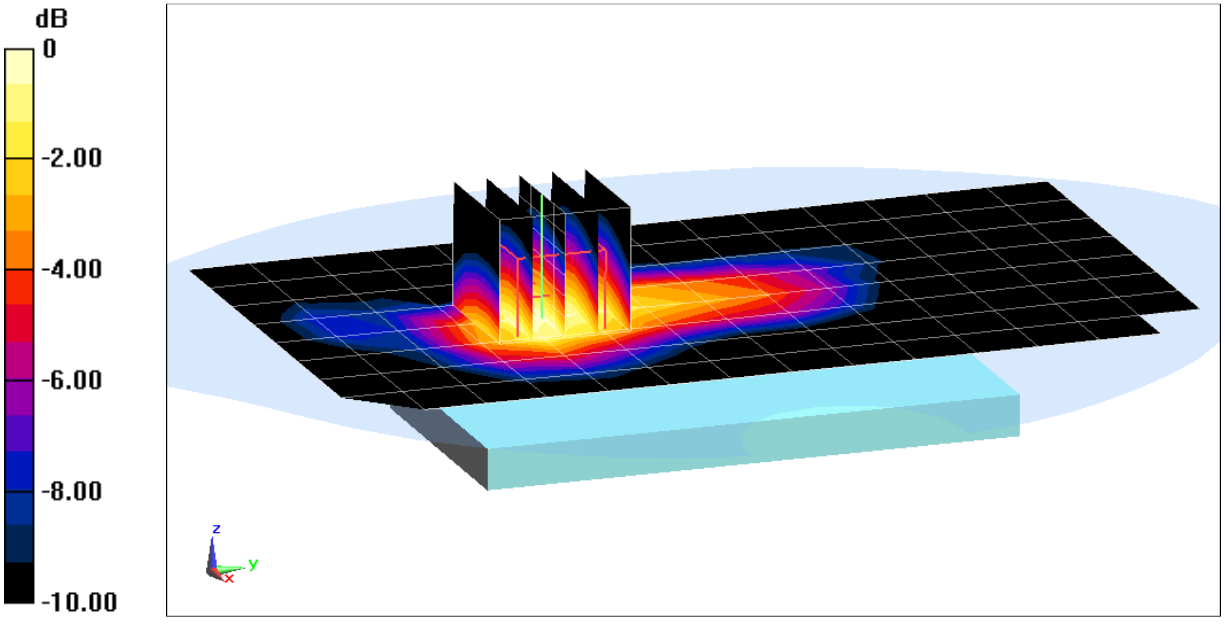
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.559 S/m; ε_r = 51.469; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.781 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.210 W/kg
SAR(1 g) = 0.137 W/kg



0 dB = 0.160 W/kg = -7.96 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D46

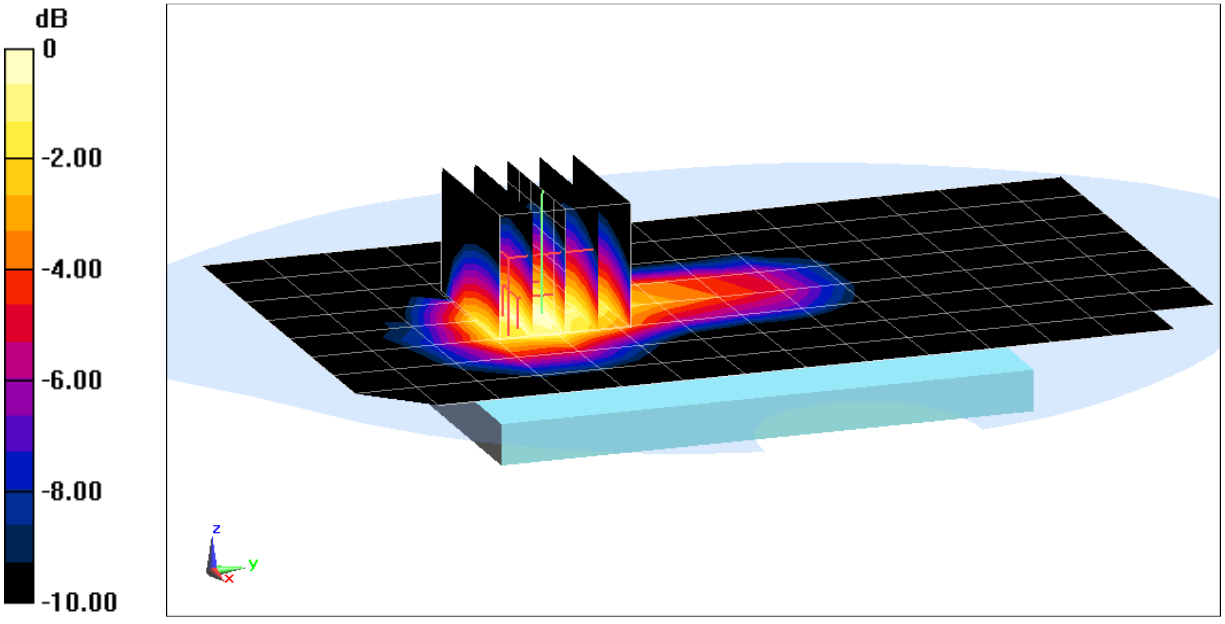
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.559 S/m; ε_r = 51.469; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.22 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.229 W/kg
SAR(1 g) = 0.149 W/kg



0 dB = 0.170 W/kg = -7.70 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E59

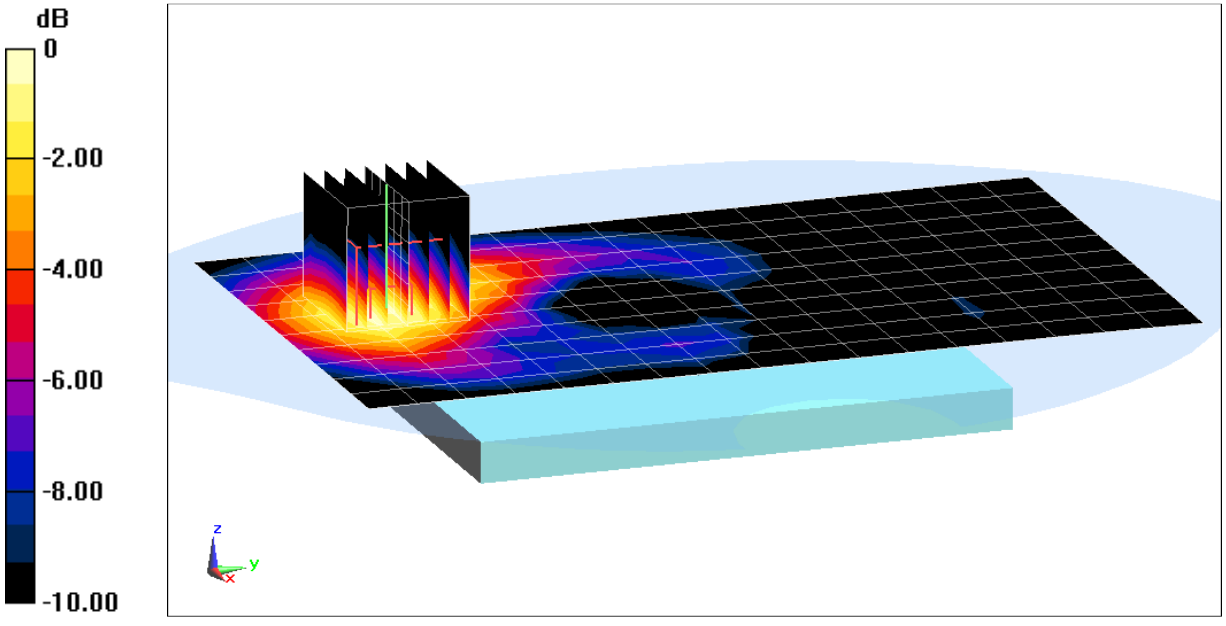
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2310 MHz; σ = 1.794 S/m; ε_r = 51.263; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3263; ConvF(4.42, 4.42, 4.42); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 30, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.269 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.148 W/kg
SAR(1 g) = 0.084 W/kg



0 dB = 0.102 W/kg = -9.91 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E5B

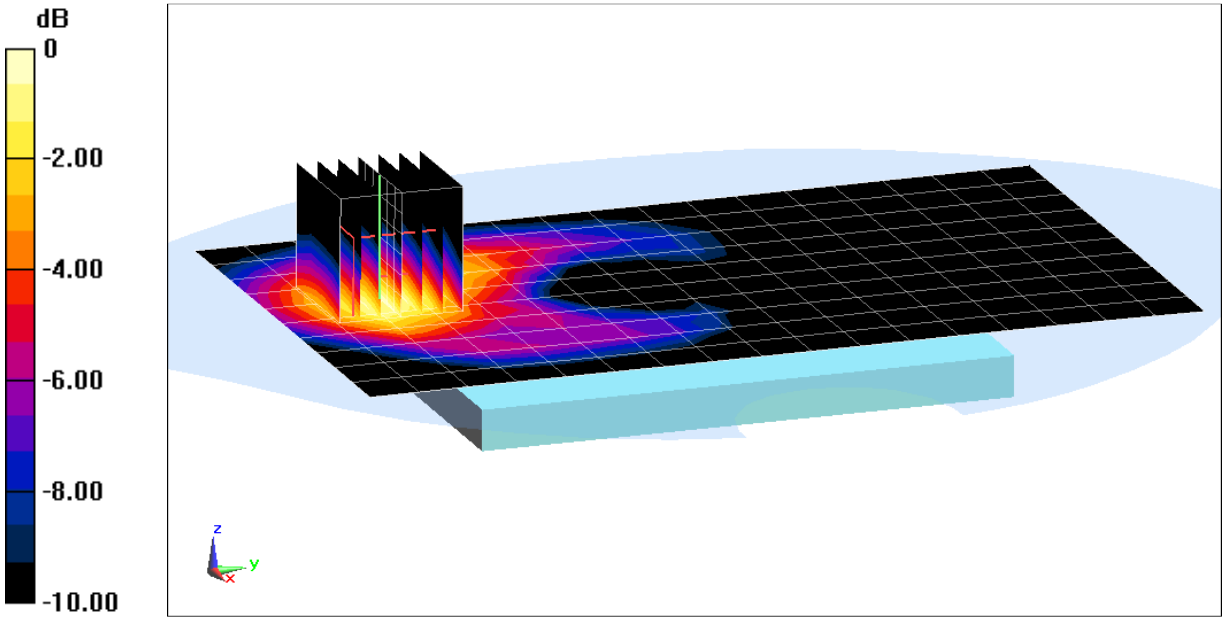
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2310 MHz; σ = 1.794 S/m; ε_r = 51.263; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3263; ConvF(4.42, 4.42, 4.42); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 30, Body SAR, Back Side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.591 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.143 W/kg



0 dB = 0.176 W/kg = -7.54 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E5B

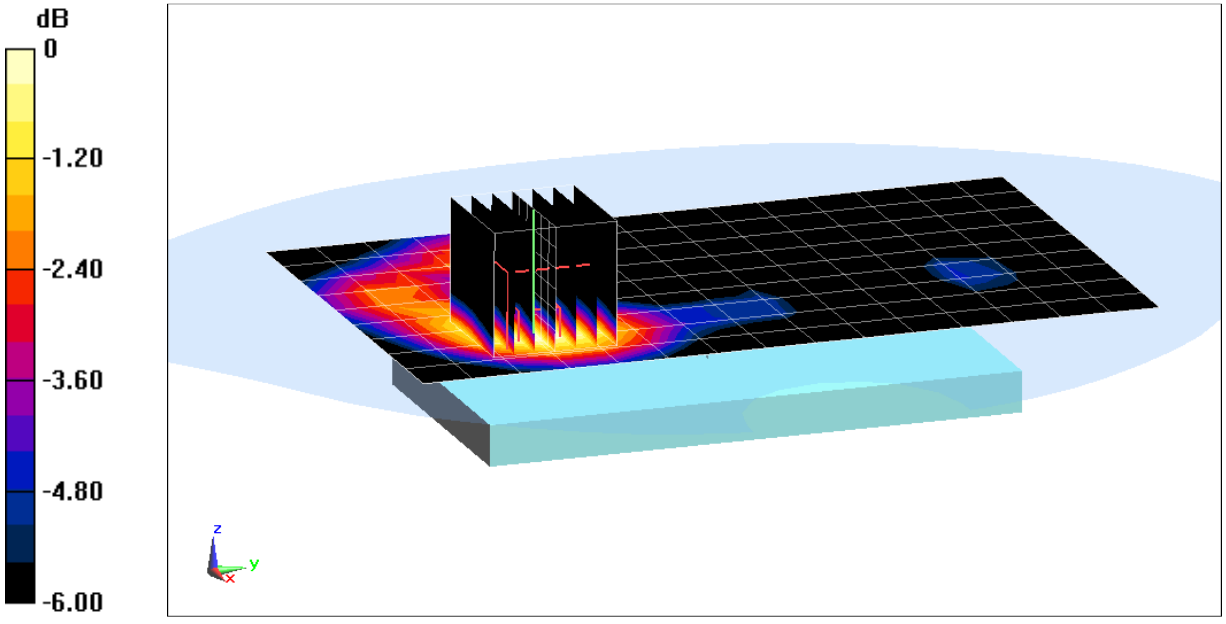
Communication System: UID 0, LTE Band 41; Frequency: 2680 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2680 MHz; σ = 2.293 S/m; ε_r = 49.949; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2016; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3263; ConvF(4.11, 4.11, 4.11); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 41, Body SAR, Back Side, High.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.142 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.158 W/kg
SAR(1 g) = 0.078 W/kg



0 dB = 0.0967 W/kg = -10.15 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D13

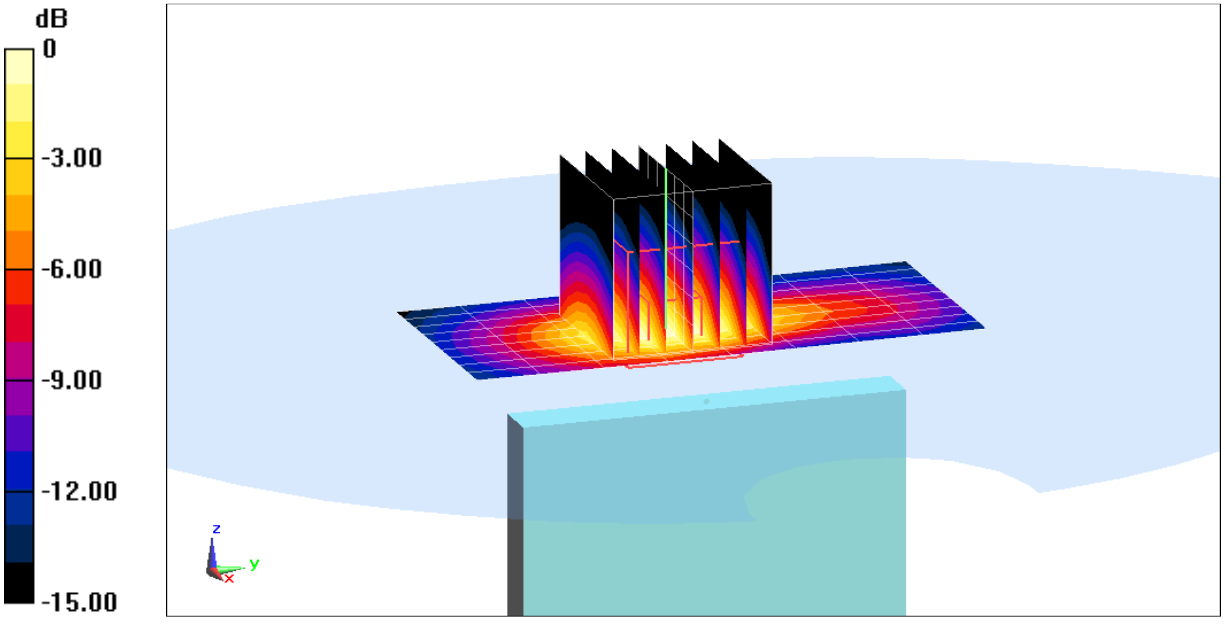
Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.58
Medium: 2450 Body Medium parameters used (interpolated):
f = 2506 MHz; σ = 2.047 S/m; ε_r = 50.592; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3263; ConvF(4.28, 4.28, 4.28); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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 41, Body SAR, Bottom Edge, Low.ch, 20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset, Wireless Charging Cover

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.76 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.797 W/kg
SAR(1 g) = 0.386 W/kg



0 dB = 0.501 W/kg = -3.00 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E99

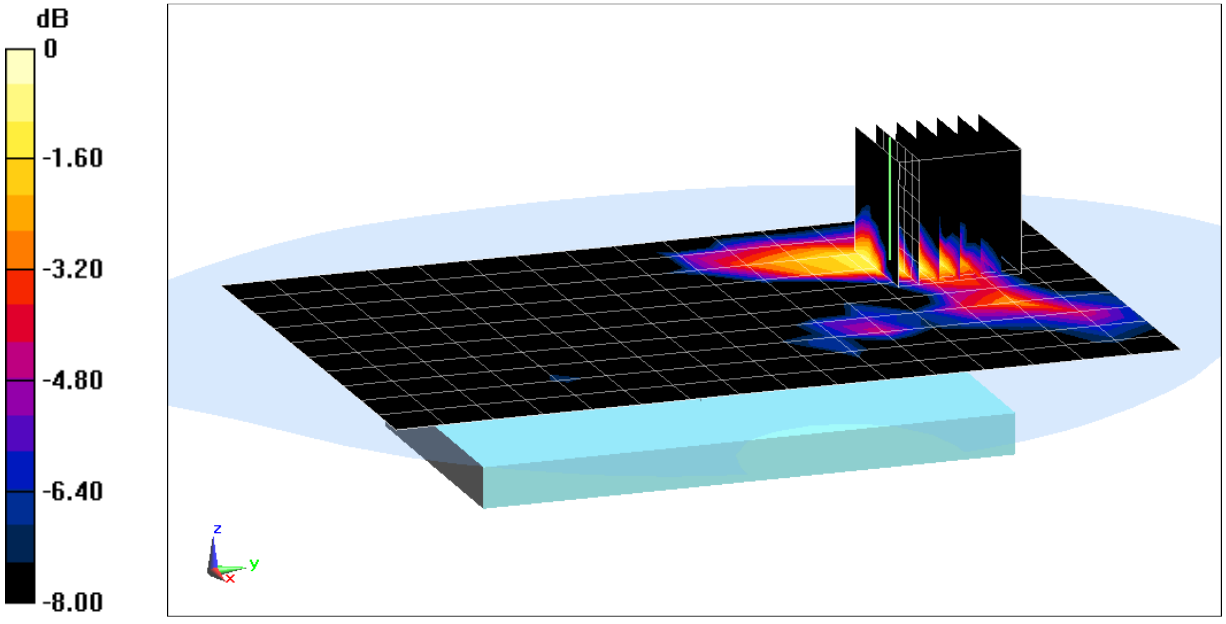
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.975 S/m; ε_r = 51.615; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2016; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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 802.11b, Antenna 1, 22 MHz Bandwidth, Body SAR, Back Side, Ch 6, 1 Mbps, Wireless Charging Cover

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.160 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0330 W/kg
SAR(1 g) = 0.018 W/kg



0 dB = 0.0230 W/kg = -16.38 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3E99

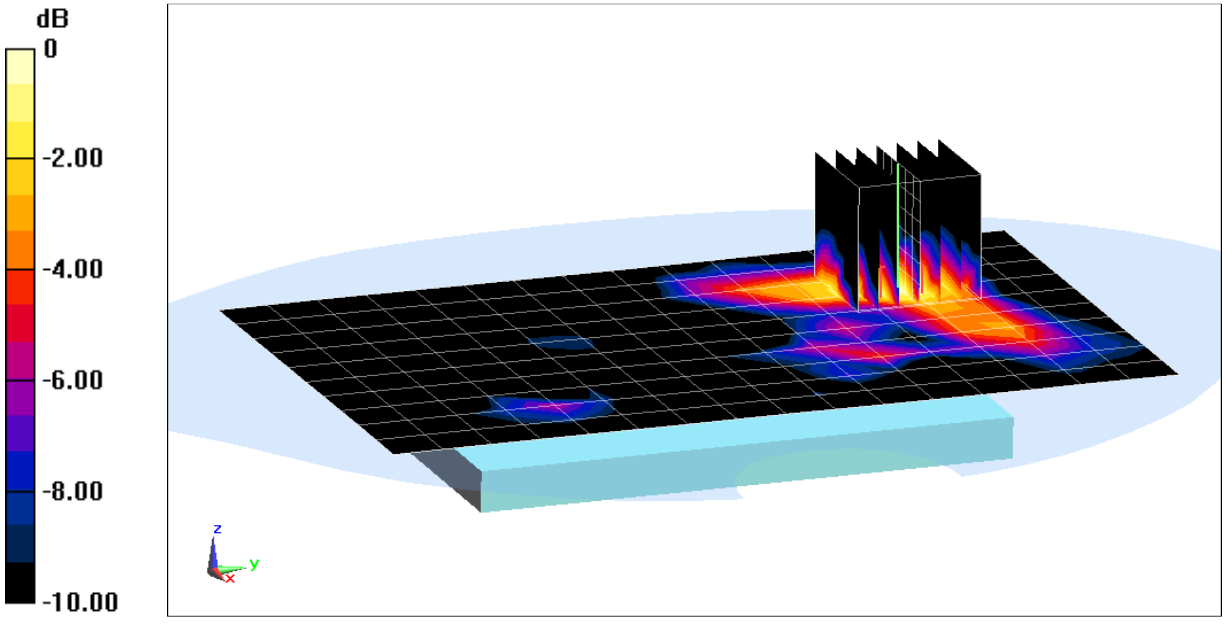
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.975 S/m; ε_r = 51.615; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2016; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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 802.11b, Antenna 1, 22 MHz Bandwidth, Body SAR, Back Side, Ch 6, 1 Mbps, Wireless Charging Cover

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.551 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.0790 W/kg
SAR(1 g) = 0.035 W/kg



0 dB = 0.0465 W/kg = -13.33 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D00

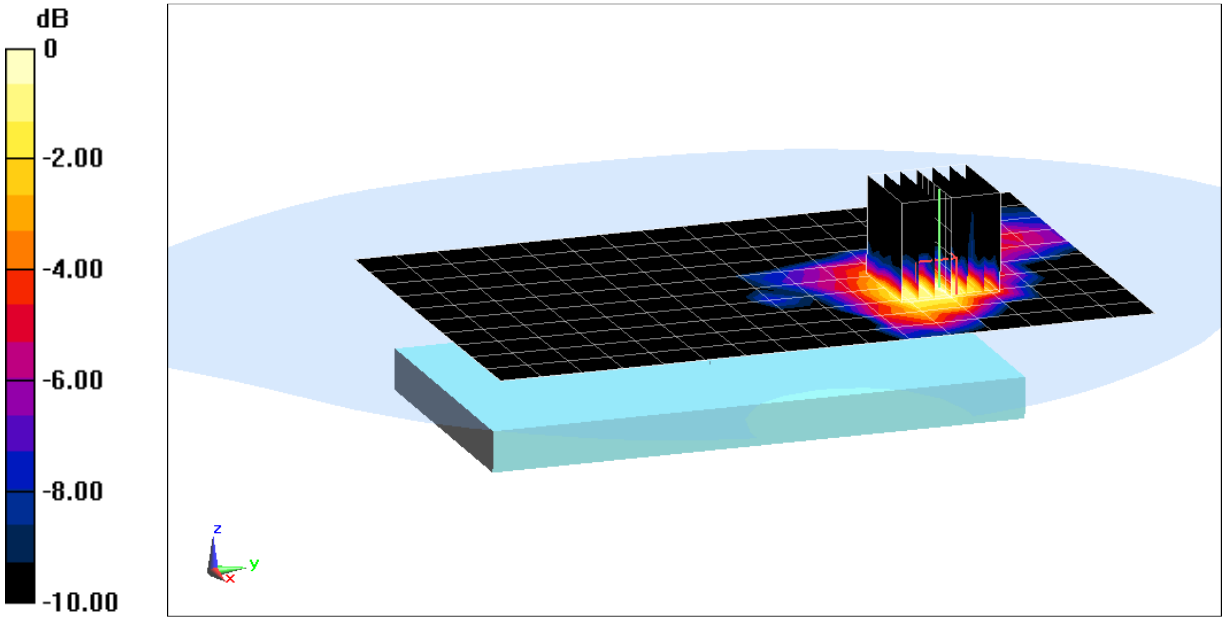
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.932 S/m; ε_r = 46.77; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7357; ConvF(3.72, 3.72, 3.72); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, U-NII-2C, Antenna 1, 20 MHz Bandwidth, Body SAR, Back Side, Ch 120, 6 Mbps, Wireless Charging Cover

Area Scan (11x17x1): 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 = 3.840 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.306 W/kg
SAR(1 g) = 0.084 W/kg



0 dB = 0.176 W/kg = -7.54 dBW/kg

DUT: A3LSMG930US; Type: Portable Handset; Serial: C3D00

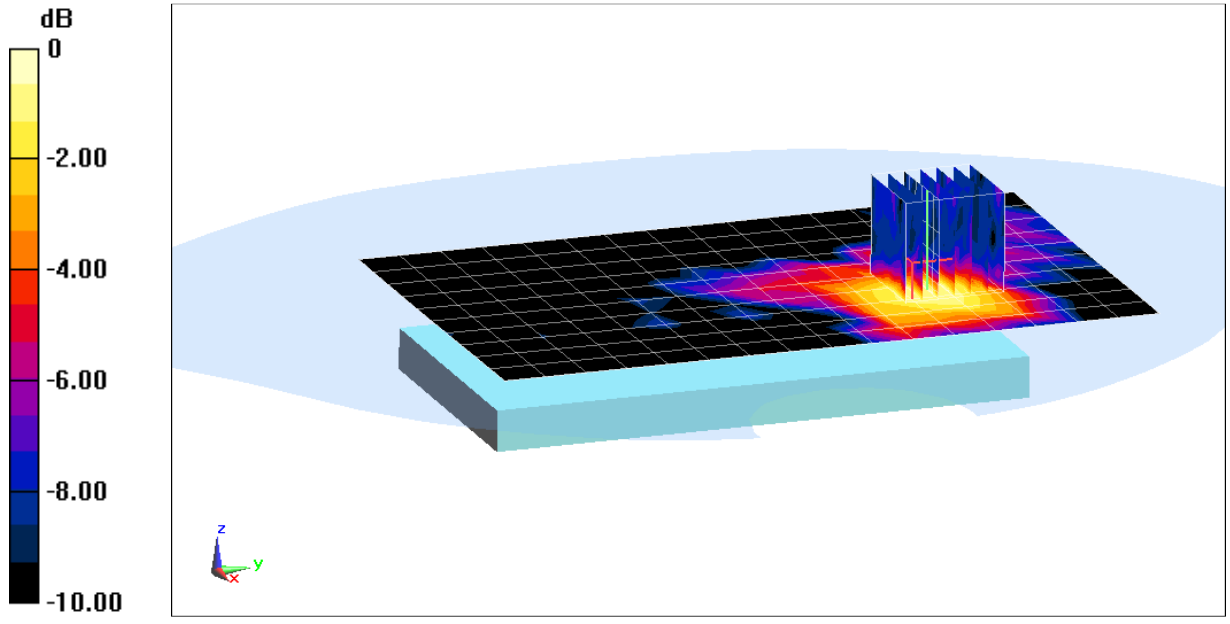
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; σ = 6.18 S/m; ε_r = 46.452; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7357; ConvF(3.82, 3.82, 3.82); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
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, Body SAR, Back Side, Ch 157, 6 Mbps, Wireless Charging Cover

Area Scan (11x17x1): 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 = 2.696 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.056 W/kg



0 dB = 0.110 W/kg = -9.59 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

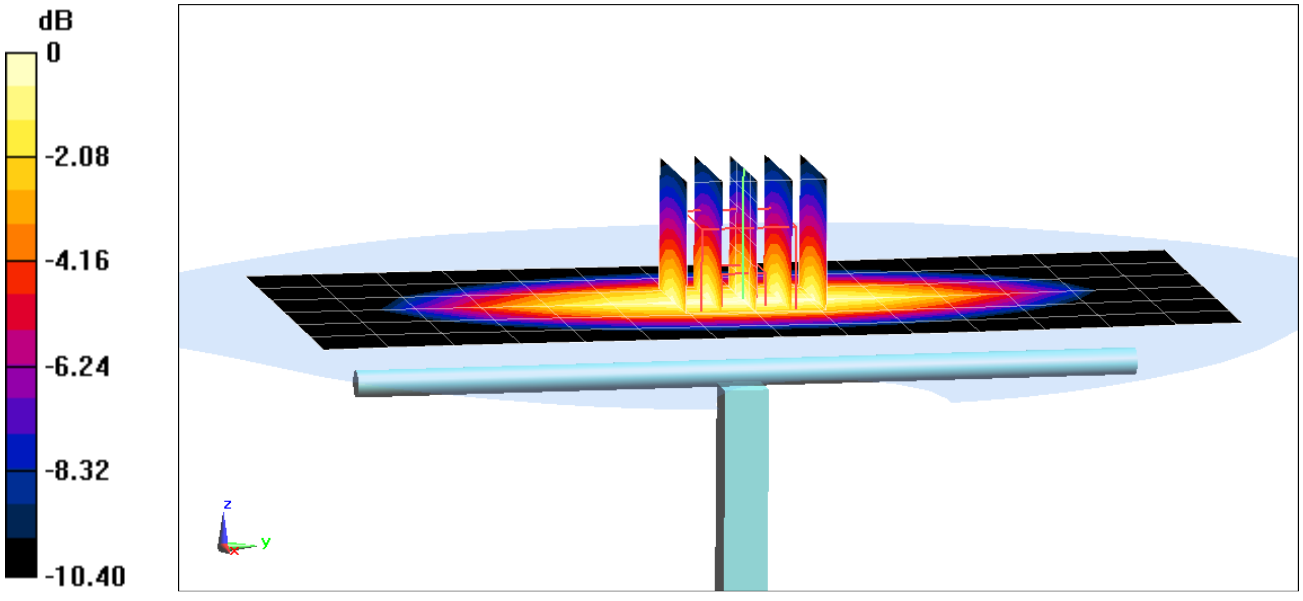
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.903 S/m; ε_r = 42.726; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
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) = 2.56 W/kg
SAR(1 g) = 1.72 W/kg
Deviation(1 g) = 3.86%



0 dB = 2.01 W/kg = 3.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

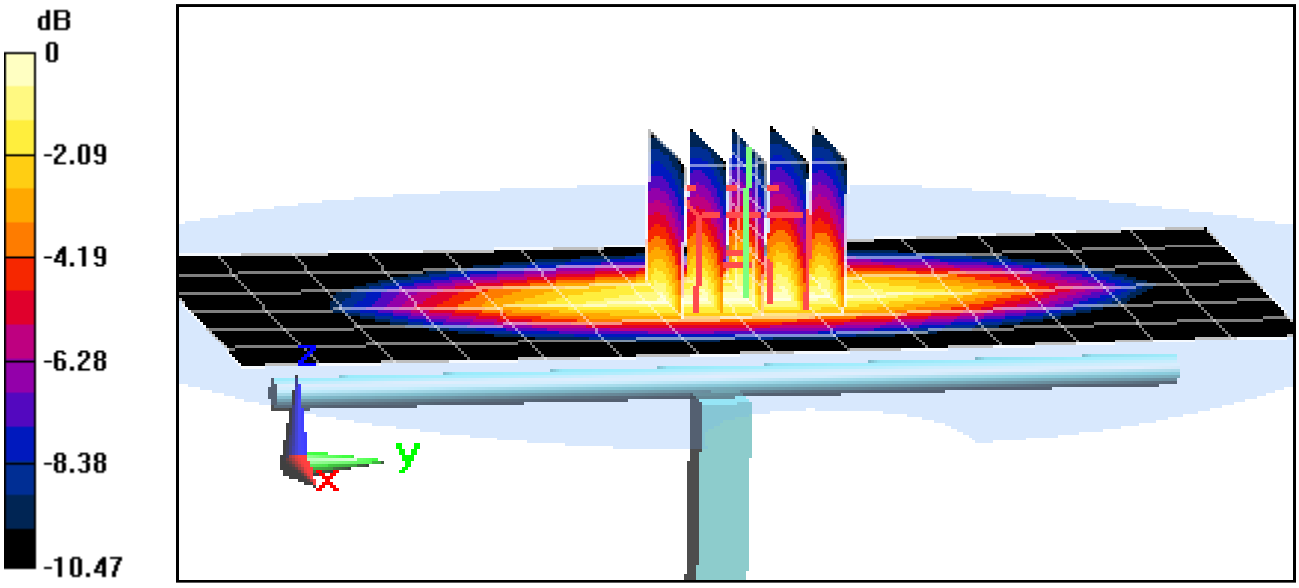
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.905 S/m; ε_r = 41.886; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-04-2016; Ambient Temp: 23.4°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3333; ConvF(6.46, 6.46, 6.46); 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)

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) = 2.47 W/kg
SAR(1 g) = 1.67 W/kg
Deviation(1 g) = 0.85%



0 dB = 1.95 W/kg = 2.90 dBW/kg

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

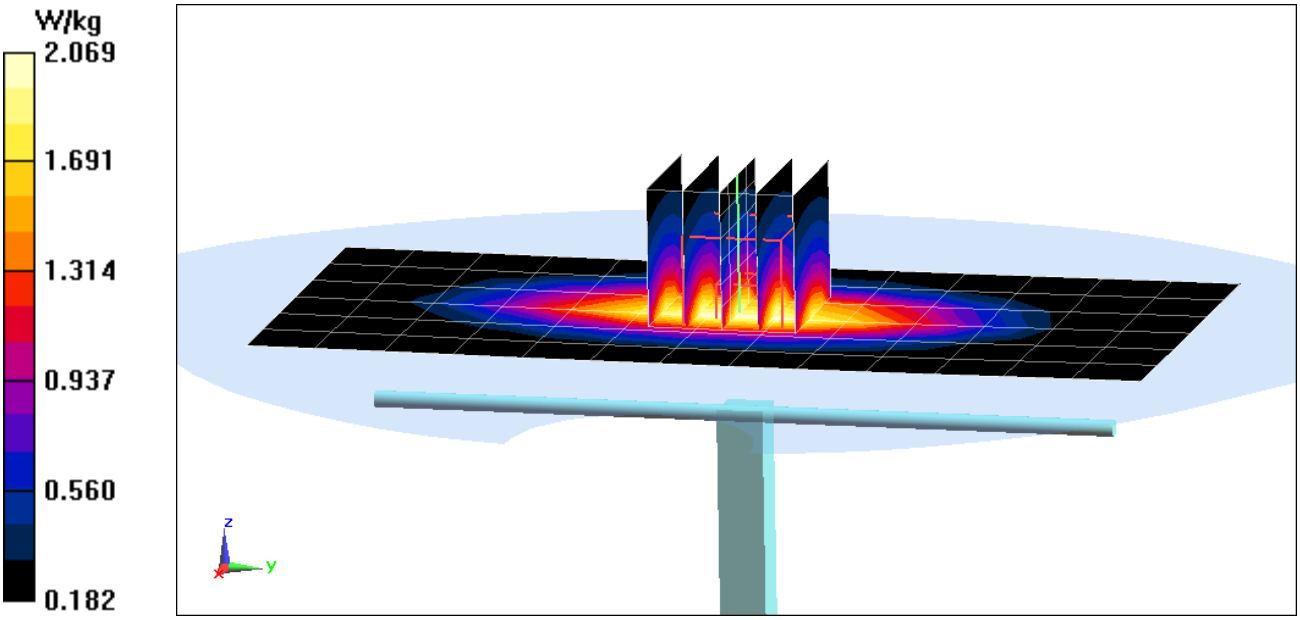
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.896 S/m; ε_r = 40.076; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); 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)

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) = 2.62 W/kg
SAR(1 g) = 1.77 W/kg
Deviation(1 g) = -5.65%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

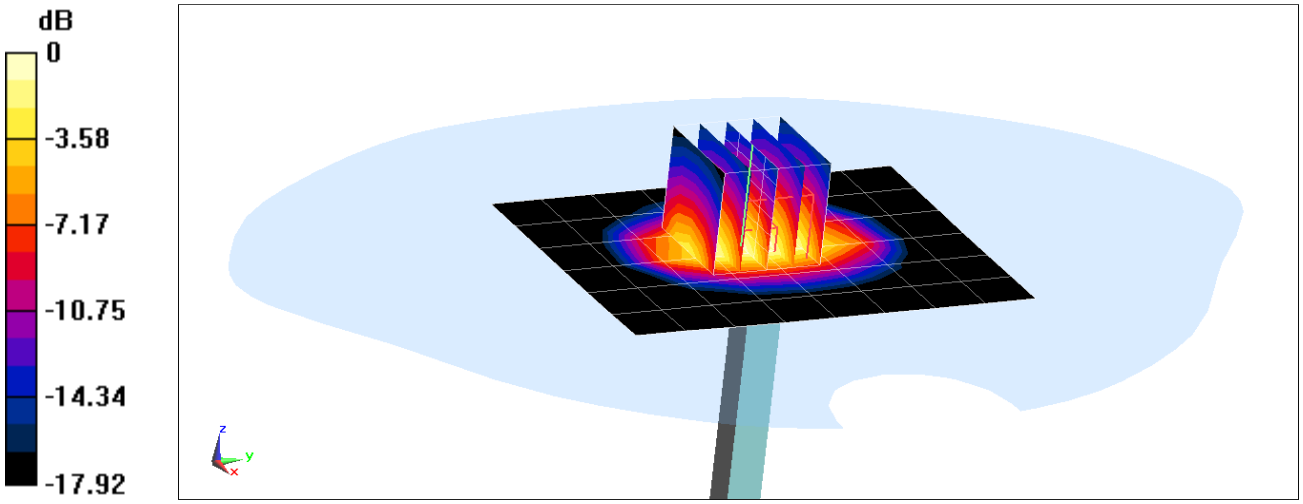
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.353 S/m; ε_r = 38.344; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-27-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3334; ConvF(5.39, 5.39, 5.39); 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)

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) = 6.89 W/kg
SAR(1 g) = 3.82 W/kg
Deviation(1 g) = 5.52%



0 dB = 4.79 W/kg = 6.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

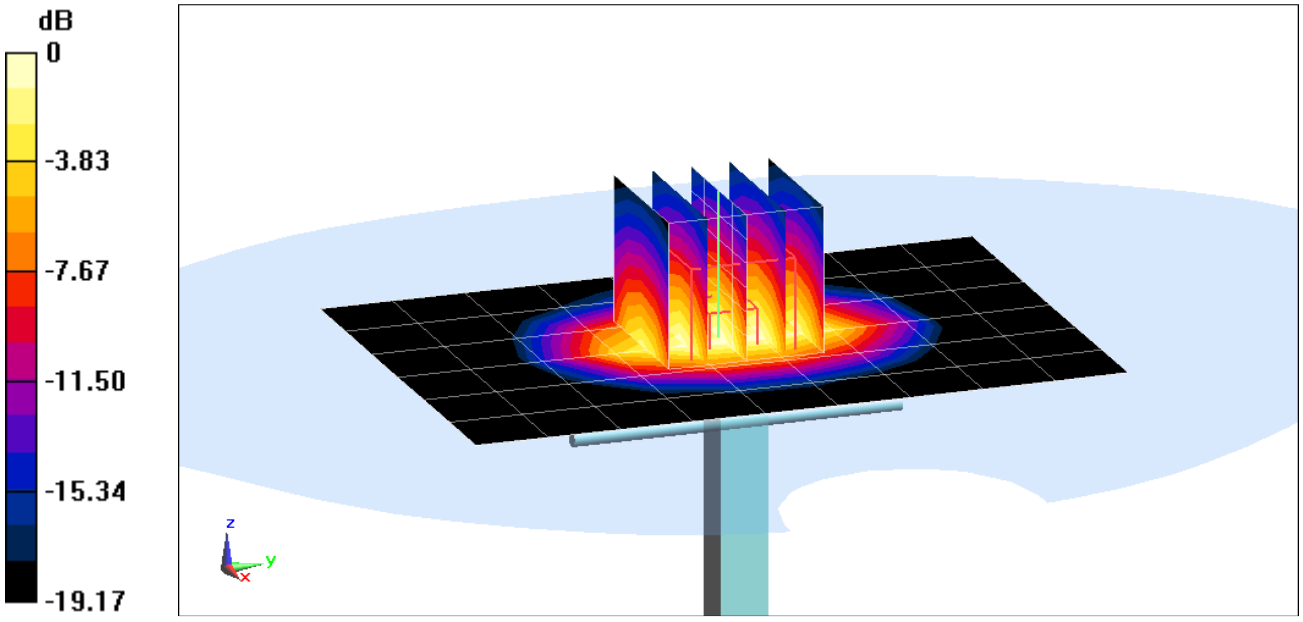
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.448 S/m; ε_r = 38.732; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 20.8°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3334; ConvF(5.18, 5.18, 5.18); 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)

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) = 8.10 W/kg
SAR(1 g) = 4.32 W/kg
Deviation(1 g) = 6.14%



0 dB = 5.50 W/kg = 7.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

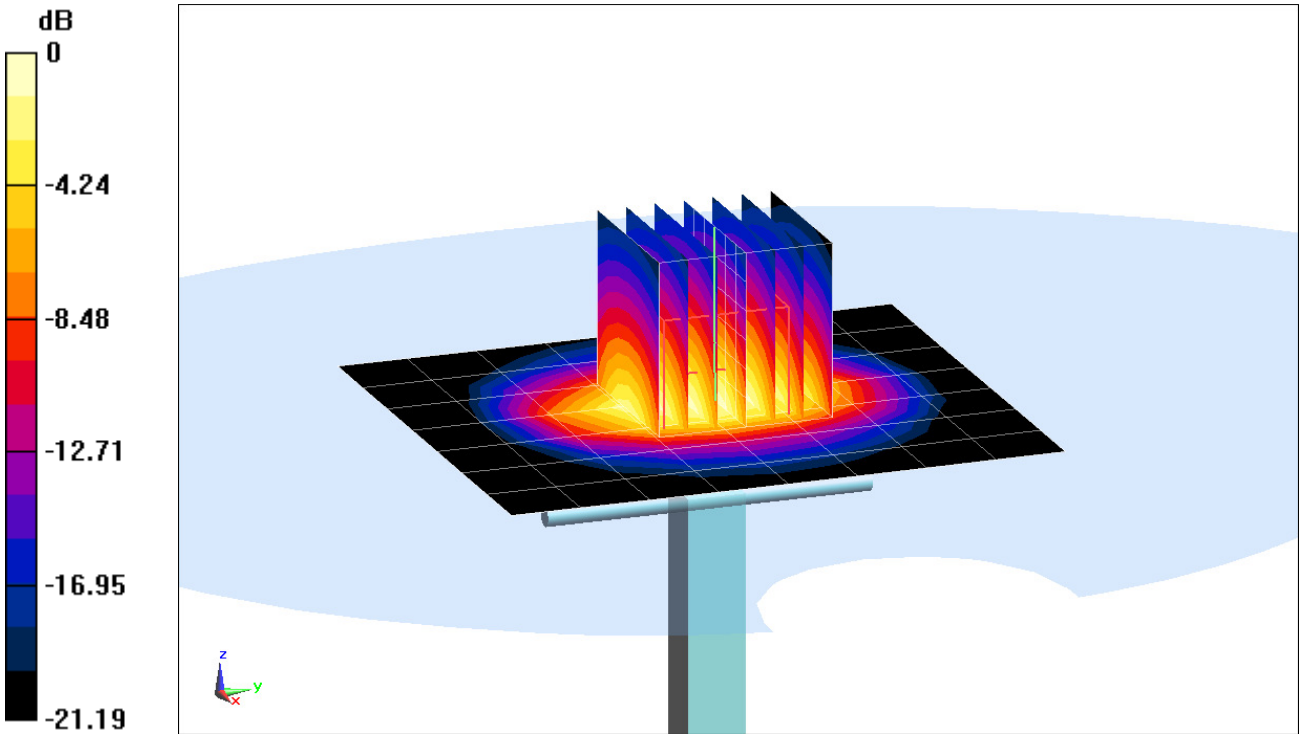
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Head Medium parameters used:
f = 2300 MHz; σ = 1.667 S/m; ε_r = 39.393; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2016; Ambient Temp: 24.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.63, 4.63, 4.63); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 9.81 W/kg
SAR(1 g) = 4.90 W/kg
Deviation(1 g) = 2.94%



0 dB = 6.40 W/kg = 8.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

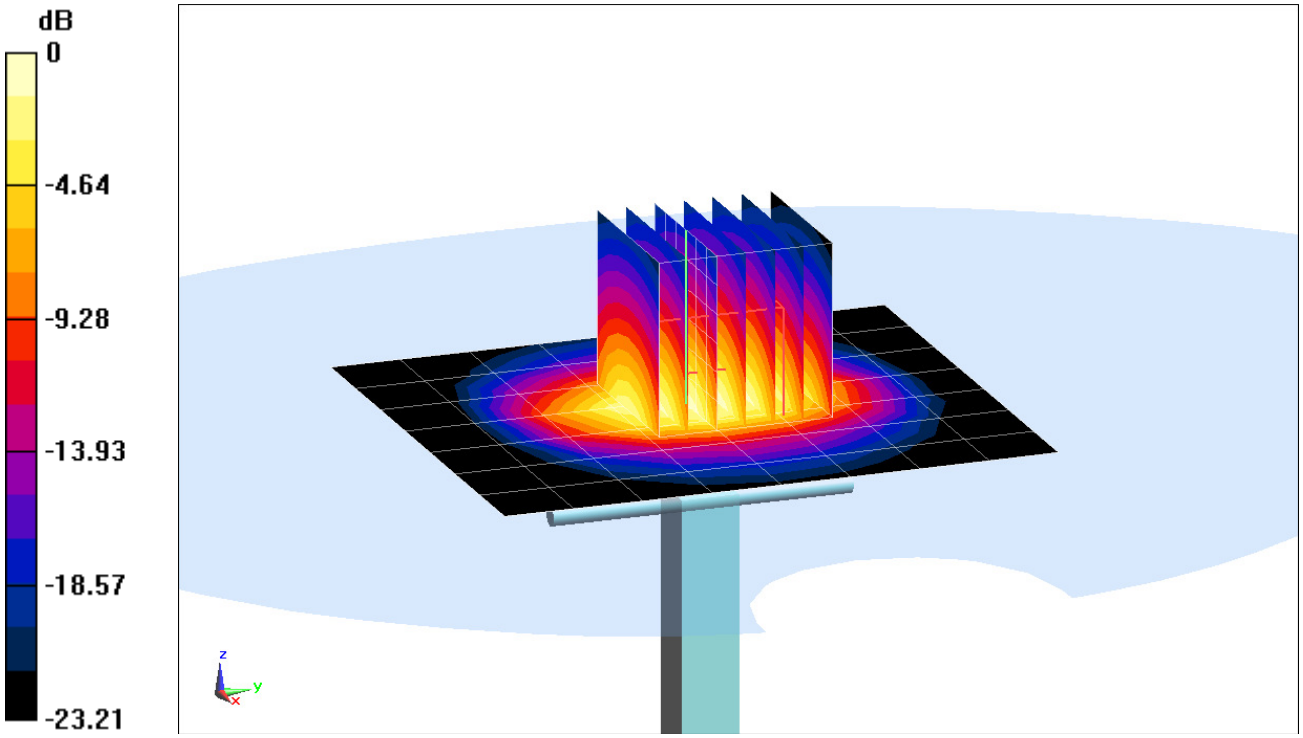
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.836 S/m; ε_r = 38.748; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2016; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.4, 4.4, 4.4); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 11.6 W/kg
SAR(1 g) = 5.60 W/kg
Deviation(1 g) = 3.32%



0 dB = 7.35 W/kg = 8.66 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

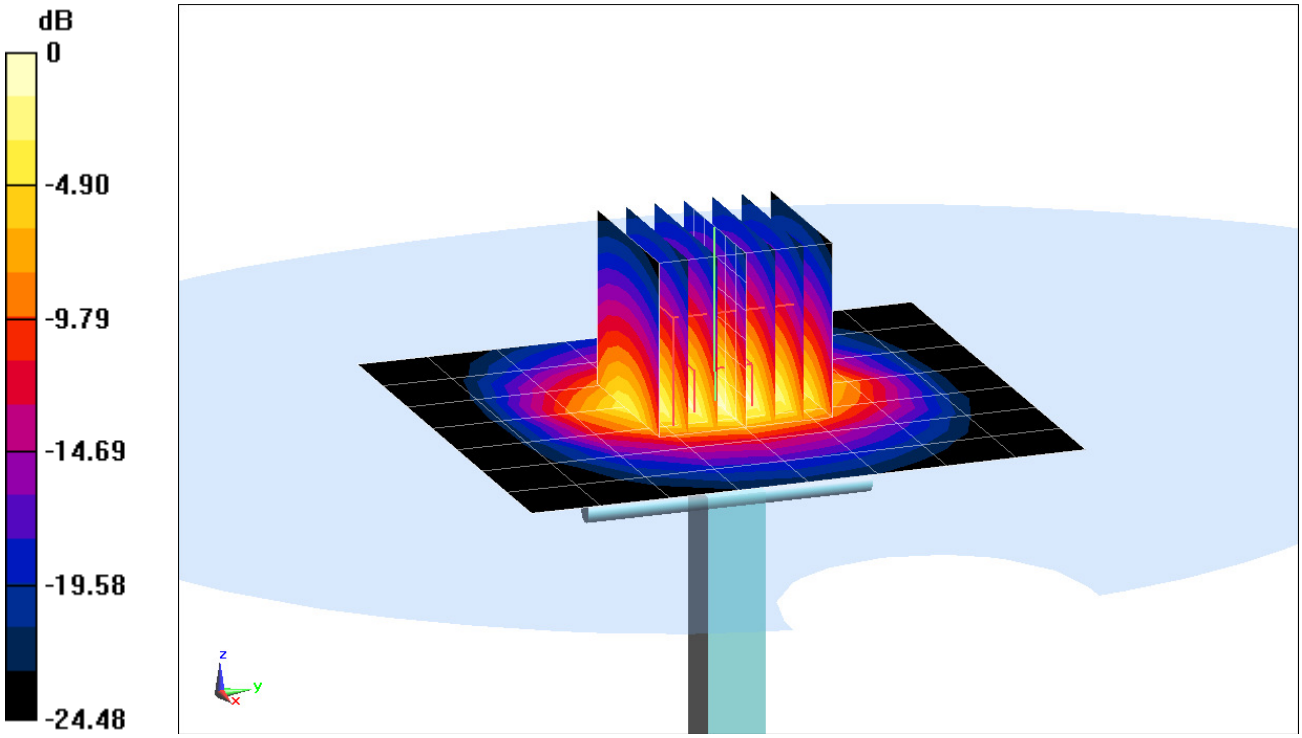
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 2.016 S/m; ε_r = 38.141; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2016; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3263; ConvF(4.25, 4.25, 4.25); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 13.2 W/kg
SAR(1 g) = 5.91 W/kg
Deviation(1 g) = 5.91%



0 dB = 7.92 W/kg = 8.99 dBW/kg

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

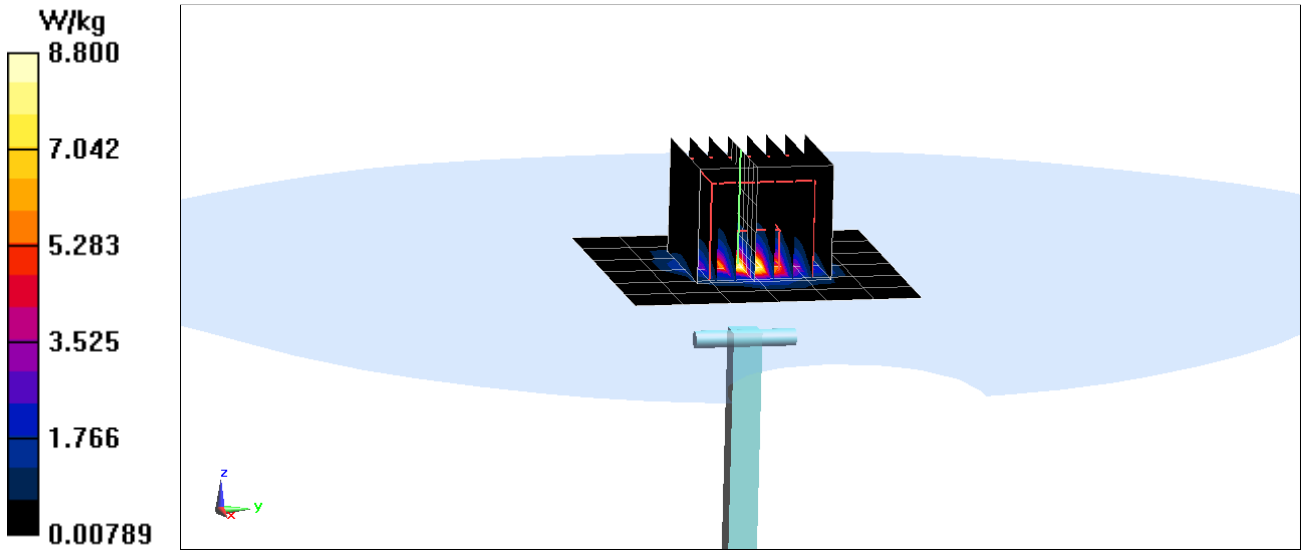
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5800 MHz; σ = 5.274 S/m; ε_r = 36.408; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2016; Ambient Temp: 23.1°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7357; ConvF(4.41, 4.41, 4.41); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5800 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) = 3.68 W/kg
Deviation(1 g) = -4.79%



PCTEST ENGINEERING LABORATORY, INC.

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

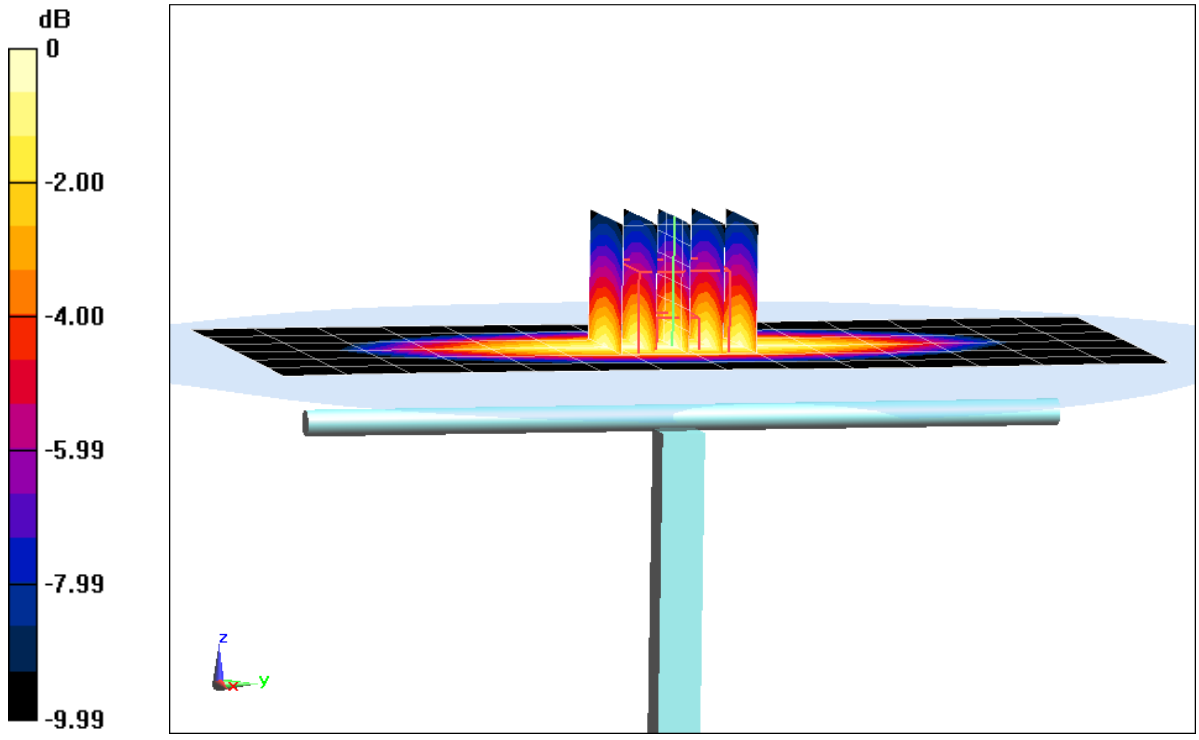
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.964 S/m; ε_r = 56.648; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
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) = 2.59 W/kg
SAR(1 g) = 1.76 W/kg
Deviation(1 g) = 3.17%



0 dB = 2.05 W/kg = 3.12 dBW/kg

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

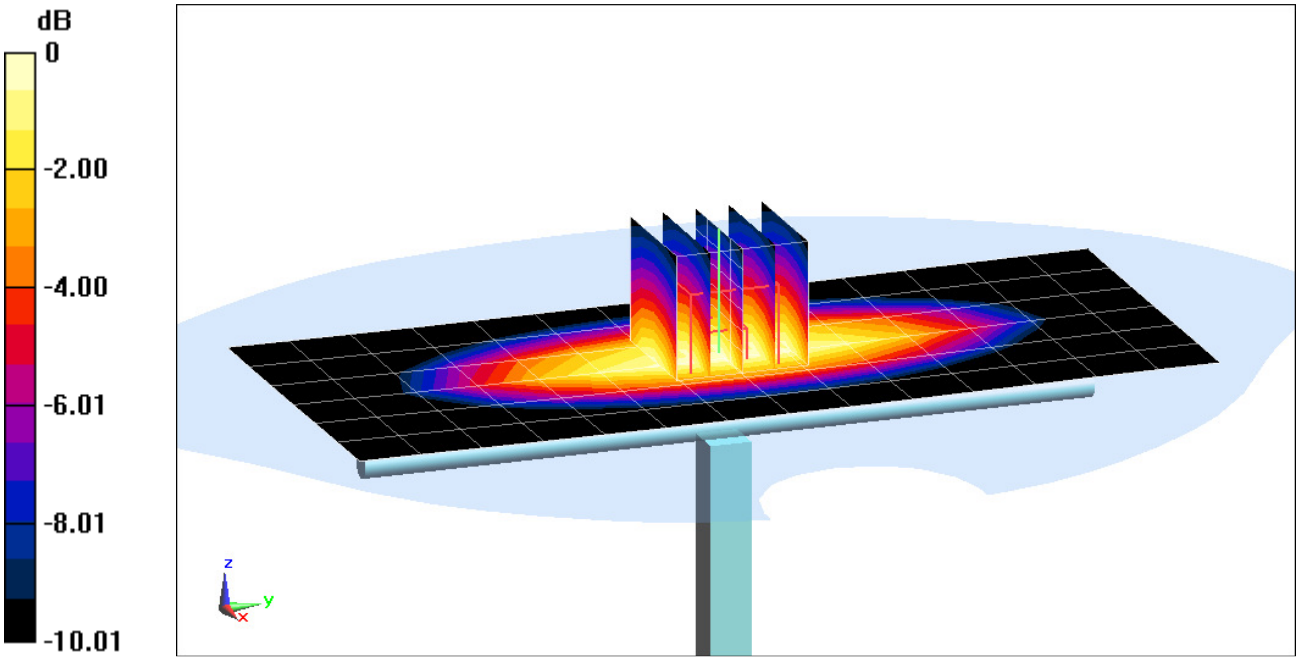
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.961 S/m; ε_r = 53.869; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-02-2016; Ambient Temp: 24.1°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3263; ConvF(6.07, 6.07, 6.07); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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)

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) = 2.53 W/kg
SAR(1 g) = 1.75 W/kg
Deviation(1 g) = 2.58%



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

PCTEST ENGINEERING LABORATORY, INC.

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

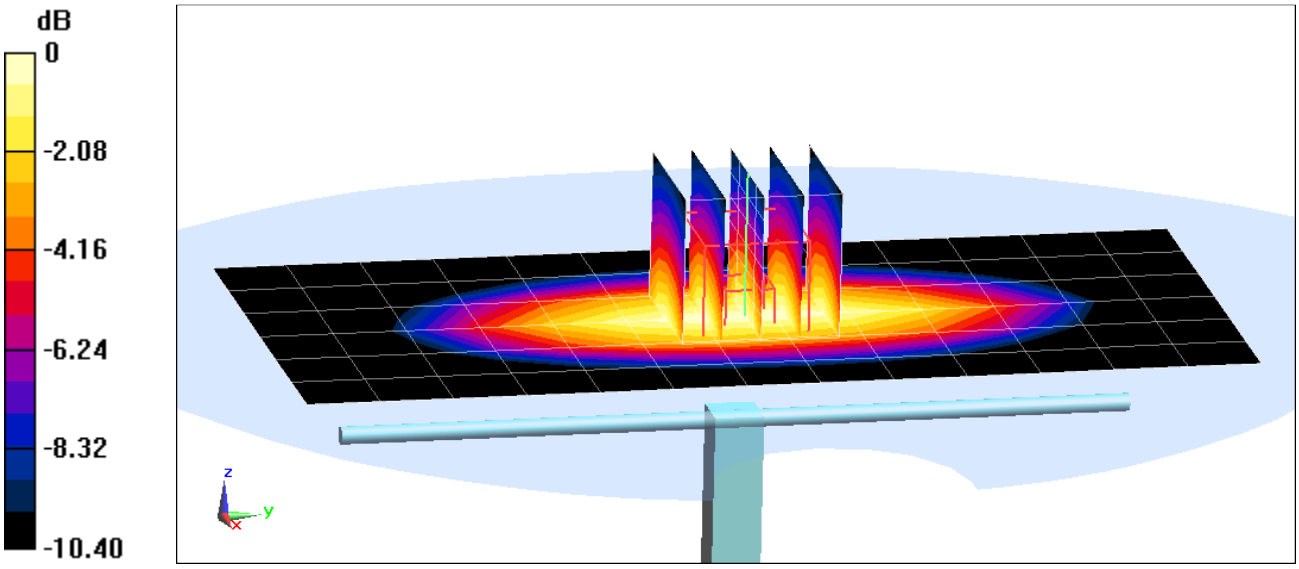
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.004 S/m; ε_r = 53.454; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3351; ConvF(6.11, 6.11, 6.11); Calibrated: 6/22/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2015
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
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) = 2.79 W/kg
SAR(1 g) = 1.91 W/kg
Deviation(1 g) = 3.80%



0 dB = 2.23 W/kg = 3.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

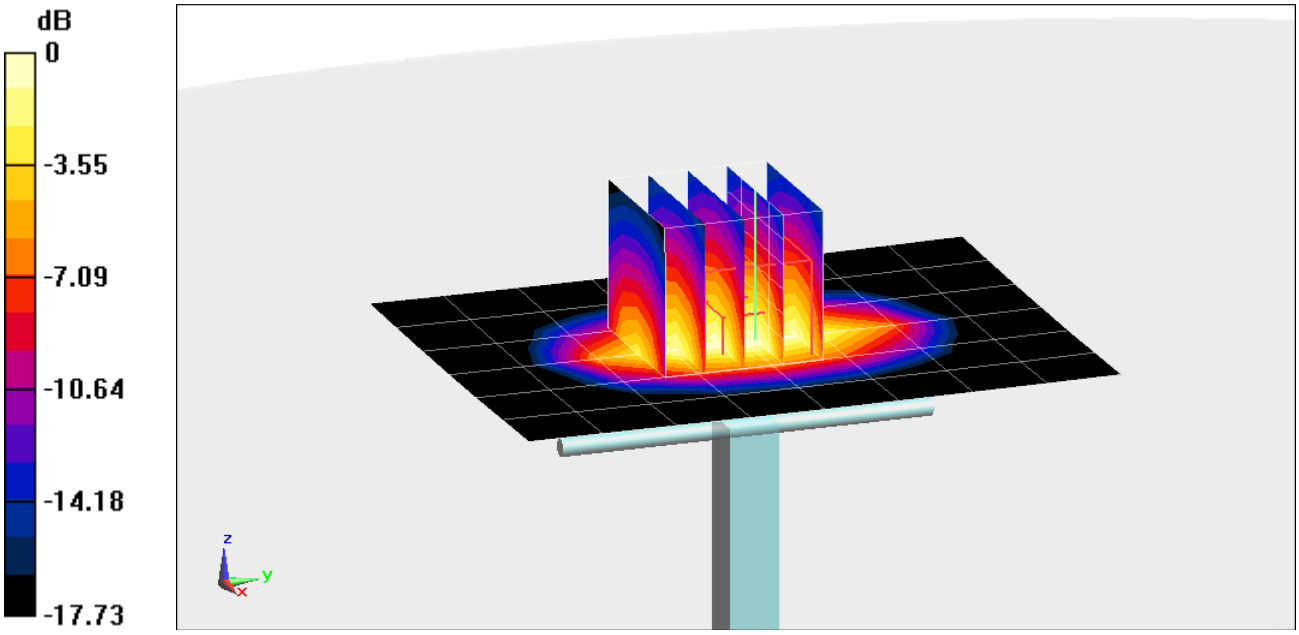
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.526 S/m; ε_r = 52.462; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-20-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(4.79, 4.79, 4.79); Calibrated: 8/26/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
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) = 6.98 W/kg
SAR(1 g) = 3.96 W/kg
Deviation(1 g) = 6.74%



0 dB = 4.92 W/kg = 6.92 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

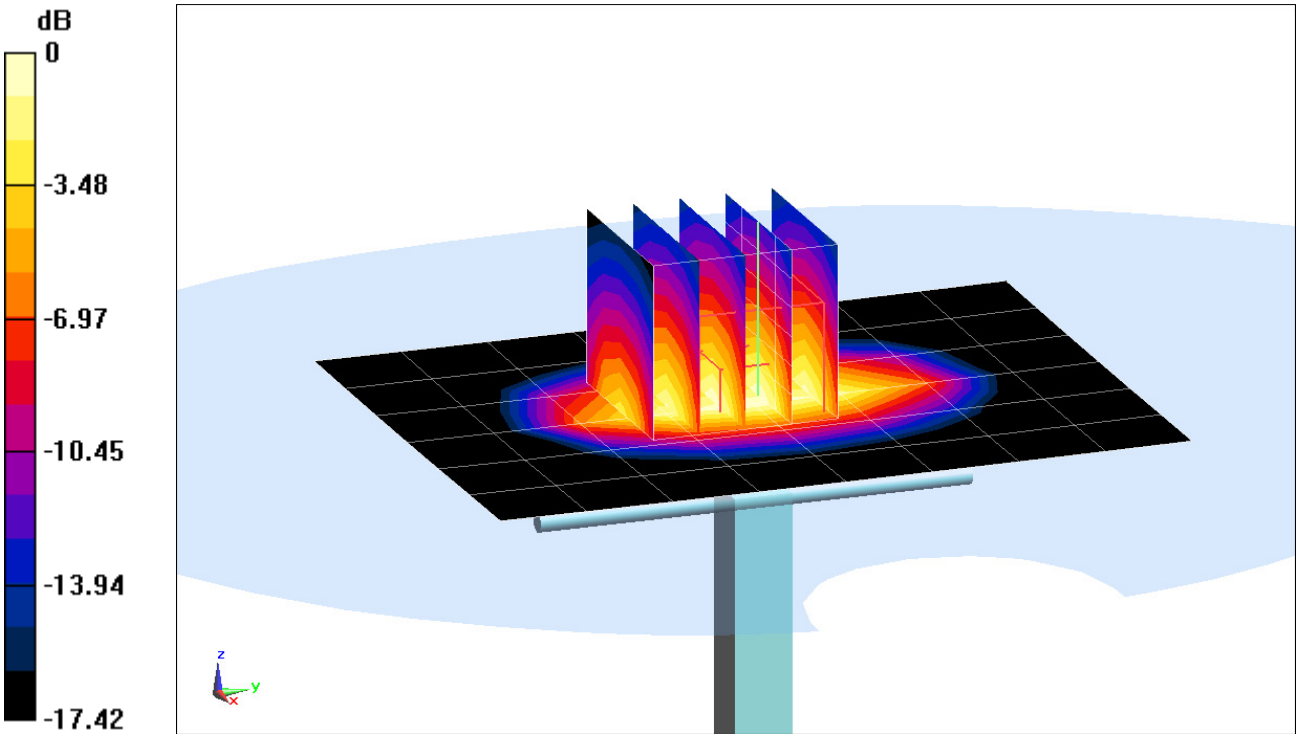
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.492 S/m; ε_r = 51.897; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-28-2016; Ambient Temp: 24.3°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.88, 4.88, 4.88); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
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)

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) = 6.83 W/kg
SAR(1 g) = 3.94 W/kg
Deviation(1 g) = 6.20%



0 dB = 4.89 W/kg = 6.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

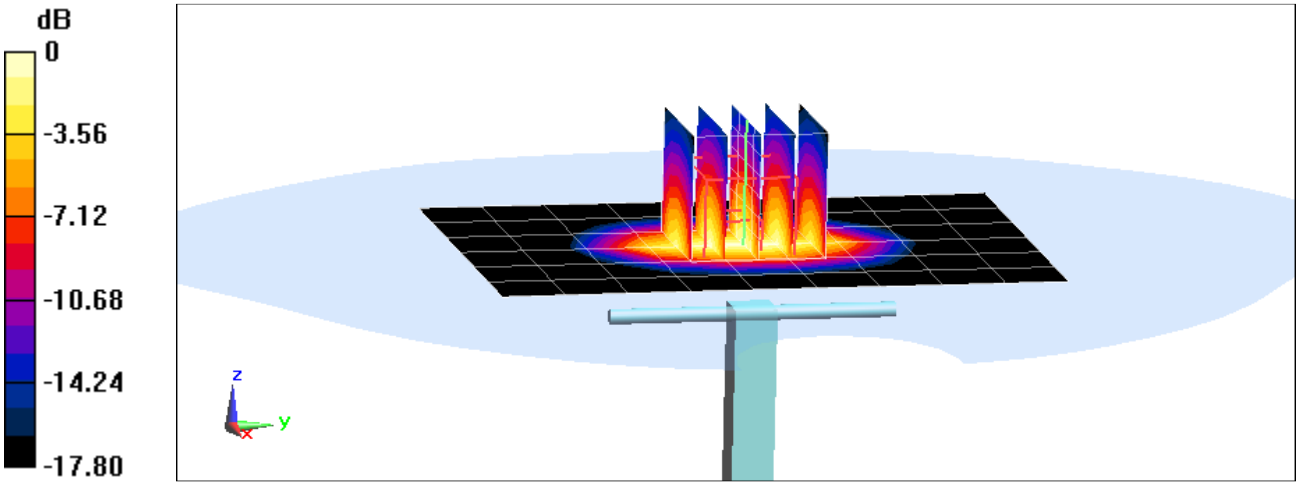
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.555 S/m; ε_r = 51.688; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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)

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) = 7.03 W/kg
SAR(1 g) = 3.96 W/kg
Deviation(1 g) = -1.98%



0 dB = 5.03 W/kg = 7.02 dBW/kg

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

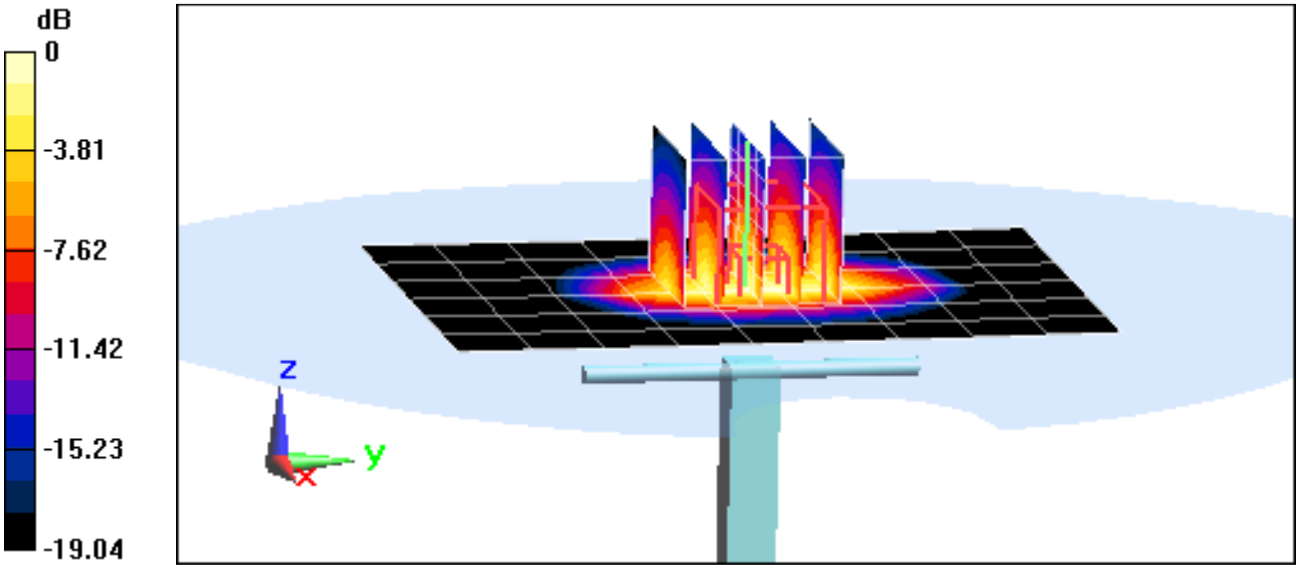
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.553 S/m; ε_r = 51.489; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2016; Ambient Temp: 21.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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) = 7.52 W/kg
SAR(1 g) = 4.07 W/kg
Deviation(1 g) = 1.75%



0 dB = 5.14 W/kg = 7.11 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

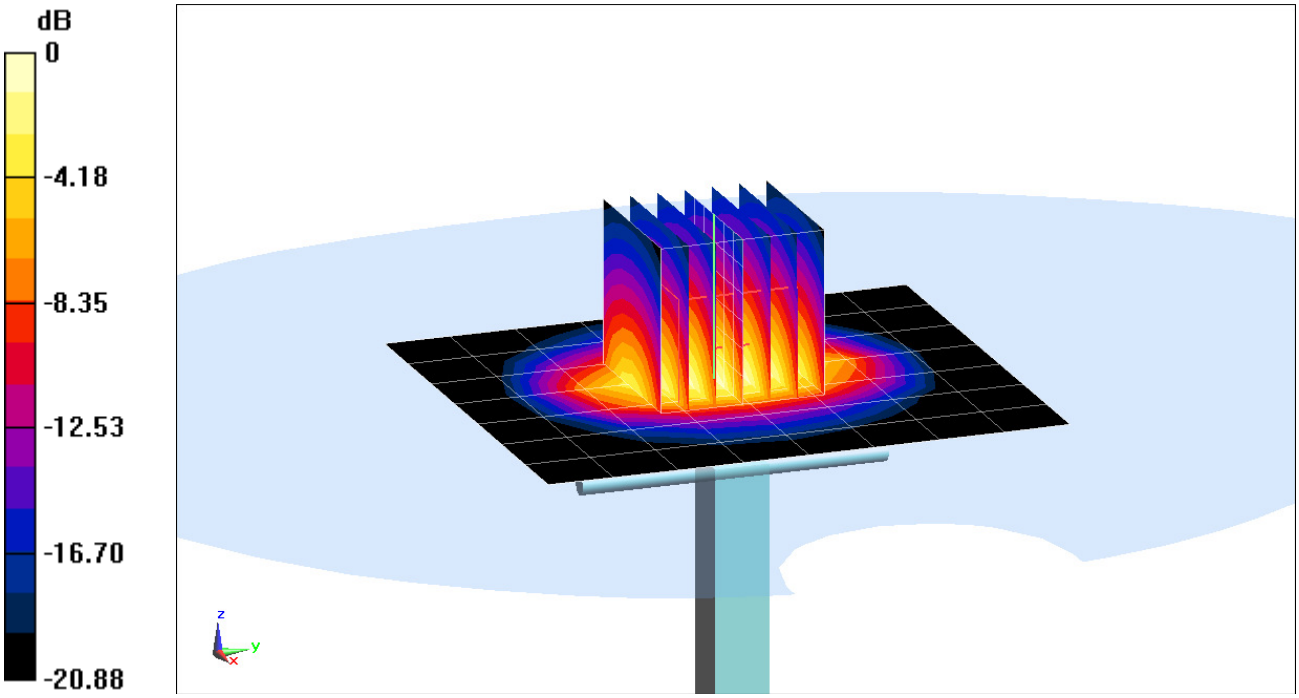
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2300 MHz; σ = 1.781 S/m; ε_r = 51.296; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3263; ConvF(4.42, 4.42, 4.42); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 9.65 W/kg
SAR(1 g) = 4.87 W/kg
Deviation(1 g) = 7.03%



0 dB = 6.36 W/kg = 8.03 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 797

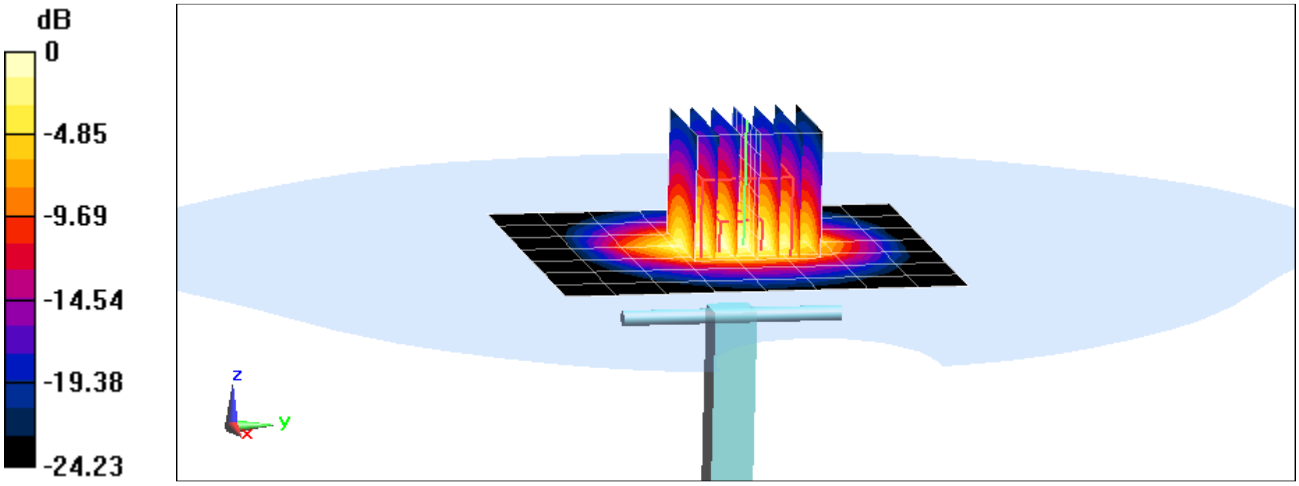
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.992 S/m; ε_r = 51.567; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2016; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
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)

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) = 11.3 W/kg
SAR(1 g) = 4.99 W/kg
Deviation(1 g) = -3.11%



0 dB = 6.65 W/kg = 8.23 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

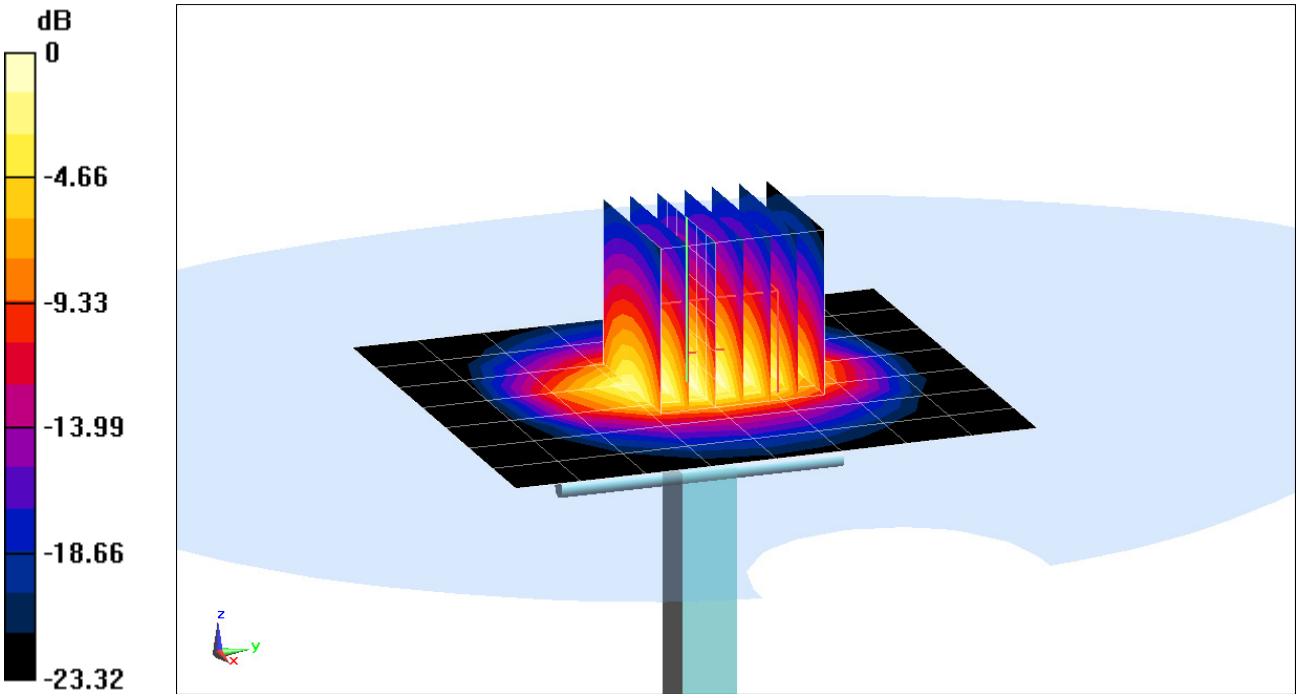
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.974 S/m; ε_r = 50.764; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3263; ConvF(4.28, 4.28, 4.28); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 11.8 W/kg
SAR(1 g) = 5.45 W/kg
Deviation(1 g) = 5.01%



0 dB = 7.18 W/kg = 8.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

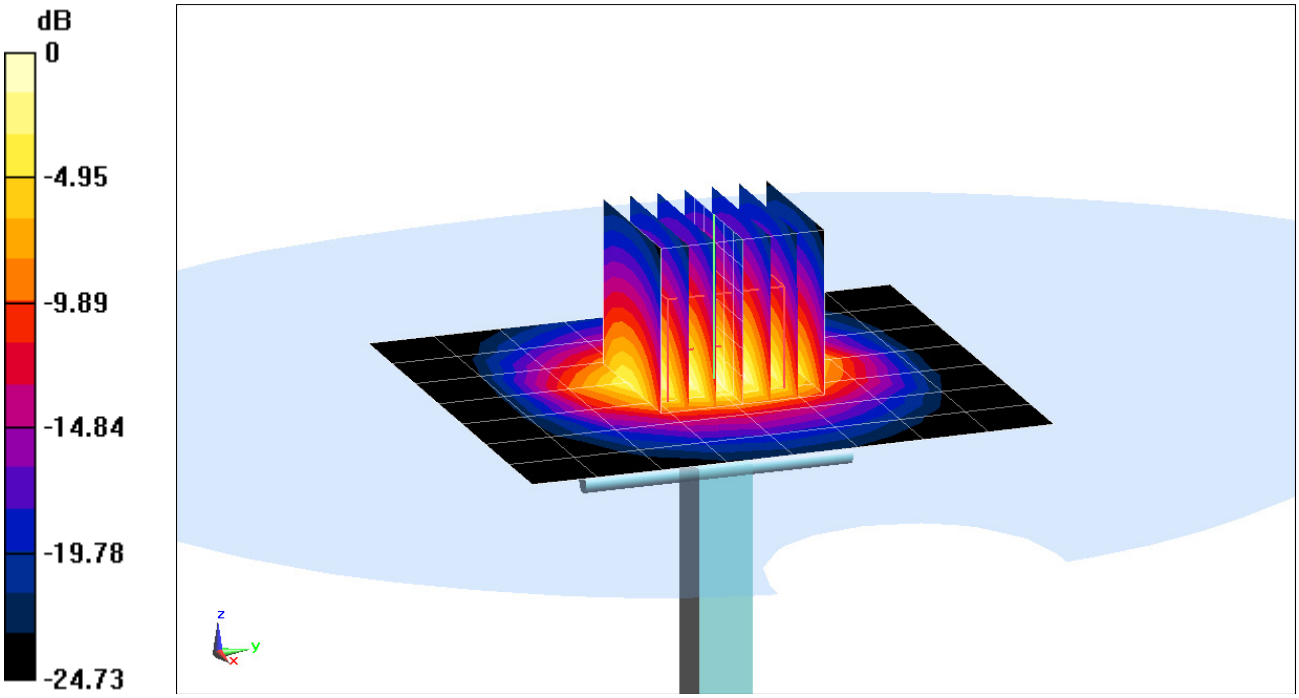
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.178 S/m; ε_r = 50.259; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3263; ConvF(4.11, 4.11, 4.11); Calibrated: 5/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 6/17/2015
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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) = 13.6 W/kg
SAR(1 g) = 5.94 W/kg
Deviation(1 g) = 5.69%



0 dB = 7.82 W/kg = 8.93 dBW/kg

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

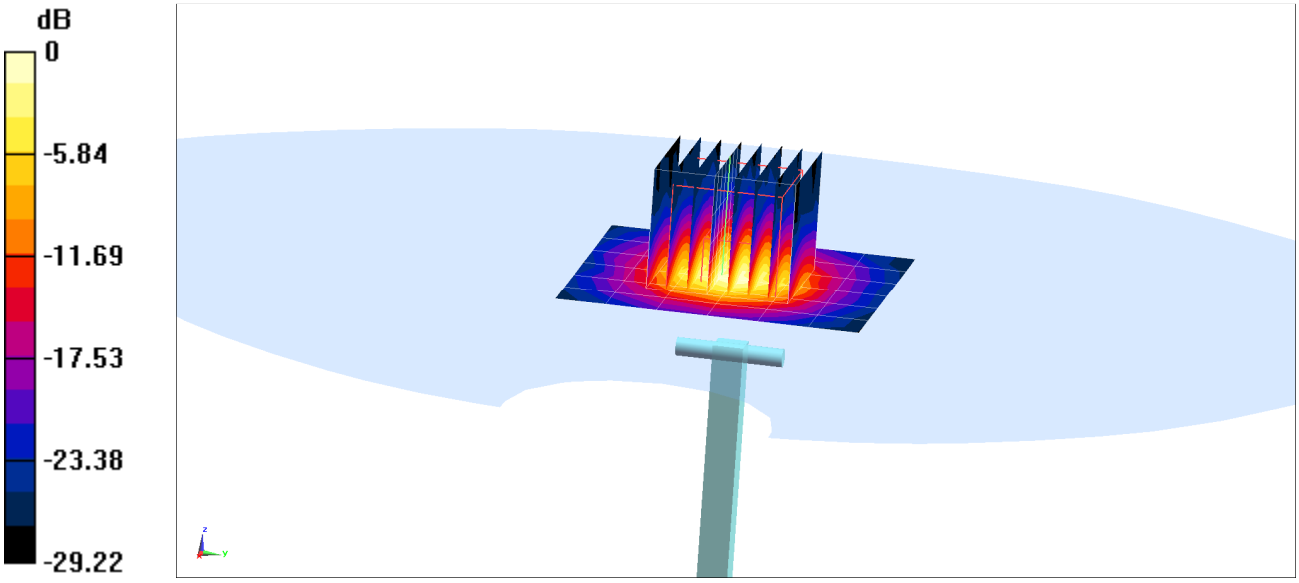
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.932 S/m; ε_r = 46.77; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7357; ConvF(3.72, 3.72, 3.72); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5600 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) = 16.5 W/kg
SAR(1 g) = 4.01 W/kg
Deviation(1 g) = 3.62%



0 dB = 9.64 W/kg = 9.84 dBW/kg

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

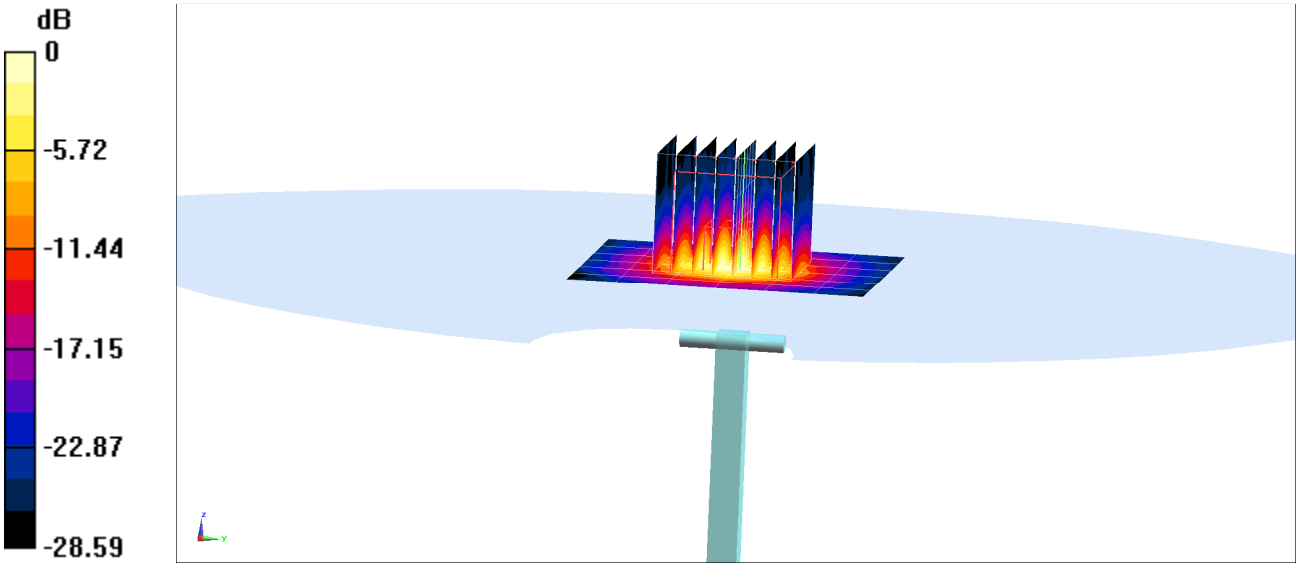
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.197 S/m; ε_r = 46.449; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7357; ConvF(3.82, 3.82, 3.82); Calibrated: 4/23/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/20/2015
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5800 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) = 16.8 W/kg
SAR(1 g) = 3.87 W/kg
Deviation(1 g) = 1.44%



0 dB = 9.32 W/kg = 9.69 dBW/kg

APPENDIX C: PROBE CALIBRATION

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

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

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

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D750V3-1054_Mar15

CALIBRATION CERTIFICATE

Object D750V3 - SN:1054

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

CC V 3/26/15

Calibration date: March 11, 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-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

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

Issued: March 11, 2015

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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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	40.8 ± 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	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.28 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.42 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	54.7 ± 6 %	0.99 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	2.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.53 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.68 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	54.8 Ω - 0.6 jΩ
Return Loss	- 26.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.8 Ω - 2.6 jΩ
Return Loss	- 30.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 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	November 08, 2011

DASY5 Validation Report for Head TSL

Date: 11.03.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

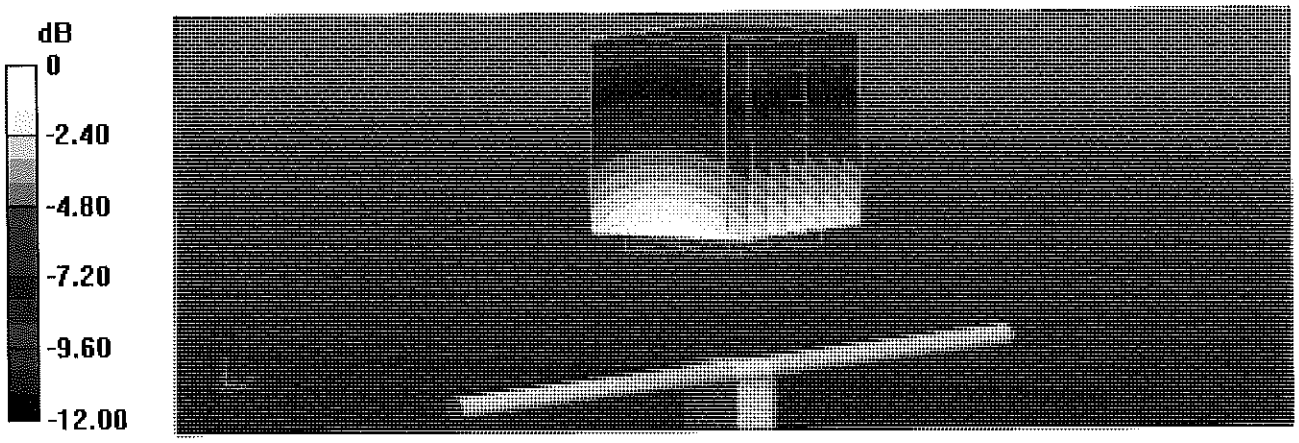
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.44, 6.44, 6.44); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

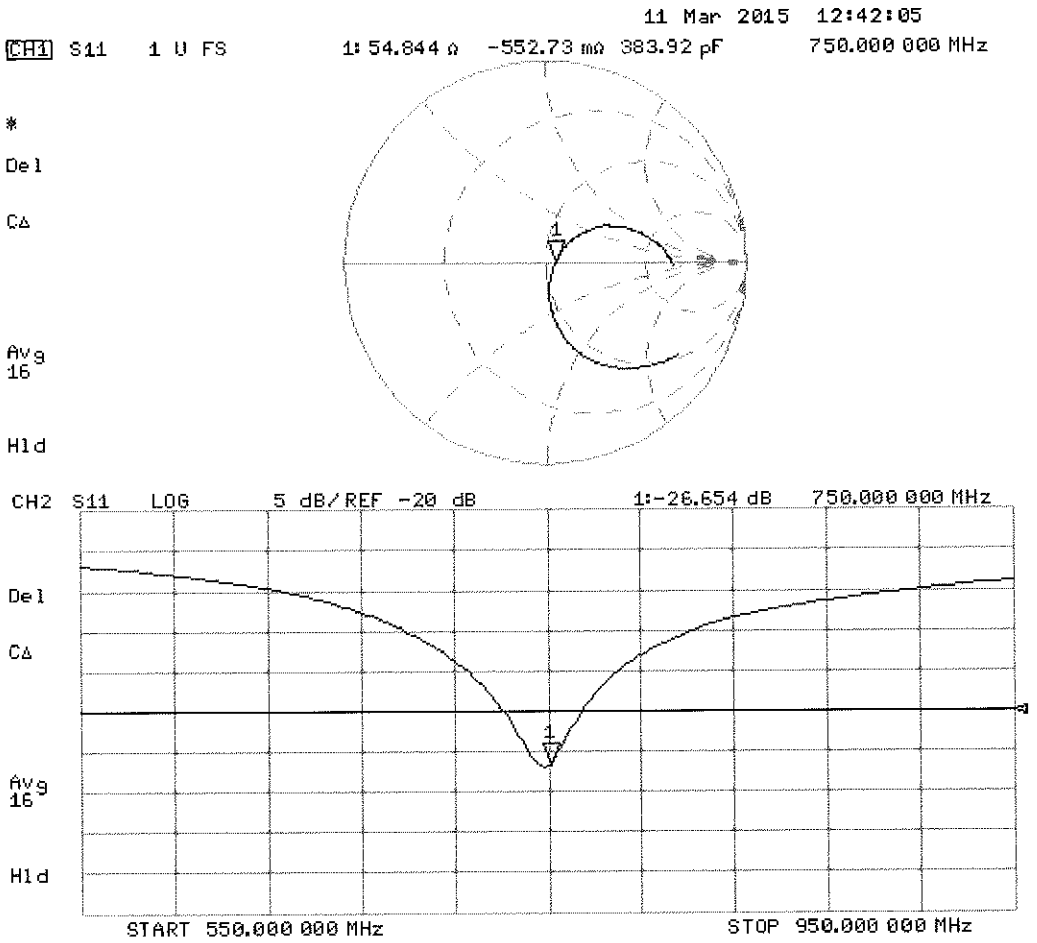
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.06 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.46 W/kg



0 dB = 2.46 W/kg = 3.91 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.03.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

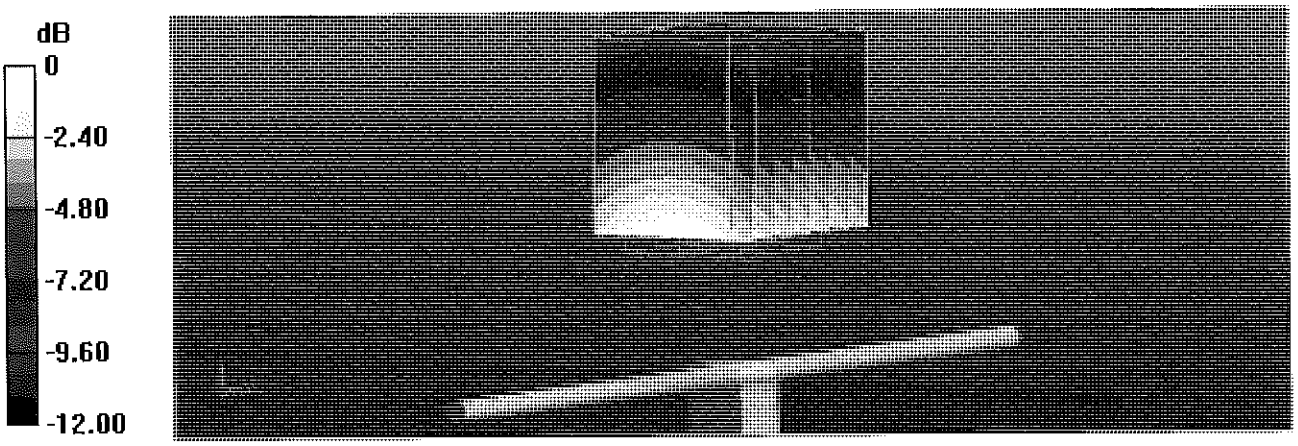
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.21, 6.21, 6.21); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

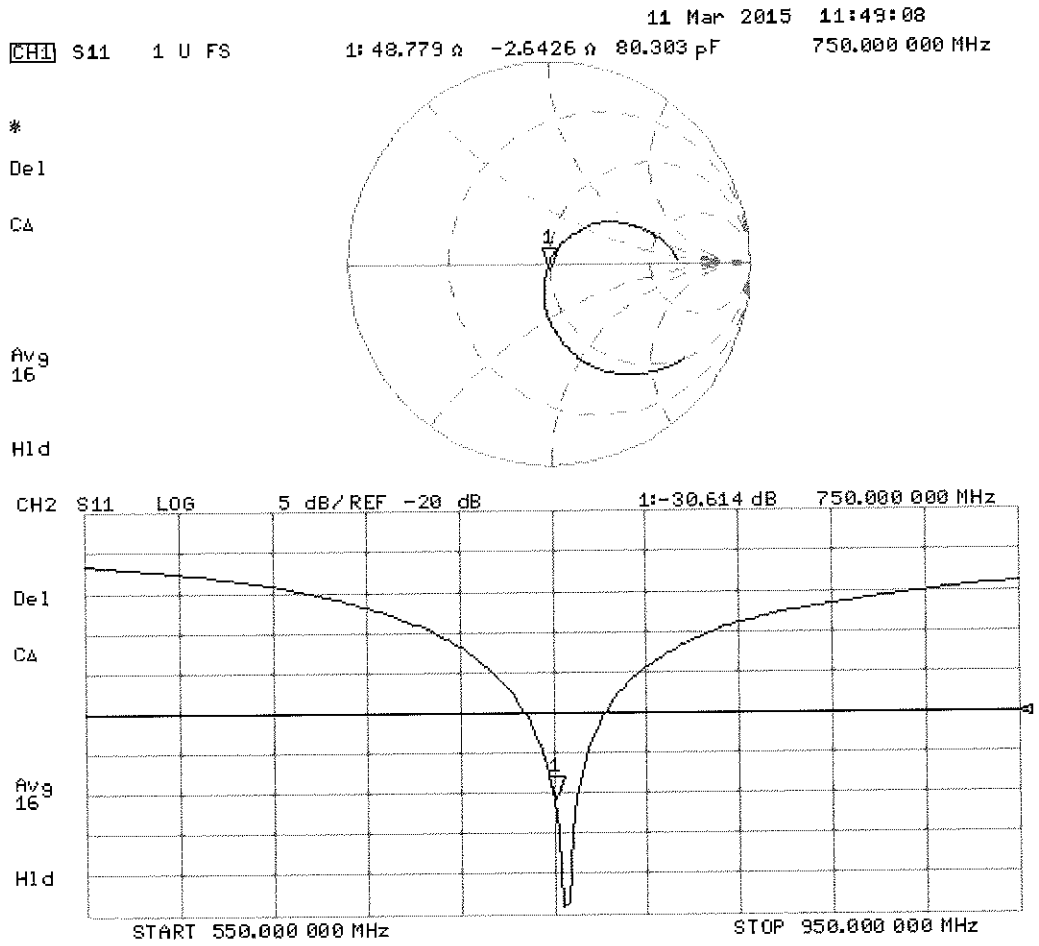
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.35 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.20 W/kg
SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.54 W/kg



0 dB = 2.54 W/kg = 4.05 dBW/kg

Impedance Measurement Plot for Body TSL



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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d119_Apr15

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d119

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

RN ✓ 4/29/15

Calibration date: April 13, 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-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
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 ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Israe Elnaouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 13, 2015

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

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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

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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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	40.9 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.38 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.11 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	55.4 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.20 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.06 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	50.2 Ω - 2.2 jΩ
Return Loss	- 33.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω - 4.9 jΩ
Return Loss	- 25.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 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

Date: 13.04.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

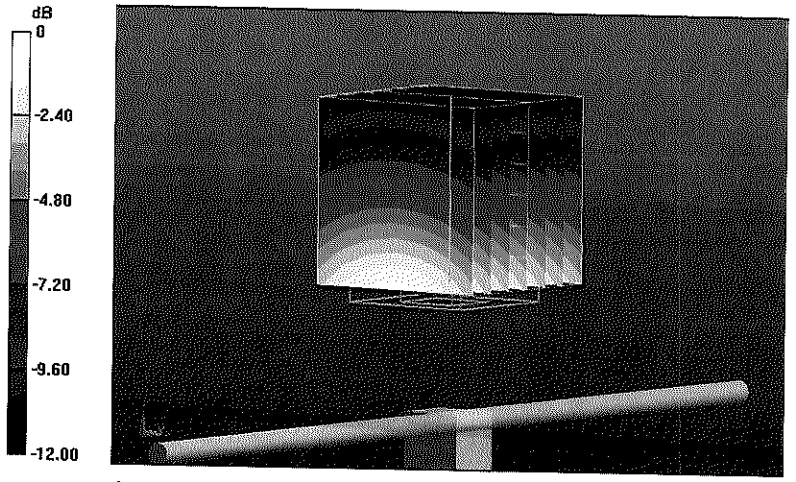
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.2, 6.2, 6.2); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

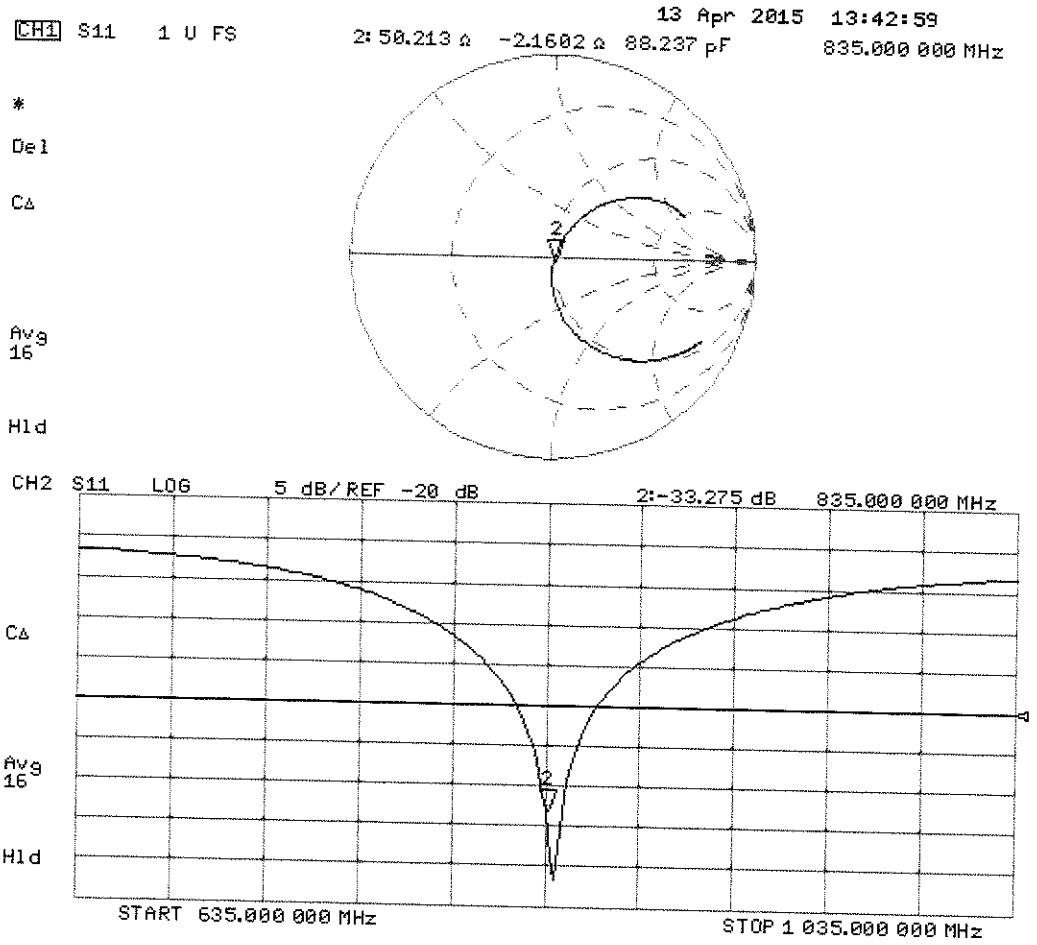
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.77 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.04.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

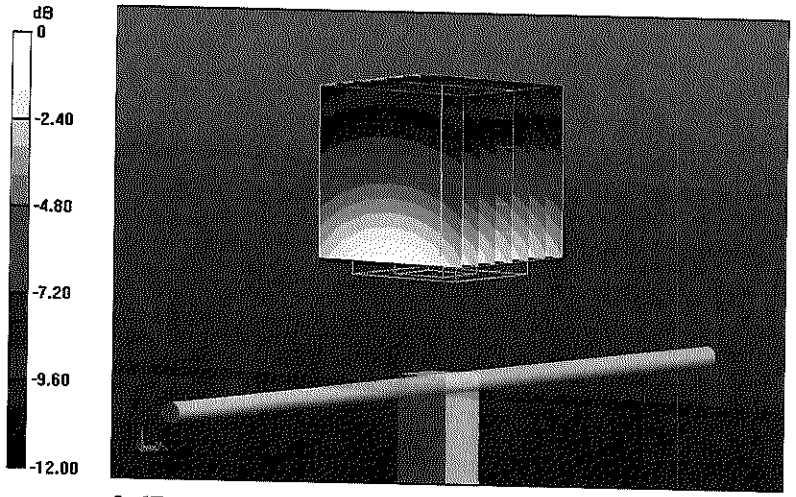
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.17, 6.17, 6.17); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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 = 54.44 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.52 W/kg
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

Impedance Measurement Plot for Body TSL