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SAR COMPLIANCE EVALUATION REPORT

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220
United States

Date of Testing:
01/09/12 - 01/31/12
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1201060034-R2.A3L

FCC ID: A3LSGHI757

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

EUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SGH-I757

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
LTE Band 17	706.5 - 713.5 MHz	22.20	0.20	0.36	0.36
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	32.85	0.31	0.72	0.72
WCDMA/HSPA 850	826.40 - 846.60 MHz	22.69	0.20	0.37	0.40
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	23.22	0.24	0.49	0.58
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	30.32	0.19	0.46	0.56
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz	22.60	0.33	0.63	0.74
2.4 GHz WLAN	2412 - 2462 MHz	17.77	0.10	0.05	0.05
5.8 GHz WLAN	5745 - 5825 MHz	13.58	0.01	0.00	
5.2 GHz WLAN	5180 - 5240 MHz	13.65	0.07	0.11	
5.3 GHz WLAN	5260 - 5320 MHz	13.84	0.09	0.09	
5.5 GHz WLAN	5500 - 5700 MHz	13.46	0.04	0.04	
Bluetooth	2402 - 2480 MHz	11.26	N/A		
Simultaneous SAR per KDB 690783 D01:			0.43	0.74	0.77

Note: Powers in the above table represent output powers for the SAR test configurations and may not represent the highest output powers for all capabilities.

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 FCC/OET Bulletin 65 Supplement C (2001), IEEE 1528-2003 and in applicable Industry Canada Radio Standards Specifications (RSS); for North American frequency bands only.

Note: This revised Test Report (S/N: 0Y1201060034-R2.A3L) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

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1 EQUIPMENT UNDER TEST

1.1 Device Overview

Band & Mode	Tx Frequency
LTE Band 17	706.5 - 713.5 MHz
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz
WCDMA/HSPA 850	826.40 - 846.60 MHz
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz
2.4 GHz WLAN	2412 - 2462 MHz
5.8 GHz WLAN	5745 - 5825 MHz
5.2 GHz WLAN	5180 - 5240 MHz
5.3 GHz WLAN	5260 - 5320 MHz
5.5 GHz WLAN	5500 - 5700 MHz
Bluetooth	2402 - 2480 MHz
NFC	13.56 MHz

1.2 Near Field Communications (NFC) Antenna

This DUT has NFC operations. This model supports two battery covers; the NFC antenna is integrated into one battery cover while the standard battery cover has no antenna. All testing was performed with the standard battery cover and worst case configurations per band, per mode for Head, Body-Worn and Hotspot SAR were additionally evaluated with the NFC Battery Cover. No change in SAR distribution was observed between the two battery covers, with the NFC battery cover being plastic with a metallic component.

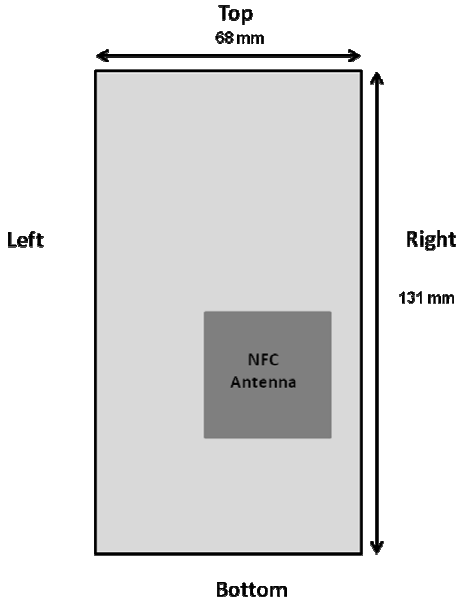

Figure 1-1
NFC Antenna Location on the Battery Cover

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1.3 DUT Antenna Locations

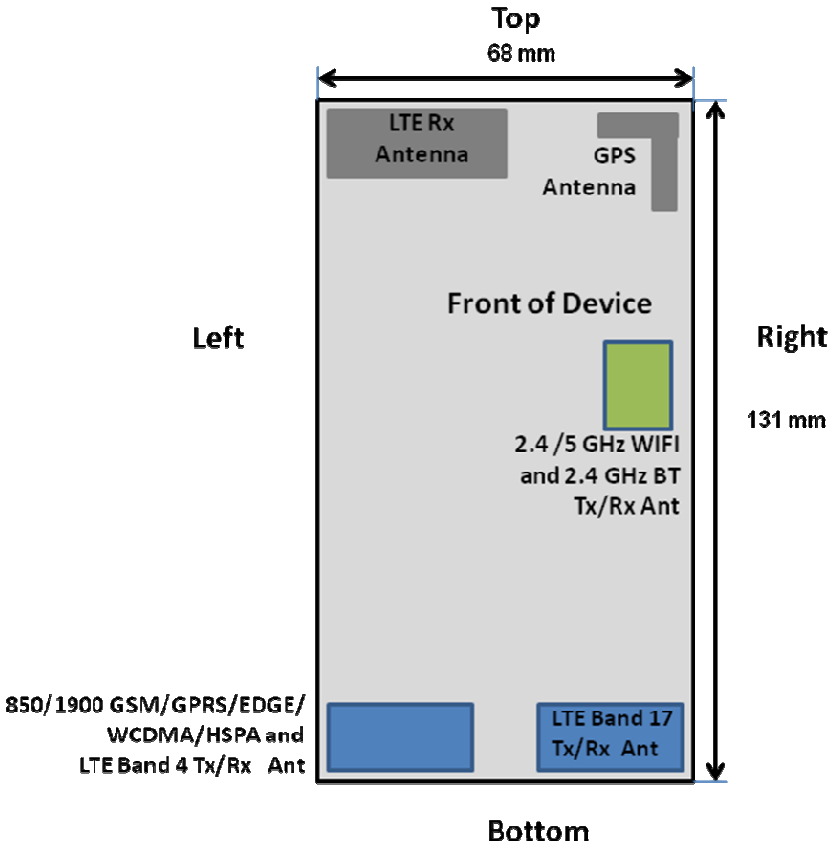

Figure 1-2
DUT Antenna Locations

The 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and LTE Band 4 antenna and the LTE Band 17 antenna share a switch and cannot transmit simultaneously.

1.4 Simultaneous Transmission Capabilities

According to KDB 648474, 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. Possible transmission paths for the DUT are shown in Figure 1-3 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

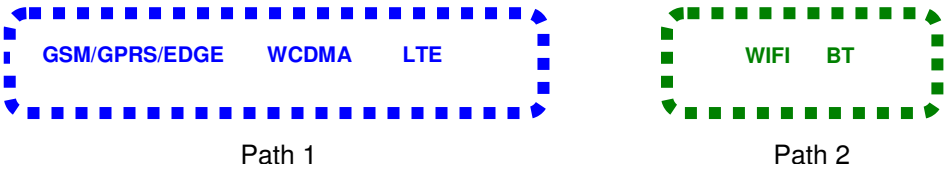

Figure 1-3
Simultaneous Transmission Paths

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Table 1-1
Possible Simultaneous Transmission Scenarios Transmission Supported by EUT

No.	Capable Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Note	Scenario Possible?
		IEEE 1528, Supp C	Supp C	FCC KDB 941225 D06 edges/sides		
1	GSM 850/1900 MHz Voice + WiFi 2.4GHz	Yes	10mm	N/A		Yes
2	850/1900 WCDMA Voice + WiFi 2.4GHz	Yes	10mm	N/A		Yes
3	850/1900 MHz GPRS/EDGE Data + WIFI 2.4 GHz	N/A	N/A	Yes	2G Hotspot	Yes
4	850/1900 MHz WCDMA/HSPA Data + WIFI 2.4 GHz	N/A	N/A	Yes	3G Hotspot	Yes
5	700/1750 MHz Band17/4 LTE Data + WIFI 2.4 GHz	Yes*	10mm*	Yes	4G Hotspot	Yes
6	GSM 850/1900 MHz Voice + WiFi 5GHz	Yes	10mm	N/A	5GHz Client only	Yes
7	850/1900 MHz WCDMA Voice + WIFI 5 GHz	Yes	10mm	N/A	5GHz Client only	Yes
8	850/1900 MHz GPRS/EDGE Data + WiFi 5GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
9	850/1900 MHz WCDMA/HSPA Data + WIFI 5 GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
10	700/1750 MHz Band17/4 LTE Data + WIFI 5 GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
11	All Voice + LTE	N/A	N/A	N/A	Not Supported by H/W	No
12	All Voice + WIFI + LTE	N/A	N/A	N/A	Not Supported by H/W	No

Notes:

1.GSM/WCDMA/LTE use one modem and transciever IC.The signals can not be transmitted simultaneously.
2.This model cannot act as a master device in 5GHz WiFi, so this model is not capable of 5GHz WiFi hotspot. This cannot be changedby any S/W modification by any party after it is manufactured.
3. * = for VoIP 3rd party apps possibly installed by end-user.

** WCDMA/HSPA hotspot may be active during voice WDCMA mode because, in WCDMA, both voice and data use the same physical channel. When doing multiple services (multi-Radio Access Bearer or multi-RAB), the power control will be 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 WCDMA+WLAN sum also represents the WCDMA Voice + WCDMA/HSPA Data + WLAN scenario.

1.5 SAR Test Exclusions Applied

(A) WIFI/BT Testing

Since Wireless Router operations are not allowed by the chipset firmware using 5 GHz WIFI, only 2.4 GHz WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations in KDB 914225 D06.

5 GHz WIFI may act as a client to transmitting simultaneously with GSM/WCDMA circuit switched voice modes. These possible combinations are reflected in Table 1-1.

Per KDB Publication 647484, **2.4 and 5 GHz SAR is required** since:

The maximum average power average conducted power of 2.4 GHz WIFI is 59.98 mW.
The maximum average power average conducted power of 5 GHz WIFI is 24.89 mW.
The Bluetooth/WLAN to main antenna (GSM/WCDMA/LTE) separation distance is 42 mm.

Per April 2011 TCB Workshop Slides, Bluetooth SAR was not required based on the following:

1. The maximum RF conducted power for Bluetooth, 13.366 mW, is less than 60/f.
2. Bluetooth and 2.4 GHz WLAN share the same antenna path and cannot transmit simultaneously.
3. The maximum peak and average Bluetooth power is less than the respective peak and average output powers in all WLAN modes.
4. The measured WLAN SAR is < 0.4 W/kg for all applicable Bluetooth configurations (Body-Worn).
5. Simultaneous transmission SAR exclusion applies to all applicable configurations involving WLAN or Bluetooth since all simultaneous sums for WLAN are less than 1.6 W/kg.

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(B) GSM/WCDMA/LTE Testing

This model does not support Simultaneous Voice and Data for the licensed transmitter in any modes except in WCDMA that allows Multi-RAB transmissions that share voice and data operations on a single physical channel.

GSM/GPRS/EDGE DTM is disabled. Therefore **GSM Voice cannot transmit simultaneously with GPRS/EDGE Data**.

GSM/WCDMA Voice/Data and LTE data ("SVLTE") cannot transmit simultaneously since they utilize the same transmission path as illustrated in Figure 1-3.

WCDMA/HSPA hotspot may be active during voice WDCMA mode because, in WCDMA, both voice and data use the same physical channel. When doing multiple services (multi-Radio Access Bearer or multi-RAB), the power control will be 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 WCDMA+WLAN sum also represents the WCDMA Voice + WCDMA/HSPA Data + WLAN scenario.

This device is only capable of QPSK HSUPA in the uplink, but is capable of HSPA+ in the downlink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01.

Simultaneous transmission for the GSM/GPRS/WCDMA + LTE + WIFI is not supported via hardware.

Per FCC KDB 941225, LTE SAR for the lower bandwidths are not required to be tested when the SAR is not >1.45 W/kg for the highest bandwidth and the maximum average output power over all channels and configurations is not more than 0.5 dB higher than the higher bandwidths.

1.6 Power Reduction for SAR

There is no power reduction for any band/mode implemented in this device for SAR purposes.

1.7 Additional FCC Guidance Applied

- FCC OET Supplement C
- IEEE 1528-2003
- April 2011 TCB Workshop Notes for RF Exposure, Chan, p.20 (additional Bluetooth exclusion for SAR)
- FCC KDB 941225 (2G/3G/4G) and hotspot
- FCC KDB 248227 (802.11)
- FCC KDB 648474
- FCC KDB 865664 (802.11a)

1.8 Samples Used for SAR Testing

Several samples with identical hardware were used to facilitate SAR testing only.

Table 1-2
SAR Test Sample Serial Numbers

	LTE Band 17	LTE Band 4	GSM/GPRS	WCDMA	2.4 GHz WIFI	5 GHz WIFI
Head	FI-347-B	FI-347-A	FI-347-A	FI-347-A	FI-347-A	FI-347-C
Body	FI-347-A	FI-347-A	FI-347-A	FI-347-A	FI-347-A	FI-347-C

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2 LTE CHECKLIST PER FCC KDB 941225 D05

KDB 941225 Pub LTE Information				
KDB 941225 Section	FCC ID	A3LSGHI757		
	Form Factor	Handset		
1)	Frequency Range of each LTE transmission band	BAND4 : Tx (1712.5 - 1752.5MHz) BAND17: Tx (706 - 711 MHz)		
2)	Channel Bandwidths	BAND4 : 5.0MHz, 10MHz BAND17 : 5.0MHz, 10MHz		
3)	Channel Numbers and Frequencies (MHz)	Low	Mid	High
	LTE Band 4 and BW 5MHz	1712.5MHz(19975)	1732.5MHz(20175)	1752.5MHz(20375)
	LTE Band 4 and BW 10MHz	1715MHz(20000)	1732.5MHz(20175)	1750MHz(20350)
	LTE Band 17 and BW 5MHz	706.5MHz(23755)	710MHz(23790)	713.5MHz(23825)
	LTE Band 17 and BW 10MHz	709MHz(23780)	710MHz(23790)	711MHz(23800)
4)(a)	UE Category	3		
(b)	Modulations Supported in UL	QPSK, 16QAM		
	LTE Transmitter and Antenna Implementation	GSM/GPRS/EDGE/WCDMA/HSPA/LTE share the same transmission path		
5)	Description of LTE Tx and Ant. Implementation	1 Main TX/RX Ant and 1 Diversity RX Ant		
6)	LTE Voice available?	No		
	Hotspot with LTE+WIFI	Yes		
	Hotspot with LTE+WIFI active with Voice sessions?	No		
7)	LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	Yes		
	A-MPR (Additional MPR) disabled for SAR Testing?	Yes		
8)	Conducted power Table provided for 1RB (low and high offset), 50% RB (centered), 100% RB	Yes		
9-10)	Non-LTE US Wireless Operating Modes/Band	RF Output Power	RF Exposure Configurations	
	850 MHz GSM	See Page 1		
	1900MHz GSM			
	850 MHz WCDMA			
	1900 MHz WCDMA			
	2.4GHz Bluetooth			
	2.4GHz WI-FI			
	5GHz WI-FI			
11)	Simultaneous Tx Conditions (Voice and Data Configurations)	See Section 1.4		
12)	Power Reduction used for SAR Compliance?	No		
13)	Describe Power Reduction (LTE Modes)	N/A		
14)	SAR Test Plan	N/A		
15)	SAR test data, preliminary	N/A		

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3 INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 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 [24]. 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.

3.1 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 Fig. 1-1).

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

Figure 3-1
SAR Mathematical Equation

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

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

where:

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

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

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4 TEST SITE LOCATION

4.1 INTRODUCTION

The map at the right shows the location of the PCTEST LABORATORY in Columbia, Maryland. It is in proximity to the FCC Laboratory, the Baltimore-Washington International (BWI) airport, the city of Baltimore and Washington, DC.

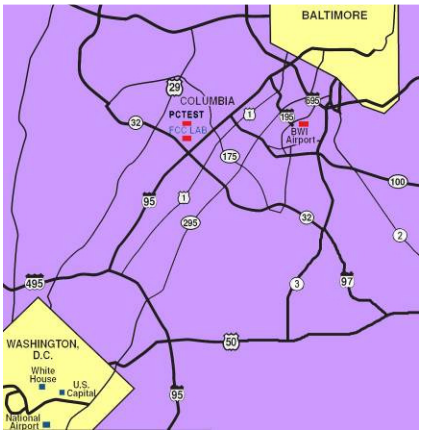

Figure 4-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49' 38" W longitude. The facility is 1.5 miles north of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on January 27, 2006 and Industry Canada.

4.2 Test Facility / Accreditations:

Measurements were performed at an independent accredited PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.

- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing-Aid Compatibility (HAC), Battery Safety, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC-2451).
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and all Industry Canada Standards (RSS).

- PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS and CDMA, and EvDO mobile phones.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO Data, CDMA 1xRTT Data

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5 SAR MEASUREMENT SETUP

5.1 Robotic System

Measurements are performed using the DASY4 and DASY5 automated dosimetric assessment system. The DASY4 and DASY5 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of a high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the SAM phantom containing the head or body equivalent material. The robot is a six-axis industrial robot, performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure 5-1).

5.2 System Hardware

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and a remote control used to drive the robot motors. The PC consists of the SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit that performs the signal amplification, signal multiplexing, A/D conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal from the DAE and transfers data to the PC card.

5.3 System Electronics

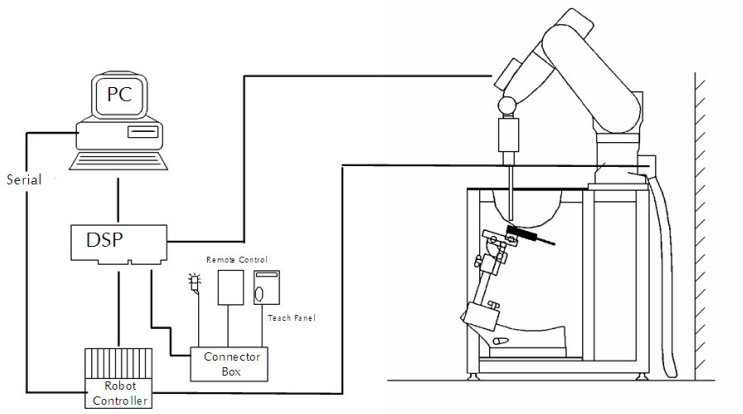

Figure 5-1
SAR Measurement System Setup

The DAE consists of a highly sensitive electrometer-grade auto-zeroing preamplifier, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

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5.4 Automated Test System Specifications

Test Software:	SPEAG DASY4 version 4.7 Measurement Software
Robot:	Stäubli Unimation Corp. Robot RX60L and Robot TX90XL
Repeatability:	0.02 mm
No. of Axes:	6

Data Acquisition Electronic System (DAE)

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter & control logic
Software:	SEMCAD and SEMCAD X software
Connecting Lines:	Optical Downlink for data and status info Optical upload for commands and clock

PC Interface Card

Function:	Link to DAE 16-bit A/D converter for surface detection system Two Serial & Ethernet link to robotics Direct emergency stop output for robot

Phantom

Type:	SAM Twin Phantom (V4.0 and V5.0)
Shell Material:	Composite
Thickness:	2.0 ± 0.2 mm

Figure 5-2
SAR Measurement System

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6 DASY E-FIELD PROBE SYSTEM

6.1 Probe Measurement System

Figure 6-1
SAR System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration (see Figure 6-3) and optimized for dosimetric evaluation [9]. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order curve fitting. The approach is stopped at reaching the maximum.

6.2 Probe Specifications

Model(s):	ES3DV2, ES3DV3, EX3DV4
Frequency Range:	10 MHz – 6.0 GHz (EX3DV4) 10 MHz – 4 GHz (ES3DV3, ES3DV2)
Calibration:	In head and body simulating tissue at Frequencies from 300 up to 6000MHz
Linearity:	± 0.2 dB (30 MHz to 6 GHz) for EX3DV4 ± 0.2 dB (30 MHz to 4 GHz) for ES3DV3, ES3DV2
Dynamic Range:	10 mW/kg – 100 W/kg
Probe Length:	330 mm
Probe Tip Length:	20 mm
Body Diameter:	12 mm
Tip Diameter:	2.5 mm (3.9mm for ES3DV3)
Tip-Center:	1 mm (2.0 mm for ES3DV3)
Application:	SAR Dosimetry Testing Compliance tests of mobile phones Dosimetry in strong gradient fields

Figure 6-2
Near-Field Probe

Figure 6-3
Triangular Probe Configuration

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7 PHANTOM AND EQUIVALENT TISSUES

7.1 SAM Phantoms

Figure 7-1
SAM Phantoms

The SAM Twin Phantom V4.0 and V5.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to represent the 90th percentile of the population [12][13]. The phantom enables the dosimetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

7.2 Tissue Simulating Mixture Characterization

Figure 7-2
SAM Phantom with Simulating Tissue

The mixture is characterized to obtain proper dielectric constant (permittivity) and conductivity of the tissue of interest. The tissue dielectric parameters recommended in IEEE 1528 and IEC 62209 have been used as targets for the compositions, and are to match within 5%, per the FCC recommendations.

Table 7-1
Composition of the Tissue Equivalent Matter

Frequency (MHz)	835	835	1750	1750	1900	1900	2450	2450	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)										
Bactericide	0.1	0.1								
DGBE			47	31	44.92	29.44	7.99	26.7		
HEC	1	1								
NaCl	1.45	0.94	0.4	0.2	0.18	0.39	0.16	0.1		
Sucrose	57	44.9								
Triton X-100							19.97		17.24	10.67
Diethylenglycol monohexylether									17.24	10.67
Water	40.45	53.06	52.6	68.8	54.9	70.17	71.88	73.2	65.52	78.66

Please see next page for 750MHz tissue characteristics.

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Table 7-2
Composition of 750 MHz Head and Body Tissue Equivalent Matter

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

H_2O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7% Relevant for safety; Refer to the respective Safety Data Sheet*.

Note: 750MHz liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MSL 750)**
Product No.	SL AAM 075 AA (Charge: 110606-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated OCP probe (type DAK).

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

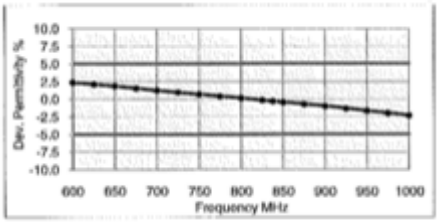
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

Additional Information

TSL Density	1.212 g/cm³
TSL Heat-capacity	3.006 kJ/(kg*K)

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e"	sigma	eps	sigma	Δ-eps	Δ-sigma
600	57.4	24.88	0.83	56.1	0.95	2.4	-12.7
625	57.2	24.53	0.85	56.0	0.95	2.1	-10.6
650	57.0	24.18	0.87	55.9	0.96	1.8	-8.5
675	56.7	23.90	0.90	55.8	0.96	1.5	-6.3
700	56.4	23.61	0.92	55.7	0.96	1.2	-4.2
725	56.2	23.37	0.94	55.6	0.96	0.9	-2.0
750	55.9	23.12	0.96	55.5	0.96	0.7	0.1
775	55.7	22.95	0.99	55.4	0.97	0.4	2.5
800	55.4	22.78	1.01	55.3	0.97	0.1	4.8
825	55.2	22.61	1.04	55.2	0.98	-0.2	6.1
838	55.0	22.52	1.05	55.2	0.98	-0.3	6.7
850	54.9	22.44	1.06	55.2	0.99	-0.4	7.3
875	54.7	22.30	1.09	55.1	1.02	-0.7	6.5
900	54.5	22.17	1.11	55.0	1.05	-1.0	5.7
925	54.2	22.05	1.13	55.0	1.06	-1.3	6.8
950	54.0	21.94	1.16	54.9	1.08	-1.7	7.8
975	53.8	21.85	1.18	54.9	1.09	-2.0	9.0
1000	53.6	21.75	1.21	54.8	1.10	-2.3	10.2



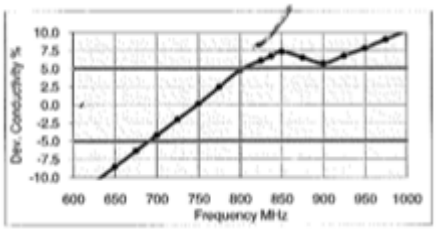


Figure 7-3
750MHz Body Tissue Equivalent Matter

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Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HSL 750)**
Product No.	SL AAH 075 (Charge: 110601-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated OCP probe (type DAK).

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

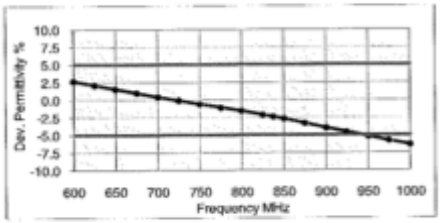
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

Additional Information

TSL Density	1.284 g/cm^3
TSL Heat-capacity	2.701 kJ/(kg*K)

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e"	sigma	eps	sigma	Δ-eps	Δ-sigma
600	43.9	23.01	0.77	42.7	0.88	2.7	-12.9
625	43.5	22.75	0.79	42.6	0.88	2.1	-10.5
650	43.1	22.49	0.81	42.5	0.89	1.5	-8.2
675	42.7	22.26	0.84	42.3	0.89	1.0	-5.9
700	42.4	22.03	0.86	42.2	0.89	0.4	-3.5
725	42.0	21.84	0.88	42.1	0.89	-0.1	-1.2
750	**41.7**	**21.65**	**0.90**	**41.9**	**0.89**	**-0.6**	**1.1**
775	41.4	21.50	0.93	41.8	0.90	-1.1	3.5
800	41.0	21.34	0.95	41.7	0.90	-1.6	5.9
825	40.7	21.19	0.97	41.6	0.91	-2.1	7.3
838	40.5	21.12	0.98	41.5	0.91	-2.4	8.0
850	40.4	21.05	1.00	41.5	0.92	-2.7	8.6
875	40.1	20.91	1.02	41.5	0.94	-3.3	7.9
900	39.8	20.77	1.04	41.5	0.97	-4.0	7.2
925	39.6	20.66	1.06	41.5	0.98	-4.6	8.2
950	39.3	20.55	1.09	41.4	0.99	-5.2	9.2
975	39.0	20.44	1.11	41.4	1.00	-5.8	10.3
1000	38.7	20.32	1.13	41.3	1.01	-6.4	11.4



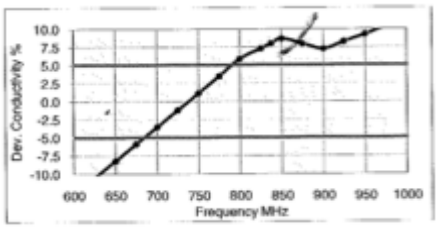


Figure 7-4
750MHz Head Tissue Equivalent Matter

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8 DOSIMETRIC ASSESSMENT & PHANTOM SPECS

8.1 SAR Measurement Procedure

The evaluation was performed using the following procedure:

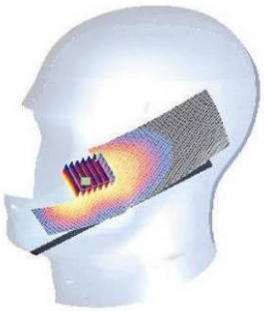

Figure 8-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head 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 head and the horizontal grid spacing was 15mm x 15mm for up to 3 GHz frequencies. The horizontal grid spacing was 10mm x 10mm for 5-6 GHz frequencies per KDB pub 865664.
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 testing the 1 gram cube. This fixed point was measured and used as a reference value.
3. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation. Around this point, a volume of 32mm x 32mm x 30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual for more details):
   a. The data was extrapolated to the surface of the outer-shell of the phantom. The combined distance extrapolated was the combined distance from the center of the dipoles 2.7mm away from the tip of the probe housing plus the 1.2 mm distance between the surface and the lowest measuring point. 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. If the value deviated by more than 5%, the SAR evaluation was repeated.

8.2 5 GHz SAR Measurements

5. For 5 GHz testing, finer resolution Area scans were performed as specified by FCC SAR Measurement Requirements for 3 – 6 GHz, KDB pub 865664. The 5 GHz Area Scan requires a minimum resolution of10mm on the x and y axis for each grid measurement point.
6. For 5 GHz testing finer resolution zoom scans were performed as specified by FCC SAR Measurement Requirements for 3 – 6 GHz, KDB pub 865664. The 5 GHz zoom scan requires a minimum volume of 24mm x 24mm x 20mm and 7 x 7 x 11 points.

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9 DEFINITION OF REFERENCE POINTS

9.1 EAR REFERENCE POINT

Figure 9-1 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 9-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 9-2). 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].

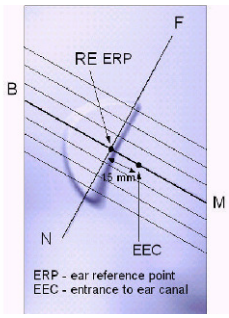

Figure 9-1
Close-Up Side view of ERP

9.2 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 "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 9-3). The "test device reference point" 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 it's 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.

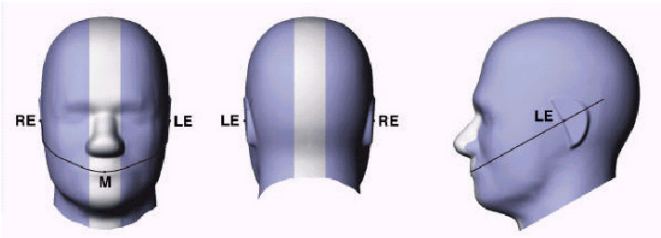

Figure 9-2
Front, back and side view of SAM Twin Phantom

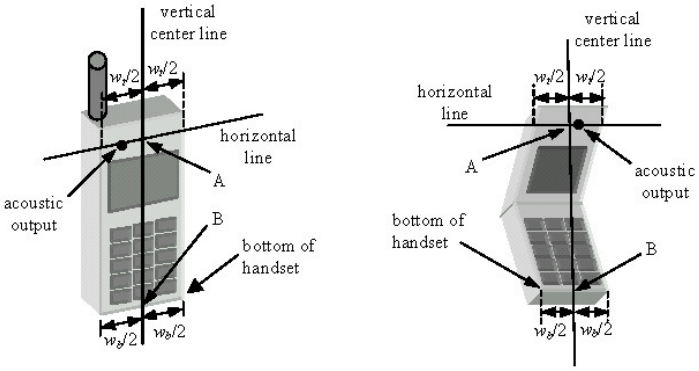

Figure 9-3
Handset Vertical Center & Horizontal Line Reference Points

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10 TEST CONFIGURATION POSITIONS

10.1 Device Holder

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

10.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset 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 10-1), 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.

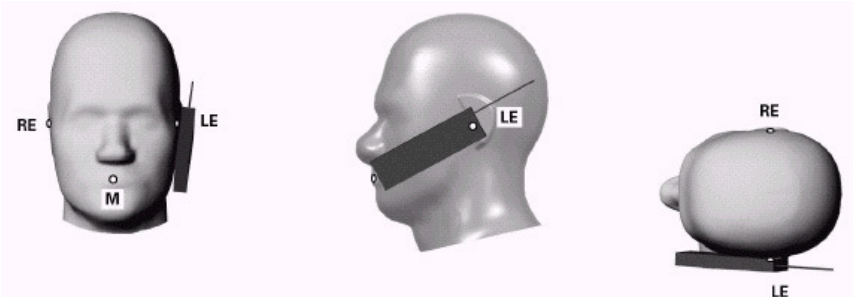

Figure 10-1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was hen 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 phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 10-2).

10.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek/Touch 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 15degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches 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. 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 10-2).

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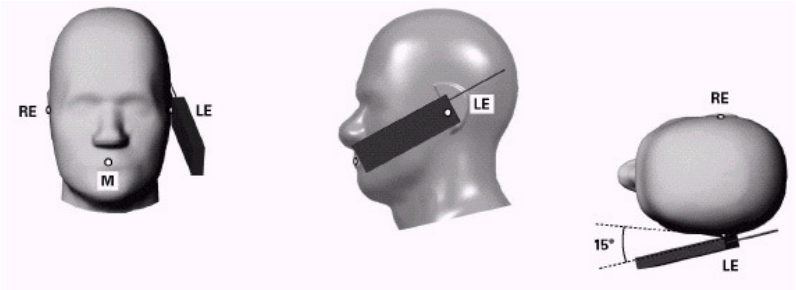

Figure 10-2 Front, Side and Top View of Ear/15º Tilt Position

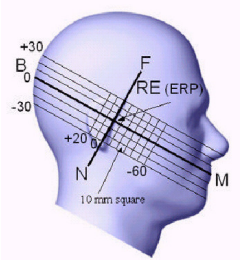

Figure 10-3
Side view w/ relevant markings

Figure 10-4 Body SAR Sample Photo
(Not Actual EUT)

10.4 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. It has been known for some time that there are SAR measurement difficulties in these regions of the SAM phantom. SAR probes are calibrated in tissue equivalent liquids with sufficient separation between the probe sensors and nearby physical boundaries to ensure scattering does not affect probe calibration. When the probe tip is moved into tight regions with multiple boundaries surrounding its sensors, probe calibration and measurement accuracy can become questionable. In addition, these measurement locations often require a probe to be tilted at steep angles, where it may no longer comply with calibration requirements and measurement protocols, or satisfy the required measurement uncertainty. In some situations it is not feasible to tilt the probe or rotate the phantom, as suggested by measurement standards, to conduct these measurements.

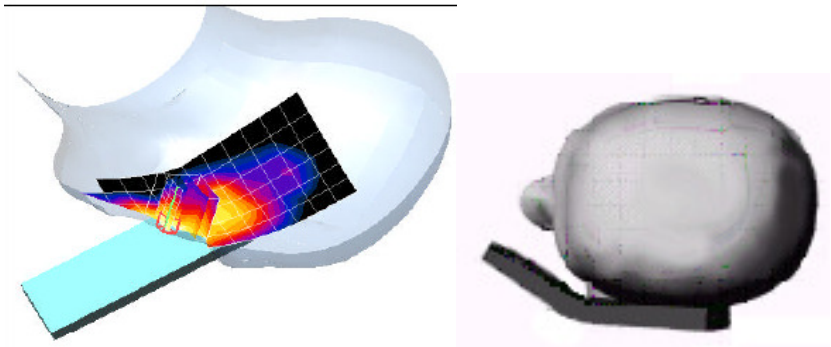

Figure 10-5
SAR Scans near the Jaw/Mouth

In order to ensure there is sufficient conservativeness for ensuring compliance until practical solutions are available, additional measurement considerations are necessary to address these technical difficulties. When measurements are required near the mouth, nose, jaw or similar tight regions of the SAM phantom,

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area or zoom scans are often unable to fully enclose the peak SAR location as required by IEEE 1528 and Supplement C, due to probe orientation and positioning difficulties. Even when limited measurements are possible, the test results could be questionable due to probe calibration and measurement uncertainty issues. Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document publication 648474. The SAR required in these regions of SAM should be measured using a flat phantom. **Rectangular shaped phones** should be positioned with its bottom edge positioned from the flat phantom with the same distance provided by the cheek touching position using SAM. The ear reference point (ERP, as defined for SAM) of the phone should be positioned ½ cm from the flat phantom shell. **Clam-shell phones** should be positioned with the hinge against a smooth edge of the flat phantom where the upper half of the phone is unfolded and extended beyond the phantom side wall. The lower half of the phone is secured in the test device holder at a fixed distance below the flat phantom determined by the minimum separation along the lower edge of the phone in the cheek touching position using SAM. Any case with substantial variation in separation distance along the lower edge of a clam shell is discussed with the FCC for best-to-use methodology.

The flat phantom data should allow test results to be compared uniformly across measurement systems, until suitable solutions are available in measurement standards to address certain probe calibration and positioning issues, due to implementation differences between horizontal and upright SAM configurations. These flat phantom procedures are only applicable for stand-alone SAR evaluation in tight regions of the SAM phantom, where measurement is not feasible or test results can be questionable due to probe calibration and accessibility issues. Details on device positioning and photos showing how separation distances are determined are included in the SAR report Photographs. SAR for other regions of the head must be evaluated using SAM; therefore, a phone with antennas at different locations may require flat and SAM phantom evaluation for the different antennas.

10.5 Body Holster /Belt Clip 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 10-4). A device with a headset output is tested with a headset connected to the device.

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.

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11 FCC RF EXPOSURE LIMITS

11.1 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.

11.2 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 11-1
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)
SPATIAL PEAK SAR Brain	1.6	8.0
SPATIAL AVERAGE SAR Whole Body	0.08	0.4
SPATIAL PEAK SAR Hands, Feet, Ankles, Wrists	4.0	20

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

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12 FCC MEASUREMENT PROCEDURES

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

12.1 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.

12.2 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes following SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.

12.2.1 MPR

MPR is permanently implemented for this device. The specific manufacturer target MPR is indicated alongside the SAR results. With the MPR permanently implemented, this device will never operate at higher power levels. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

12.2.2 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests.

12.2.3 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05:

a. Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
b. Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel is tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation because the SAR is < 0.8 W/kg.
c. Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required for the highest bandwidth.
d. Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation since the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. 1 RB low and high offset configurations are considered together for a single channel selection.
e. Per Page 4, 3) B), I), when the SAR for QPSK 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
f. Per Page 4, 4) A), 16QAM with 50% RB is required for the highest bandwidth on the channel with the highest measured SAR for QPSK with 50% RB allocation.

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g. Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
h. Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required for the highest bandwidth on the highest output power channel for the 1 RB allocation when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. 1 RB low and high offset configurations are considered together for a single channel selection. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.
i. Per Page 5, 4) B), I), when the SAR for 16QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
j. Per Page 4, 4), A) I) and Page 5, 4), A) I, 100% RB Allocation is not required to be tested when the SAR is not > 1.45 W/kg for the highest bandwidth.
k. Per Page 5, 5) B) I), LTE SAR for the lower bandwidths are not required to be tested when the SAR is not >1.45 W/kg for the highest bandwidth and the maximum average output power over all channels and configurations is not more than 0.5 dB higher then the higher bandwidths.

12.3 SAR Measurement Conditions for WCDMA per FCC KDB Pub. 941225

12.3.1 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”.

12.3.2 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.

12.3.3 Body SAR Measurements

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

12.3.4 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 $\leq$ 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

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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.

12.3.5 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.

12.4 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/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 for more details.

12.4.1 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.

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12.4.2 Frequency Channel Configurations [27]

802.11 a/b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g/n modes are tested on channels 1, 6 and 11. 802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; channels 104, 116 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz §15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. These are referred to as the "default test channels". For 2.4 GHz, 802.11g/n modes were evaluated only if the output power was 0.25 dB higher than the 802.11b mode. For 5 GHz, 802.11n modes were evaluated only if the output power was 0.25 dB higher than the 802.11a mode. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 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.

Table 12-1
802.11 Test Channels per FCC KDB Publication 248227

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

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands.

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13 RF CONDUCTED POWERS

13.1 LTE Conducted Powers

Table 13-1
Band 17 LTE RF Output Conducted Powers

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Maximun MPR Allowed per 3GPP [dB]
710.0	23790	5	QPSK	1	0	22.00	0	0
710.0	23790	5	QPSK	1	24	22.04	0	0
710.0	23790	5	QPSK	12	6	21.00	1	0-1
710.0	23790	5	QPSK	25	0	21.07	1	0-1
710.0	23790	5	16-QAM	1	0	21.10	1	0-1
710.0	23790	5	16-QAM	1	24	21.16	1	0-1
710.0	23790	5	16-QAM	12	6	19.90	2	0-2
710.0	23790	5	16-QAM	25	0	20.10	2	0-2
710.0	23790	10	QPSK	1	0	**22.15**	0	0
710.0	23790	10	QPSK	1	49	**22.20**	0	0
710.0	23790	10	QPSK	25	12	**21.07**	1	0-1
710.0	23790	10	QPSK	50	0	21.04	1	0-1
710.0	23790	10	16QAM	1	0	**21.11**	1	0-1
710.0	23790	10	16QAM	1	49	**21.08**	1	0-1
710.0	23790	10	16QAM	25	12	**20.70**	1	0-2
710.0	23790	10	16QAM	50	0	20.15	2	0-2

Note: Differences from expected MPR levels are a result of measurement uncertainty. Per the manufacturer, the measured powers are acceptable for use within the intended network infrastructure. Powers measured below the expected levels on the devices were extrapolated to ensure compliance for SAR.

Table 13-2
Band 4 LTE 5 MHz BW RF Output Conducted Powers

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Maximun MPR Allowed per 3GPP [dB]
1712.5	19975	5	QPSK	1	0	23.22	0	0
1712.5	19975	5	QPSK	1	24	23.25	0	0
1712.5	19975	5	QPSK	12	6	22.00	1	0-1
1712.5	19975	5	QPSK	25	0	22.10	1	0-1
1712.5	19975	5	16-QAM	1	0	22.30	1	0-1
1712.5	19975	5	16-QAM	1	24	22.24	1	0-1
1712.5	19975	5	16-QAM	12	6	21.12	2	0-2
1712.5	19975	5	16-QAM	25	0	21.25	2	0-2
1732.5	20175	5	QPSK	1	0	23.27	0	0
1732.5	20175	5	QPSK	1	24	23.30	0	0
1732.5	20175	5	QPSK	12	6	22.20	1	0-1
1732.5	20175	5	QPSK	25	0	22.32	1	0-1
1732.5	20175	5	16-QAM	1	0	22.28	1	0-1
1732.5	20175	5	16-QAM	1	24	22.25	1	0-1
1732.5	20175	5	16-QAM	12	6	21.10	2	0-2
1732.5	20175	5	16-QAM	25	0	21.22	2	0-2
1752.5	20375	5	QPSK	1	0	23.20	0	0
1752.5	20375	5	QPSK	1	24	23.15	0	0
1752.5	20375	5	QPSK	12	6	22.09	1	0-1
1752.5	20375	5	QPSK	25	0	22.04	1	0-1
1752.5	20375	5	16-QAM	1	0	22.18	1	0-1
1752.5	20375	5	16-QAM	1	24	22.14	1	0-1
1752.5	20375	5	16-QAM	12	6	21.01	2	0-2
1752.5	20375	5	16-QAM	25	0	21.13	2	0-2

Note: Differences from expected MPR levels are a result of measurement uncertainty. Per the manufacturer, the measured powers are acceptable for use within the intended network infrastructure. Powers measured below the expected levels on the devices were extrapolated to ensure compliance for SAR.

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Table 13-3
Band 4 LTE10 MHz BW RF Output Conducted Powers

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Maximun MPR Allowed per 3GPP [dB]
1715	20000	10	QPSK	1	0	23.14	0	0
1715	20000	10	QPSK	1	49	23.18	0	0
1715	20000	10	QPSK	25	12	22.21	1	0-1
1715	20000	10	QPSK	50	0	22.17	1	0-1
1715	20000	10	16QAM	1	0	22.19	1	0-1
1715	20000	10	16QAM	1	49	22.03	1	0-1
1715	20000	10	16QAM	25	12	21.78	1	0-2
1715	20000	10	16QAM	50	0	21.35	2	0-2
1732.5	20175	10	QPSK	1	0	**23.22**	0	0
1732.5	20175	10	QPSK	1	49	**23.13**	0	0
1732.5	20175	10	QPSK	25	12	**22.34**	1	0-1
1732.5	20175	10	QPSK	50	0	22.26	1	0-1
1732.5	20175	10	16QAM	1	0	**22.06**	1	0-1
1732.5	20175	10	16QAM	1	49	**22.15**	1	0-1
1732.5	20175	10	16QAM	25	12	**21.80**	1	0-2
1732.5	20175	10	16QAM	50	0	21.33	2	0-2
1750	20350	10	QPSK	1	0	22.97	0	0
1750	20350	10	QPSK	1	49	23.02	0	0
1750	20350	10	QPSK	25	12	22.28	1	0-1
1750	20350	10	QPSK	50	0	22.20	1	0-1
1750	20350	10	16QAM	1	0	22.01	1	0-1
1750	20350	10	16QAM	1	49	22.03	1	0-1
1750	20350	10	16QAM	25	12	21.70	1	0-2
1750	20350	10	16QAM	50	0	21.27	2	0-2

Note: Differences from expected MPR levels are a result of measurement uncertainty. Per the manufacturer, the measured powers are acceptable for use within the intended network infrastructure. Powers measured below the expected levels on the devices were extrapolated to ensure compliance for SAR.

13.1.1 LTE SAR Test Requirements

According to FCC KDB 941225 D05:

1) Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
2) Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel is tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation because the SAR is < 0.8 W/kg.
3) Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required for the highest bandwidth.
4) Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation since the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. 1 RB low and high offset configurations are considered together for a single channel selection.
5) Per Page 4, 3) B), I), when the SAR for QPSK 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
6) Per Page 4, 4) A), 16QAM with 50% RB is required for the highest bandwidth on the channel with the highest measured SAR for QPSK with 50% RB allocation.
7) Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
8) Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required for the highest bandwidth on the highest output power channel for the 1 RB allocation when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. 1 RB low and high offset configurations

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are considered together for a single channel selection. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.

9) Per Page 5, 4) B), I), when the SAR for 16QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
10) Per Page 4, 4), A) I) and Page 5, 4), A) I, 100% RB Allocation is not required to be tested when the SAR is not > 1.45 W/kg for the highest bandwidth.
11) Per Page 5, 5) B) I), LTE SAR for the lower bandwidths are not required to be tested when the SAR is not >1.45 W/kg for the highest bandwidth and the maximum average output power over all channels and configurations is not more than 0.5 dB higher then the higher bandwidths
12) The bold powers in section 13.1 were evaluated for SAR

Figure 13-1
Power Measurement Setup

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13.2 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**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
Cellular	128	32.81	32.89	**30.78**	27.02	26.85
	190	32.85	32.84	**30.83**	27.02	26.74
	251	32.83	32.83	**30.93**	27.05	26.73
PCS	512	30.08	30.20	**28.43**	25.98	25.65
	661	30.32	30.44	**28.22**	25.91	25.61
	810	30.18	30.31	**28.20**	26.07	25.67

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**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
Cellular	128	23.78	23.86	**24.76**	17.99	20.83
	190	23.82	23.81	**24.81**	17.99	20.72
	251	23.80	23.80	**24.91**	18.02	20.71
PCS	512	21.05	21.17	**22.41**	16.95	19.63
	661	21.29	21.41	**22.20**	16.88	19.59
	810	21.15	21.28	**22.18**	17.04	19.65

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.

The bolded GPRS/EDGE modes were selected according to the highest frame-averaged output power table according to KDB 941225 D03.

GPRS/EDGE (GMSK) output powers were measured with CS1 on the base station simulator. EDGE (8-PSK) powers were measured with MCS7 on the base station simulator.

GSM Class: B
GPRS Multislot class: 10 (max 2 Tx Uplink slots)
EDGE Multislot class: 10 (max 2Tx Uplink slots)
DTM Multislot Class: N/A

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13.2.1 HSPA Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			βc	βd	MPR [dB]
			4132	4183	4233	9262	9400	9538			
99	WCDMA	12.2 kbps RMC	22.81	22.69	22.77	22.62	22.60	**22.88**	-	-	-
99		12.2 kbps AMR	**22.83**	22.70	22.81	22.53	22.59	22.75	-	-	-
6	HSDPA	Subtest 1	21.69	21.57	21.65	21.47	21.57	21.82	2	15	0
6		Subtest 2	21.88	21.77	21.79	21.50	21.66	22.03	11	15	0
6		Subtest 3	21.80	21.80	21.83	21.57	21.69	21.88	15	8	0.5
6		Subtest 4	21.38	21.28	21.34	20.96	21.21	21.29	15	4	0.5
6	HSUPA	Subtest 1	21.23	21.20	20.98	20.98	21.12	21.80	10	15	0
6		Subtest 2	18.87	18.86	18.97	18.74	18.68	19.06	6	15	2
6		Subtest 3	20.49	20.61	20.58	19.98	20.51	20.15	15	9	1
6		Subtest 4	21.81	21.82	21.01	21.40	20.97	22.09	2	15	2
6		Subtest 5	21.81	21.71	21.75	21.52	21.67	21.78	14	15	0

WCDMA SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.

This device is only capable of HSUPA in the uplink (QPSK in the uplink), but is capable of HSPA+ in the downlink. Information about the uplink and downlink capabilities is explained in further detail in the technical descriptions for this model.

Figure 13-2
Power Measurement Setup

13.3 WLAN Conducted Powers

Table 13-4
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps] 1	2	5.5	11
802.11b	2412	1	17.51	17.58	17.60	17.60
802.11b	2437	6	17.71	17.72	17.71	17.68
802.11b	2462	11	17.77	17.78	17.78	17.74

Table 13-5
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps] 6	9	12	18	24	36	48	54
802.11g	2412	1	14.53	14.51	14.53	14.53	14.52	14.52	14.50	14.54
802.11g	2437	6	14.61	14.60	14.57	14.65	14.58	14.55	14.49	14.55
802.11g	2462	11	14.66	14.59	14.54	14.66	14.65	14.61	14.62	14.62

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Table 13-6
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	2412	1	12.47	12.43	12.43	12.48	12.42	12.37	12.39	12.40
802.11n	2437	6	12.46	12.52	12.54	12.52	12.48	12.50	12.55	12.48
802.11n	2462	11	12.51	12.54	12.56	12.54	12.49	12.56	12.52	12.58

Table 13-7
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	**5180**	**36**	13.49	13.44	13.54	13.56	13.49	13.62	13.65	13.67
802.11a	5200	40	13.49	13.50	13.52	13.67	13.63	13.53	13.68	13.64
802.11a	5220	44	13.65	13.63	13.58	13.65	13.62	13.63	13.65	13.72
802.11a	**5240**	**48**	13.57	13.64	13.54	13.61	13.75	13.70	13.72	13.70
802.11a	**5260**	**52**	13.66	13.68	13.57	13.59	13.67	13.63	13.67	13.69
802.11a	5280	56	13.69	13.75	13.83	13.80	13.80	13.84	13.83	13.84
802.11a	5300	60	13.75	13.77	13.82	13.77	13.79	13.88	13.91	13.86
802.11a	**5320**	**64**	13.84	13.86	13.73	13.81	13.96	13.89	13.86	13.82
802.11a	5500	100	13.41	13.31	13.40	13.36	13.38	13.37	13.45	13.46
802.11a	**5520**	**104**	13.31	13.42	13.34	13.27	13.36	13.40	13.32	13.38
802.11a	5540	108	13.30	13.27	13.27	13.44	13.40	13.43	13.46	13.48
802.11a	5560	112	13.38	13.42	13.40	13.45	13.43	13.48	13.47	13.51
802.11a	**5580**	**116**	13.46	13.50	13.42	13.44	13.46	13.49	13.50	13.46
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	**5620**	**124**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	13.39	13.41	13.41	13.44	13.45	13.45	13.54	13.58
802.11a	**5680**	**136**	13.39	13.44	13.40	13.42	13.46	13.56	13.52	13.45
802.11a	5700	140	13.39	13.40	13.44	13.42	13.35	13.44	13.56	13.49
802.11a	**5745**	**149**	13.41	13.35	13.59	13.66	13.59	13.66	13.66	13.66
802.11a	5765	153	13.58	13.52	13.61	13.65	13.70	13.58	13.69	13.65
802.11a	**5785**	**157**	13.58	13.55	13.50	13.55	13.49	13.64	13.66	13.60
802.11a	**5805**	**161**	13.48	13.58	13.53	13.58	13.59	13.63	13.63	13.66
802.11a	5825	165	13.53	13.52	13.53	13.54	13.54	13.60	13.60	13.64

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

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Table 13-8
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps] 6.5	13	20	26	39	52	58	65
802.11n	**5180**	**36**	12.87	13.13	13.25	12.91	13.10	13.24	13.03	13.26
802.11n	5200	40	12.84	13.02	13.00	12.96	13.05	12.93	12.92	12.98
802.11n	5220	44	12.94	13.11	12.95	13.00	13.06	12.97	13.07	13.07
802.11n	**5240**	**48**	12.87	12.98	12.97	13.11	13.12	13.06	13.14	13.21
802.11n	**5260**	**52**	12.96	13.13	13.00	12.99	13.20	13.14	13.16	13.11
802.11n	5280	56	13.02	13.06	12.99	12.96	12.96	12.95	13.05	13.06
802.11n	5300	60	12.86	12.96	12.91	12.87	12.78	12.89	12.94	12.96
802.11n	**5320**	**64**	12.89	12.86	12.91	12.93	12.93	12.95	12.95	12.94
802.11n	5500	100	12.55	12.53	12.60	12.48	12.52	12.48	12.34	12.66
802.11n	**5520**	**104**	12.60	12.60	12.56	12.57	12.64	12.61	12.54	12.54
802.11n	5540	108	12.50	12.54	12.59	12.55	12.52	12.55	12.67	12.54
802.11n	5560	112	12.46	12.51	12.51	12.54	12.58	12.55	12.59	12.67
802.11n	**5580**	**116**	12.51	12.52	12.52	12.59	12.60	12.55	12.47	12.71
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	**5620**	**124**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	12.55	12.38	12.51	12.50	12.55	12.67	12.60	12.62
802.11n	**5680**	**136**	12.55	12.51	12.56	12.53	12.56	12.62	12.55	12.67
802.11n	5700	140	12.45	12.51	12.51	12.56	12.57	12.58	12.70	12.61
802.11n	**5745**	**149**	12.45	12.55	12.53	12.51	12.54	12.57	12.67	12.61
802.11n	5765	153	12.49	12.47	12.51	12.52	12.66	12.76	12.67	12.62
802.11n	**5785**	**157**	12.51	12.50	12.57	12.55	12.54	12.59	12.69	12.58
802.11n	**5805**	**161**	12.54	12.50	12.51	12.50	12.59	12.53	12.62	12.57
802.11n	5825	165	12.44	12.55	12.49	12.53	12.51	12.55	12.67	12.65

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands.

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 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.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) 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 802.11a mode.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 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.
- The underlined data rate and channel above were tested for SAR.

Figure 13-3
Power Measurement Setup

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14 FCC PERSONAL WIRELESS ROUTER CONFIGURATIONS

14.1 Personal Wireless Router Considerations

Some battery-operated handsets have the capability to transmit and receive internet connectivity through simultaneous transmission of WIFI in conjunction with a separate licensed transmitter. The FCC has provided guidance in KDB Publication 941225 D06 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 with antennas 2.5 cm or closer to the edge of the device, 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.

14.2 SAR Test Setup for Personal Wireless Router Features

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. Therefore, SAR must be evaluated for each frequency transmission and mode separately and summed with the WIFI transmitter according to KDB 648474 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

14.3 SAR Test Configurations

See Figure 1-2 for DUT antenna locations to determine the wireless router edges required for SAR testing bases on FCC KDB 941225 D06. Certain DUT edges were not required to be evaluated for Wireless Router SAR if the transmitting antenna was greater than 2.5 cm from the edge of the device to be considered for RF exposure evaluation.

Table 14-1
DUT Sides for Wireless Router SAR testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
LTE Band 17	Yes	Yes	No	Yes	Yes	No
GPRS 850	Yes	Yes	No	Yes	No	Yes
WCDMA 850	Yes	Yes	No	Yes	No	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	No	Yes
GPRS 1900	Yes	Yes	No	Yes	No	Yes
WCDMA 1900	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN	Yes	Yes	No	No	Yes	No

When hotspot is enabled, all 5 GHz bands are disabled.

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15 SYSTEM VERIFICATION

15.1 Tissue Verification

Table 15-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C˚)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/14/2012	700H	21.1	680	0.846	43.81	0.885	42.273	-4.41%	3.64%
			695	0.859	43.53	0.886	42.193	-3.05%	3.17%
			710	0.871	43.22	0.887	42.113	-1.80%	2.63%
			725	0.890	43.00	0.888	42.033	0.23%	2.30%
			740	0.905	42.94	0.889	41.953	1.80%	2.35%
			755	0.917	42.55	0.891	41.876	2.92%	1.61%
01/25/2012	700H	21.9	680	0.852	44.00	0.885	42.273	-3.73%	4.09%
			695	0.870	43.84	0.886	42.193	-1.81%	3.90%
			710	0.875	43.62	0.887	42.113	-1.35%	3.58%
			725	0.880	43.59	0.888	42.033	-0.90%	3.70%
			740	0.901	43.25	0.889	41.953	1.35%	3.09%
			755	0.919	42.87	0.891	41.876	3.14%	2.37%
01/10/2012	835H	20.5	820	0.866	41.18	0.898	41.571	-3.56%	-0.94%
			835	0.884	40.93	0.900	41.500	-1.78%	-1.37%
			850	0.901	40.85	0.916	41.500	-1.64%	-1.57%
01/16/2012	1750H	21.8	1710	1.379	38.50	1.348	40.136	2.30%	-4.08%
			1750	1.416	38.40	1.370	40.100	3.36%	-4.24%
			1790	1.460	38.26	1.394	40.020	4.73%	-4.40%
01/10/2012	1900H	22.1	1850	1.405	40.95	1.400	40.000	0.36%	2.38%
			1880	1.435	40.93	1.400	40.000	2.50%	2.33%
			1910	1.464	40.79	1.400	40.000	4.57%	1.98%
01/24/2012	1900H	22.5	1850	1.403	40.08	1.400	40.000	0.21%	0.20%
			1880	1.429	39.90	1.400	40.000	2.07%	-0.25%
			1910	1.457	39.79	1.400	40.000	4.07%	-0.53%
01/12/2012	2450H	21.9	2401	1.822	37.78	1.758	39.298	3.64%	-3.86%
			2450	1.876	37.59	1.800	39.200	4.22%	-4.11%
			2499	1.943	37.45	1.852	39.135	4.91%	-4.31%
1/10/2012	5200H-5800H	24.8	5200	4.555	35.01	4.660	36.000	-2.25%	-2.75%
			5220	4.592	34.99	4.680	35.980	-1.88%	-2.75%
			5320	4.707	34.82	4.780	35.880	-1.53%	-2.95%
			5500	4.885	34.57	4.965	35.650	-1.61%	-3.03%
			5580	4.985	34.38	5.049	35.530	-1.27%	-3.24%
			5745	5.125	34.15	5.215	35.355	-1.73%	-3.41%
			5800	5.222	34.04	5.270	35.300	-0.91%	-3.57%

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Table 15-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C˚)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/11/2012	700B	21.5	680	0.926	58.71	0.956	56.069	-3.14%	4.71%
			695	0.939	58.69	0.957	55.985	-1.88%	4.83%
			710	0.959	58.40	0.958	55.901	0.10%	4.47%
			725	0.971	58.33	0.960	55.817	1.15%	4.50%
			740	0.980	58.30	0.961	55.733	1.98%	4.61%
			755	0.994	58.14	0.963	55.649	3.22%	4.48%
01/09/2012	835B	20.2	820	0.967	53.76	0.969	55.284	-0.21%	-2.76%
			835	0.985	53.47	0.970	55.200	1.55%	-3.13%
			850	0.998	53.40	0.988	55.154	1.01%	-3.18%
01/13/2012	1750B	21.5	1710	1.513	50.95	1.460	53.540	3.63%	-4.84%
			1750	1.548	50.89	1.490	53.430	3.89%	-4.75%
			1790	1.583	50.74	1.510	53.330	4.83%	-4.86%
01/31/2012	1750B	22.2	1710	1.427	51.58	1.460	53.540	-2.26%	-3.66%
			1750	1.465	51.43	1.490	53.430	-1.68%	-3.74%
			1790	1.504	51.27	1.510	53.330	-0.40%	-3.86%
01/10/2012	1900B	21.9	1850	1.484	53.30	1.520	53.300	-2.37%	0.00%
			1880	1.526	53.24	1.520	53.300	0.39%	-0.11%
			1910	1.558	53.14	1.520	53.300	2.50%	-0.30%
01/13/2012	2450B	20.6	2401	1.975	51.06	1.903	52.765	3.78%	-3.23%
			2450	2.037	50.86	1.950	52.700	4.46%	-3.49%
			2499	2.114	50.71	2.019	52.638	4.71%	-3.66%
01/25/2012	2450B	21.3	2401	1.945	50.44	1.903	52.765	2.21%	-4.41%
			2450	2.012	50.29	1.950	52.700	3.18%	-4.57%
			2499	2.079	50.08	2.019	52.638	2.97%	-4.86%
01/26/2012	5200B-5800B	23.9	5200	5.347	47.71	5.299	49.014	0.91%	-2.66%
			5220	5.335	47.32	5.323	48.987	0.23%	-3.40%
			5320	5.514	47.16	5.439	48.607	1.38%	-2.98%
			5500	5.771	46.64	5.650	48.580	2.14%	-3.99%
			5580	5.940	46.52	5.743	48.471	3.43%	-4.03%
			5785	6.267	45.99	5.982	48.242	4.76%	-4.67%
			5800	6.257	45.96	6.000	48.200	4.28%	-4.65%

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Note: KDB Publication 450824 was ensured to be applied for probe calibration frequencies greater than or equal to 50 MHz of the DUT frequencies.

The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies (per IEEE 1528 6.6.1.2). The SAR test plots may slightly differ from the table above since the DASY software rounds to three significant digits.

Probe calibration used within ±100 MHz of the test frequency in either 5.725 - 5.85 or 5.47-5.725 GHz is acceptable per KDB Publication 865664 since the design of the SAR probe supports the extended frequency, provided the DASY software version recommended is used for the tests, and the expanded calibration uncertainty (k=2) is less than or equal to 15% (See SAR probe calibration certificate for this information). The dielectric and conductivities measured are within 10% and 5% respectively of the target parameters specified in Supplement C 01-01.

15.2 Measurement Procedure for Tissue verification

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the sample which was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
3) The complex admittance with respect to the probe aperture was measured
4) The complex relative permittivity , for example from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{[\ln(b/a)]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r^{'}\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

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15.3 Test System Verification

Prior to assessment, the system is verified to ±10% of the manufacturer SAR measurement on the reference dipole at the time of calibration.

Table 15-3
System Verification Results

System Verification TARGET & MEASURED											
Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Tissue Frequency (MHz)	Dipole SN	Probe SN	Tissue Type	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g}	Deviation (%)
01/14/2012	23.6	22.5	0.100	750	1046	3258	Head	0.86	8.400	8.600	2.38%
01/25/2012	22.8	20.2	0.100	750	1003	3209	Head	0.851	8.370	8.510	1.67%
01/10/2012	19.8	19.5	0.100	835	4d119	3258	Head	1	9.400	10.000	6.38%
01/16/2012	20.6	21.2	0.100	1750	1008	3258	Head	3.69	36.500	36.900	1.10%
01/10/2012	21.2	20.9	0.100	1900	502	3209	Head	4.03	40.200	40.300	0.25%
01/24/2012	24.1	22.2	0.100	1900	502	3209	Head	4.14	40.200	41.400	2.99%
01/12/2012	24.9	23.2	0.040	2450	719	3258	Head	2.21	53.800	55.250	2.70%
01/10/2012	23.6	22.9	0.100	5200	1007	3561	Head	8.52	79.800	85.200	6.77%
01/10/2012	23.6	23.1	0.100	5500	1007	3561	Head	8.67	86.300	86.700	0.46%
01/10/2012	23.9	23.0	0.100	5800	1007	3561	Head	8.51	79.400	85.100	7.18%
01/11/2012	23.5	22.3	0.100	750	1046	3561	Body	0.887	8.800	8.870	0.80%
01/09/2012	23.7	22.1	0.105	835	4d119	3258	Body	1.05	9.540	10.000	4.82%
01/13/2012	22.9	21.1	0.100	1750	1051	3209	Body	4.05	37.000	40.500	9.46%
01/31/2012	21.8	22.3	0.040	1750	1051	3561	Body	1.44	37.000	36.000	-2.70%
01/10/2012	21.9	20.0	0.100	1900	502	3209	Body	4.28	41.100	42.800	4.14%
01/13/2012	22.2	21.2	0.040	2450	719	3258	Body	2.2	51.300	55.000	7.21%
01/25/2012	24.8	23.1	0.040	2450	719	3258	Body	2.19	51.300	54.750	6.73%
01/26/2012	23.6	22.4	0.100	5200	1007	3561	Body	7.9	75.500	79.000	4.64%
01/26/2012	23.7	22.2	0.100	5500	1007	3561	Body	8.21	81.300	82.100	0.98%
01/26/2012	23.8	22.3	0.100	5800	1007	3561	Body	7.72	75.300	77.200	2.52%

Note: Per KDB Publication 865664, when a reference dipole is not defined within ±100MHz of the test frequency, the system verification may be conducted within ± 200 MHz of the center frequency of the measurement frequencies if the SAR probe calibration is valid and the same tissue-equivalent matter is used for verification and test measurements.

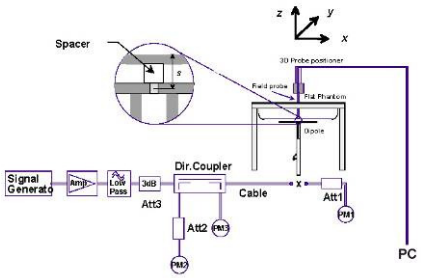

Figure 15-1
System Verification Setup Diagram

Figure 15-2
System Verification Setup Photo

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16 SAR DATA SUMMARY

16.1 Head SAR Data

Table 16-1
LTE Band 17 Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Battery Cover Type	Phone Serial Number	Bandwidth [MHz]	RB Size	RB Offset	SAR (1g)
MHz	Ch.													(W/kg)
710	23790	LTE Band 17	QPSK	21.07	0.03	1	Right	Touch	Standard	FI-347-B	10	25	12	0.117
710	23790	LTE Band 17	QPSK	22.15	-0.04	0	Right	Touch	Standard	FI-347-B	10	1	0	0.157
710	23790	LTE Band 17	QPSK	22.15	-0.06	0	Right	Touch	NFC	FI-347-B	10	1	0	**0.200**
710	23790	LTE Band 17	QPSK	22.20	0.00	0	Right	Touch	Standard	FI-347-B	10	1	49	0.157
710	23790	LTE Band 17	16QAM	20.70	0.07	1	Right	Touch	Standard	FI-347-B	10	25	12	0.105
710	23790	LTE Band 17	16QAM	21.11	0.04	1	Right	Touch	Standard	FI-347-B	10	1	0	0.124
710	23790	LTE Band 17	16QAM	21.08	-0.01	1	Right	Touch	Standard	FI-347-B	10	1	49	0.122
710	23790	LTE Band 17	QPSK	21.07	0.03	1	Right	Tilt	Standard	FI-347-B	10	25	12	0.072
710	23790	LTE Band 17	QPSK	22.15	0.05	0	Right	Tilt	Standard	FI-347-B	10	1	0	0.094
710	23790	LTE Band 17	QPSK	22.20	0.03	0	Right	Tilt	Standard	FI-347-B	10	1	49	**0.096**
710	23790	LTE Band 17	16QAM	20.70	0.09	1	Right	Tilt	Standard	FI-347-B	10	25	12	0.064
710	23790	LTE Band 17	16QAM	21.11	0.06	1	Right	Tilt	Standard	FI-347-B	10	1	0	0.073
710	23790	LTE Band 17	16QAM	21.08	0.18	1	Right	Tilt	Standard	FI-347-B	10	1	49	0.076
710	23790	LTE Band 17	QPSK	21.07	0.02	1	Left	Touch	Standard	FI-347-B	10	25	12	0.089
710	23790	LTE Band 17	QPSK	22.15	0.01	0	Left	Touch	Standard	FI-347-B	10	1	0	0.119
710	23790	LTE Band 17	QPSK	22.20	0.05	0	Left	Touch	Standard	FI-347-B	10	1	49	**0.121**
710	23790	LTE Band 17	16QAM	20.70	0.09	1	Left	Touch	Standard	FI-347-B	10	25	12	0.078
710	23790	LTE Band 17	16QAM	21.11	0.06	1	Left	Touch	Standard	FI-347-B	10	1	0	0.091
710	23790	LTE Band 17	16QAM	21.08	0.05	1	Left	Touch	Standard	FI-347-B	10	1	49	0.093
710	23790	LTE Band 17	QPSK	21.07	-0.04	1	Left	Tilt	Standard	FI-347-B	10	25	12	0.063
710	23790	LTE Band 17	QPSK	22.15	-0.02	0	Left	Tilt	Standard	FI-347-B	10	1	0	0.081
710	23790	LTE Band 17	QPSK	22.20	0.00	0	Left	Tilt	Standard	FI-347-B	10	1	49	**0.091**
710	23790	LTE Band 17	16QAM	20.70	0.03	1	Left	Tilt	Standard	FI-347-B	10	25	12	0.057
710	23790	LTE Band 17	16QAM	21.11	0.05	1	Left	Tilt	Standard	FI-347-B	10	1	0	0.063
710	23790	LTE Band 17	16QAM	21.08	0.18	1	Left	Tilt	Standard	FI-347-B	10	1	49	0.074
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Head 1.6 W/kg (mW/g)** averaged over 1 gram							

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Table 16-2
GSM/WCDMA Head SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Battery Cover Type	Phone Serial Number	SAR (1g)
MHz	Ch.								(W/kg)
836.60	190	GSM 850	32.85	0.02	Right	Touch	Standard	FI-347-A	0.273
836.60	190	GSM 850	32.85	0.06	Right	Tilt	Standard	FI-347-A	0.199
836.60	190	GSM 850	32.85	0.09	Left	Touch	Standard	FI-347-A	0.314
836.60	190	GSM 850	32.85	0.06	Left	Touch	NFC	FI-347-A	0.303
836.60	190	GSM 850	32.85	0.05	Left	Tilt	Standard	FI-347-A	0.208
836.60	4183	WCDMA 850	22.69	0.00	Right	Touch	Standard	FI-347-A	0.173
836.60	4183	WCDMA 850	22.69	0.07	Right	Tilt	Standard	FI-347-A	0.136
836.60	4183	WCDMA 850	22.69	0.07	Left	Touch	Standard	FI-347-A	0.195
836.60	4183	WCDMA 850	22.69	-0.19	Left	Touch	NFC	FI-347-A	0.175
836.60	4183	WCDMA 850	22.69	0.02	Left	Tilt	Standard	FI-347-A	0.146
1880.00	661	GSM 1900	30.32	-0.03	Right	Touch	Standard	FI-347-A	0.186
1880.00	661	GSM 1900	30.32	0.06	Right	Touch	NFC	FI-347-A	0.167
1880.00	661	GSM 1900	30.32	0.00	Right	Tilt	Standard	FI-347-A	0.089
1880.00	661	GSM 1900	30.32	-0.07	Left	Touch	Standard	FI-347-A	0.130
1880.00	661	GSM 1900	30.32	-0.06	Left	Tilt	Standard	FI-347-A	0.084
1880.00	9400	WCDMA 1900	22.60	0.07	Right	Touch	Standard	FI-347-A	0.306
1880.00	9400	WCDMA 1900	22.60	-0.09	Right	Touch	NFC	FI-347-A	0.333
1880.00	9400	WCDMA 1900	22.60	0.10	Right	Tilt	Standard	FI-347-A	0.159
1880.00	9400	WCDMA 1900	22.60	-0.09	Left	Touch	Standard	FI-347-A	0.260
1880.00	9400	WCDMA 1900	22.60	-0.08	Left	Tilt	Standard	FI-347-A	0.146
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**Head 1.6 W/kg (mW/g) averaged over 1 gram**				

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Table 16-3
LTE Band 4 (AWS) Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Battery Cover Type	Phone Serial Number	Bandwidth [MHz]	RB Size	Data Rate (Mbps)	SAR (1g)
MHz	Ch.													(W/kg)
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	-0.14	1	Right	Touch	Standard	FI-347-A	10	25	12	0.178
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	-0.13	0	Right	Touch	Standard	FI-347-A	10	1	0	0.215
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	-0.16	0	Right	Touch	Standard	FI-347-A	10	1	49	**0.235**
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.00	0	Right	Touch	NFC	FI-347-A	10	1	49	0.219
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	-0.20	1	Right	Touch	Standard	FI-347-A	10	25	12	0.166
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	-0.16	1	Right	Touch	Standard	FI-347-A	10	1	0	0.172
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	-0.22	1	Right	Touch	Standard	FI-347-A	10	1	49	0.191
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	0.04	1	Right	Tilt	Standard	FI-347-A	10	25	12	0.128
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	-0.02	0	Right	Tilt	Standard	FI-347-A	10	1	0	0.154
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.01	0	Right	Tilt	Standard	FI-347-A	10	1	49	**0.166**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	-0.05	1	Right	Tilt	Standard	FI-347-A	10	25	12	0.116
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.07	1	Right	Tilt	Standard	FI-347-A	10	1	0	0.120
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	-0.08	1	Right	Tilt	Standard	FI-347-A	10	1	49	0.131
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	-0.03	1	Left	Touch	Standard	FI-347-A	10	25	12	0.170
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.02	0	Left	Touch	Standard	FI-347-A	10	1	0	0.208
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	-0.07	0	Left	Touch	Standard	FI-347-A	10	1	49	**0.231**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	-0.14	1	Left	Touch	Standard	FI-347-A	10	25	12	0.161
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	-0.13	1	Left	Touch	Standard	FI-347-A	10	1	0	0.162
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	-0.05	1	Left	Touch	Standard	FI-347-A	10	1	49	0.182
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	-0.04	1	Left	Tilt	Standard	FI-347-A	10	25	12	0.108
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.06	0	Left	Tilt	Standard	FI-347-A	10	1	0	0.135
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.00	0	Left	Tilt	Standard	FI-347-A	10	1	49	**0.137**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	0.11	1	Left	Tilt	Standard	FI-347-A	10	25	12	0.098
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.07	1	Left	Tilt	Standard	FI-347-A	10	1	0	0.105
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	-0.11	1	Left	Tilt	Standard	FI-347-A	10	1	49	0.107
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Head 1.6 W/kg (mW/g)** averaged over 1 gram							

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Table 16-4
2.4 and 5 GHz WLAN Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Battery Cover Type	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	DSSS	17.77	0.14	Right	Touch	Standard	FI-347-A	1	0.046
2462	11	IEEE 802.11b	DSSS	17.77	-0.14	Right	Tilt	Standard	FI-347-A	1	0.029
2462	11	IEEE 802.11b	DSSS	17.77	-0.02	Left	Touch	Standard	FI-347-A	1	0.096
2462	11	IEEE 802.11b	DSSS	17.77	0.14	Left	Touch	NFC	FI-347-A	1	0.081
2462	11	IEEE 802.11b	DSSS	17.77	0.17	Left	Tilt	Standard	FI-347-A	1	0.035
5785	157	IEEE 802.11a	OFDM	13.58	0.04	Right	Touch	Standard	FI-347-C	6	0.010
5785	157	IEEE 802.11a	OFDM	13.58	0.01	Right	Tilt	Standard	FI-347-C	6	0.000
5785	157	IEEE 802.11a	OFDM	13.58	0.06	Left	Touch	Standard	FI-347-C	6	0.000
5785	157	IEEE 802.11a	OFDM	13.58	0.09	Left	Tilt	Standard	FI-347-C	6	0.000
5220	44	IEEE 802.11a	OFDM	13.65	0.14	Right	Touch	Standard	FI-347-C	6	0.072
5220	44	IEEE 802.11a	OFDM	13.65	0.14	Right	Tilt	Standard	FI-347-C	6	0.011
5220	44	IEEE 802.11a	OFDM	13.65	0.17	Left	Touch	Standard	FI-347-C	6	0.046
5220	44	IEEE 802.11a	OFDM	13.65	0.12	Left	Tilt	Standard	FI-347-C	6	0.017
5320	64	IEEE 802.11a	OFDM	13.84	-0.06	Right	Touch	Standard	FI-347-C	6	0.092
5320	64	IEEE 802.11a	OFDM	13.84	0.05	Right	Touch	NFC	FI-347-C	6	0.083
5320	64	IEEE 802.11a	OFDM	13.84	0.13	Right	Tilt	Standard	FI-347-C	6	0.026
5320	64	IEEE 802.11a	OFDM	13.84	0.04	Left	Touch	Standard	FI-347-C	6	0.067
5320	64	IEEE 802.11a	OFDM	13.84	0.09	Left	Tilt	Standard	FI-347-C	6	0.031
5580	116	IEEE 802.11a	OFDM	13.46	0.19	Right	Touch	Standard	FI-347-C	6	0.035
5580	116	IEEE 802.11a	OFDM	13.46	0.17	Right	Tilt	Standard	FI-347-C	6	0.011
5580	116	IEEE 802.11a	OFDM	13.46	0.10	Left	Touch	Standard	FI-347-C	6	0.033
5580	116	IEEE 802.11a	OFDM	13.46	0.19	Left	Tilt	Standard	FI-347-C	6	0.002
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Head 1.6 W/kg (mW/g)** averaged over 1 gram					

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16.2 Body-Worn SAR Data

Table 16-5
GSM/GPRS/WCDMA Body-Worn SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Battery Cover Type	Phone Serial Number	# of Time Slots	Side	SAR (1g)
MHz	Ch.										(W/kg)
836.60	190	GSM 850	GSM	32.85	0.05	1.0 cm	Standard	FI-347-A	1	back	0.578
836.60	190	GSM 850	GPRS	30.83	0.07	1.0 cm	Standard	FI-347-A	2	back	0.719
836.60	190	GSM 850	GPRS	30.83	0.10	1.0 cm	NFC	FI-347-A	2	back	0.620
836.60	4183	WCDMA 850	RMC	22.69	0.00	1.0 cm	Standard	FI-347-A	N/A	back	0.367
836.60	4183	WCDMA 850	RMC	22.69	0.01	1.0 cm	NFC	FI-347-A	N/A	back	0.329
1880.00	661	GSM 1900	GSM	30.32	-0.01	1.0 cm	Standard	FI-347-A	1	back	0.377
1880.00	661	GSM 1900	GPRS	28.22	0.02	1.0 cm	Standard	FI-347-A	2	back	0.461
1880.00	661	GSM 1900	GPRS	28.22	0.09	1.0 cm	NFC	FI-347-A	2	back	0.415
1880.00	9400	WCDMA 1900	RMC	22.60	0.02	1.0 cm	Standard	FI-347-A	N/A	back	0.628
1880.00	9400	WCDMA 1900	RMC	22.60	-0.06	1.0 cm	NFC	FI-347-A	N/A	back	0.545
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 16-6
LTE Body-Worn SAR Results

MEASUREMENT RESULTS														
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Spacing	Battery Cover Type	Phone Serial Number	Bandwidth [MHz]	RB Size	RB Offset	Side	SAR (1g)
MHz	Ch.													(W/kg)
710.00	23790	LTE Band 17	QPSK	21.07	-0.04	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.300
710.00	23790	LTE Band 17	QPSK	22.15	0.01	0	1.0 cm	Standard	FI-347-A	10	1	0	back	0.361
710.00	23790	LTE Band 17	QPSK	22.15	-0.08	0	1.0 cm	NFC	FI-347-A	10	1	0	back	0.283
710.00	23790	LTE Band 17	QPSK	22.20	-0.10	0	1.0 cm	Standard	FI-347-A	10	1	49	back	0.357
710.00	23790	LTE Band 17	16QAM	20.70	-0.03	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.232
710.00	23790	LTE Band 17	16QAM	21.11	-0.06	1	1.0 cm	Standard	FI-347-A	10	1	0	back	0.270
710.00	23790	LTE Band 17	16QAM	21.08	-0.06	1	1.0 cm	Standard	FI-347-A	10	1	49	back	0.277
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	-0.01	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.425
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.03	0	1.0 cm	Standard	FI-347-A	10	1	0	back	0.438
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.02	0	1.0 cm	Standard	FI-347-A	10	1	49	back	0.492
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	-0.22	0	1.0 cm	NFC	FI-347-A	10	1	49	back	0.374
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	0.04	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.338
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.00	1	1.0 cm	Standard	FI-347-A	10	1	0	back	0.339
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	0.00	1	1.0 cm	Standard	FI-347-A	10	1	49	back	0.446
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 16-7
WLAN Body-Worn SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Battery Cover Type	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	DSSS	17.77	0.00	1.0 cm	Standard	FI-347-A	1	back	0.044
2462	11	IEEE 802.11b	DSSS	17.77	0.16	1.0 cm	NFC	FI-347-A	1	back	0.049
5785	157	IEEE 802.11a	OFDM	13.58	0.16	1.0 cm	Standard	FI-347-C	6	back	0.004
5220	44	IEEE 802.11a	OFDM	13.65	-0.11	1.0 cm	Standard	FI-347-C	6	back	0.101
5220	44	IEEE 802.11a	OFDM	13.65	-0.07	1.0 cm	NFC	FI-347-C	6	back	0.114
5320	64	IEEE 802.11a	OFDM	13.84	0.17	1.0 cm	Standard	FI-347-C	6	back	0.090
5580	116	IEEE 802.11a	OFDM	13.46	-0.16	1.0 cm	Standard	FI-347-C	6	back	0.035
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Body 1.6 W/kg (mW/g)** averaged over 1 gram					

16.3 Hotspot SAR Data

Table 16-8
LTE Band 17 Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Spacing	Battery Cover Type	Phone Serial Number	Bandwidth [MHz]	RB Size	RB Offset	Side	SAR (1g)
MHz	Ch.													(W/kg)
710	23790	LTE Band 17	QPSK	21.07	-0.04	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.300
710	23790	LTE Band 17	QPSK	22.15	0.01	0	1.0 cm	Standard	FI-347-A	10	1	0	back	**0.361**
710	23790	LTE Band 17	QPSK	22.15	-0.08	0	1.0 cm	NFC	FI-347-A	10	1	0	back	0.283
710	23790	LTE Band 17	QPSK	22.20	-0.10	0	1.0 cm	Standard	FI-347-A	10	1	49	back	0.357
710	23790	LTE Band 17	16QAM	20.70	-0.03	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.232
710	23790	LTE Band 17	16QAM	21.11	-0.06	1	1.0 cm	Standard	FI-347-A	10	1	0	back	0.270
710	23790	LTE Band 17	16QAM	21.08	-0.06	1	1.0 cm	Standard	FI-347-A	10	1	49	back	0.277
710	23790	LTE Band 17	QPSK	21.07	-0.04	1	1.0 cm	Standard	FI-347-A	10	25	12	front	0.131
710	23790	LTE Band 17	QPSK	22.15	0.12	0	1.0 cm	Standard	FI-347-A	10	1	0	front	0.170
710	23790	LTE Band 17	QPSK	22.20	-0.04	0	1.0 cm	Standard	FI-347-A	10	1	49	front	**0.183**
710	23790	LTE Band 17	16QAM	20.70	-0.07	1	1.0 cm	Standard	FI-347-A	10	25	12	front	0.126
710	23790	LTE Band 17	16QAM	21.11	-0.16	1	1.0 cm	Standard	FI-347-A	10	1	0	front	0.132
710	23790	LTE Band 17	16QAM	21.08	-0.11	1	1.0 cm	Standard	FI-347-A	10	1	49	front	0.134
710	23790	LTE Band 17	QPSK	21.07	-0.21	1	1.0 cm	Standard	FI-347-A	10	25	12	bottom	0.079
710	23790	LTE Band 17	QPSK	22.15	-0.03	0	1.0 cm	Standard	FI-347-A	10	1	0	bottom	0.107
710	23790	LTE Band 17	QPSK	22.20	0.00	0	1.0 cm	Standard	FI-347-A	10	1	49	bottom	**0.113**
710	23790	LTE Band 17	16QAM	20.70	-0.11	1	1.0 cm	Standard	FI-347-A	10	25	12	bottom	0.068
710	23790	LTE Band 17	16QAM	21.11	0.06	1	1.0 cm	Standard	FI-347-A	10	1	0	bottom	0.081
710	23790	LTE Band 17	16QAM	21.08	-0.08	1	1.0 cm	Standard	FI-347-A	10	1	49	bottom	0.088
710	23790	LTE Band 17	QPSK	21.07	-0.12	1	1.0 cm	Standard	FI-347-A	10	25	12	right	0.197
710	23790	LTE Band 17	QPSK	22.15	-0.06	0	1.0 cm	Standard	FI-347-A	10	1	0	right	0.223
710	23790	LTE Band 17	QPSK	22.20	-0.04	0	1.0 cm	Standard	FI-347-A	10	1	49	right	**0.245**
710	23790	LTE Band 17	16QAM	20.70	-0.09	1	1.0 cm	Standard	FI-347-A	10	25	12	right	0.156
710	23790	LTE Band 17	16QAM	21.11	-0.11	1	1.0 cm	Standard	FI-347-A	10	1	0	right	0.183
710	23790	LTE Band 17	16QAM	21.08	-0.15	1	1.0 cm	Standard	FI-347-A	10	1	49	right	0.199
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Body 1.6 W/kg (mW/g)** averaged over 1 gram							

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Table 16-9
GPRS/WCDMA Hotspot SAR Data

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Battery Cover Type	Phone Serial Number	# of GPRS Slots	Side	SAR (1g)
MHz	Ch.										(W/kg)
836.60	190	GSM 850	GPRS	30.83	0.07	1.0 cm	Standard	FI-347-A	2	back	0.719
836.60	190	GSM 850	GPRS	30.83	0.10	1.0 cm	NFC	FI-347-A	2	back	0.620
836.60	190	GSM 850	GPRS	30.83	-0.07	1.0 cm	Standard	FI-347-A	2	front	0.518
836.60	190	GSM 850	GPRS	30.83	0.15	1.0 cm	Standard	FI-347-A	2	bottom	0.287
836.60	190	GSM 850	GPRS	30.83	-0.02	1.0 cm	Standard	FI-347-A	2	left	0.697
836.60	4183	WCDMA 850	RMC	22.69	0.00	1.0 cm	Standard	FI-347-A	N/A	back	0.367
836.60	4183	WCDMA 850	RMC	22.69	0.01	1.0 cm	NFC	FI-347-A	N/A	back	0.329
836.60	4183	WCDMA 850	RMC	22.69	0.08	1.0 cm	Standard	FI-347-A	N/A	front	0.273
836.60	4183	WCDMA 850	RMC	22.69	0.07	1.0 cm	Standard	FI-347-A	N/A	bottom	0.174
836.60	4183	WCDMA 850	RMC	22.69	0.00	1.0 cm	Standard	FI-347-A	N/A	left	0.404
836.60	4183	WCDMA 850	RMC	22.69	-0.01	1.0 cm	NFC	FI-347-A	N/A	left	0.379
1880.00	661	GSM 1900	GPRS	28.22	0.02	1.0 cm	Standard	FI-347-A	2	back	0.461
1880.00	661	GSM 1900	GPRS	28.22	0.09	1.0 cm	NFC	FI-347-A	2	back	0.415
1880.00	661	GSM 1900	GPRS	28.22	0.15	1.0 cm	Standard	FI-347-A	2	front	0.296
1880.00	661	GSM 1900	GPRS	28.22	-0.13	1.0 cm	Standard	FI-347-A	2	bottom	0.560
1880.00	661	GSM 1900	GPRS	28.22	0.08	1.0 cm	NFC	FI-347-A	2	bottom	0.494
1880.00	661	GSM 1900	GPRS	28.22	-0.03	1.0 cm	Standard	FI-347-A	2	left	0.154
1880.00	9400	WCDMA 1900	RMC	22.60	0.02	1.0 cm	Standard	FI-347-A	N/A	back	0.628
1880.00	9400	WCDMA 1900	RMC	22.60	-0.06	1.0 cm	NFC	FI-347-A	N/A	back	0.545
1880.00	9400	WCDMA 1900	RMC	22.60	0.02	1.0 cm	Standard	FI-347-A	N/A	front	0.460
1880.00	9400	WCDMA 1900	RMC	22.60	0.02	1.0 cm	Standard	FI-347-A	N/A	bottom	0.740
1880.00	9400	WCDMA 1900	RMC	22.60	-0.05	1.0 cm	NFC	FI-347-A	N/A	bottom	0.734
1880.00	9400	WCDMA 1900	RMC	22.60	-0.03	1.0 cm	Standard	FI-347-A	N/A	left	0.207
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Body 1.6 W/kg (mW/g)** averaged over 1 gram					

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Table 16-10
LTE Band 4 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Spacing	Battery Cover Type	Phone Serial Number	Bandwidth [MHz]	RB Size	RB Offset	Side	SAR (1g)
MHz	Ch.													(W/kg)
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	-0.01	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.425
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.03	0	1.0 cm	Standard	FI-347-A	10	1	0	back	0.438
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.02	0	1.0 cm	Standard	FI-347-A	10	1	49	back	**0.492**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	0.04	1	1.0 cm	Standard	FI-347-A	10	25	12	back	0.338
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.00	1	1.0 cm	Standard	FI-347-A	10	1	0	back	0.339
1720.50	20175	LTE Band 4 (AWS)	16QAM	22.15	0.00	1	1.0 cm	Standard	FI-347-A	10	1	49	back	0.446
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	0.02	1	1.0 cm	Standard	FI-347-A	10	25	12	front	0.293
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.01	0	1.0 cm	Standard	FI-347-A	10	1	0	front	0.350
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.03	0	1.0 cm	Standard	FI-347-A	10	1	49	front	**0.387**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	0.02	1	1.0 cm	Standard	FI-347-A	10	25	12	front	0.266
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.00	1	1.0 cm	Standard	FI-347-A	10	1	0	front	0.270
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	-0.02	1	1.0 cm	Standard	FI-347-A	10	1	49	front	0.304
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	0.08	1	1.0 cm	Standard	FI-347-A	10	25	12	bottom	0.446
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	-0.01	0	1.0 cm	Standard	FI-347-A	10	1	0	bottom	0.534
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	-0.07	0	1.0 cm	Standard	FI-347-A	10	1	49	bottom	**0.580**
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	-0.17	0	1.0 cm	NFC	FI-347-A	10	1	49	bottom	0.580
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	-0.02	1	1.0 cm	Standard	FI-347-A	10	25	12	bottom	0.407
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	-0.01	1	1.0 cm	Standard	FI-347-A	10	1	0	bottom	0.414
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	0.00	1	1.0 cm	Standard	FI-347-A	10	1	49	bottom	0.456
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.34	0.05	1	1.0 cm	Standard	FI-347-A	10	25	12	left	0.139
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.22	0.00	0	1.0 cm	Standard	FI-347-A	10	1	0	left	0.165
1732.50	20175	LTE Band 4 (AWS)	QPSK	23.13	0.03	0	1.0 cm	Standard	FI-347-A	10	1	49	left	**0.182**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.80	0.11	1	1.0 cm	Standard	FI-347-A	10	25	12	left	0.122
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.06	0.03	1	1.0 cm	Standard	FI-347-A	10	1	0	left	0.129
1732.50	20175	LTE Band 4 (AWS)	16QAM	22.15	0.01	1	1.0 cm	Standard	FI-347-A	10	1	49	left	0.144
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Body 1.6 W/kg (mW/g)** averaged over 1 gram							

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Table 16-11
WLAN Hotspot SAR Data

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Battery Cover Type	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	DSSS	17.77	0.00	1.0 cm	Standard	FI-347-A	1	back	0.044
2462	11	IEEE 802.11b	DSSS	17.77	0.16	1.0 cm	NFC	FI-347-A	1	back	0.049
2462	11	IEEE 802.11b	DSSS	17.77	0.04	1.0 cm	Standard	FI-347-A	1	front	0.026
2462	11	IEEE 802.11b	DSSS	17.77	0.17	1.0 cm	Standard	FI-347-A	1	right	0.039
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Body 1.6 W/kg (mW/g)** averaged over 1 gram					

16.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC/OET Bulletin 65, Supplement C [June 2001].
2. Batteries are fully charged for all readings. Standard battery was used.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Liquid tissue depth was at least 15.0 cm.
5. All samples tested were electrically identical per the applicant.
6. Device was tested using a fixed spacing for body-worn testing. A separation distance of 10 mm was tested because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. To confirm the proper SAR liquid depth, the z-axis plots from the system verifications were included since the system verifications were performed using the same liquid, probe and DAE as the SAR tests in the same time period.
8. A NFC battery cover is available and contains a near field communications (NFC) antenna. Tests were performed with the standard battery cover and then worst case for Head, Body-Worn, and Hotspot was additionally tested with the NFC battery cover. The technical description contains detailed information about the near field communications antenna.

GSM Notes:

1. Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
2. Body-Worn accessory testing is typically associated with voice operations. Therefore body-worn SAR testing was additionally performed in GSM voice mode. GPRS Data mode is covered in the Hotspot SAR Testing at the same test distance
3. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode (GPRS), it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.
4. Justification for reduced test configurations per KDB Publication 941225 D03: The source-based time-averaged output power was evaluated for all multi-slot operations. In addition to the worst-

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case reported, all source-based time-averaged powers within 10% of the worst-case were additionally included in the evaluation for data modes.

WCDMA Notes:

1. Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
2. WCDMA mode in Body SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
3. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.
4. AWS WCDMA SAR was measured with a probe calibrated at 1750 MHz and is valid for measuring SAR from ± 50 MHz. The 1750MHz specific liquid was verified with specific probe calibration factors as required per FCC KDB Publication 450824 D01.

LTE Notes:

1. Considerations: LTE test configurations are determined according to SAR Test Considerations for LTE handsets and Data Modems KDB 941225 D05 Publication:
    a. Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
    b. Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel should be tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation because the SAR is < 0.8 W/kg.
    c. Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required for the highest bandwidth.
    d. Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation when the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. 1 RB low and high offset configurations are considered together for a single channel selection. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.
    e. Per Page 4, 3) B), I), when the SAR for QPSK 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
    f. Per Page 4, 4) A), 16QAM with 50% RB is required for the highest bandwidth on the channel with the highest measured SAR for QPSK with 50% RB allocation.
    g. Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
    h. Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required for the highest bandwidth on the highest output power channel for the 1 RB allocation when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. 1 RB low and high offset configurations are considered together for a single channel selection. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.
    i. Per Page 5, 4) B), I), when the SAR for 16QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
    j. Per Page 4, 4), A) I) and Page 5, 4), A) I, 100% RB Allocation is not required to be tested when the SAR is not > 1.45 W/kg for the highest bandwidth.

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k. Per Page 5, 5) B) I), LTE SAR for the lower bandwidths are not required to be tested when the SAR is not >1.45 W/kg for the highest bandwidth and the maximum average output power over all channels and configurations is not more than 0.5 dB higher then the higher bandwidths

2. There is a permanently applied MPR implemented by the manufacturer. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1. The differences noted are not cases of implemented MPR but rather associated with measurement uncertainty and allowable tolerances per 3GPP standard and the manufacturer.
3. A-MPR was disabled for all SAR tests.
4. Only the primary Tx/Rx LTE antenna was transmitting during testing. The secondary LTE antenna was for receive-only and was not transmitting during testing.
5. LTE Head was evaluated to cover third-party VOIP applications that may result in LTE being used held to the ear.
6. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.
7. LTE band 4 SAR was measured with a probe calibrated at 1750 MHz and is valid for measuring SAR from ± 50 MHz. The 1750MHz specific liquid was verified with specific probe calibration factors as required per FCC KDB Publication 450824 D01

WLAN Notes:

1. Justification for reduced test configurations for 2.4 GHz WIFI channels per KDB Publication 248227 and April 2010 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. Justification for reduced test configurations for 5 GHz WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n) 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 802.11a mode.
3. When Hotspot is enabled, all 5 GHz bands are disabled.
4. WLAN transmission was verified using a spectrum analyzer
5. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 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. .
6. For 2.4 GHz WIFI, per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

Hotspot Notes:

1. Top and Right Edges were not tested for the GSM/WCDMA and LTE Band 4 (AWS) antenna since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 14.3).

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2. Top and Left Edges were not tested for the LTE Band 17 antenna since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 14.3).
3. Top, Left, and Bottom Edges for the WLAN transmitter was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 14.3).
4. During SAR Testing for the Wireless Router conditions per KDB 941225 D06, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 14.2).
5. For Hotspot SAR testing, transmission modes were evaluated separately for SAR.
6. SAR evaluation requires a single frequency of measurement for valid measurements using the SAR probe and tissue calibrated which are calibrated for specific limited frequency ranges. Therefore, during SAR evaluation it was ensured that the WIFI transmission was disabled by the manufacturer to assess the standalone SAR to be evaluated for SAR. WIFI SAR was separately evaluated to account for the WIFI SAR for portable hotspot exposure conditions (See Section 14).

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17 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

17.1 Introduction

The following procedures adopted from "FCC SAR Considerations for Cell Phones with Multiple Transmitters" FCC KDB Publication 648474 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

17.2 FCC Power Tables & Conditions

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this table.				

Figure 17-1
Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only ○ when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed ○ when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas ○ when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – ○ output ≤ 60/f: SAR not required ○ output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when ○ output ≤ $2 \cdot P_{Ref}$ and antenna is ≥ 5.0 cm from other antennas ○ output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas ○ output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required ○ test SAR on highest output channel for each wireless mode and exposure condition ○ if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	

Figure 17-2
SAR Evaluation Requirements for Multiple Transmitter Handsets

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17.3 Head SAR Simultaneous Transmission Analysis

Table 17-1
2.4 GHz Simultaneous Transmission Scenario (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.273	0.046	0.319	Head SAR	Right Cheek	0.186	0.046	**0.232**
	Right Tilt	0.199	0.029	0.228		Right Tilt	0.089	0.029	0.118
	Left Cheek	0.314	0.096	**0.410**		Left Cheek	0.130	0.096	0.226
	Left Tilt	0.208	0.035	0.243		Left Tilt	0.084	0.035	0.119
Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.173	0.046	0.219	Head SAR	Right Cheek	0.333	0.046	**0.379**
	Right Tilt	0.136	0.029	0.165		Right Tilt	0.159	0.029	0.188
	Left Cheek	0.195	0.096	**0.291**		Left Cheek	0.260	0.096	0.356
	Left Tilt	0.146	0.035	0.181		Left Tilt	0.146	0.035	0.181

The above tables represent a held to ear voice call potentially simultaneously operating with 2.4 GHz WLAN.

Table 17-2
2.4 GHz Simultaneous Transmission Scenario (Held to Ear)

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.200	0.046	**0.246**	Head SAR	Right Cheek	0.235	0.046	0.281
	Right Tilt	0.096	0.029	0.125		Right Tilt	0.166	0.029	0.195
	Left Cheek	0.121	0.096	0.217		Left Cheek	0.231	0.096	**0.327**
	Left Tilt	0.091	0.035	0.126		Left Tilt	0.137	0.035	0.172

The above tables represent a held to ear LTE VOIP call (through 3rd party software) potentially simultaneously operating with 2.4 GHz WLAN hotspot.

Table 17-3
5 GHz Simultaneous Transmission Scenario (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.273	0.092	0.365	Head SAR	Right Cheek	0.186	0.092	**0.278**
	Right Tilt	0.199	0.026	0.225		Right Tilt	0.089	0.026	0.115
	Left Cheek	0.314	0.067	**0.381**		Left Cheek	0.130	0.067	0.197
	Left Tilt	0.208	0.031	0.239		Left Tilt	0.084	0.031	0.115
Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.173	0.092	**0.265**	Head SAR	Right Cheek	0.333	0.092	**0.425**
	Right Tilt	0.136	0.026	0.162		Right Tilt	0.159	0.026	0.185
	Left Cheek	0.195	0.067	0.262		Left Cheek	0.260	0.067	0.327
	Left Tilt	0.146	0.031	0.177		Left Tilt	0.146	0.031	0.177

The above tables represent a held to ear voice call potentially simultaneously operating with 5 GHz WLAN.

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17.4 Body-Worn Simultaneous Transmission Analysis

Table 17-4
2.4 GHz Simultaneous Transmission Scenario (Body-Worn) at 1.0 cm

Configuration	Mode	2G/3G SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.578	0.049	0.627
Back Side	WCDMA 850	0.367	0.049	0.416
Back Side	GSM 1900	0.377	0.049	0.426
Back Side	WCDMA 1900	0.628	0.049	**0.677**

The above tables represent a body-worn voice call potentially simultaneously operating with 2.4 GHz WLAN.

Table 17-5
2.4 GHz Simultaneous Transmission Scenario (Body-Worn) at 1.0 cm

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 17	0.361	0.049	0.410
Back Side	LTE Band 4	0.492	0.049	0.541

The above tables represent a held to ear LTE VOIP call (through 3rd party software) potentially simultaneously operating with 2.4 GHz WLAN hotspot.

Table 17-6
5 GHz Simultaneous Transmission Scenario (Body-Worn) at 1.0 cm

Configuration	Mode	2G/3G SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.578	0.114	0.692
Back Side	WCDMA 850	0.367	0.114	0.481
Back Side	GSM 1900	0.377	0.114	0.491
Back Side	WCDMA 1900	0.628	0.114	**0.742**

The above tables represent a body-worn voice call potentially simultaneously operating with 5 GHz WLAN.

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17.5 Hotspot SAR Simultaneous Transmission Analysis

Table 17-7
Simultaneous Transmission Scenario (Hotspot) at 1.0 cm

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.361	0.049	**0.410**	Body SAR	Back	0.492	0.049	0.541
	Front	0.183	0.026	0.209		Front	0.387	0.026	0.413
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.113	-	0.113		Bottom	0.580	-	**0.580**
	Right	0.245	0.039	0.284		Right	-	0.039	0.039
	Left	-	-	0.000		Left	0.182	-	0.182
Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.719	0.049	**0.768**	Body SAR	Back	0.461	0.049	0.510
	Front	0.518	0.026	0.544		Front	0.296	0.026	0.322
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.287	-	0.287		Bottom	0.560	-	**0.560**
	Right	-	0.039	0.039		Right	-	0.039	0.039
	Left	0.697	-	0.697		Left	0.154	-	0.154
Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.367	0.049	**0.416**	Body SAR	Back	0.628	0.049	0.677
	Front	0.273	0.026	0.299		Front	0.460	0.026	0.486
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.174	-	0.174		Bottom	0.740	-	**0.740**
	Right	-	0.039	0.039		Right	-	0.039	0.039
	Left	0.404	-	0.404		Left	0.207	-	0.207

Note: Per FCC KDB Publication 941225 D06, the edges with antennas more than 2.5 cm are not required to be evaluated for SAR ("-"). The above tables represent a portable hotspot condition.

17.6 Simultaneous Transmission Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. No volumetric SAR summation is required per FCC KDB Publication 648474.

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18 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2011	Annual	10/10/2012	3613A00315
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/21/2011	Annual	4/21/2012	JP38020182
Agilent	E5515C	Wireless Communications Test Set	10/10/2011	Annual	10/10/2012	GB46110872
Agilent	E5515C	Wireless Communications Test Set	10/20/2011	Annual	10/20/2012	GB46310798
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/8/2011	Annual	4/8/2012	MY45470194
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
Index SAR	IXTL-010	Dielectric Measurement Kit	N/A		N/A	N/A
Index SAR	IXTL-030	30MM TEM line for 6 GHz	N/A		N/A	N/A
Pasternack	PE2208-6	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	N/A
Pasternack	PE2209-10	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	4/19/2011	Annual	4/19/2012	107826
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
SPEAG	D1765V2	1765 MHz SAR Dipole	6/16/2011	Annual	6/16/2012	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/17/2011	Annual	2/17/2012	502
SPEAG	D2450V2	2450 MHz SAR Dipole	8/19/2011	Annual	8/19/2012	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	7/26/2011	Annual	7/26/2012	1007
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2011	Annual	4/20/2012	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/21/2011	Annual	2/21/2012	649
SPEAG	EX3DV4	SAR Probe	7/27/2011	Annual	7/27/2012	3561
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/19/2011	Annual	5/19/2012	859
SPEAG	D750V3	750 MHz Dipole	2/14/2011	Annual	2/14/2012	1003
SPEAG	ES3DV3	SAR Probe	4/18/2011	Annual	4/18/2012	3209
Rohde & Schwarz	SMIQ03B	Signal Generator	4/6/2011	Annual	4/6/2012	DE27259
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5318
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5442
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	1190013
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	98150041
Agilent	8648D	Signal Generator	4/5/2011	Annual	4/5/2012	3629U00687
Anritsu	ML2438A	Power Meter	10/13/2011	Annual	10/13/2012	1070030
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5821
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	8013
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5605
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	2400
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB43304447
Agilent	E5515C	Wireless Communications Tester	4/21/2011	Annual	4/21/2012	US41140256
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	N/A		N/A	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	N/A	N/A
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331322
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331323
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331330
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331332
Control Company	61220-416	Long-Stem Thermometer	3/16/2011	Biennial	3/16/2013	111391601
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286445
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286460
VWR	36934-158	Wall-Mounted Thermometer	5/26/2010	Biennial	5/26/2012	101718589
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286454
VWR	36934-158	Wall-Mounted Thermometer	2/26/2010	Biennial	2/26/2012	101536273
SPEAG	ES3DV3	SAR Probe	4/8/2011	Annual	4/8/2012	3258
SPEAG	D1750V2	1750 MHz SAR Dipole	5/24/2011	Annual	5/24/2012	1051
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	N/A	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT	N/A	N/A	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	N/A	120
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	N/A	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	N/A	N/A
SPEAG	D835V2	835 MHz SAR Dipole	12/21/2011	Annual	12/21/2012	4d119
SPEAG	D750V3	750 MHz Dipole	10/27/2011	Annual	10/27/2012	1046
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	N/A	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	N/A	N/A

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, 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.

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19 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

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

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Applicable for frequencies up to 6 GHz.

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	6.55	N	1	1.0	1.0	6.6	6.6	∞
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				12.4	12.0	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.7	24.0	

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

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20 CONCLUSION

20.1 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

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DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-B

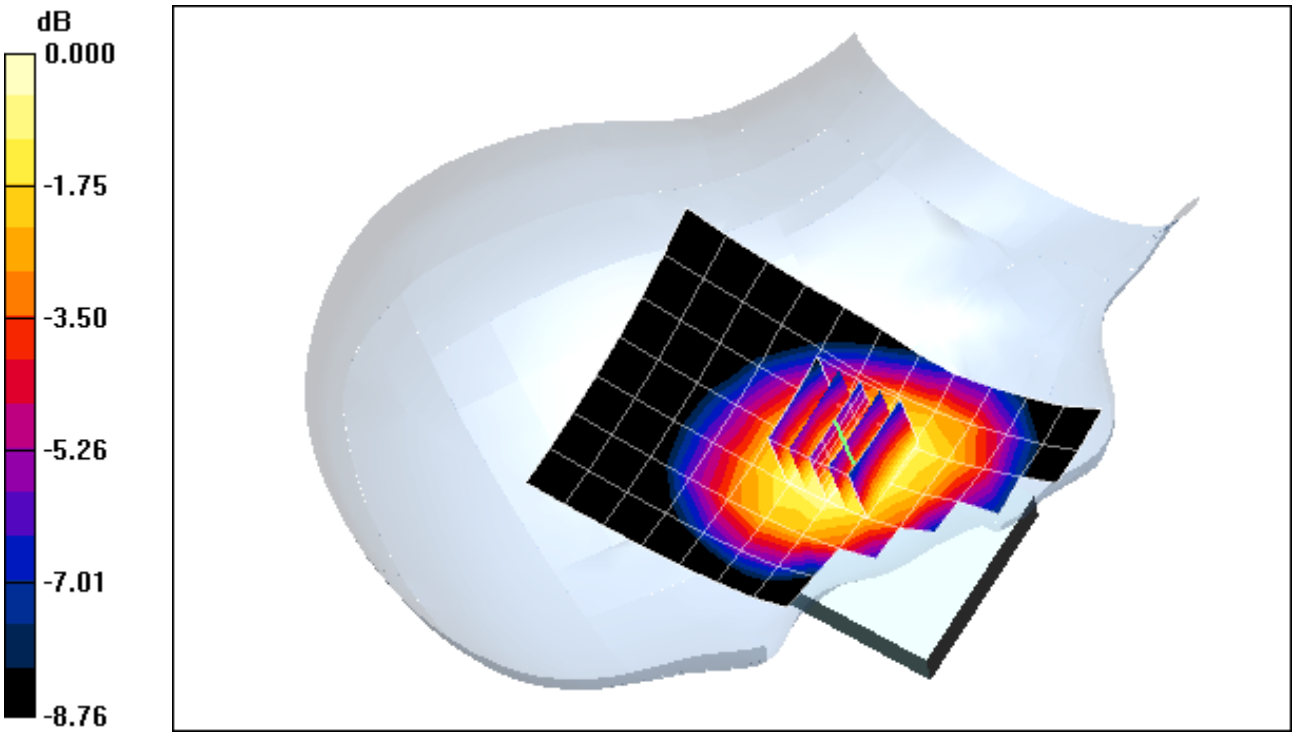
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.875 mho/m; ε_r = 43.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-25-2012; Ambient Temp: 22.8°C; Tissue Temp: 20.2°C

Probe: ES3DV3 - SN3209; ConvF(6.42, 6.42, 6.42); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Right Head, Touch, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 0 RB Offset, NFC Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 0.258 W/kg
SAR(1 g) = 0.200 mW/g; SAR(10 g) = 0.152 mW/g



0 dB = 0.211mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-B

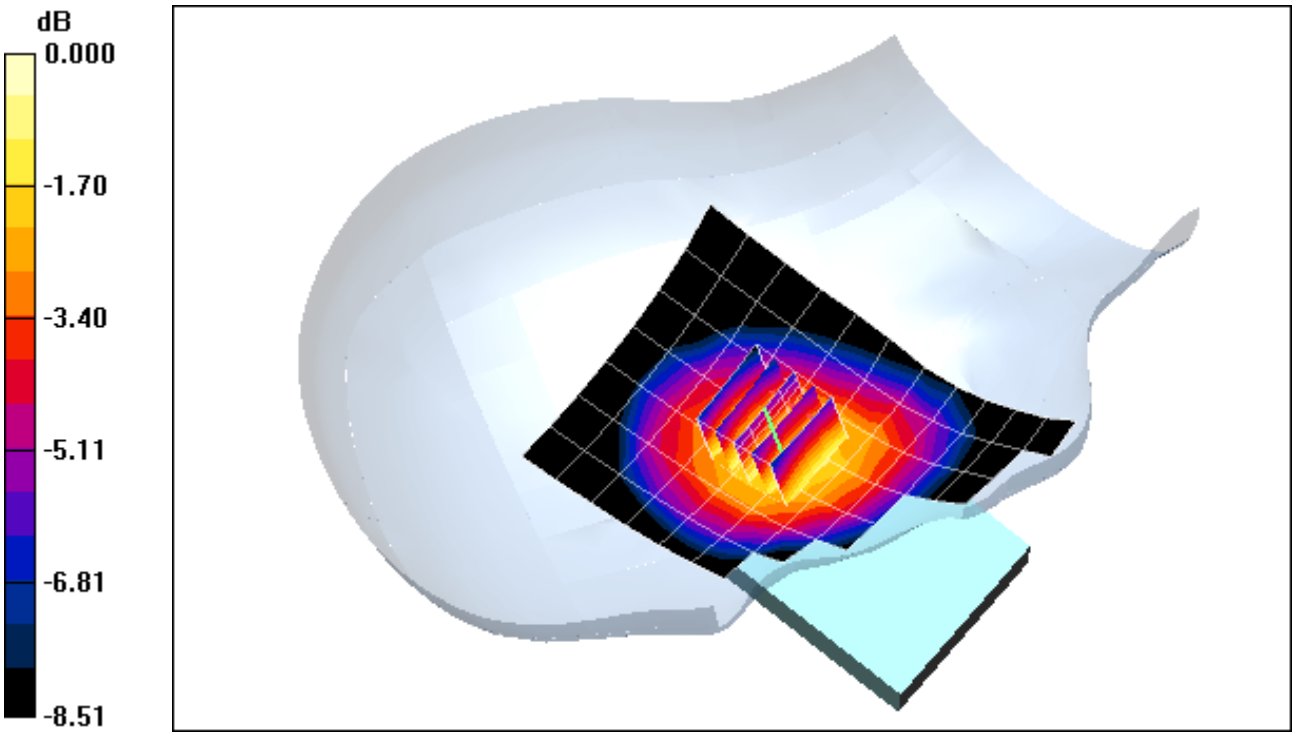
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.871 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-14-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3258; ConvF(6.41, 6.41, 6.41); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Right Head, Tilt, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.075 mW/g



0 dB = 0.100mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-B

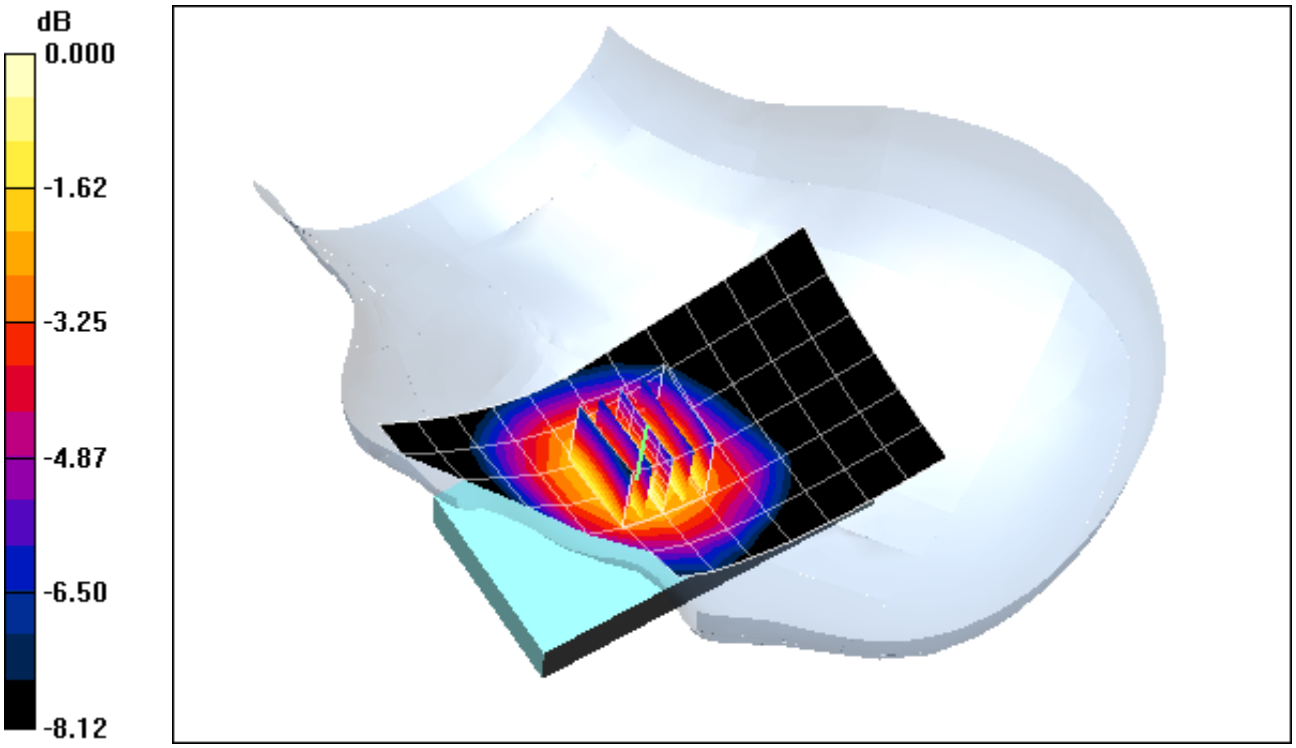
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.871 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-14-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3258; ConvF(6.41, 6.41, 6.41); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Left Head, Touch, Mid.ch
QPSK, 10MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 0.148 W/kg
SAR(1 g) = 0.121 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.126mW/g

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-B

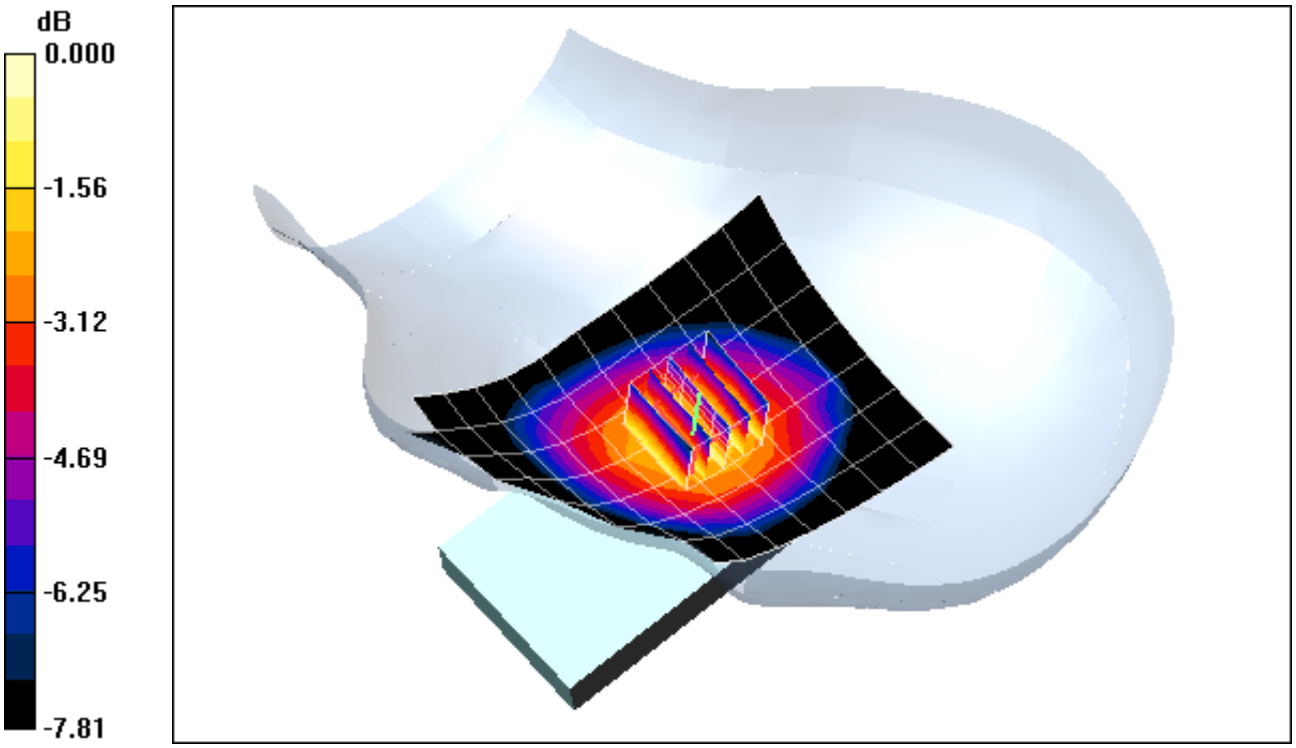
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.871 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-14-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3258; ConvF(6.41, 6.41, 6.41); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Left Head, Tilt, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.071 mW/g



0 dB = 0.095mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

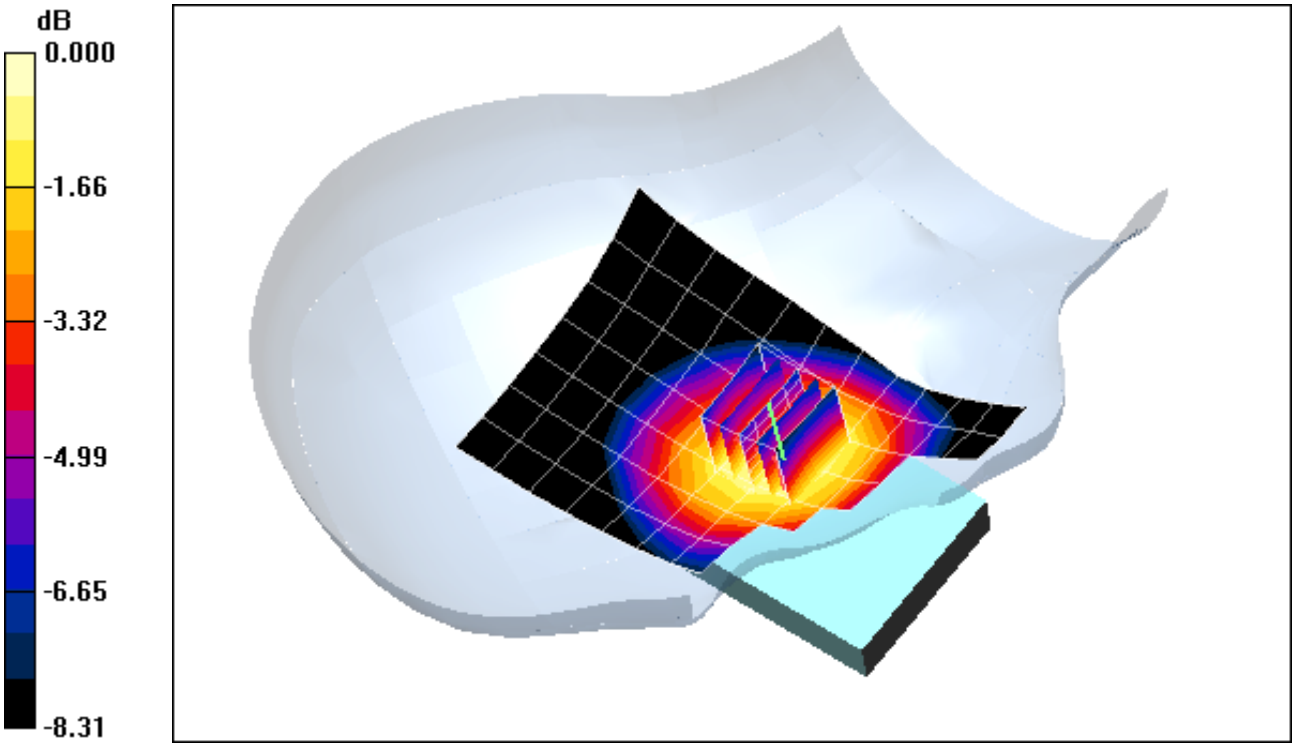
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Right Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.2 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.343 W/kg
SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.207 mW/g



0 dB = 0.287mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

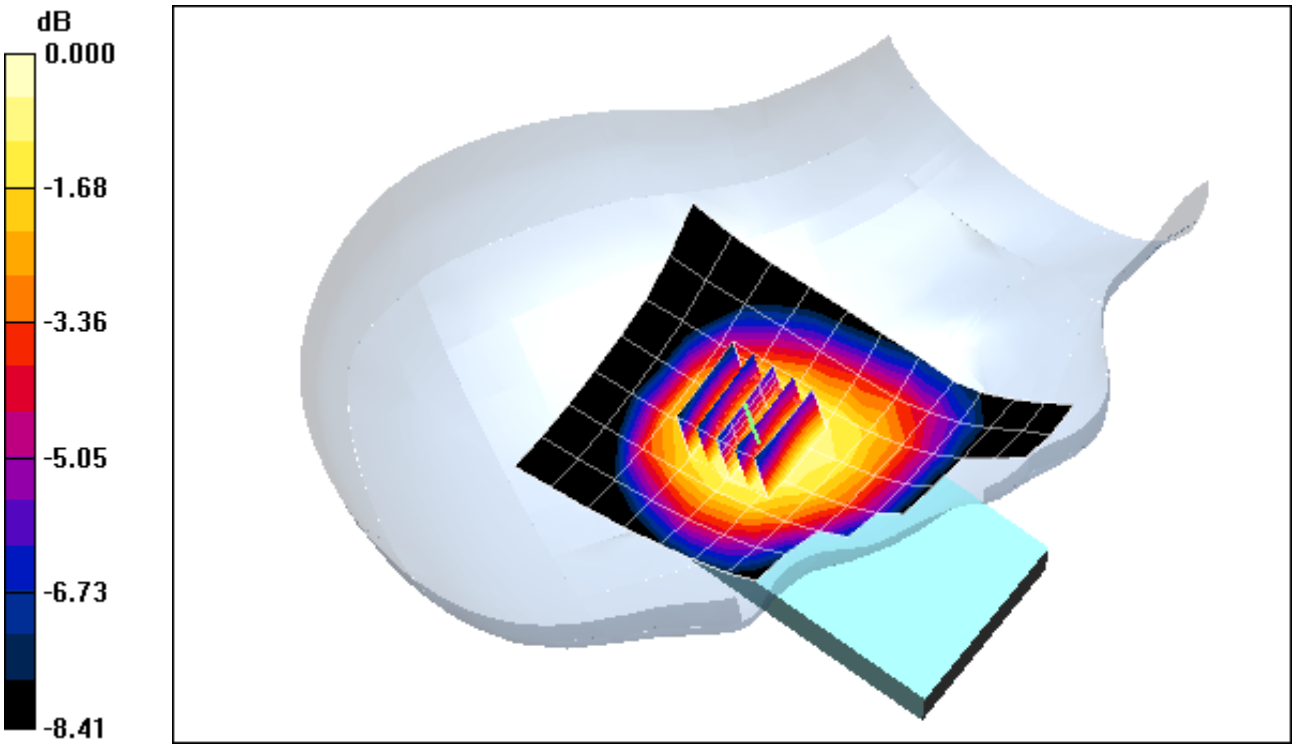
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Right Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.2 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.247 W/kg
SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.152 mW/g



0 dB = 0.208mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

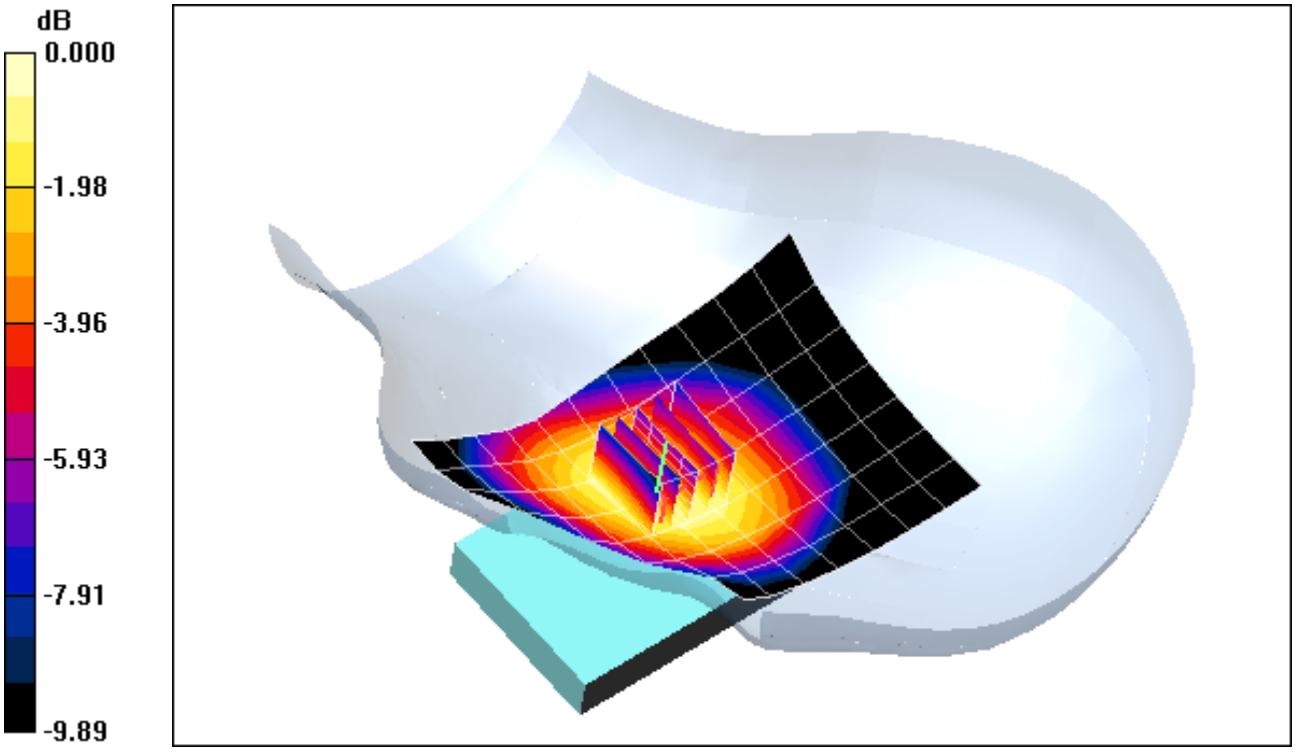
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Left Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.2 V/m; Power Drift = 0.087 dB
Peak SAR (extrapolated) = 0.400 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.235 mW/g



0 dB = 0.336mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

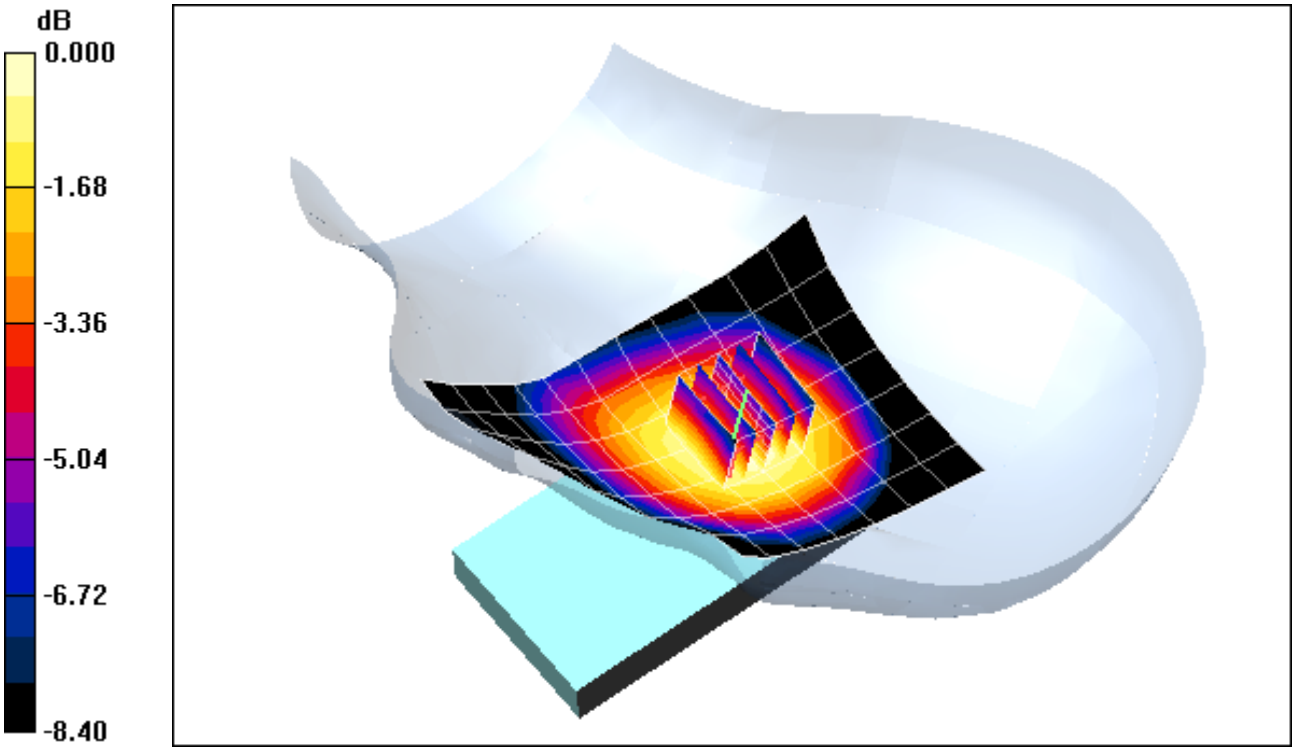
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Left Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = 0.049 dB
Peak SAR (extrapolated) = 0.258 W/kg
SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.159 mW/g



0 dB = 0.219mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

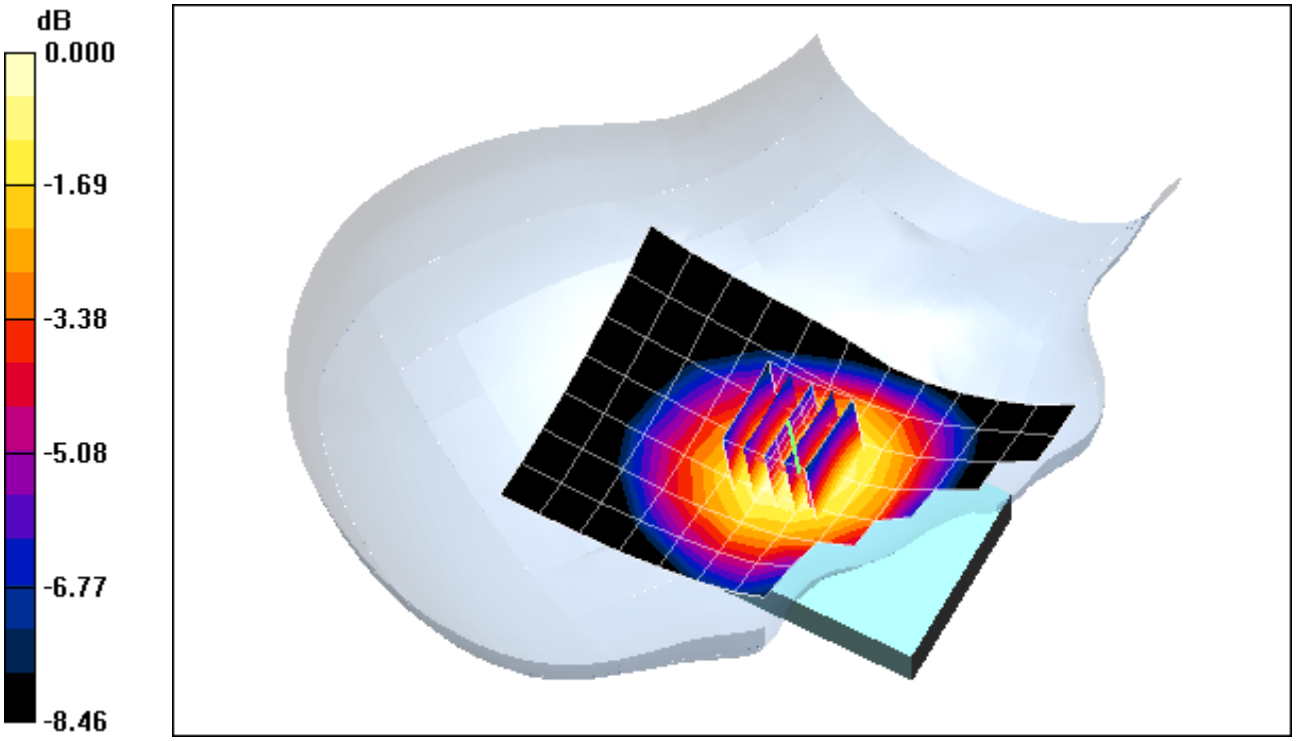
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Right Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.173 mW/g; SAR(10 g) = 0.132 mW/g



0 dB = 0.182mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

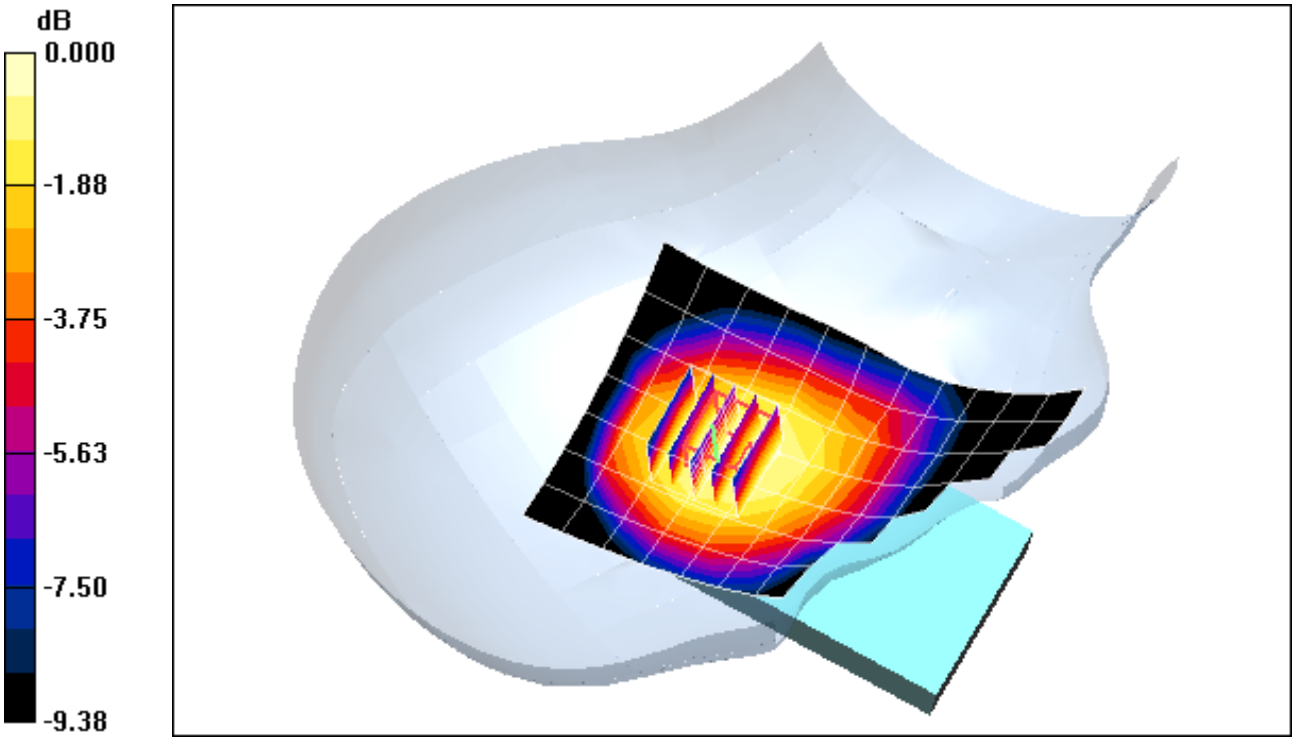
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Right Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.103 mW/g



0 dB = 0.142mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

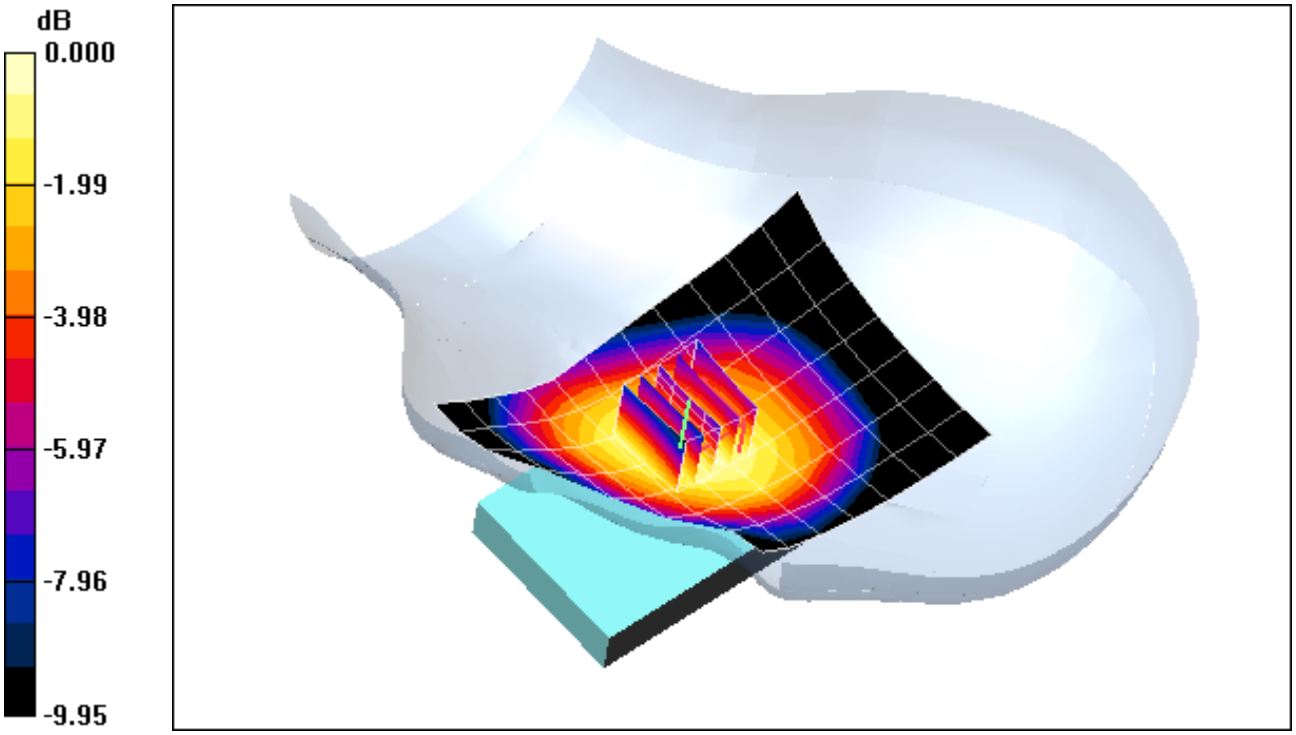
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Left Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.1 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.195 mW/g; SAR(10 g) = 0.147 mW/g



0 dB = 0.208mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

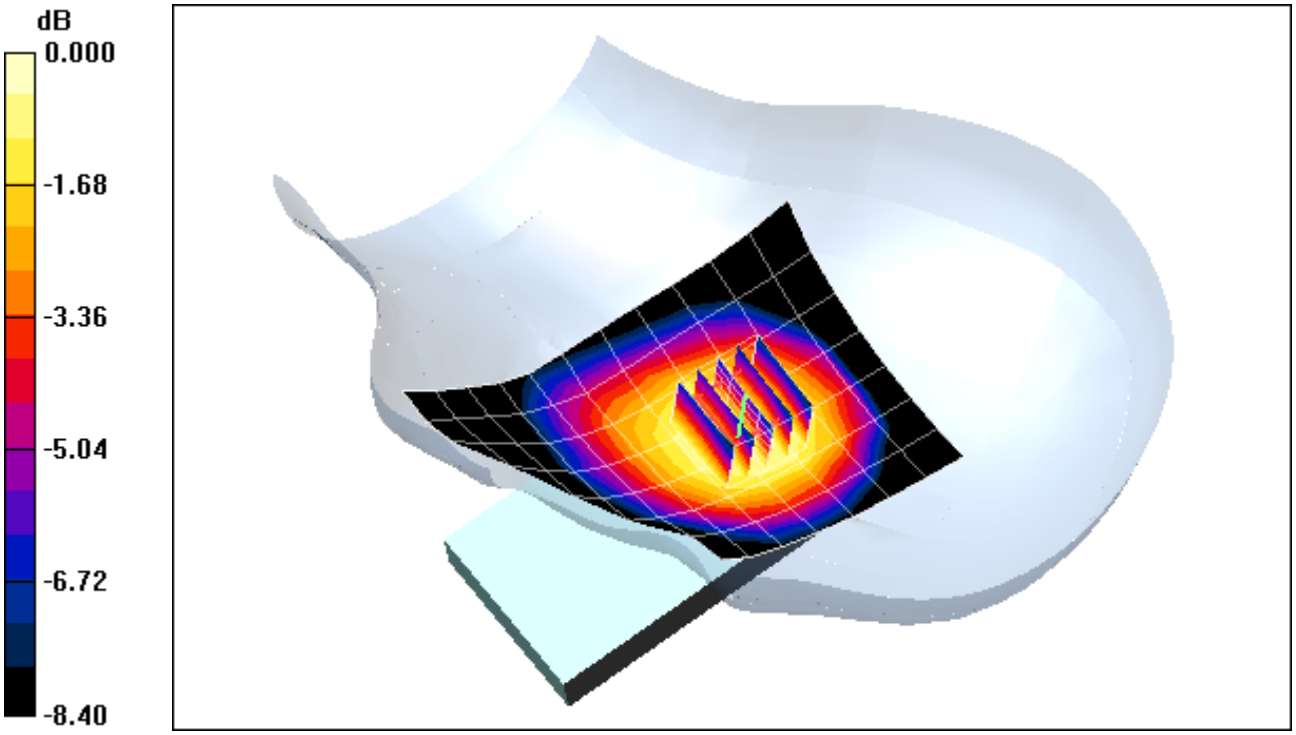
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.886 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Left Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.111 mW/g



0 dB = 0.152mW/g

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

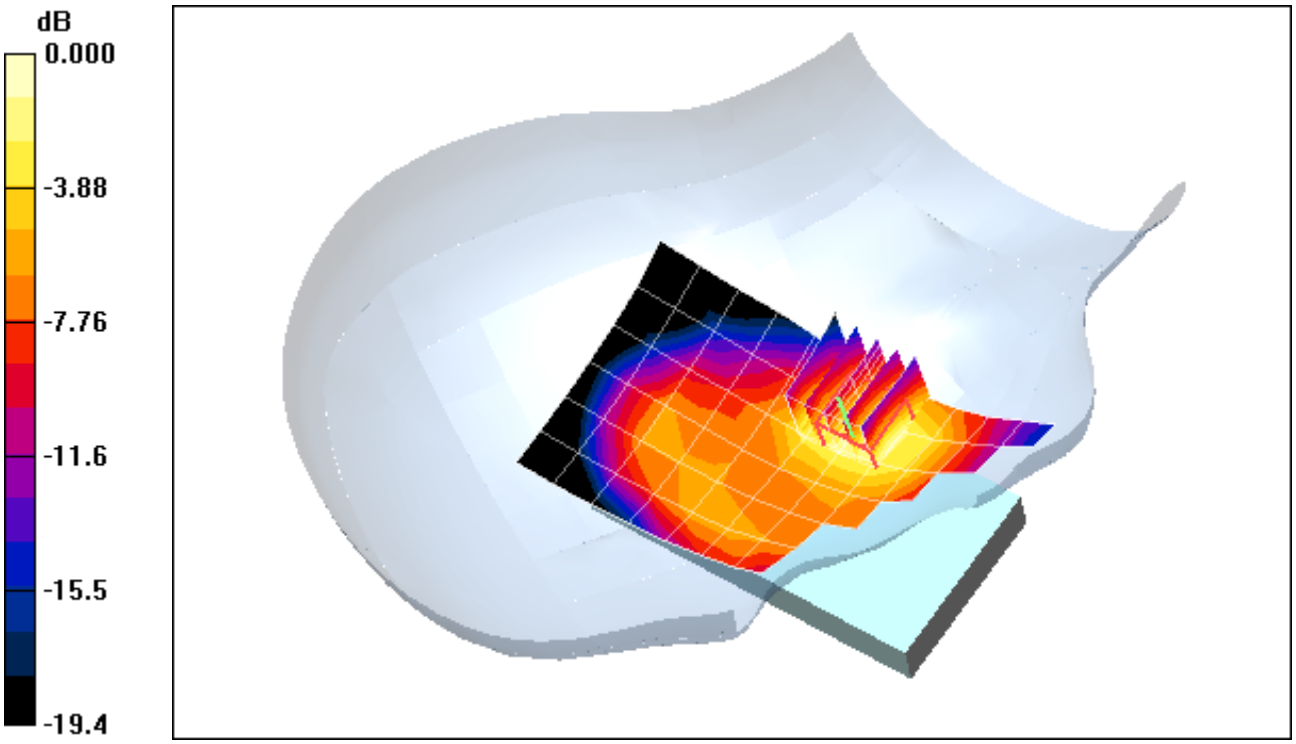
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.4 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Right Head, Touch, Mid.ch,
QPSK, 10 MHz BW 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.162 dB
Peak SAR (extrapolated) = 0.361 W/kg
SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.142 mW/g



0 dB = 0.248mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

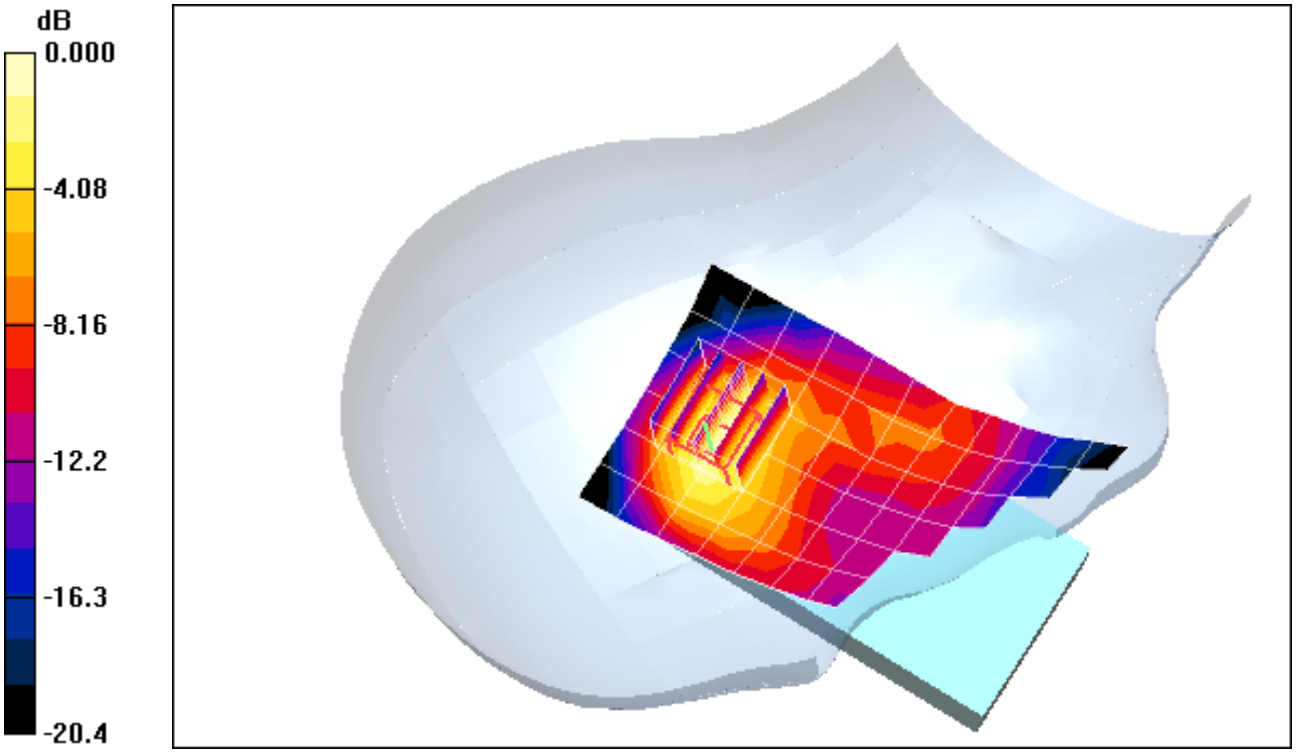
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.4 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Right Head, Tilt, Mid.ch,
10 MHz BW, QPSK, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.182mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

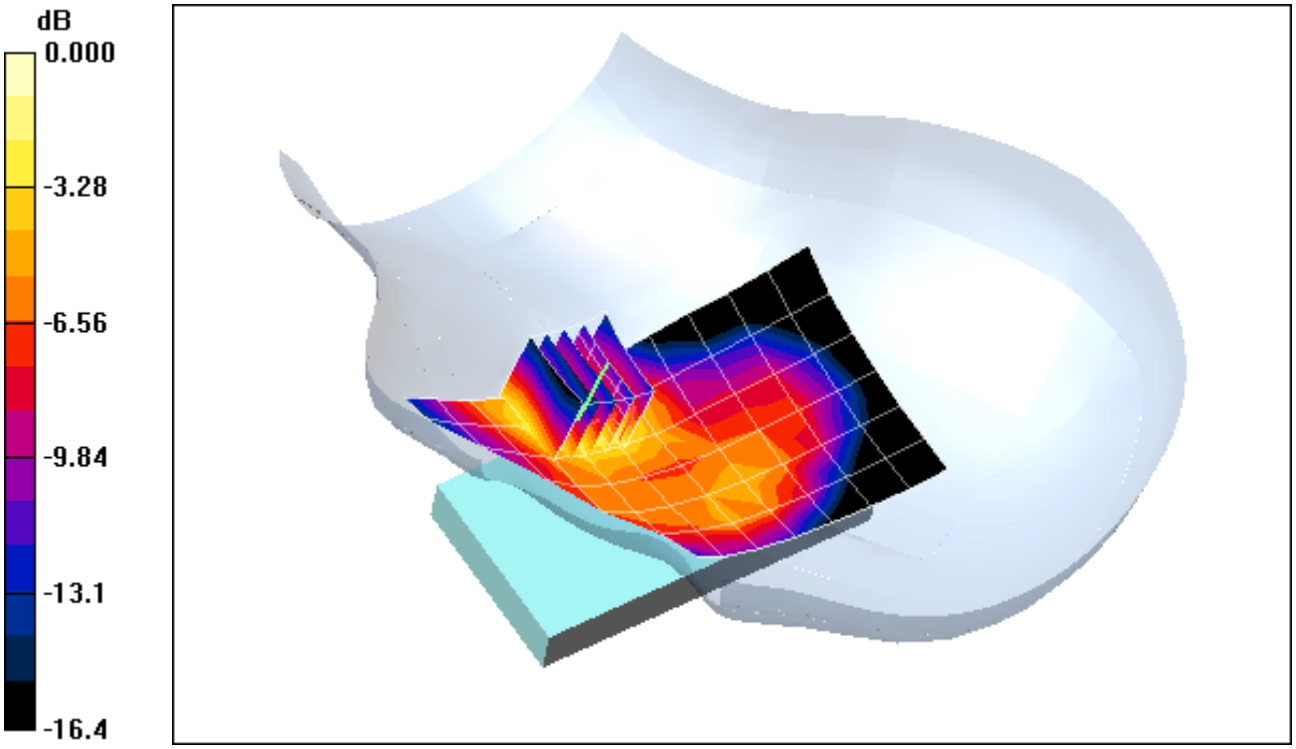
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.4 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Left Head, Touch, Mid. Ch,
QPSK, 10 MHz, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.370 W/kg
SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.138 mW/g



0 dB = 0.253mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

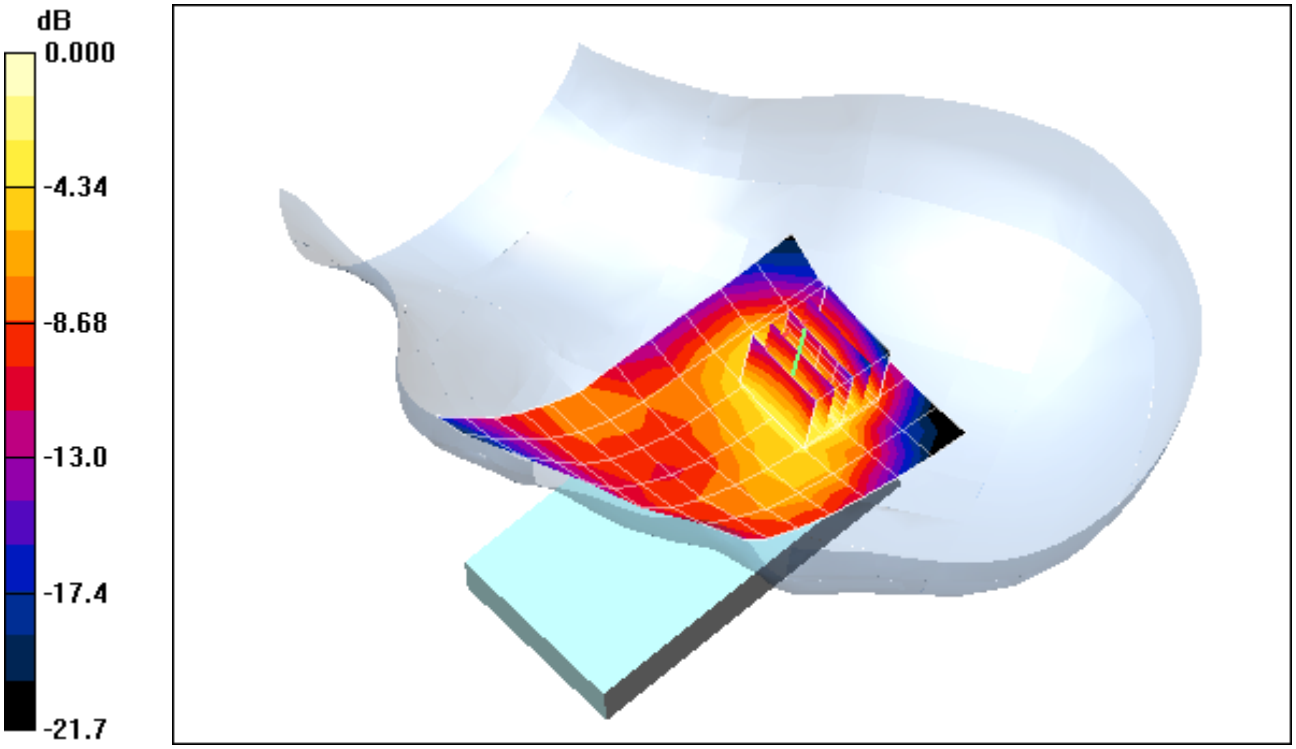
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.4 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Left Head, Tilt, Mid.ch,
QPSK, 10 MHz, 1 RB, 49 RB Offset Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 0.224 W/kg
SAR(1 g) = 0.137 mW/g; SAR(10 g) = 0.080 mW/g



0 dB = 0.149mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

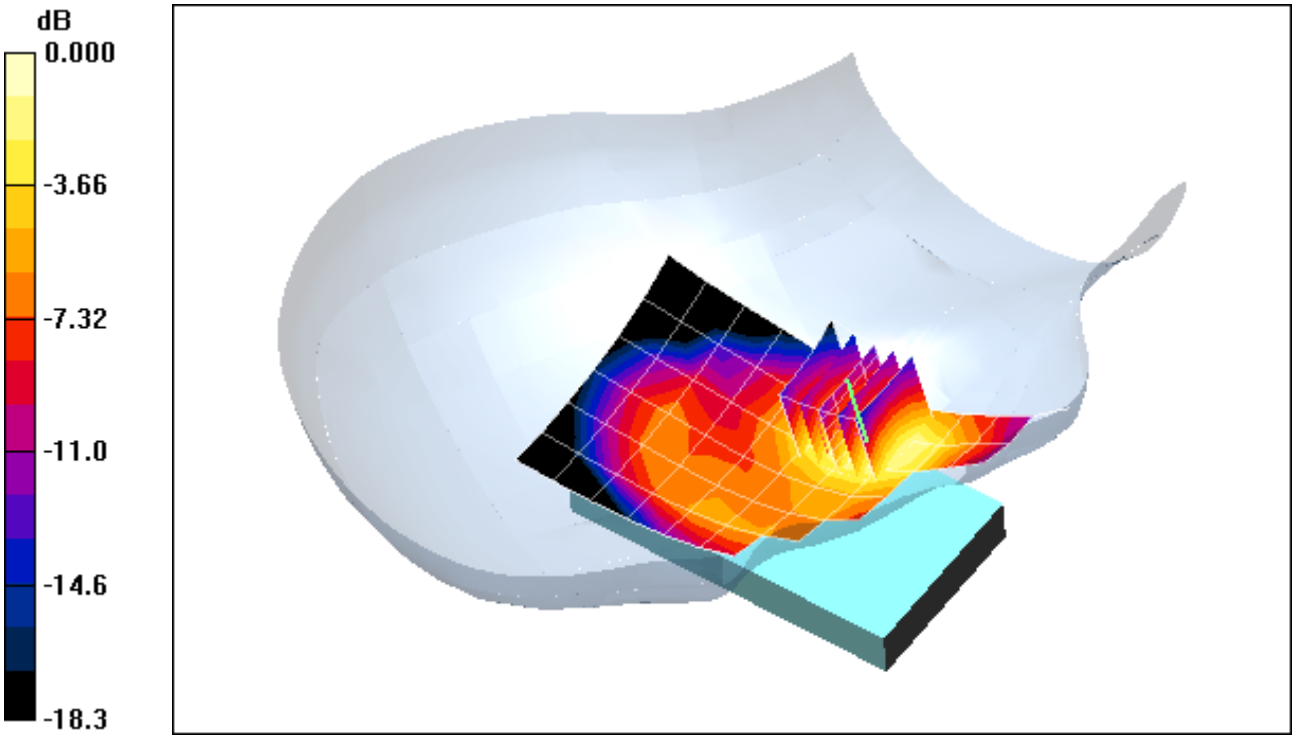
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Right Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.297 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.113 mW/g



0 dB = 0.203mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

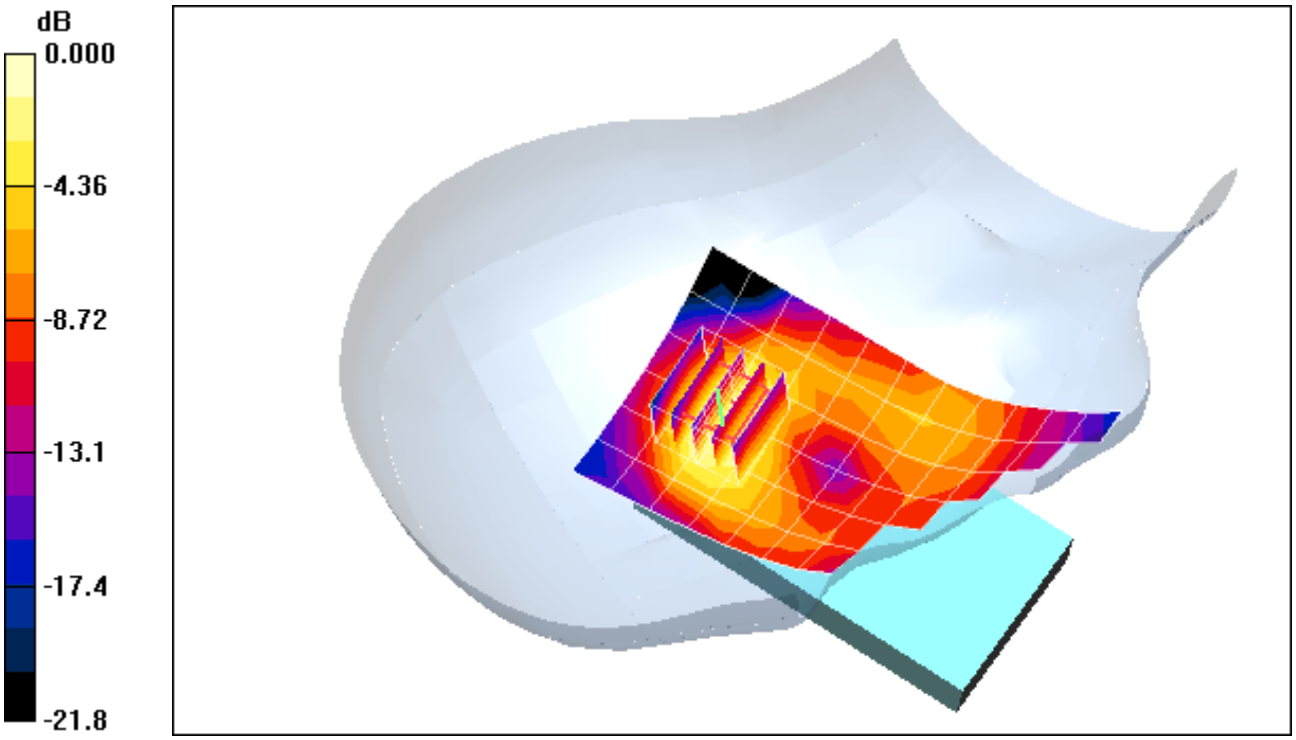
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Right Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.29 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 0.154 W/kg
SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.049 mW/g



0 dB = 0.099mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

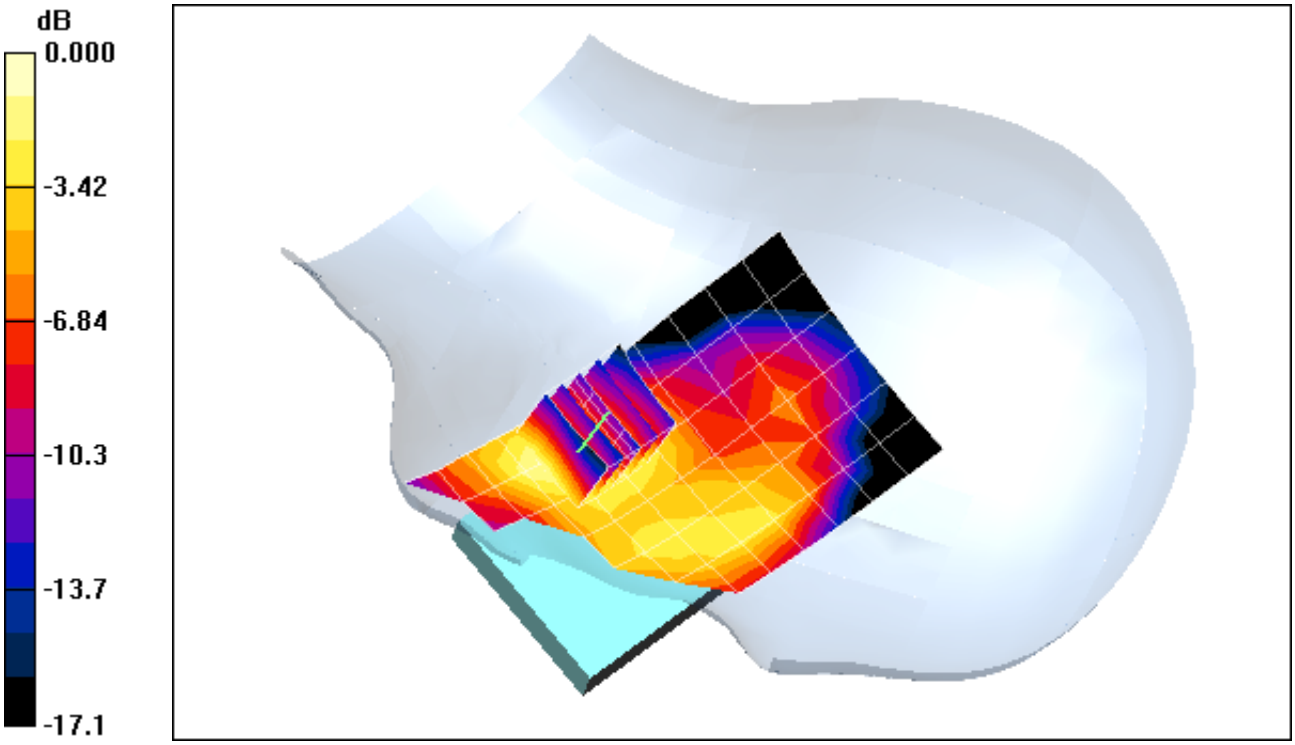
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Left Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.91 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 0.211 W/kg
SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.077 mW/g



0 dB = 0.144mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

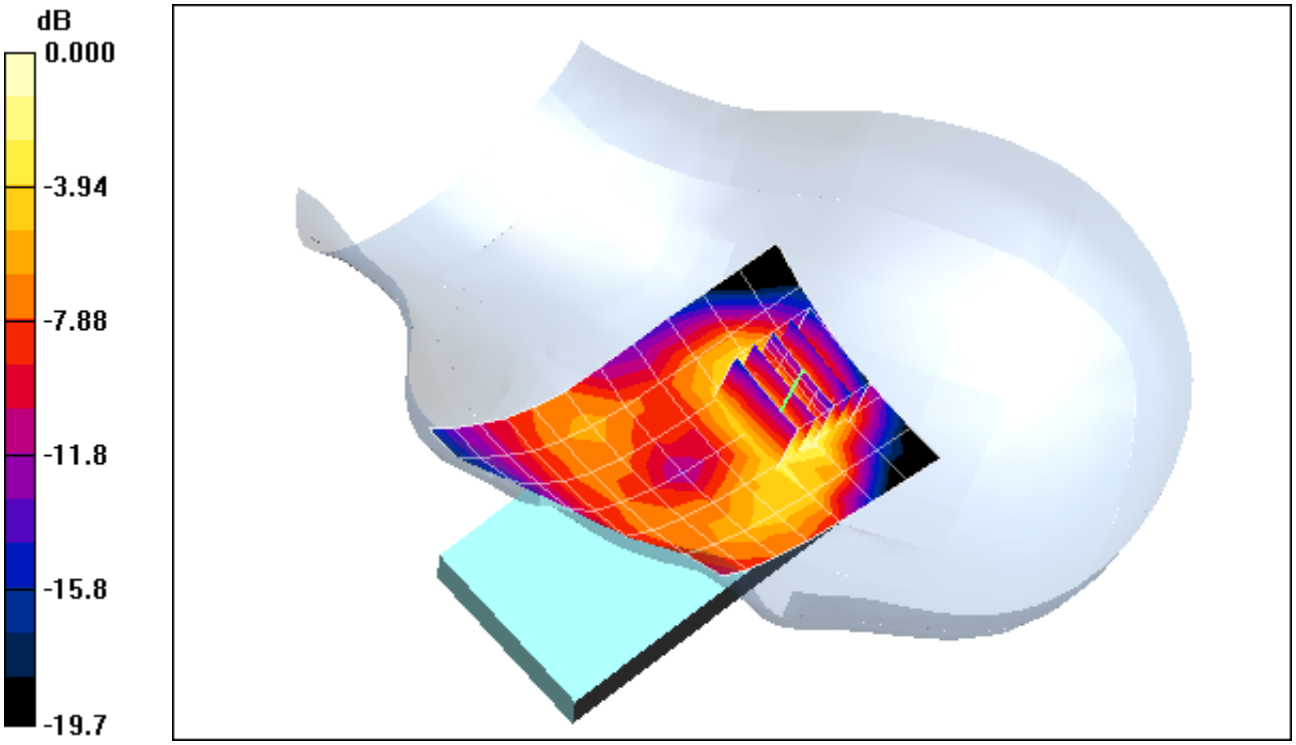
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Left Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.24 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.047 mW/g



0 dB = 0.091mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

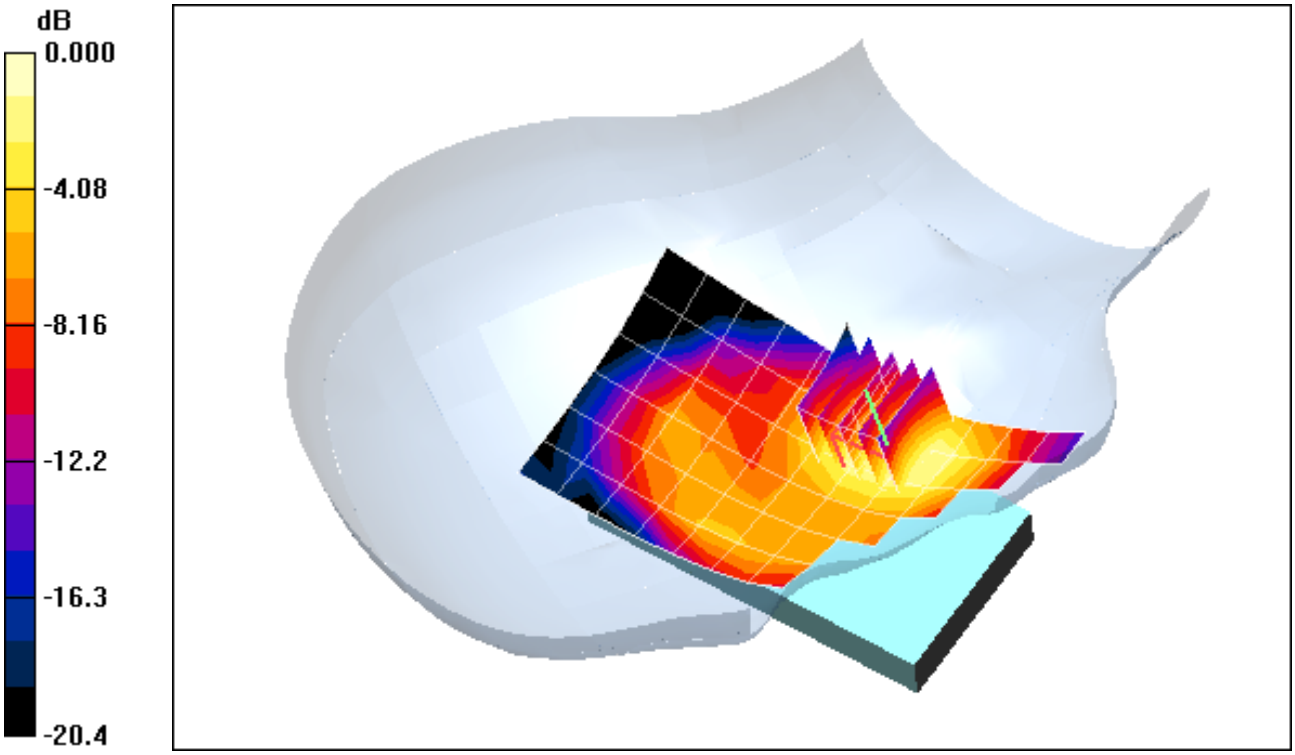
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-24-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Right Head, Touch, Mid.ch, NFC Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = -0.086 dB
Peak SAR (extrapolated) = 0.534 W/kg
SAR(1 g) = 0.333 mW/g; SAR(10 g) = 0.201 mW/g



0 dB = 0.367mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

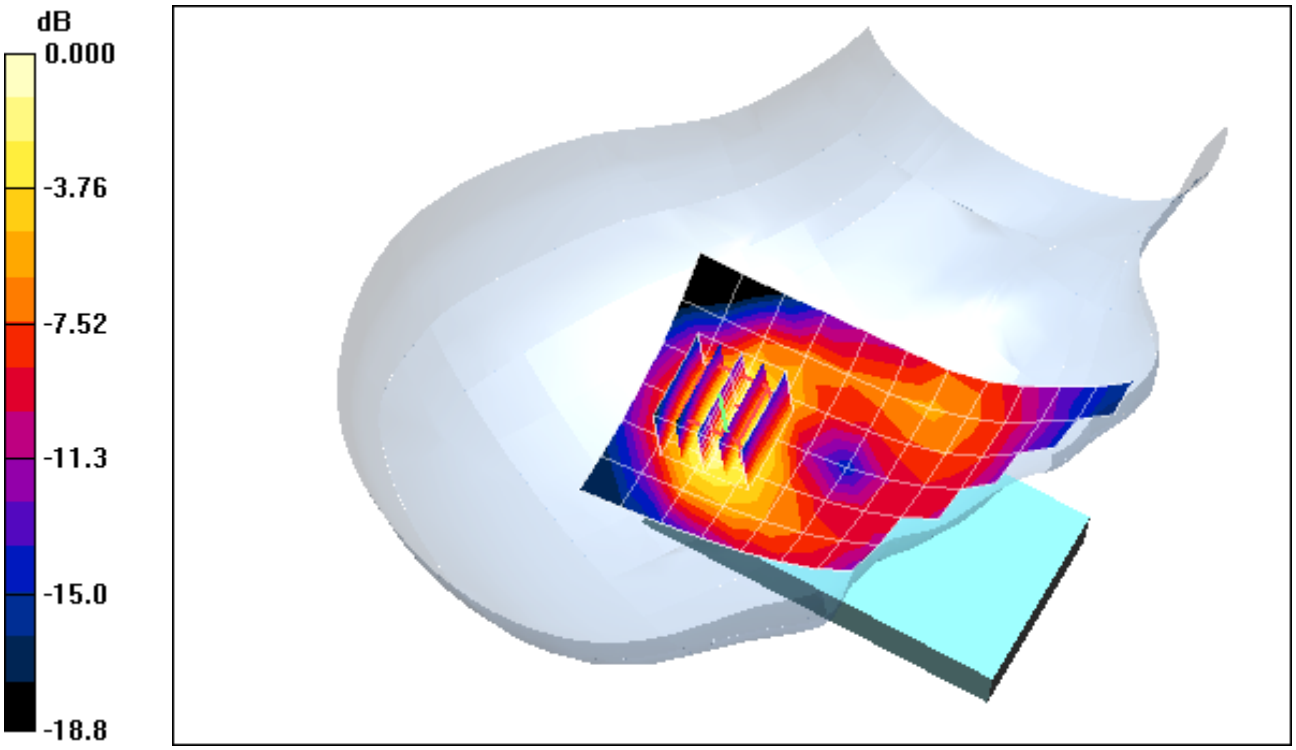
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Right Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = 0.100 dB
Peak SAR (extrapolated) = 0.288 W/kg
SAR(1 g) = 0.159 mW/g; SAR(10 g) = 0.086 mW/g



0 dB = 0.175mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

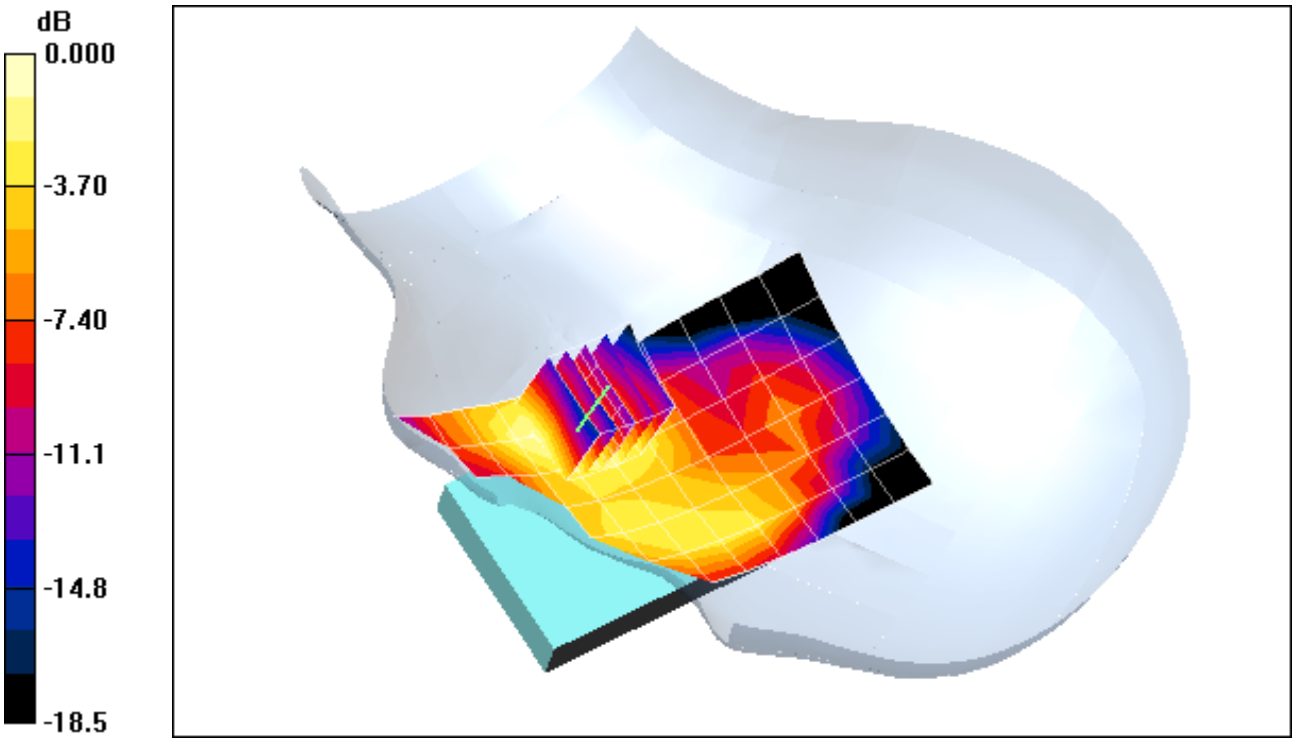
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Left Head, Touch, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.154 mW/g



0 dB = 0.289mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

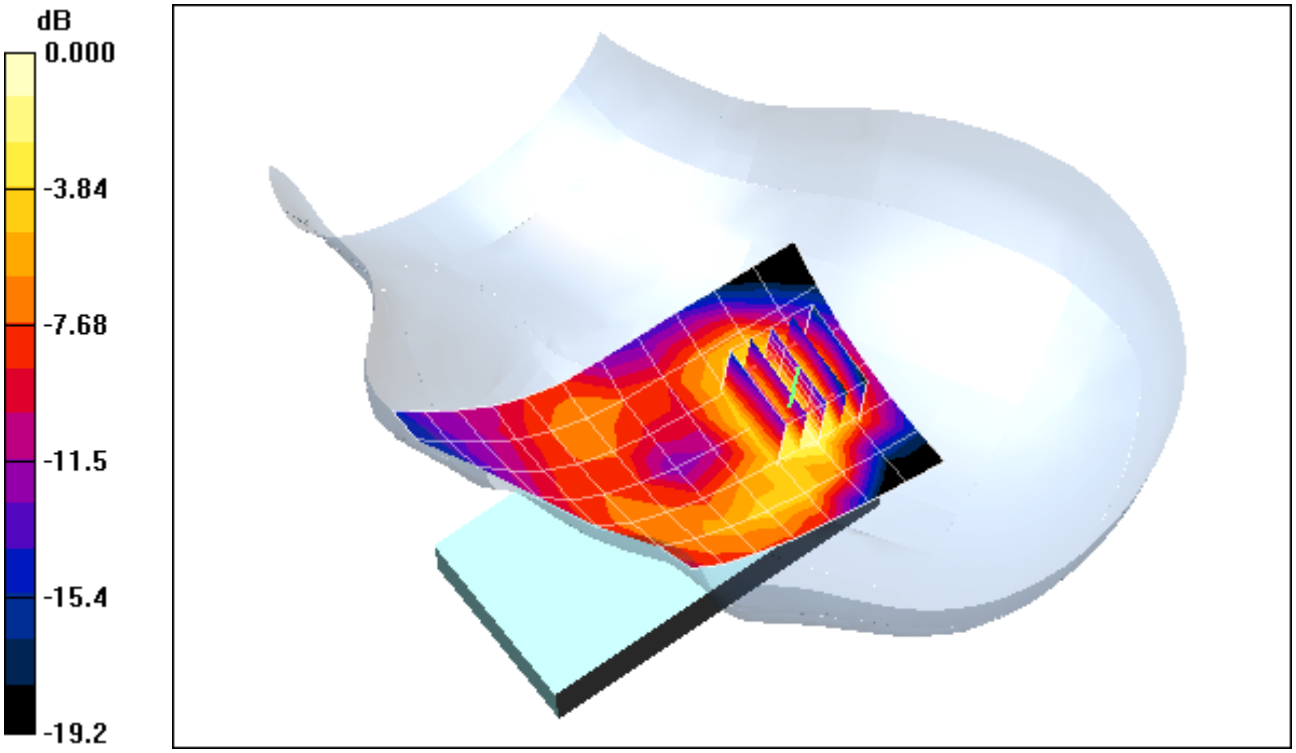
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 21.2 °C; Tissue Temp: 20.9 °C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Left Head, Tilt, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.080 mW/g



0 dB = 0.161mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

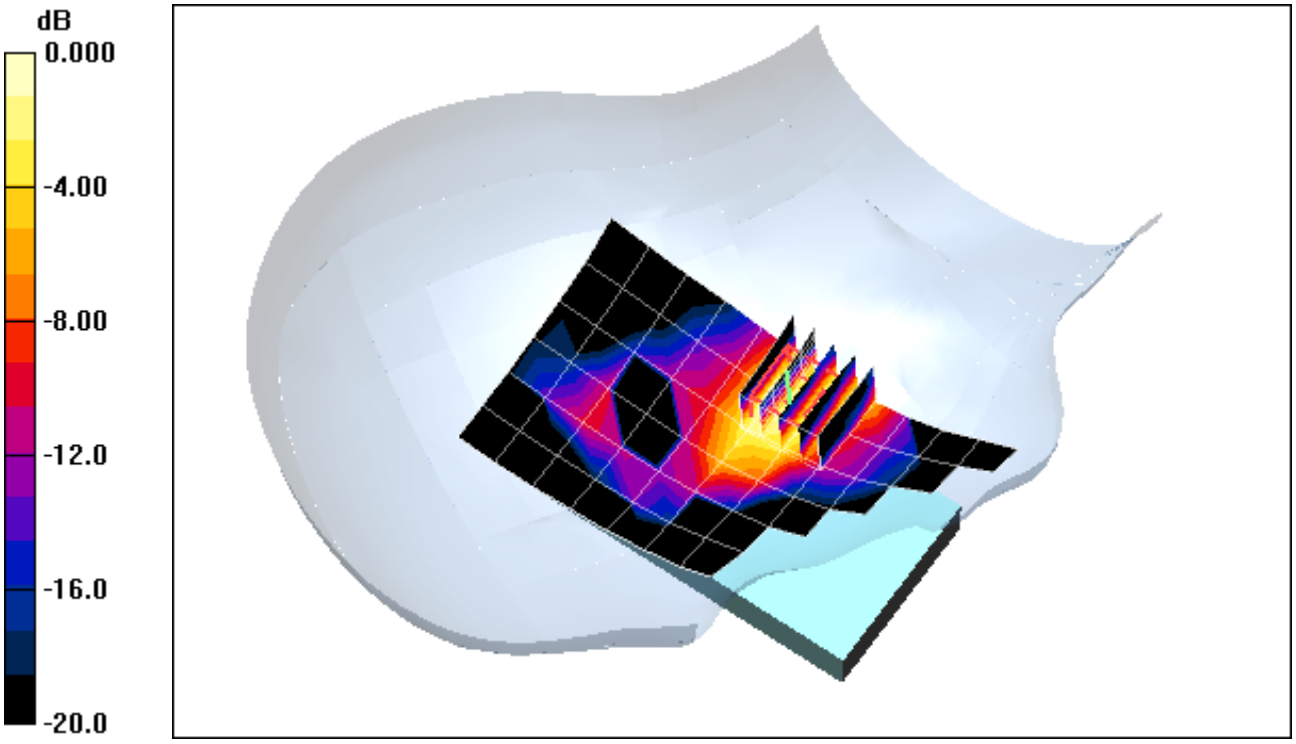
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.89 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Touch, Ch 11, 1 Mbps, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.03 V/m; Power Drift = 0.140 dB
Peak SAR (extrapolated) = 0.095 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.022 mW/g



0 dB = 0.056mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

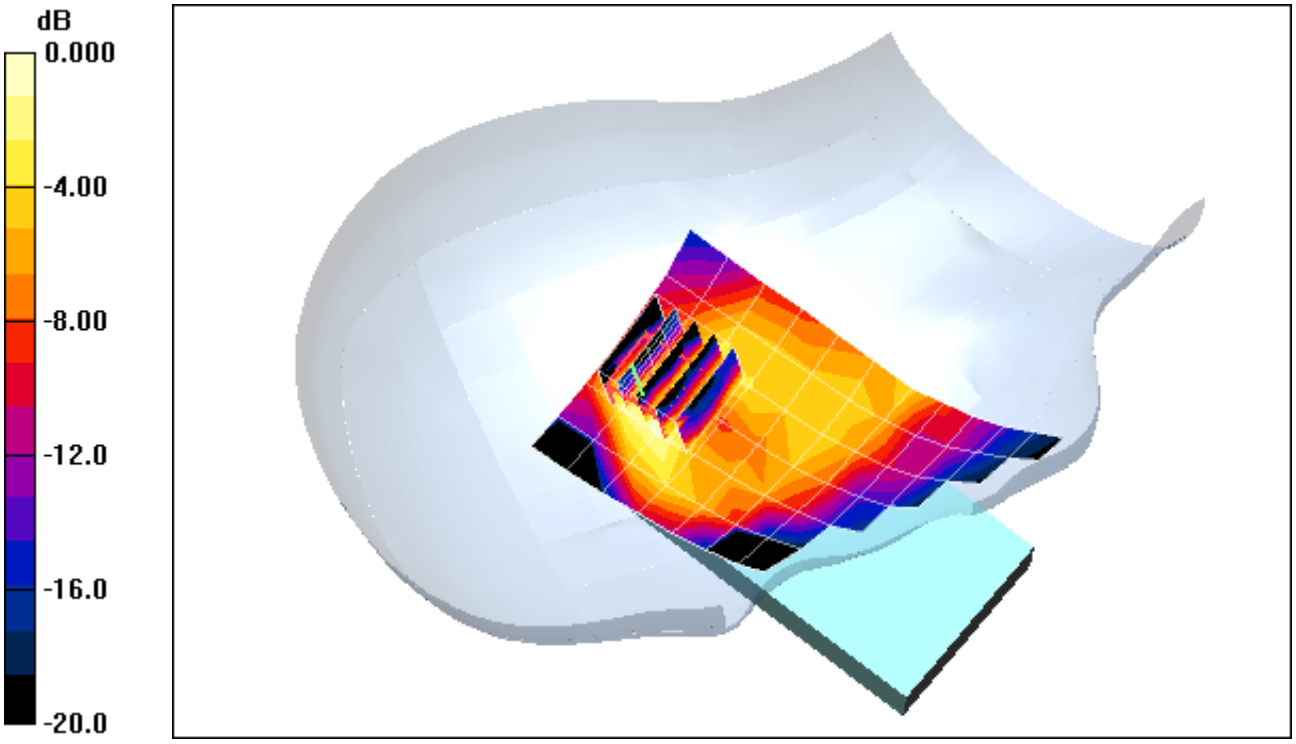
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.89 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Tilt, Ch 11, 1 Mbps, Standard Battery Cover

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.82 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 0.058 W/kg
SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.014 mW/g



0 dB = 0.036mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

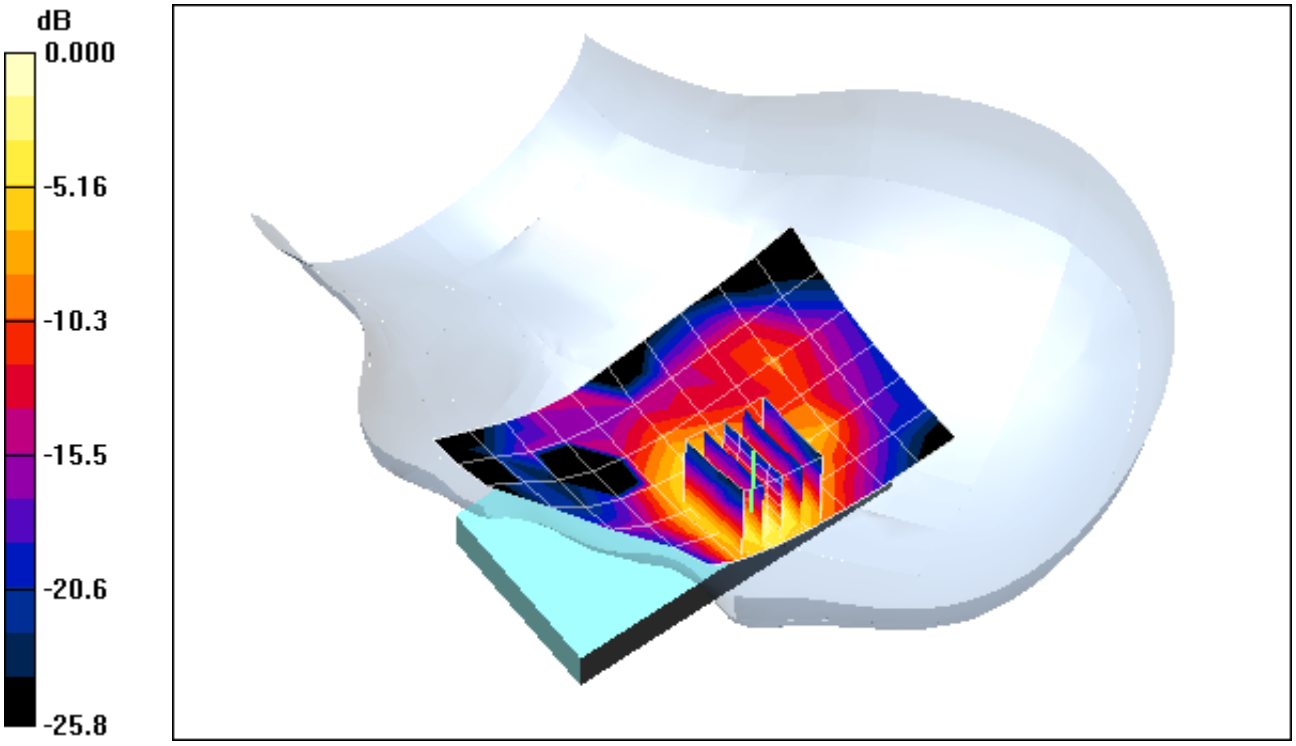
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.89 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Touch, Ch 11, 1 Mbps, Standard Battery Cover

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.28 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.202 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.046 mW/g



0 dB = 0.127mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

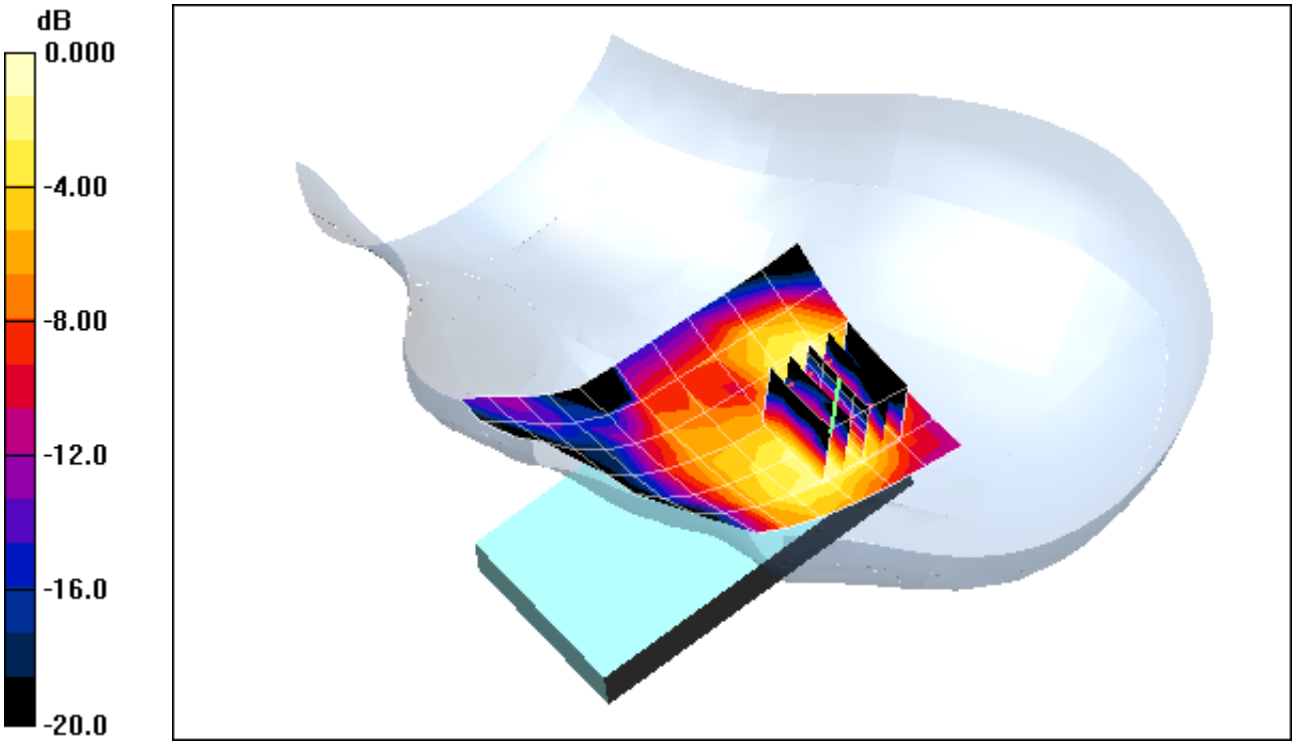
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.89 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Tilt, Ch 11, 1 Mbps, Standard Battery Cover

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.68 V/m; Power Drift = 0.174 dB
Peak SAR (extrapolated) = 0.066 W/kg
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.017 mW/g



0 dB = 0.045mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-C

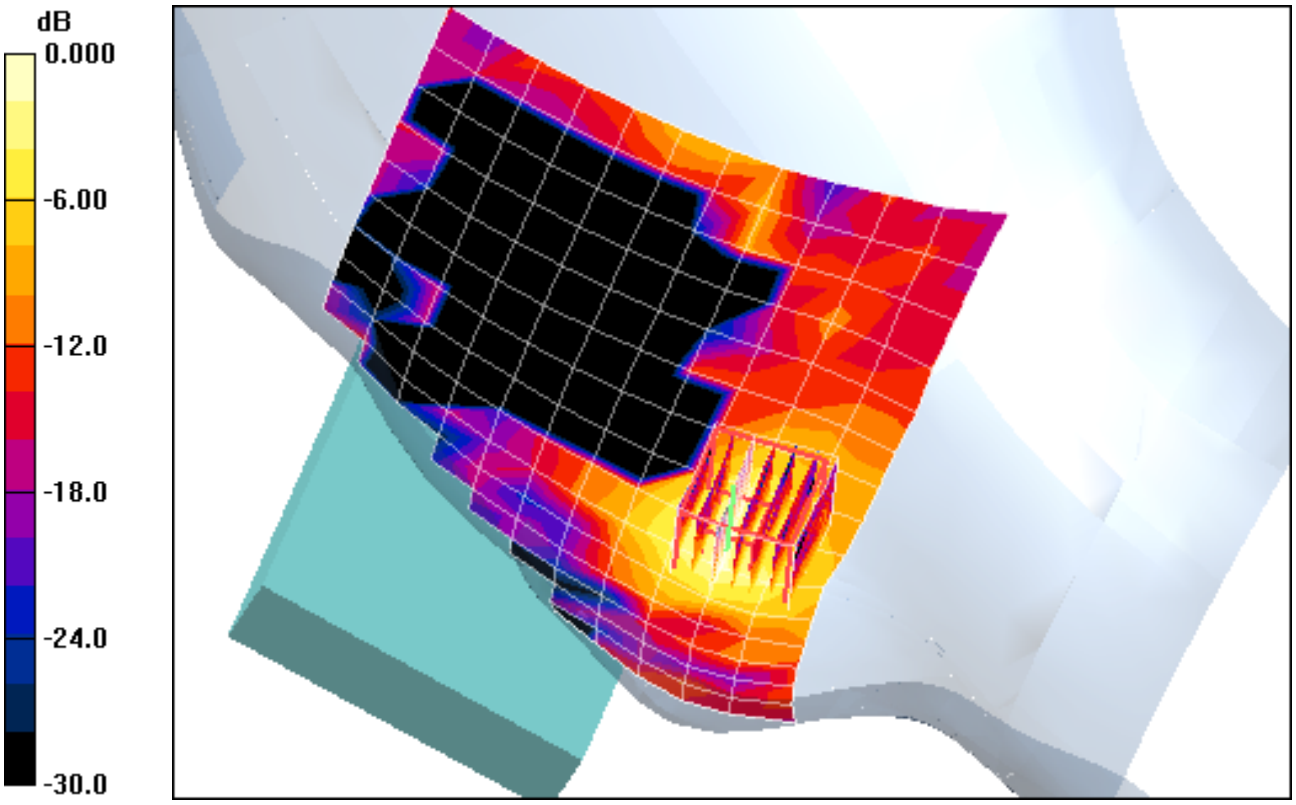
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5320 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5320 MHz; σ = 4.707 mho/m; ε_r = 34.82; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.03, 4.03, 4.03); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.3 GHz, Right Head, Touch,
Ch 64, 6 Mbps, Standard Battery Cover

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.68 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.031 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-C

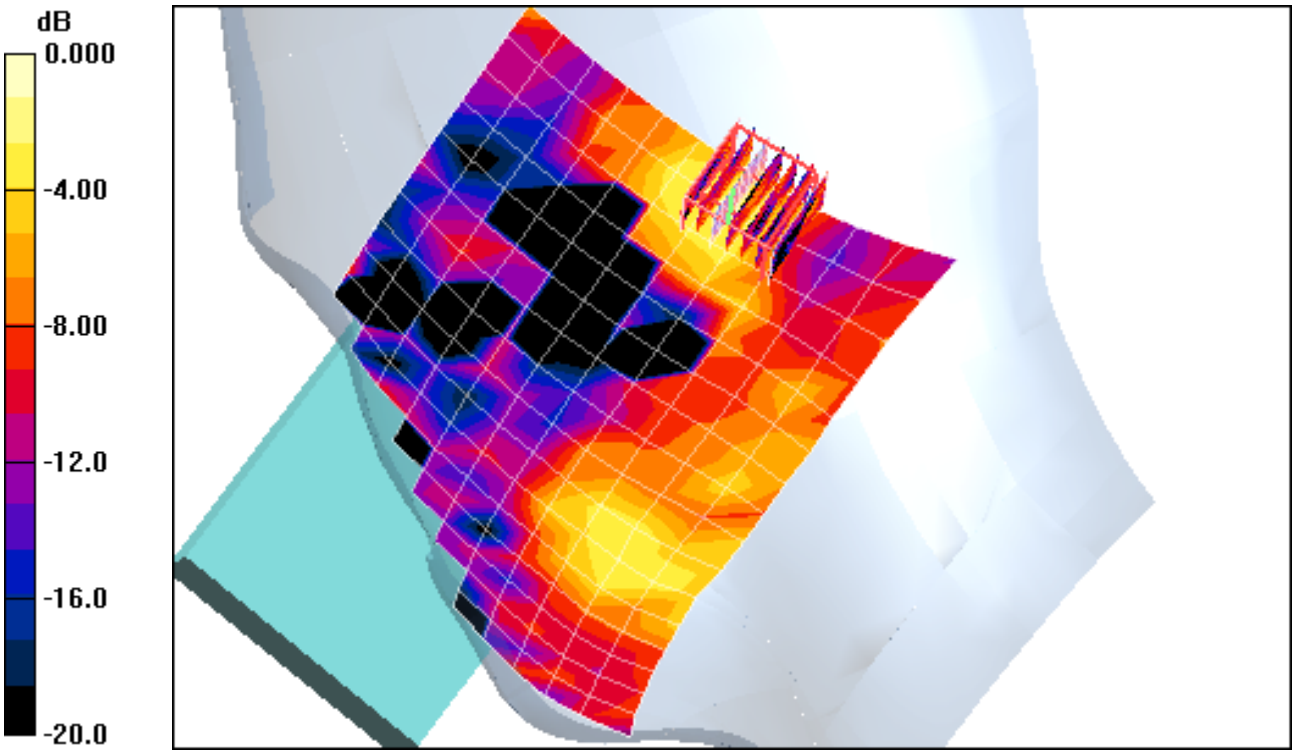
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5320 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5320 MHz; σ = 4.707 mho/m; ε_r = 34.82; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.03, 4.03, 4.03); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.3 GHz, Right Head, Tilt,
Ch 64, 6 Mbps, Standard Battery Cover

Area Scan (12x17x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.16 V/m; Power Drift = 0.134 dB
Peak SAR (extrapolated) = 0.194 W/kg
SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.00871 mW/g



0 dB = 0.057mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-C

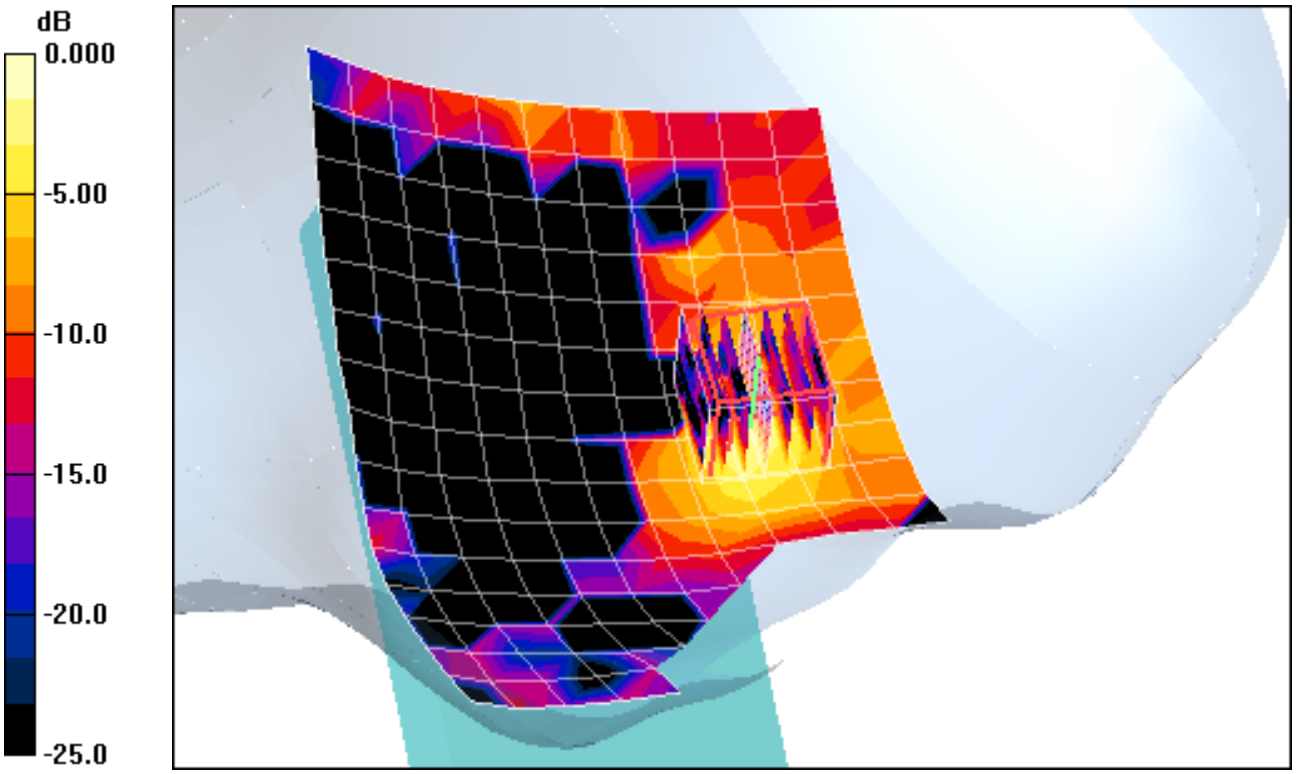
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5320 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5320 MHz; σ = 4.707 mho/m; ε_r = 34.82; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.03, 4.03, 4.03); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.3 GHz Left Head, Touch,
Ch 64, 6 Mbps, Standard Battery Cover

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.29 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 0.247 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.023 mW/g



0 dB = 0.141mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-C

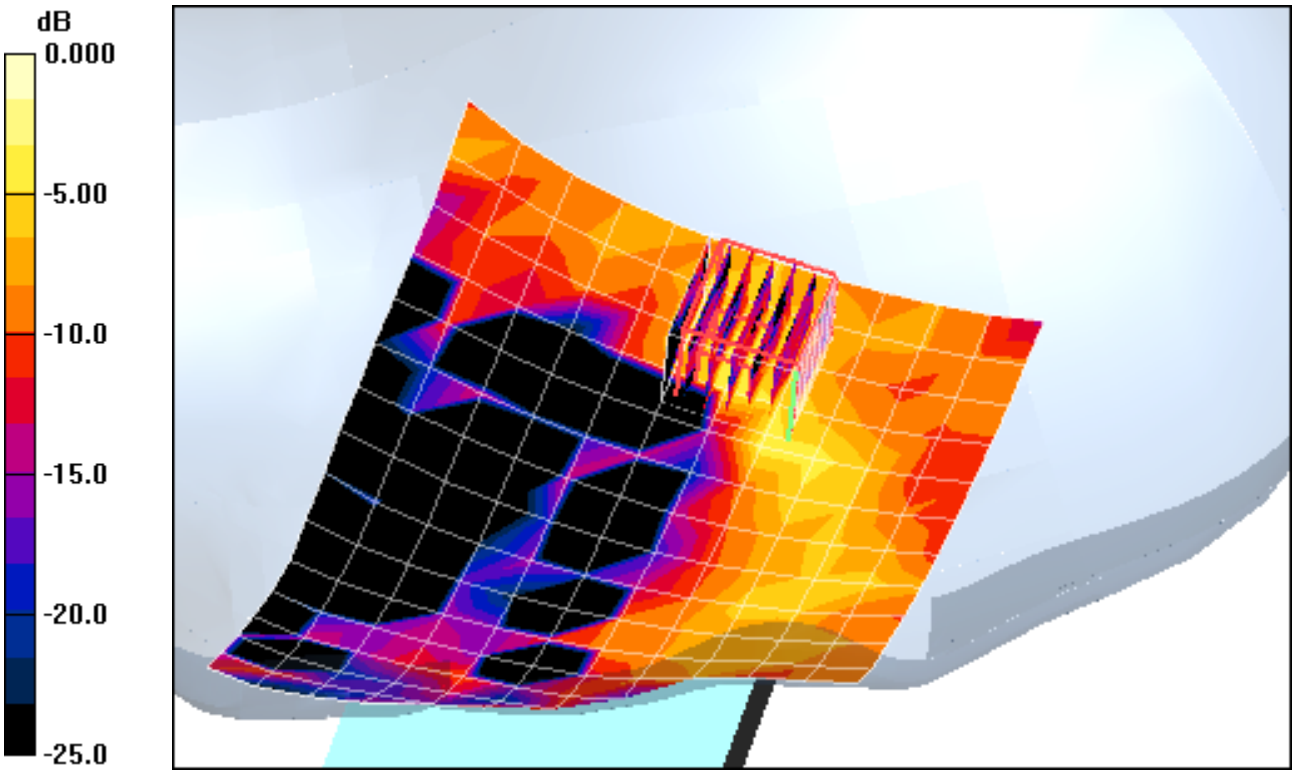
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5320 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5320 MHz; σ = 4.707 mho/m; ε_r = 34.82; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.03, 4.03, 4.03); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.3 GHz Left Head, Tilt,
Ch 64, 6 Mbps, Standard Battery Cover

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.98 V/m; Power Drift = 0.090 dB
Peak SAR (extrapolated) = 0.286 W/kg
SAR(1 g) = 0.031 mW/g; SAR(10 g) = 0.010 mW/g



0 dB = 0.089mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

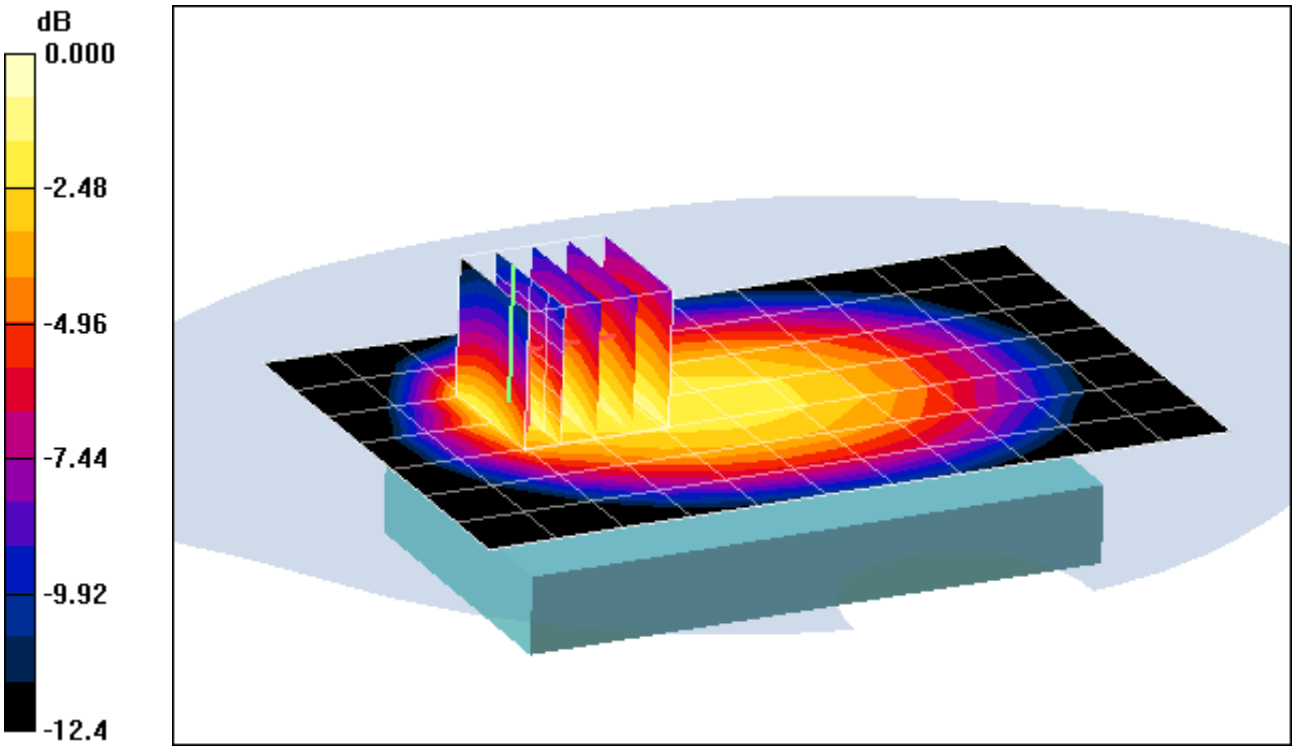
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.959 mho/m; ε_r = 58.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Back side, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 0 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 0.587 W/kg
SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.237 mW/g



0 dB = 0.394mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

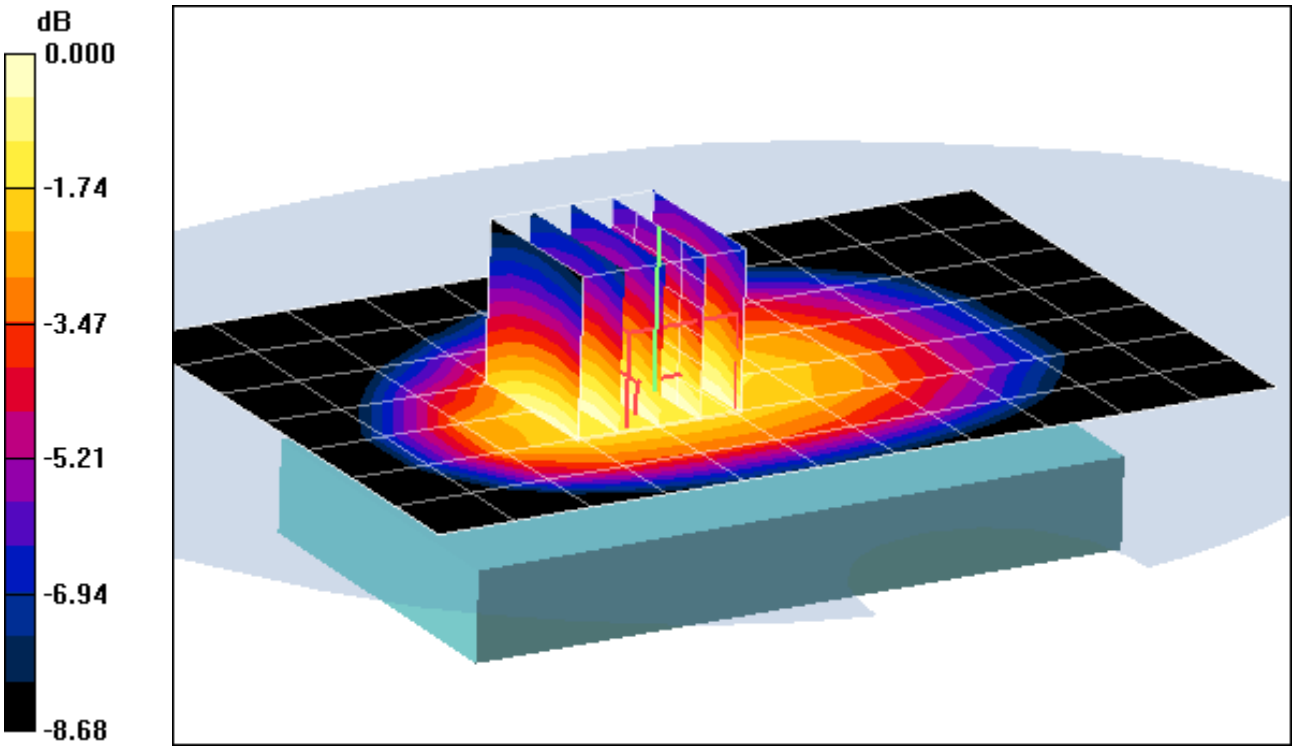
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.959 mho/m; ε_r = 58.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Front side, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 0.232 W/kg
SAR(1 g) = 0.183 mW/g; SAR(10 g) = 0.140 mW/g



0 dB = 0.189mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

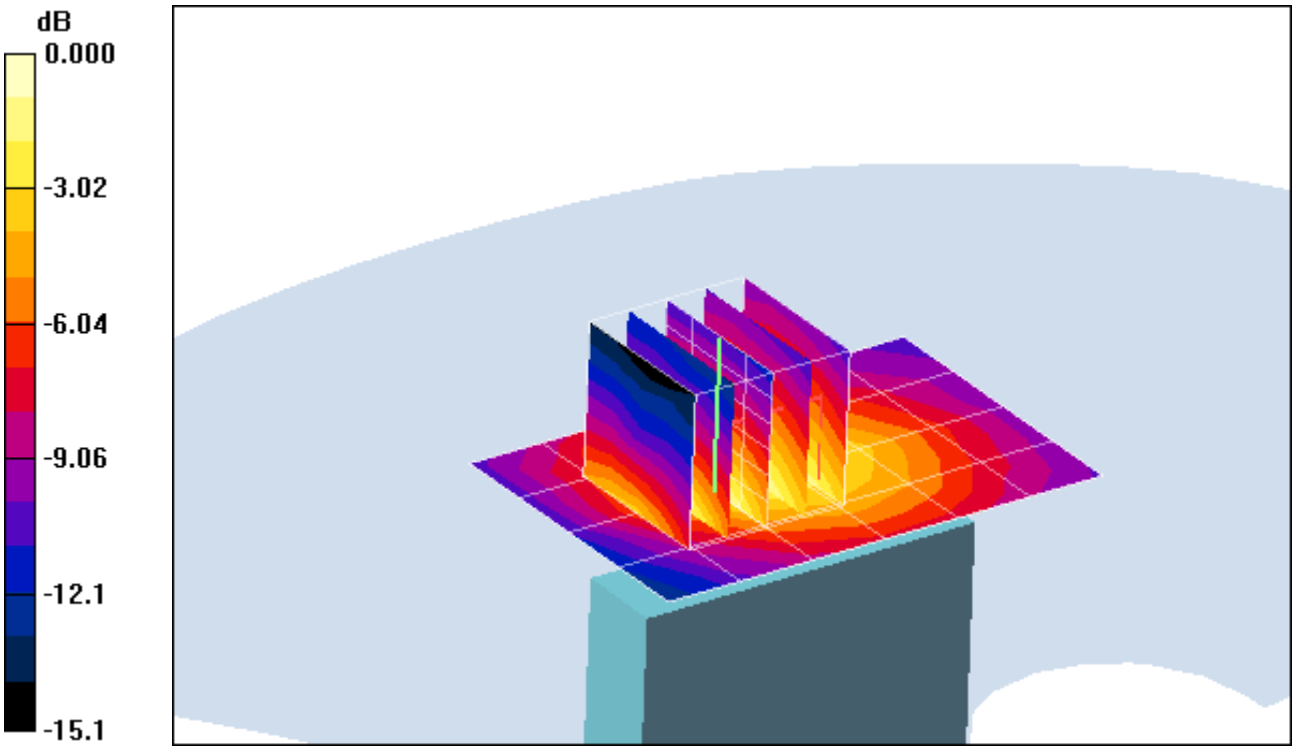
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.959 mho/m; ε_r = 58.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Bottom Edge, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.068 mW/g



0 dB = 0.123mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

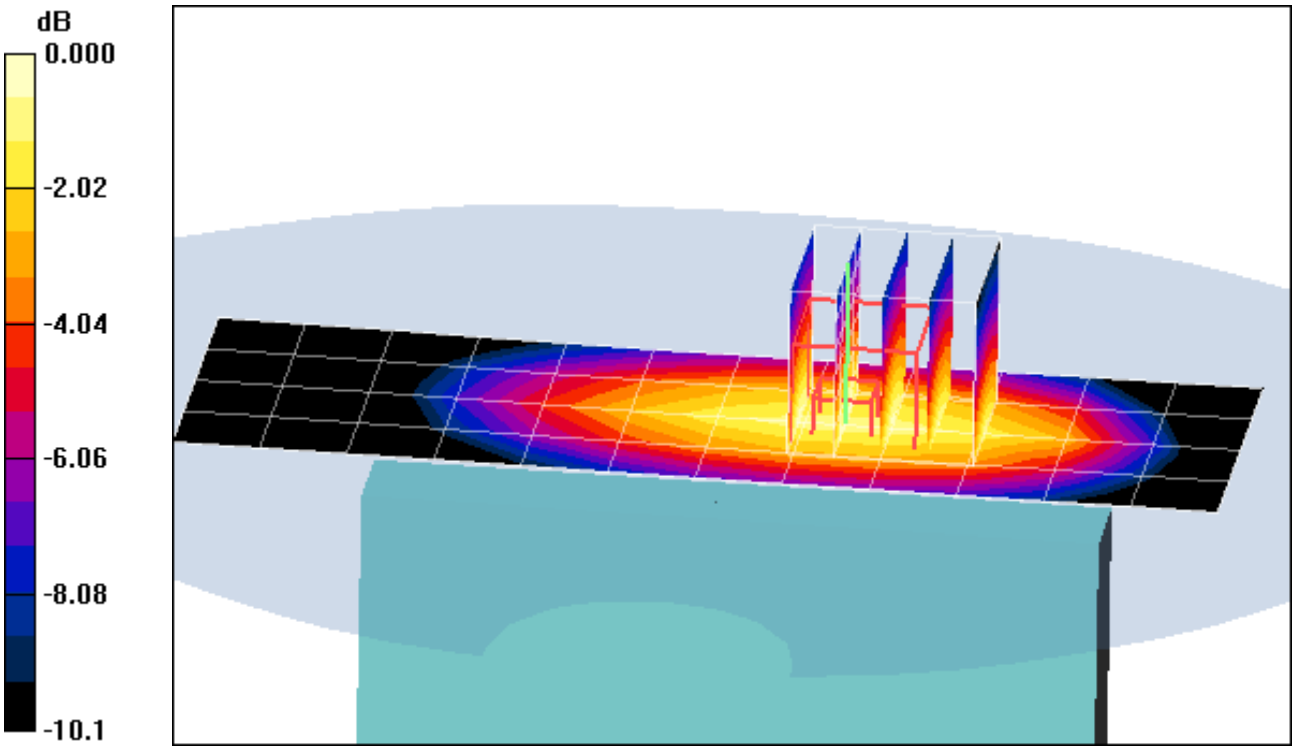
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.959 mho/m; ε_r = 58.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode:LTE Band 17, Body SAR, Right Edge, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset Standard Battery Cover

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.170 mW/g



0 dB = 0.261mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

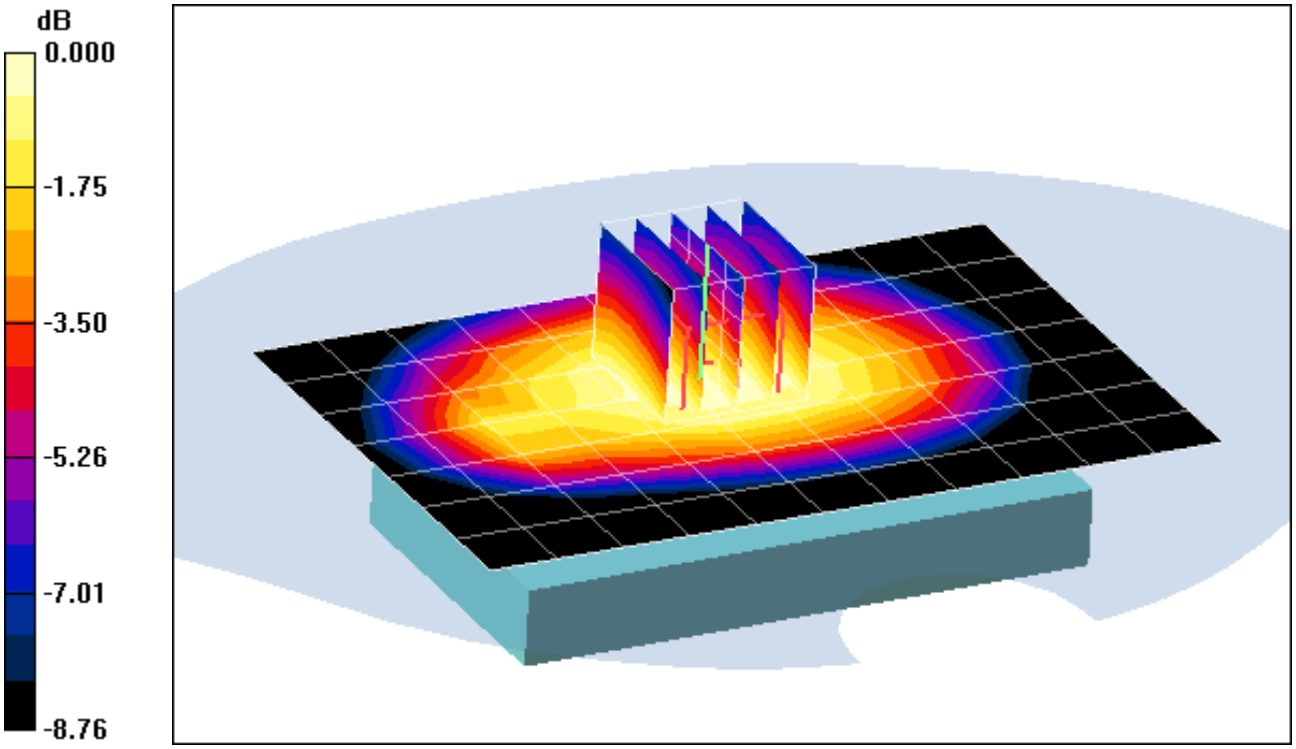
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.6 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 0.894 W/kg
SAR(1 g) = 0.719 mW/g; SAR(10 g) = 0.549 mW/g



0 dB = 0.751mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

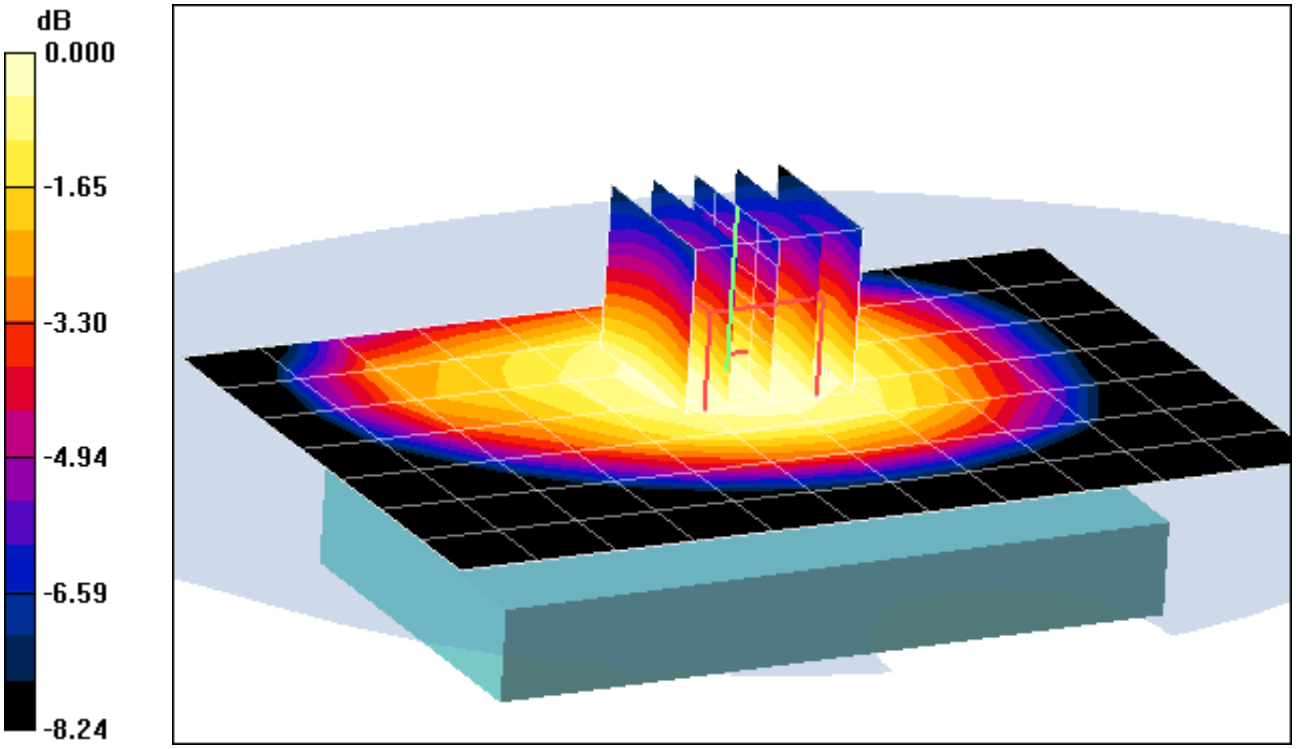
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Front side, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.6 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.518 mW/g; SAR(10 g) = 0.400 mW/g



0 dB = 0.543mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

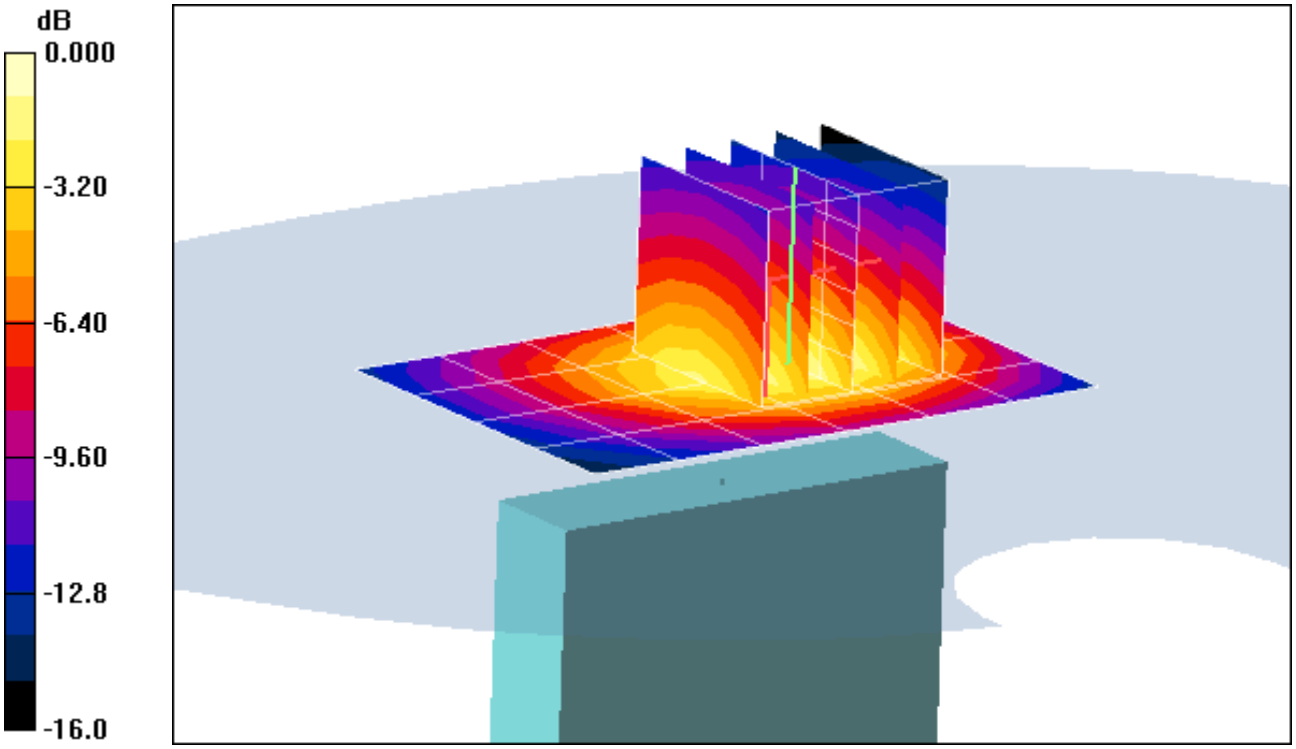
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Bottom Edge, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = 0.147 dB
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.287 mW/g; SAR(10 g) = 0.161 mW/g



0 dB = 0.312mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

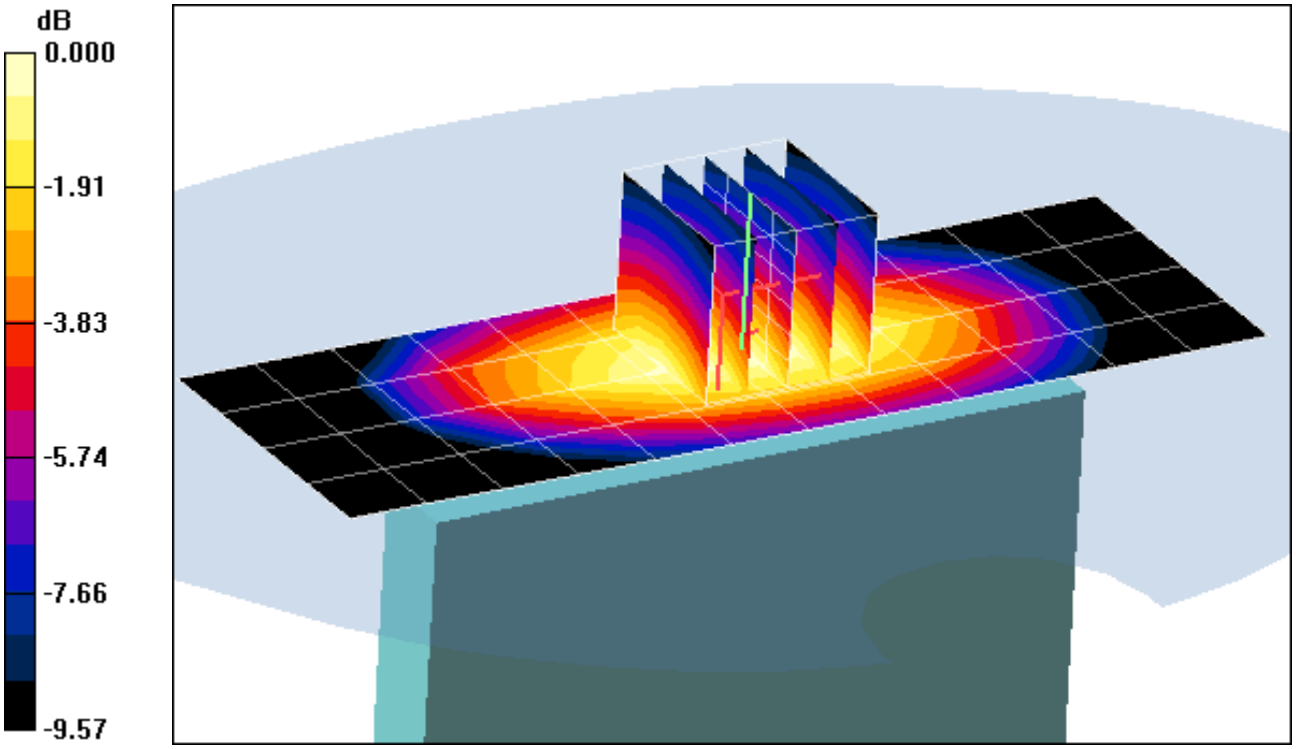
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Left Edge, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.7 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.997 W/kg
SAR(1 g) = 0.697 mW/g; SAR(10 g) = 0.477 mW/g



0 dB = 0.743mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

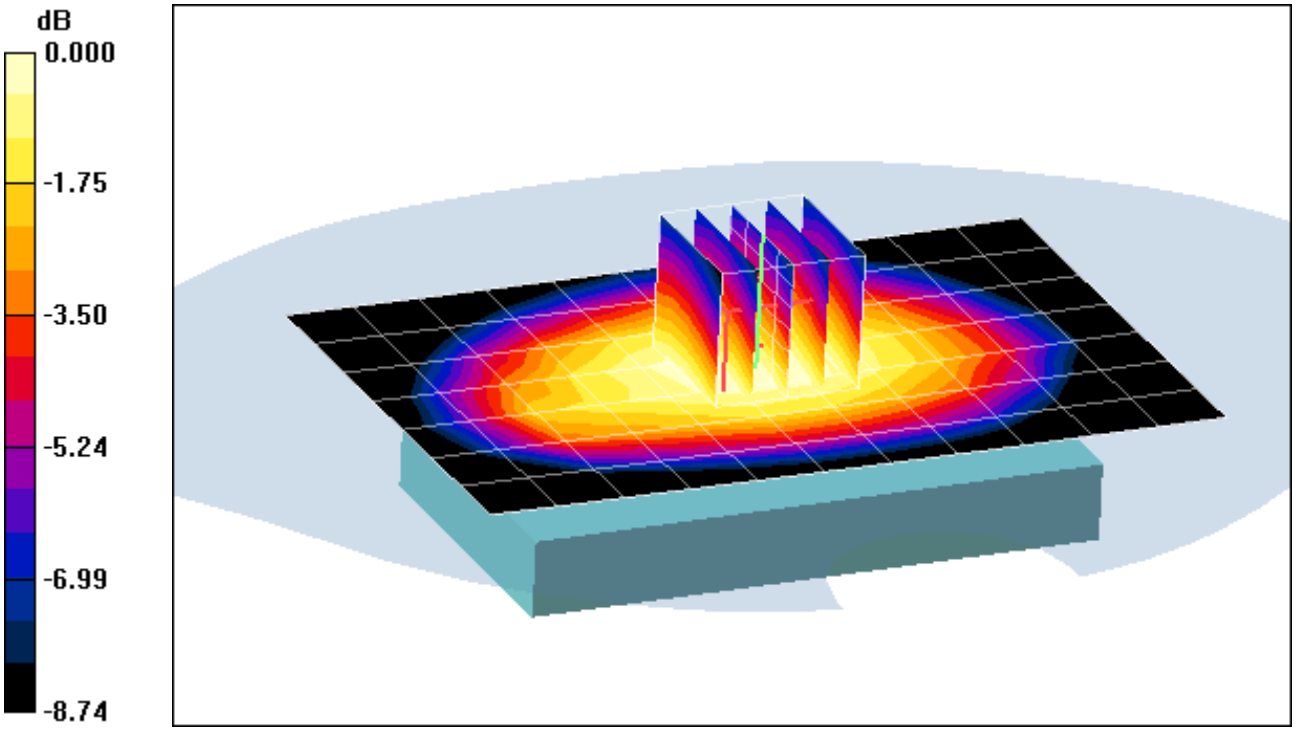
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Back side, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.463 W/kg
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.279 mW/g



0 dB = 0.384mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

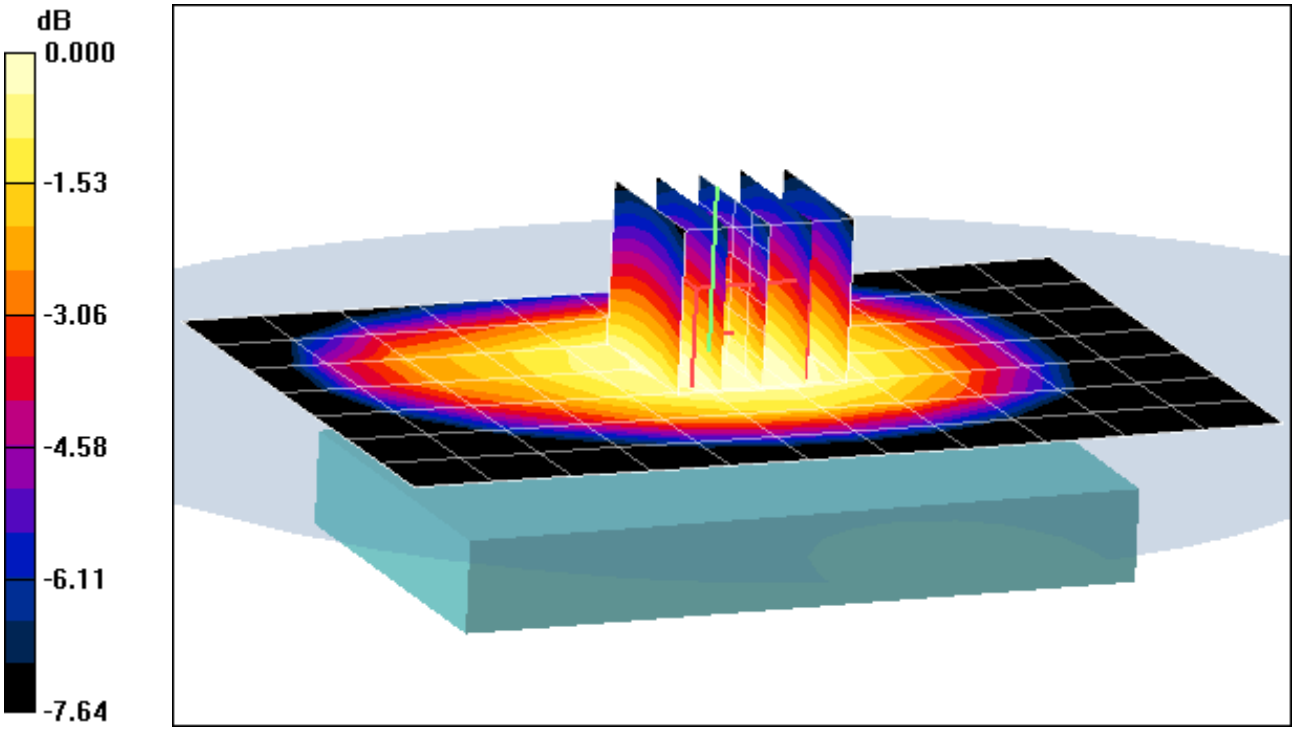
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Front side, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.0 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.211 mW/g



0 dB = 0.285mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

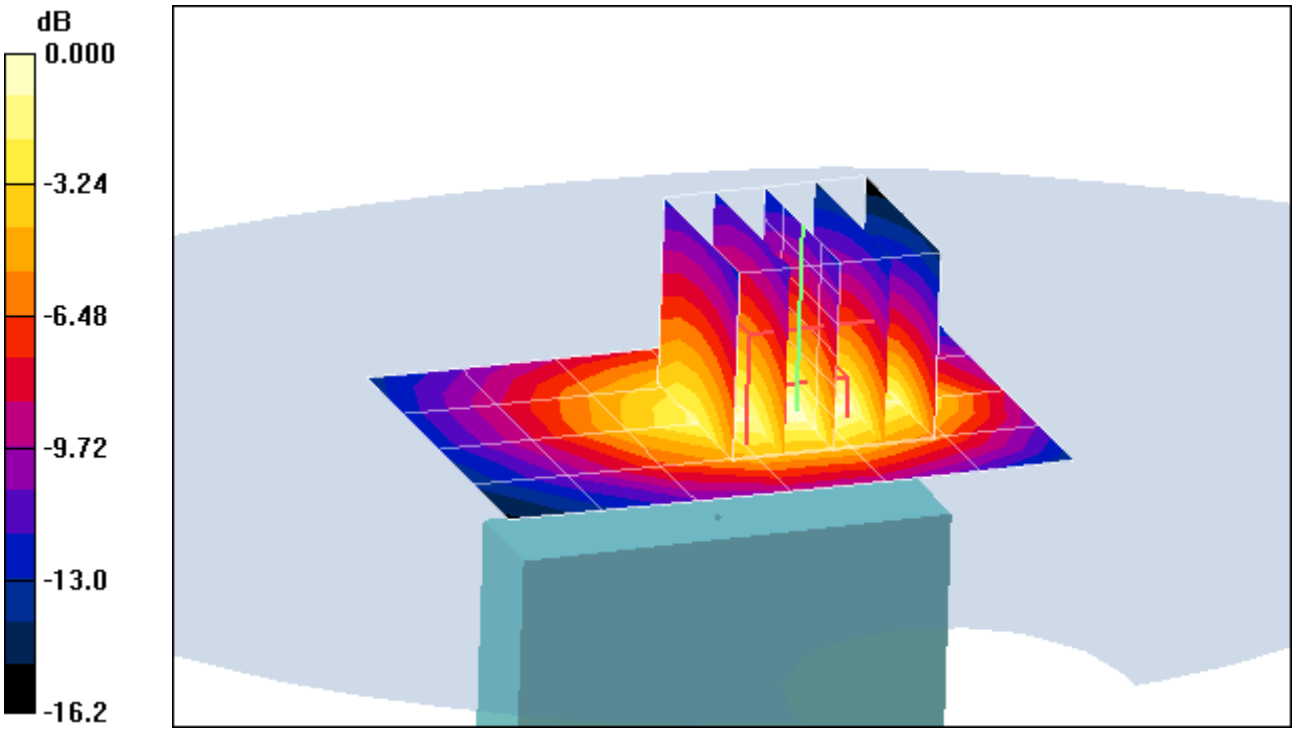
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Bottom Edge, Mid.ch, Standard Battery Cover

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = 0.067 dB
Peak SAR (extrapolated) = 0.332 W/kg
SAR(1 g) = 0.174 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.189mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

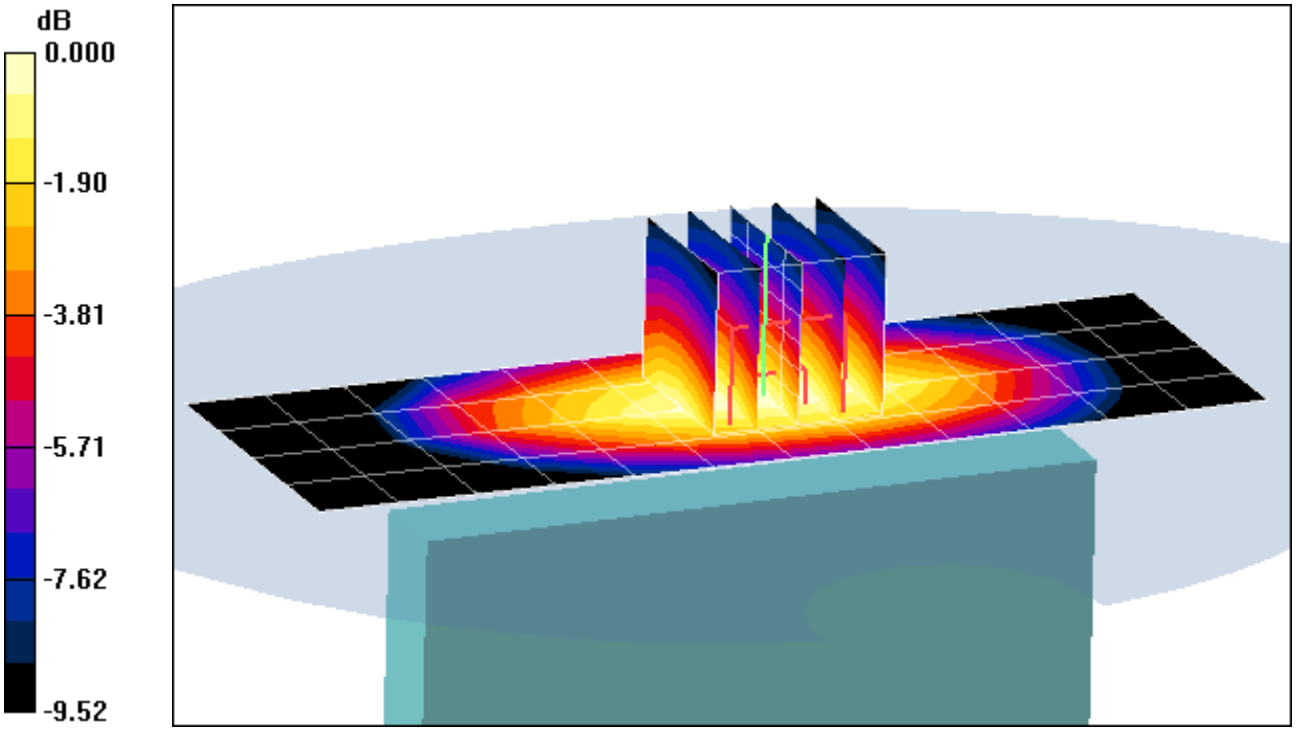
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Left Edge, Mid.ch, Standard Battery Cover

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 0.575 W/kg
SAR(1 g) = 0.404 mW/g; SAR(10 g) = 0.277 mW/g



0 dB = 0.432mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

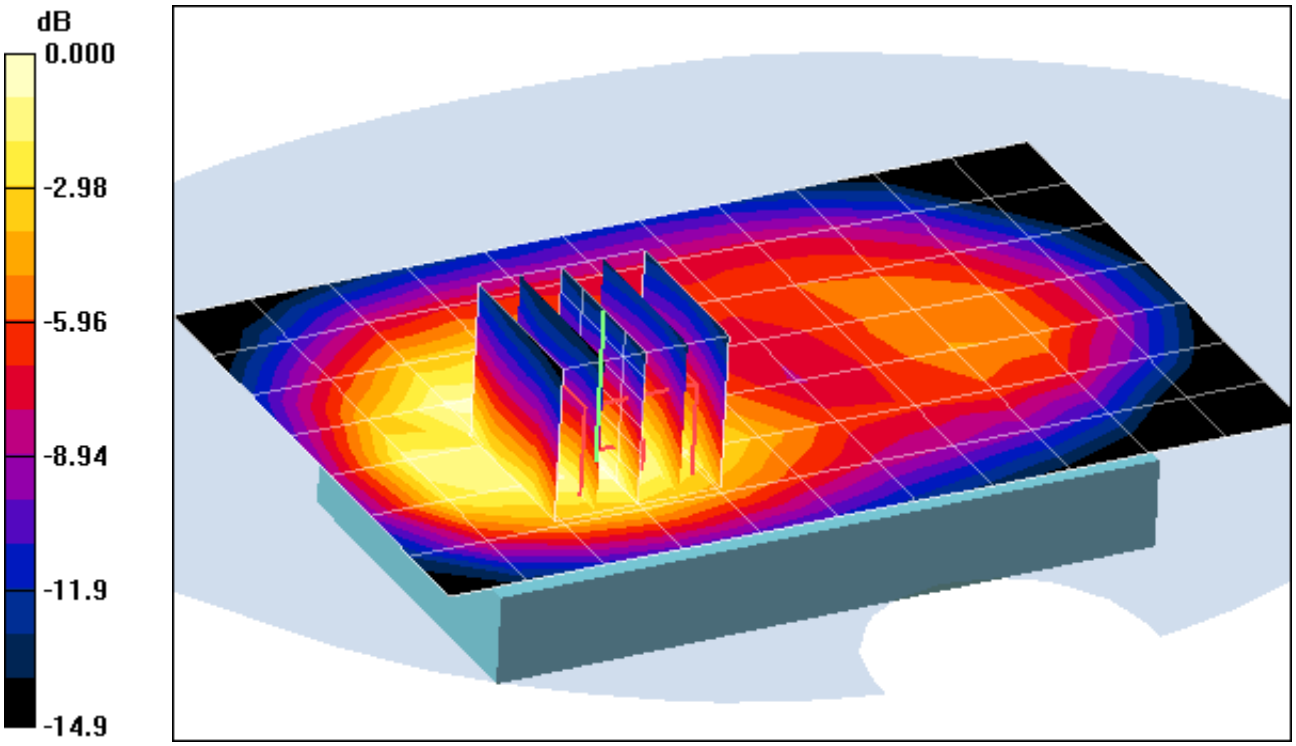
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.45 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 21.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.3 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.843 W/kg
SAR(1 g) = 0.492 mW/g; SAR(10 g) = 0.284 mW/g



0 dB = 0.542mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

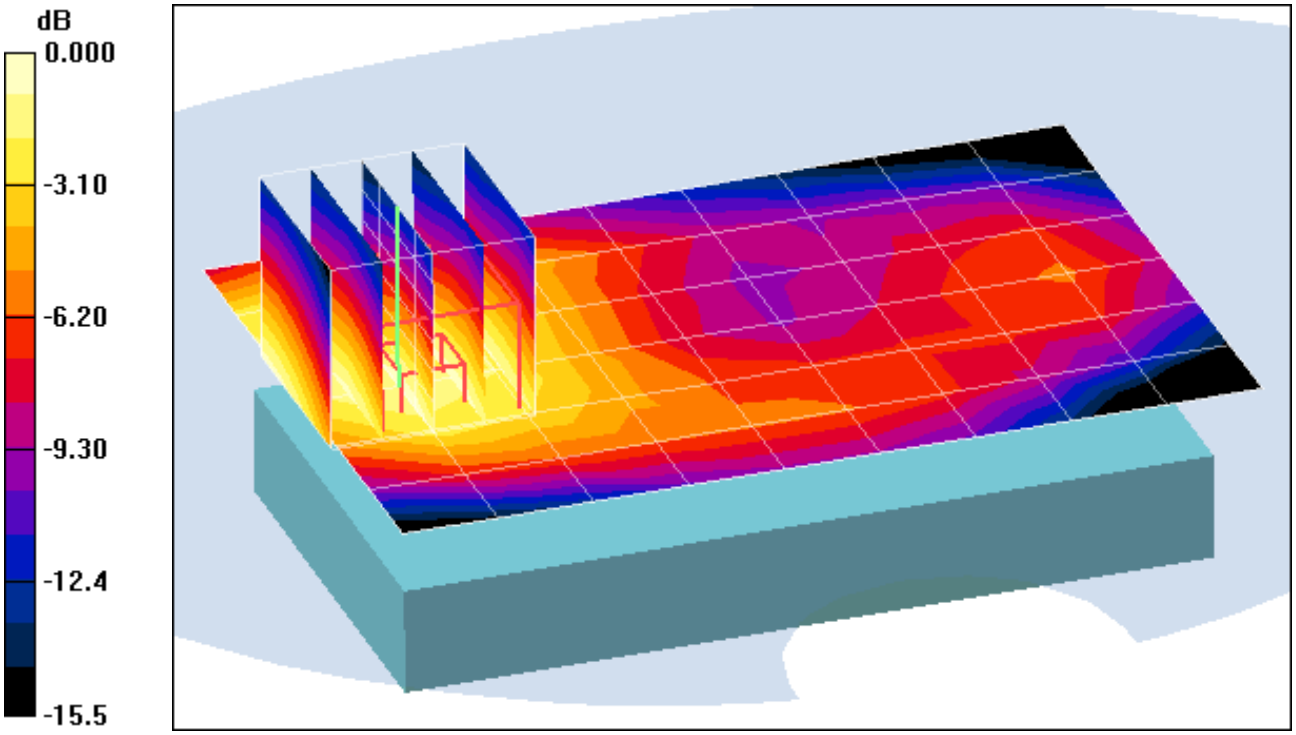
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.53 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(4.75, 4.75, 4.75); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Front side, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 0.624 W/kg
SAR(1 g) = 0.387 mW/g; SAR(10 g) = 0.234 mW/g



0 dB = 0.409mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

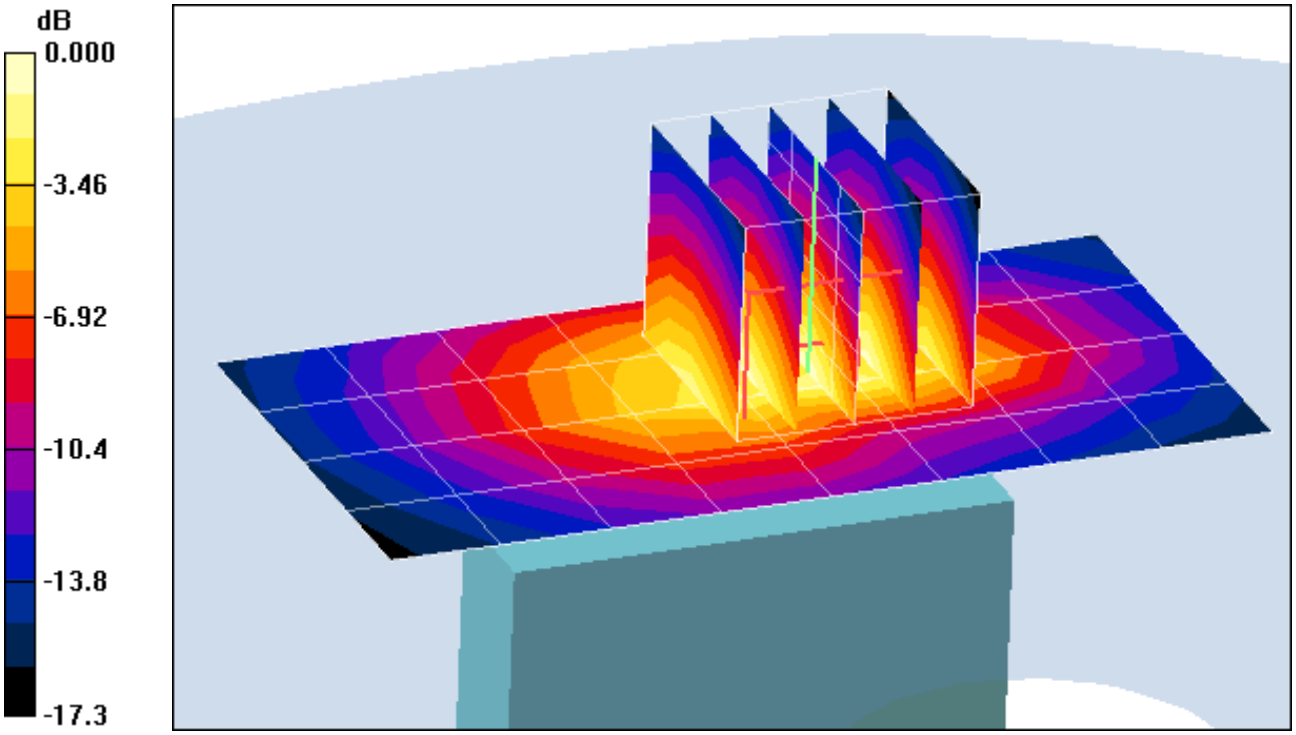
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.53 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(4.75, 4.75, 4.75); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Bottom Edge, Mid.ch, QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.310 mW/g



0 dB = 0.652mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

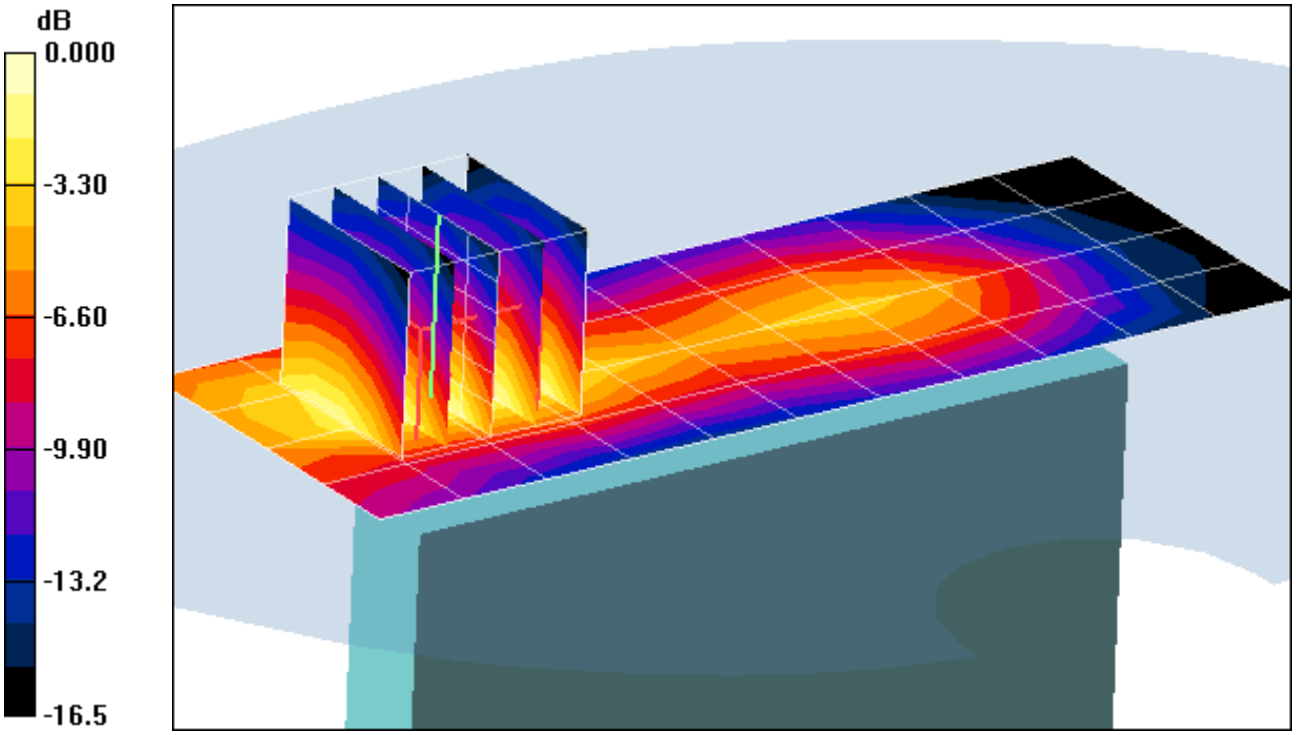
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.53 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(4.75, 4.75, 4.75); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Left Edge, Mid.ch,
QPSK, 10 MHz BW, 1 RB, 49 RB Offset, Standard Battery Cover

Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 0.313 W/kg
SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.101 mW/g



0 dB = 0.202mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

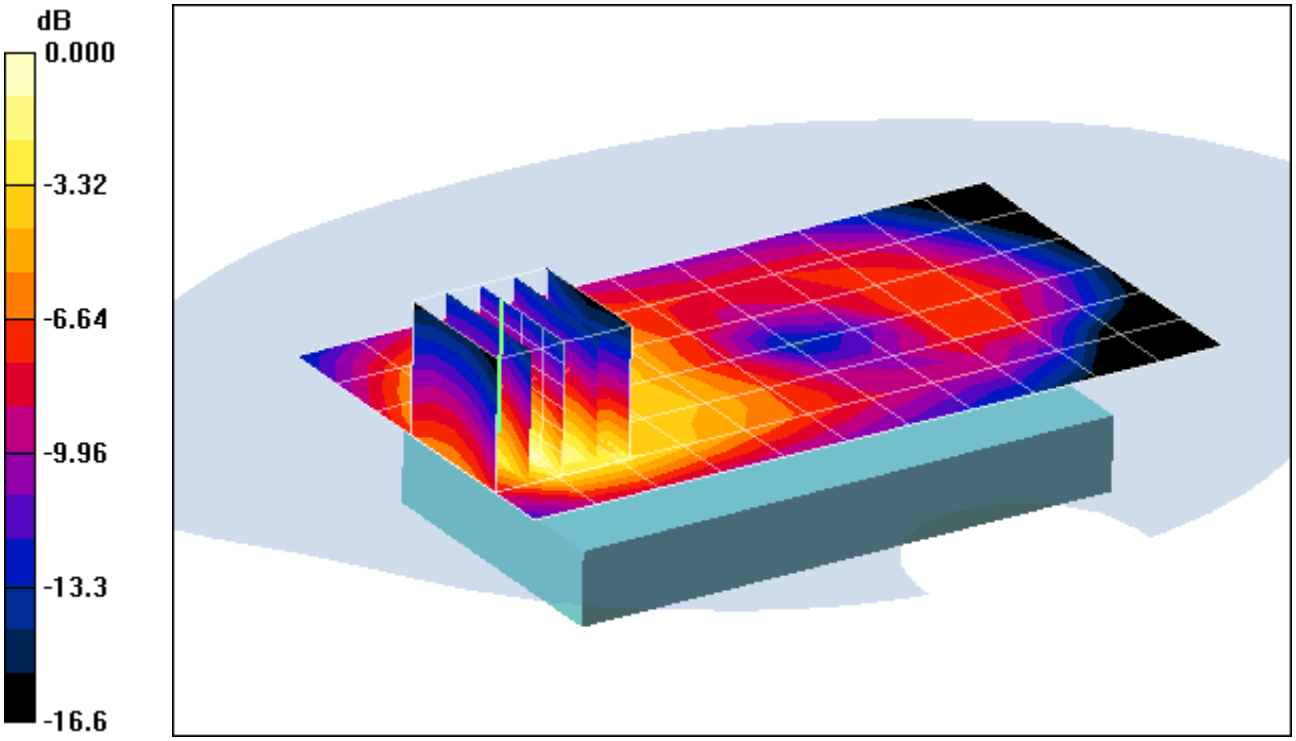
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.3 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.805 W/kg
SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.255 mW/g



0 dB = 0.515mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

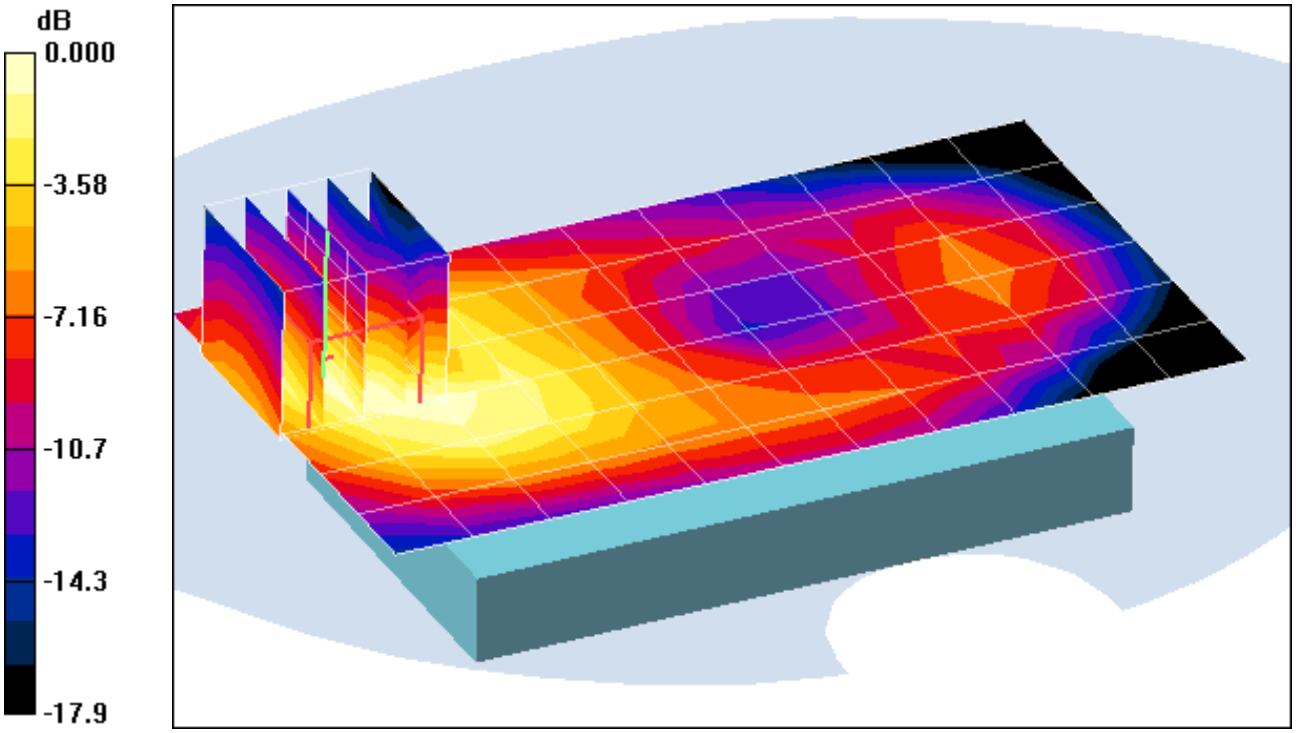
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Front side, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = 0.152 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.296 mW/g; SAR(10 g) = 0.166 mW/g



0 dB = 0.337mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

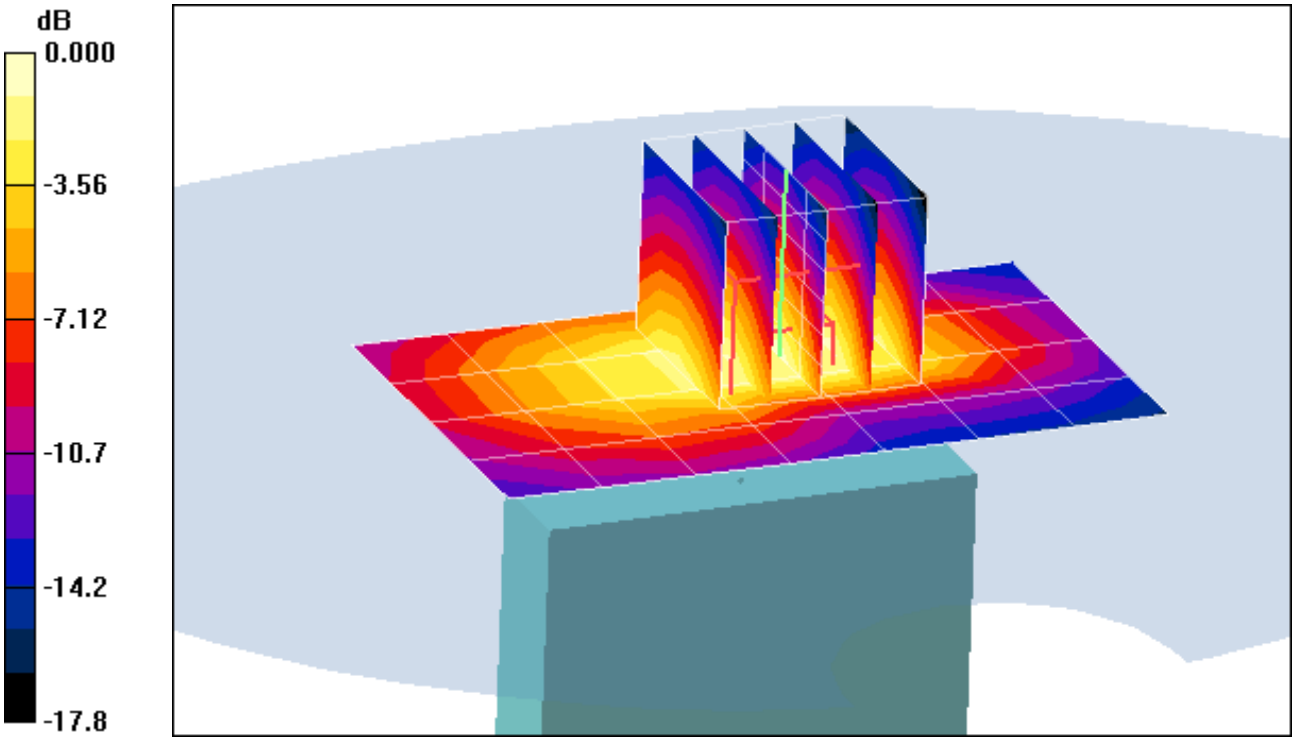
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Bottom Edge, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = -0.134 dB
Peak SAR (extrapolated) = 0.999 W/kg
SAR(1 g) = 0.560 mW/g; SAR(10 g) = 0.293 mW/g



0 dB = 0.632mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

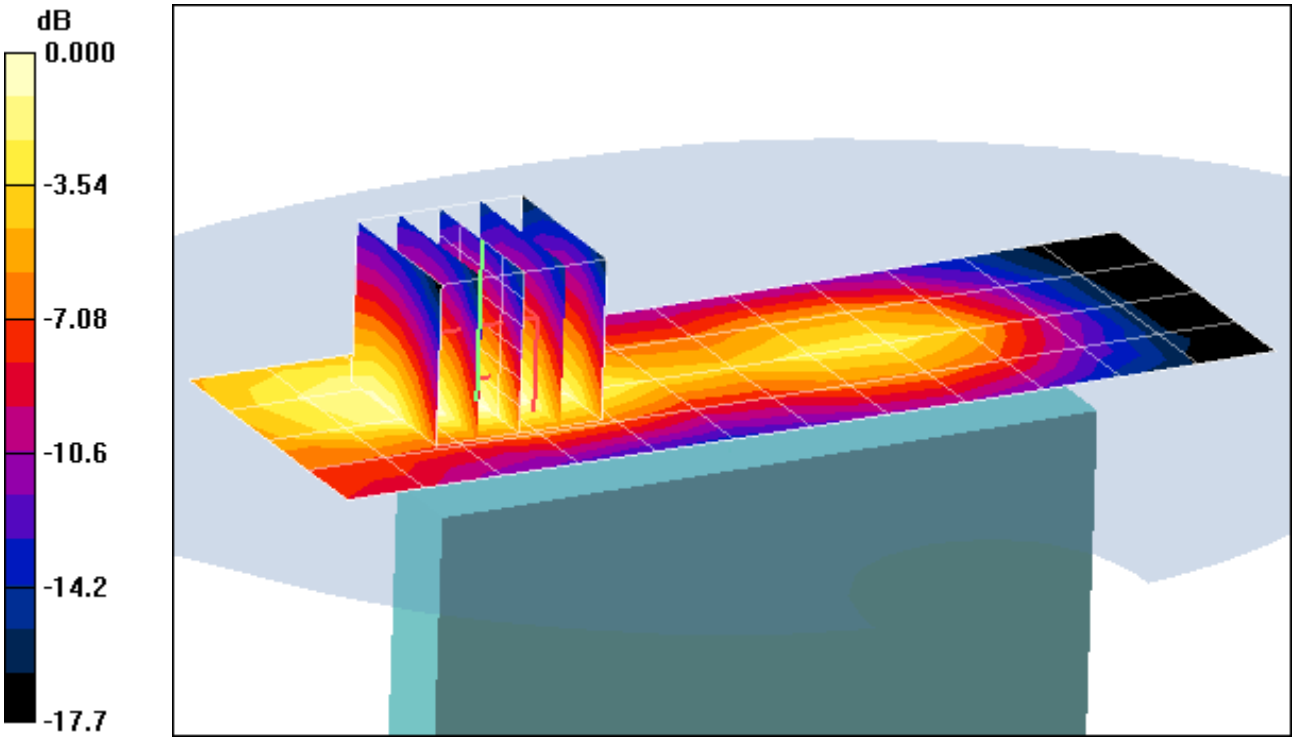
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Left Edge, Mid.ch, 2 Tx Slots, Standard Battery Cover

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.087 mW/g



0 dB = 0.170mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

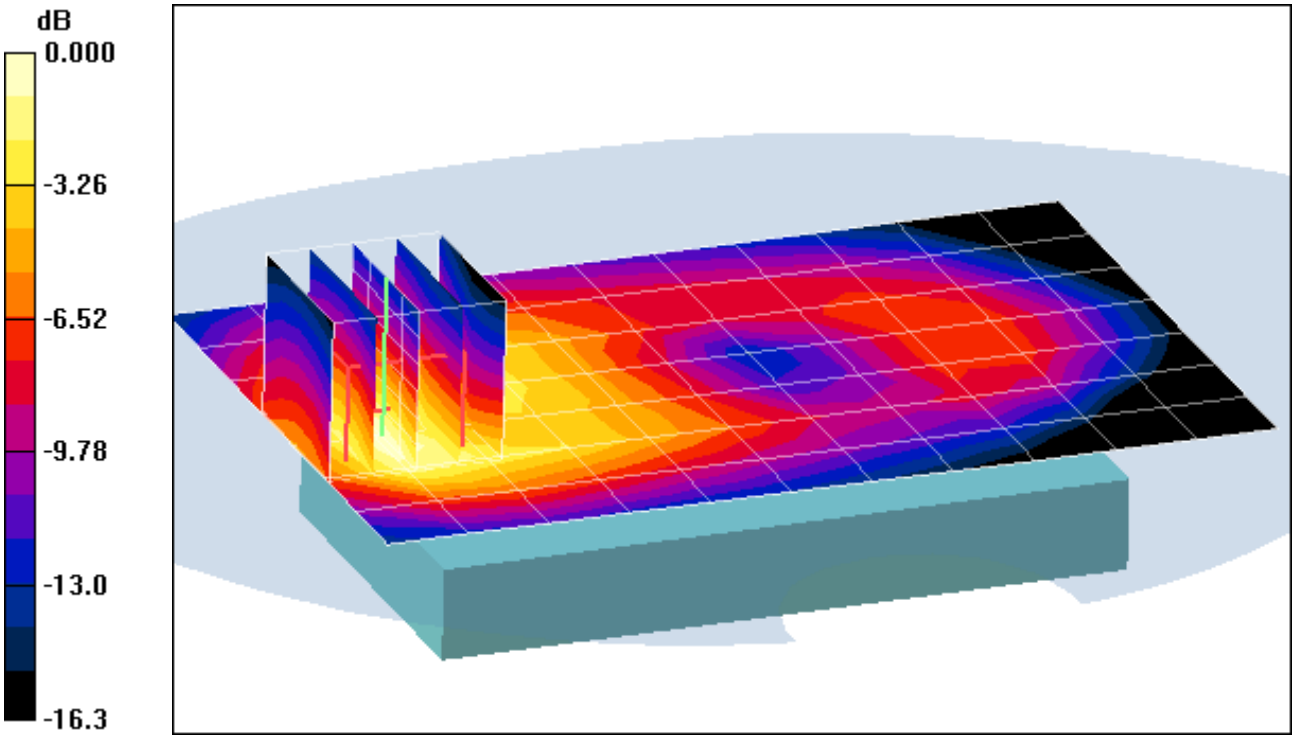
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Back side, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.9 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.352 mW/g



0 dB = 0.707mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

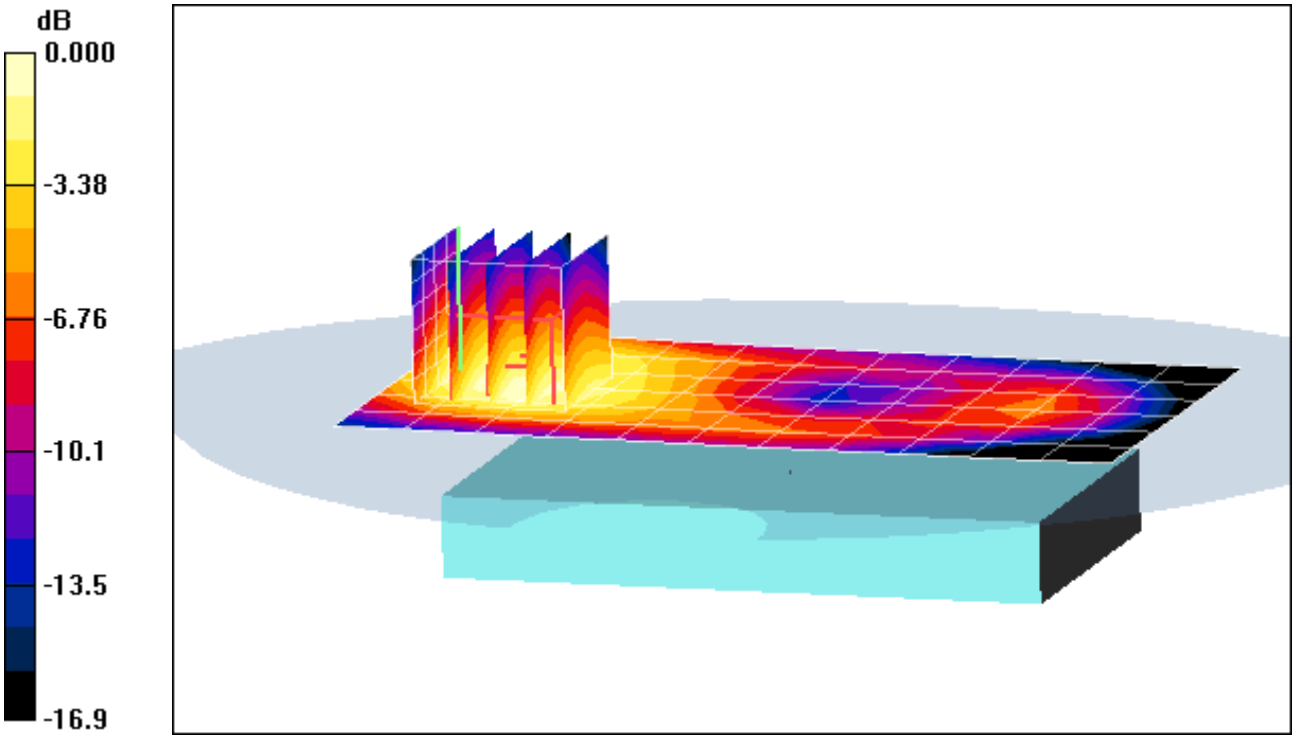
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Front side, Mid.ch, Standard Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.0 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.760 W/kg
SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.275 mW/g



0 dB = 0.499mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

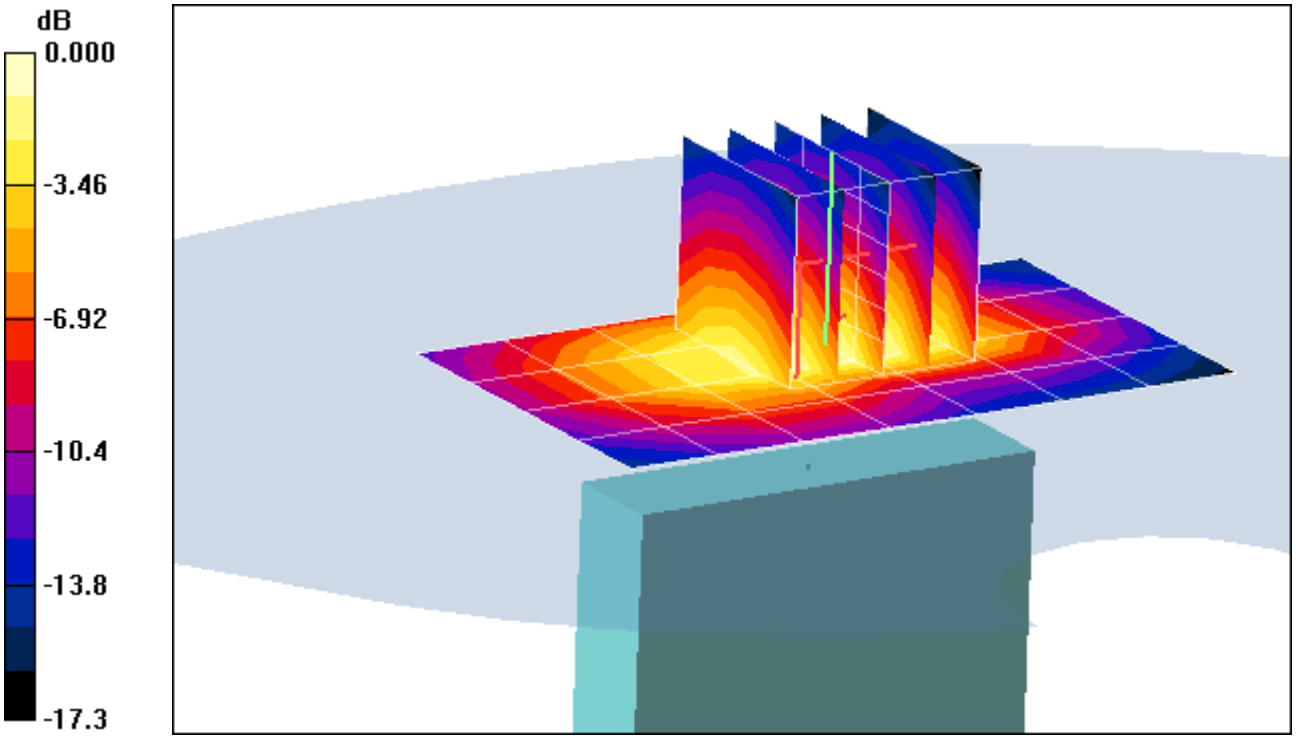
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Bottom Edge, Mid.ch, Standard Battery Cover

Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.399 mW/g



0 dB = 0.833mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

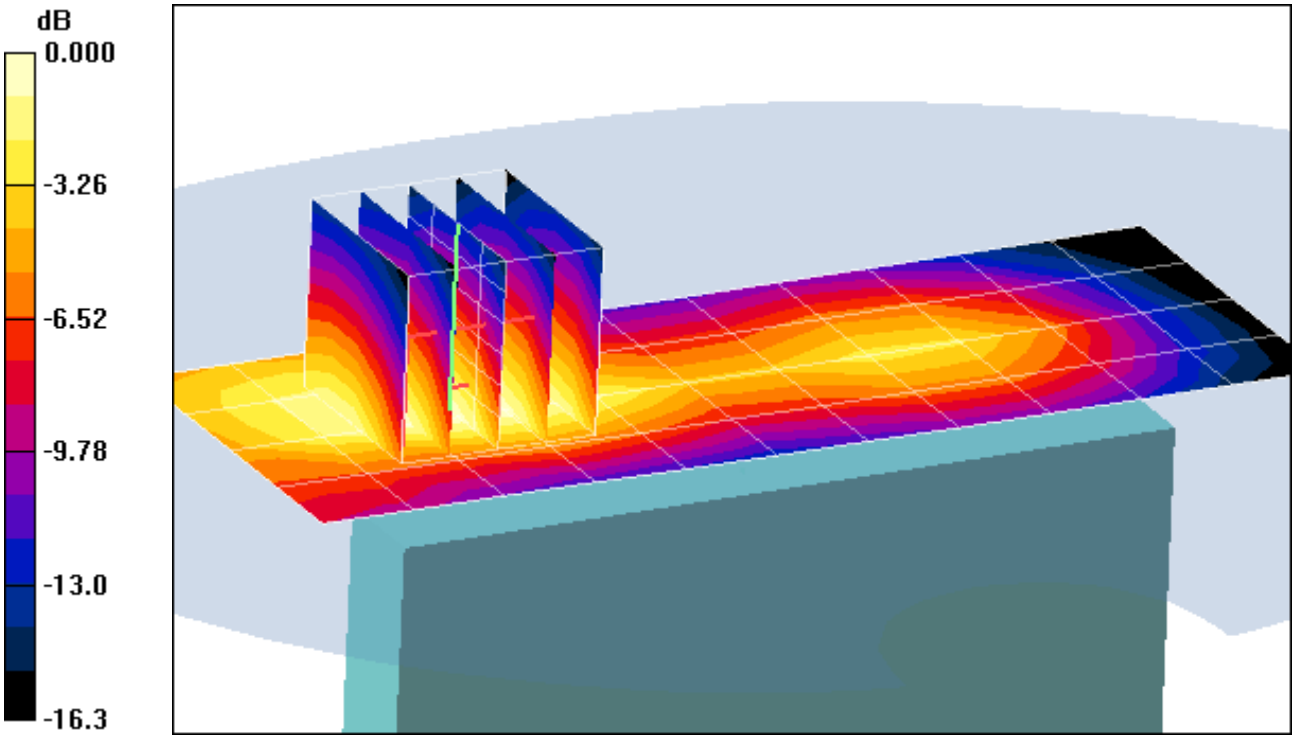
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Left Edge, Mid.ch, Standard Battery Cover

Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.355 W/kg
SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.117 mW/g



0 dB = 0.228mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

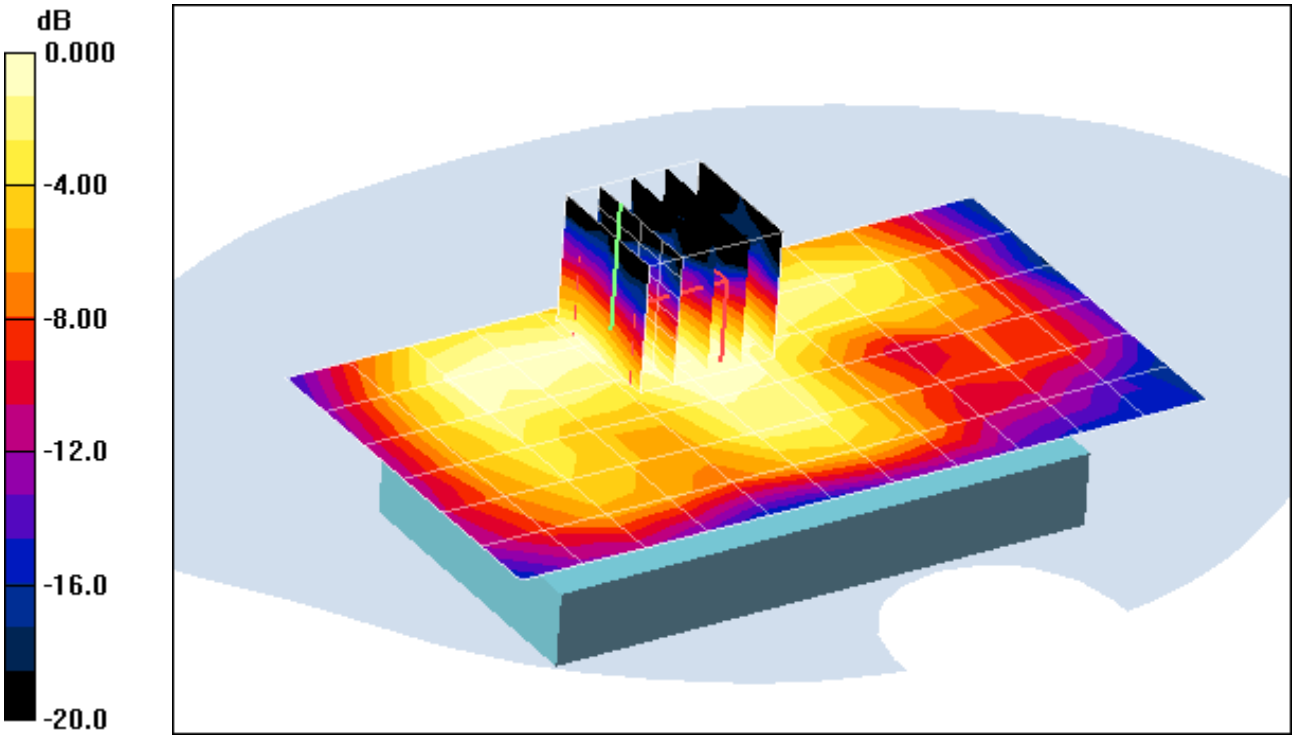
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.03 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2012; Ambient Temp: 24.8°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Back Side, NFC Battery Cover

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.11 V/m; Power Drift = 0.157 dB
Peak SAR (extrapolated) = 0.099 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.026 mW/g



0 dB = 0.059mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

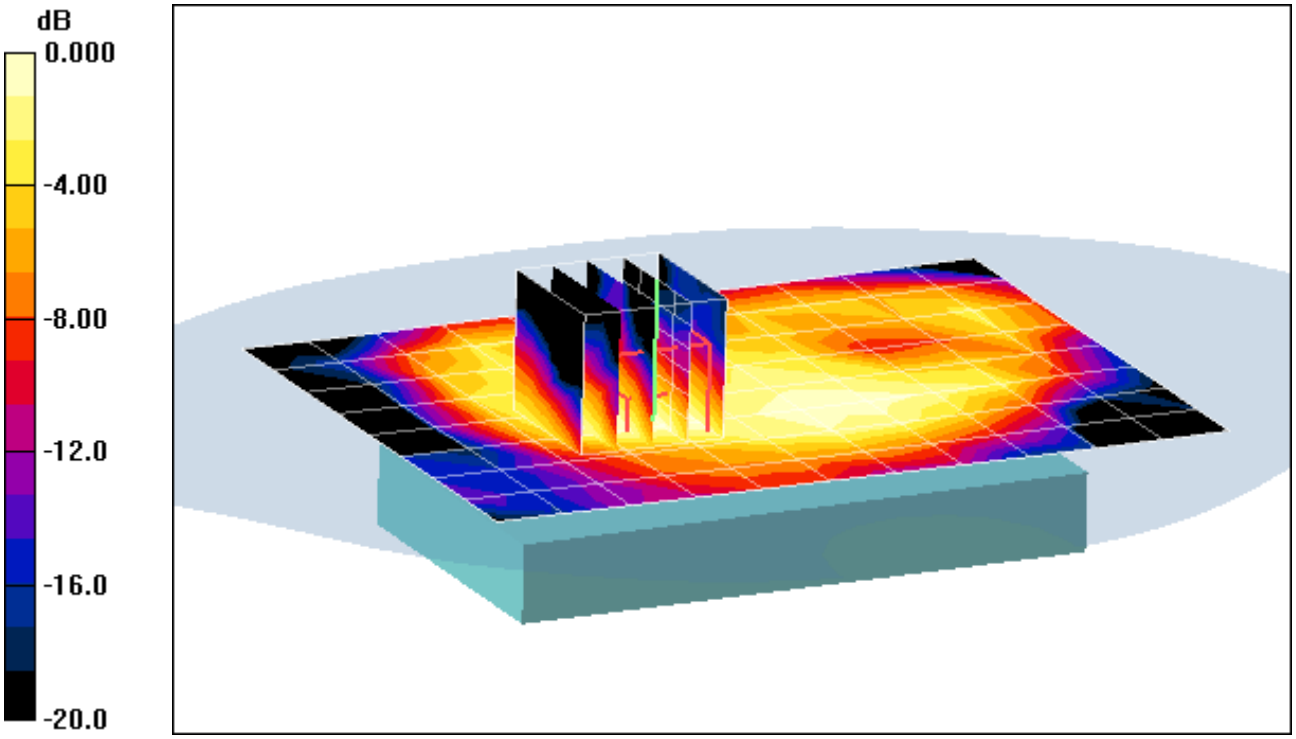
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.06 mho/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.2°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Front Side, Standard Battery Cover

Area Scan (9x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.61 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.013 mW/g



0 dB = 0.033mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-A

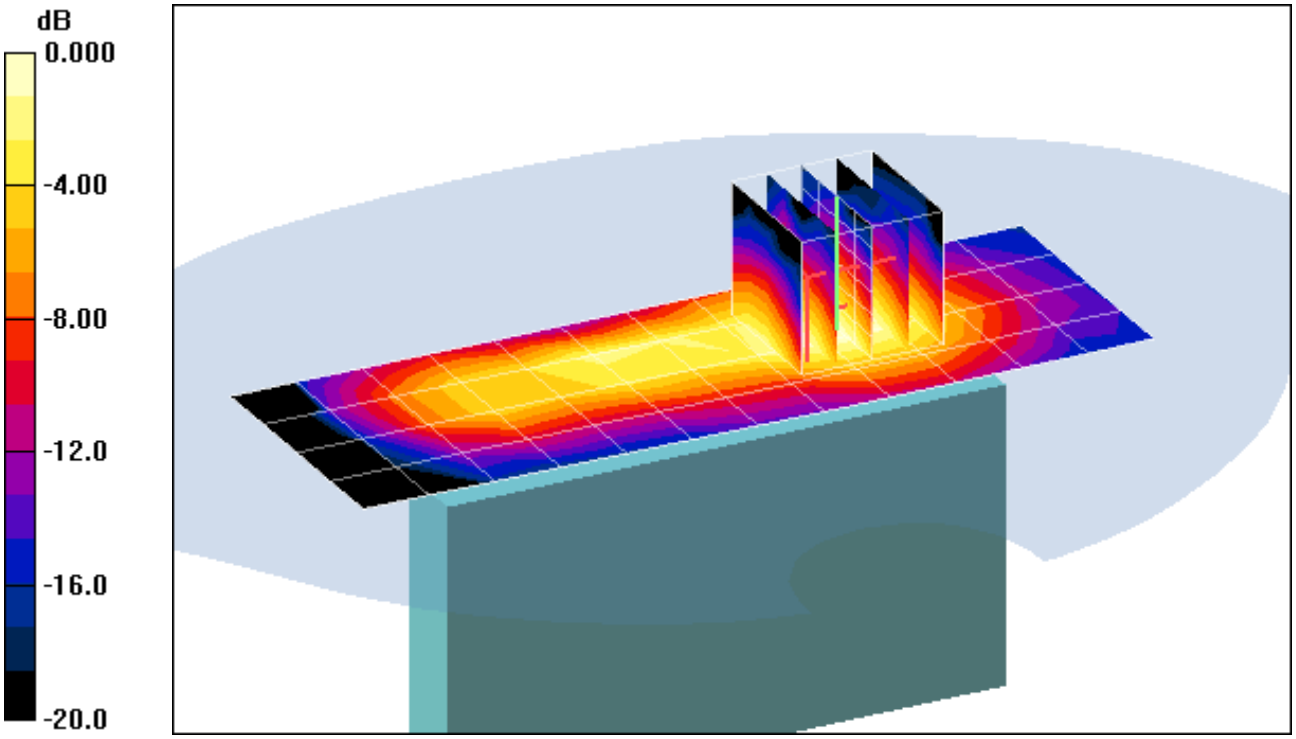
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.06 mho/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.2°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Right Edge, Standard Battery Cover

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.47 V/m; Power Drift = 0.173 dB
Peak SAR (extrapolated) = 0.073 W/kg
SAR(1 g) = 0.039 mW/g; SAR(10 g) = 0.020 mW/g



0 dB = 0.049mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI757; Type: Portable Handset; Serial: FI-347-C

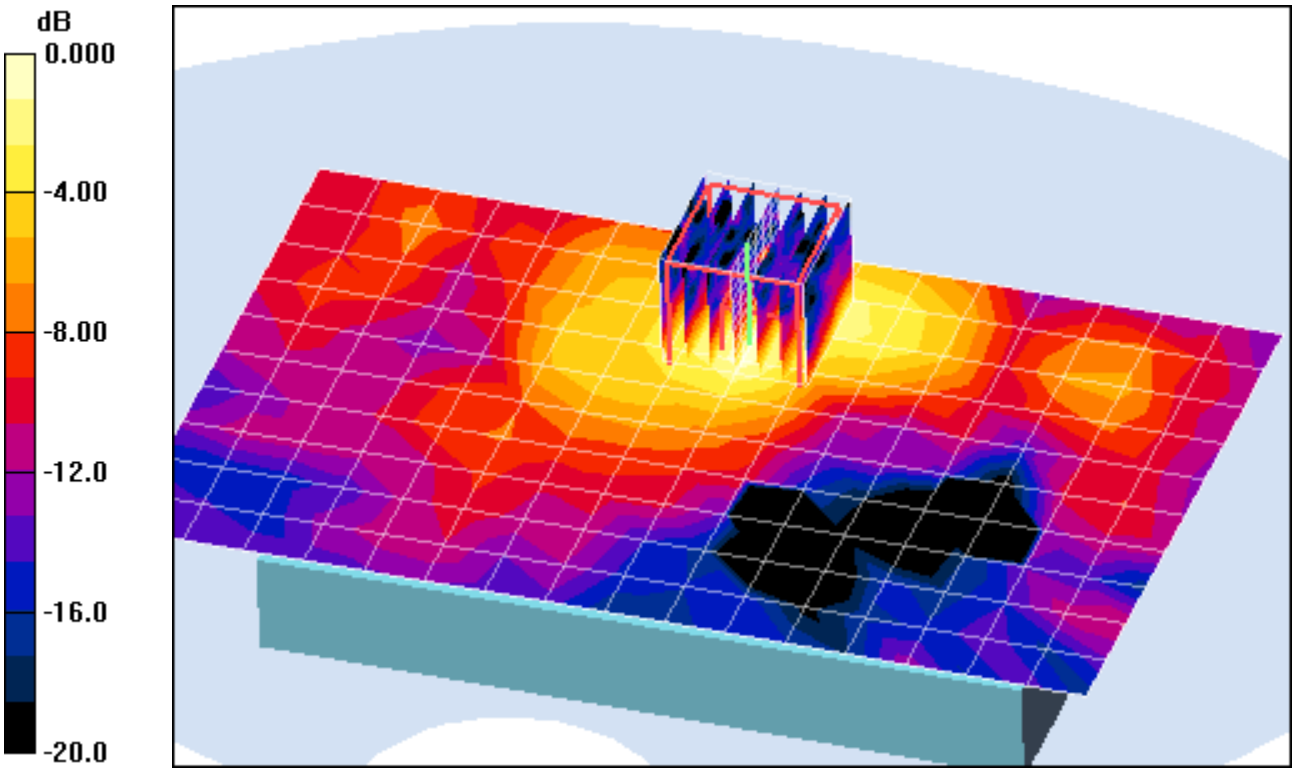
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5220 MHz; σ = 5.335 mho/m; ε_r = 47.32; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3561; ConvF(3.7, 3.7, 3.7); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.2 GHz, Body SAR, Back Side,
Ch 44, 6 Mbps, NFC Battery Cover

Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.34 V/m; Power Drift = -0.065 dB
Peak SAR (extrapolated) = 0.377 W/kg
SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.037 mW/g



0 dB = 0.258mW/g

APPENDIX B: DIPOLE VALIDATION

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PCTEST ENGINEERING LABORATORY, INC.

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

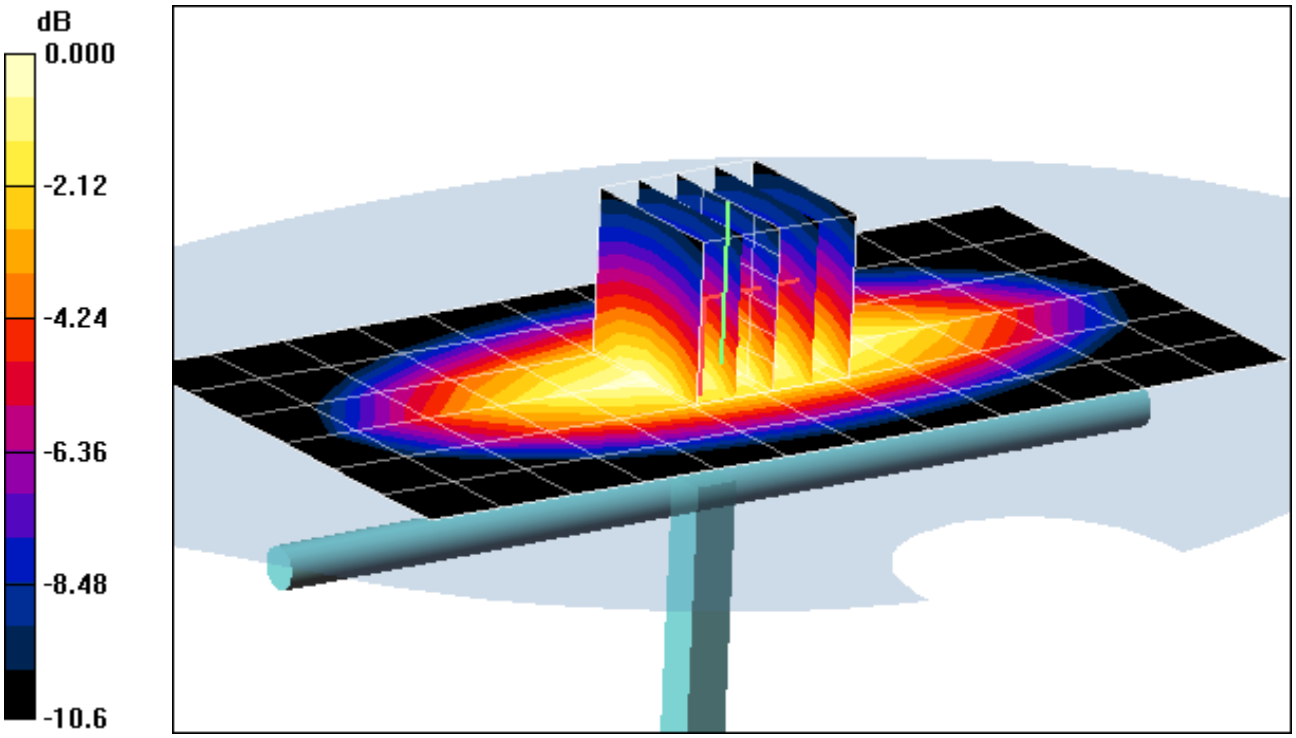
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.913 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3258; ConvF(6.41, 6.41, 6.41); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.860 mW/g; SAR(10 g) = 0.560 mW/g
Deviation = 2.38%



0 dB = 0.928mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

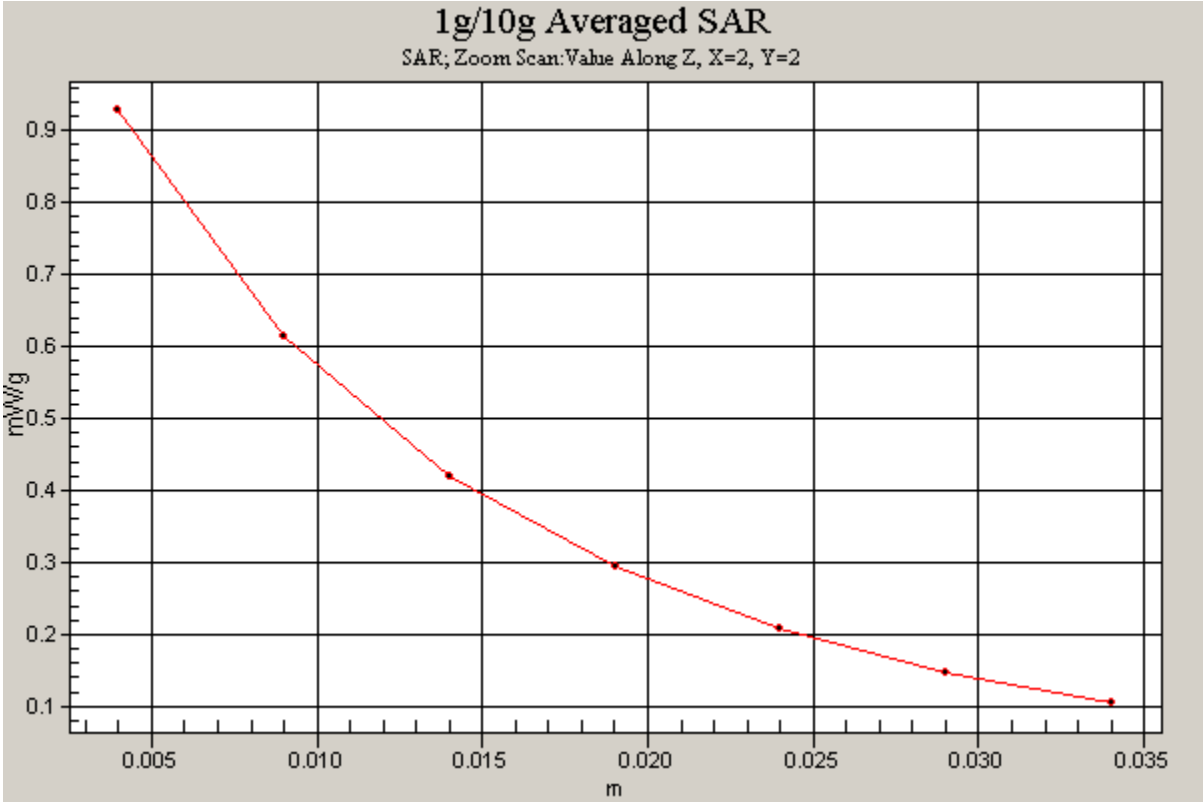
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.913 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3258; ConvF(6.41, 6.41, 6.41); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.860 mW/g; SAR(10 g) = 0.560 mW/g
Deviation = 2.38%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

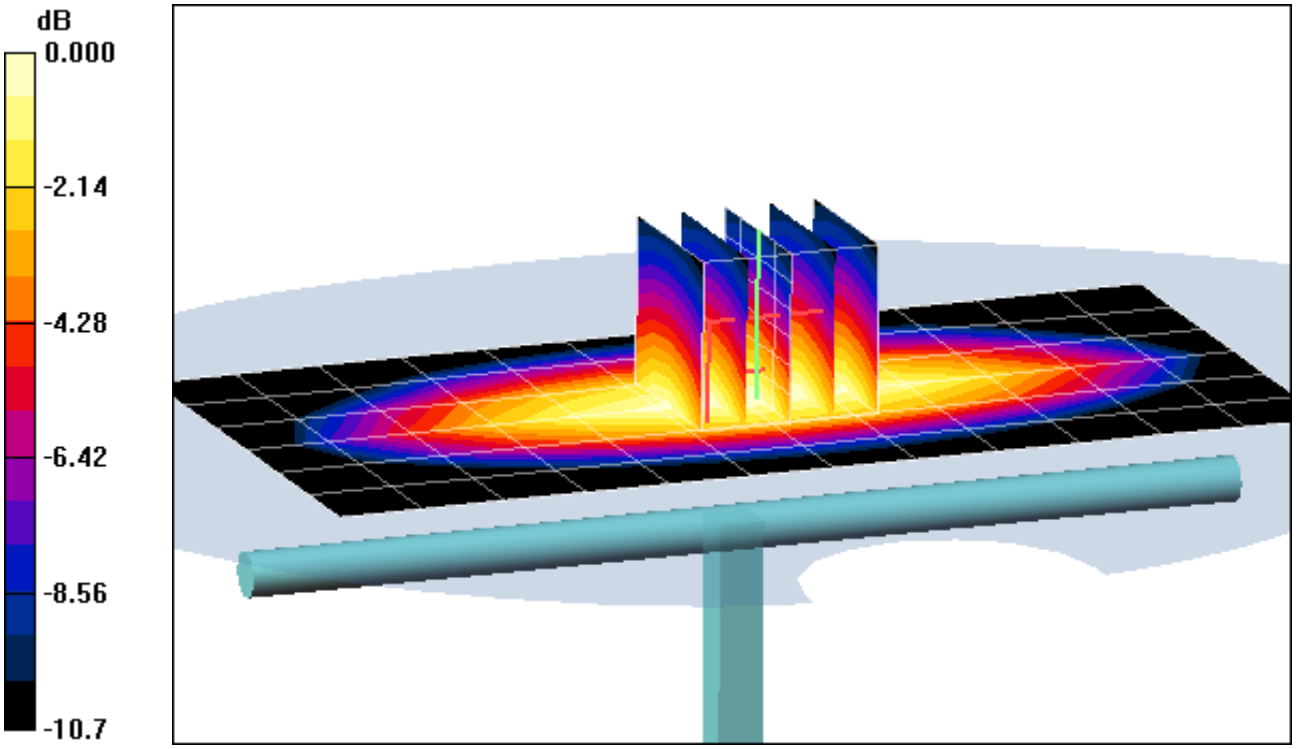
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.913 mho/m; ε_r = 43; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2012; Ambient Temp: 22.8°C; Tissue Temp: 20.2°C

Probe: ES3DV3 - SN3209; ConvF(6.42, 6.42, 6.42); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.851 mW/g; SAR(10 g) = 0.553 mW/g
Deviation = 1.67%



0 dB = 0.916mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

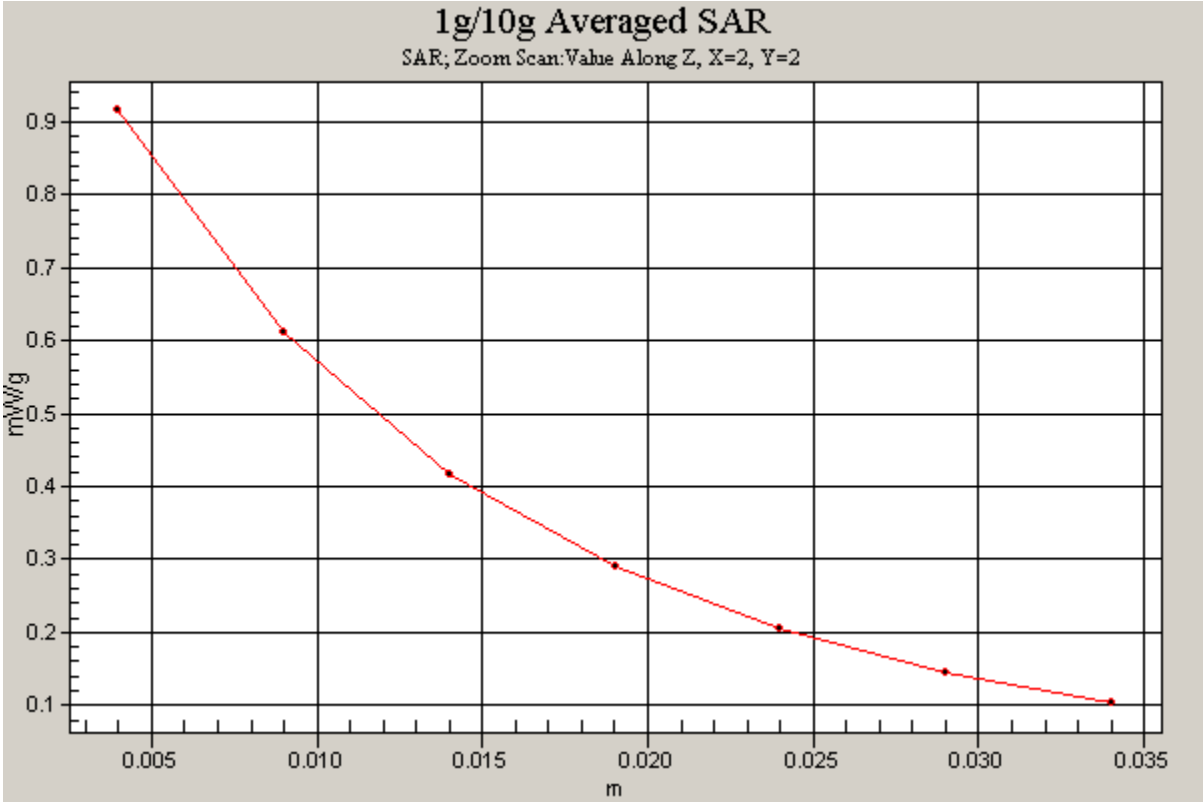
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.913 mho/m; ε_r = 43; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-25-2012; Ambient Temp: 22.8°C; Tissue Temp: 20.2°C

Probe: ES3DV3 - SN3209; ConvF(6.42, 6.42, 6.42); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.851 mW/g; SAR(10 g) = 0.553 mW/g
Deviation = 1.67%



PCTEST ENGINEERING LABORATORY, INC.

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

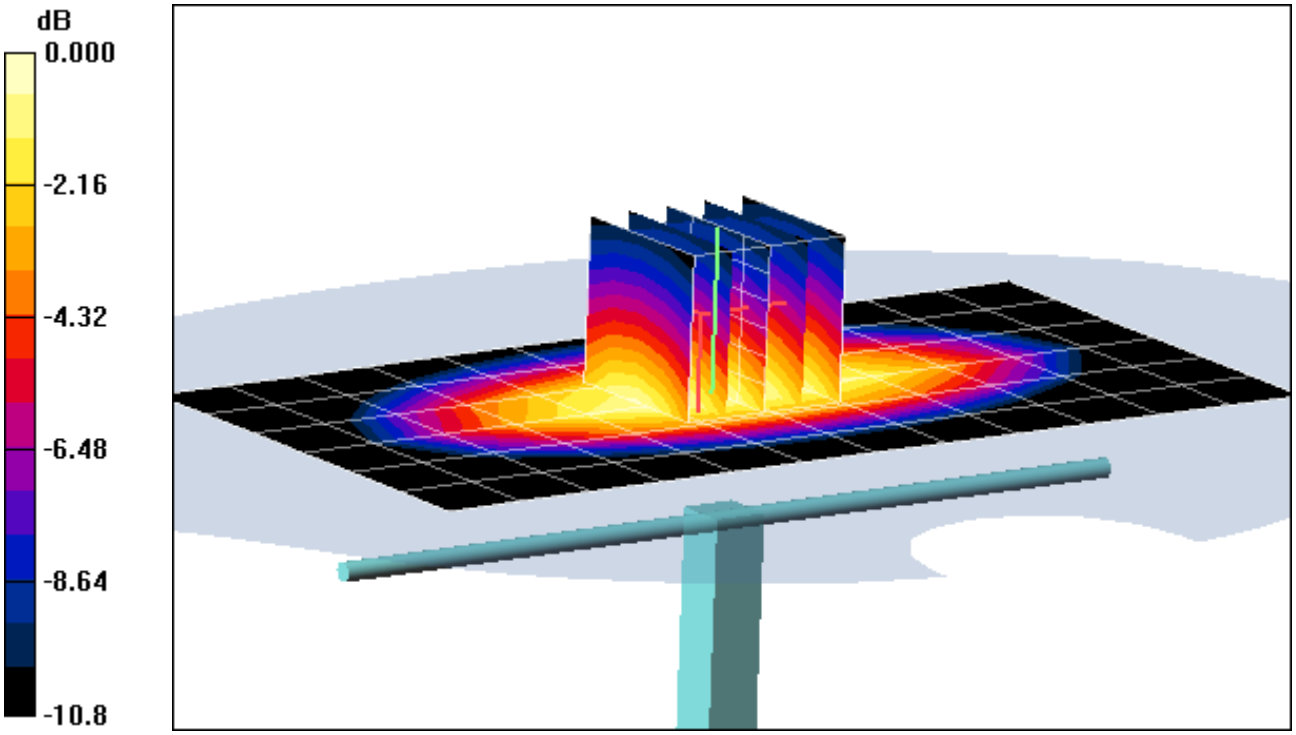
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.884 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.648 mW/g
Deviation = 6.38%



0 dB = 1.08mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

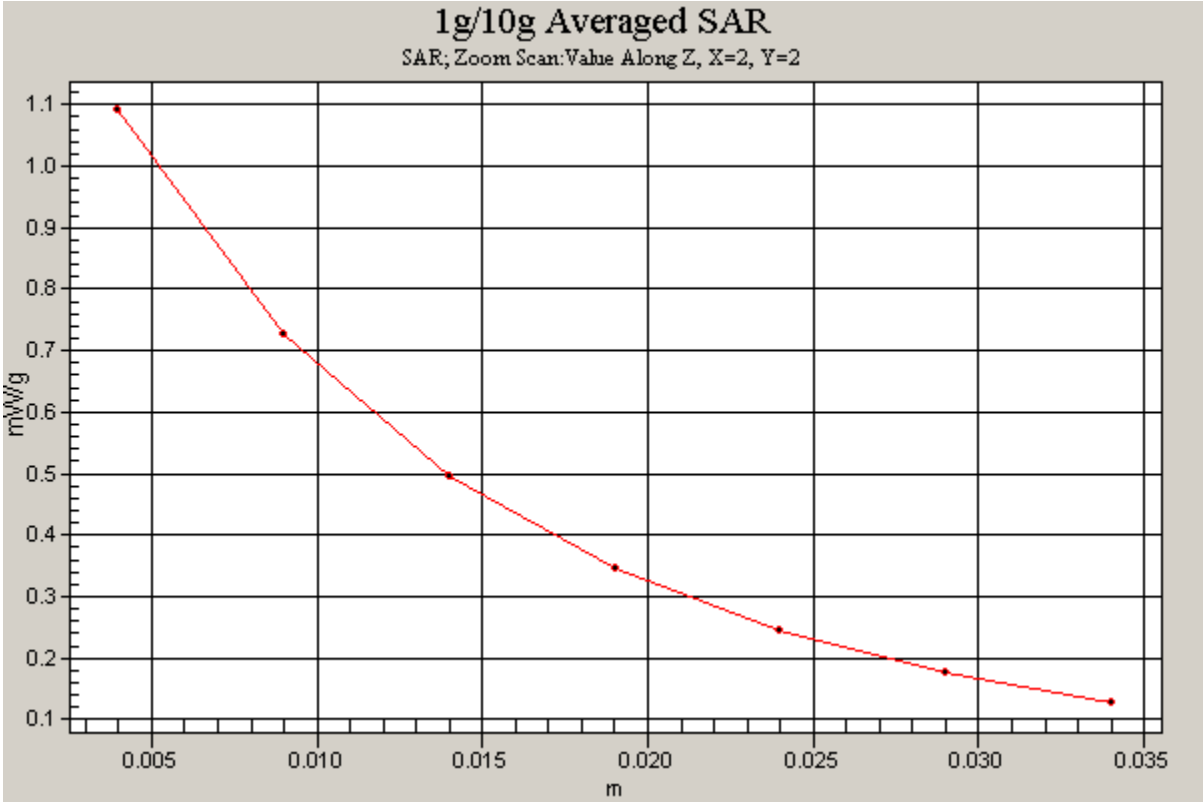
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.884 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-10-2012; Ambient Temp: 19.8°C; Tissue Temp: 19.5°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.648 mW/g
Deviation = 6.38%



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

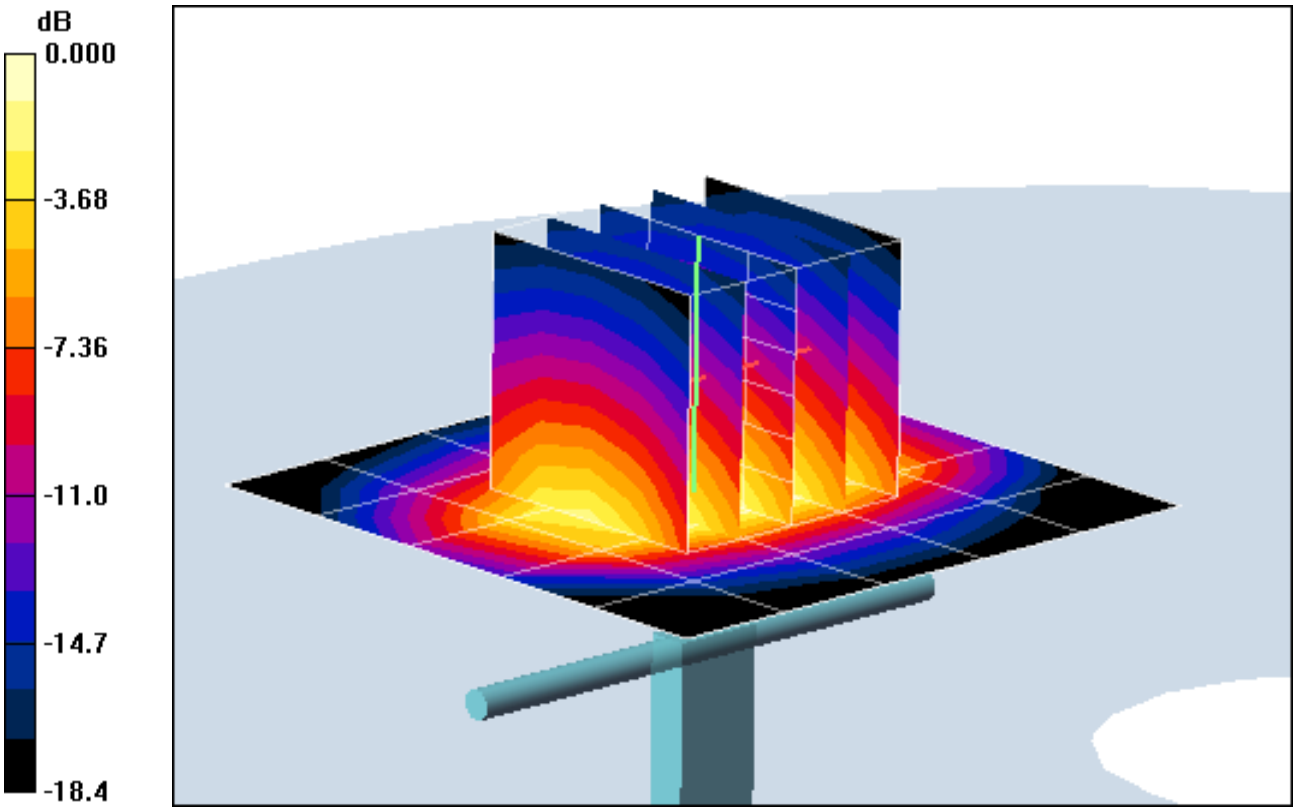
Communication System: CW; Frequency: 1765 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.42 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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)
SAR(1 g) = 3.69 mW/g; SAR(10 g) = 1.88 mW/g
Deviation = 1.10 %



0 dB = 4.13mW/g

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

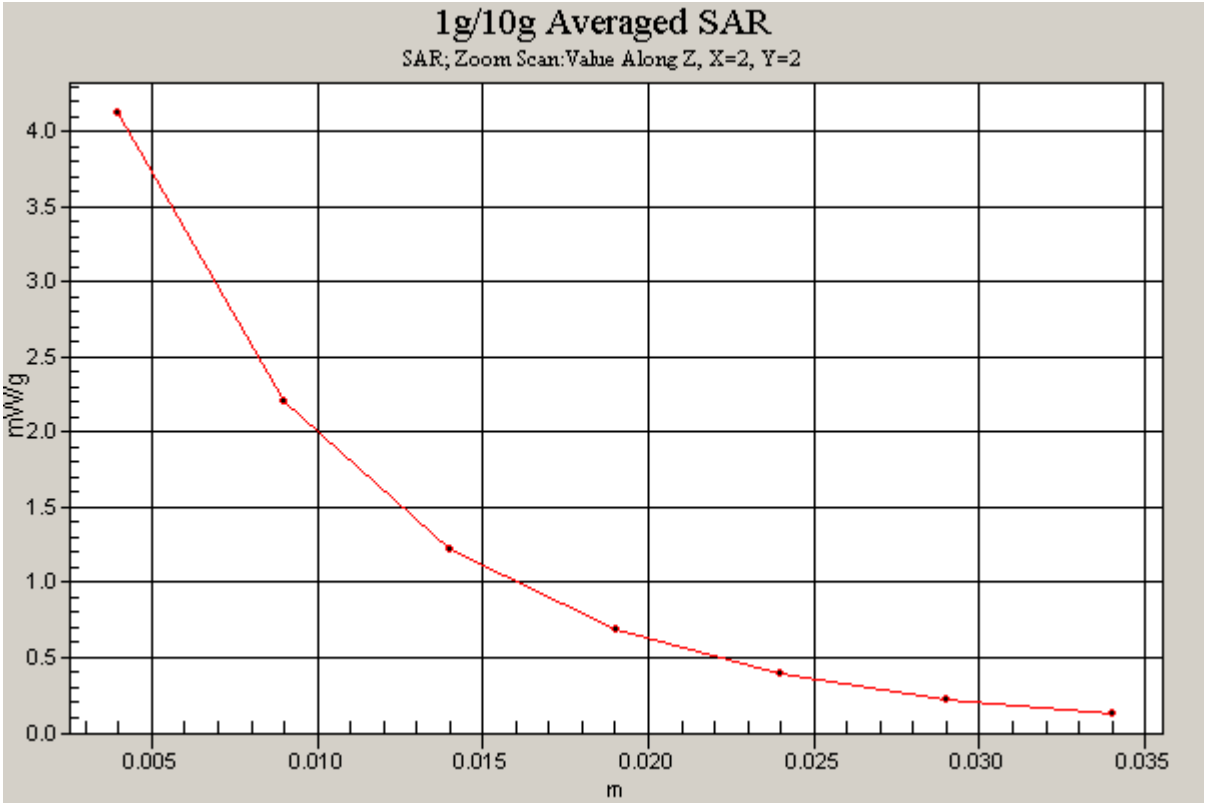
Communication System: CW; Frequency: 1765 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.42 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2012; Ambient Temp: 20.6°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(5.32, 5.32, 5.32); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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)
SAR(1 g) = 3.69 mW/g; SAR(10 g) = 1.88 mW/g
Deviation = 1.10 %



DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

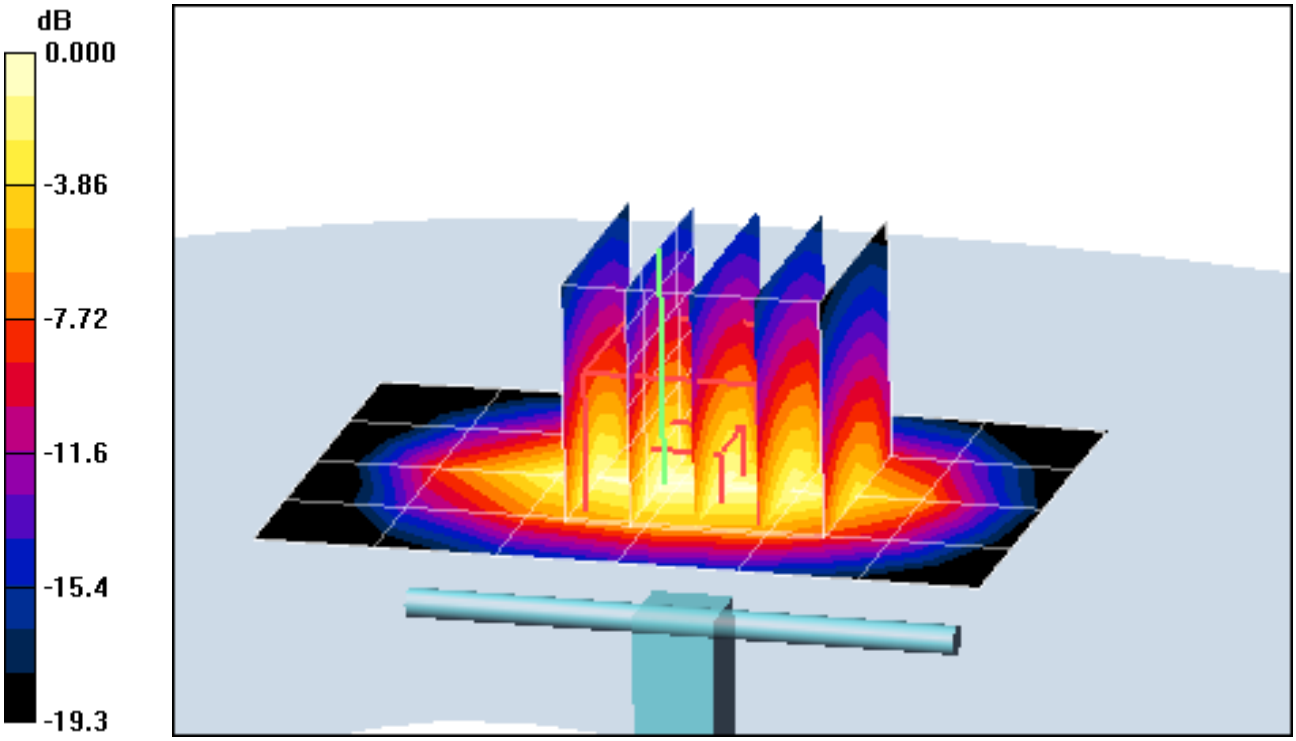
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.45 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.2°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): 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)
SAR(1 g) = 4.03 mW/g; SAR(10 g) = 2.06 mW/g
Deviation = 0.25%



0 dB = 4.43mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

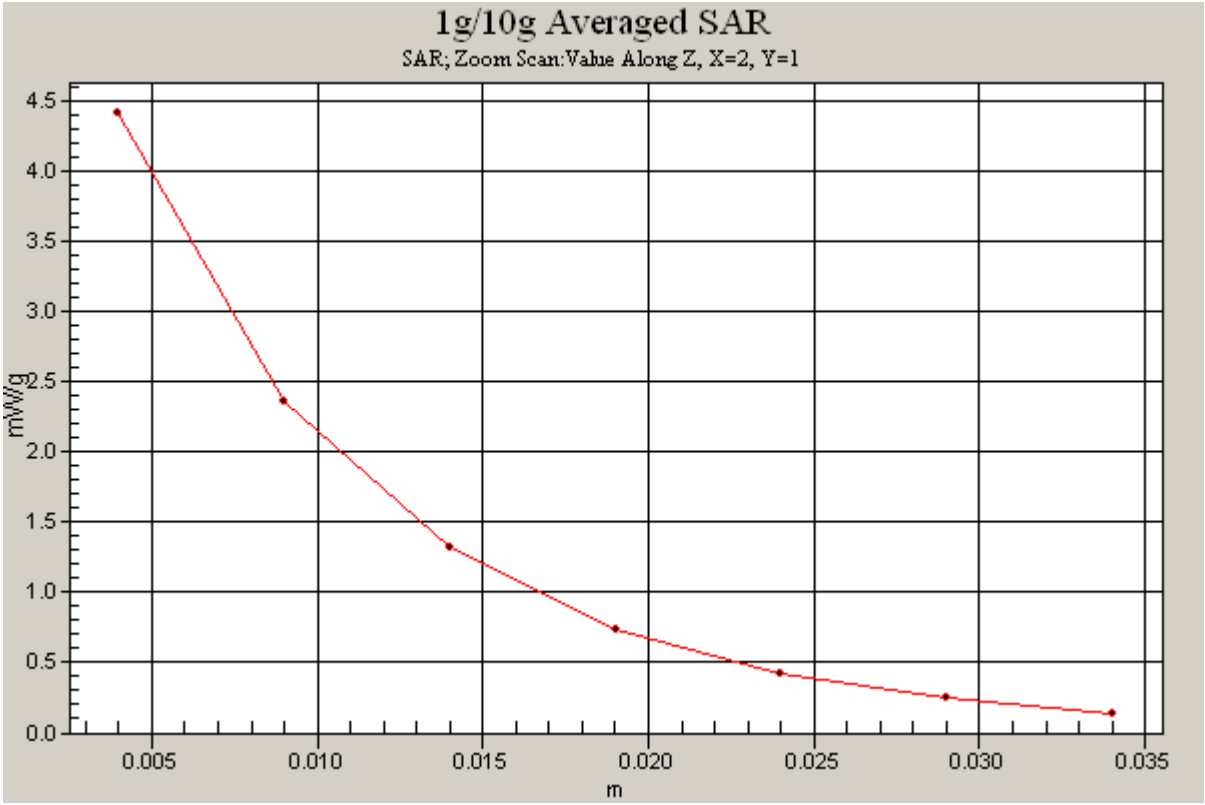
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.45 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.2°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): 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)
SAR(1 g) = 4.03 mW/g; SAR(10 g) = 2.06 mW/g
Deviation = 0.25%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

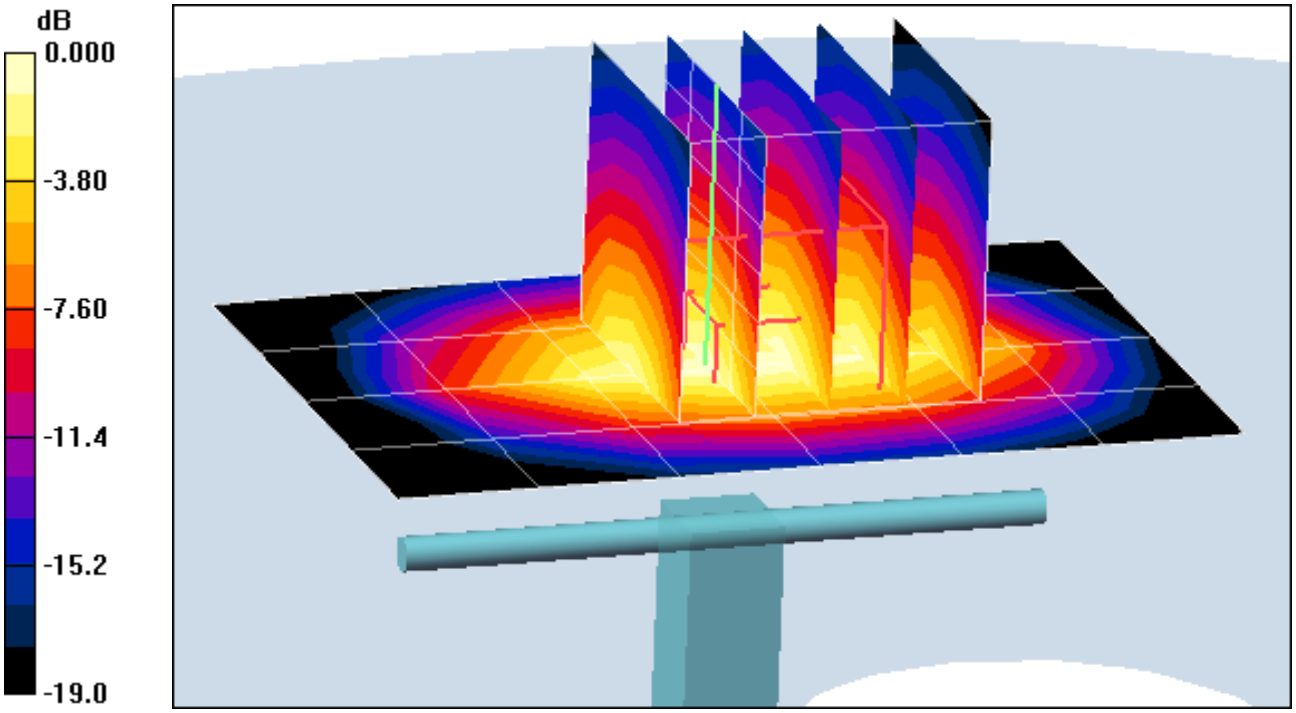
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-24-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20 dBm (100 mW)
SAR(1 g) = 4.14 mW/g; SAR(10 g) = 2.11 mW/g
Deviation = 2.99 %



0 dB = 4.56mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

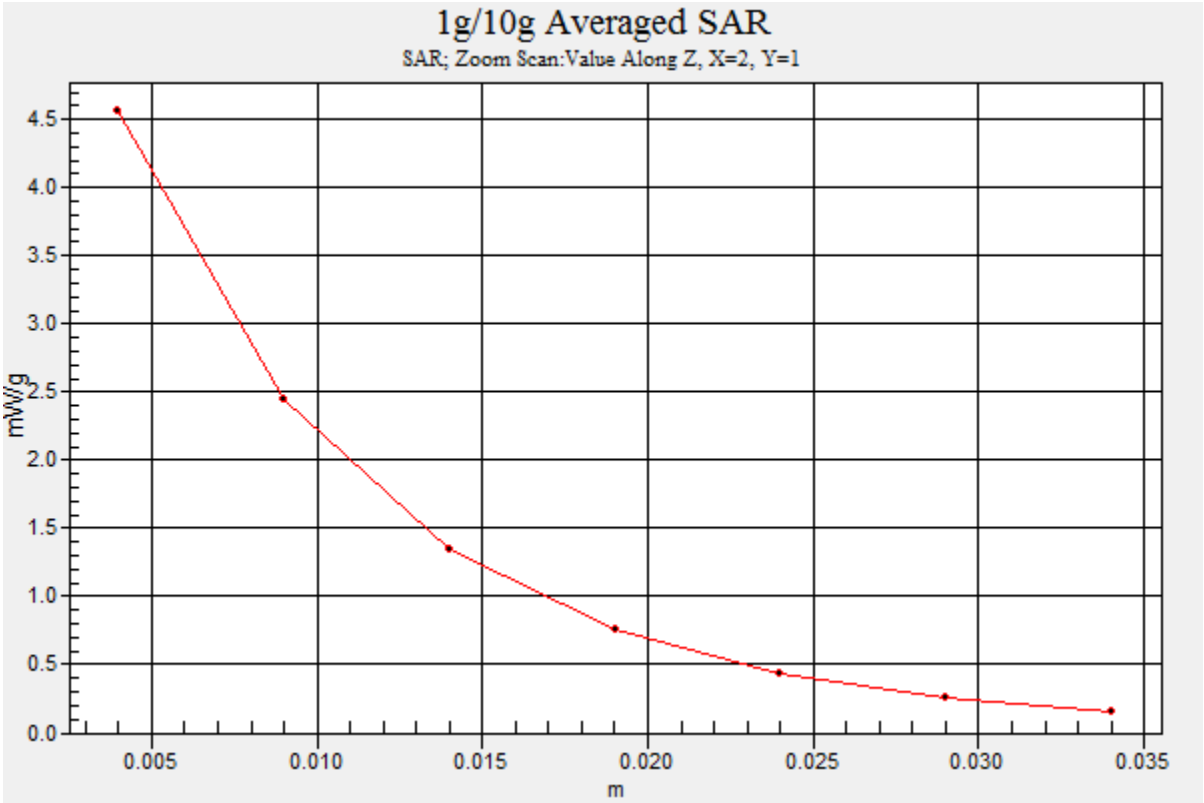
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-24-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20 dBm (100 mW)
SAR(1 g) = 4.14 mW/g; SAR(10 g) = 2.11 mW/g
Deviation = 2.99 %



PCTEST ENGINEERING LABORATORY, INC.

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

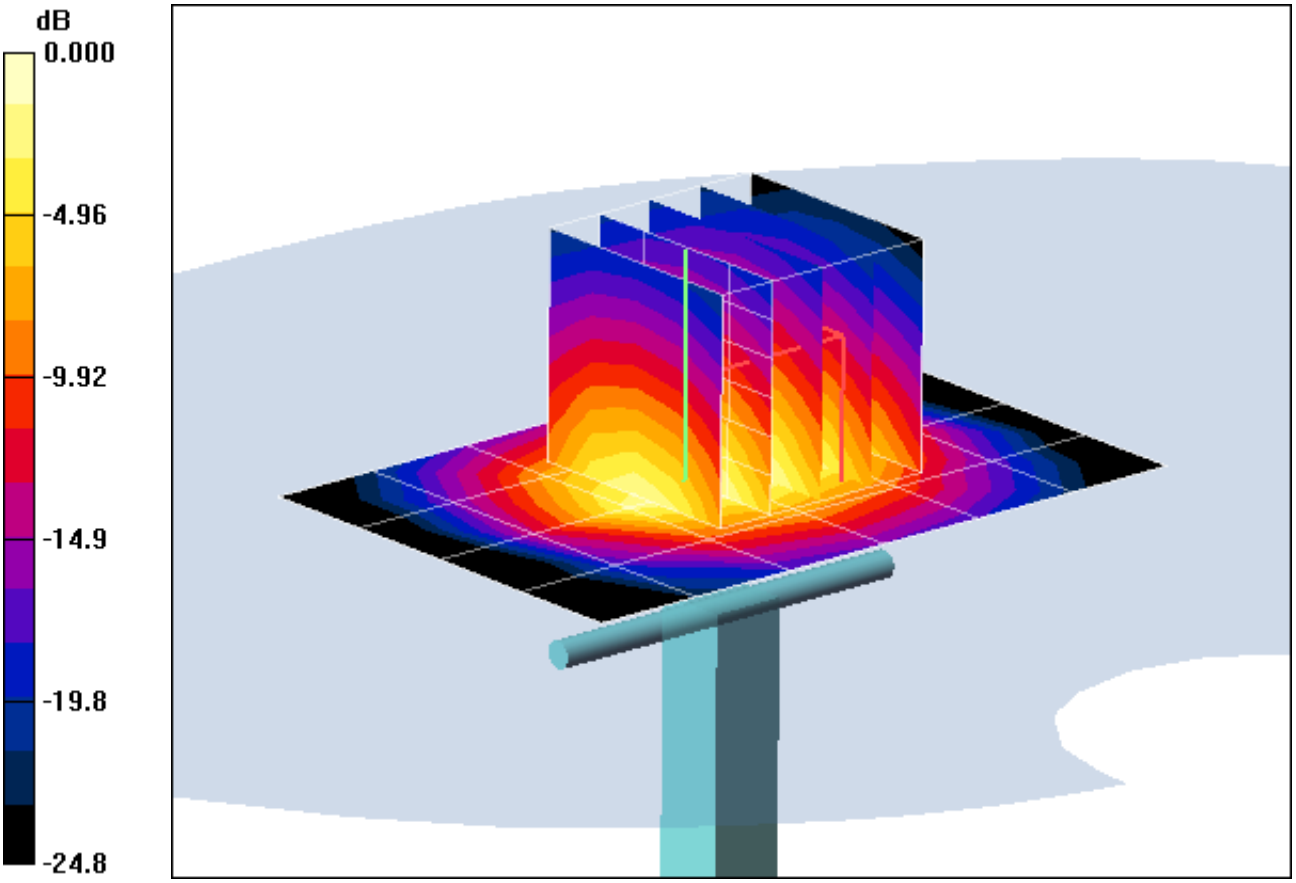
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.02 mW/g
Deviation = 2.70 %



0 dB = 2.81mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

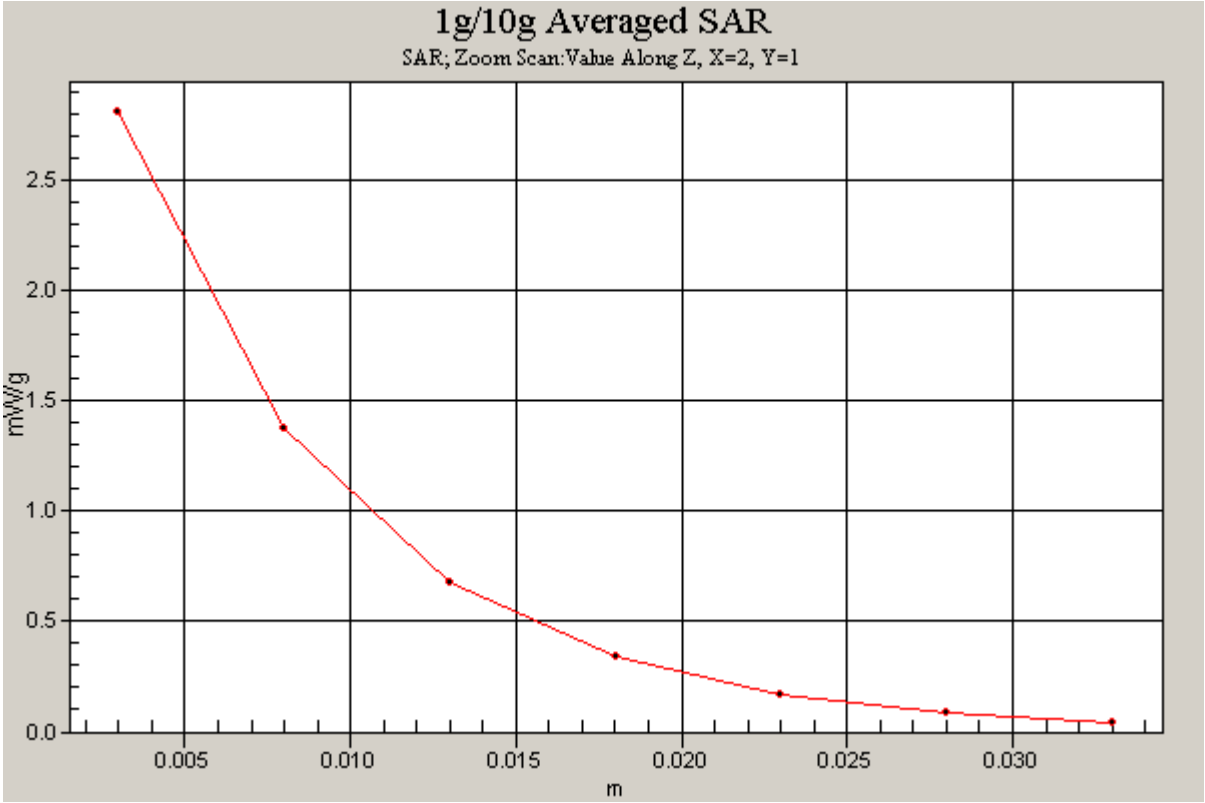
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.88 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.02 mW/g
Deviation = 2.70 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

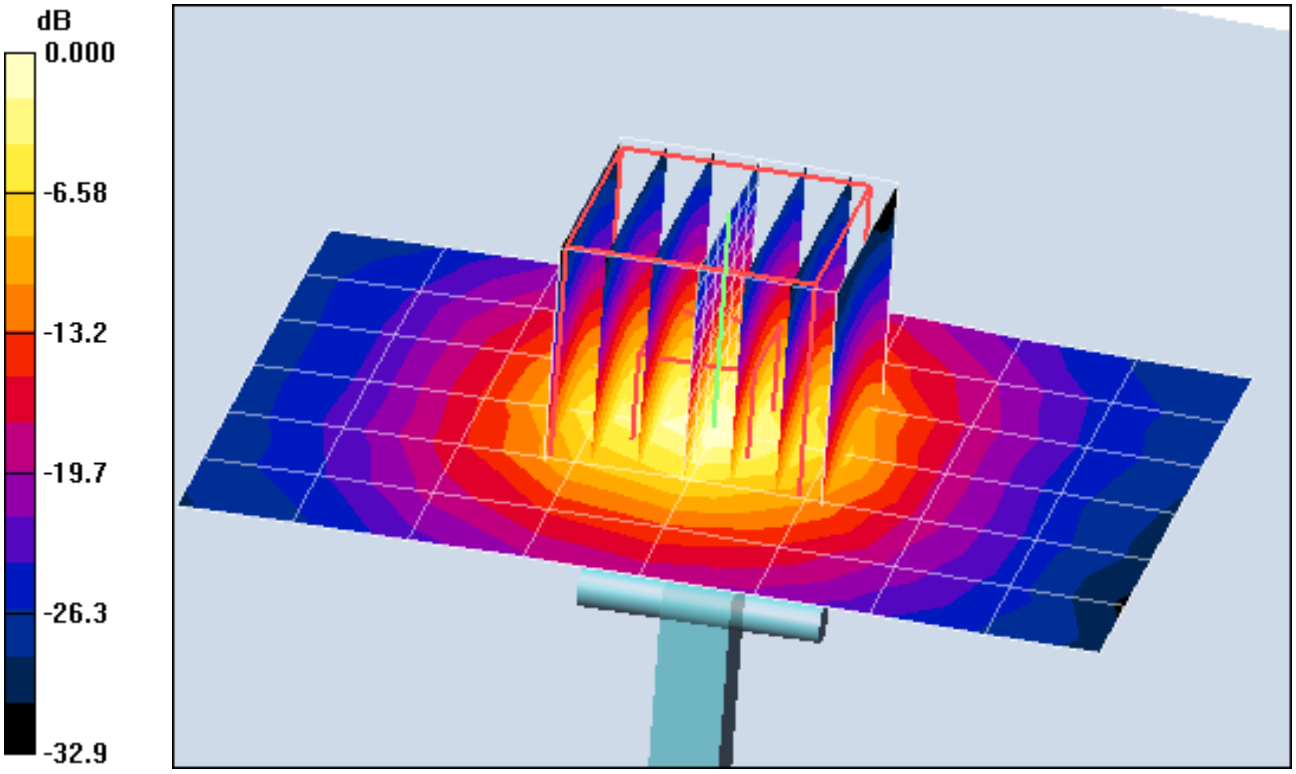
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5200 MHz; σ = 4.555 mho/m; ε_r = 35.01; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.27, 4.27, 4.27); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.52 mW/g; SAR(10 g) = 2.44 mW/g
Deviation: 6.77%



0 dB = 17.7mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

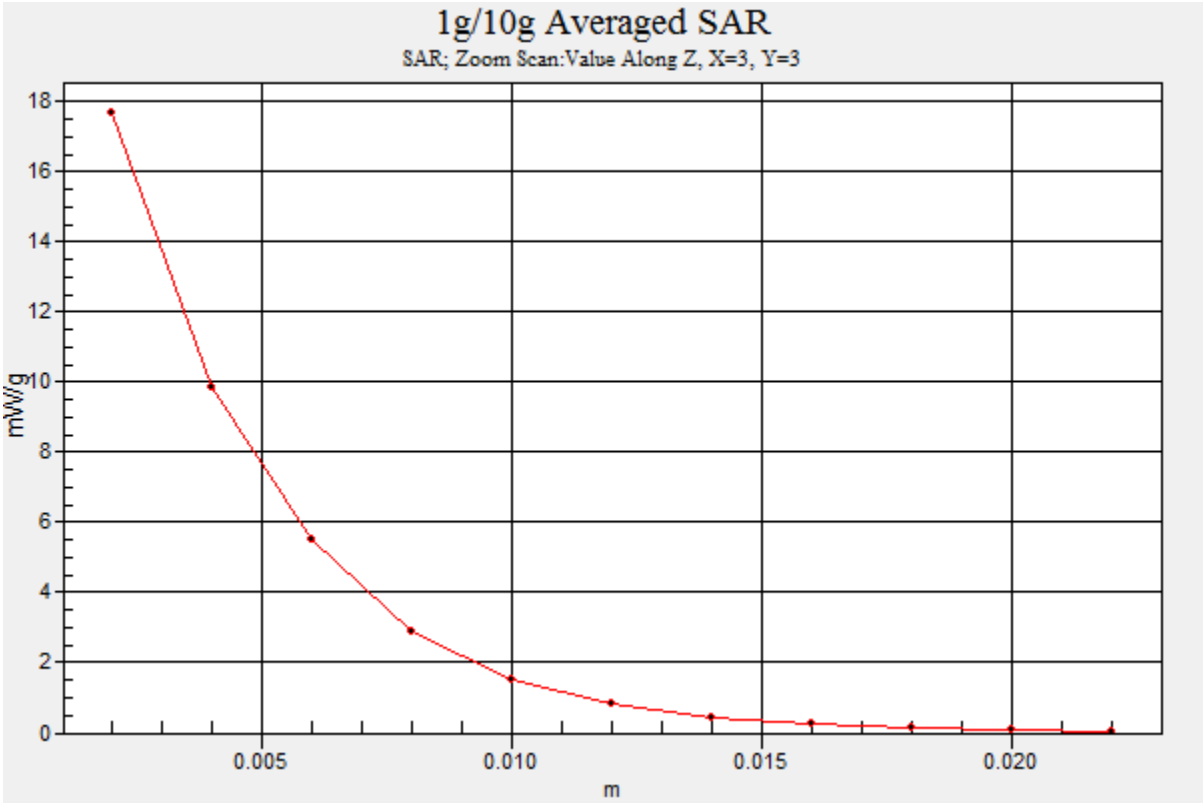
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5200 MHz; σ = 4.555 mho/m; ε_r = 35.01; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3561; ConvF(4.27, 4.27, 4.27); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.52 mW/g; SAR(10 g) = 2.44 mW/g
Deviation: 6.77%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

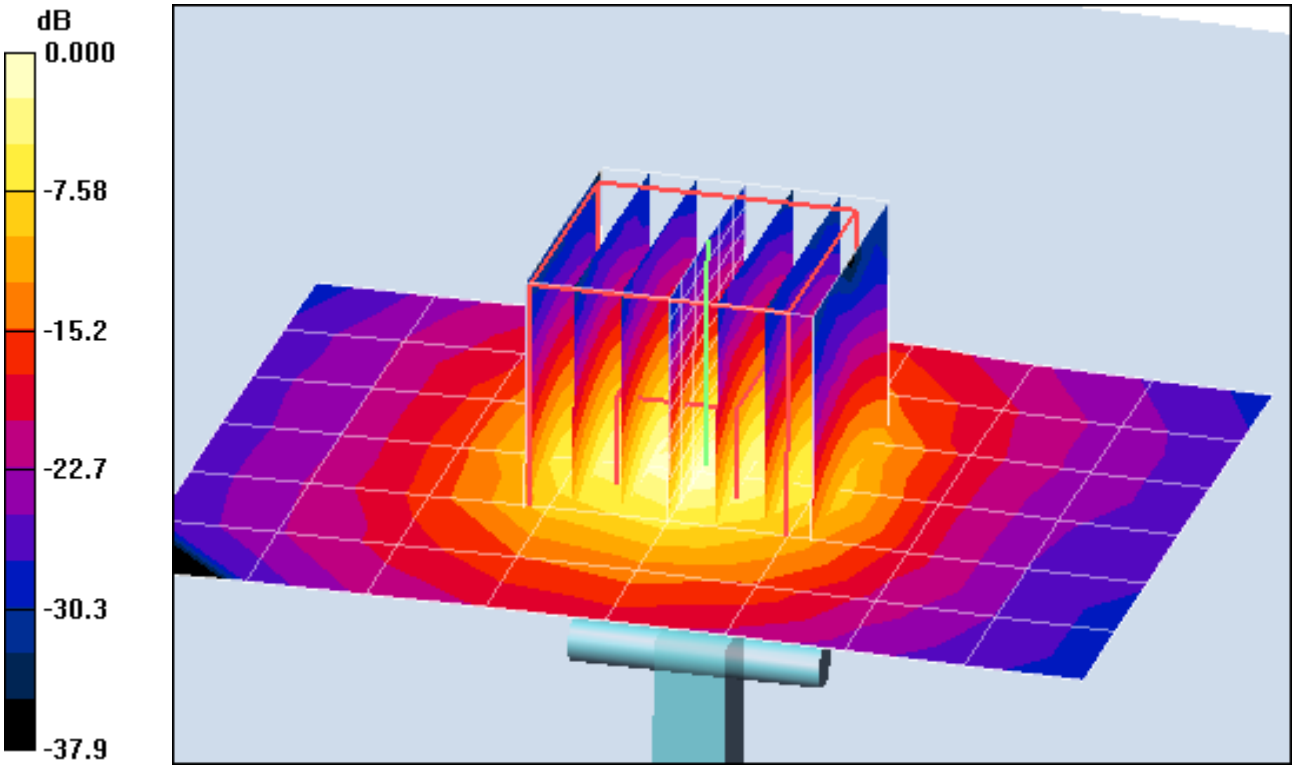
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5500 MHz; σ = 4.885 mho/m; ε_r = 34.57; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3561; ConvF(4.04, 4.04, 4.04); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.67 mW/g; SAR(10 g) = 2.43 mW/g
Deviation: 0.46%



0 dB = 17.9mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

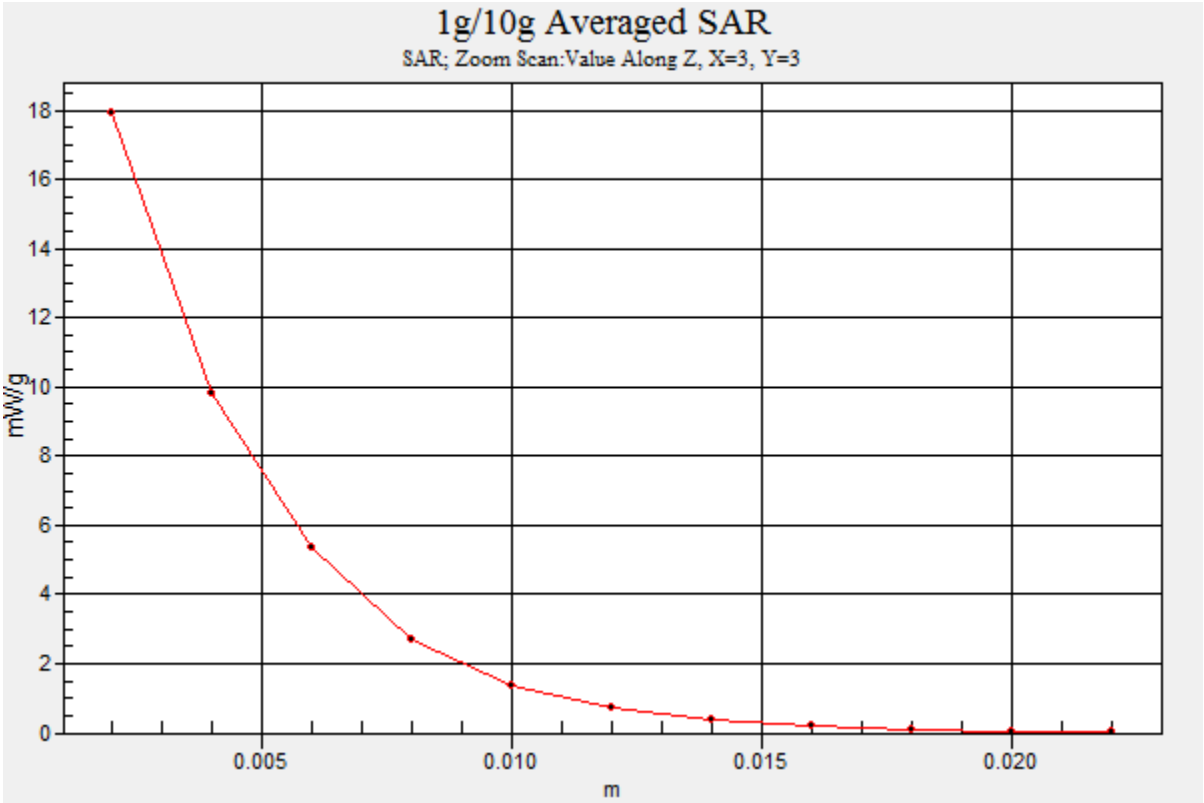
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5500 MHz; σ = 4.885 mho/m; ε_r = 34.57; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.6°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3561; ConvF(4.04, 4.04, 4.04); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.67 mW/g; SAR(10 g) = 2.43 mW/g
Deviation: 0.46%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

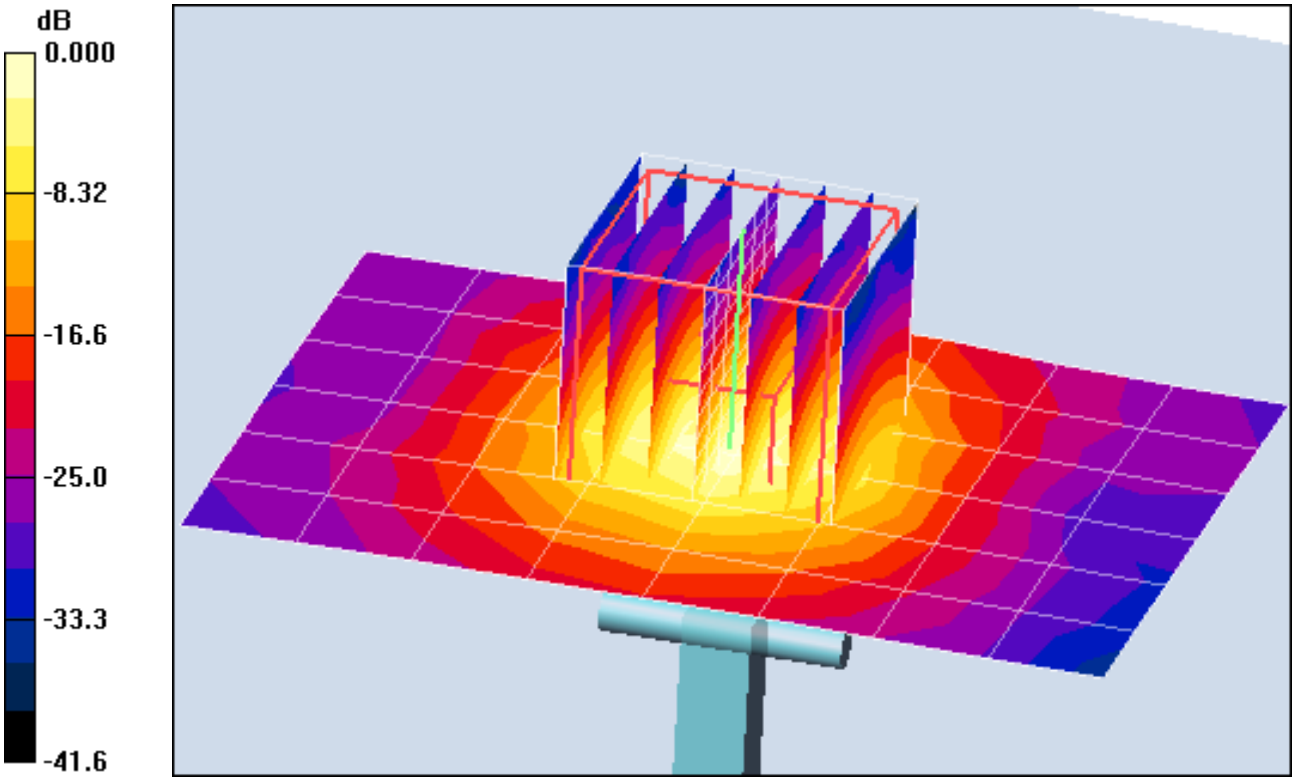
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5800 MHz; σ = 5.222 mho/m; ε_r = 34.04; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3561; ConvF(3.88, 3.88, 3.88); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.51 mW/g; SAR(10 g) = 2.37 mW/g
Deviation: 7.18%



0 dB = 18.1mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

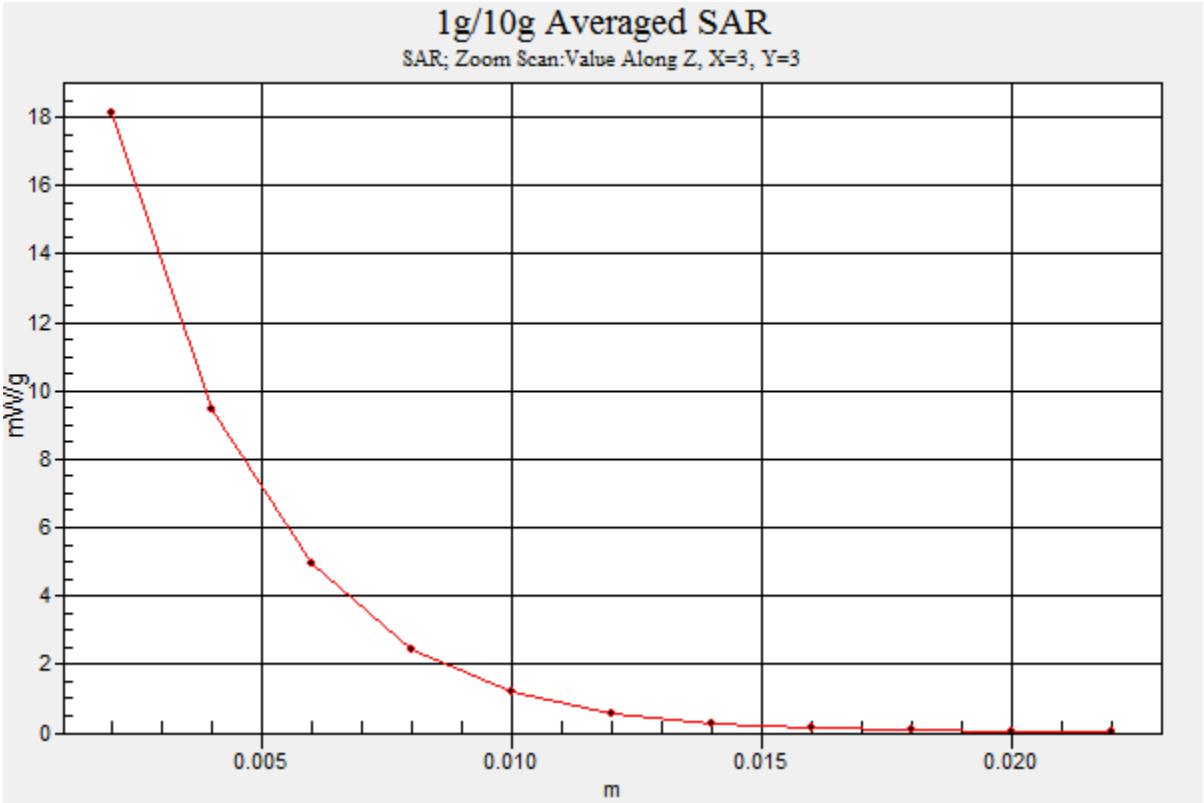
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5800 MHz; σ = 5.222 mho/m; ε_r = 34.04; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 23.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3561; ConvF(3.88, 3.88, 3.88); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.51 mW/g; SAR(10 g) = 2.37 mW/g
Deviation: 7.18%



PCTEST ENGINEERING LABORATORY, INC.

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

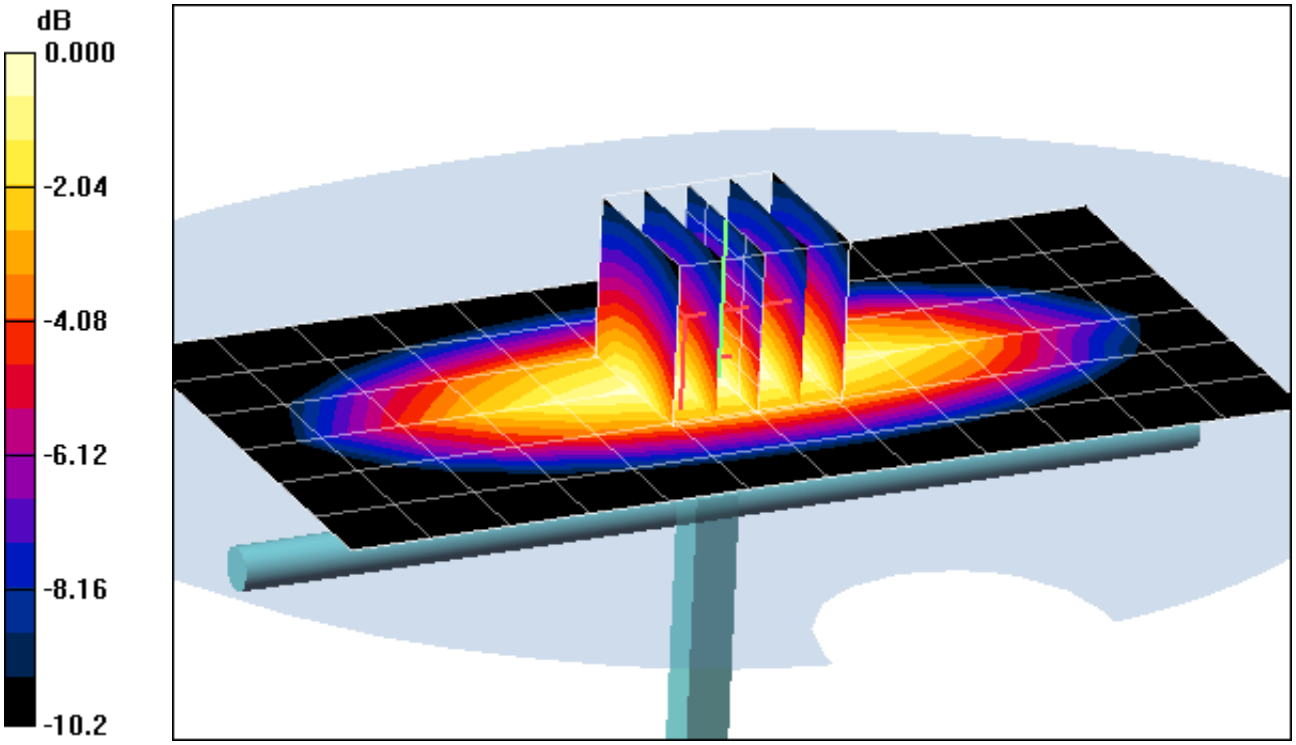
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.989 mho/m; ε_r = 58.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.887 mW/g; SAR(10 g) = 0.584 mW/g
Deviation = 0.80%



0 dB = 0.957mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

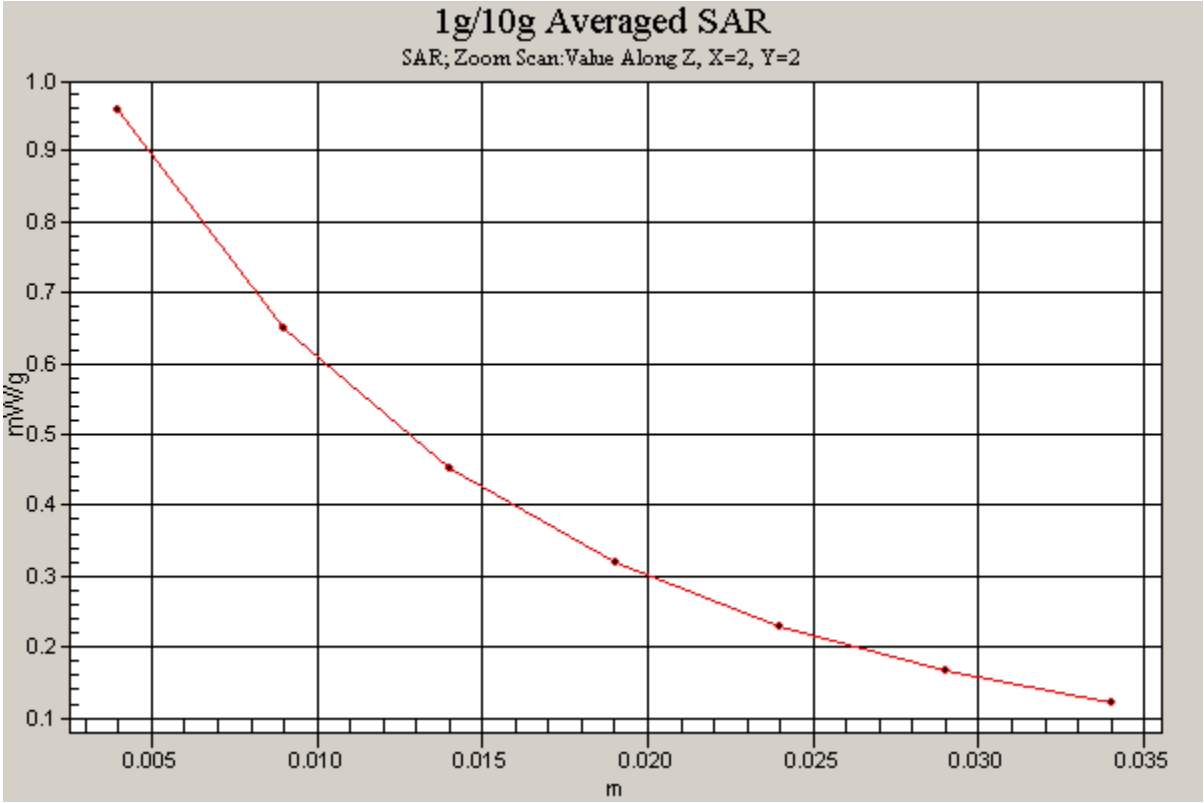
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.989 mho/m; ε_r = 58.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2012; Ambient Temp: 23.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

Area Scan (7x13x1): 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)
SAR(1 g) = 0.887 mW/g; SAR(10 g) = 0.584 mW/g
Deviation = 0.80%



PCTEST ENGINEERING LABORATORY, INC.

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

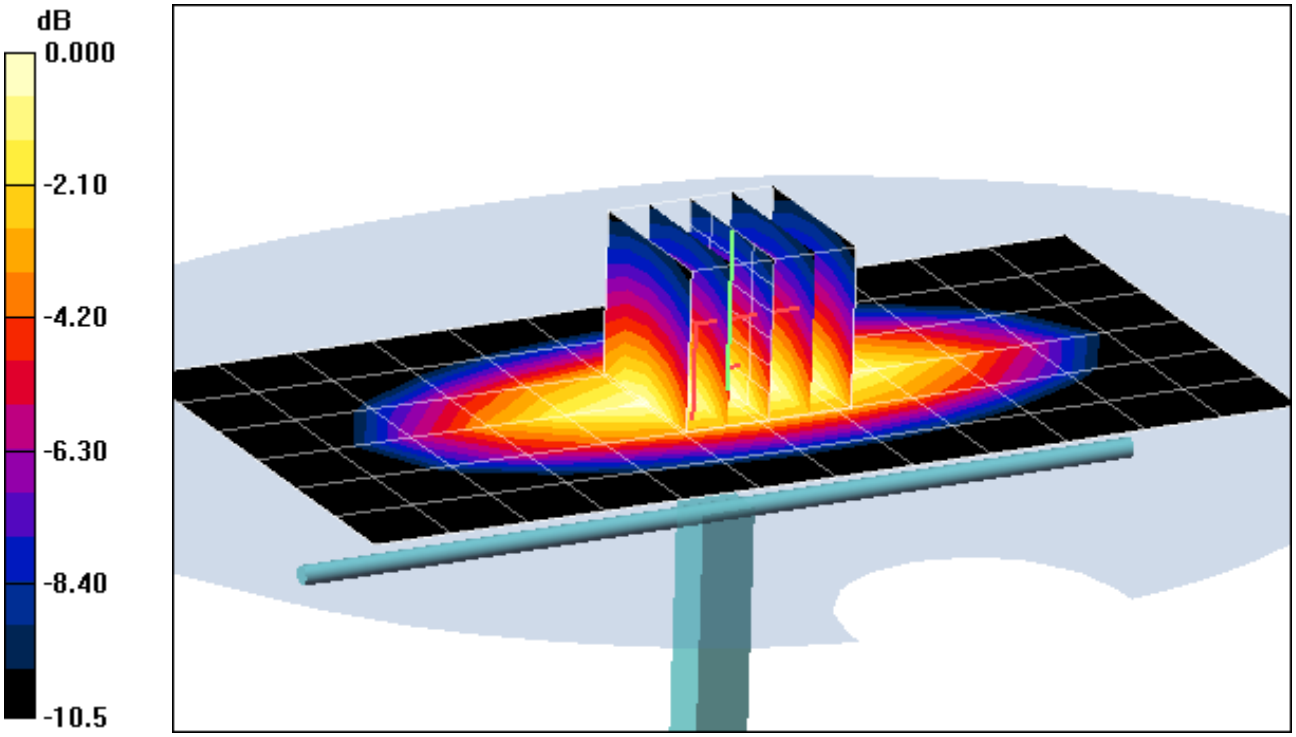
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.985 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.2 dBm (105 mW)
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.694 mW/g
Deviation = 4.82%



0 dB = 1.15mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

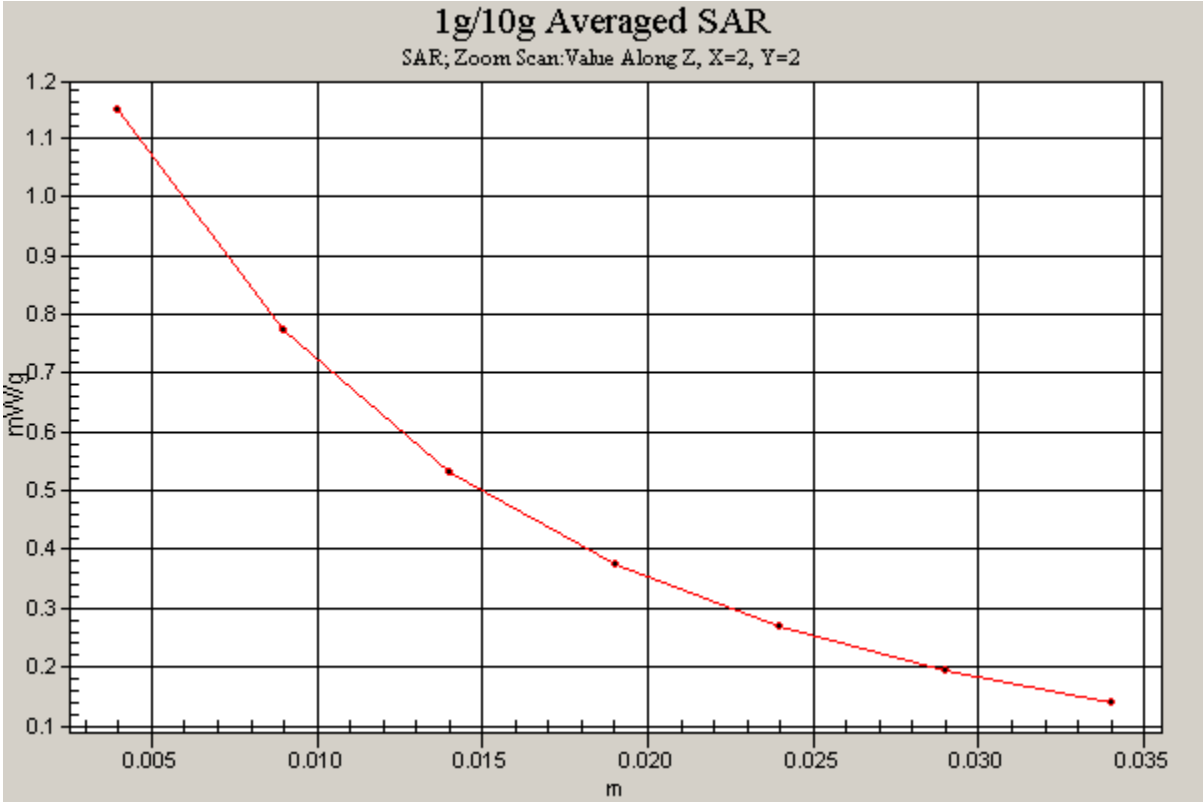
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.985 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.2 dBm (105 mW)
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.694 mW/g
Deviation = 4.82%



PCTEST ENGINEERING LABORATORY, INC.

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

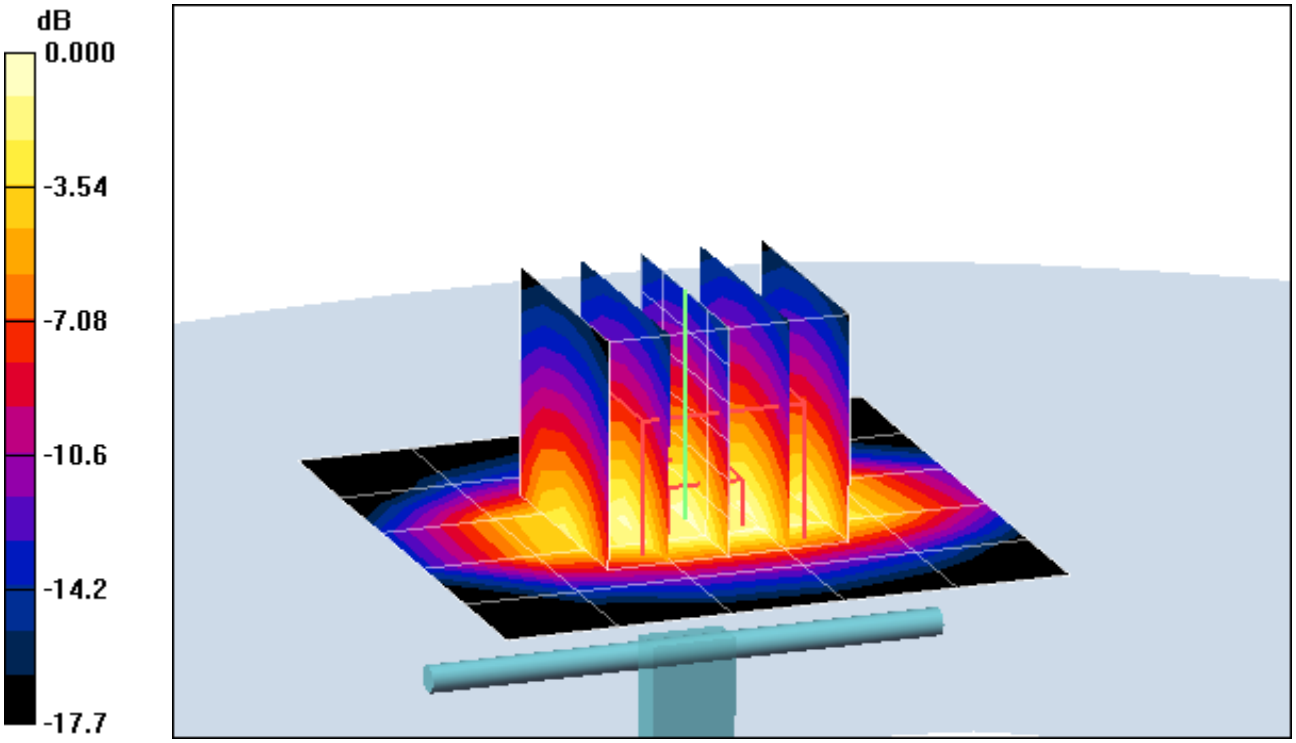
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.55 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(4.75, 4.75, 4.75); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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)
SAR(1 g) = 4.05 mW/g; SAR(10 g) = 2.12 mW/g
Deviation = 9.46%



0 dB = 4.56mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

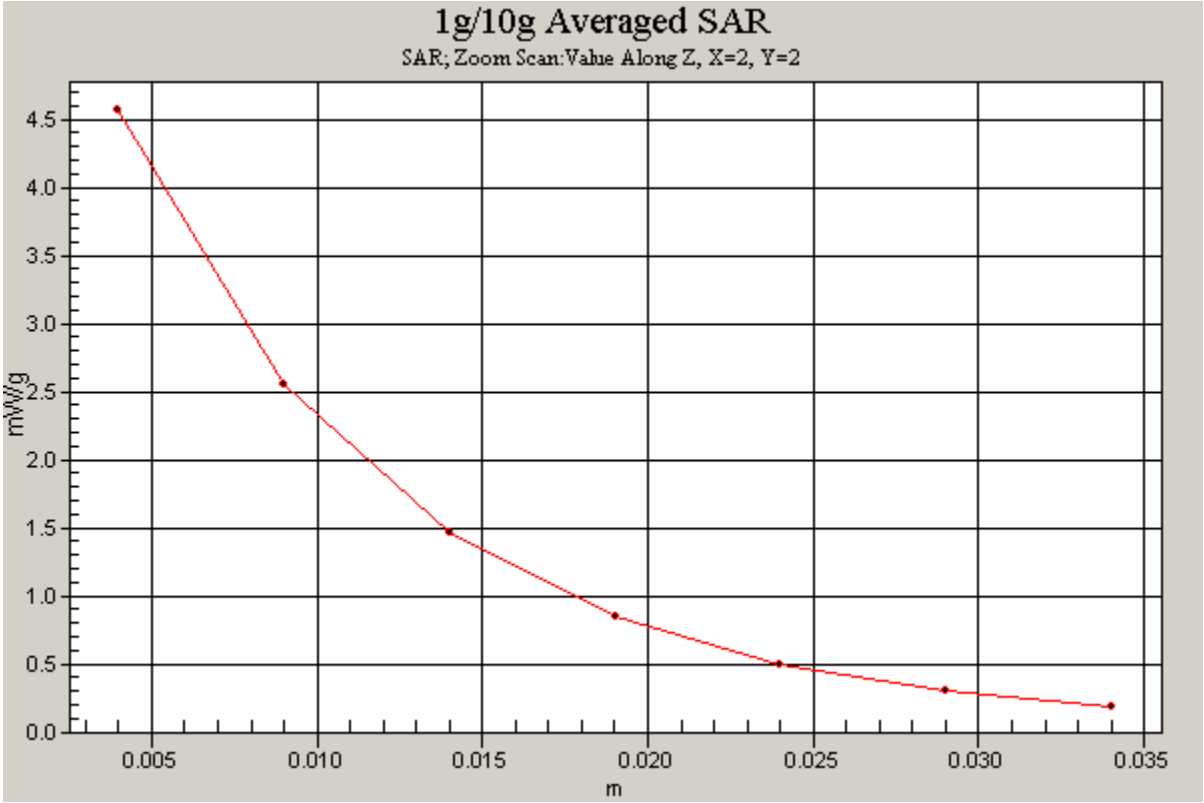
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.55 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(4.75, 4.75, 4.75); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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)
SAR(1 g) = 4.05 mW/g; SAR(10 g) = 2.12 mW/g
Deviation = 9.46%



PCTEST ENGINEERING LABORATORY, INC.

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

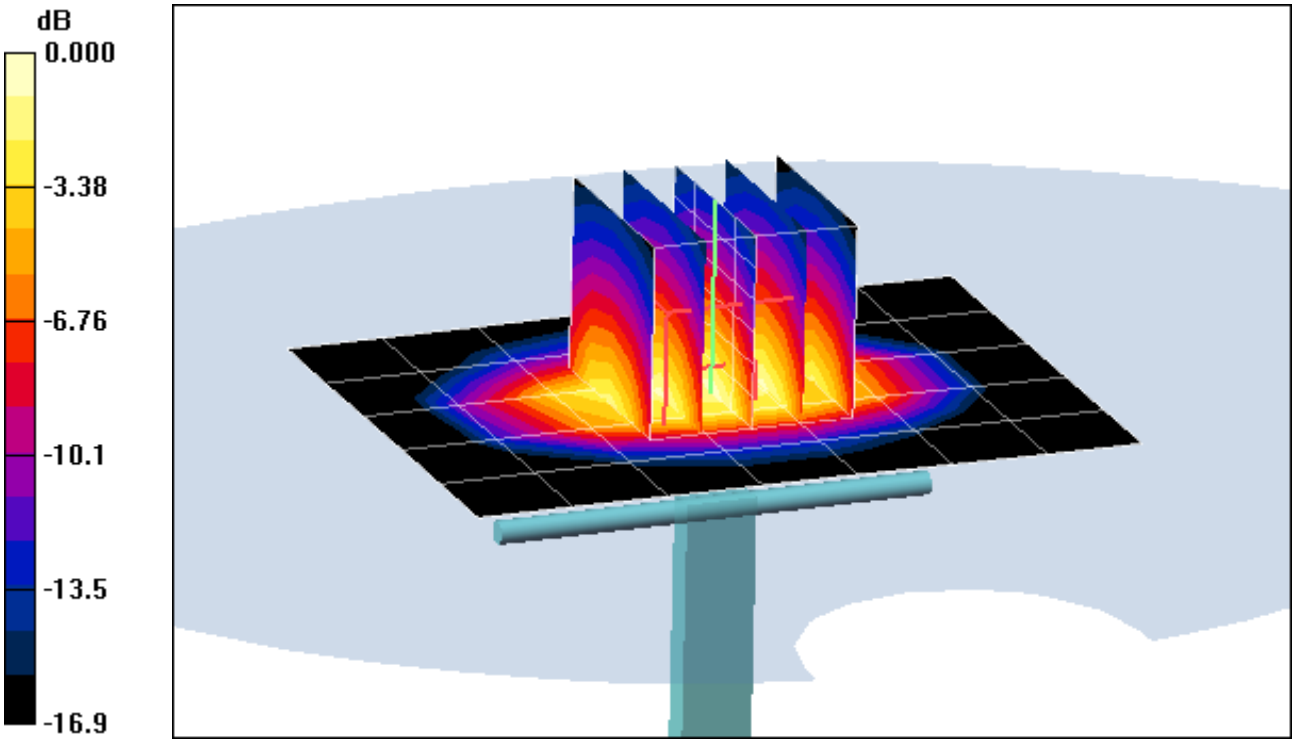
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.47 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 21.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16 dBm (40 mW)
SAR(1 g) = 1.44 mW/g; SAR(10 g) = 0.750 mW/g
Deviation = -2.70%



0 dB = 1.62mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

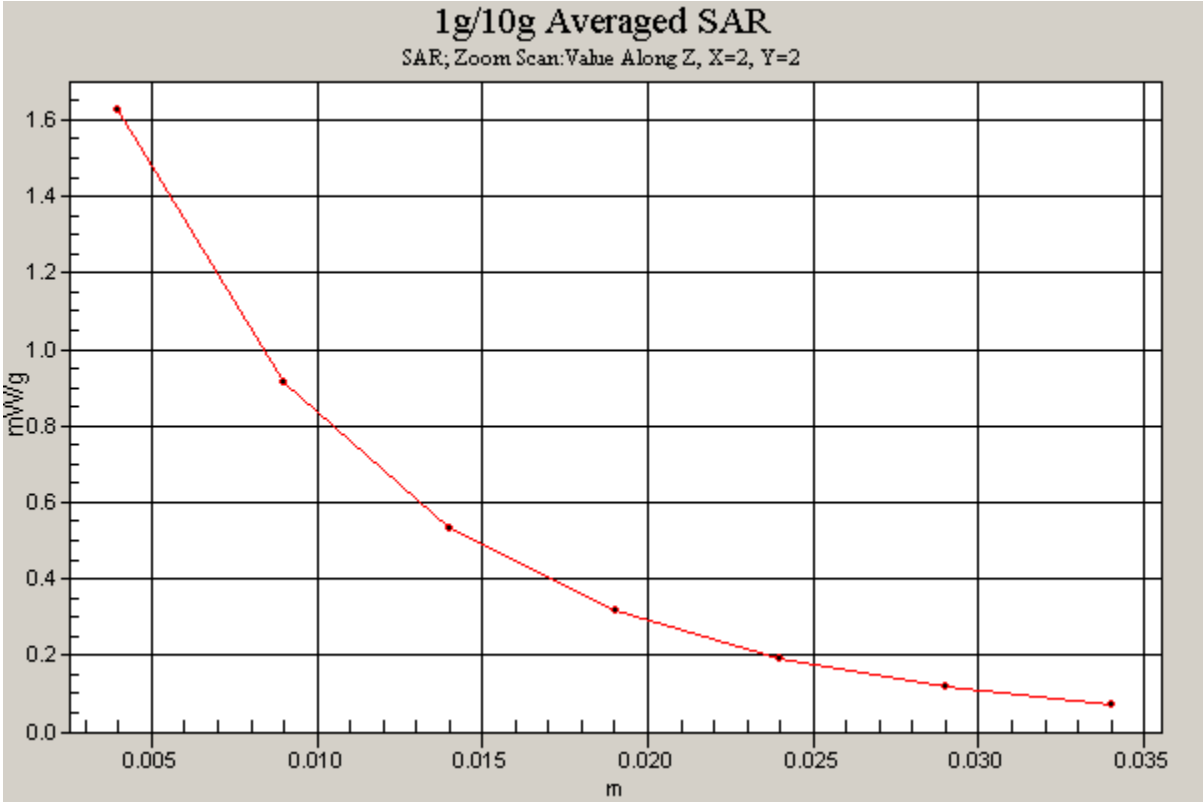
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.47 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 21.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16 dBm (40 mW)
SAR(1 g) = 1.44 mW/g; SAR(10 g) = 0.750 mW/g
Deviation = -2.70%



DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

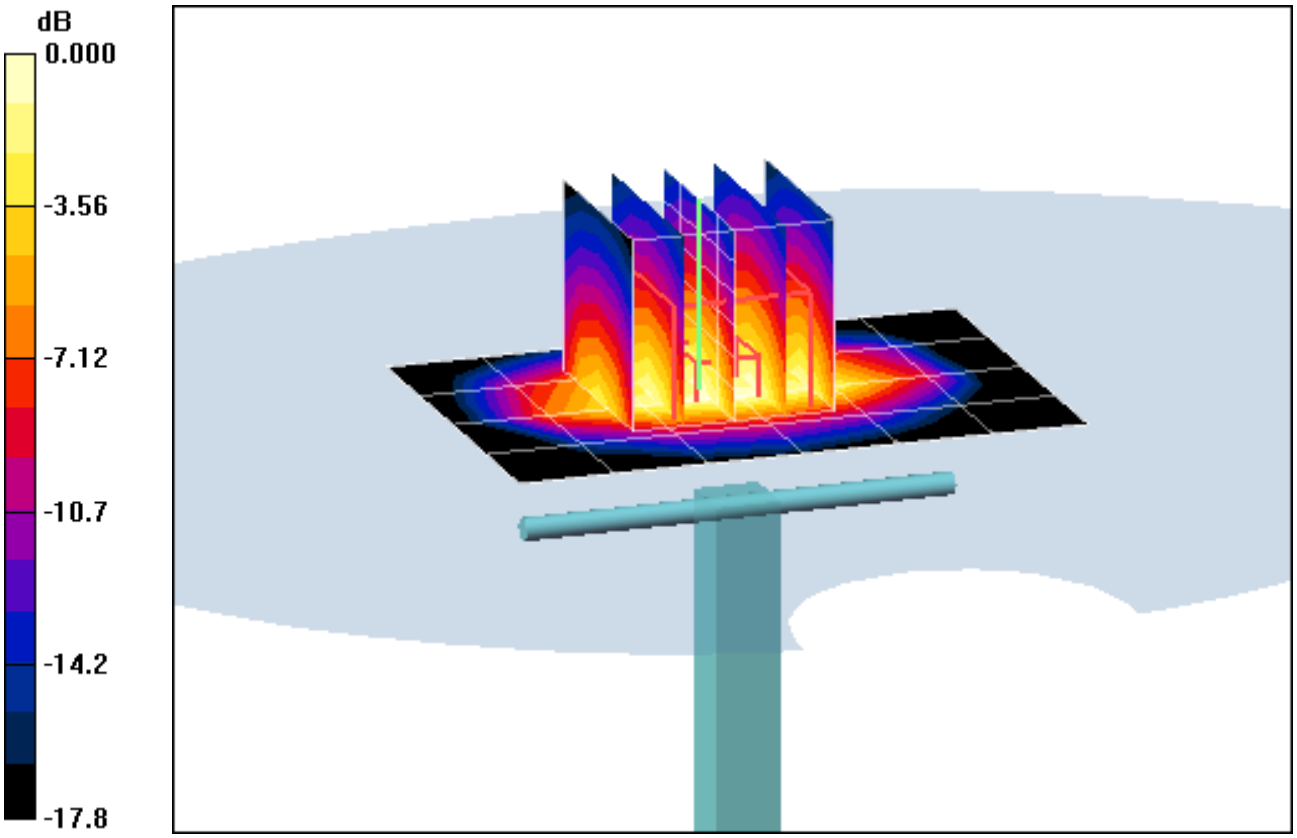
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): 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)
SAR(1 g) = 4.28 mW/g; SAR(10 g) = 2.25 mW/g
Deviation = 4.14 %



0 dB = 4.79mW/g

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502

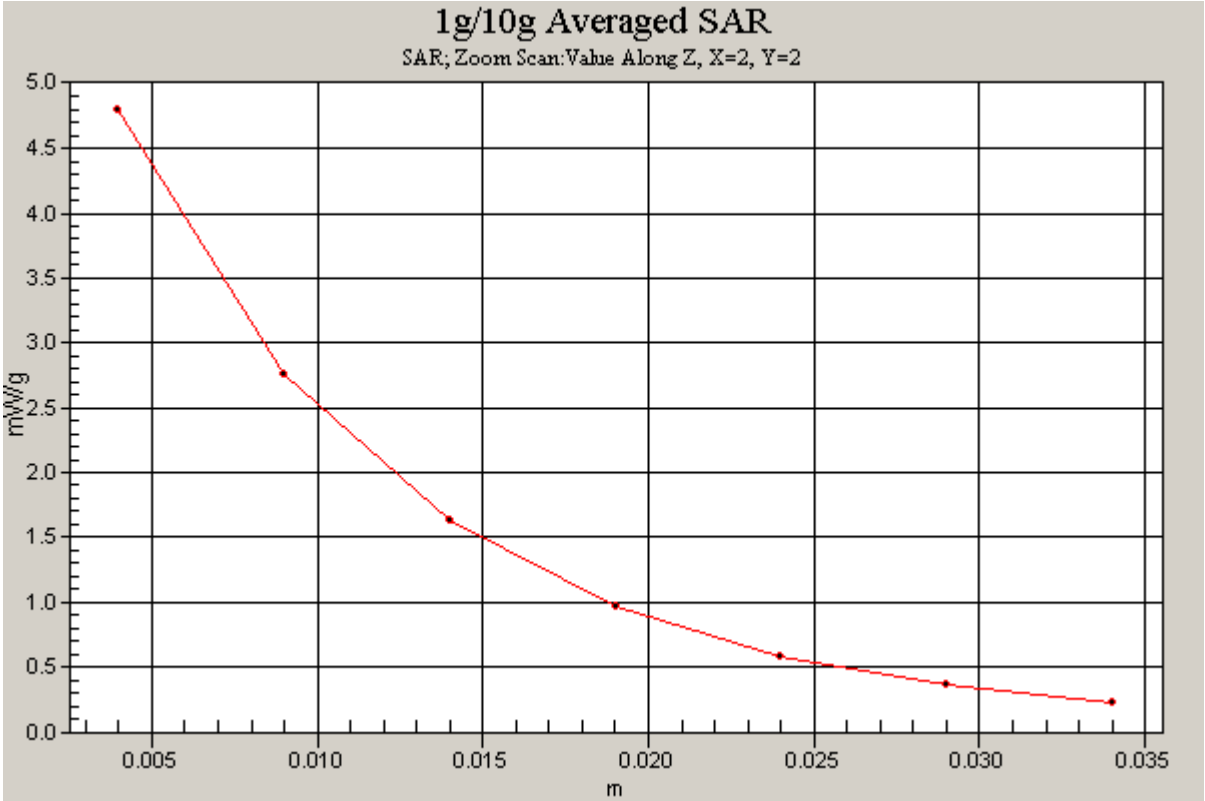
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2012; Ambient Temp: 21.9°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): 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)
SAR(1 g) = 4.28 mW/g; SAR(10 g) = 2.25 mW/g
Deviation = 4.14 %



PCTEST ENGINEERING LABORATORY, INC.

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

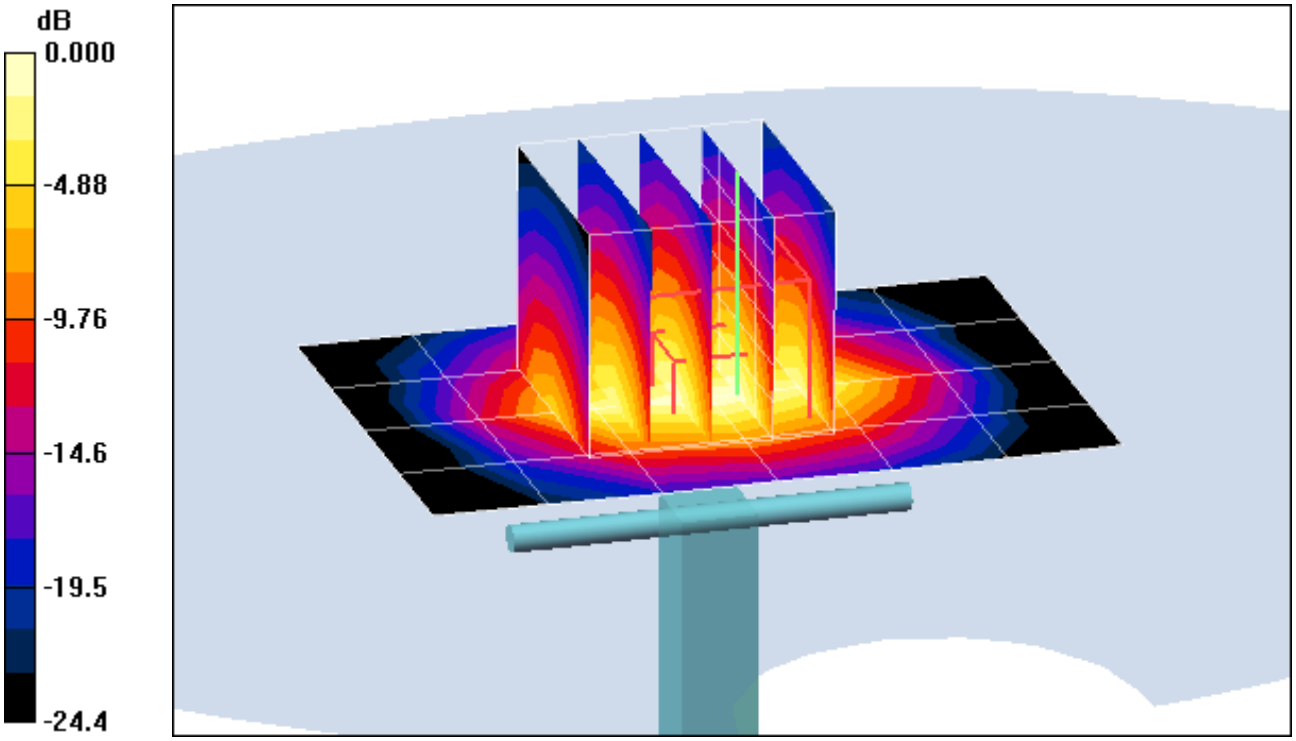
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.04 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.2°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16 dBm (40 mW)
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 0.989 mW/g
Deviation = 7.21%



0 dB = 2.84mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

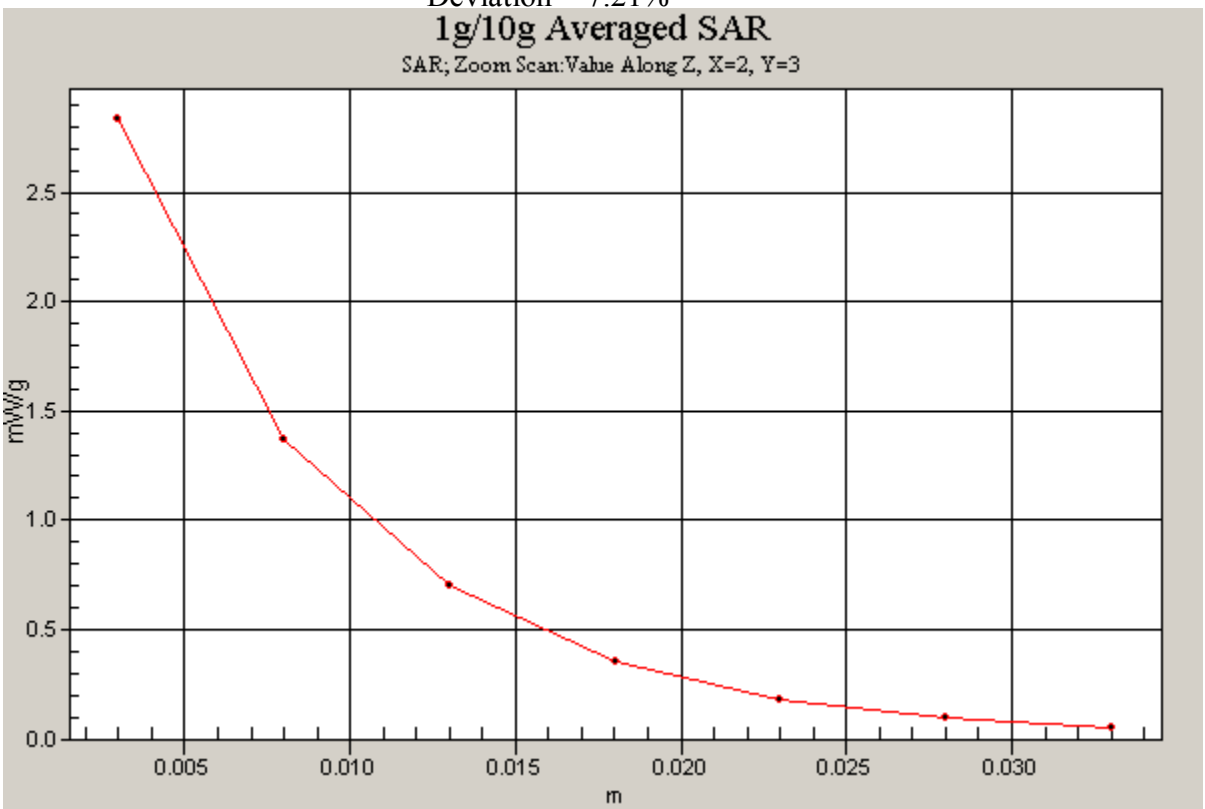
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.04 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2012; Ambient Temp: 22.2°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16 dBm (40 mW)
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 0.989 mW/g
Deviation = 7.21%



PCTEST ENGINEERING LABORATORY, INC.

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

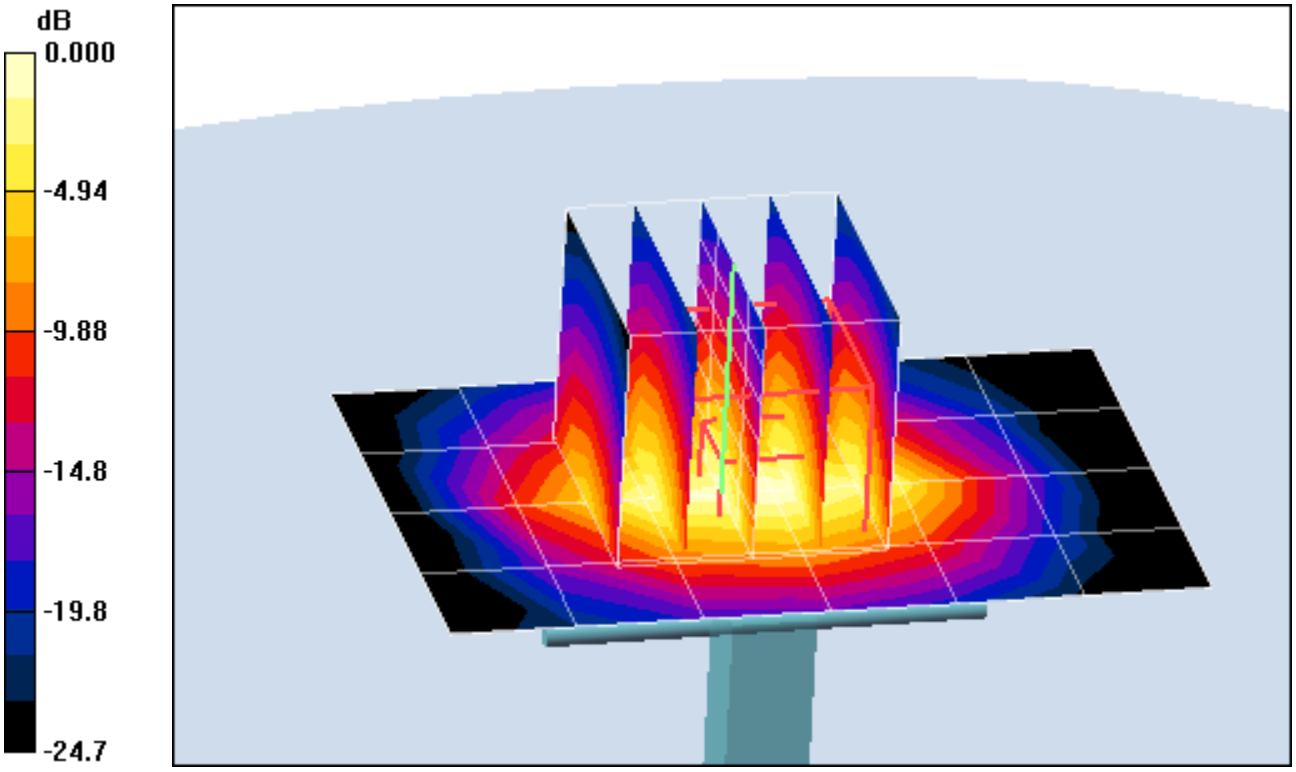
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.01 mho/m; ε_r = 50.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2012; Ambient Temp: 24.8°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 16.0 dBm (40 mW)
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 0.980 mW/g
Deviation: 6.73%



0 dB = 2.85mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

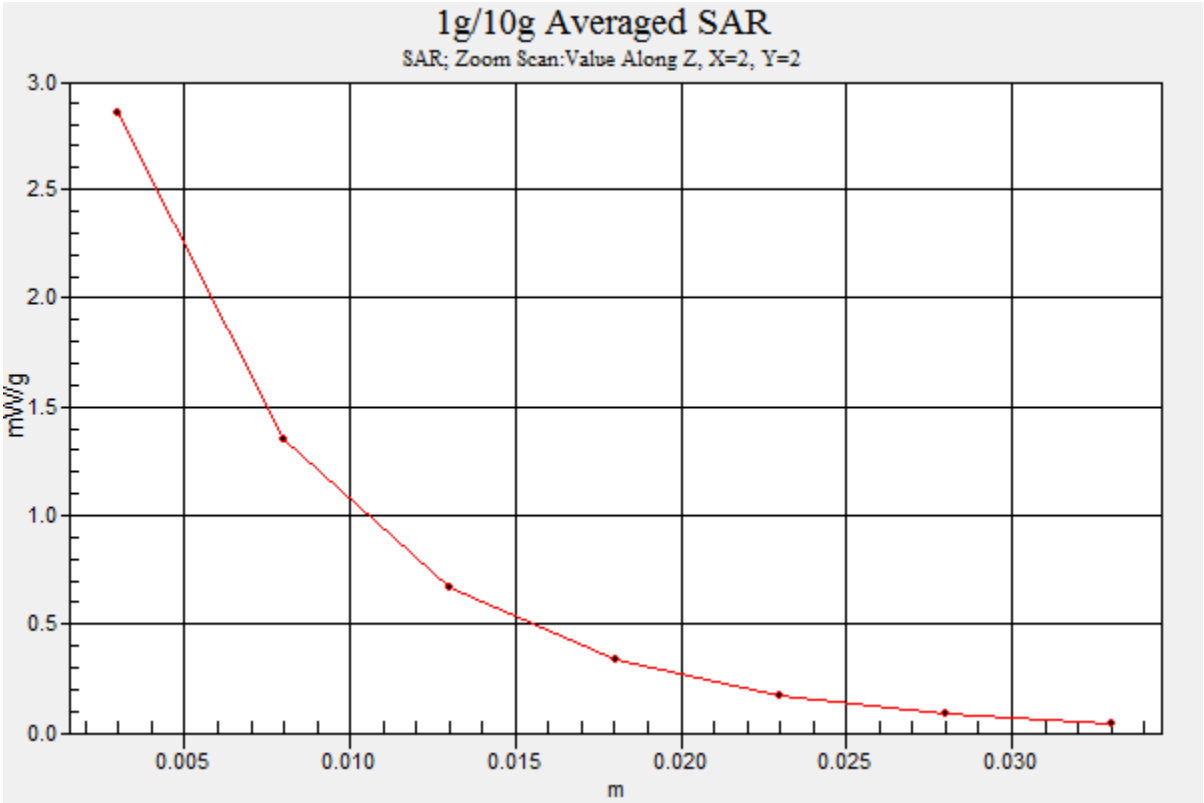
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.01 mho/m; ε_r = 50.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2012; Ambient Temp: 24.8°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(4.34, 4.34, 4.34); Calibrated: 4/8/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 16.0 dBm (40 mW)
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 0.980 mW/g
Deviation: 6.73%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

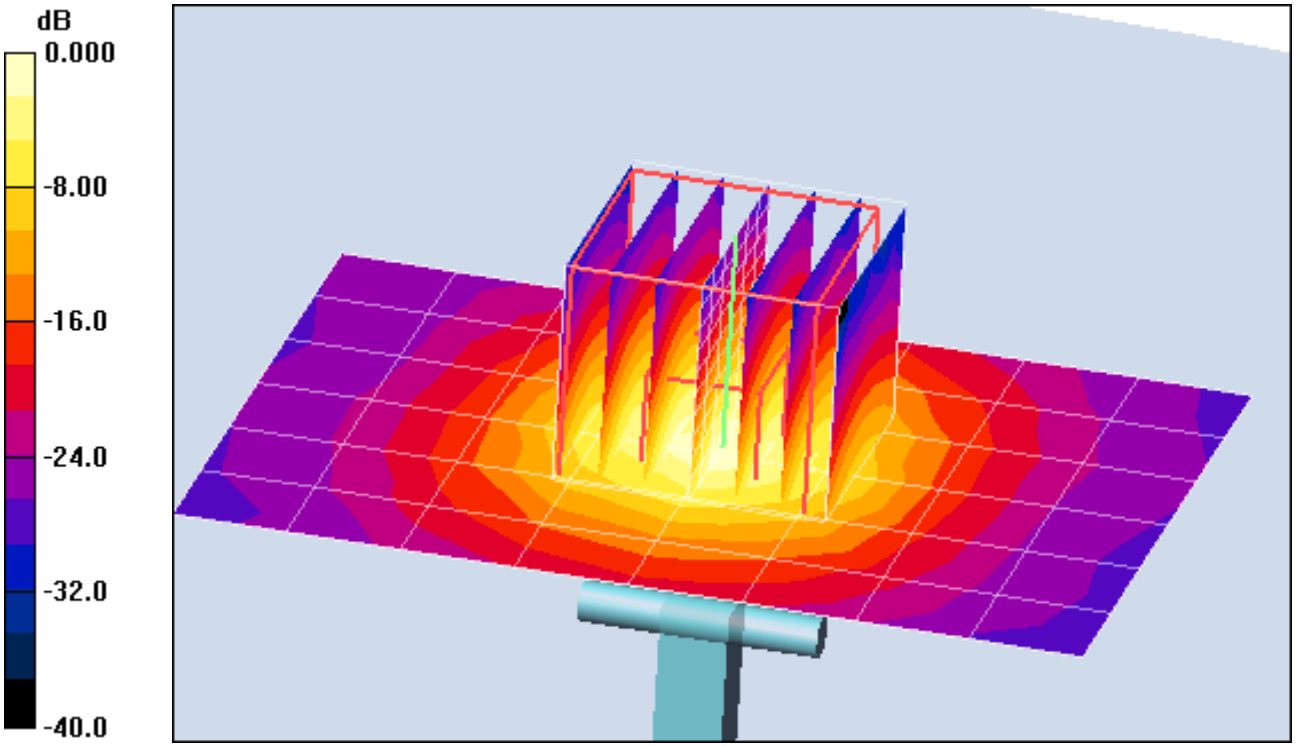
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.347 mho/m; ε_r = 47.71; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3561; ConvF(3.7, 3.7, 3.7); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.18 mW/g
Deviation: 4.64%



0 dB = 16.5mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

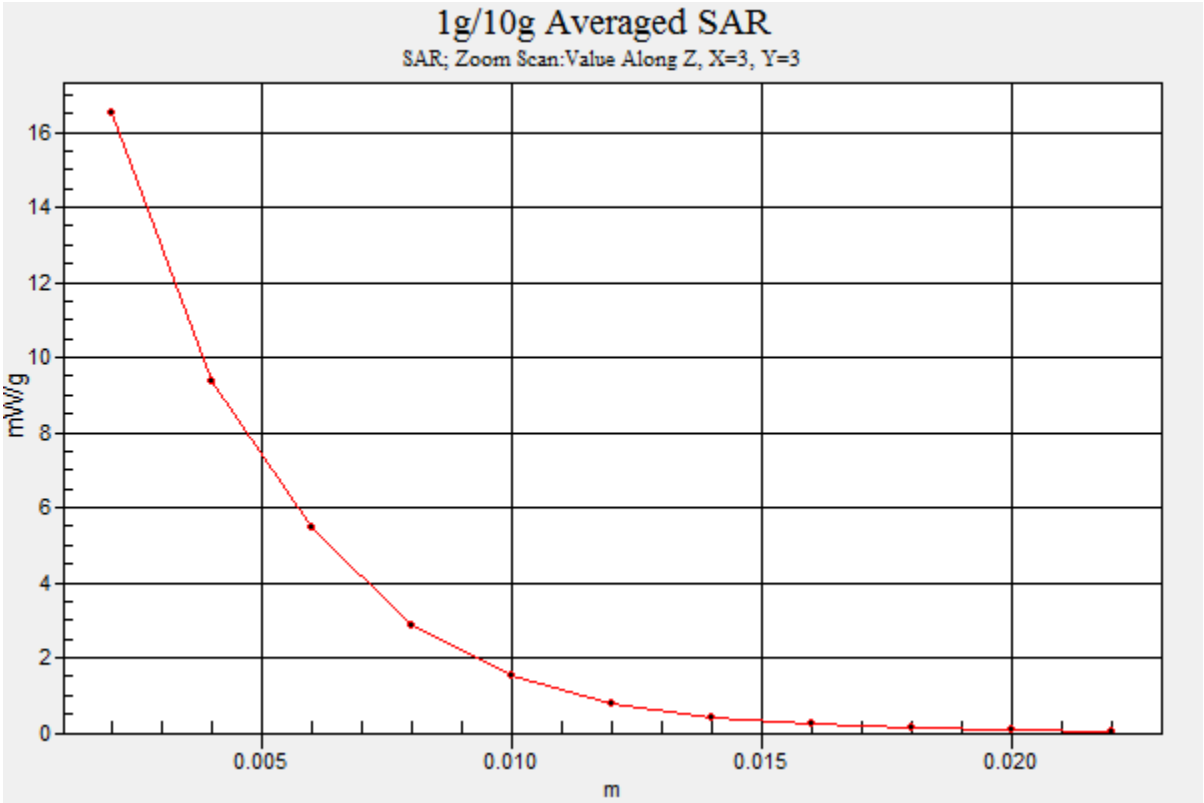
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.347 mho/m; ε_r = 47.71; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3561; ConvF(3.7, 3.7, 3.7); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.18 mW/g
Deviation: 4.64%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

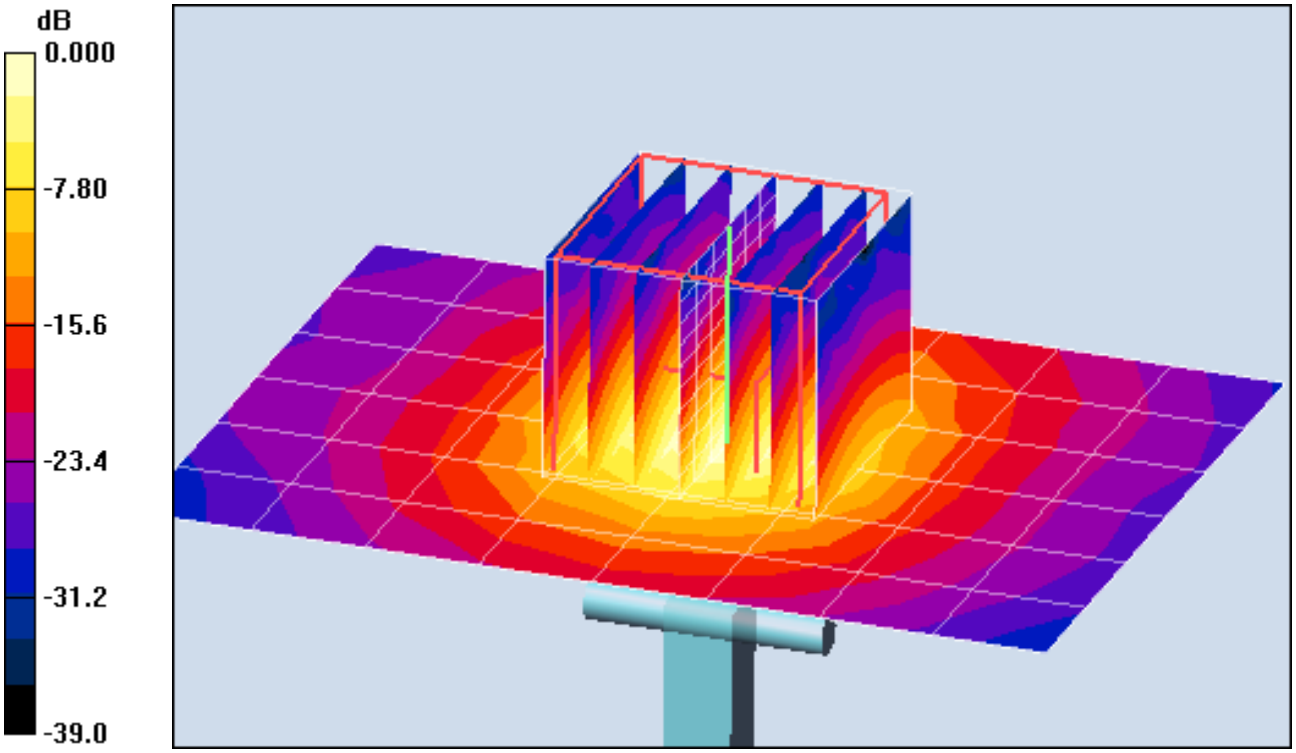
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.771 mho/m; ε_r = 46.64; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN3561; ConvF(3.28, 3.28, 3.28); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.21 mW/g; SAR(10 g) = 2.27 mW/g
Deviation: 0.98%



0 dB = 16.9mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

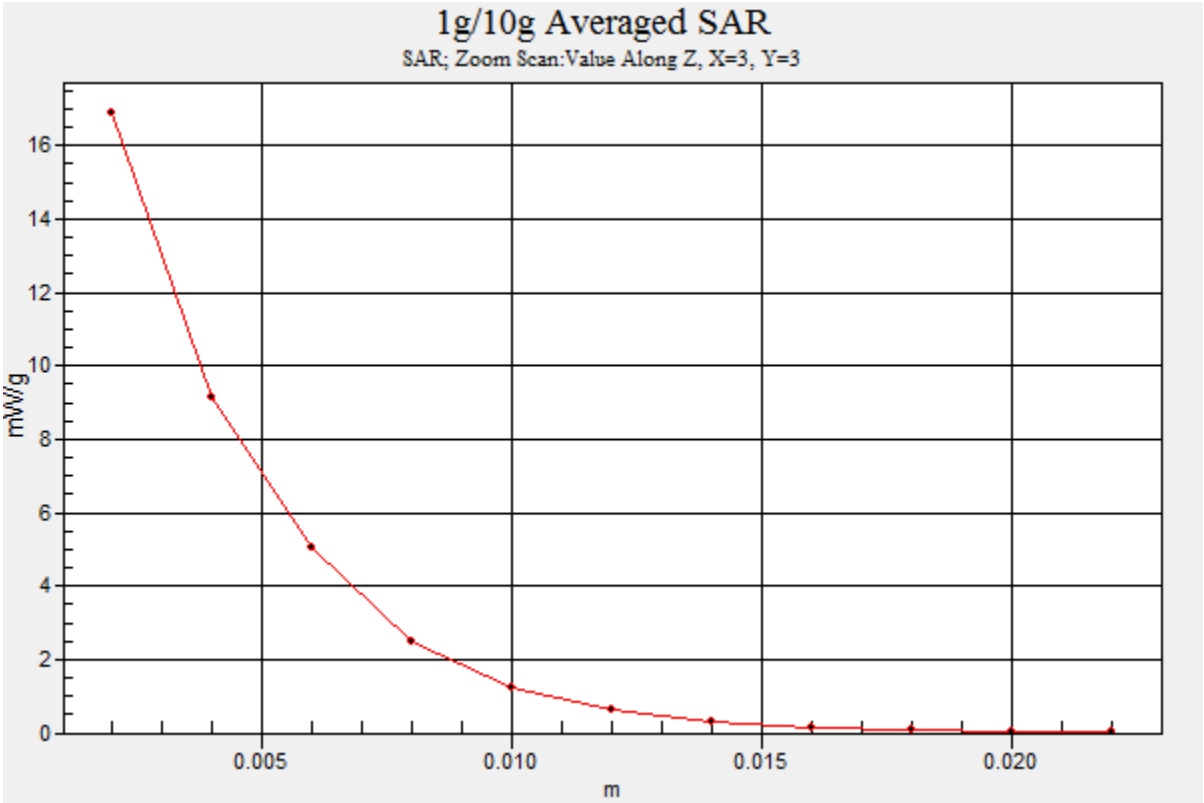
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.771 mho/m; ε_r = 46.64; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN3561; ConvF(3.28, 3.28, 3.28); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 8.21 mW/g; SAR(10 g) = 2.27 mW/g
Deviation: 0.98%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

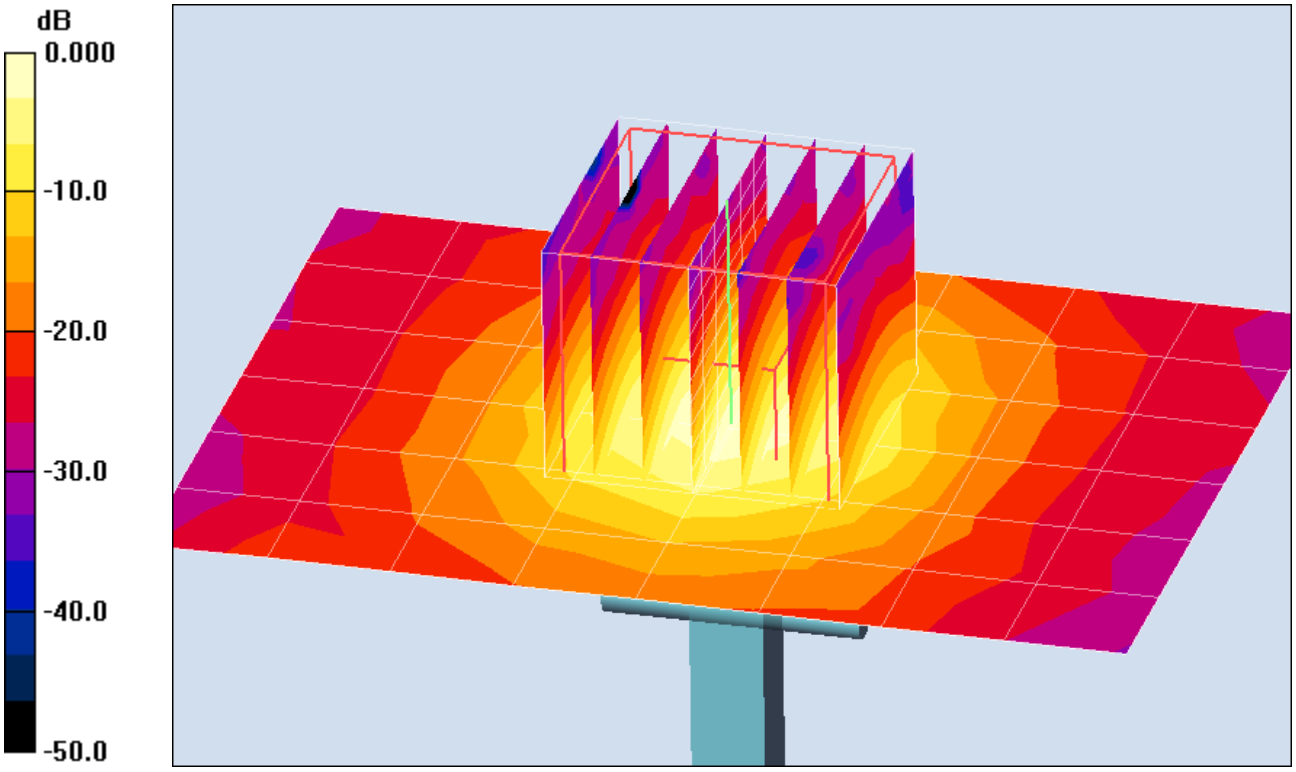
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.257 mho/m; ε_r = 45.96; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(3.34, 3.34, 3.34); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 7.72 mW/g; SAR(10 g) = 2.1 mW/g
Deviation: 2.52%



0 dB = 16.3mW/g

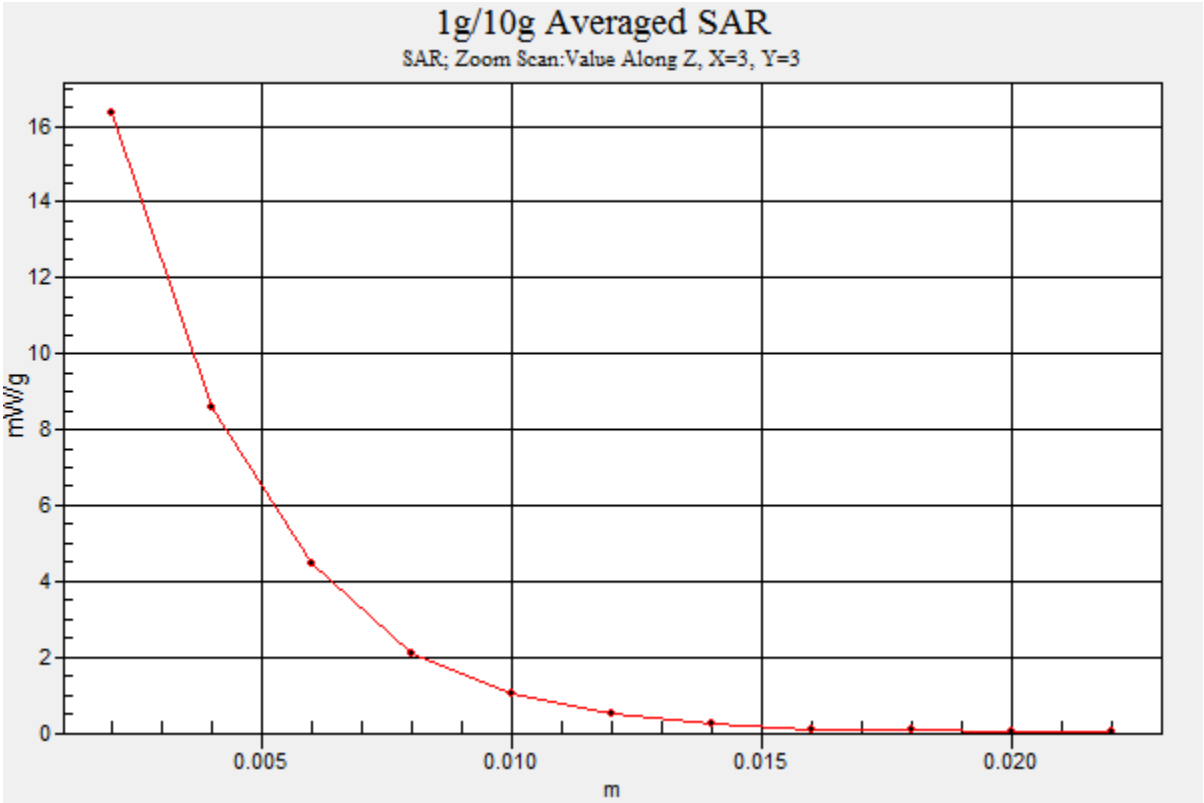
PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.257 mho/m; ε_r = 45.96; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-26-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(3.34, 3.34, 3.34); Calibrated: 7/27/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power: 20.0 dBm (100 mW)
SAR(1 g) = 7.72 mW/g; SAR(10 g) = 2.1 mW/g
Deviation: 2.52%