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SAR EVALUATION REPORT

Applicant Name:
Motorola Mobility LLC
8000 West Sunrise Blvd,
Plantation, FL 33322
United States

Date of Testing:
02/17/14 - 03/10/14
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1402120376.IHD

FCC ID:	**IHDT56PJ1**
APPLICANT:	**MOTOROLA MOBILITY LLC**

DUT Type:	Portable Handset
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093

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	0.56	0.91	1.55
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.38	0.70	1.60
PCE	UMTS 850	826.40 - 846.60 MHz	0.67	0.97	1.20
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.80	0.91	1.34
DTS	2.4 GHz WLAN	2412 - 2462 MHz	1.50	0.18	0.37
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r02:			1.60		

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 1.7 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

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

TABLE OF CONTENTS

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 1900	Voice/Data	1852.4 - 1907.6 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
Bluetooth	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device utilizes maximum power reduction for UMTS 1900 under portable hotspot condition for SAR compliance. When the device is radiating with hotspot mode ON, a reduced maximum power limit is enforced for UMTS 1900. Power reduction mechanism is verified through radiated SAR test. A complete description of power reduction is provided in Operational Description for FCC filing. Please see supplemental SAR report to show the confirmation of power reduction operations.

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05.

1.3.1 Maximum Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**33.5**	**33.5**	**32.5**	**29.25**	**28.0**	**28.0**	**27.0**	**24.0**	**22.5**
	Nominal	**32.5**	**32.5**	**31.5**	**27.75**	**26.5**	**26.5**	**25.5**	**22.5**	**21.0**
GSM/GPRS/EDGE 1900	Maximum	**30.5**	**30.5**	**30.0**	**26.25**	**25.0**	**27.0**	**26.0**	**22.75**	**21.5**
	Nominal	**29.5**	**29.5**	**28.5**	**24.75**	**23.5**	**25.5**	**24.5**	**21.25**	**20.0**

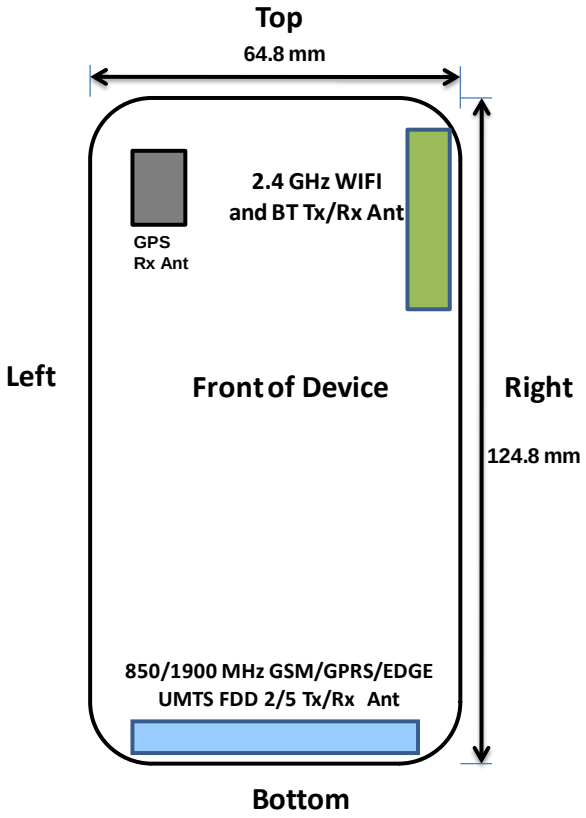
Mode / Band		Modulated Average (in dBm)		
		3GPP WCDMA Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*
UMTS Band 5 (850 MHz)	Maximum	**24.0**	**24.0**	**24.0**
	Nominal	**23.0**	**23.0**	**23.0**
UMTS Band 2 (1900 MHz)	Maximum	**24.0**	**24.0**	**24.0**
	Nominal	**23.0**	**23.0**	**23.0**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**19.5**
	Nominal	**19.0**
IEEE 802.11g (2.4 GHz) (Channel 1)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11g (2.4 GHz) (Channel 2)	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11g (2.4 GHz) (Channels 3-9)	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11g (2.4 GHz) (Channel 10)	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11g (2.4 GHz) (Channel 11)	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11n (2.4 GHz) (Channel 1)	Maximum	**9.5**
	Nominal	**9.0**
IEEE 802.11n (2.4 GHz) (Channel 2)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (2.4 GHz) (Channels 3-9)	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11n (2.4 GHz) (Channel 10)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (2.4 GHz) (Channel 11)	Maximum	**12.5**
	Nominal	**12.0**
Bluetooth	Maximum	**11.5**
Bluetooth LE	Maximum	**1.0**

1.3.2 Reduced Power – Hotspot

Mode / Band		Modulated Average (in dBm)		
		3GPP WCDMA Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*
UMTS Band 2 (1900 MHz)	Maximum	**21.0**	**21.0**	**21.0**

1.4 DUT Antenna Locations



Note: Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.

Figure 1-1
DUT Antenna Locations

Table 1-1
Mobile Hotspot Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	Yes	No

Note: Particular DUT edges were not required to be evaluated for Wireless Router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v01 guidance, page 2.

1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D05v01, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.
This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router
1	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A
2	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A
3	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes
4	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A
5	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes

When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.

1.6 SAR Test Exclusions Applied

(A) WIFI/BT

Per FCC KDB 447498 D01v05, the SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth SAR was not required; [(14/15)* √2.441] = 1.5< 3.0. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v02.

1.7 Guidance Applied

- IEEE 1528-2003
- FCC KDB Publication 941225 D01-D06 (2G/3G and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.8 Device Serial Numbers

Several samples were used with identical hardware 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.

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	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number
GSM/GPRS/EDGE 850	LETA270111	LETA270111	LETA270111
GSM/GPRS/EDGE 1900	LETA270111	LETA270111	LETA270111
UMTS 850	LETA270111	LETA270111	LETA270111
UMTS 1900	LETA270111	LETA270111	LETA270111
2.4 GHz WLAN	LETA270186	LETA270186	LETA270186

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 D01v01 and IEEE 1528-2013:

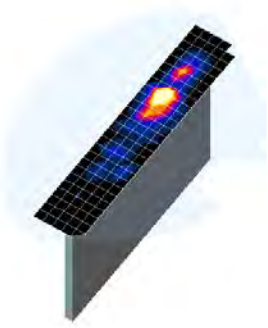

Figure 3-1
Sample SAR Area Scan

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 D01v01 (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 D01v01 (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 D01v01*

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

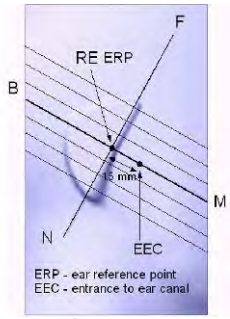

Figure 4-1
Close-Up Side view of ERP

4.2 HANDSET REFERENCE POINTS

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

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

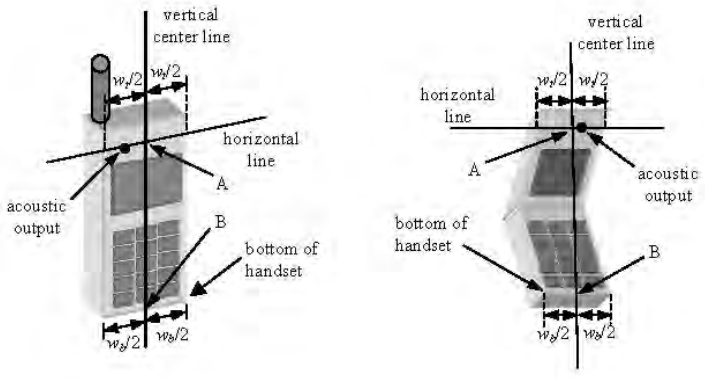

Figure 4-3
Handset Vertical Center & Horizontal Line Reference Points

5 TEST CONFIGURATION POSITIONS FOR HANDSETS

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).

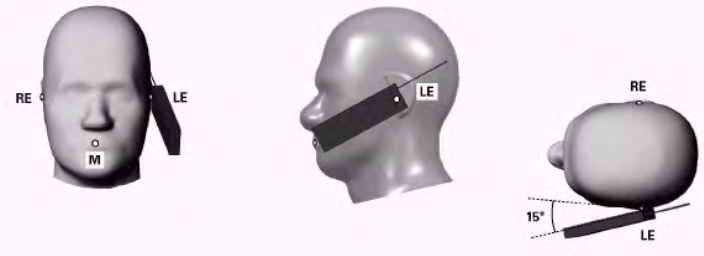

Figure 5-2 Front, Side and Top View of Ear/15º Tilt Position

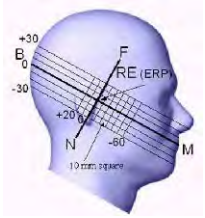

Figure 5-3
Side view w/ relevant markings

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 D04_v01. 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.

Figure 5-4 Twin SAM Chin20

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 5-5). Per FCC KDB Publication 648474 D04v01, 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 D01v05 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.

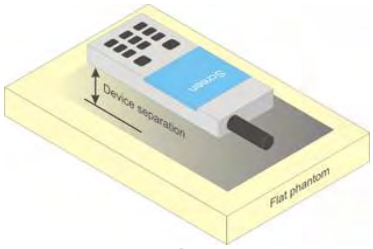

Figure 5-5
Sample Body-Worn Diagram

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 44798 D01v05 should be applied to determine SAR test requirements.

Per KDB Publication 44798 D01v05, 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 D06 v01 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 D01v05 publication procedures.

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 FCC MEASUREMENT PROCEDURES

Power measurements were performed using a base station simulator under digital average power.

7.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r02.

7.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

The device was placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test were evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device was tested throughout the SAR test at maximum output power, the SAR measurement system measures a "point SAR" at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviated by more than 5%, the SAR test and drift measurements were repeated.

7.3 SAR Measurement Conditions for UMTS

7.3.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s".

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121 (release 5), using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

7.3.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all "1s". SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a

3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

7.3.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s".

7.3.4 SAR Measurements for Handsets with Rel 5 HSDPA

Body SAR for HSDPA is not required for handsets with HSDPA capabilities when the maximum average output power of each RF channel with HSDPA active is less than 0.25 dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit. Otherwise, SAR is measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration measured in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that resulted in the highest SAR in 12.2 kbps RMC mode for that RF channel.

The H-set used in FRC for HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HSPDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the applicable H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the FRC for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 2 ms to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors of βc=9 and βd=15, and power offset parameters of ΔACK= ΔNACK =5 and ΔCQI=2 is used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

Sub-Test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

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

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{hs} = 30/15$) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{hs} = 24/15$) with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Figure 7-1
Table C.10.1.4 of TS 234.121-1

7.3.5 SAR Measurements for Handsets with Rel 6 HSUPA

Body SAR for HSUPA is not required when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 0.25 dB higher than as measured without HSUPA/HSDPA using 12.2 kbps RMC and maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise SAR is measured on the maximum output channel for the body exposure configuration produced highest SAR in 12.2 kbps RMC for that RF channel, using the additional procedures under "Release 6 HSPA data devices"

Head SAR for VOIP operations under HSPA is not required when maximum average output of each RF channel with HSPA is less than 0.25 dB higher than as measured using 12.2 kbps RMC. Otherwise SAR is measured using same HSPA configuration as used for body SAR.

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

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

7.4 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v01r02 for more details.

7.4.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

7.4.2 Frequency Channel Configurations [24]

For 2.4 GHz, the highest average RF output power channel between the low, mid and high channel at the lowest data rate was selected for SAR evaluation in 802.11b mode. 802.11g/n modes and higher data rates for 802.11b were additionally evaluated for SAR if the output power of the respective mode was 0.25 dB or higher than the powers of the SAR configurations tested in the 802.11b mode.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg and if the 1g averaged SAR was less than 0.8 W/kg, SAR testing was not required for the other test channels in the band.

8 RF CONDUCTED POWERS

8.1 GSM Conducted Powers

		Maximum Burst-Averaged Output Power								
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	32.45	31.85	**30.70**	27.12	25.76	27.20	25.45	22.38	20.87
	190	32.60	32.15	**30.95**	27.21	25.94	27.34	25.58	22.55	21.00
	251	32.69	32.29	**31.02**	27.28	26.02	27.21	25.51	22.59	21.03
GSM 1900	512	29.93	29.05	**28.25**	24.26	22.93	25.69	24.40	21.26	20.27
	661	29.72	28.85	**28.26**	23.93	22.60	25.36	24.09	20.95	19.89
	810	29.65	28.95	**28.58**	23.81	22.48	25.28	24.01	20.98	19.90

		Calculated Maximum Frame-Averaged Output Power								
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	23.42	22.82	**24.68**	22.86	22.75	18.17	19.43	18.12	17.86
	190	23.57	23.12	**24.93**	22.95	22.93	18.31	19.56	18.29	17.99
	251	23.66	23.26	**25.00**	23.02	23.01	18.18	19.49	18.33	18.02
GSM 1900	512	20.90	20.02	**22.23**	20.00	19.92	16.66	18.38	17.00	17.26
	661	20.69	19.82	**22.24**	19.67	19.59	16.33	18.07	16.69	16.88
	810	20.62	19.92	**22.56**	19.55	19.47	16.25	17.99	16.72	16.89
GSM 850	**Frame Avg.Targets:**	23.47	23.47	**25.48**	23.49	23.49	17.47	19.48	18.24	17.99
GSM 1900		20.47	20.47	**22.48**	20.49	20.49	16.47	18.48	16.99	16.99

Note: Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.

Per October 2013 TCB Workshop Notes, the source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.

GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.

EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: B
GPRS Multislot class: 12 (Max 4 Tx uplink slots)
EDGE Multislot class: 12 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A

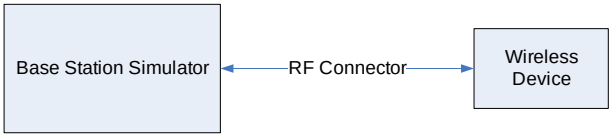

Figure 8-1
Power Measurement Setup

8.2 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.36	22.48	22.32	22.39	22.18	22.34	-
99		12.2 kbps AMR	22.38	22.40	22.15	22.38	22.06	22.17	-
6	HSDPA	Subtest 1	21.57	21.43	21.37	21.44	21.43	21.52	0
6		Subtest 2	21.60	21.54	21.33	21.46	21.39	21.53	0
6		Subtest 3	21.03	20.97	20.82	21.01	20.88	21.08	0.5
6		Subtest 4	21.00	20.91	20.90	21.03	20.87	21.03	0.5
6	HSUPA	Subtest 1	21.40	21.55	21.38	21.31	21.11	21.44	0
6		Subtest 2	20.45	20.16	19.99	20.40	20.23	20.36	2
6		Subtest 3	20.08	20.21	20.36	20.00	20.24	20.25	1
6		Subtest 4	21.02	21.10	20.27	20.84	21.69	20.86	2
6		Subtest 5	20.61	20.58	20.79	20.51	21.00	20.50	0

Note:

1. UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02.

2. HSPA SAR was required for body configuration since the body SAR was higher than 1.2 W/kg. The following steps were verified to evaluate an over the air HSPA connection according to KDB 941225 D01:

    a. A CMU200 was set according to 3GPP TS 34-141 Table C.11.1.3 for Sub-test 5.
    b. The UE was registered on the CMU200.
    c. Before establishing a HSUPA call, the UE was positioned on the SAR phantom. The antenna was positioned at a fixed distance from the UE.
    d. A HSUPA call was established between the UE and the CMU200.
    e. Power control bits of one TPC_cmd = +1 commands were sent to the UE to monitor the expected E-TFCI until the E-TFCI changed.

f. A power control bits of one TPC_cmd = -1 command was sent to the UE. The E-TFCI was monitored until there was a decrease in E-TFCI until equal to the target E-TFCI in Sub-test 5 in 3GPP TS 31.121 Table C.11.1.3.
g. After the E-TFCI was confirmed, SAR testing is performed while keeping the UE and the Base Station simulator antenna stationary.
h. For the duration of the SAR test, the E-TFCI sent by the UE and AG index were monitored closely to ensure E-TFCI did not decrease and that the rate of E-TFCI sent and AG index was stable for the duration of the SAR test.

3. This device does not support DC-HSDPA.

4. There is no power reduction for UMTS Band 5.

Figure 8-2
Power Measurement Setup

8.3 WLAN Conducted Powers

Table 8-1
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	18.65	18.75	18.77	18.59
802.11b	2437	6*	**19.00**	19.05	19.24	19.22
802.11b	2462	11*	18.77	18.90	19.01	18.95

Table 8-2
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	10.20	10.22	10.25	10.24	9.45	9.22	9.15	8.20
802.11g	2417	2	13.41	13.44	13.42	13.44	12.40	12.30	12.35	11.31
802.11g	2437	6	16.45	16.44	16.44	16.45	14.52	14.57	14.55	13.52
802.11g	2457	10	14.08	14.06	14.03	14.01	12.95	12.97	12.95	11.90
802.11g	2462	11	12.26	12.34	12.30	12.25	11.35	11.22	11.27	10.12

Table 8-3
IEEE 802.11n Average RF Power – LGI

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	9.30	8.37	8.35	8.36	7.35	7.32	6.25	5.30
802.11n	2417	2	12.43	11.42	11.46	11.45	10.30	10.32	9.25	8.25
802.11n	2437	6	15.60	14.65	14.66	14.61	13.65	13.70	12.60	11.65
802.11n	2457	10	13.03	12.00	12.02	11.93	10.90	10.87	9.80	8.82
802.11n	2462	11	12.30	11.40	11.35	11.36	10.25	10.25	9.25	8.20

Table 8-4
IEEE 802.11n Average RF Power – SGI

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm] SG							
			Data Rate [Mbps]							
			7.2	14.4	21.7	28.90	43.30	57.80	65.0	72.20
802.11n	2412	1	9.34	8.40	8.35	8.42	7.37	7.38	6.42	5.30
802.11n	2417	2	12.47	11.44	11.42	11.36	10.31	10.25	9.28	8.20
802.11n	2437	6	15.68	14.75	14.72	14.70	13.65	13.65	12.62	11.55
802.11n	2417	10	13.49	12.48	12.42	12.45	11.38	11.44	10.30	9.31
802.11n	2462	11	12.38	11.45	11.35	11.38	10.26	10.23	9.28	8.22

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- According to KDB 248227 D01 Page 4, “802.11g/n modes are tested on channels 1,6,11; however, if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channels closest to each of these channels must be tested instead." Therefore, channels 2 and 10 were additionally considered.
- The bolded data rate and channel above were tested for SAR.

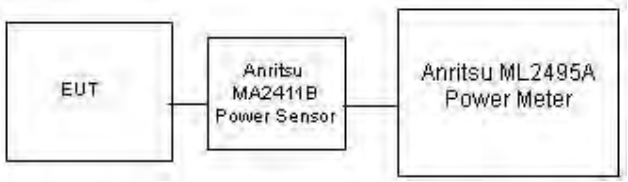

Figure 8-3
Power Measurement Setup

9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	%dev σ	%dev ε
02/19/2014	835H	23.8	820	0.925	43.018	0.899	41.578	2.89%	3.46%
			835	0.939	42.810	0.900	41.500	4.33%	3.16%
			850	0.954	42.634	0.916	41.500	4.15%	2.73%
03/06/2014	835H	23.1	820	0.877	40.052	0.899	41.578	-2.45%	-3.67%
			835	0.892	39.863	0.900	41.500	-0.89%	-3.94%
			850	0.905	39.692	0.916	41.500	-1.20%	-4.36%
02/17/2014	1900H	22.8	1850	1.345	39.455	1.400	40.000	-3.93%	-1.36%
			1880	1.378	39.328	1.400	40.000	-1.57%	-1.68%
			1910	1.408	39.204	1.400	40.000	0.57%	-1.99%
03/05/2014	1900H	23.1	1850	1.400	41.251	1.400	40.000	0.00%	3.13%
			1880	1.433	41.107	1.400	40.000	2.36%	2.77%
			1910	1.467	40.987	1.400	40.000	4.79%	2.47%
02/27/2014	2450H	22.2	2401	1.728	38.196	1.756	39.287	-1.59%	-2.78%
			2450	1.785	38.027	1.800	39.200	-0.83%	-2.99%
			2499	1.834	37.882	1.853	39.138	-1.03%	-3.21%
03/10/2014	2450H	22.1	2401	1.764	38.293	1.756	39.287	0.46%	-2.53%
			2450	1.819	38.117	1.800	39.200	1.06%	-2.76%
			2499	1.869	37.941	1.853	39.138	0.86%	-3.06%
02/17/2014	835B	22.4	820	0.992	54.953	0.969	55.258	2.37%	-0.55%
			835	1.006	54.810	0.970	55.200	3.71%	-0.71%
			850	1.021	54.662	0.988	55.154	3.34%	-0.89%
03/10/2014	835B	22.4	820	0.993	53.697	0.969	55.258	2.48%	-2.82%
			835	1.007	53.551	0.970	55.200	3.81%	-2.99%
			850	1.023	53.373	0.988	55.154	3.54%	-3.23%
02/21/2014	1900B	24.3	1850	1.489	52.167	1.520	53.300	-2.04%	-2.13%
			1880	1.523	52.072	1.520	53.300	0.20%	-2.30%
			1910	1.558	51.953	1.520	53.300	2.50%	-2.53%
03/03/2014	1900B	22.7	1850	1.464	51.883	1.520	53.300	-3.68%	-2.66%
			1880	1.497	51.786	1.520	53.300	-1.51%	-2.84%
			1910	1.532	51.670	1.520	53.300	0.79%	-3.06%
03/10/2014	1900B	23.2	1850	1.492	51.449	1.520	53.300	-1.84%	-3.47%
			1880	1.525	51.361	1.520	53.300	0.33%	-3.64%
			1910	1.558	51.274	1.520	53.300	2.50%	-3.80%
02/27/2014	2450B	23.5	2401	1.950	50.748	1.903	52.765	2.47%	-3.82%
			2450	2.019	50.576	1.950	52.700	3.54%	-4.03%
			2499	2.079	50.390	2.019	52.638	2.97%	-4.27%

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 865664 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.

9.2 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 9-2
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)	$Deviation_{1g}$ (%)
J	835	HEAD	02/19/2014	24.2	23.4	0.100	4d119	3332	0.956	9.680	9.560	-1.24%
I	835	HEAD	03/06/2014	24.3	22.6	0.100	4d119	3319	0.974	9.680	9.740	0.62%
D	1900	HEAD	02/17/2014	24.2	22.8	0.100	5d149	3022	3.800	40.400	38.000	-5.94%
H	1900	HEAD	03/05/2014	24.3	23.0	0.100	5d149	3589	3.940	40.400	39.400	-2.48%
K	2450	HEAD	02/27/2014	24.5	22.2	0.100	719	3287	5.580	53.200	55.800	4.89%
E	2450	HEAD	03/10/2014	24.4	22.1	0.040	719	3914	2.110	53.200	52.750	-0.85%
G	835	BODY	02/17/2014	24.0	22.4	0.100	4d119	3209	0.925	9.540	9.250	-3.04%
K	835	BODY	03/10/2014	23.8	22.4	0.100	4d119	3333	0.982	9.540	9.820	2.94%
E	1900	BODY	02/21/2014	24.5	24.4	0.100	5d149	3914	4.110	40.500	41.100	1.48%
D	1900	BODY	03/03/2014	23.2	22.7	0.100	5d149	3022	3.850	40.500	38.500	-4.94%
D	1900	BODY	03/10/2014	22.4	23.2	0.100	5d149	3022	3.940	40.500	39.400	-2.72%
K	2450	BODY	02/27/2014	24.4	23.5	0.100	719	3333	5.180	51.700	51.800	0.19%

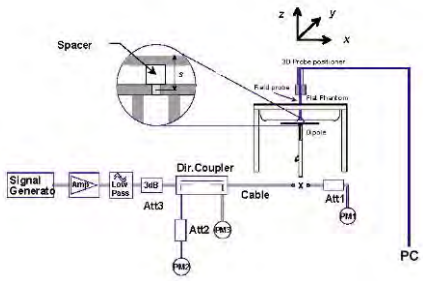

Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Head SAR Data

Table 10-1
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.5	32.60	0.02	Right	Cheek	LETA270111	1:8.3	0.452	1.230	0.556	A1
836.60	190	GSM 850	GSM	33.5	32.60	0.00	Right	Tilt	LETA270111	1:8.3	0.275	1.230	0.338	
836.60	190	GSM 850	GSM	33.5	32.60	0.15	Left	Cheek	LETA270111	1:8.3	0.421	1.230	0.518	
836.60	190	GSM 850	GSM	33.5	32.60	0.04	Left	Tilt	LETA270111	1:8.3	0.291	1.230	0.358	
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 10-2
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.5	29.72	0.11	Right	Cheek	LETA270111	1:8.3	0.313	1.197	0.375	A2
1880.00	661	GSM 1900	GSM	30.5	29.72	0.05	Right	Tilt	LETA270111	1:8.3	0.120	1.197	0.144	
1880.00	661	GSM 1900	GSM	30.5	29.72	0.00	Left	Cheek	LETA270111	1:8.3	0.147	1.197	0.176	
1880.00	661	GSM 1900	GSM	30.5	29.72	0.09	Left	Tilt	LETA270111	1:8.3	0.126	1.197	0.151	
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 10-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.0	22.48	0.15	Right	Cheek	LETA270111	1:1	0.471	1.419	0.668	A3
836.60	4183	UMTS 850	RMC	24.0	22.48	0.09	Right	Tilt	LETA270111	1:1	0.284	1.419	0.403	
836.60	4183	UMTS 850	RMC	24.0	22.48	0.05	Left	Cheek	LETA270111	1:1	0.447	1.419	0.634	
836.60	4183	UMTS 850	RMC	24.0	22.48	0.03	Left	Tilt	LETA270111	1:1	0.277	1.419	0.393	
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 10-4
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	24.0	22.18	-0.03	Right	Cheek	LETA270111	1:1	0.524	1.521	**0.797**	A4
1880.00	9400	UMTS 1900	RMC	24.0	22.18	0.04	Right	Tilt	LETA270111	1:1	0.222	1.521	0.338	
1880.00	9400	UMTS 1900	RMC	24.0	22.18	0.06	Left	Cheek	LETA270111	1:1	0.298	1.521	0.453	
1880.00	9400	UMTS 1900	RMC	24.0	22.18	-0.04	Left	Tilt	LETA270111	1:1	0.244	1.521	0.371	
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 10-5
DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	19.5	18.65	0.02	Right	Cheek	LETA270186	1	1:1	0.876	1.216	1.065	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.04	Right	Cheek	LETA270186	1	1:1	0.917	1.122	1.029	
2462	11	IEEE 802.11b	DSSS	19.5	18.77	0.04	Right	Cheek	LETA270186	1	1:1	0.720	1.183	0.852	
2412	1	IEEE 802.11b	DSSS	19.5	18.65	0.05	Right	Tilt	LETA270186	1	1:1	0.739	1.216	0.899	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	-0.12	Right	Tilt	LETA270186	1	1:1	0.789	1.122	0.885	
2462	11	IEEE 802.11b	DSSS	19.5	18.77	0.02	Right	Tilt	LETA270186	1	1:1	0.716	1.183	0.847	
2412	1	IEEE 802.11b	DSSS	19.5	18.65	0.03	Left	Cheek	LETA270186	1	1:1	1.180	1.216	1.435	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.14	Left	Cheek	LETA270186	1	1:1	1.340	1.122	**1.503**	A5
2462	11	IEEE 802.11b	DSSS	19.5	18.77	0.11	Left	Cheek	LETA270186	1	1:1	1.110	1.183	1.313	
2412	1	IEEE 802.11b	DSSS	19.5	18.65	0.03	Left	Tilt	LETA270186	1	1:1	0.736	1.216	0.895	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.02	Left	Tilt	LETA270186	1	1:1	0.916	1.122	1.028	
2462	11	IEEE 802.11b	DSSS	19.5	18.77	-0.05	Left	Tilt	LETA270186	1	1:1	0.812	1.183	0.961	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.02	Left	Cheek	LETA270186	1	1:1	1.340	1.122	**1.503**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram								

Note: Blue highlighted entry represents variability measurement data.

10.2 Standalone Body-Worn SAR Data

Table 10-6
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
824.20	128	GSM 850	GSM	33.5	32.45	0.00	15 mm	LETA270111	1	1:8.3	back	0.604	1.274	0.769	
836.60	190	GSM 850	GSM	33.5	32.60	0.05	15 mm	LETA270111	1	1:8.3	back	0.740	1.230	0.910	A6
848.80	251	GSM 850	GSM	33.5	32.69	0.00	15 mm	LETA270111	1	1:8.3	back	0.719	1.205	0.866	
836.60	190	GSM 850	GSM	33.5	32.60	-0.03	15 mm	LETA270111	1	1:8.3	front	0.588	1.230	0.723	
1880.00	661	GSM 1900	GSM	30.5	29.72	-0.11	15 mm	LETA270111	1	1:8.3	back	0.585	1.197	0.700	A7
1880.00	661	GSM 1900	GSM	30.5	29.72	-0.08	15 mm	LETA270111	1	1:8.3	front	0.350	1.197	0.419	
826.40	4132	UMTS 850	RMC	24.0	22.36	-0.01	15 mm	LETA270111	N/A	1:1	back	0.512	1.459	0.747	
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.01	15 mm	LETA270111	N/A	1:1	back	0.675	1.419	0.958	A8
846.60	4233	UMTS 850	RMC	24.0	22.32	-0.02	15 mm	LETA270111	N/A	1:1	back	0.657	1.472	**0.967**	
836.60	4183	UMTS 850	RMC	24.0	22.48	0.05	15 mm	LETA270111	N/A	1:1	front	0.505	1.419	0.717	
1852.40	9262	UMTS 1900	RMC	24.0	22.39	-0.07	15 mm	LETA270111	N/A	1:1	back	0.346	1.449	0.501	
1880.00	9400	UMTS 1900	RMC	24.0	22.18	0.00	15 mm	LETA270111	N/A	1:1	back	0.599	1.521	0.911	A9
1907.60	9538	UMTS 1900	RMC	24.0	22.34	-0.02	15 mm	LETA270111	N/A	1:1	back	0.491	1.466	0.720	
1880.00	9400	UMTS 1900	RMC	24.0	22.18	0.09	15 mm	LETA270111	N/A	1:1	front	0.365	1.521	0.555	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram							

Table 10-7
DTS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.13	15 mm	LETA270186	1	back	1:1	0.155	1.122	0.174	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.07	15 mm	LETA270186	1	front	1:1	0.158	1.122	**0.177**	A10
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram							

10.3 Standalone Wireless Router SAR Data

Table 10-8
GPRS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
824.20	128	GSM 850	GPRS	32.5	30.70	-0.14	10 mm	LETA270111	2	1:4.15	back	1.000	1.514	1.514	
836.60	190	GSM 850	GPRS	32.5	30.95	-0.11	10 mm	LETA270111	2	1:4.15	back	0.996	1.429	1.423	
848.80	251	GSM 850	GPRS	32.5	31.02	-0.03	10 mm	LETA270111	2	1:4.15	back	1.100	1.406	1.547	A11
824.20	128	GSM 850	GPRS	32.5	30.70	-0.14	10 mm	LETA270111	2	1:4.15	front	0.655	1.514	0.992	
836.60	190	GSM 850	GPRS	32.5	30.95	-0.15	10 mm	LETA270111	2	1:4.15	front	0.759	1.429	1.085	
848.80	251	GSM 850	GPRS	32.5	31.02	-0.07	10 mm	LETA270111	2	1:4.15	front	0.801	1.406	1.126	
836.60	190	GSM 850	GPRS	32.5	30.95	0.05	10 mm	LETA270111	2	1:4.15	bottom	0.074	1.429	0.106	
824.20	128	GSM 850	GPRS	32.5	30.70	-0.19	10 mm	LETA270111	2	1:4.15	right	0.781	1.514	1.182	
836.60	190	GSM 850	GPRS	32.5	30.95	-0.06	10 mm	LETA270111	2	1:4.15	right	0.831	1.429	1.187	
848.80	251	GSM 850	GPRS	32.5	31.02	-0.13	10 mm	LETA270111	2	1:4.15	right	0.840	1.406	1.181	
824.20	128	GSM 850	GPRS	32.5	30.70	-0.20	10 mm	LETA270111	2	1:4.15	left	0.638	1.514	0.966	
836.60	190	GSM 850	GPRS	32.5	30.95	0.00	10 mm	LETA270111	2	1:4.15	left	0.777	1.429	1.110	
848.80	251	GSM 850	GPRS	32.5	31.02	-0.06	10 mm	LETA270111	2	1:4.15	left	0.727	1.406	1.022	
848.80	251	GSM 850	GPRS	32.5	31.02	0.01	10 mm	LETA270111	2	1:4.15	back	1.060	1.406	1.490	
1850.20	512	GSM 1900	GPRS	30.0	28.25	-0.01	10 mm	LETA270111	2	1:4.15	back	0.693	1.496	1.037	
1880.00	661	GSM 1900	GPRS	30.0	28.26	-0.03	10 mm	LETA270111	2	1:4.15	back	0.718	1.493	1.072	
1909.80	810	GSM 1900	GPRS	30.0	28.58	0.02	10 mm	LETA270111	2	1:4.15	back	0.779	1.387	1.080	
1880.00	661	GSM 1900	GPRS	30.0	28.26	-0.14	10 mm	LETA270111	2	1:4.15	front	0.455	1.493	0.679	
1850.20	512	GSM 1900	GPRS	30.0	28.25	-0.09	10 mm	LETA270111	2	1:4.15	bottom	0.999	1.496	1.495	
1880.00	661	GSM 1900	GPRS	30.0	28.26	-0.11	10 mm	LETA270111	2	1:4.15	bottom	1.010	1.493	1.508	
1909.80	810	GSM 1900	GPRS	30.0	28.58	-0.02	10 mm	LETA270111	2	1:4.15	bottom	1.150	1.387	**1.595**	
1880.00	661	GSM 1900	GPRS	30.0	28.26	-0.03	10 mm	LETA270111	2	1:4.15	right	0.157	1.493	0.234	
1880.00	661	GSM 1900	GPRS	30.0	28.26	0.15	10 mm	LETA270111	2	1:4.15	left	0.026	1.493	0.039	
1909.80	810	GSM 1900	GPRS	30.0	28.58	-0.02	10 mm	LETA270111	2	1:4.15	bottom	1.150	1.387	**1.595**	A12
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram							

Note: Blue highlighted entries represent variability measurement data.

Table 10-9
UMTS Hotspot SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
826.40	4132	UMTS 850	RMC	24.0	22.36	-0.06	10 mm	LETA270111	1:1	back	0.602	1.459	0.878	
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.02	10 mm	LETA270111	1:1	back	0.789	1.419	1.120	
846.60	4233	UMTS 850	RMC	24.0	22.32	0.01	10 mm	LETA270111	1:1	back	0.814	1.472	1.198	A13
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.18	10 mm	LETA270111	1:1	front	0.562	1.419	0.797	
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.14	10 mm	LETA270111	1:1	bottom	0.043	1.419	0.061	
826.40	4132	UMTS 850	RMC	24.0	22.36	-0.01	10 mm	LETA270111	1:1	right	0.468	1.459	0.683	
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.04	10 mm	LETA270111	1:1	right	0.687	1.419	0.975	
846.60	4233	UMTS 850	RMC	24.0	22.32	-0.10	10 mm	LETA270111	1:1	right	0.641	1.472	0.944	
826.40	4132	UMTS 850	RMC	24.0	22.36	0.01	10 mm	LETA270111	1:1	left	0.474	1.459	0.692	
836.60	4183	UMTS 850	RMC	24.0	22.48	-0.04	10 mm	LETA270111	1:1	left	0.696	1.419	0.988	
846.60	4233	UMTS 850	RMC	24.0	22.32	0.05	10 mm	LETA270111	1:1	left	0.647	1.472	0.952	
1880.00	9400	UMTS 1900	RMC	21.0	See Supplement	0.07	10 mm	LETA270111	1:1	back	0.515	See Supplement	0.744	
1880.00	9400	UMTS 1900	RMC	21.0	See Supplement	0.01	10 mm	LETA270111	1:1	front	0.353	See Supplement	0.510	
1852.40	9262	UMTS 1900	RMC	21.0	See Supplement	0.09	10 mm	LETA270111	1:1	bottom	0.871	See Supplement	1.199	
1880.00	9400	UMTS 1900	RMC	21.0	See Supplement	0.15	10 mm	LETA270111	1:1	bottom	0.929	See Supplement	1.342	
1907.60	9538	UMTS 1900	RMC	21.0	See Supplement	0.05	10 mm	LETA270111	1:1	bottom	0.938	See Supplement	1.307	A14
1880.00	9400	UMTS 1900	HSPA	21.0	See Supplement	-0.06	10 mm	LETA270111	1:1	bottom	0.306	See Supplement	0.580	
1880.00	9400	UMTS 1900	RMC	21.0	See Supplement	0.00	10 mm	LETA270111	1:1	right	0.252	See Supplement	0.364	
1880.00	9400	UMTS 1900	RMC	21.0	See Supplement	-0.19	10 mm	LETA270111	1:1	left	0.023	See Supplement	0.033	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 10-10
WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.02	10 mm	LETA270186	1	back	1:1	0.331	1.122	**0.371**	A15
2437	6	IEEE 802.11b	DSSS	19.5	19.00	-0.03	10 mm	LETA270186	1	front	1:1	0.251	1.122	0.282	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	-0.01	10 mm	LETA270186	1	top	1:1	0.240	1.122	0.269	
2437	6	IEEE 802.11b	DSSS	19.5	19.00	0.03	10 mm	LETA270186	1	right	1:1	0.306	1.122	0.343	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

10.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. 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.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. 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.
7. Per FCC KDB Publication 648474 D04v01, 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 SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01 v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. This device utilizes maximum power reduction for UMTS 1900 under portable hotspot condition for SAR compliance. When the device is radiating with hotspot mode ON, a reduced maximum power limit is enforced for UMTS 1900. A complete description of power reduction is provided in Operational Description for FCC filing. In supplemental technical report (S/N: 0Y1402120376S.IHD), the power reduction operation is verified.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D03v01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02
2. HSPA SAR was required for body configuration since the body SAR was higher than 1.2 W/kg. The following steps were verified to evaluate an over the air HSPA connection according to KDB 941225 D01:

    a. A CMU200 was set according to 3GPP TS 34-141 Table C.11.1.3 for Sub-test 5.
    b. The UE was registered on the CMU200.
    c. Before establishing a HSUPA call, the UE was positioned on the SAR phantom. The antenna was positioned at a fixed distance from the UE.

d. A HSUPA call was established between the UE and the CMU200.
e. Power control bits of one TPC_cmd = +1 commands were sent to the UE to monitor the expected E-TFCI until the E-TFCI changed.
f. A power control bits of one TPC_cmd = -1 command was sent to the UE. The E-TFCI was monitored until there was a decrease in E-TFCI until equal to the target E-TFCI in Sub-test 5 in 3GPP TS 31.121 Table C.11.1.3.
g. After the E-TFCI was confirmed, SAR testing is performed while keeping the UE and the Base Station simulator antenna stationary.
h. For the duration of the SAR test, the E-TFCI sent by the UE and AG index were monitored closely to ensure E-TFCI did not decrease and that the rate of E-TFCI sent and AG index was stable for the duration of the SAR test.

3. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. WIFI transmission was verified using an uncalibrated spectrum analyzer.
3. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other default channels was not required.

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1.iii 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. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Table 11-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	11.50	15	**0.194**

Note: Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

11.3 Head SAR Simultaneous Transmission Analysis

Table 11-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simultaneous Transmission SAR (W/kg)
Head SAR	Right Cheek	0.556	1.065	See Note 1	0.04	N/A
	Right Tilt	0.338	0.899	1.237	N/A	N/A
	Left Cheek	0.518	1.503	See Note 1	See Note 2	1.39
	Left Tilt	0.358	1.028	**1.386**	N/A	N/A
Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simultaneous Transmission SAR (W/kg)
Head SAR	Right Cheek	0.375	1.065	**1.440**	N/A	N/A
	Right Tilt	0.144	0.899	1.043	N/A	N/A
	Left Cheek	0.176	1.503	See Note 1	0.04	N/A
	Left Tilt	0.151	1.028	1.179	N/A	N/A
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simultaneous Transmission SAR (W/kg)
Head SAR	Right Cheek	0.668	1.065	See Note 1	0.04	N/A
	Right Tilt	0.403	0.899	1.302	N/A	N/A
	Left Cheek	0.634	1.503	See Note 1	See Note 2	1.39
	Left Tilt	0.393	1.028	**1.421**	N/A	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simultaneous Transmission SAR (W/kg)
Head SAR	Right Cheek	0.797	1.065	See Note 1	0.04	N/A
	Right Tilt	0.338	0.899	1.237	N/A	N/A
	Left Cheek	0.453	1.503	See Note 1	See Note 2	1.53
	Left Tilt	0.371	1.028	**1.399**	N/A	N/A

Note 1: No evaluation was performed to determined aggregate 1-g SAR in this configuration as the SPLSR of antenna pairs was not higher than 0.04 per FCC KDB Publication 447498 D01. See Section 11.6 for detailed SPLSR analysis.
Note 2: Since the SPLSR in this configuration was not less than or equal to 0.04, further analysis was performed to determine the aggregate 1-g SAR. The aggregate volumetric SAR evaluation was less than 1.6 W/kg. See Section 11.7 for detailed volumetric evaluation analysis.

11.4 Body-Worn Simultaneous Transmission Analysis

Table 11-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.910	0.174	1.084
Front Side	GSM 850	0.723	0.177	0.900
Back Side	GSM 1900	0.700	0.174	0.874
Front Side	GSM 1900	0.419	0.177	0.596
Back Side	UMTS 850	0.967	0.174	1.141
Front Side	UMTS 850	0.717	0.177	0.894
Back Side	UMTS 1900	0.911	0.174	1.085
Front Side	UMTS 1900	0.555	0.177	0.732

Table 11-4
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.910	0.194	1.104
Front Side	GSM 850	0.723	0.194	0.917
Back Side	GSM 1900	0.700	0.194	0.894
Front Side	GSM 1900	0.419	0.194	0.613
Back Side	UMTS 850	0.967	0.194	1.161
Front Side	UMTS 850	0.717	0.194	0.911
Back Side	UMTS 1900	0.911	0.194	1.105
Front Side	UMTS 1900	0.555	0.194	0.749

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

11.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 11-5
Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	1.547	0.371	See Note 1	0.04
	Front	1.126	0.282	1.408	N/A
	Top	-	0.269	0.269	N/A
	Bottom	0.106	-	0.106	N/A
	Right	1.187	0.343	**1.530**	N/A
	Left	1.110	-	1.110	N/A

Note 1: No evaluation was performed to determined aggregate 1-g SAR in this configuration as the SPLSR of antenna pairs was not higher than 0.04 per FCC KDB Publication 447498 D01. See Section 11.6 for detailed SPLSR analysis.

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	1.080	0.371	1.451	N/A
	Front	0.679	0.282	0.961	N/A
	Top	-	0.269	0.269	N/A
	Bottom	1.595	-	**1.595**	N/A
	Right	0.234	0.343	0.577	N/A
	Left	0.039	-	0.039	N/A
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	1.198	0.371	**1.569**	N/A
	Front	0.797	0.282	1.079	N/A
	Top	-	0.269	0.269	N/A
	Bottom	0.061	-	0.061	N/A
	Right	0.975	0.343	1.318	N/A
	Left	0.988	-	0.988	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.744	0.371	1.115	N/A
	Front	0.510	0.282	0.792	N/A
	Top	-	0.269	0.269	N/A
	Bottom	1.342	-	**1.342**	N/A
	Right	0.364	0.343	0.707	N/A
	Left	0.033	-	0.033	N/A

11.6 SPLSR Evaluation and Analysis

Per FCC KDB Publication 447498 D01v05, when the sum of the standalone transmitters is more than 1.6 W/kg, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤ 0.04, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

$$\text{Distance}_{Tx1-Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

$$\text{SPLS Ratio} = \frac{(SAR_1 + SAR_2)^{1.5}}{R_i}$$

The sum of the standalone SAR values was above 1.6 W/kg for the Right Cheek configuration with GSM 850 antenna operating at maximum output power with 2.4GHz.

Table 11-6
Peak SAR Locations for Right Cheek GSM 850 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
GSM 850	68.60	-271.00	-170.00
802.11 b	22.40	-307.00	-170.00

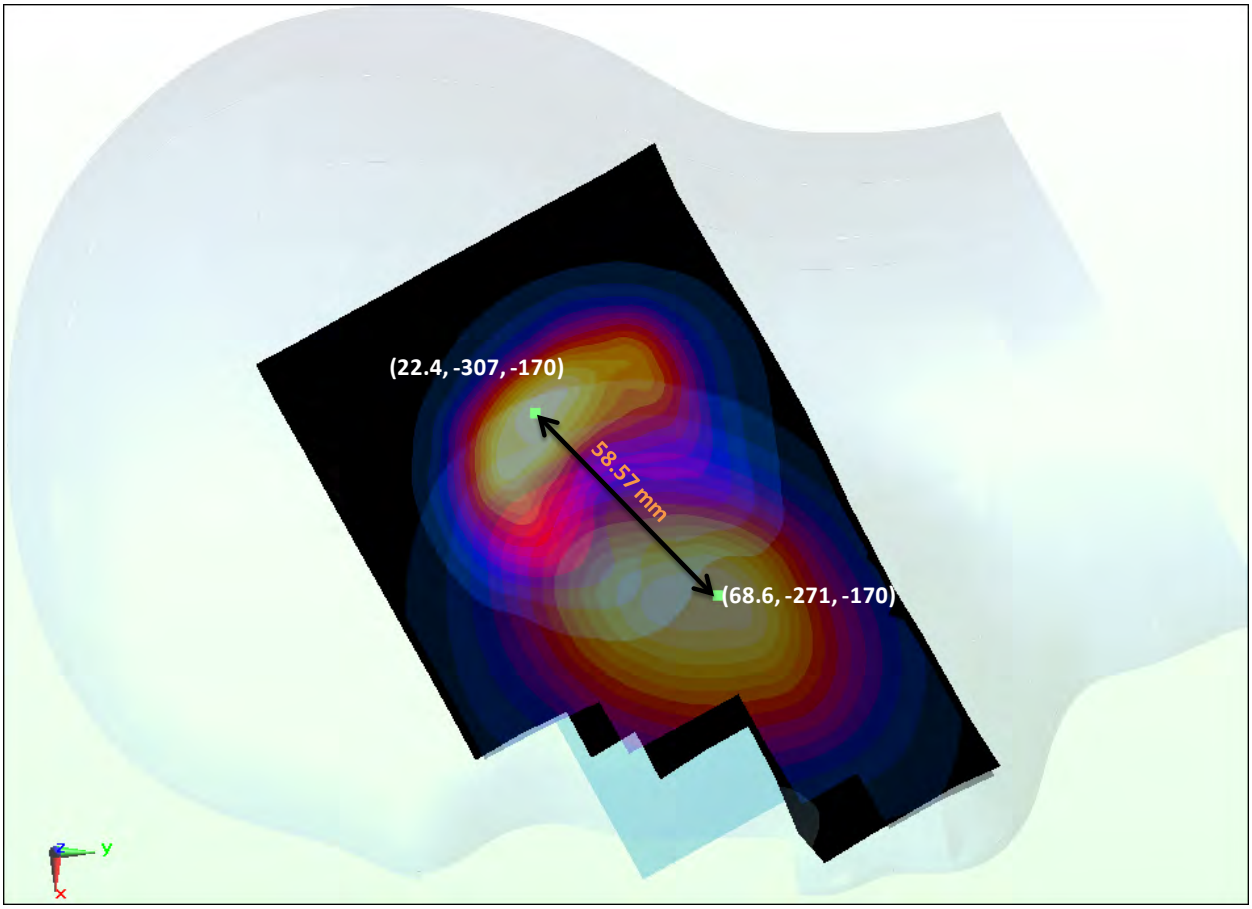

Figure 11-1
Peak SAR Locations of 2.4 GHz WLAN Antenna and GSM 850

Table 11-7
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GSM 850	802.11 b	0.556	1.065	1.621	58.57	0.04

The sum of the standalone SAR values was above 1.6 W/kg for the Left Cheek configuration with GSM 850 antenna operating at maximum output power with 2.4GHz.

Table 11-8
Peak SAR Locations for Left Cheek GSM 850 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
GSM 850	68.50	274.00	-171.00
802.11 b	37.90	326.00	-172.00

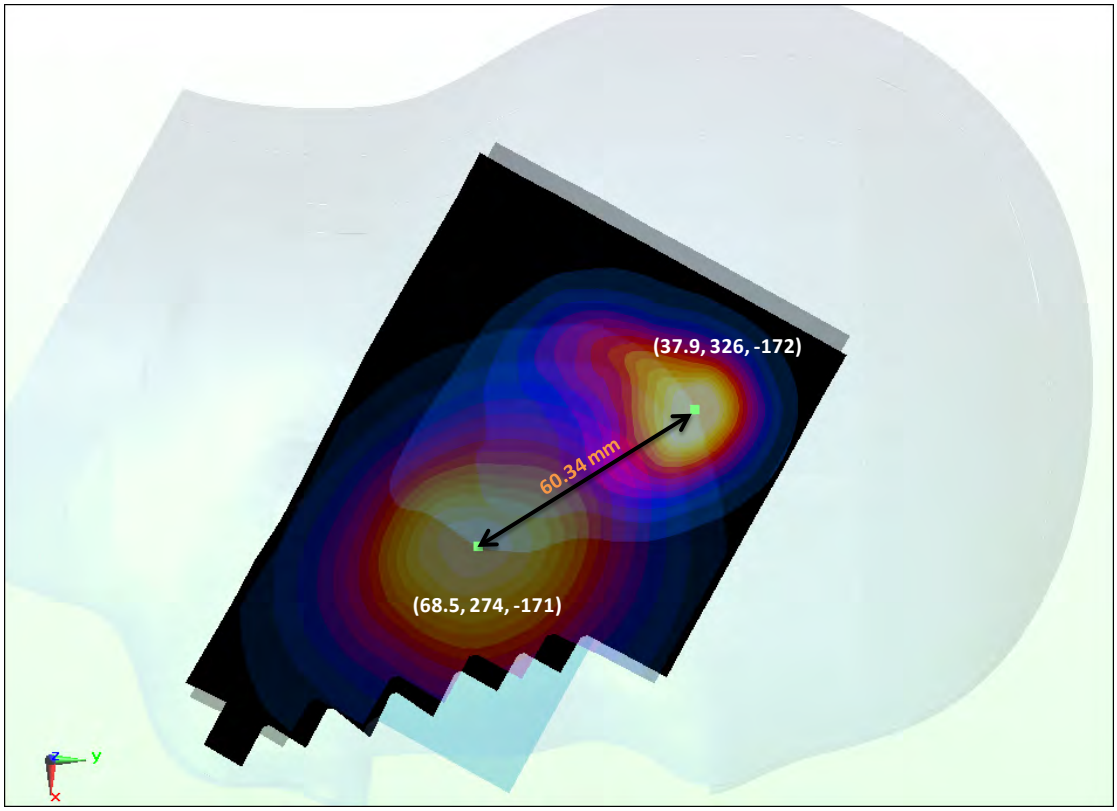

Figure 11-2
Peak SAR Locations of 2.4 GHz WLAN Antenna and GSM 850

Table 11-9
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GSM 850	802.11 b	0.518	1.503	2.021	60.34	See Note

Note: When considering a GSM 850 voice call potentially simultaneously operating with 2.4GHz WLAN, the SPLSR is not less than or equal to 0.04. Please see Section 11.7 for volumetric SAR evaluation details.

The sum of the standalone SAR values was above 1.6 W/kg for the Left Cheek configuration with GSM 1900 antenna operating at maximum output power with 2.4GHz.

Table 11-10
Peak SAR Locations for Left Cheek GSM 1900 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
GSM 1900	74.90	291.00	-171.00
802.11 b	37.90	326.00	-172.00

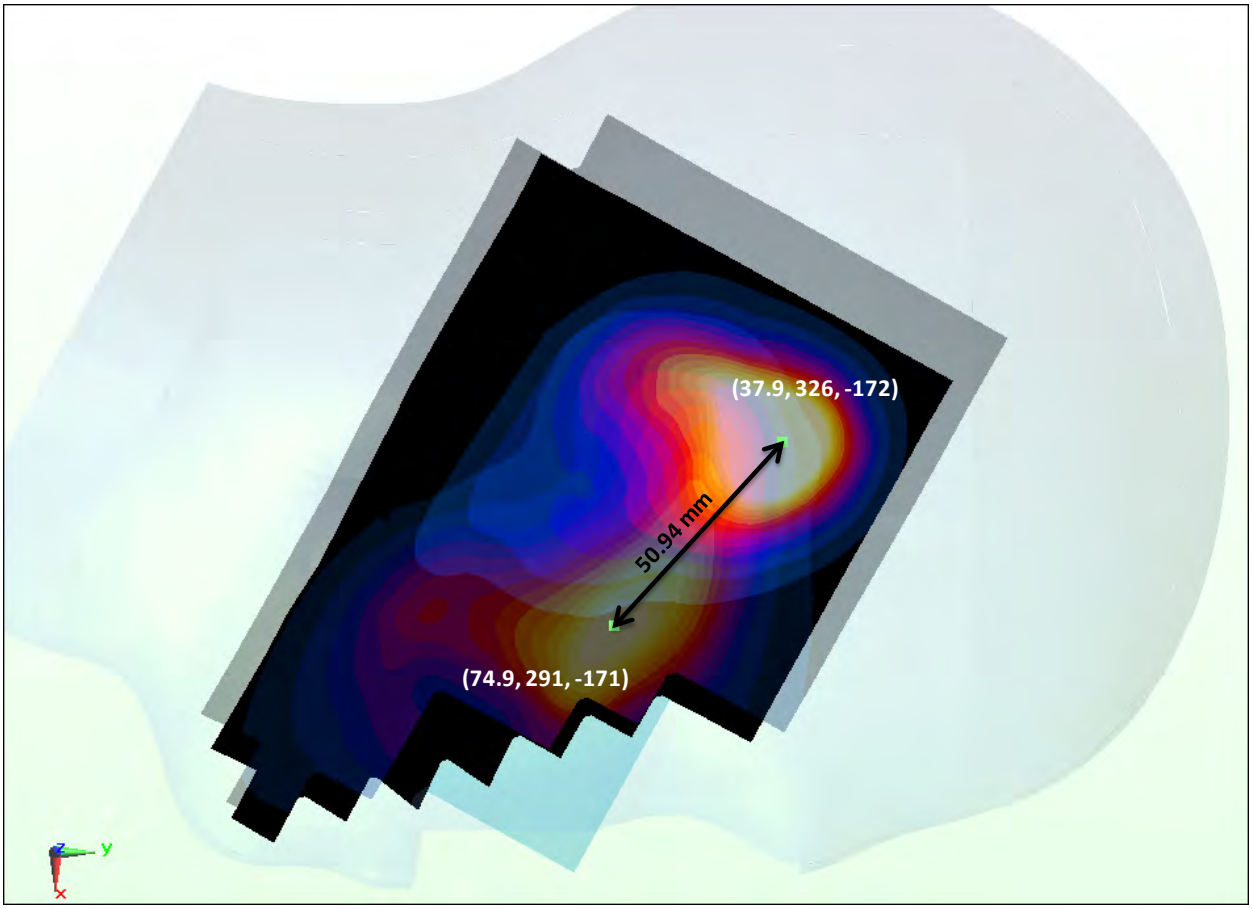

Figure 11-3
Peak SAR Locations of 2.4 GHz WLAN Antenna and GSM 1900

Table 11-11
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GSM 1900	802.11 b	0.176	1.503	1.679	50.94	0.04

The sum of the standalone SAR values was above 1.6 W/kg for the Right Cheek configuration with UMTS 850 antenna operating at maximum output power with 2.4GHz.

Table 11-12
Peak SAR Locations for Right Cheek UMTS 850 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
UMTS 850	65.00	-271.00	-171.00
802.11 b	22.40	-307.00	-170.00

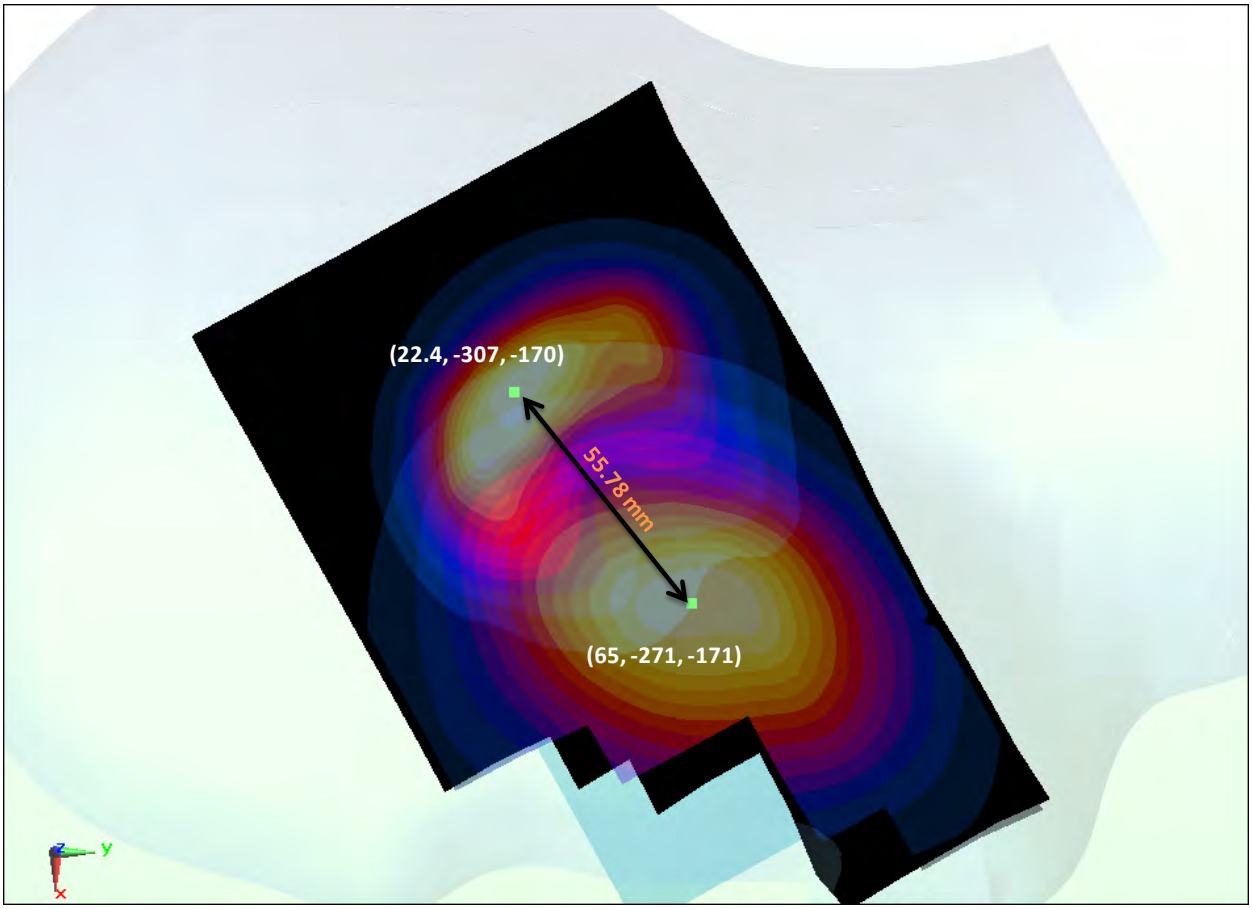

Figure 11-4
Peak SAR Locations of 2.4 GHz WLAN Antenna and UMTS 850

Table 11-13
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 850	802.11 b	0.668	1.065	1.733	55.78	0.04

The sum of the standalone SAR values was above 1.6 W/kg for the Left Cheek configuration with UMTS 850 antenna operating at maximum output power with 2.4GHz.

Table 11-14
Peak SAR Locations for Left Cheek UMTS 850 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
UMTS 850	68.50	274.00	-170.00
802.11 b	37.90	326.00	-172.00

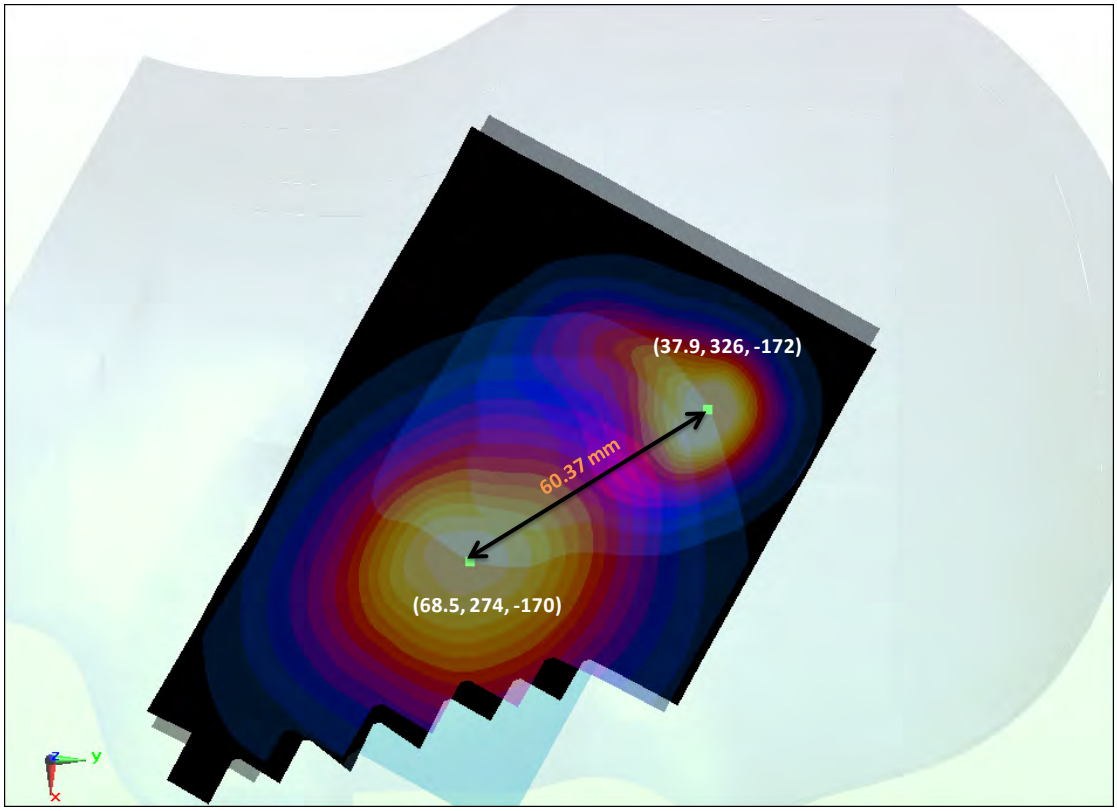

Figure 11-5
Peak SAR Locations of 2.4 GHz WLAN Antenna and UMTS 850

Table 11-15
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 850	802.11 b	0.634	1.503	2.137	60.37	See Note

Note: When considering a UMTS 850 voice call potentially simultaneously operating with 2.4GHz WLAN, the SPLSR is not less than or equal to 0.04. Please see Section 11.7 for volumetric SAR evaluation details.

The sum of the standalone SAR values was above 1.6 W/kg for the Right Cheek configuration with UMTS 1900 antenna operating at maximum output power with 2.4GHz.

Table 11-16
Peak SAR Locations for Right Cheek UMTS 1900 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
UMTS 1900	62.70	-255.00	-171.00
802.11 b	22.40	-307.00	-170.00

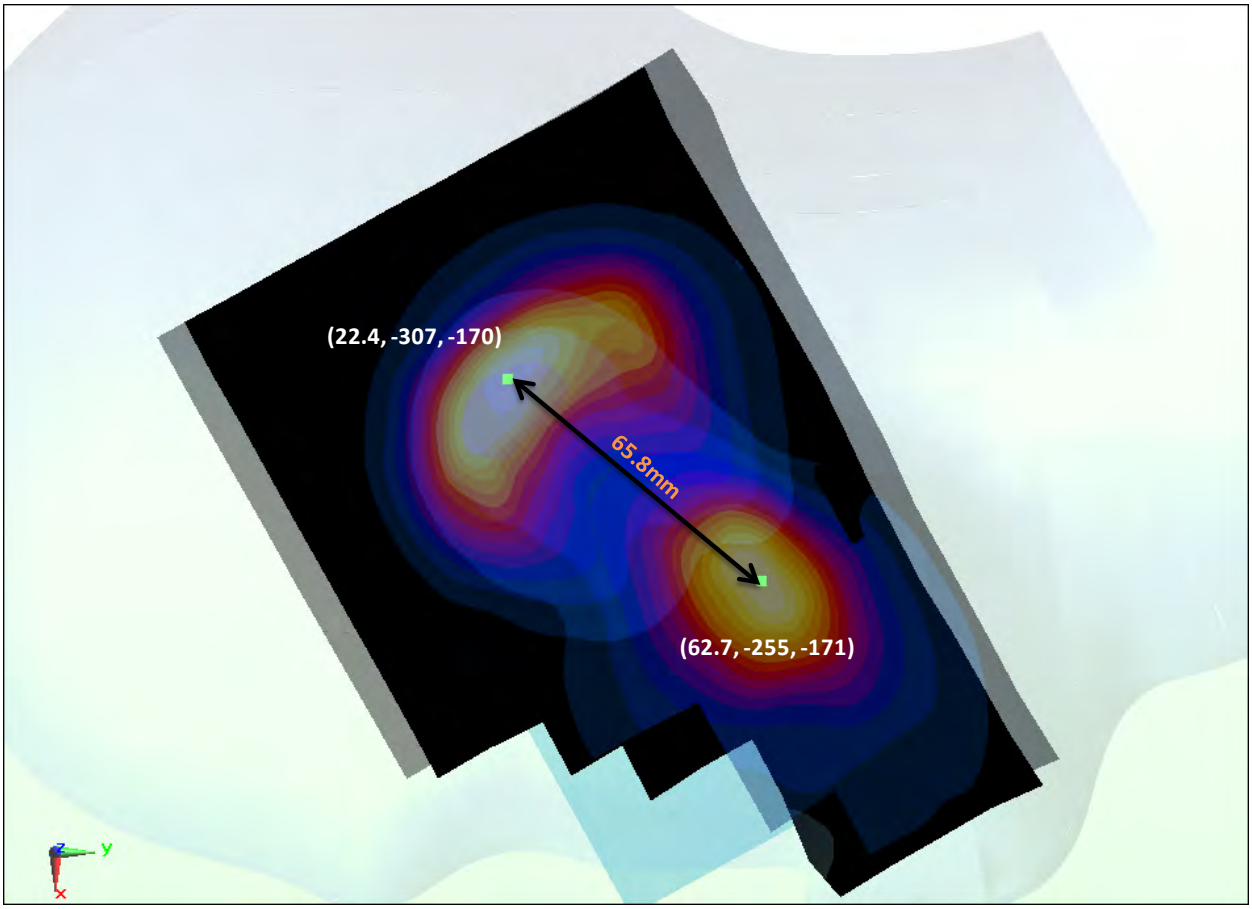

Figure 11-6
Peak SAR Locations of 2.4 GHz WLAN Antenna and UTMS 1900

Table 11-17
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1900	802.11 b	0.797	1.065	1.862	65.8	0.04

The sum of the standalone SAR values was above 1.6 W/kg for the Left Cheek configuration with UMTS 1900 antenna operating at maximum output power with 2.4GHz.

Table 11-18
Peak SAR Locations for Left Cheek UMTS 1900 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)	z (mm)
UMTS 1900	72.60	292.00	-171.00
802.11 b	37.90	326.00	-172.00

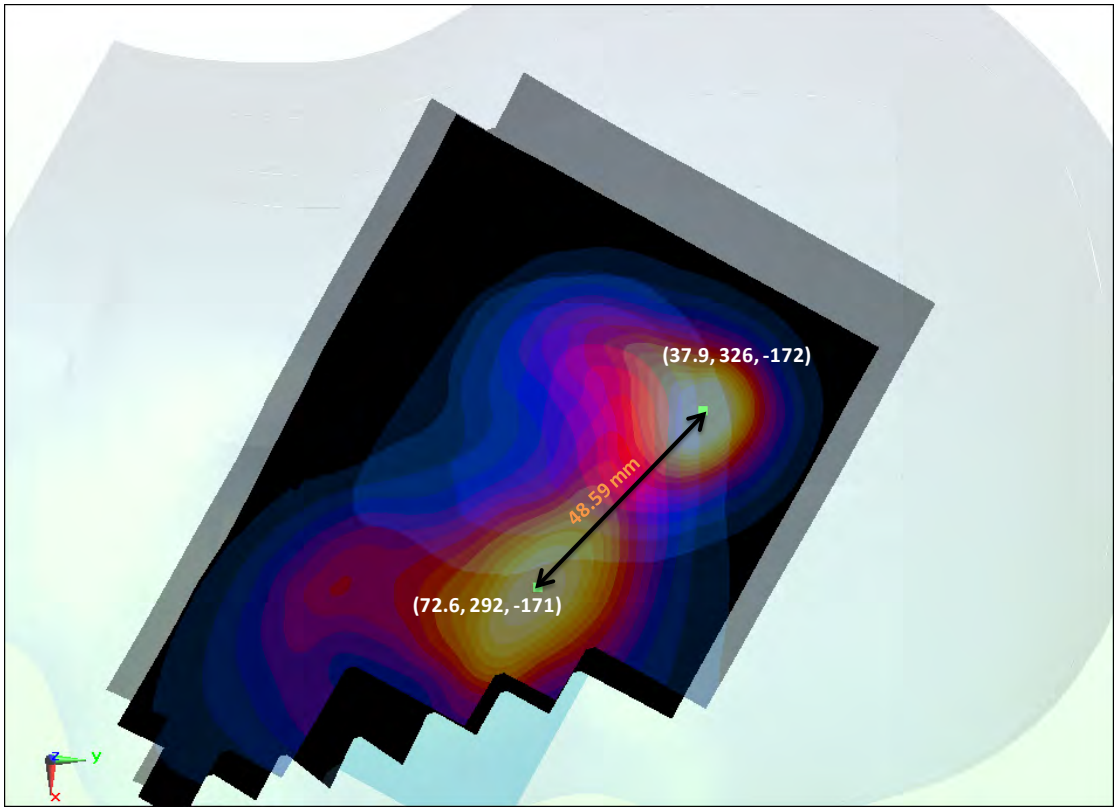

Figure 11-7
Peak SAR Locations of 2.4 GHz WLAN Antenna and UMTS 1900

Table 11-19
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1900	802.11 b	0.453	1.503	1.956	48.59	See Note

Note: When considering a UMTS 1900 voice call potentially simultaneously operating with 2.4GHz WLAN, the SPLSR is not less than or equal to 0.04. Please see Section 11.7 for volumetric SAR evaluation details.

The sum of the standalone SAR values was above 1.6 W/kg for the back side at 10mm configuration with GPRS 850 antenna operating at maximum output power with 2.4GHz.

Table 11-20
Peak SAR Locations for Back Side GPRS 850 and 2.4 GHz WLAN Antenna

Mode/Band	x (mm)	y (mm)
GPRS 850	-24.00	-7.00
802.11 b	-41.00	53.40

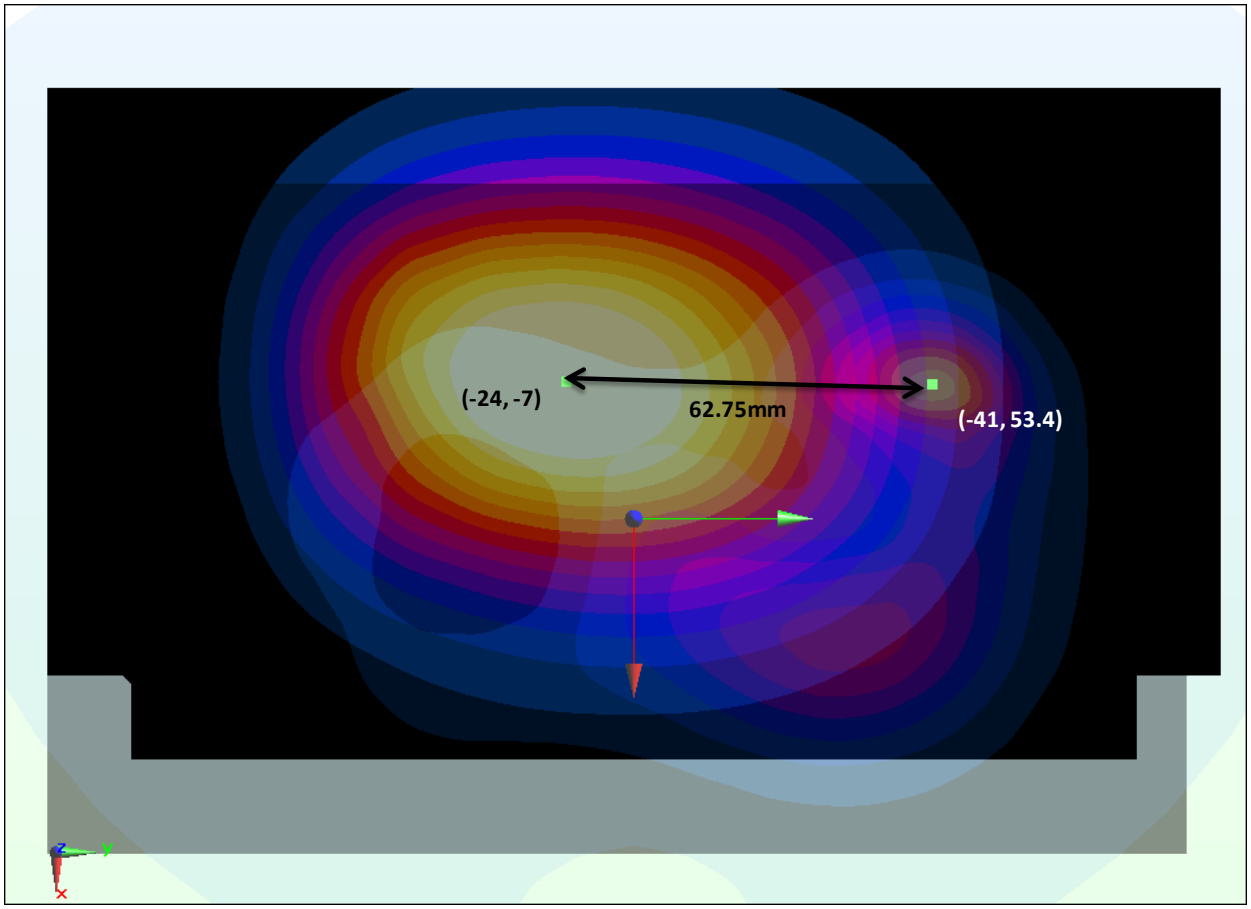

Figure 11-8
Peak SAR Locations of 2.4 GHz WLAN Antenna and GPRS 850

Table 11-21
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GPRS 850	802.11 b	1.547	0.371	1.918	62.75	0.04

11.7 Volumetric SAR Evaluation Analysis

Per KDB Publication 865664, when the sum of the transmitters potentially operating simultaneously is greater than 1.6 W/kg and the sum to peak SAR location separation ratio between any pair of transmitters is more than 0.04, SAR tests are required for simultaneous transmission to determine the aggregate 1-g SAR. When required, each transmitter should be tested for simultaneous transmission in the configuration, channel and operating mode that resulted in the highest SAR during the stand-alone evaluation.

Simultaneous Transmission SAR was required for the left cheek configuration for following scenario:

Table 11-22
Simultaneous Transmission SAR Analysis

Band/Mode	Configuration	Measured Standalone 1g SAR (W/kg)	Power [dBm]	Target Power + Tolerance (0.5 dB) [dBm]	Scaling Factor	Standalone SAR Plot Number	Simultaneous Transmission SAR (W/kg)	Scaled Simultaneous Transmission SAR (W/kg)	Simultaneous Transmission SAR Plot Number
GSM 850	Left Cheek Mid ch.	0.421	32.60	33.50	1.230	-	0.394	0.485	A16
UMTS 850	Left Cheek Mid ch.	0.447	22.48	24.00	1.419	-	0.321	0.455	A17
UMTS 1900	Left Cheek Mid ch.	0.298	22.18	24.00	1.521	-	0.349	0.531	A18
2.4 GHz WLAN	Left Cheek Ch. 6, 1 Mbps	1.340	19.00	19.50	1.122	A5	1.230	1.380	A19

Simultaneous Transmission Bands/Modes		Scaled Multi-Band SAR (W/kg)	Simultaneous SAR Plot Number
GSM 850	2.4 GHz WLAN	1.39	A20
UMTS 850	2.4 GHz WLAN	1.39	A21
UMTS 1900	2.4 GHz WLAN	1.53	A22

Note:

1. All volumetric zoom scans were performed with DASY52 SAR system version 52.8.7.1137. Post-processor SEMCAD X 14.6.10 multiband combiner requires enlarged zoom scans to overlap but does not require measurement point resolutions within the volumes to be identical for interpolation and superposition.
2. WLAN SAR volume scan was evaluated with a resolution of Δx = 5mm, Δy = 5mm, and Δz = 5mm with a grid of 25x33x7 points.
3. UMTS/GSM SAR volume scans were evaluated with a resolution of Δx = 8mm, Δy = 8mm, and Δz = 5mm with a grid of 16x21x7 points.
4. Each antenna was evaluated independently using the channel/configuration that produced the highest measured SAR when the standalone SAR was tested.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. The simultaneous transmission SAR results of the individual transmitters were scaled using SEMCAD X during processing.

11.8 Simultaneous Transmission Conclusion

Based on the simultaneous transmission analysis guidance described in FCC KDB 447498 D01v05 and IEEE 1528-2013 Section 6.3.4.1.2, the above simultaneous transmission SAR analyses indicate that the device operating in any of the simultaneous transmission scenarios will not exceed the SAR limit.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

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

Table 12-1
Head SAR Measurement Variability Results

HEAD VARIABILITY RESULTS														
Band	FREQUENCY		Mode/Band	Service	Side	Test Position	Data Rate (Mbps)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2450	2437.00	6	IEEE 802.11b	DSSS	Left	Cheek	1	1.340	1.340	1.00	N/A	N/A	N/A	N/A
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 12-2
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	# of Time Slots	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
835	848.80	251	GSM 850	GPRS	2	back	10 mm	1.100	1.060	1.04	N/A	N/A	N/A	N/A
1900	1909.80	810	GSM 1900	GPRS	2	bottom	10 mm	1.150	1.150	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram								

12.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/16/2013	Annual	4/16/2014	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Agilent	N5182A	MXG Vector Signal Generator	10/28/2013	Annual	10/28/2014	US46240505
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Agilent	E5515C	Wireless Communications Test Set	10/18/2012	Biennial	10/18/2014	GB43193563
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43304447
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Anritsu	MA2411B	Pulse Power Sensor	11/14/2013	Annual	11/14/2014	1126066
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6200901190
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6201300731
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349501
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349503
Fisher Scientific	15-07BJ	Long Stem Thermometer	1/7/2013	Biennial	1/7/2015	130018204
Fisher Scientific	15-07BJ	Long Stem Thermometer	1/7/2013	Biennial	1/7/2015	130018243
Fisher Scientific	15-077-960	Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Gigatronics	8651A	Universal Power Meter	10/30/2013	Annual	10/30/2014	8650319
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
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	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	9/23/2013	Annual	9/23/2014	109892
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
Rohde & Schwarz	SME06	Signal Generator	10/30/2013	Annual	10/30/2014	832026
Rohde & Schwarz	NRVS	Single Channel Power Meter	10/31/2013	Annual	10/31/2014	835360/0079
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2013	Annual	7/22/2014	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2013	Annual	8/23/2014	719
SPEAG	D835V2	835 MHz SAR Dipole	4/25/2013	Annual	4/25/2014	4d119
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2013	Annual	3/8/2014	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/22/2013	Annual	4/22/2014	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/21/2013	Annual	8/21/2014	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/18/2013	Annual	11/18/2014	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2014	Annual	1/22/2015	1272
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/14/2013	Annual	5/14/2014	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/13/2013	Annual	11/13/2014	1091
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2013	Annual	8/18/2014	1008
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2013	Annual	8/18/2014	1009
SPEAG	ES3DV3	SAR Probe	3/15/2013	Annual	3/15/2014	3209
SPEAG	ES3DV3	SAR Probe	4/29/2013	Annual	4/29/2014	3319
SPEAG	ES3DV2	SAR Probe	8/22/2013	Annual	8/22/2014	3022
SPEAG	EX3DV4	SAR Probe	10/23/2013	Annual	10/23/2014	3914
SPEAG	ES3DV3	SAR Probe	11/20/2013	Annual	11/20/2014	3287
SPEAG	ES3DV3	SAR Probe	11/22/2013	Annual	11/22/2014	3333
SPEAG	ES3DV3	SAR Probe	11/25/2013	Annual	11/25/2014	3332
SPEAG	EX3DV4	SAR Probe	1/29/2014	Annual	1/29/2015	3589
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Annual	8/8/2014	130477877
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Annual	8/8/2014	130258636

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.

Note: All calibrated equipments were used within their calibration periods.

14 MEASUREMENT UNCERTAINTIES

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**IEEE 1528 Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	6.0	N	1	1.0	1.0	6.0	6.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)			RSS				12.1	11.7	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.2	23.5	

The above measurement uncertainties are according to IEEE Std. 1528-2003

15 CONCLUSION

15.1 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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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

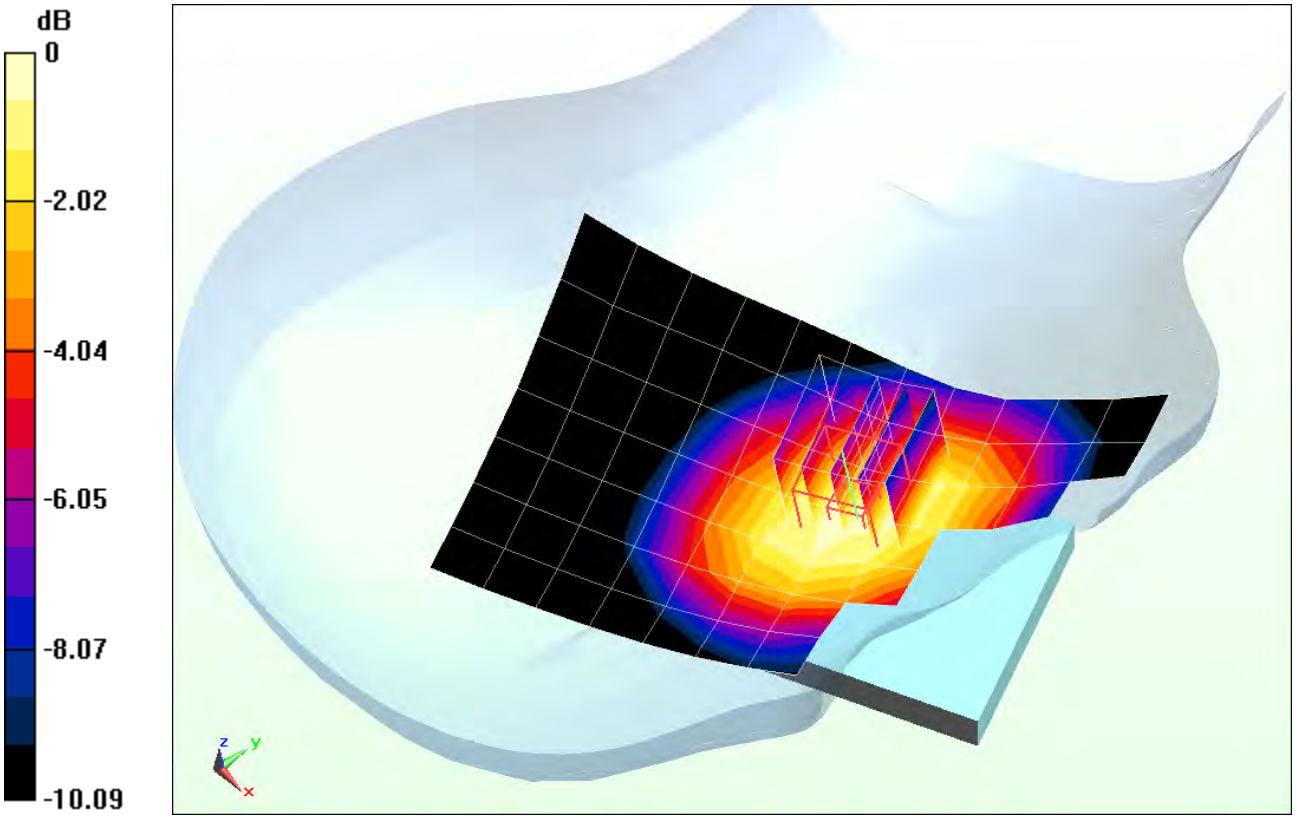
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.941 S/m; ε_r = 42.791; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-19-2014; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

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

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.505 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.570 W/kg
SAR(1 g) = 0.452 W/kg



0 dB = 0.475 W/kg = -3.23 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

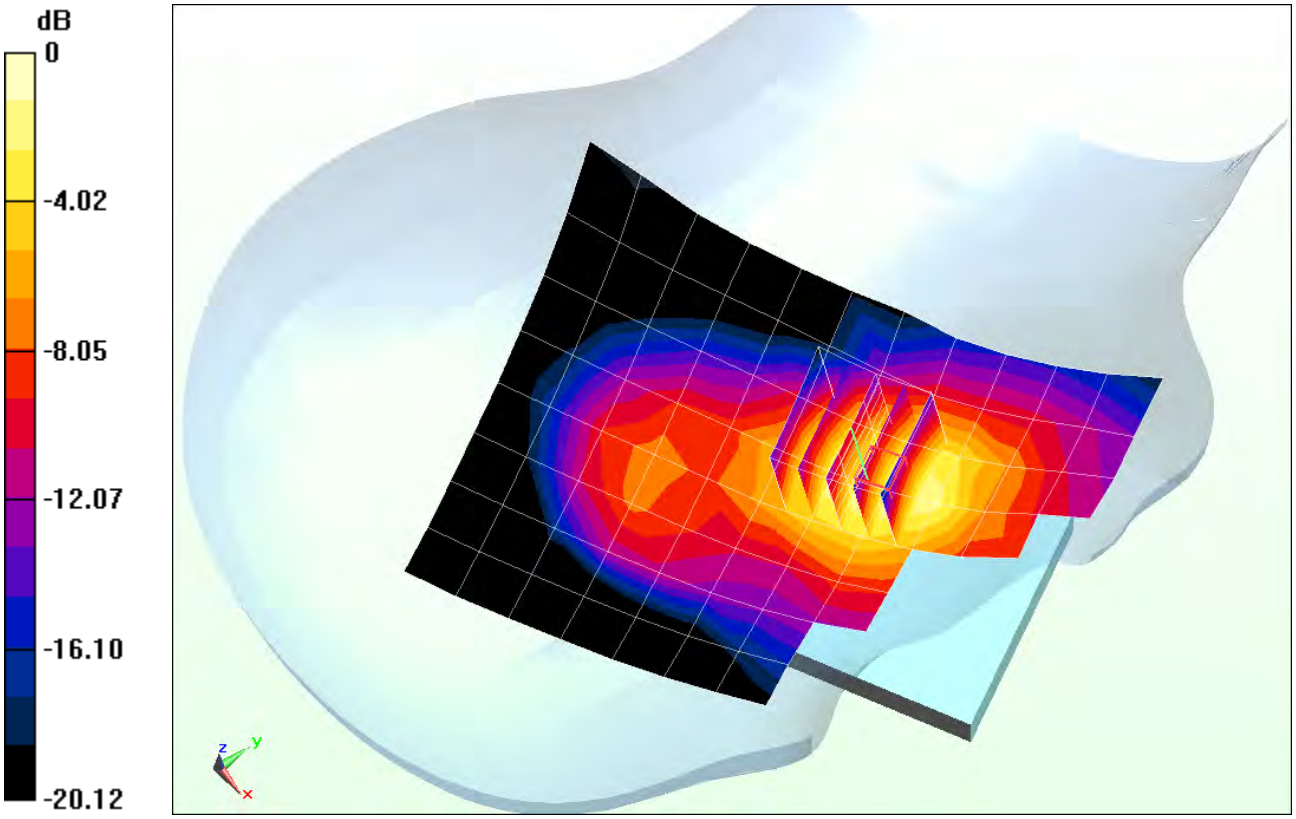
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.328; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-17-2014; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(5.03, 5.03, 5.03); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.452 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.490 W/kg
SAR(1 g) = 0.313 W/kg



0 dB = 0.338 W/kg = -4.71 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

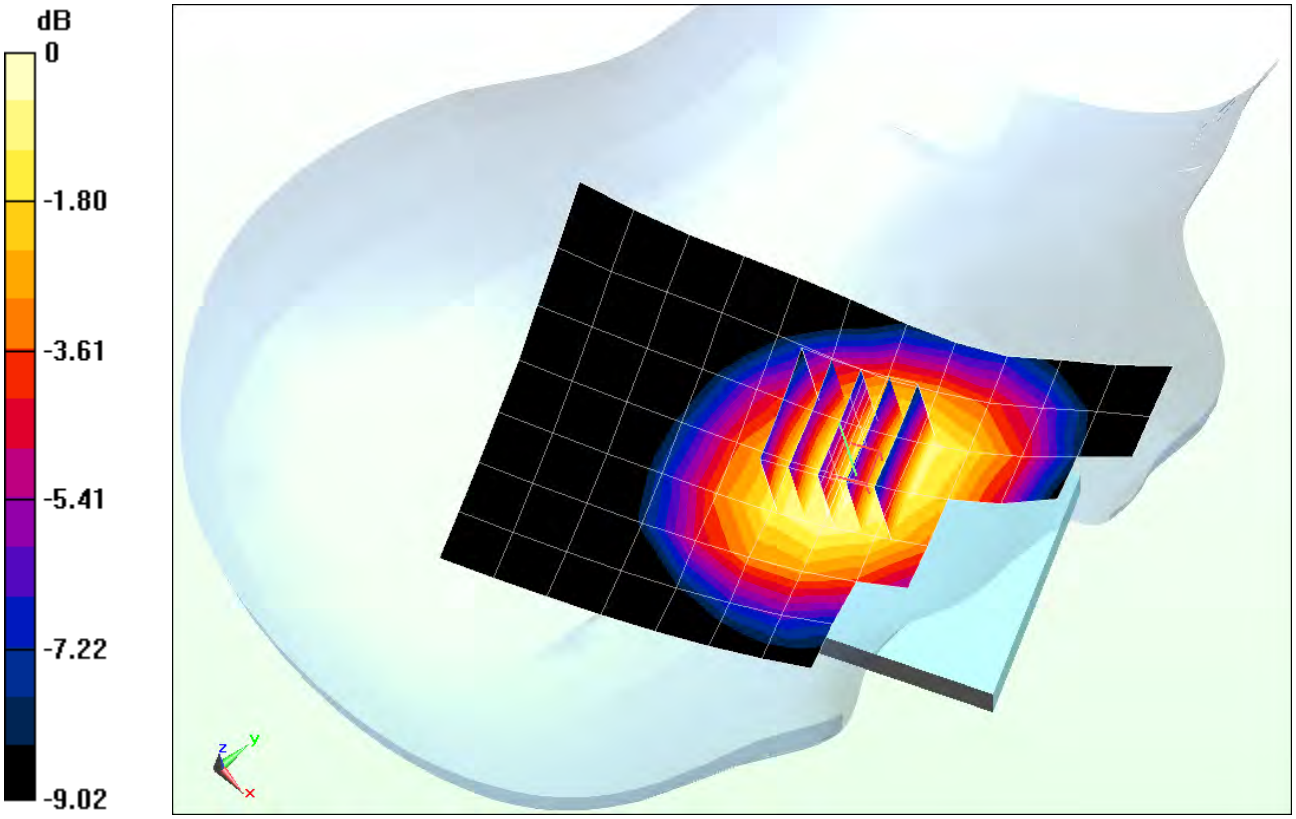
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.941 S/m; ε_r = 42.791; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-19-2014; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Right Head, Cheek, Mid.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.919 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.602 W/kg
SAR(1 g) = 0.471 W/kg



0 dB = 0.491 W/kg = -3.09 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

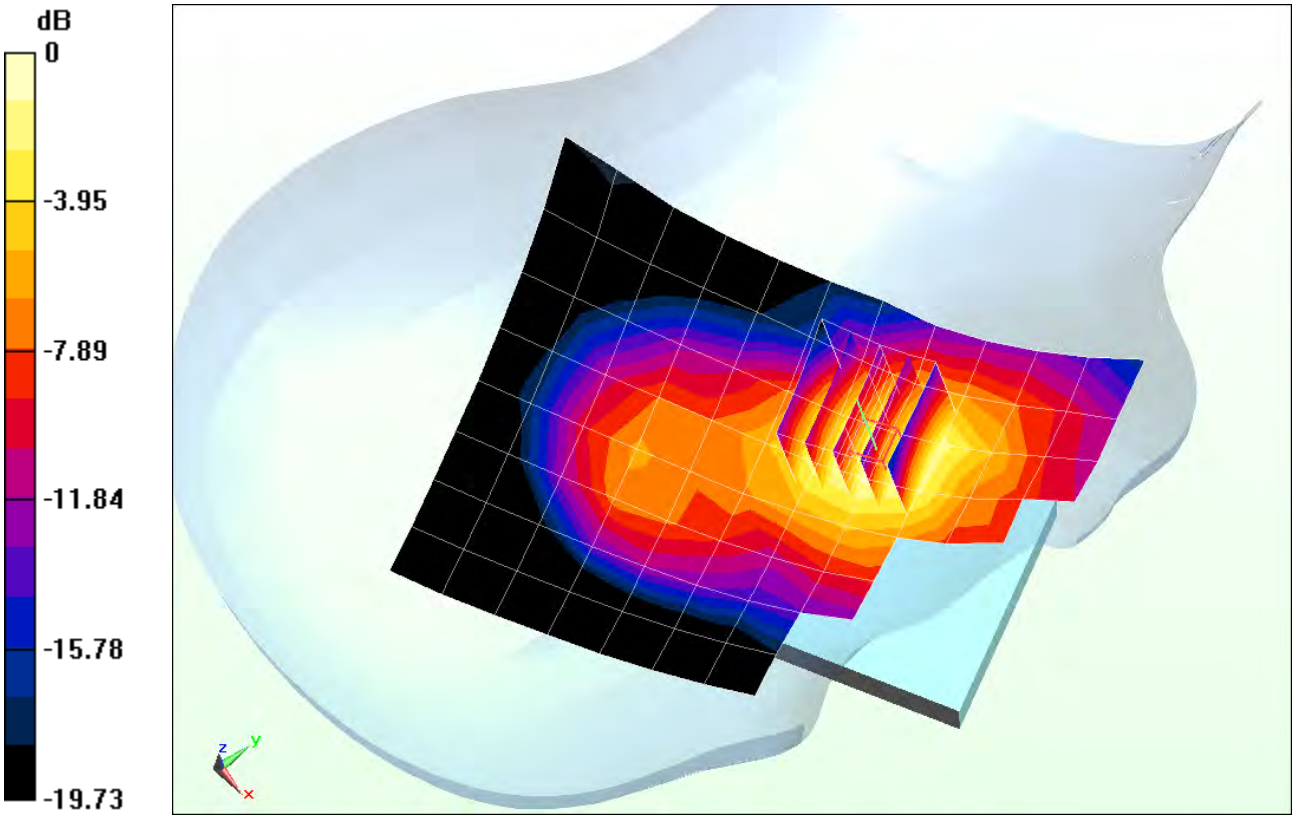
Communication System: UID 0, UMTS; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.328; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-17-2014; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(5.03, 5.03, 5.03); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.592 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.797 W/kg
SAR(1 g) = 0.524 W/kg



0 dB = 0.577 W/kg = -2.39 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270186

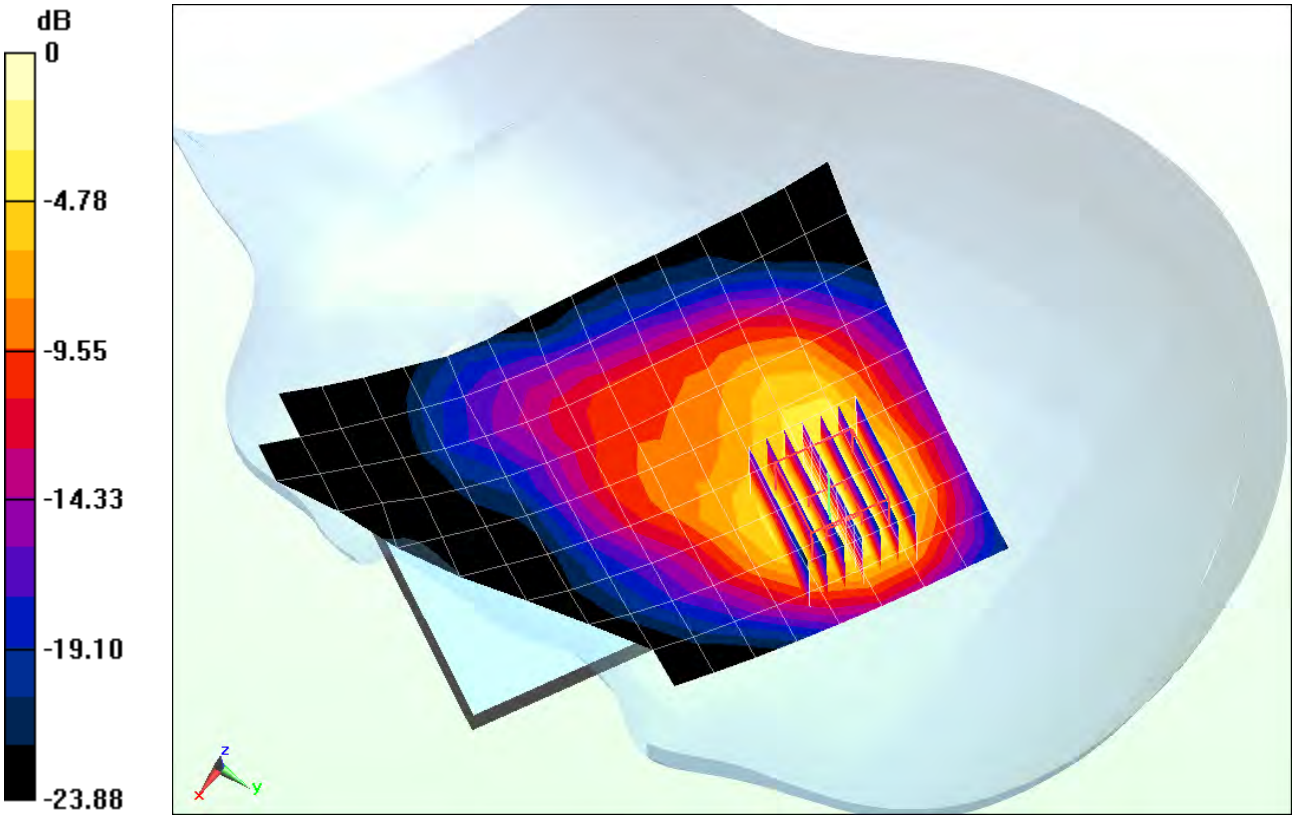
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.77 S/m; ε_r = 38.072; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-27-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Left Head, Cheek, Ch 06, 1 Mbps

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.296 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 2.57 W/kg
SAR(1 g) = 1.34 W/kg



0 dB = 1.72 W/kg = 2.36 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

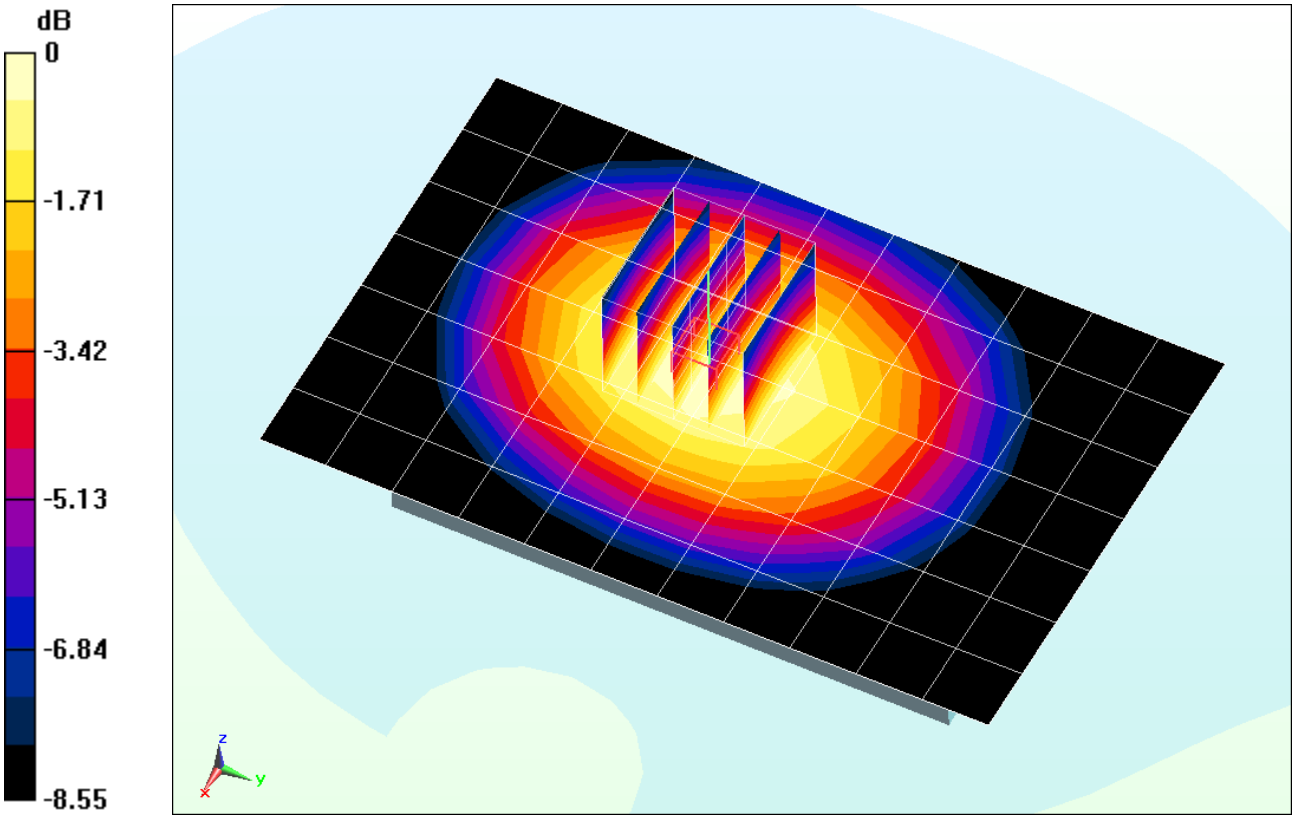
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.008 S/m; ε_r = 54.794; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-17-2014; Ambient Temp: 24.0°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 850, Body SAR, Back side, Mid.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.157 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.918 W/kg
SAR(1 g) = 0.740 W/kg



0 dB = 0.780 W/kg = -1.08 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

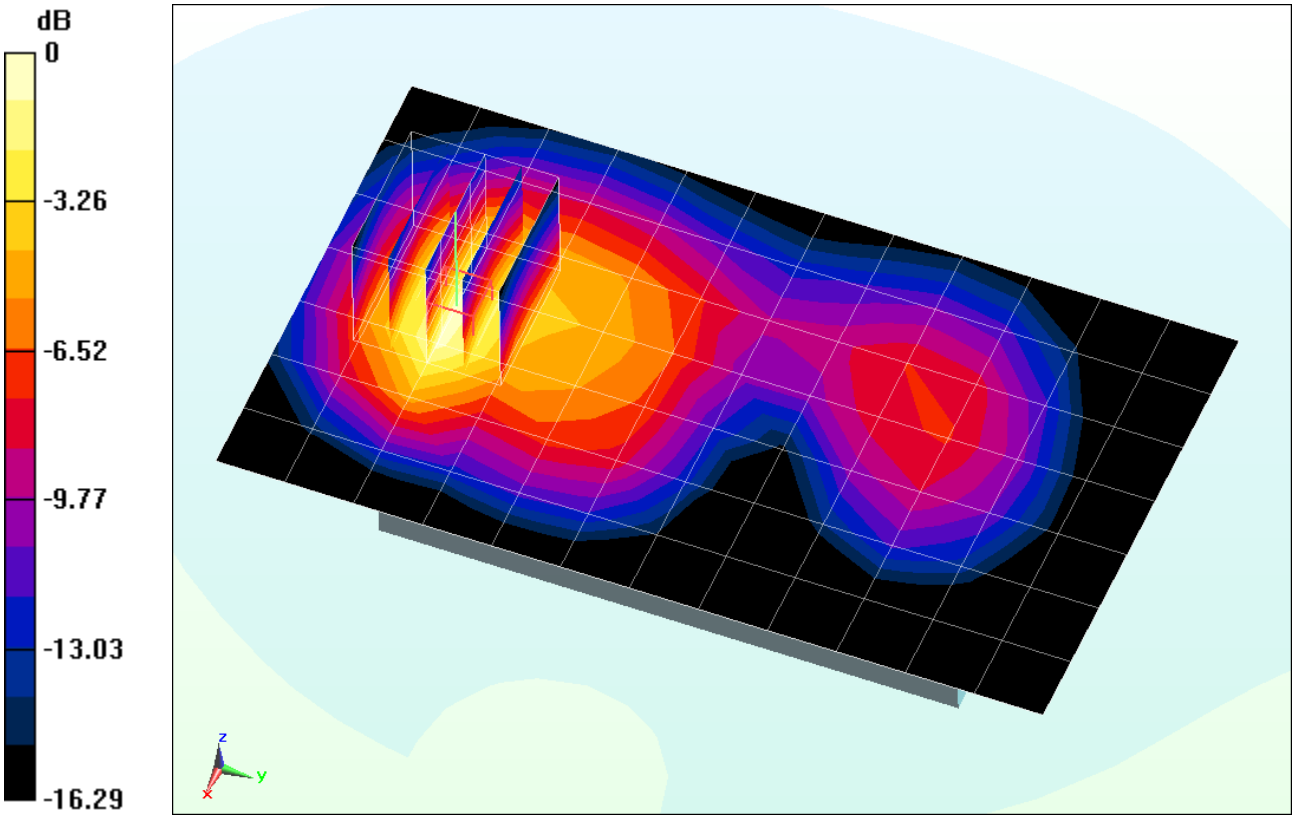
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.523 S/m; ε_r = 52.072; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-21-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.4°C

Probe: EX3DV4 - SN3914; ConvF(7.51, 7.51, 7.51); Calibrated: 10/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 1900, Body SAR, Back side, Mid.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.280 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.585 W/kg



0 dB = 0.654 W/kg = -1.84 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

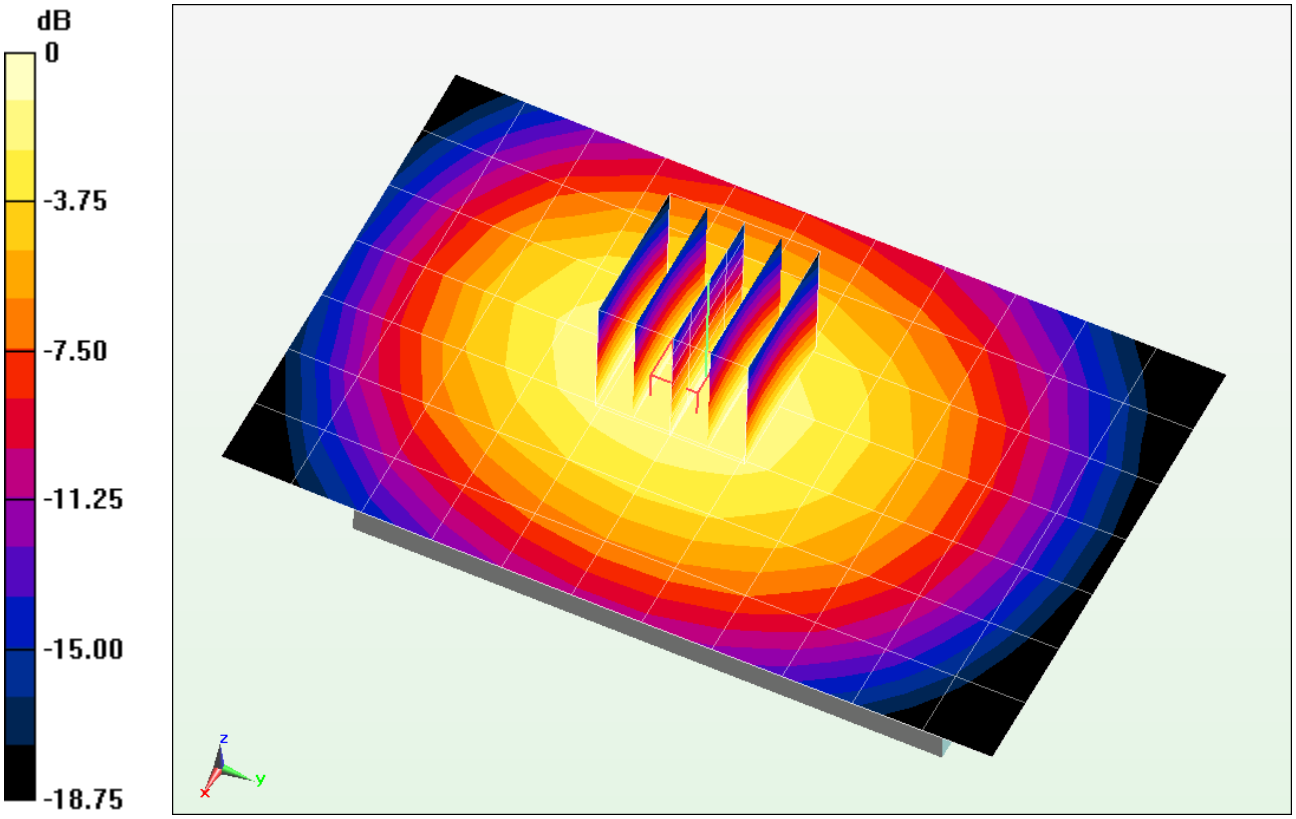
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.009 S/m; ε_r = 53.532; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-10-2014; Ambient Temp: 23.8°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3333; ConvF(6.07, 6.07, 6.07); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Body SAR, Back side, Mid.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.703 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.849 W/kg
SAR(1 g) = 0.675 W/kg



0 dB = 0.703 W/kg = -1.53 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

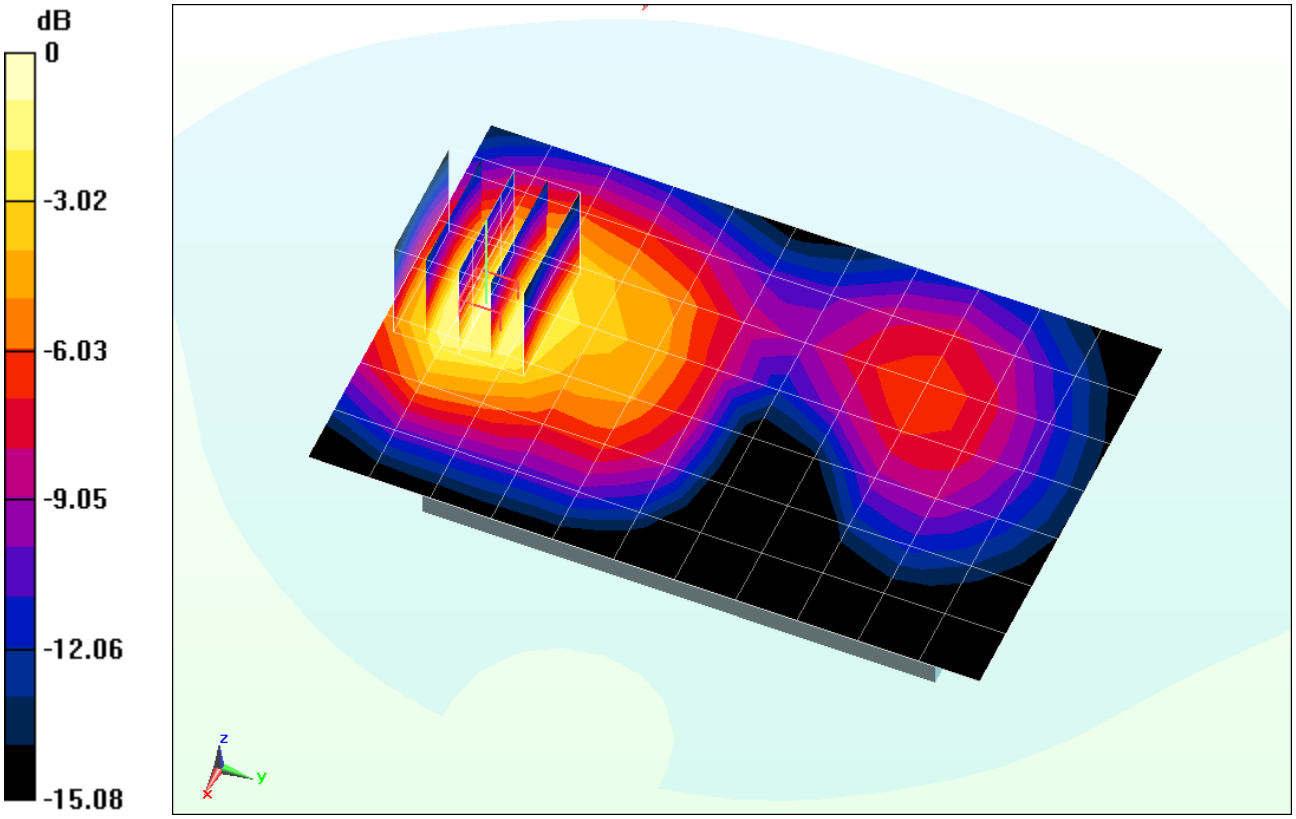
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.497 S/m; ε_r = 51.786; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-03-2014; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Body SAR, Back side, Mid.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.039 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.948 W/kg
SAR(1 g) = 0.599 W/kg



0 dB = 0.657 W/kg = -1.82 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270186

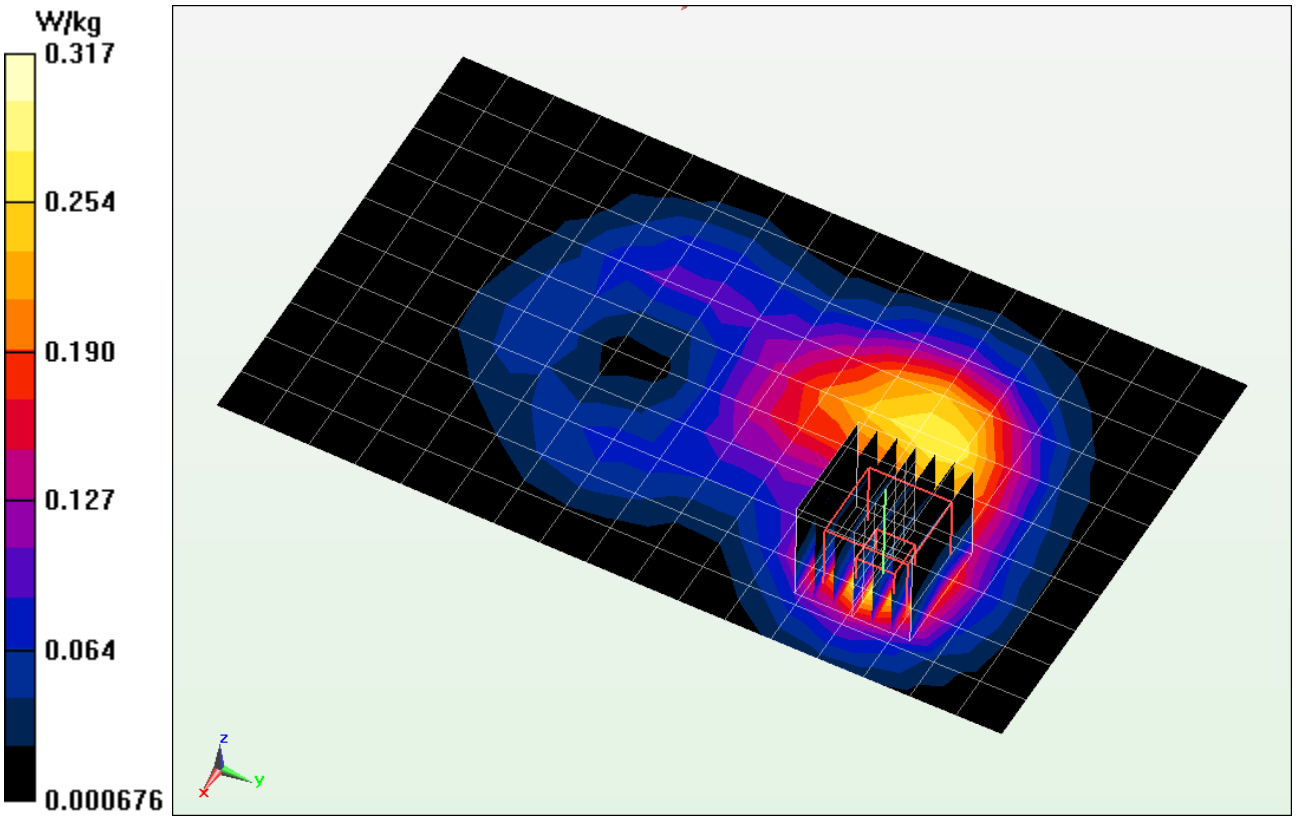
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.001 S/m; ε_r = 50.622; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-27-2014; Ambient Temp: 24.4°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.22, 4.22, 4.22); Calibrated: 11/22/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Front Side

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.352 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.158 W/kg



DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

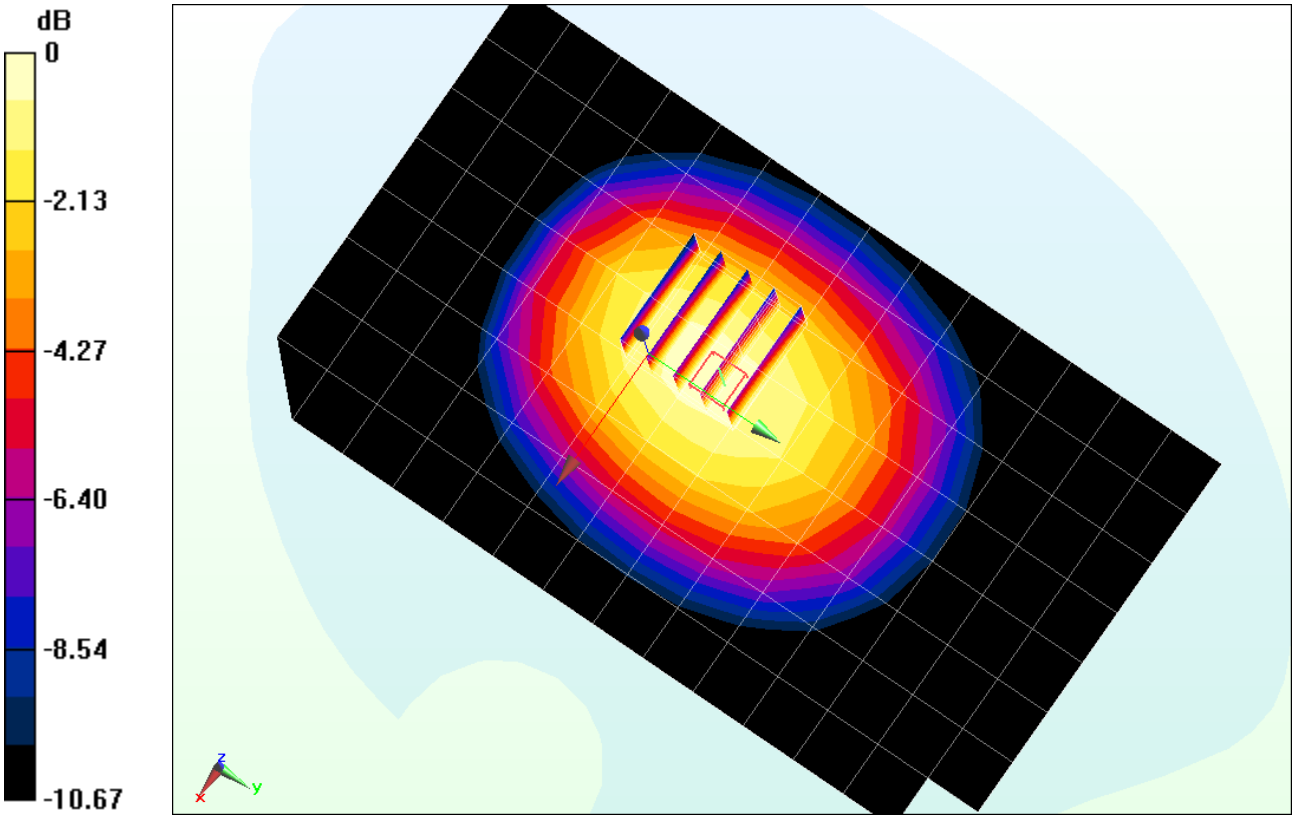
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 848.8 MHz; Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 848.8 MHz; σ = 1.02 S/m; ε_r = 54.674; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-17-2014; Ambient Temp: 24.0°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 850, Body SAR, Back side, High.ch, 2 Tx Slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.961 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 1.1 W/kg



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

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DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

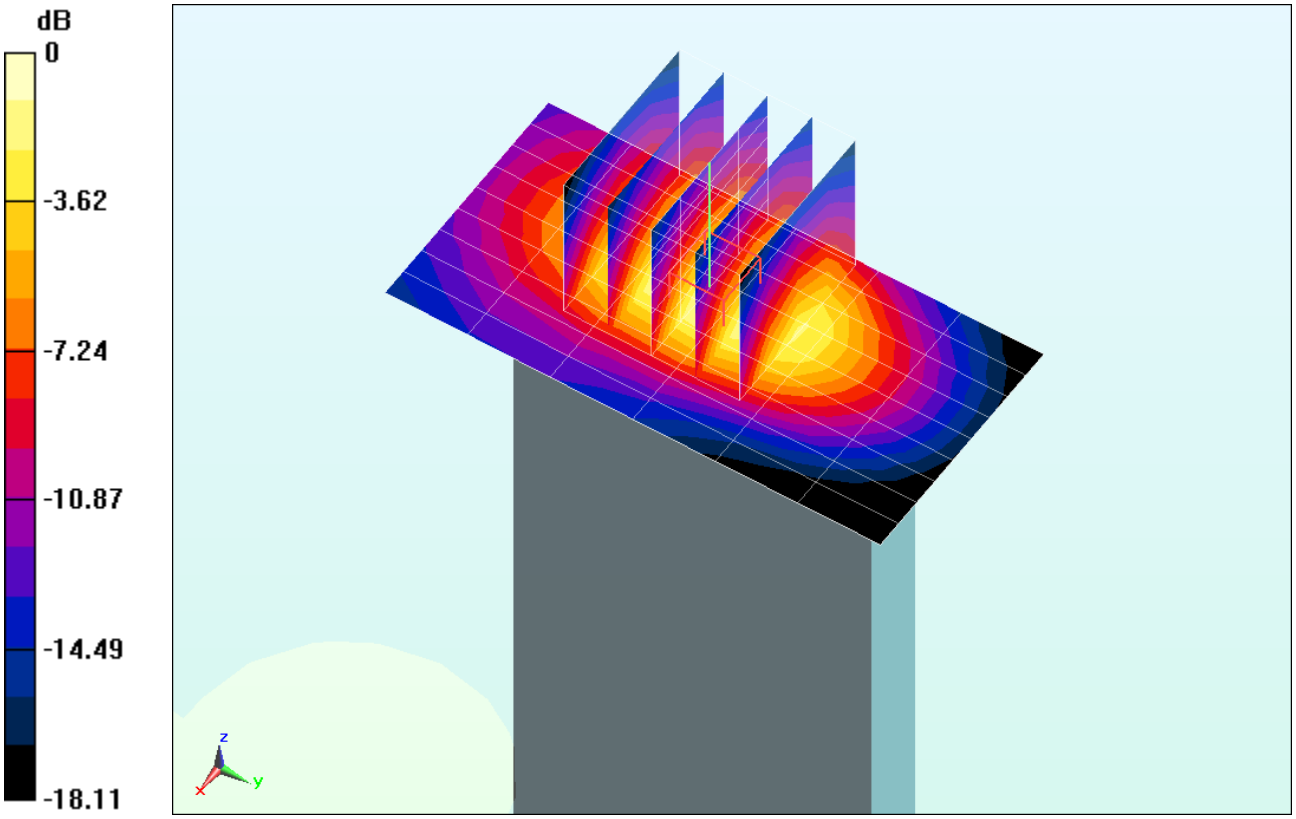
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15
Medium: 1900 Body; Medium parameters used:
f = 1910 MHz; σ = 1.558 S/m; ε_r = 51.274; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-10-2014; Ambient Temp: 22.4°C; Tissue Temp: 23.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Bottom Edge, High.ch, 2 Tx Slots

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.486 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 1.15 W/kg



0 dB = 1.26 W/kg = 1.00 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

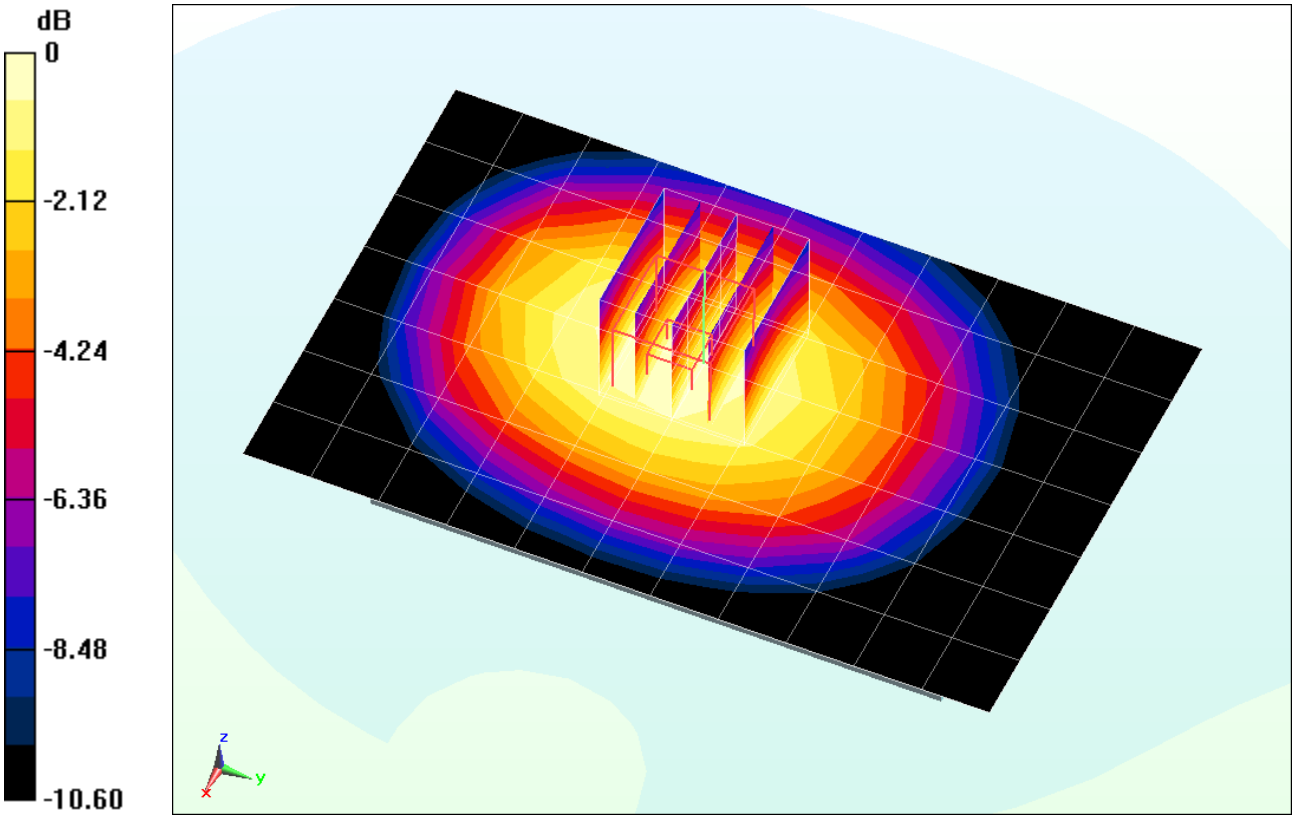
Communication System: UID 0, UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 846.6 MHz; σ = 1.018 S/m; ε_r = 54.696; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-17-2014; Ambient Temp: 24.0°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Body SAR, Back side, High.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.372 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.814 W/kg



0 dB = 0.852 W/kg = -0.70 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

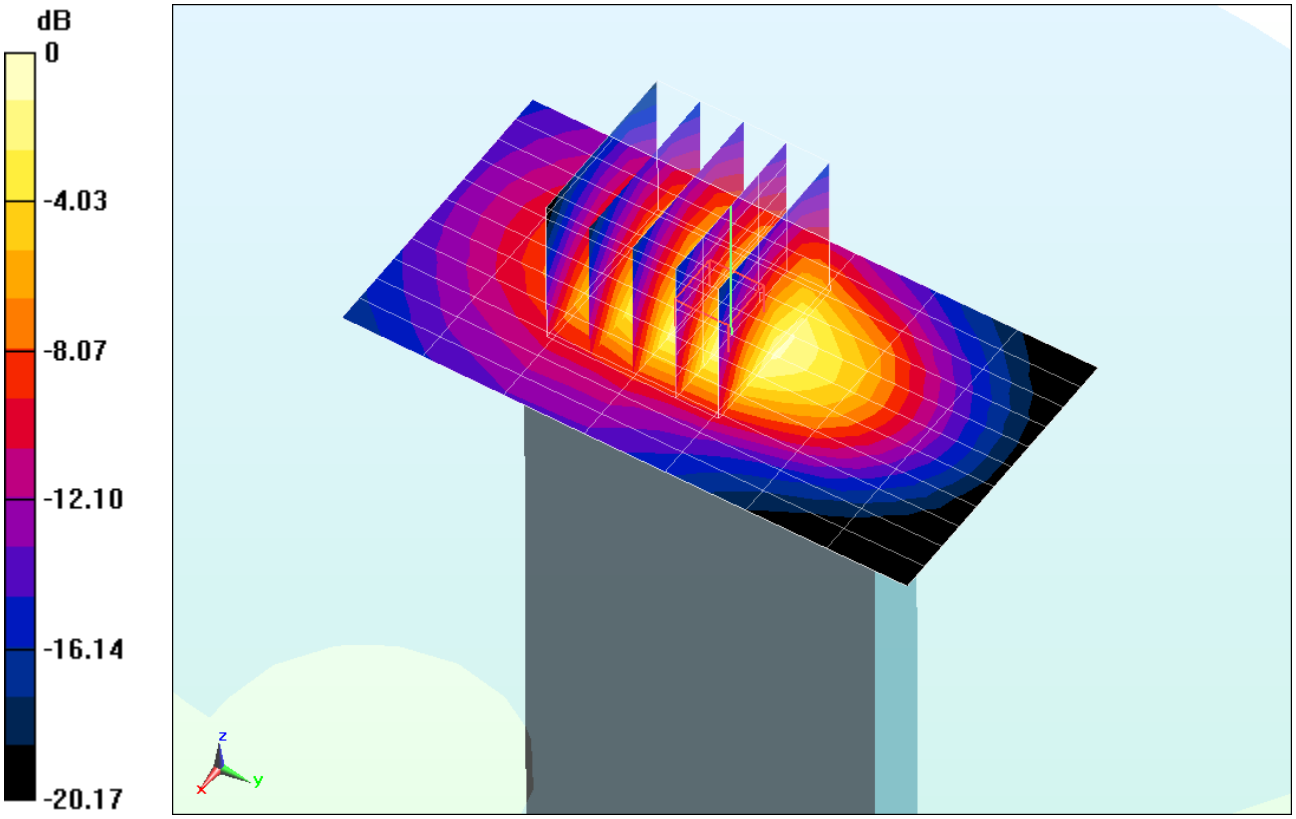
Communication System: UID 0, UMTS; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.529 S/m; ε_r = 51.679; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-03-2014; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Body SAR, Bottom Edge, High.ch

Area Scan (12x8x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.083 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 0.938 W/kg



0 dB = 1.02 W/kg = 0.09 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270186

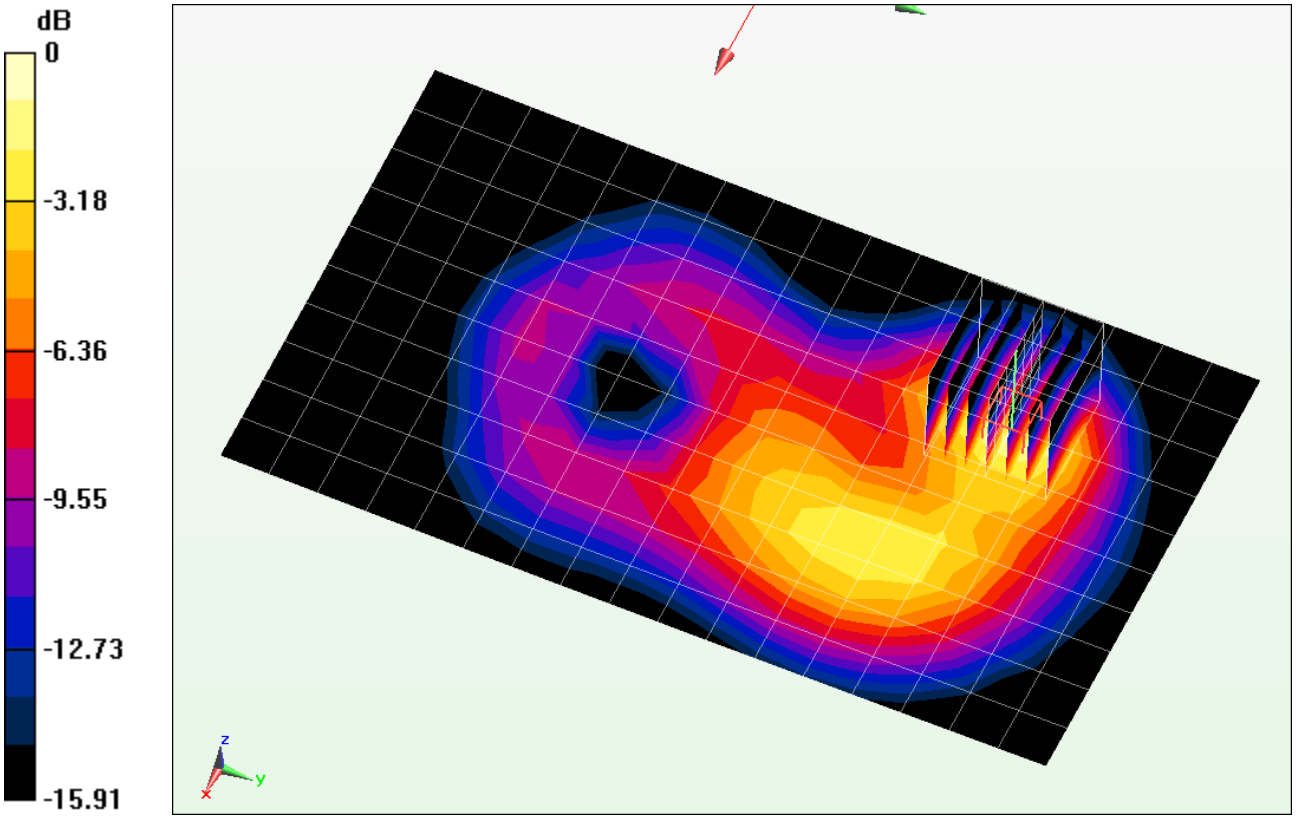
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.001 S/m; ε_r = 50.622; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2014; Ambient Temp: 24.4°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.22, 4.22, 4.22); Calibrated: 11/22/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Back Side

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.609 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.331 W/kg



0 dB = 0.434 W/kg = -3.63 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

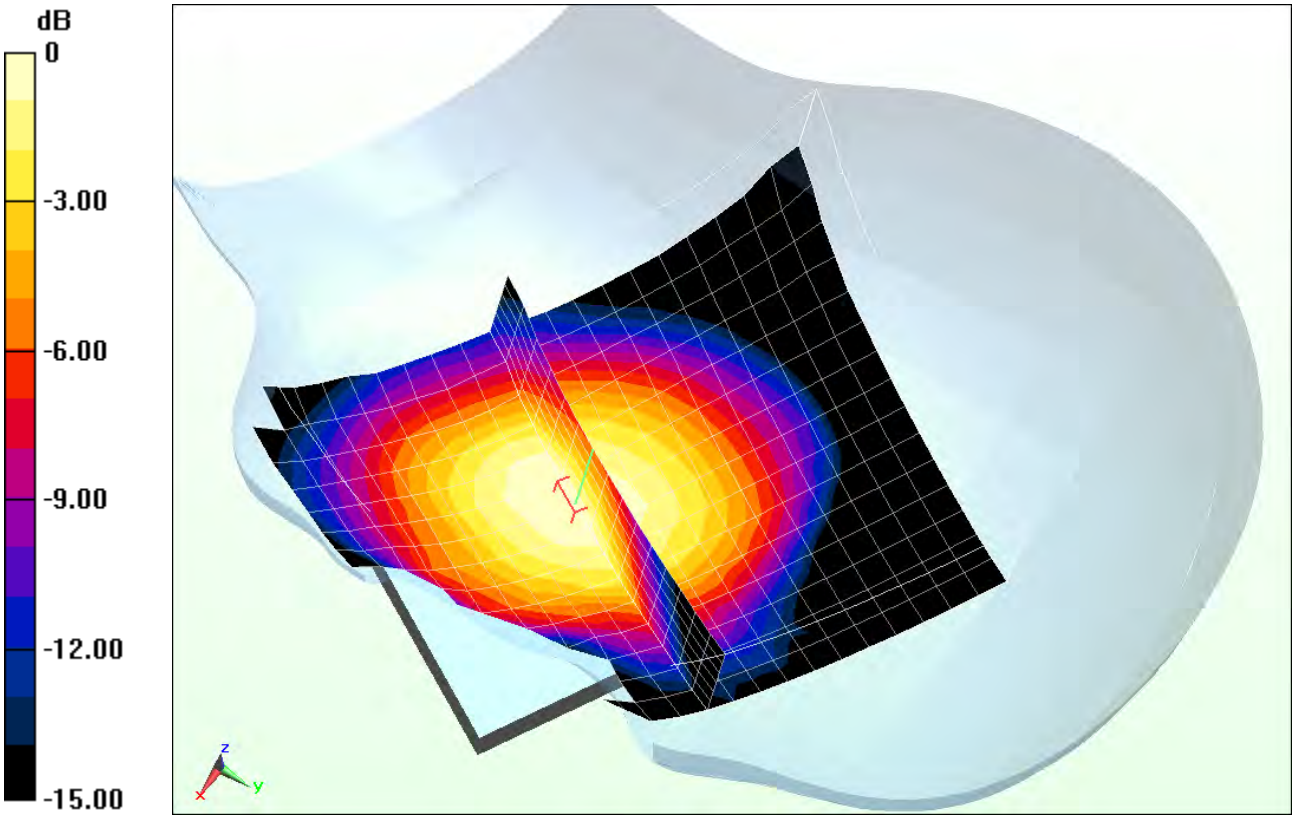
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.893 S/m; ε_r = 39.845; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-06-2014; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3319; ConvF(6.23, 6.23, 6.23); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 850, Left Head, Cheek, Mid.ch

Zoom Scan (16x21x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.931 V/m; Power Drift = -0.21 dB
Peak SAR (extrapolated) = 0.515 W/kg
SAR(1 g) = 0.394 W/kg



0 dB = 0.416 W/kg = -3.81 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

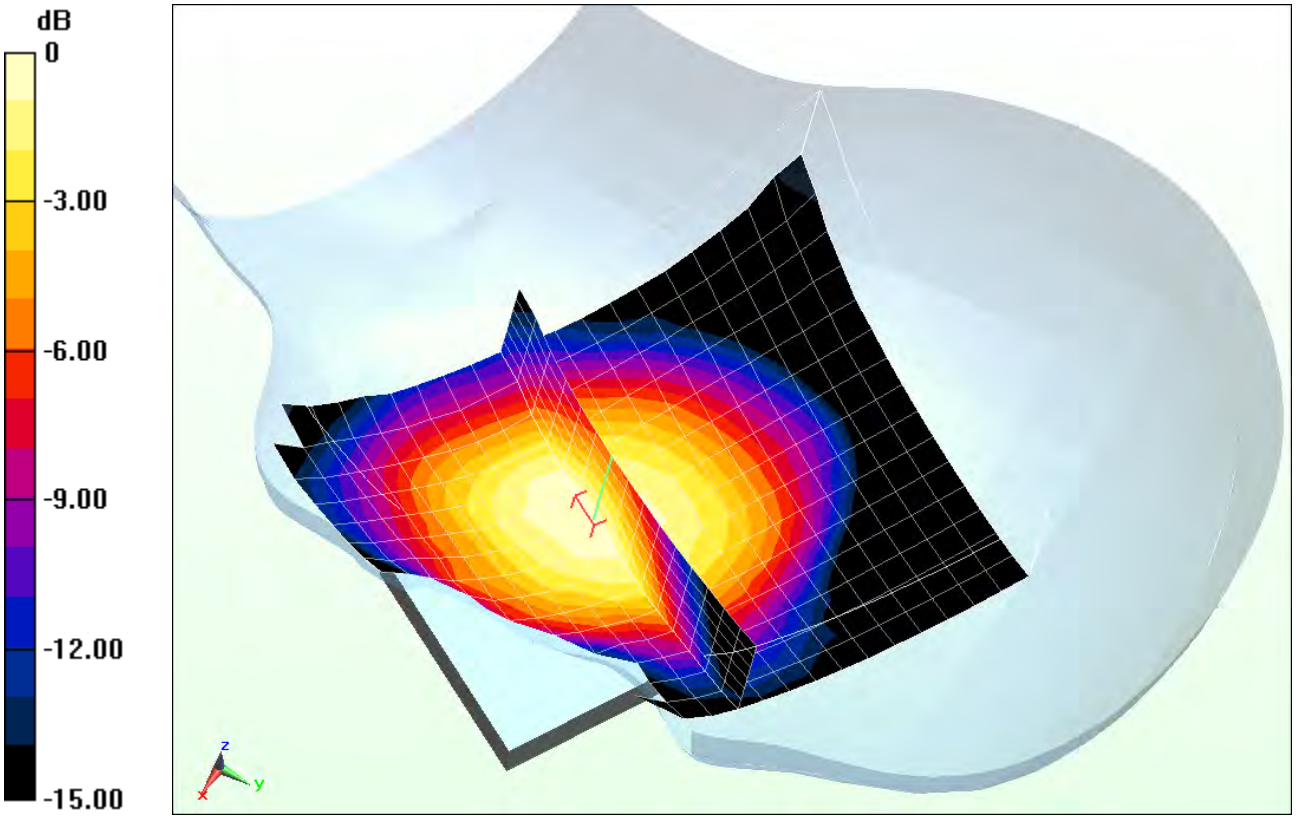
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.893 S/m; ε_r = 39.845; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-06-2014; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3319; ConvF(6.23, 6.23, 6.23); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Left Head, Cheek, Mid.ch

Zoom Scan (16x21x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.652 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.321 W/kg



0 dB = 0.341 W/kg = -4.67 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270111

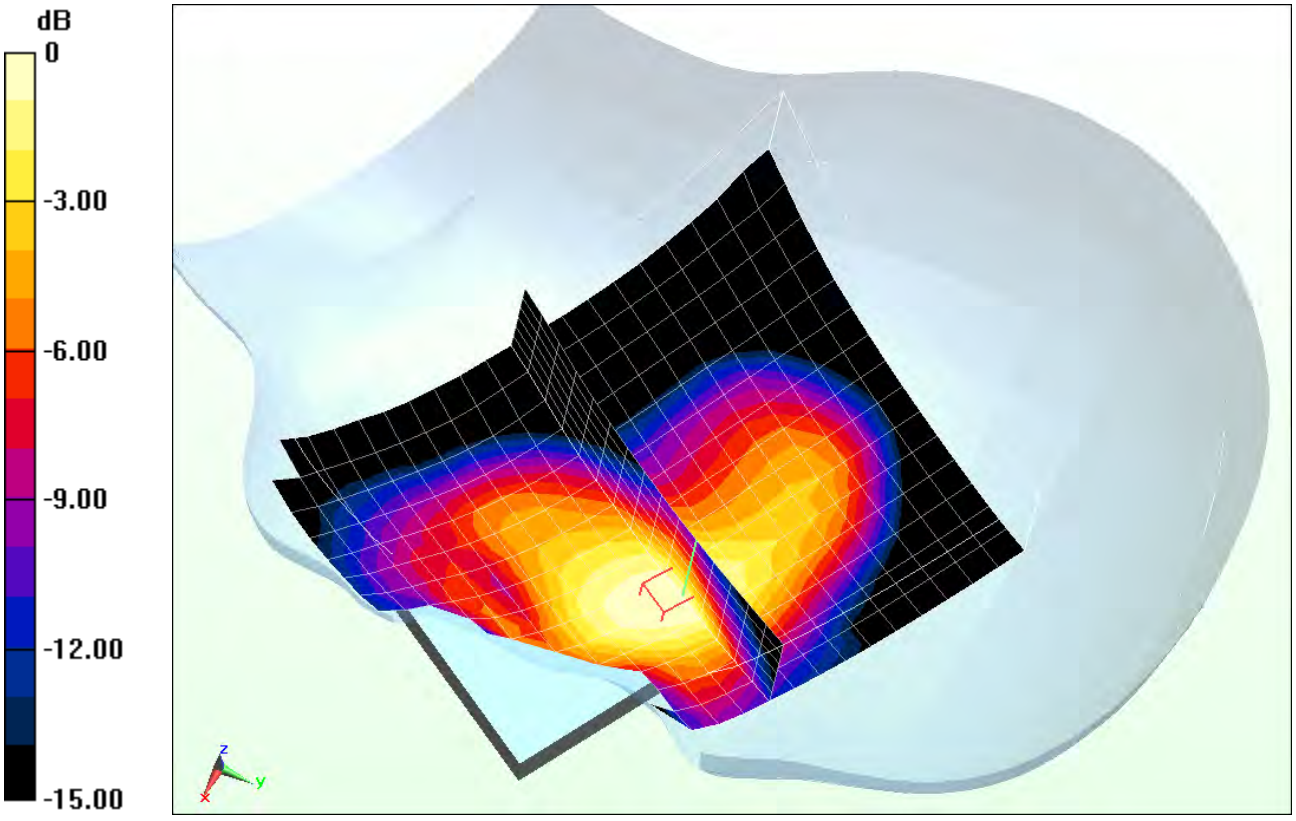
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.433 S/m; ε_r = 41.107; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-05-2014; Ambient Temp: 24.3°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(7.05, 7.05, 7.05); Calibrated: 1/29/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Left Head, Cheek, Mid.ch

Zoom Scan (16x21x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.832 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.505 W/kg
SAR(1 g) = 0.349 W/kg



0 dB = 0.376 W/kg = -4.25 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset; Serial: LETA270186

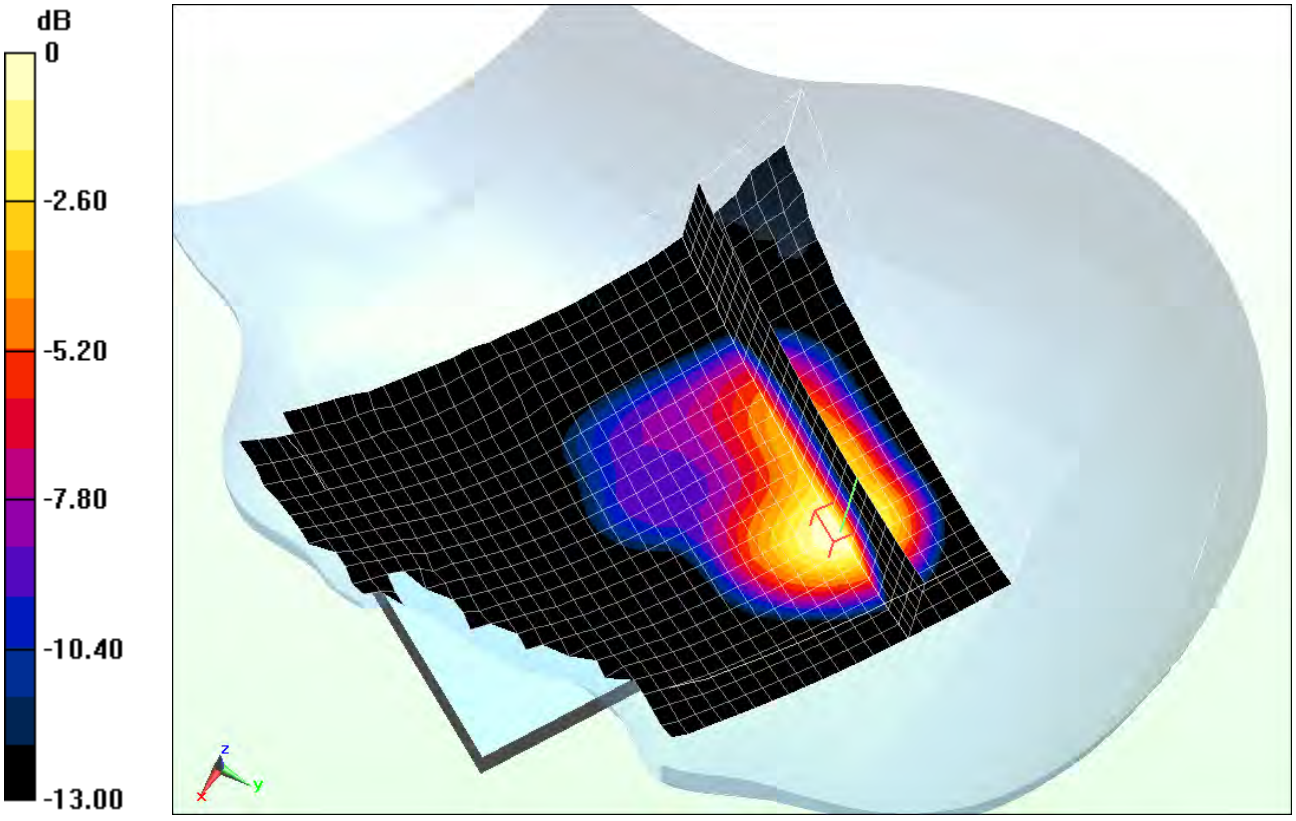
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.804 S/m; ε_r = 38.164; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-10-2014; Ambient Temp: 24.4°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3914; ConvF(6.95, 6.95, 6.95); Calibrated: 10/23/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Left Head, Cheek, Ch 06, 1 Mbps

Zoom Scan (25x33x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.023 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 2.26 W/kg
SAR(1 g) = 1.23 W/kg



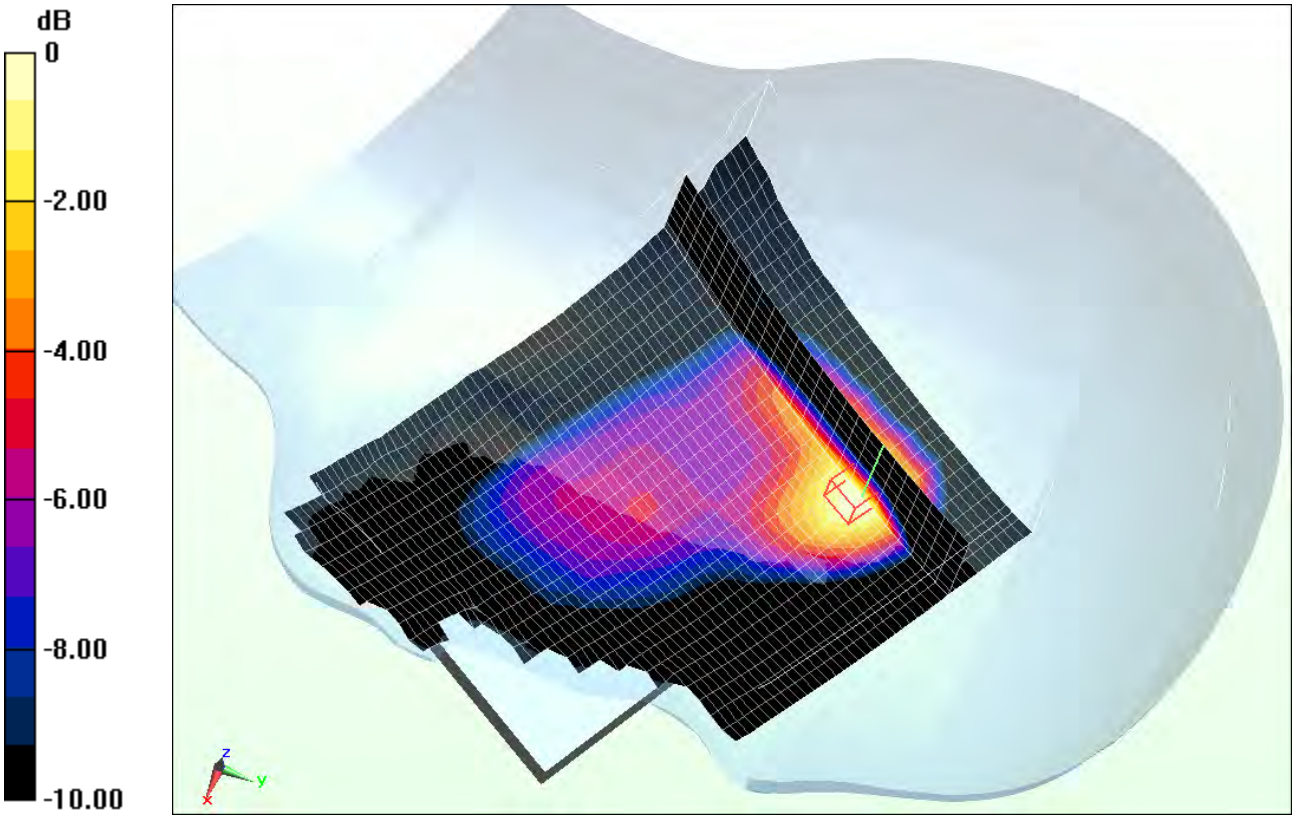
0 dB = 1.59 W/kg = 2.01 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset

Mode: GSM 850, Left Head, Cheek, Mid.ch, Scaling Factor: 1.23
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 = 0.893 S/m; ε_r = 39.845; ρ = 1000 kg/m^3
Phantom section: Left Section

Mode: IEEE 802.11b, Left Head, Cheek, Ch 06, 1 Mbps, Scaling Factor: 1.122
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 = 1.804 S/m; ε_r = 38.164; ρ = 1000 kg/m^3
Phantom section: Left Section

Multi Band Result:
SAR(1 g) = 1.39 W/kg



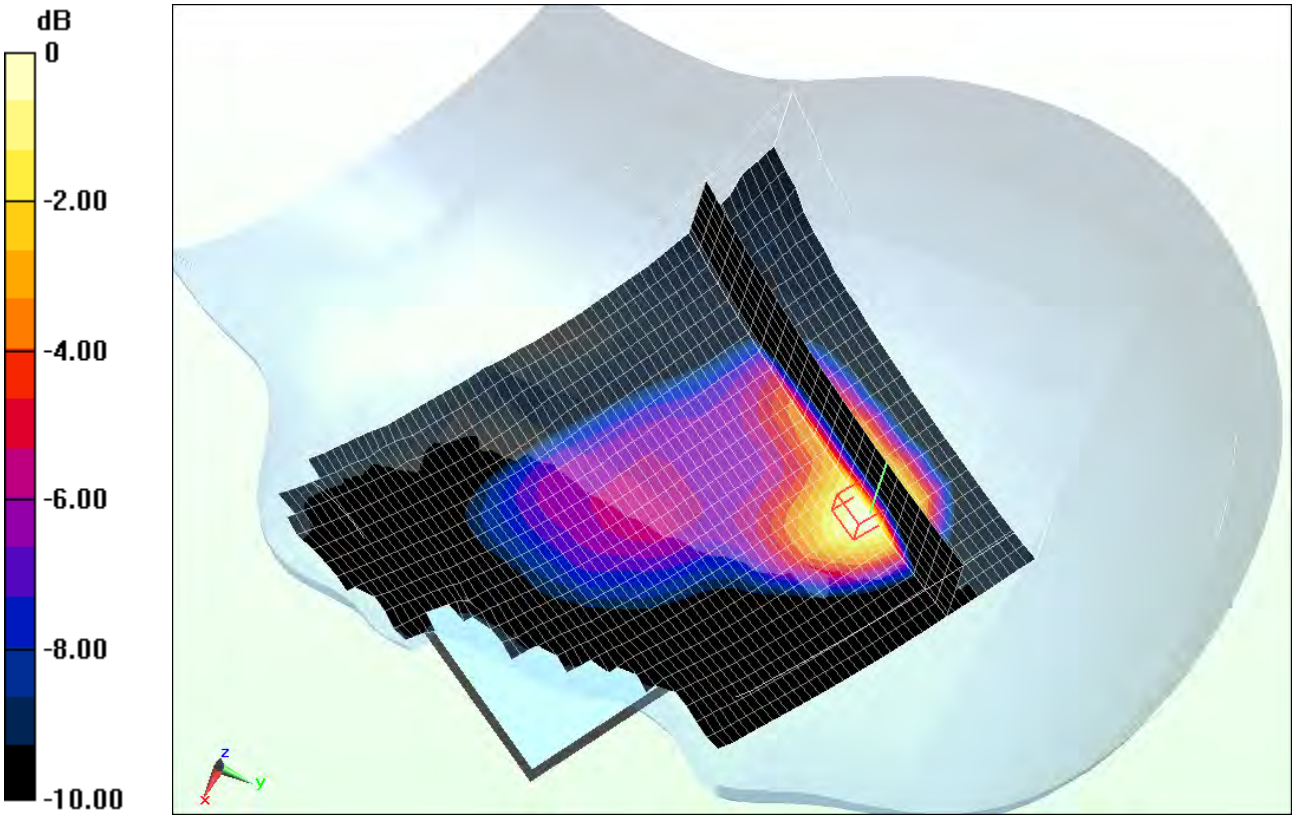
0 dB = 2.60 W/kg = 4.15 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset

Mode: UMTS 850, Left Head, Cheek, Mid.ch, Scaling Factor: 1.419
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 = 0.893 S/m; ε_r = 39.845; ρ = 1000 kg/m^3
Phantom section: Left Section

Mode: IEEE 802.11b, Left Head, Cheek, Ch 06, 1 Mbps, Scaling Factor: 1.122
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 = 1.804 S/m; ε_r = 38.164; ρ = 1000 kg/m^3
Phantom section: Left Section

Multi Band Result:
SAR(1 g) = 1.39 W/kg



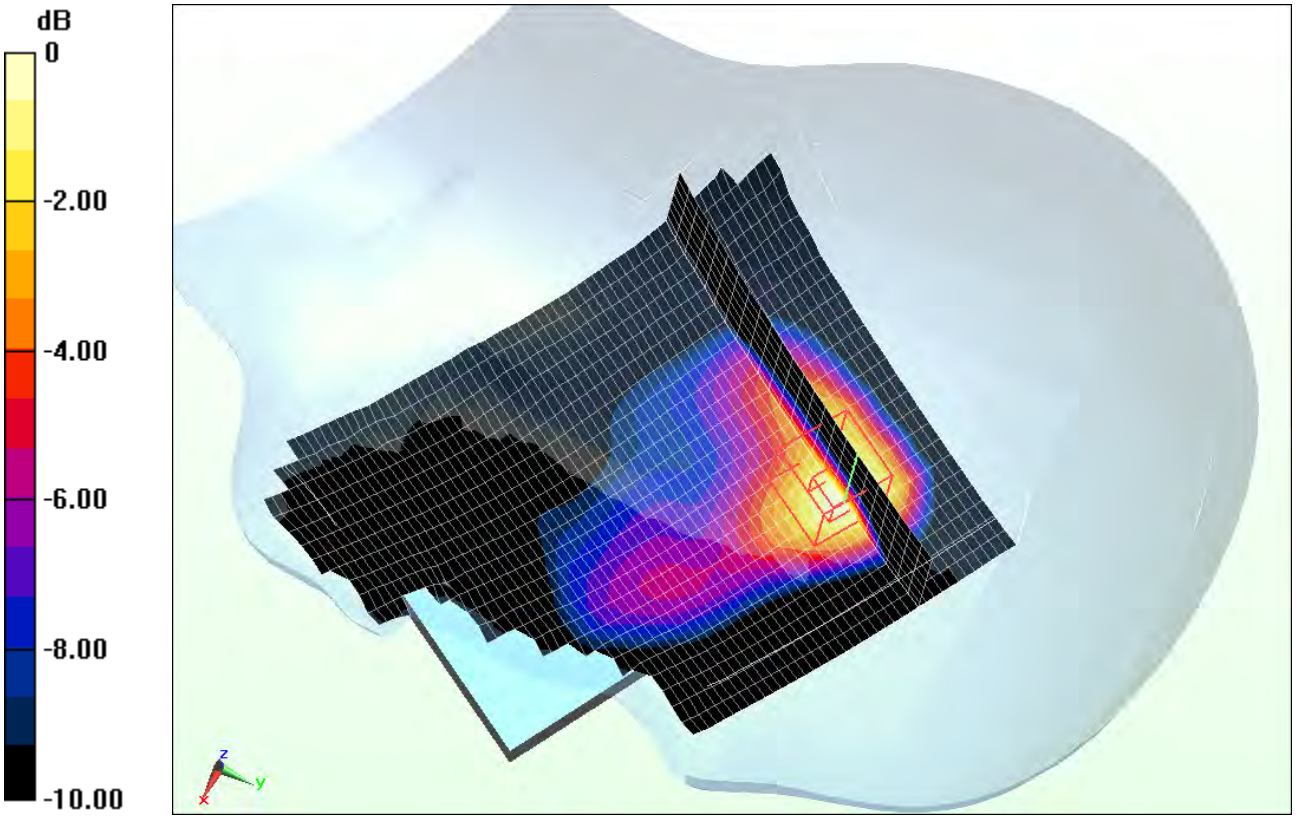
0 dB = 2.60 W/kg = 4.15 dBW/kg

DUT: IHDT56PJ1; Type: Portable Handset

Mode: UMTS 1900, Left Head, Cheek, Mid.ch, Scaling Factor: 1.521
Communication System: UID 0, UMTS; 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.433 S/m; ε_r = 41.107; ρ = 1000 kg/m^3
Phantom section: Left Section

Mode: IEEE 802.11b, Left Head, Cheek, Ch 06, 1 Mbps, Scaling Factor: 1.122
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 = 1.804 S/m; ε_r = 38.164; ρ = 1000 kg/m^3
Phantom section: Left Section

Multi Band Result:
SAR(1 g) = 1.53 W/kg



0 dB = 2.79 W/kg = 4.46 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

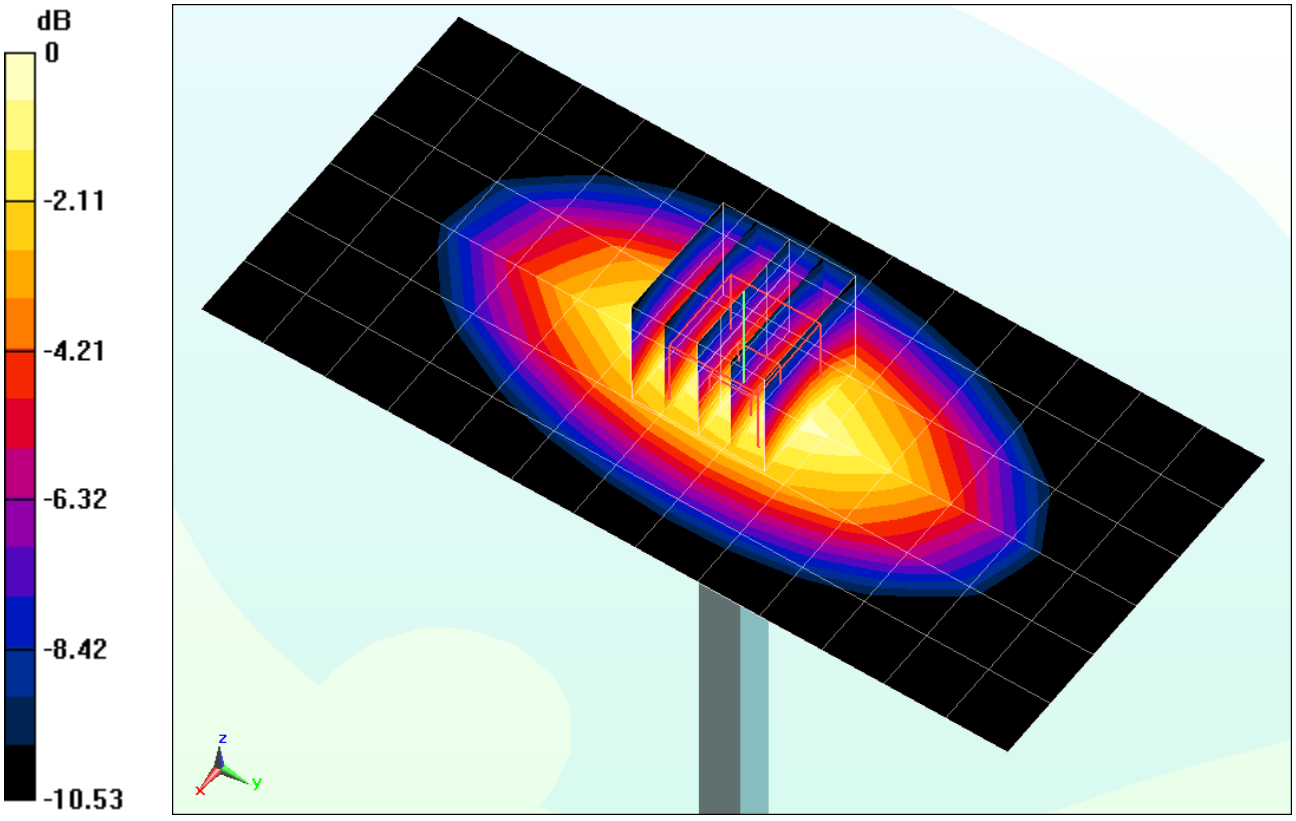
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used:
f = 835 MHz; σ = 0.939 S/m; ε_r = 42.81; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-19-2014; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.956 W/kg
Deviation = -1.24%



0 dB = 1.03 W/kg = 0.13 dBW/kg

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

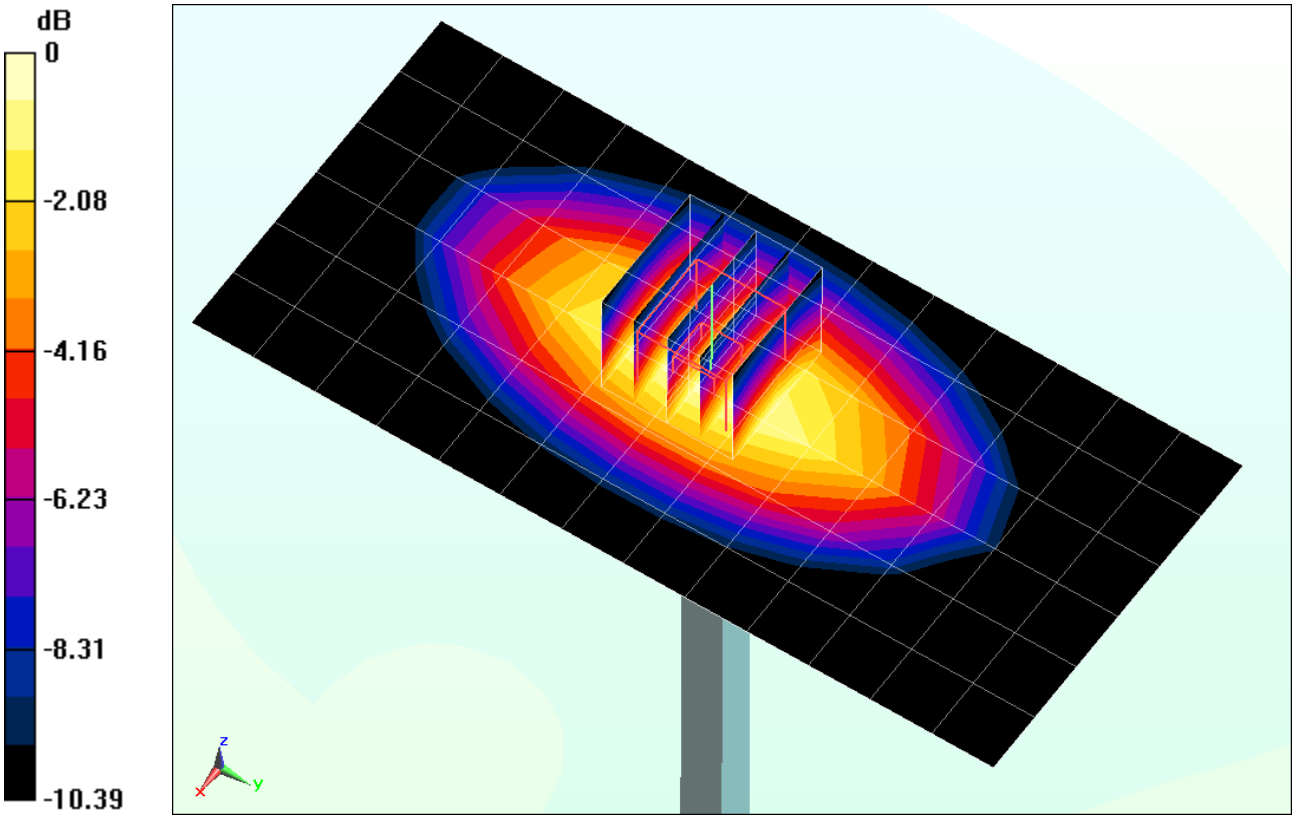
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used:
f = 835 MHz; σ = 0.892 S/m; ε_r = 39.863; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-06-2014; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3319; ConvF(6.23, 6.23, 6.23); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.974 W/kg
Deviation = 0.62%



0 dB = 1.06 W/kg = 0.25 dBW/kg

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

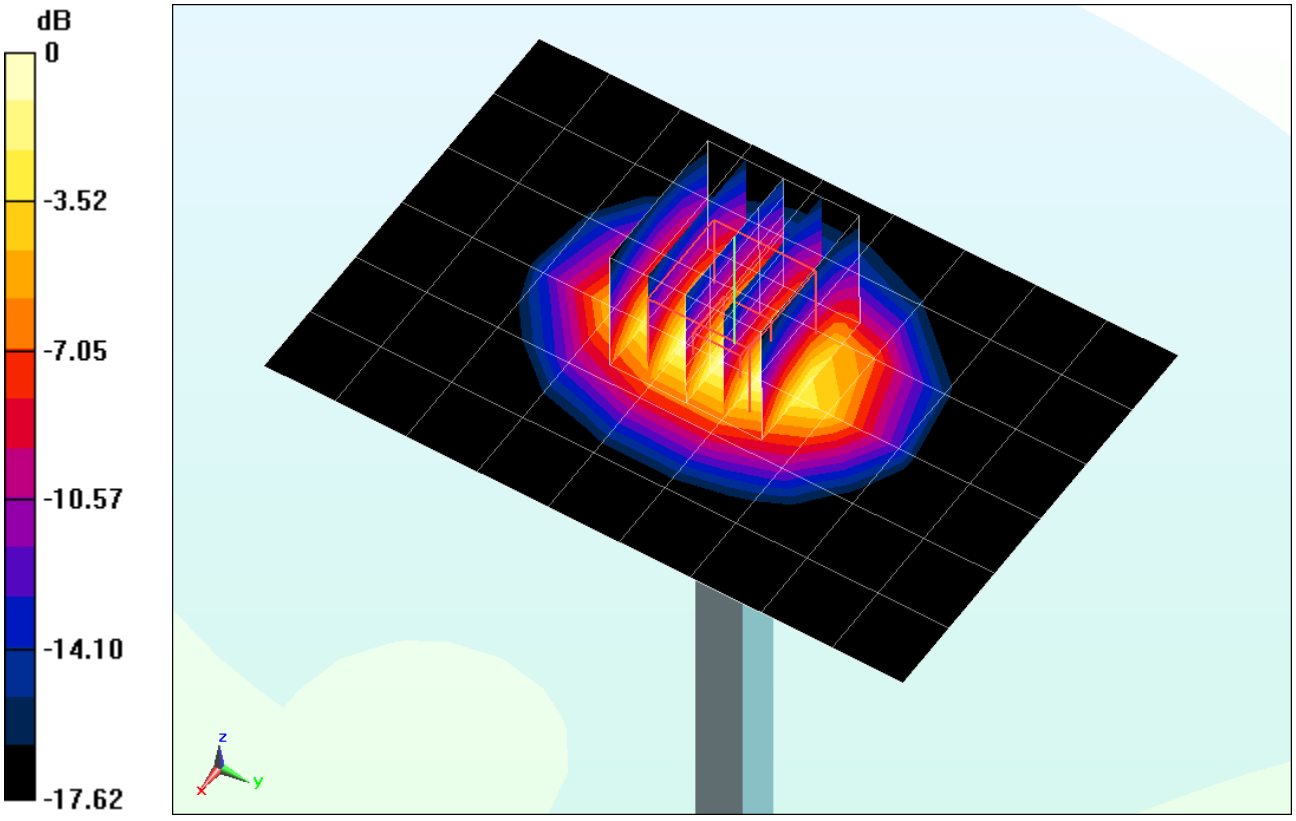
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.398 S/m; ε_r = 39.245; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-17-2014; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(5.03, 5.03, 5.03); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.94 W/kg
SAR(1 g) = 3.8 W/kg
Deviation = -5.94%



0 dB = 4.27 W/kg = 6.30 dBW/kg

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

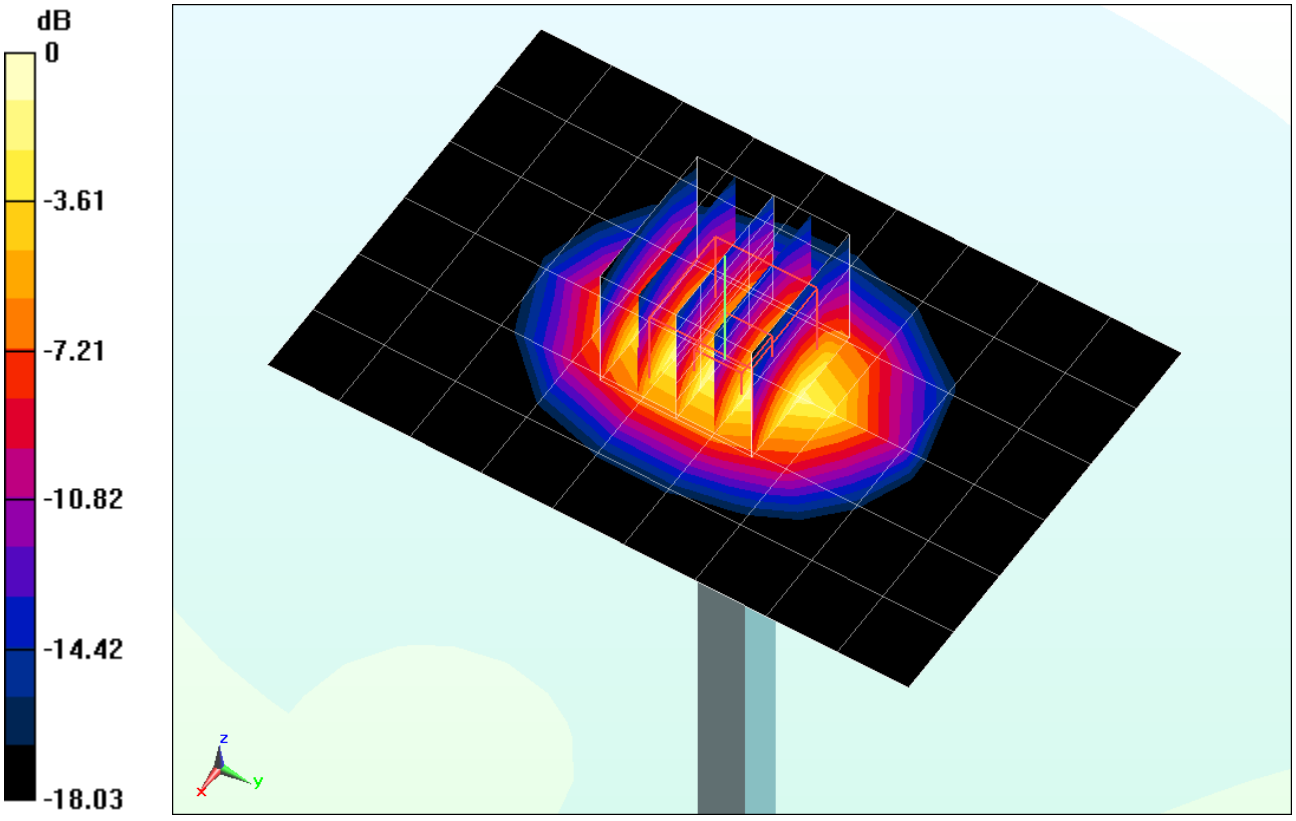
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.456 S/m; ε_r = 41.027; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-05-2014; Ambient Temp: 24.3°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(7.05, 7.05, 7.05); Calibrated: 1/29/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.33 W/kg
SAR(1 g) = 3.94 W/kg
Deviation = -2.48%



0 dB = 4.42 W/kg = 6.45 dBW/kg

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

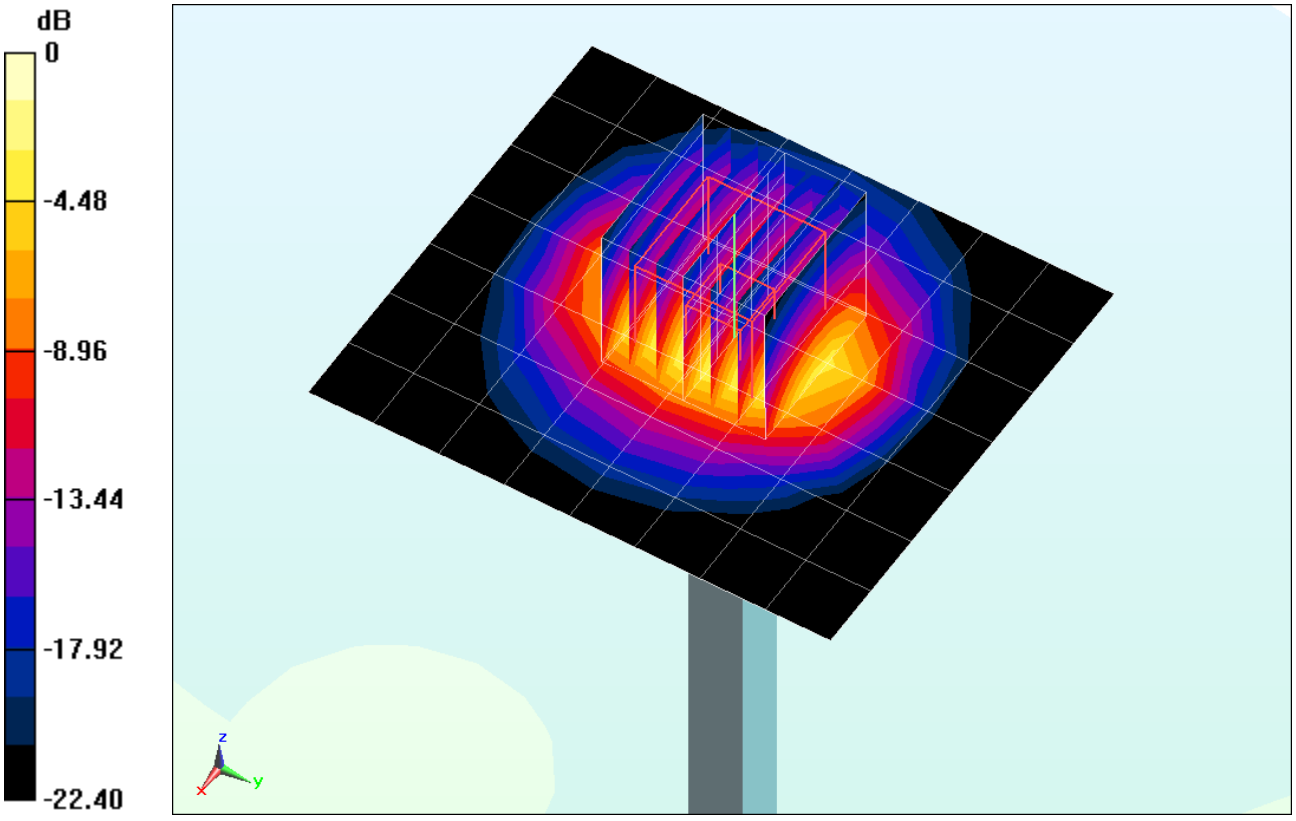
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used:
f = 2450 MHz; σ = 1.785 S/m; ε_r = 38.027; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.58 W/kg
Deviation = 4.89%



0 dB = 7.24 W/kg = 8.60 dBW/kg

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

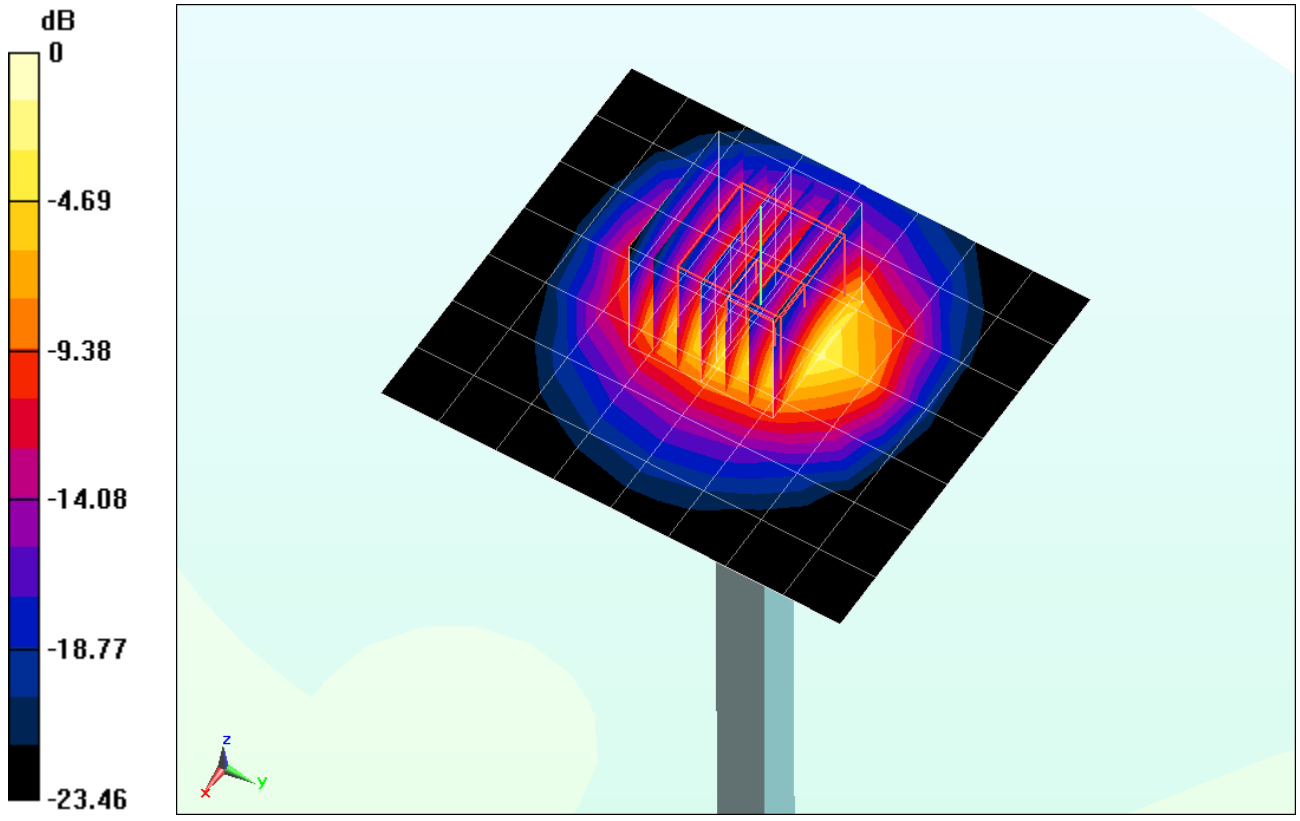
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used:
f = 2450 MHz; σ = 1.819 S/m; ε_r = 38.117; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-10-2014; Ambient Temp: 24.4°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3914; ConvF(6.95, 6.95, 6.95); Calibrated: 10/23/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 4.38 W/kg
SAR(1 g) = 2.11 W/kg
Deviation = -0.85%



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

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

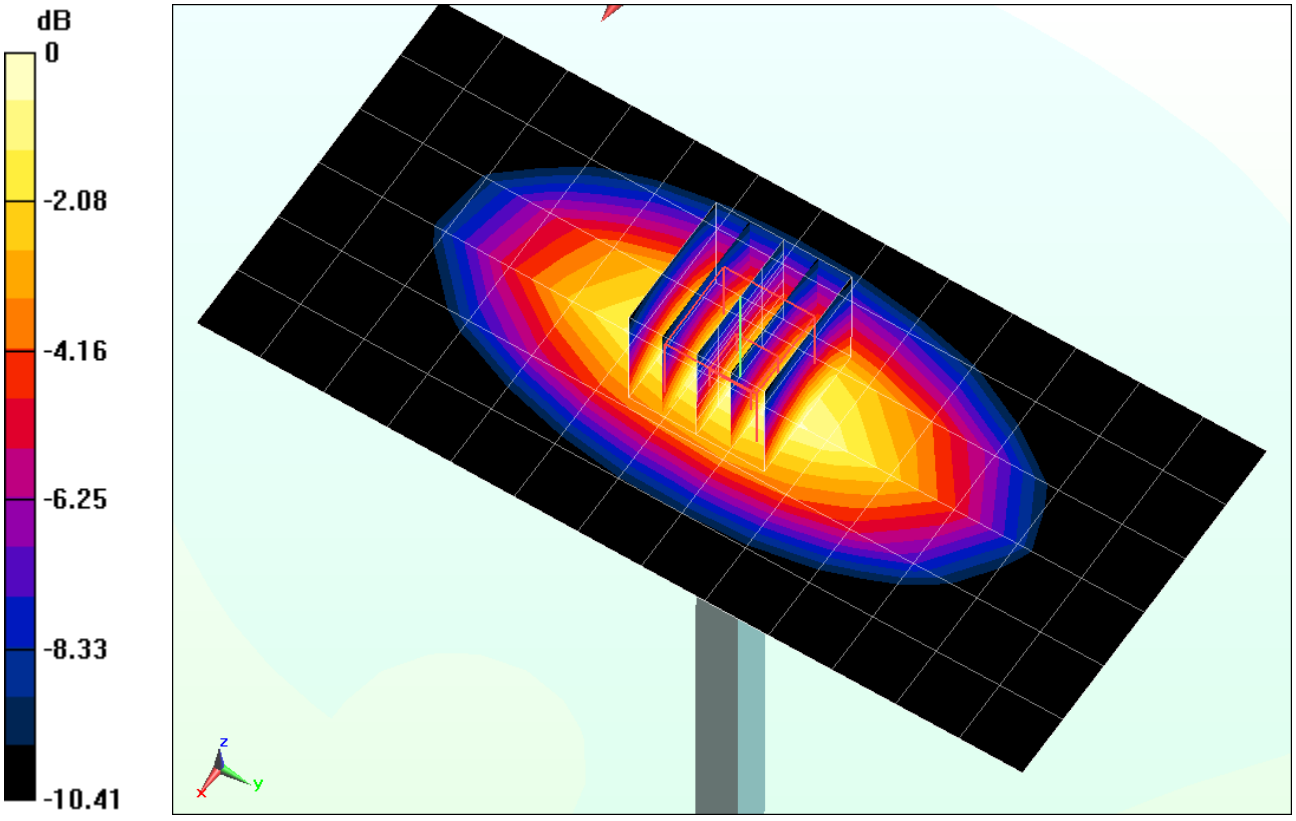
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used:
f = 835 MHz; σ = 1.006 S/m; ε_r = 54.81; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-17-2014; Ambient Temp: 24.0°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.925 W/kg
Deviation = -3.04%



0 dB = 1.00 W/kg = 0.00 dBW/kg

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

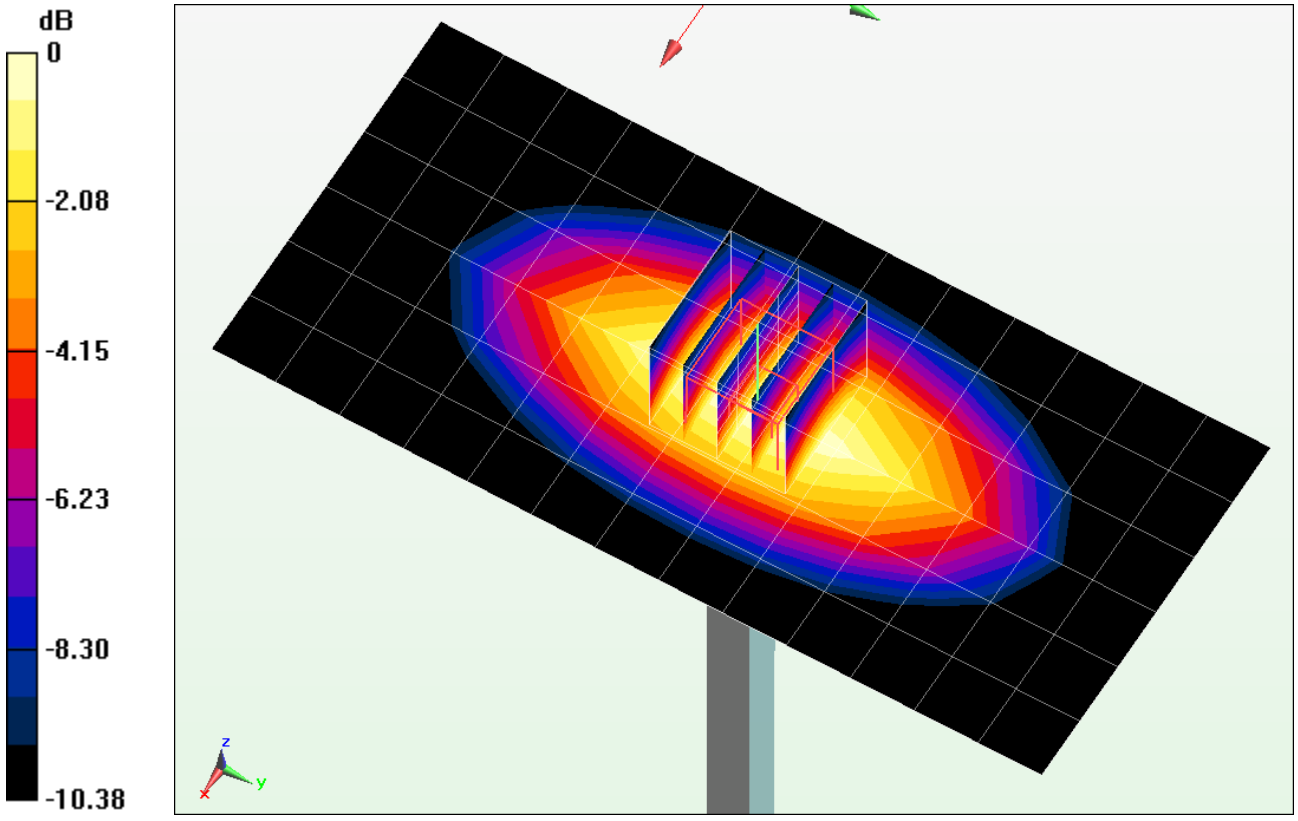
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used:
f = 835 MHz; σ = 1.007 S/m; ε_r = 53.551; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-10-2014; Ambient Temp: 23.8°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3333; ConvF(6.07, 6.07, 6.07); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.982 W/kg
Deviation = 2.94%



0 dB = 1.06 W/kg = 0.25 dBW/kg

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

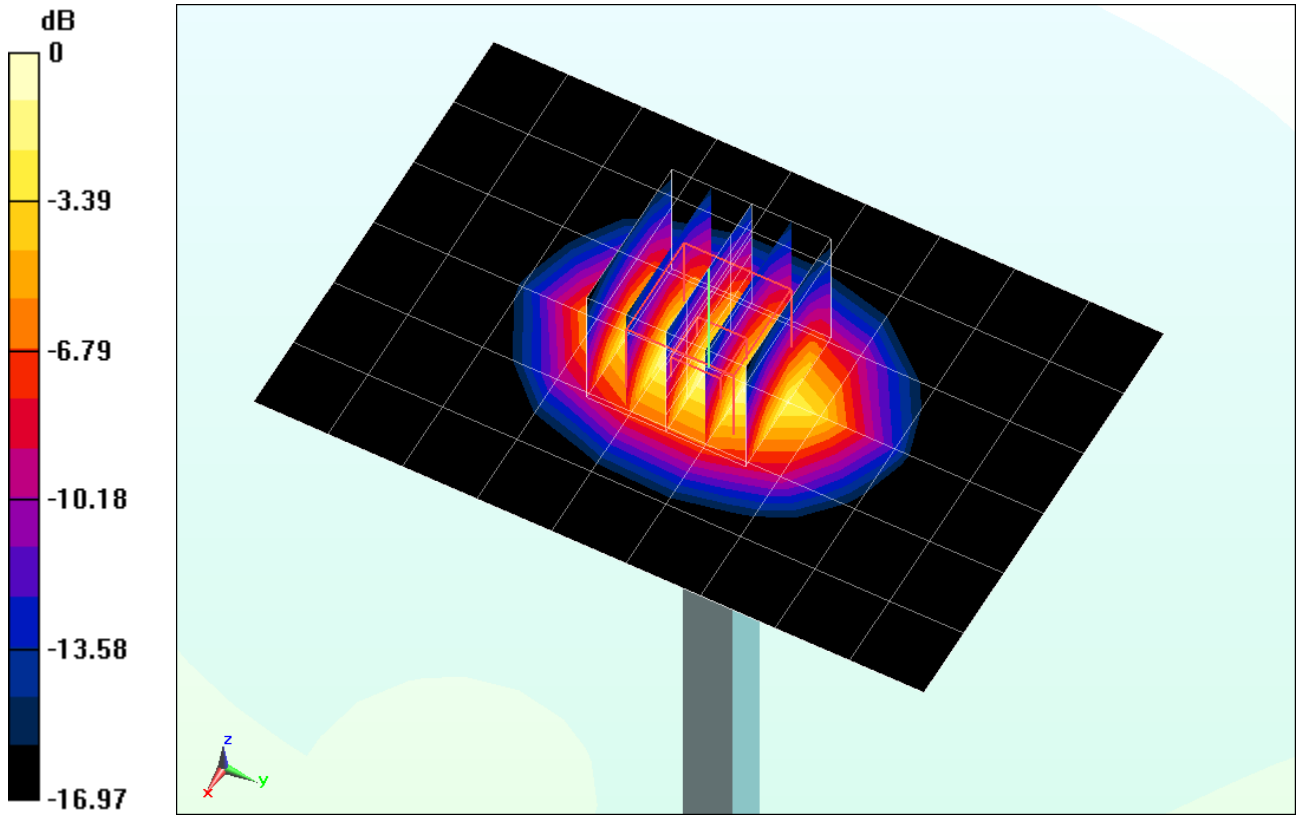
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.546 S/m; ε_r = 51.993; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.4°C

Probe: EX3DV4 - SN3914; ConvF(7.51, 7.51, 7.51); Calibrated: 10/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.40 W/kg
SAR(1 g) = 4.11 W/kg
Deviation = 1.48%



0 dB = 4.63 W/kg = 6.66 dBW/kg

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

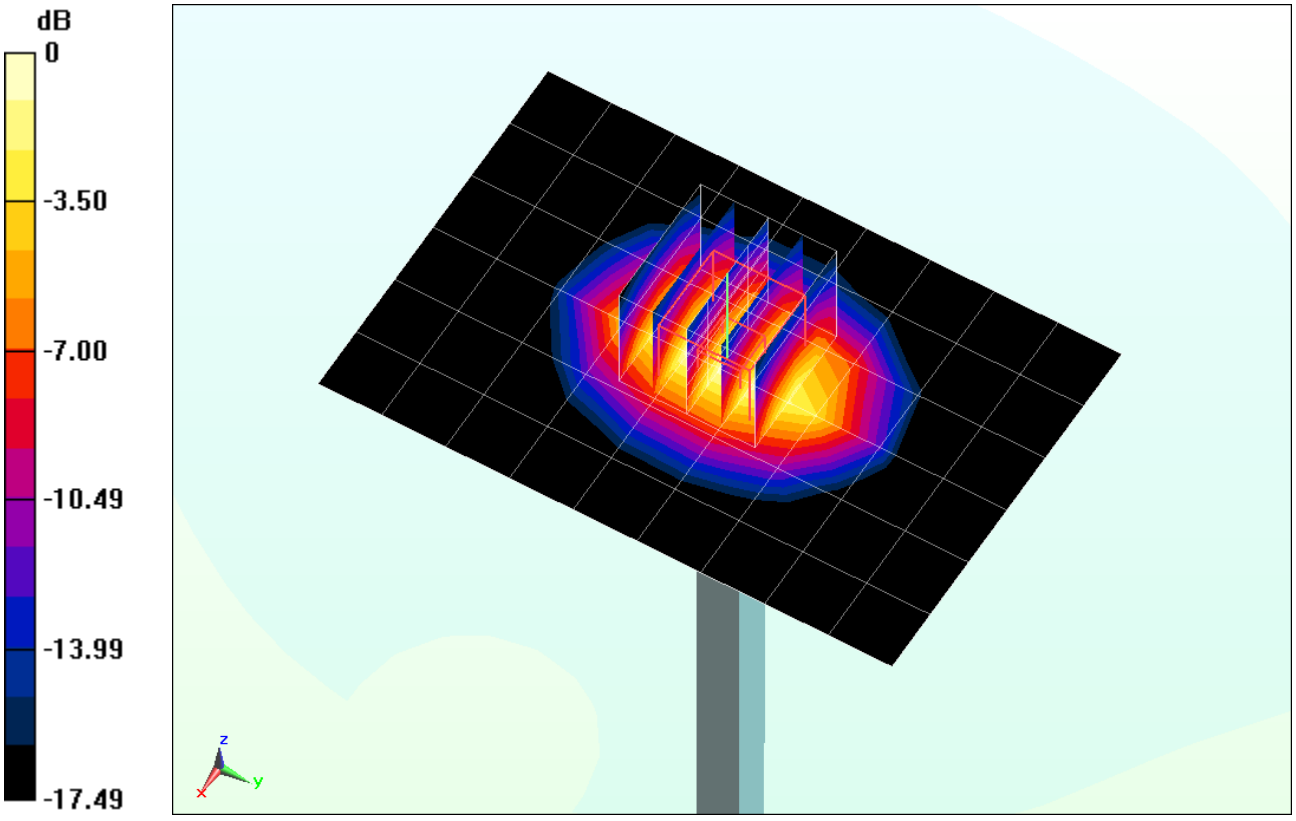
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.52 S/m; ε_r = 51.709; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-03-2014; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.97 W/kg
SAR(1 g) = 3.85 W/kg
Deviation = -4.94%



0 dB = 4.32 W/kg = 6.35 dBW/kg

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

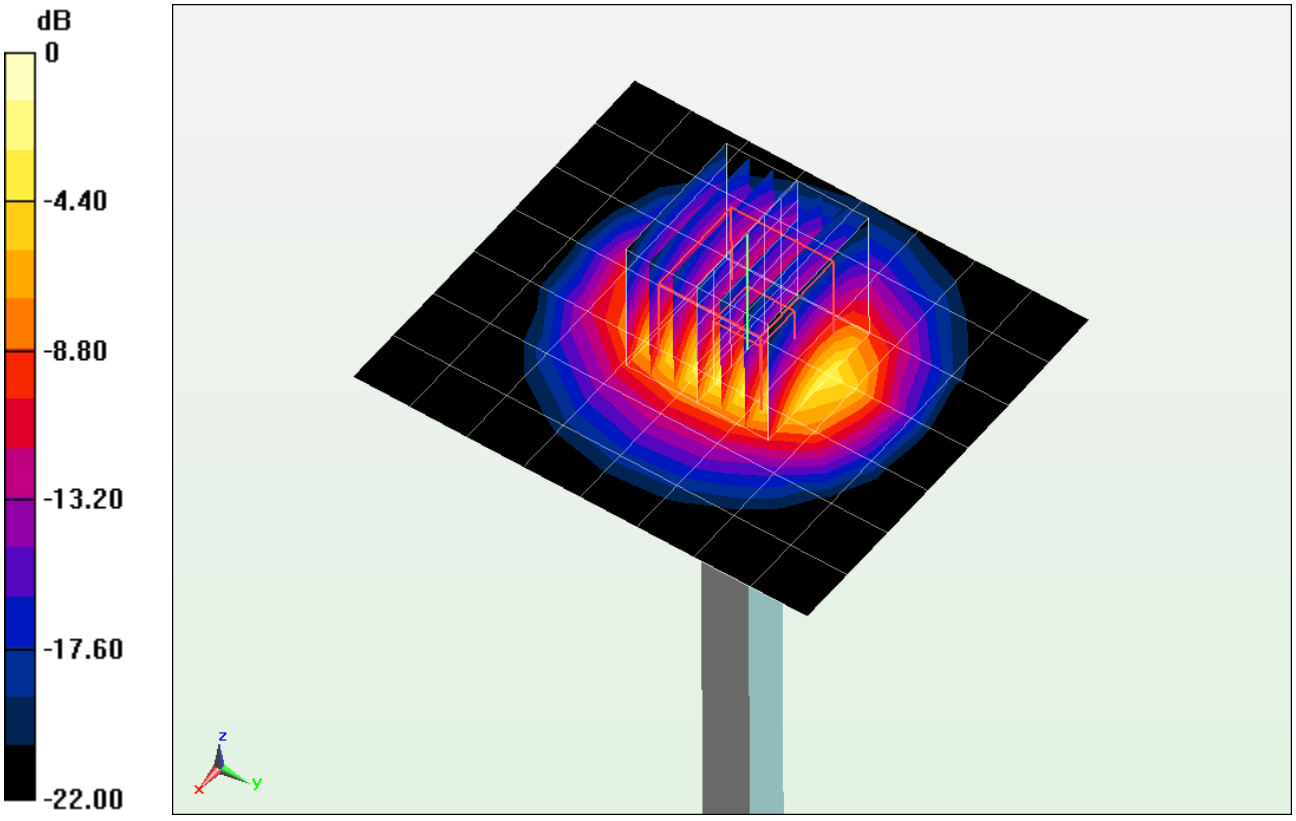
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used:
f = 2450 MHz; σ = 2.019 S/m; ε_r = 50.576; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2014; Ambient Temp: 24.4°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.22, 4.22, 4.22); Calibrated: 11/22/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.1 W/kg
SAR(1 g) = 5.18 W/kg
Deviation = 0.19%



0 dB = 6.73 W/kg = 8.28 dBW/kg