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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:
11/16/11 - 12/05/11
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1111161996-R4.A3L

FCC ID: **A3LSGHI717**

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

EUT Type: Portable Handset
FCC Rule Part(s): CFR §2.1093
Model(s): SGH-i717

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head	1 gm Body-Worn	1 gm Hotspot
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	33.03	0.27	0.65	0.65
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	30.00	0.12	0.75	0.75
WCDMA/HSPA 850	826.40 - 846.60 MHz	22.95	0.22	0.36	0.36
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz	22.97	0.16	1.04	1.04
LTE Band 17	706.5 - 713.5 MHz	22.54	0.15	0.30	0.30
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	23.08	0.22	0.58	0.58
2.4 GHz WLAN	2412 - 2462 MHz	14.25	0.02	0.05	0.05
5.8 GHz WLAN	5745 - 5825 MHz	12.23	0.07	0.09	
5.2 GHz WLAN	5180 - 5240 MHz	12.06	0.14	0.39	
5.3 GHz WLAN	5260 - 5320 MHz	12.20	0.10	0.36	
5.5 GHz WLAN	5500 - 5700 MHz	11.97	0.06	0.08	
Bluetooth	2402 - 2480 MHz	10.32	N/A		
Simultaneous SAR per KDB 690783 D01:			0.41	1.43	1.09

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.

Note: This revised Test Report (S/N: 0Y1111161996-R4.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.

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.

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
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz
WCDMA/HSPA 850	826.40 - 846.60 MHz
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz
LTE Band 17	706.5 - 713.5 MHz
LTE AWS	1712.5 - 1752.5 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 EUT has NFC operations. The NFC antenna is integrated into the standard battery cover and will be the only battery cover available from the manufacturer for this model. Therefore all SAR tests were performed with the standard cover which already integrates the NFC antenna.

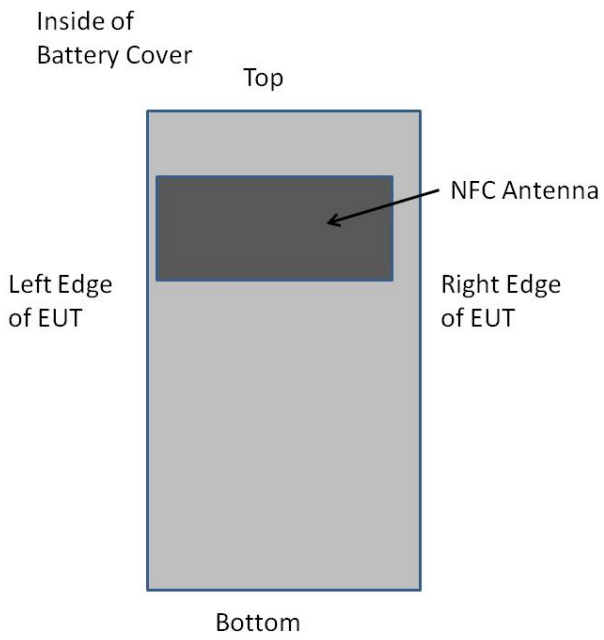

Figure 1-1
NFC Antenna Location on the Battery Cover

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1.3 EUT Antenna Locations

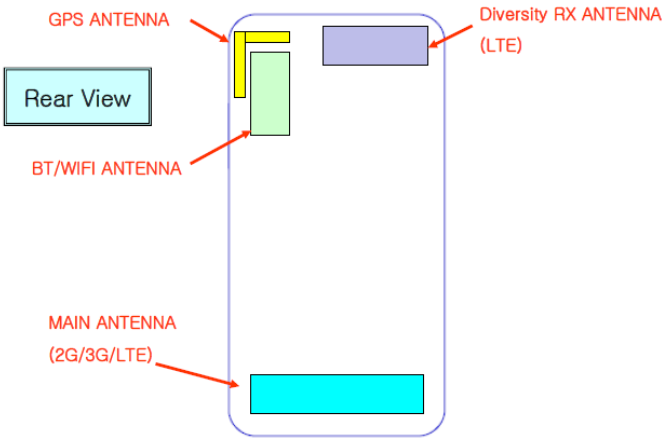

Figure 1-2
EUT Antenna Locations

1.4 Simultaneous Transmission Capabilities

Simultaneous transmissions according to KDB 648474, except for transmissions during network hand-offs, with maximum hand-off duration less than 30 seconds, transmitters are considered to be transmitting simultaneously when there is overlapping transmission.

Figure 1-3
Simultaneous Transmission Paths

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

No.	Capable Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Note
		IEEE 1528, Supp C	Supp C	FCC KDB 941225 D06 edges/sides	
1	GSM 850/1900 MHz Voice + WiFi 2.4GHz	Yes	10mm	-	-
2	850/1900 WCDMA/HSPA Voice/Data + WiFi 2.4GHz	Yes	10mm	Yes	3G Hotspot**
3	850/1900 MHz GPRS/EDGE Data + WIFI 2.4 GHz	-	-	Yes	2G Hotspot
4	700/1750 MHz Band17/4 LTE Data + WIFI 2.4 GHz	Yes*	Yes*	Yes	4G Hotspot
5	GSM 850/1900 MHz Voice + WiFi 5GHz	Yes	10mm	-	5GHz Client only
6	850/1900 MHz WCDMA Voice + WIFI 5 GHz	Yes	10mm	-	5GHz Client only
7	850/1900 MHz GPRS/EDGE Data + WiFi 5GHz	-	-	-	Blocked by Chipset F/W
8	850/1700/1900 MHz WCDMA/HSPA Data + WIFI 5 GHz	-	-	-	Blocked by Chipset F/W
9	700/1750 MHz Band17/4 LTE Data + WIFI 5 GHz	-	-	-	Blocked by Chipset F/W
10	850/1900 MHz GSM Voice + 850/1900 MHz WCDMA/HSPA Data				Not Supported by H/W
11	850/1900 MHz GPRS/EDGE Data + 850/1900 MHz WCDMA Voice				Not Supported by H/W
12	All Voice + LTE	-	-	-	Not Supported by H/W
13	All Voice + WIFI + LTE	-	-	-	Not Supported by H/W

(*) = for VoIP 3rd party apps possibly installed and used by end-user
(**) = When the user utilizes multiple services in WCDMA 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the WCDMA+WLAN scenario also represents the WCDMA Voice/Data + WLAN Hotspot scenario.

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1.5 Device Restrictions Applicable for SAR Testing

(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.

Per KDB Publication 648474, **Bluetooth SAR was not required** since the maximum conducted power of Bluetooth Tx is 11.94 mW and the Bluetooth/WLAN to main antenna (GSM/WCDMA/LTE) separation distance is 60 mm.

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**.

(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**.

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.

LTE SAR for the lower BWs were not tested for SAR since the average output power was not more than 0.5 dB higher than the highest bandwidth; and LTE SAR for the highest BW was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05.

1.6 Power Reduction for SAR

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

1.7 Additional FCC Guidance Applied

None

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2 LTE CHECKLIST PER FCC KDB 941225 D05

Table 2-1
LTE Checklist per KDB 941225 D05

KDB 941225 Section	FCC ID	A3LSGHI717		
	Form Factor	Handset		
1)	Frequency Range of each LTE transmission band	Band 4: Tx (1712.5 - 1752.5 MHz) Band 17: Tx (706.5 - 713.5 MHz)		
2)	Channel Bandwidths	Band 4: 5 MHz, 10 MHz Band 17: 5 MHz, 10 MHz		
3)	Channel Numbers and Frequencies (MHz)	Low	Mid	High
	LTE Band 4 and BW 5 MHz	1712.5 MHz (19975)	1732.5 MHz (20175)	1752.5 MHz (20375)
	LTE Band 4 and BW 10 MHz	1715 MHz (20000)	1732.5 MHz (20175)	1750 MHz (20350)
	LTE Band 17 and BW 5 MHz	706.5 MHz (23755)	710 MHz (23790)	713.5 MHz (23825)
	LTE Band 17 and BW 10 MHz	709 MHz (23780)	710 MHz (23790)	711 MHz (23800)
4)(a)	UE Category	3		
(b)	Modulations Supported in UL	QPSK, 16QAM		
	LTE Transmitter and Antenna Implementation	Operational Description		
5)	Description of LTE Tx and Ant. Implementation	1 TX/RX Ant; 1 Rx Ant		
6)	LTE Voice available?	No (VoIP possible through 3rd party applications)		
	Hotspot with LTE+WIFI	Yes		
	Hotspot with LTE+WIFI active with GSM/WCDMA 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	
	835 MHz GSM	see page 1	Head, Body-Worn and Hotspot	
	1900 MHz GSM		Head, Body-Worn and Hotspot	
	850 MHz WCDMA		Head, Body-Worn and Hotspot	
	1900 MHz WCDMA		Head, Body-Worn and Hotspot	
	2.4 GHz Bluetooth		Body-Worn	
	2.4 GHz WI-FI		Head, Body-Worn and Hotspot	
	5 GHz WI-FI		Head and Body-Worn	
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 SAR 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.

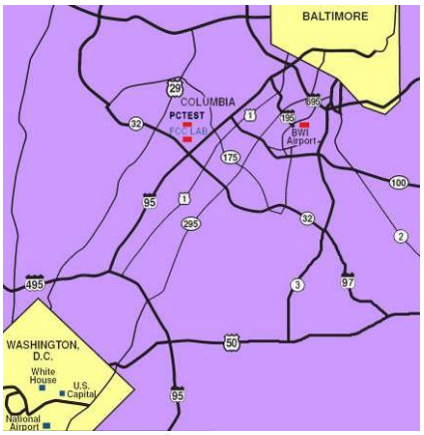

Figure 4-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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 SYSTEM

5.1 Robotic System

Measurements are performed using the DASY4 automated dosimetric assessment system. The DASY4 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

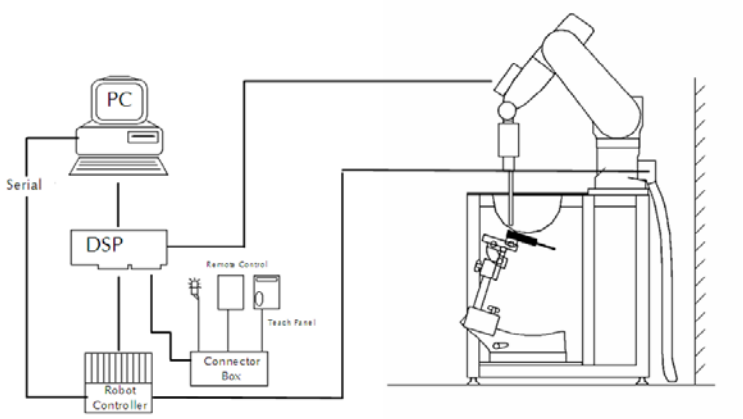

Figure 5-1
SAR Measurement System Setup

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
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 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
Shell Material:	Composite
Thickness:	2.0 ± 0.2 mm

Figure 5-2
SAR Measurement System

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6 E-FIELD PROBE FOR SAR TESTING

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

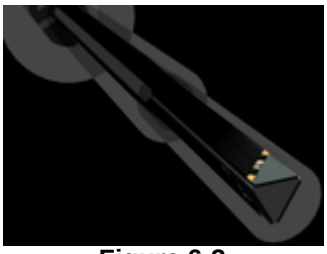

Figure 6-3
Triangular Probe Configuration

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7 PHANTOM AND EQUIVALENT TISSUES

7.1 SAM Phantoms

Figure 7-1
SAM Phantoms

The phantom for handset SAR assessment testing is a low-loss dielectric shell, with shape and dimensions derived from the anthropometric data of the 90th percentile adult male head dimensions as tabulated by the US Army. The SAM Twin Phantom shell is bisected along the mid-sagittal plane into right and left halves (see **Figure 7-1**). The perimeter sidewalls of each phantom halves are extended to allow the phantom to be filled with liquid to a depth that is sufficient to minimize reflections from the upper surface. The liquid depth is maintained at a minimum depth of 15 cm.

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

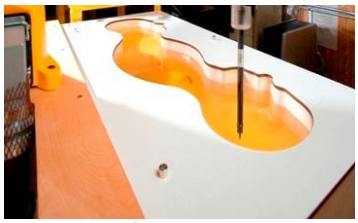

Figure 7-2
SAM Phantom with Simulating Tissue

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

See next page for 750 MHz Tissue Composition

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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

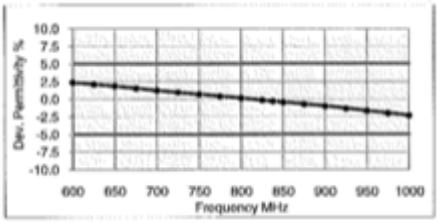
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

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



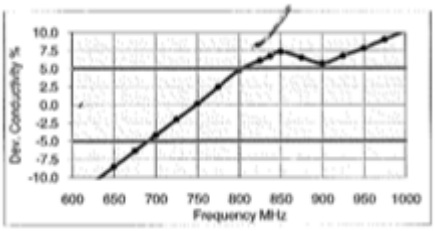


Figure 7-3
750MHz Body Tissue Equivalent Matter

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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

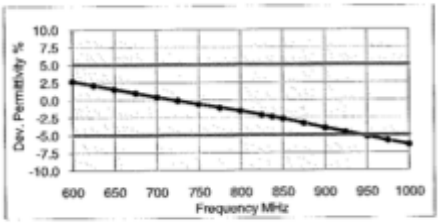
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

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



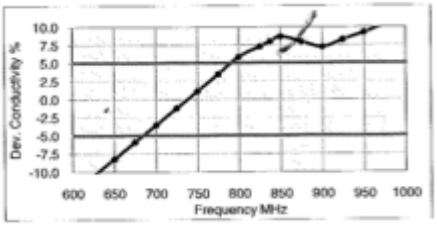


Figure 7-4
750MHz Head Tissue Equivalent Matter

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8 DOSIMETRIC ASSESSMENT

8.1 SAR Measurement Procedure

The evaluation was performed using the following procedure:

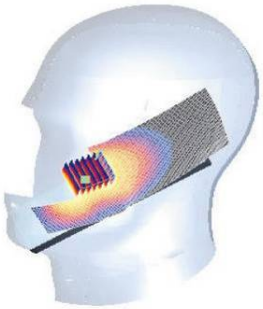

Figure 8-1
Sample SAR Area Scan

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.
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 to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

8.2 5 GHz SAR Measurements

5. 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 8-1 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 8-1. 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].

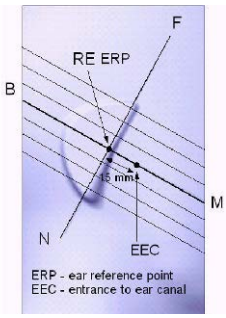

Figure 9-1
Close-Up Side view of ERP

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

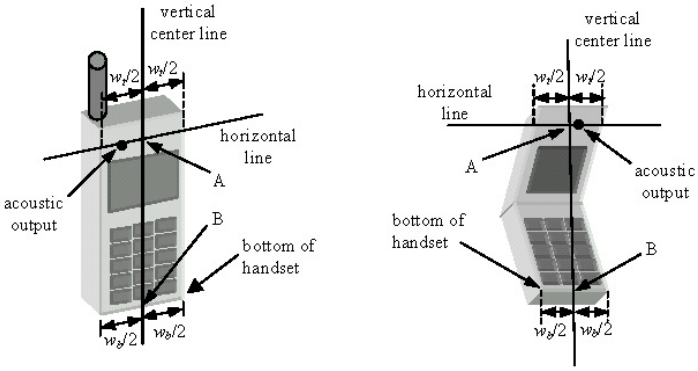

Figure 9-3
Handset Vertical Center & Horizontal Line Reference Points

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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.

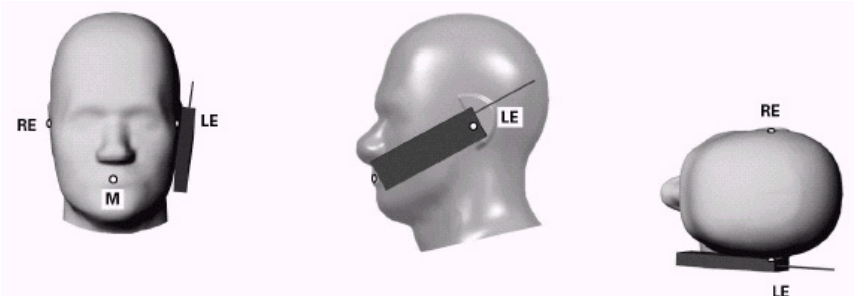

Figure 10-1 Front, Side and Top View of Cheek/Touch Position

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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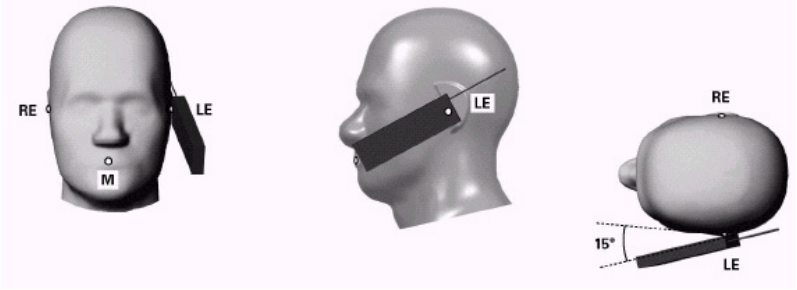

Figure 10-2 Front, Side and Top View of Ear/15º Tilt Position

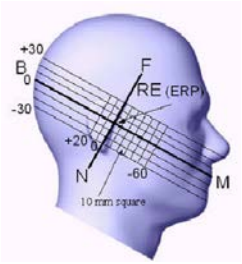

Figure 10-3
Side view w/ relevant markings

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.

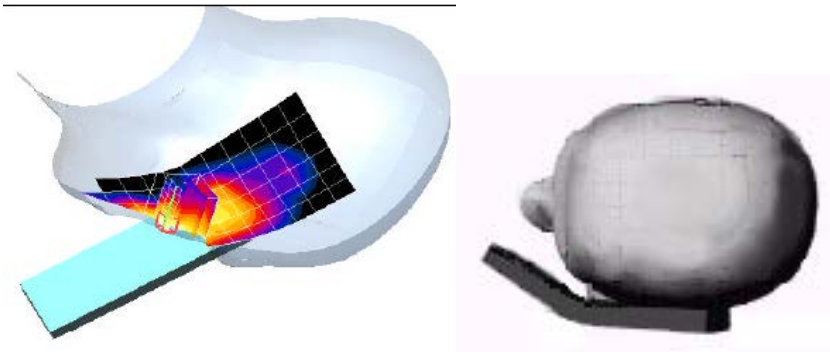

Figure 10-5
SAR Scans near the Jaw/Mouth

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 941225 D01 publication "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. When the power drift was more than 5%, the SAR test was 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.
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 since the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM.
i. Per Page 4, 4) B), I), when the SAR for QPSK 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 since SAR is not > 1.45 W/kg for the highest bandwidth are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth and conducted powers of the smaller bandwidths were not more than 0.5 dB higher than the larger bandwidth.
k. Per Page 5, 5) B) I), smaller bandwidths are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth.

12.3 SAR Measurement Conditions for WCDMA per FCC KDB 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 12.2 kbps RMC with 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 ≤ 75% of the SAR limit. Otherwise, SAR is measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration measured in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that resulted in the highest SAR in 12.2 kbps RMC mode for that RF channel.

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

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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

The SAR test procedures for devices with 802.11 modes are adopted from FCC KDB 248227 publication.

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. Therefore the SAR for these devices was measured using chipset based test mode software to ensure the results are consistent and reliable. See FCC KDB Publication 248227 for more details.

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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.

12.4.2 Frequency Channel Configurations [27]

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

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. 802.11n modes and higher data rates for 802.11a/n were evaluated only if the respective mode was 0.25 dB or higher than the 802.11a mode. Also, if the maximum extrapolated peak SAR of the zoom scan for the highest output channel of the default channels was less than 1.6 W/kg or if the 1g averaged SAR was less than 0.8 W/kg, SAR testing was not required for the other default test channels in the sub-band.

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

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

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.

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13 RF CONDUCTED POWERS

13.1 LTE Mode

Table 13-1
Band 17 LTE RF Output Conducted Powers

Freq. (MHz)	Uplink Channel Number	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
706.5	23755	QPSK	5 MHz	1	0	0	0	22.34
706.5	23755	16QAM	5 MHz	1	0	0-1	1	21.30
706.5	23755	QPSK	5 MHz	1	24	0	0	22.33
706.5	23755	16QAM	5 MHz	1	24	0-1	1	21.29
706.5	23755	QPSK	5 MHz	12	6	0-1	1	21.42
706.5	23755	16QAM	5 MHz	12	6	0-2	2	20.23
706.5	23755	QPSK	5 MHz	25	0	0-1	1	21.52
706.5	23755	16QAM	5 MHz	25	0	0-2	2	20.79
710	23790	QPSK	5 MHz	1	0	0	0	22.45
710	23790	16QAM	5 MHz	1	0	0-1	1	21.35
710	23790	QPSK	5 MHz	1	24	0	0	22.36
710	23790	16QAM	5 MHz	1	24	0-1	1	21.24
710	23790	QPSK	5 MHz	12	6	0-1	1	21.58
710	23790	16QAM	5 MHz	12	6	0-2	2	20.26
710	23790	QPSK	5 MHz	25	0	0-1	1	21.56
710	23790	16QAM	5 MHz	25	0	0-2	2	20.80
713.5	23825	QPSK	5 MHz	1	0	0	0	22.32
713.5	23825	16QAM	5 MHz	1	0	0-1	1	21.73
713.5	23825	QPSK	5 MHz	1	24	0	0	22.22
713.5	23825	16QAM	5 MHz	1	24	0-1	1	21.64
713.5	23825	QPSK	5 MHz	12	6	0-1	1	21.44
713.5	23825	16QAM	5 MHz	12	6	0-2	2	20.24
713.5	23825	QPSK	5 MHz	25	0	0-1	1	21.50
713.5	23825	16QAM	5 MHz	25	0	0-2	2	20.68
710	23790	QPSK	10 MHz	1	0	0	0	**22.54**
710	23790	16QAM	10 MHz	1	0	0-1	1	**21.18**
710	23790	QPSK	10 MHz	1	49	0	0	**22.20**
710	23790	16QAM	10 MHz	1	49	0-1	1	**21.10**
710	23790	QPSK	10 MHz	25	12	0-1	1	**21.68**
710	23790	16QAM	10 MHz	25	12	0-2	1	**21.25**
710	23790	QPSK	10 MHz	50	0	0-1	1	21.58
710	23790	16QAM	10 MHz	50	0	0-2	2	20.85

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.

Per KDB 447498 6)c), only 1 channel is required for LTE Band 17 SAR with 10 MHz Bandwidth.

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Table 13-2
Band 4 LTE Low Ch. RF Output Conducted Powers

Freq. (MHz)	Uplink Channel Number	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1712.5	19975	QPSK	5 MHz	1	0	0	0	22.95
1712.5	19975	16QAM	5 MHz	1	0	0-1	1	22.00
1712.5	19975	QPSK	5 MHz	1	24	0	0	23.05
1712.5	19975	16QAM	5 MHz	1	24	0-1	1	22.11
1712.5	19975	QPSK	5 MHz	12	6	0-1	1	21.90
1712.5	19975	16QAM	5 MHz	12	6	0-2	2	20.87
1712.5	19975	QPSK	5 MHz	25	0	0-1	1	22.02
1712.5	19975	16QAM	5 MHz	25	0	0-2	2	21.19
1715	20000	QPSK	10 MHz	1	0	0	0	**22.95**
1715	20000	16QAM	10 MHz	1	0	0-1	1	**21.89**
1715	20000	QPSK	10 MHz	1	49	0	0	**23.08**
1715	20000	16QAM	10 MHz	1	49	0-1	1	**22.01**
1715	20000	QPSK	10 MHz	25	12	0-1	1	22.09
1715	20000	16QAM	10 MHz	25	12	0-2	1	21.71
1715	20000	QPSK	10 MHz	50	0	0-1	1	22.13
1715	20000	16QAM	10 MHz	50	0	0-2	2	21.34

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 13-3
Band 4 LTE Mid Ch. RF Output Conducted Powers

Freq. (MHz)	Uplink Channel Number	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1732.5	20175	QPSK	5 MHz	1	0	0	0	23.02
1732.5	20175	16QAM	5 MHz	1	0	0-1	1	22.08
1732.5	20175	QPSK	5 MHz	1	24	0	0	22.96
1732.5	20175	16QAM	5 MHz	1	24	0-1	1	22.11
1732.5	20175	QPSK	5 MHz	12	6	0-1	1	21.97
1732.5	20175	16QAM	5 MHz	12	6	0-2	2	20.80
1732.5	20175	QPSK	5 MHz	25	0	0-1	1	22.05
1732.5	20175	16QAM	5 MHz	25	0	0-2	2	21.17
1732.5	20175	QPSK	10 MHz	1	0	0	0	22.94
1732.5	20175	16QAM	10 MHz	1	0	0-1	1	21.89
1732.5	20175	QPSK	10 MHz	1	49	0	0	22.94
1732.5	20175	16QAM	10 MHz	1	49	0-1	1	21.93
1732.5	20175	QPSK	10 MHz	25	12	0-1	1	**22.02**
1732.5	20175	16QAM	10 MHz	25	12	0-2	1	**21.44**
1732.5	20175	QPSK	10 MHz	50	0	0-1	1	22.09
1732.5	20175	16QAM	10 MHz	50	0	0-2	2	21.23

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 13-4
Band 4 LTE High Ch. RF Output Conducted Powers

Freq. (MHz)	Uplink Channel Number	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1752.5	20375	QPSK	5 MHz	1	0	0	0	22.93
1752.5	20375	16QAM	5 MHz	1	0	0-1	1	21.94
1752.5	20375	QPSK	5 MHz	1	24	0	0	22.89
1752.5	20375	16QAM	5 MHz	1	24	0-1	1	22.00
1752.5	20375	QPSK	5 MHz	12	6	0-1	1	21.90
1752.5	20375	16QAM	5 MHz	12	6	0-2	2	20.74
1752.5	20375	QPSK	5 MHz	25	0	0-1	1	21.95
1752.5	20375	16QAM	5 MHz	25	0	0-2	2	21.14
1750	20350	QPSK	10 MHz	1	0	0	0	22.93
1750	20350	16QAM	10 MHz	1	0	0-1	1	21.70
1750	20350	QPSK	10 MHz	1	49	0	0	22.89
1750	20350	16QAM	10 MHz	1	49	0-1	1	21.65
1750	20350	QPSK	10 MHz	25	12	0-1	1	21.93
1750	20350	16QAM	10 MHz	25	12	0-2	1	21.40
1750	20350	QPSK	10 MHz	50	0	0-1	1	22.02
1750	20350	16QAM	10 MHz	50	0	0-2	2	21.07

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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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	**33.24**	33.15	**31.55**	27.04	26.90
	190	**33.03**	32.93	**31.83**	27.00	26.82
	251	**33.02**	32.90	**31.50**	26.93	26.74
PCS	512	**30.10**	30.00	**28.37**	25.27	25.24
	661	**30.00**	29.91	**28.34**	25.17	25.14
	810	**30.29**	30.24	**28.77**	25.31	25.27

		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	**24.21**	24.12	**25.53**	18.01	20.88
	190	**24.00**	23.90	**25.81**	17.97	20.80
	251	**23.99**	23.87	**25.48**	17.90	20.72
PCS	512	**21.07**	20.97	**22.35**	16.24	19.22
	661	**20.97**	20.88	**22.32**	16.14	19.12
	810	**21.26**	21.21	**22.75**	16.28	19.25

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 2 Tx Uplink slots)
DTM Multislot Class: N/A

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13.3 HSPA Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			MPR
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	**22.75**	**22.95**	**22.94**	**22.84**	**22.90**	**22.97**	-
99		12.2 kbps AMR	22.74	22.90	22.89	22.80	22.93	22.88	-
6	HSDPA	Subtest 1	22.75	22.97	22.85	22.84	22.93	22.95	0
6		Subtest 2	22.90	23.00	22.97	22.95	23.02	23.05	0
6		Subtest 3	22.42	22.50	22.67	22.53	22.64	22.70	0.5
6		Subtest 4	22.35	22.48	22.61	22.51	22.65	22.70	0.5
6	HSUPA	Subtest 1	22.25	22.37	22.30	22.87	22.80	22.85	0
6		Subtest 2	20.97	21.35	20.99	21.35	21.70	21.78	2
6		Subtest 3	21.76	22.05	21.82	21.91	22.40	22.57	1
6		Subtest 4	21.20	21.41	21.77	21.45	21.61	21.27	2
6		Subtest 5	23.01	22.94	22.67	22.35	22.45	22.50	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 some HSPA subtests may show as little as 0 dB power reduction according to the chipset implementation in this model.

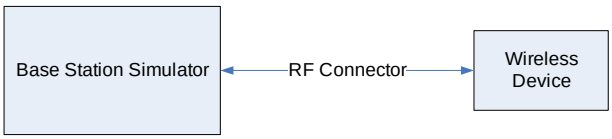

Figure 13-1
Power Measurement Setup

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13.4 WLAN Conducted Powers

Table 13-5
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	14.00	14.04	14.02	14.05
802.11b	2437	6	**14.25**	14.24	14.17	14.27
802.11b	2462	11	14.21	14.35	14.38	14.21

Table 13-6
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	14.06	14.11	14.09	14.13	14.01	14.08	14.03	14.03
802.11g	2437	6	14.18	14.21	14.18	14.26	14.18	14.27	14.23	14.21
802.11g	2462	11	14.38	14.39	14.39	14.41	14.29	14.31	14.31	14.29

Table 13-7
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	12.11	12.06	12.11	12.03	12.04	12.03	12.07	12.06
802.11n	2437	6	12.21	12.23	12.18	12.28	12.23	12.21	12.33	12.27
802.11n	2462	11	12.32	12.43	12.41	12.43	12.36	12.29	12.37	12.31

Table 13-8
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	11.78	11.82	11.90	11.98	11.99	12.05	12.12	11.70
802.11a	5200	40	**12.06**	11.99	11.84	11.81	11.82	11.75	11.81	11.82
802.11a	5220	44	11.92	11.97	11.89	11.98	11.99	12.04	12.08	12.10
802.11a	5240	48	11.72	12.18	12.09	12.13	11.96	12.20	12.00	11.97
802.11a	5260	52	12.00	12.05	12.20	12.09	11.89	11.81	12.09	12.00
802.11a	5280	56	11.73	12.15	12.04	11.74	12.25	11.99	11.79	12.04
802.11a	5300	60	11.87	11.91	11.94	11.91	11.91	11.91	12.05	11.97
802.11a	5320	64	**12.20**	11.87	12.10	12.18	12.26	11.94	12.26	12.19
802.11a	5500	100	11.80	11.67	11.63	12.12	11.92	11.88	12.02	11.86
802.11a	5520	104	11.26	11.29	11.30	11.42	11.44	11.44	11.51	11.51
802.11a	5540	108	11.19	11.20	11.19	11.30	11.40	11.41	11.40	11.47
802.11a	5560	112	11.15	11.08	11.18	11.22	11.24	11.30	11.32	11.28
802.11a	5580	116	11.59	11.52	11.59	11.57	11.59	11.69	11.66	11.55
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	10.78	10.79	10.75	10.83	10.90	10.90	10.94	10.95
802.11a	5680	136	10.67	10.66	10.67	10.73	10.82	10.84	10.94	10.83
802.11a	5700	140	**11.97**	12.15	12.06	12.08	12.12	12.29	12.17	12.21
802.11a	5745	149	**12.23**	12.07	12.10	12.08	12.29	12.26	12.18	12.08
802.11a	5765	153	11.80	11.84	11.82	11.94	12.04	11.98	12.04	12.09
802.11a	5785	157	11.94	11.91	12.16	11.92	11.91	12.12	12.11	12.04
802.11a	5805	161	11.81	11.86	11.82	11.85	11.91	11.90	11.91	11.95
802.11a	5825	165	11.90	11.97	12.05	11.83	12.01	11.99	11.88	12.05

This device does not transmit any beacons or initiate any transmissions in the 5.3 and 5.5 GHz Bands

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.

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Table 13-9
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	11.89	11.54	11.68	11.63	11.79	12.11	11.97	11.94
802.11n	5200	40	11.85	11.69	11.67	12.13	11.99	11.83	11.83	11.67
802.11n	5220	44	11.85	11.78	11.92	11.83	11.94	11.94	11.94	12.10
802.11n	5240	48	11.76	11.93	11.93	11.97	12.01	11.97	12.15	12.10
802.11n	5260	52	12.04	11.59	11.88	11.86	11.89	11.86	12.09	12.19
802.11n	5280	56	12.01	12.15	12.20	12.09	12.17	12.12	11.98	12.24
802.11n	5300	60	11.74	11.86	11.86	11.89	11.93	11.98	11.87	11.99
802.11n	5320	64	11.91	11.88	12.12	11.71	11.97	12.16	12.17	11.84
802.11n	5500	100	11.74	12.02	11.57	11.66	11.61	11.66	12.20	11.94
802.11n	5520	104	11.34	11.35	11.35	11.49	11.48	11.44	11.59	11.49
802.11n	5540	108	11.27	11.31	11.33	11.32	11.30	11.43	11.44	11.56
802.11n	5560	112	11.10	11.22	11.20	11.27	11.23	11.31	11.34	11.26
802.11n	5580	116	11.55	11.52	11.63	11.68	11.89	11.63	11.56	11.81
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	10.83	10.83	10.88	10.79	10.92	10.94	10.96	10.96
802.11n	5680	136	10.65	10.70	10.77	10.80	10.85	10.94	10.84	10.92
802.11n	5700	140	11.95	12.15	12.10	11.99	12.22	12.02	12.20	12.11
802.11n	5745	149	12.05	12.04	12.11	12.14	12.31	12.19	12.24	12.26
802.11n	5765	153	11.82	11.85	11.88	11.87	11.90	11.98	12.02	11.98
802.11n	5785	157	11.72	12.00	12.02	11.85	12.00	12.02	12.15	12.19
802.11n	5805	161	11.68	11.70	11.83	11.84	11.82	11.85	11.90	11.93
802.11n	5825	165	11.87	11.98	11.88	11.86	11.87	12.21	11.98	11.94

This device does not transmit any beacons or initiate any transmissions in the 5.3 and 5.5 GHz Bands

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.

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting:

- For 2.4 GHz, 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.
- For 5 GHz, 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 802.11 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 802.11a mode.
- The bolded power in the above tables was tested for SAR.

Figure 13-2
Power Measurement Setup

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14 FCC PERSONAL WIRELESS ROUTER CONFIGURATIONS

14.1 Personal Wireless Router Considerations

The FCC has provided guidance in KDB Publication 941225 D06 for battery-operated handsets that have the capability to transmit and receive Internet connectivity through simultaneous transmission of WIFI in conjunction with another transmitter. SAR test considerations are based on a standard composite test separation distance of 10 mm from the edges, front and back of the device (L x W ≥ 9cm x 5cm) with antennas 2.5 cm or closer to the edge of the device. This has been determined by the FCC from general mixed use conditions for this type of devices. If the device is smaller, then a 5mm distance is required.

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 valid within a single transmission frequency.

The standalone head and body-worn accessory SAR data for the applicable voice and data configurations in each wireless mode and frequency band is analyzed separately to determine simultaneous transmission SAR test exclusion according to the procedures in KDB 648474 publication.

14.3 SAR Test Configurations

See Figure 1-2 for EUT antenna locations to determine the wireless router edges required for SAR testing bases on FCC KDB 941225 D06. Certain EUT 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
EUT Sides for Wireless Router SAR testing

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

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15 SYSTEM VERIFICATION

15.1 Tissue Verification

Table 15-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
11/29/2011	750H	23.0	680	0.848	44.02	0.885	42.273	-4.18%	4.13%
			695	0.860	43.86	0.886	42.193	-2.93%	3.95%
			710	0.879	43.56	0.887	42.113	-0.90%	3.44%
			725	0.891	43.41	0.888	42.033	0.34%	3.28%
			740	0.895	43.15	0.889	41.953	0.67%	2.85%
			755	0.915	43.20	0.891	41.876	2.69%	3.16%
11/22/2011	835H	23.5	820	0.863	42.19	0.898	41.571	-3.90%	1.49%
			835	0.871	41.89	0.900	41.500	-3.22%	0.94%
			850	0.891	41.65	0.916	41.500	-2.73%	0.36%
11/16/2011	1750H	22.1	1710	1.344	38.47	1.348	40.136	-0.30%	-4.15%
			1750	1.386	38.36	1.370	40.100	1.17%	-4.34%
			1790	1.427	38.18	1.394	40.020	2.37%	-4.60%
11/21/2011	1900H	21.9	1850	1.382	39.86	1.400	40.000	-1.29%	-0.35%
			1880	1.413	39.79	1.400	40.000	0.93%	-0.53%
			1910	1.448	39.65	1.400	40.000	3.43%	-0.88%
11/21/2011	2450H	23.4	2401	1.782	40.08	1.758	39.298	1.37%	1.99%
			2450	1.842	39.92	1.800	39.200	2.33%	1.84%
			2499	1.909	39.68	1.852	39.135	3.08%	1.39%
12/02/2011	5200H-5800H	23.3	5200	4.789	36.28	4.660	36.000	2.77%	0.78%
			5320	4.914	36.01	4.780	35.880	2.80%	0.36%
			5500	5.089	35.73	4.965	35.650	2.50%	0.22%
			5700	5.341	35.44	5.170	35.400	3.31%	0.11%
			5745	5.403	35.25	5.215	35.355	3.60%	-0.30%
			5800	5.462	35.13	5.270	35.300	3.64%	-0.48%
11/30/2011	750B	22.7	680	0.909	56.78	0.956	56.069	-4.92%	1.27%
			695	0.925	56.54	0.957	55.985	-3.34%	0.99%
			710	0.938	56.48	0.958	55.901	-2.09%	1.04%
			725	0.951	56.36	0.960	55.817	-0.94%	0.97%
			740	0.957	56.16	0.961	55.733	-0.42%	0.77%
			755	0.975	56.12	0.963	55.649	1.25%	0.85%
11/22/2011	835B	23.2	820	0.959	54.66	0.969	55.284	-1.03%	-1.13%
			835	0.975	54.66	0.970	55.200	0.52%	-0.98%
			850	0.986	54.62	0.988	55.154	-0.20%	-0.97%
11/28/2011	1750B	22.9	1710	1.494	52.42	1.460	53.540	2.33%	-2.09%
			1750	1.543	52.04	1.490	53.430	3.56%	-2.60%
			1790	1.585	52.09	1.510	53.330	4.97%	-2.33%
11/21/2011	1900B	22.2	1850	1.469	52.53	1.520	53.300	-3.36%	-1.44%
			1880	1.503	52.43	1.520	53.300	-1.12%	-1.63%
			1910	1.541	52.32	1.520	53.300	1.38%	-1.84%
12/05/2011	1900B	23.1	1850	1.487	52.41	1.520	53.300	-2.17%	-1.67%
			1880	1.523	52.37	1.520	53.300	0.20%	-1.74%
			1910	1.555	52.21	1.520	53.300	2.30%	-2.05%
11/17/2011	2450B	23.0	2401	1.879	50.78	1.903	52.765	-1.26%	-3.76%
			2450	1.949	50.48	1.950	52.700	-0.05%	-4.21%
			2499	2.016	50.44	2.019	52.638	-0.15%	-4.18%
11/23/2011	5200B-5800B	22.9	5200	5.383	47.39	5.299	49.014	1.59%	-3.31%
			5320	5.556	47.09	5.439	48.607	2.15%	-3.12%
			5500	5.787	46.85	5.650	48.580	2.42%	-3.56%
			5700	6.089	46.53	5.880	48.275	3.55%	-3.61%
			5745	6.127	46.49	5.936	48.248	3.22%	-3.64%
			5800	6.204	46.36	6.000	48.200	3.40%	-3.82%

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

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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 15-2
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} (W/kg)	Deviation (%)
11/29/2011	24.8	23.9	0.100	750	1003	3561	Head	0.84	8.370	8.400	0.36%
11/22/2011	24.8	23.4	0.100	835	4d047	3550	Head	0.915	9.530	9.150	-3.99%
11/16/2011	23.2	21.6	0.040	1750	1051	3561	Head	1.46	37.000	36.500	-1.35%
11/21/2011	23.8	22.1	0.100	1900	502	3209	Head	3.96	40.200	39.600	-1.49%
11/21/2011	23.1	21.6	0.040	2450	797	3258	Head	2.22	53.300	55.500	4.13%
12/02/2011	23.8	22.3	0.100	5200	1057	3561	Head	8.89	83.100	88.900	6.98%
12/02/2011	23.9	22.7	0.100	5500	1057	3561	Head	8.98	90.100	89.800	-0.33%
12/02/2011	24.1	22.9	0.100	5800	1057	3561	Head	8.83	82.900	88.300	6.51%
11/30/2011	23.4	22.3	0.100	750	1003	3561	Body	0.832	8.850	8.320	-5.99%
11/22/2011	24.1	23.1	0.100	835	4d047	3550	Body	0.954	9.850	9.540	-3.15%
11/28/2011	24.8	23.5	0.040	1750	1051	3561	Body	1.54	37.000	38.500	4.05%
11/21/2011	23.6	21.9	0.100	1900	502	3209	Body	4.1	41.100	41.000	-0.24%
12/05/2011	23.7	21.3	0.100	1900	502	3209	Body	4.41	41.100	44.100	7.30%
11/17/2011	24.0	22.5	0.025	2450	797	3561	Body	1.35	52.300	54.000	3.25%
11/23/2011	23.7	22.4	0.100	5200	1007	3561	Body	7.79	75.500	77.900	3.18%
11/23/2011	23.9	22.6	0.100	5500	1007	3561	Body	8.52	81.300	85.200	4.80%
11/23/2011	24.1	22.8	0.100	5800	1007	3561	Body	7.68	75.300	76.800	1.99%

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.

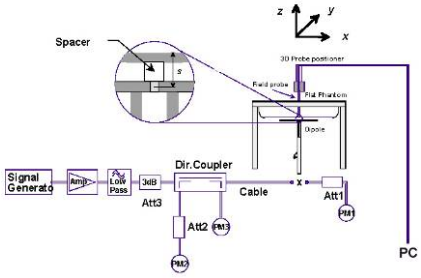

Figure 15-1
System Verification Setup Diagram

Figure 15-2
System Verification Setup Photo

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16 SAR DATA SUMMARY

16.1 Head SAR Data

Table 16-1
GSM 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	190	GSM 850	33.03	0.06	Right	Touch	FI-296-A	0.230
836.60	190	GSM 850	33.03	0.09	Right	Tilt	FI-296-A	0.138
836.60	190	GSM 850	33.03	0.07	Left	Touch	FI-296-A	0.269
836.60	190	GSM 850	33.03	0.05	Left	Tilt	FI-296-A	0.163
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 16-2
GSM 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	661	GSM 1900	30.00	0.09	Right	Touch	FI-296-A	0.087
1880.00	661	GSM 1900	30.00	-0.09	Right	Tilt	FI-296-A	0.064
1880.00	661	GSM 1900	30.00	-0.04	Left	Touch	FI-296-A	0.120
1880.00	661	GSM 1900	30.00	0.12	Left	Tilt	FI-296-A	0.050
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
WCDMA 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	4183	WCDMA 850	22.95	0.00	Right	Touch	FI-296-A	0.174
836.60	4183	WCDMA 850	22.95	-0.09	Right	Tilt	FI-296-A	0.106
836.60	4183	WCDMA 850	22.95	0.14	Left	Touch	FI-296-A	0.215
836.60	4183	WCDMA 850	22.95	0.16	Left	Tilt	FI-296-A	0.144
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**Head 1.6 W/kg (mW/g)** averaged over 1 gram			

Table 16-4
WCDMA 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	9400	WCDMA 1900	22.90	0.04	Right	Touch	FI-296-A	0.154
1880.00	9400	WCDMA 1900	22.90	0.01	Right	Tilt	FI-296-A	0.107
1880.00	9400	WCDMA 1900	22.90	-0.16	Left	Touch	FI-296-A	0.161
1880.00	9400	WCDMA 1900	22.90	0.14	Left	Tilt	FI-296-A	0.078
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 16-5
LTE Band 17 Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Bandwidth (MHz)	Phone Serial Number	RB Size	RB Offset	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	QPSK	21.68	0.19	1	Right	Touch	10	AI-065-A	25	12	0.083
710.00	23790	LTE Band 17	QPSK	22.54	0.19	0	Right	Touch	10	AI-065-A	1	0	**0.113**
710.00	23790	LTE Band 17	QPSK	22.20	0.12	0	Right	Touch	10	AI-065-A	1	49	0.099
710.00	23790	LTE Band 17	16QAM	21.25	0.18	1	Right	Touch	10	AI-065-A	25	12	0.065
710.00	23790	LTE Band 17	16QAM	21.18	0.15	1	Right	Touch	10	AI-065-A	1	0	0.086
710.00	23790	LTE Band 17	16QAM	21.10	0.13	1	Right	Touch	10	AI-065-A	1	49	0.077
710.00	23790	LTE Band 17	QPSK	21.68	0.21	1	Right	Tilt	10	AI-065-A	25	12	0.049
710.00	23790	LTE Band 17	QPSK	22.54	0.09	0	Right	Tilt	10	AI-065-A	1	0	**0.070**
710.00	23790	LTE Band 17	QPSK	22.20	0.11	0	Right	Tilt	10	AI-065-A	1	49	0.054
710.00	23790	LTE Band 17	16QAM	21.25	0.12	1	Right	Tilt	10	AI-065-A	25	12	0.044
710.00	23790	LTE Band 17	16QAM	21.18	-0.15	1	Right	Tilt	10	AI-065-A	1	0	0.062
710.00	23790	LTE Band 17	16QAM	21.10	0.09	1	Right	Tilt	10	AI-065-A	1	49	0.045
710.00	23790	LTE Band 17	QPSK	21.68	0.08	1	Left	Touch	10	AI-065-A	25	12	0.099
710.00	23790	LTE Band 17	QPSK	22.54	-0.21	0	Left	Touch	10	AI-065-A	1	0	**0.149**
710.00	23790	LTE Band 17	QPSK	22.20	0.12	0	Left	Touch	10	AI-065-A	1	49	0.109
710.00	23790	LTE Band 17	16QAM	21.25	-0.06	1	Left	Touch	10	AI-065-A	25	12	0.090
710.00	23790	LTE Band 17	16QAM	21.18	0.10	1	Left	Touch	10	AI-065-A	1	0	0.129
710.00	23790	LTE Band 17	16QAM	21.10	-0.04	1	Left	Touch	10	AI-065-A	1	49	0.092
710.00	23790	LTE Band 17	QPSK	21.68	-0.09	1	Left	Tilt	10	AI-065-A	25	12	0.054
710.00	23790	LTE Band 17	QPSK	22.54	0.19	0	Left	Tilt	10	AI-065-A	1	0	**0.073**
710.00	23790	LTE Band 17	QPSK	22.20	-0.03	0	Left	Tilt	10	AI-065-A	1	49	0.065
710.00	23790	LTE Band 17	16QAM	21.25	0.18	1	Left	Tilt	10	AI-065-A	25	12	0.047
710.00	23790	LTE Band 17	16QAM	21.18	-0.13	1	Left	Tilt	10	AI-065-A	1	0	0.064
710.00	23790	LTE Band 17	16QAM	21.10	0.14	1	Left	Tilt	10	AI-065-A	1	49	0.054
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 16-6
LTE Band 4 (AWS) Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode/Band	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Bandwidth (MHz)	Phone Serial Number	RB Size	RB Offset	SAR (1g)
MHz	Ch.												(W/kg)
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.09	1	Right	Touch	10	AI-085-A	25	12	0.151
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.00	0	Right	Touch	10	AI-085-A	1	0	0.187
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.06	0	Right	Touch	10	AI-085-A	1	49	**0.191**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.03	1	Right	Touch	10	AI-085-A	25	12	0.135
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	0.10	1	Right	Touch	10	AI-085-A	1	0	0.148
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.02	1	Right	Touch	10	AI-085-A	1	49	0.149
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.06	1	Right	Tilt	10	AI-085-A	25	12	0.061
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.11	0	Right	Tilt	10	AI-085-A	1	0	0.073
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.02	0	Right	Tilt	10	AI-085-A	1	49	**0.078**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.14	1	Right	Tilt	10	AI-085-A	25	12	0.053
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.09	1	Right	Tilt	10	AI-085-A	1	0	0.062
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.17	1	Right	Tilt	10	AI-085-A	1	49	0.061
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.13	1	Left	Touch	10	AI-085-A	25	12	0.182
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.16	0	Left	Touch	10	AI-085-A	1	0	0.215
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	-0.02	0	Left	Touch	10	AI-085-A	1	49	**0.220**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.04	1	Left	Touch	10	AI-085-A	25	12	0.160
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.04	1	Left	Touch	10	AI-085-A	1	0	0.169
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.01	1	Left	Touch	10	AI-085-A	1	49	0.170
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.13	1	Left	Tilt	10	AI-085-A	25	12	0.059
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.14	0	Left	Tilt	10	AI-085-A	1	0	0.076
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.04	0	Left	Tilt	10	AI-085-A	1	49	**0.076**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.01	1	Left	Tilt	10	AI-085-A	25	12	0.053
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.10	1	Left	Tilt	10	AI-085-A	1	0	0.057
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.19	1	Left	Tilt	10	AI-085-A	1	49	0.061
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Head 1.6 W/kg (mW/g)** averaged over 1 gram						

Note: Per KDB Publication 941225 D05, when the maximum average output power of 1 RB allocations is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, low channel was tested for the 1 RB allocation configurations for LTE Band 4 (AWS).

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Table 16-7
2.4 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	14.25	0.18	Right	Touch	FI-296-A	1	0.009
2437	6	IEEE 802.11b	DSSS	14.25	0.12	Right	Tilt	FI-296-A	1	0.005
2437	6	IEEE 802.11b	DSSS	14.25	0.00	Left	Touch	FI-296-A	1	0.021
2437	6	IEEE 802.11b	DSSS	14.25	-0.15	Left	Tilt	FI-296-A	1	0.008
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Head 1.6 W/kg (mW/g) averaged over 1 gram				

Table 16-8
5.8 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5745	149	IEEE 802.11a	OFDM	12.23	0.11	Right	Touch	FI-296-A	6	0.045
5745	149	IEEE 802.11a	OFDM	12.23	-0.11	Right	Tilt	FI-296-A	6	0.004
5745	149	IEEE 802.11a	OFDM	12.23	0.15	Left	Touch	FI-296-A	6	0.069
5745	149	IEEE 802.11a	OFDM	12.23	0.18	Left	Tilt	FI-296-A	6	0.000
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Head 1.6 W/kg (mW/g) averaged over 1 gram				

Table 16-9
5.2 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5200	40	IEEE 802.11a	OFDM	12.06	-0.12	Right	Touch	FI-296-A	6	0.094
5200	40	IEEE 802.11a	OFDM	12.06	0.17	Right	Tilt	FI-296-A	6	0.063
5200	40	IEEE 802.11a	OFDM	12.06	0.15	Left	Touch	FI-296-A	6	0.136
5200	40	IEEE 802.11a	OFDM	12.06	0.16	Left	Tilt	FI-296-A	6	0.085
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 16-10
5.3 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5320	64	IEEE 802.11a	OFDM	12.20	0.17	Right	Touch	FI-296-A	6	0.076
5320	64	IEEE 802.11a	OFDM	12.20	-0.13	Right	Tilt	FI-296-A	6	0.053
5320	64	IEEE 802.11a	OFDM	12.20	0.14	Left	Touch	FI-296-A	6	0.102
5320	64	IEEE 802.11a	OFDM	12.20	0.18	Left	Tilt	FI-296-A	6	0.050
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Head 1.6 W/kg (mW/g)** averaged over 1 gram				

Table 16-11
5.5 - 5.7 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5700	140	IEEE 802.11a	OFDM	11.97	0.20	Right	Touch	FI-296-A	6	0.001
5700	140	IEEE 802.11a	OFDM	11.97	0.13	Right	Tilt	FI-296-A	6	0.011
5700	140	IEEE 802.11a	OFDM	11.97	0.15	Left	Touch	FI-296-A	6	0.062
5700	140	IEEE 802.11a	OFDM	11.97	0.13	Left	Tilt	FI-296-A	6	0.008
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 16-12
GSM/WCDMA Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	# of Time Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GSM	33.03	-0.03	1.0 cm	FI-296-A	1	back	0.471
836.60	190	GSM 850	GPRS	31.83	0.16	1.0 cm	FI-296-A	2	back	0.645
1880.00	661	GSM 1900	GSM	30.00	-0.06	1.0 cm	FI-296-A	1	back	0.493
1880.00	661	GSM 1900	GPRS	28.34	0.20	1.0 cm	FI-296-A	2	back	0.750
836.60	4183	WCDMA 850	RMC	22.95	-0.04	1.0 cm	FI-296-A	N/A	back	0.361
1852.40	9262	WCDMA 1900	RMC	22.84	0.00	1.0 cm	FI-296-A	N/A	back	0.796
1880.00	9400	WCDMA 1900	RMC	22.90	-0.06	1.0 cm	FI-296-A	N/A	back	0.935
1907.60	9538	WCDMA 1900	RMC	22.97	0.03	1.0 cm	FI-296-A	N/A	back	1.040
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 16-13
WLAN Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	14.25	0.11	1.0 cm	FI-296-A	1	back	0.049
5745	149	IEEE 802.11a	OFDM	12.23	-0.06	1.0 cm	AI-065-A	6	back	0.090
5200	40	IEEE 802.11a	OFDM	12.06	-0.02	1.0 cm	AI-065-A	6	back	0.394
5320	64	IEEE 802.11a	OFDM	12.20	0.12	1.0 cm	AI-065-A	6	back	0.358
5700	140	IEEE 802.11a	OFDM	11.97	0.11	1.0 cm	AI-065-A	6	back	0.078
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 16-14
LTE Body-Worn SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode	Bandwidth [MHz]	Modulation	Target MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	# of Resource Blocks	RB Offset	Spacing	Serial Number	Side	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	10	QPSK	1	21.68	-0.07	25	12	1.0 cm	FI-296-A	back	0.213
710.00	23790	LTE Band 17	10	QPSK	0	22.54	0.01	1	0	1.0 cm	FI-296-A	back	0.296
710.00	23790	LTE Band 17	10	QPSK	0	22.20	0.13	1	49	1.0 cm	FI-296-A	back	0.255
710.00	23790	LTE Band 17	10	16 QAM	1	21.25	0.05	25	12	1.0 cm	FI-296-A	back	0.185
710.00	23790	LTE Band 17	10	16 QAM	1	21.18	-0.12	1	0	1.0 cm	FI-296-A	back	0.257
710.00	23790	LTE Band 17	10	16 QAM	1	21.10	0.18	1	49	1.0 cm	FI-296-A	back	0.248
1732.50	20175	LTE Band 4 (AWS)	10	QPSK	1	22.02	-0.04	25	12	1.0 cm	FI-296-A	back	0.474
1715.00	20000	LTE Band 4 (AWS)	10	QPSK	0	22.95	-0.01	1	0	1.0 cm	FI-296-A	back	**0.564**
1715.00	20000	LTE Band 4 (AWS)	10	QPSK	0	23.08	0.13	1	49	1.0 cm	FI-296-A	back	0.578
1732.50	20175	LTE Band 4 (AWS)	10	16 QAM	1	21.44	-0.02	25	12	1.0 cm	FI-296-A	back	0.394
1715.00	20000	LTE Band 4 (AWS)	10	16 QAM	1	21.89	-0.12	1	0	1.0 cm	FI-296-A	back	0.422
1715.00	20000	LTE Band 4 (AWS)	10	16 QAM	1	22.01	0.18	1	49	1.0 cm	FI-296-A	back	0.434
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram			

Note: Per KDB Publication 941225 D05 footnotes 6 and 8 on page 4, when the maximum average output power of 1 RB allocations is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, low channel was tested for the 1 RB allocations for LTE Band 4 (AWS).

16.3 Wireless Router SAR Data

Table 16-15
GPRS Wireless Router Body SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	# of GPRS Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GPRS	31.83	0.16	1.0 cm	FI-296-A	2	back	0.645
836.60	190	GSM 850	GPRS	31.83	0.01	1.0 cm	FI-296-A	2	front	0.457
836.60	190	GSM 850	GPRS	31.83	-0.12	1.0 cm	FI-296-A	2	bottom	0.503
836.60	190	GSM 850	GPRS	31.83	-0.08	1.0 cm	FI-296-A	2	right	0.390
836.60	190	GSM 850	GPRS	31.83	-0.08	1.0 cm	FI-296-A	2	left	0.493
1880.00	661	GSM 1900	GPRS	28.34	0.20	1.0 cm	FI-296-A	2	back	0.750
1880.00	661	GSM 1900	GPRS	28.34	-0.20	1.0 cm	FI-296-A	2	front	0.428
1880.00	661	GSM 1900	GPRS	28.34	-0.05	1.0 cm	FI-296-A	2	bottom	0.642
1880.00	661	GSM 1900	GPRS	28.34	0.17	1.0 cm	FI-296-A	2	right	0.217
1880.00	661	GSM 1900	GPRS	28.34	0.00	1.0 cm	FI-296-A	2	left	0.203
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 16-16
WCDMA Wireless Router Body SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	Side	SAR (1g)
MHz	Ch.								(W/kg)
836.60	4183	WCDMA 850	RMC	22.95	-0.04	1.0 cm	FI-296-A	back	0.361
836.60	4183	WCDMA 850	RMC	22.95	0.00	1.0 cm	FI-296-A	front	0.254
836.60	4183	WCDMA 850	RMC	22.95	-0.05	1.0 cm	FI-296-A	bottom	0.275
836.60	4183	WCDMA 850	RMC	22.95	-0.04	1.0 cm	FI-296-A	right	0.236
836.60	4183	WCDMA 850	RMC	22.95	-0.06	1.0 cm	FI-296-A	left	0.326
1852.40	9262	WCDMA 1900	RMC	22.84	0.00	1.0 cm	FI-296-A	back	0.796
1880.00	9400	WCDMA 1900	RMC	22.90	-0.06	1.0 cm	FI-296-A	back	0.935
1907.60	9538	WCDMA 1900	RMC	22.97	0.03	1.0 cm	FI-296-A	back	1.040
1880.00	9400	WCDMA 1900	RMC	22.90	0.02	1.0 cm	FI-296-A	front	0.521
1880.00	9400	WCDMA 1900	RMC	22.90	-0.06	1.0 cm	FI-296-A	bottom	0.762
1880.00	9400	WCDMA 1900	RMC	22.90	-0.10	1.0 cm	FI-296-A	right	0.066
1880.00	9400	WCDMA 1900	RMC	22.90	-0.02	1.0 cm	FI-296-A	left	0.228
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 16-17
LTE Band 17 Wireless Router Body SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Spacing	Bandwidth (MHz)	Phone Serial Number	RB Size	RB Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	QPSK	21.68	-0.07	1	1.0 cm	10	AI-065-A	25	12	back	0.213
710.00	23790	LTE Band 17	QPSK	22.54	0.01	0	1.0 cm	10	AI-065-A	1	0	back	**0.296**
710.00	23790	LTE Band 17	QPSK	22.20	0.13	0	1.0 cm	10	AI-065-A	1	49	back	0.255
710.00	23790	LTE Band 17	16QAM	21.25	0.05	1	1.0 cm	10	AI-065-A	25	12	back	0.185
710.00	23790	LTE Band 17	16QAM	21.18	-0.12	1	1.0 cm	10	AI-065-A	1	0	back	0.257
710.00	23790	LTE Band 17	16QAM	21.10	0.18	1	1.0 cm	10	AI-065-A	1	49	back	0.248
710.00	23790	LTE Band 17	QPSK	21.68	0.00	1	1.0 cm	10	AI-065-A	25	12	front	0.138
710.00	23790	LTE Band 17	QPSK	22.54	-0.13	0	1.0 cm	10	AI-065-A	1	0	front	**0.191**
710.00	23790	LTE Band 17	QPSK	22.20	0.22	0	1.0 cm	10	AI-065-A	1	49	front	0.171
710.00	23790	LTE Band 17	16QAM	21.25	0.01	1	1.0 cm	10	AI-065-A	25	12	front	0.122
710.00	23790	LTE Band 17	16QAM	21.18	-0.07	1	1.0 cm	10	AI-065-A	1	0	front	0.167
710.00	23790	LTE Band 17	16QAM	21.10	0.12	1	1.0 cm	10	AI-065-A	1	49	front	0.149
710.00	23790	LTE Band 17	QPSK	21.68	0.12	1	1.0 cm	10	AI-065-A	25	12	bottom	0.086
710.00	23790	LTE Band 17	QPSK	22.54	0.06	0	1.0 cm	10	AI-065-A	1	0	bottom	**0.107**
710.00	23790	LTE Band 17	QPSK	22.20	0.01	0	1.0 cm	10	AI-065-A	1	49	bottom	0.106
710.00	23790	LTE Band 17	16QAM	21.25	0.06	1	1.0 cm	10	AI-065-A	25	12	bottom	0.075
710.00	23790	LTE Band 17	16QAM	21.18	0.10	1	1.0 cm	10	AI-065-A	1	0	bottom	0.094
710.00	23790	LTE Band 17	16QAM	21.10	-0.12	1	1.0 cm	10	AI-065-A	1	49	bottom	0.086
710.00	23790	LTE Band 17	QPSK	21.68	-0.02	1	1.0 cm	10	AI-065-A	25	12	right	0.175
710.00	23790	LTE Band 17	QPSK	22.54	0.19	0	1.0 cm	10	AI-065-A	1	0	right	**0.252**
710.00	23790	LTE Band 17	QPSK	22.20	0.14	0	1.0 cm	10	AI-065-A	1	49	right	0.224
710.00	23790	LTE Band 17	16QAM	21.25	-0.04	1	1.0 cm	10	AI-065-A	25	12	right	0.155
710.00	23790	LTE Band 17	16QAM	21.18	-0.02	1	1.0 cm	10	AI-065-A	1	0	right	0.220
710.00	23790	LTE Band 17	16QAM	21.10	-0.13	1	1.0 cm	10	AI-065-A	1	49	right	0.175
710.00	23790	LTE Band 17	QPSK	21.68	-0.12	1	1.0 cm	10	AI-065-A	25	12	left	0.093
710.00	23790	LTE Band 17	QPSK	22.54	0.14	0	1.0 cm	10	AI-065-A	1	0	left	**0.119**
710.00	23790	LTE Band 17	QPSK	22.20	-0.01	0	1.0 cm	10	AI-065-A	1	49	left	0.117
710.00	23790	LTE Band 17	16QAM	21.25	0.07	1	1.0 cm	10	AI-065-A	25	12	left	0.081
710.00	23790	LTE Band 17	16QAM	21.18	-0.11	1	1.0 cm	10	AI-065-A	1	0	left	0.105
710.00	23790	LTE Band 17	16QAM	21.10	0.06	1	1.0 cm	10	AI-065-A	1	49	left	0.096
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 16-18
LTE Band 4 (AWS) Wireless Router Body SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Spacing	Bandwidth (MHz)	Phone Serial Number	RB Size	RB Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	-0.04	1	1.0 cm	10	AI-065-A	25	12	back	0.474
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	-0.01	0	1.0 cm	10	AI-065-A	1	0	back	0.564
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.13	0	1.0 cm	10	AI-065-A	1	49	back	**0.578**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	-0.02	1	1.0 cm	10	AI-065-A	25	12	back	0.394
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.12	1	1.0 cm	10	AI-065-A	1	0	back	0.422
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.18	1	1.0 cm	10	AI-065-A	1	49	back	0.434
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.01	1	1.0 cm	10	AI-065-A	25	12	front	0.349
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.11	0	1.0 cm	10	AI-065-A	1	0	front	0.409
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.03	0	1.0 cm	10	AI-065-A	1	49	front	**0.428**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	-0.01	1	1.0 cm	10	AI-065-A	25	12	front	0.311
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.01	1	1.0 cm	10	AI-065-A	1	0	front	0.325
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.12	1	1.0 cm	10	AI-065-A	1	49	front	0.352
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	1.17	1	1.0 cm	10	AI-065-A	25	12	bottom	0.393
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	-0.40	0	1.0 cm	10	AI-065-A	1	0	bottom	0.460
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	-0.73	0	1.0 cm	10	AI-065-A	1	0	bottom	**0.494**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.67	2	1.0 cm	10	AI-065-A	25	12	bottom	0.358
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.21	1	1.0 cm	10	AI-065-A	1	0	bottom	0.374
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	-0.12	1	1.0 cm	10	AI-065-A	1	49	bottom	0.401
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.36	1	1.0 cm	10	AI-065-A	25	12	right	0.074
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.03	0	1.0 cm	10	AI-065-A	1	0	right	0.085
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.14	0	1.0 cm	10	AI-065-A	1	49	right	**0.090**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	0.08	1	1.0 cm	10	AI-065-A	25	12	right	0.065
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	-0.14	1	1.0 cm	10	AI-065-A	1	0	right	0.071
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	-0.13	1	1.0 cm	10	AI-065-A	1	49	right	0.072
1732.50	20175	LTE Band 4 (AWS)	QPSK	22.02	0.20	1	1.0 cm	10	AI-065-A	25	12	left	0.216
1715.00	20000	LTE Band 4 (AWS)	QPSK	22.95	0.14	0	1.0 cm	10	AI-065-A	1	0	left	0.254
1715.00	20000	LTE Band 4 (AWS)	QPSK	23.08	0.18	0	1.0 cm	10	AI-065-A	1	49	left	**0.280**
1732.50	20175	LTE Band 4 (AWS)	16QAM	21.44	-0.01	1	1.0 cm	10	AI-065-A	25	12	left	0.192
1715.00	20000	LTE Band 4 (AWS)	16QAM	21.89	0.14	1	1.0 cm	10	AI-065-A	1	0	left	0.201
1715.00	20000	LTE Band 4 (AWS)	16QAM	22.01	0.00	1	1.0 cm	10	AI-065-A	1	49	left	0.218
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								**Body 1.6 W/kg (mW/g)** averaged over 1 gram					

Note: Per KDB Publication 941225 D05 footnotes 6 and 8 on page 4, when the maximum average output power of 1 RB allocations is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, low channel was tested for the 1 RB allocations for LTE Band 4 (AWS).

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Table 16-19
WLAN Wireless Router SAR Data

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	14.25	0.11	1.0 cm	FI-296-A	1	back	0.049
2437	6	IEEE 802.11b	DSSS	14.25	0.01	1.0 cm	FI-296-A	1	front	0.008
2437	6	IEEE 802.11b	DSSS	14.25	-0.02	1.0 cm	FI-296-A	1	top	0.004
2437	6	IEEE 802.11b	DSSS	14.25	-0.12	1.0 cm	FI-296-A	1	right	0.020
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 Additional 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. Band 4 LTE 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.
7. SAR 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.
8. 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, DAE and probe as the SAR tests in the same time period.

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

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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 (left, right, cheek/touch, tilt/ear, extended and retracted) 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.

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 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.
    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 since the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM.
    i. Per Page 4, 4) B), I), when the SAR for QPSK 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 since SAR is not > 1.45 W/kg for the highest bandwidth are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth and conducted powers of the smaller bandwidths were not more than 0.5 dB higher than the larger bandwidth.
    k. Per Page 5, 5) B) I), smaller bandwidths are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth.
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.

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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.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting 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 WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting 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. 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 Edge for the GSM/WCDMA and LTE antenna was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 14.3).
2. Bottom and Left Edges for the WLAN transmitter were not tested since the antenna distance from the edges were greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 14.3).
3. 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).
4. For Hotspot SAR testing, transmission modes were evaluated separately for SAR.
5. 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. The RSS-102 Issue 4 §3.13 refers to this recommended procedure for such devices.

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·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
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	0.230	0.009	0.239	Head SAR	Right Cheek	0.087	0.009	0.096
	Right Tilt	0.138	0.005	0.143		Right Tilt	0.064	0.005	0.069
	Left Cheek	0.269	0.021	**0.290**		Left Cheek	0.120	0.021	**0.141**
	Left Tilt	0.163	0.008	0.171		Left Tilt	0.050	0.008	0.058

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	0.174	0.009	0.183	Head SAR	Right Cheek	0.154	0.009	0.163
	Right Tilt	0.106	0.005	0.111		Right Tilt	0.107	0.005	0.112
	Left Cheek	0.215	0.021	**0.236**		Left Cheek	0.161	0.021	**0.182**
	Left Tilt	0.144	0.008	0.152		Left Tilt	0.078	0.008	0.086

The above tables represent 2.4 GHz WLAN client data simultaneously transmitting while being held to the ear during a voice call.

When the user utilizes multiple services in WCDMA 3G mode (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/Data + WLAN Hotspot scenario.

Table 17-2
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	0.113	0.009	0.122	Head SAR	Right Cheek	0.191	0.009	0.200
	Right Tilt	0.070	0.005	0.075		Right Tilt	0.078	0.005	0.083
	Left Cheek	0.149	0.021	**0.170**		Left Cheek	0.220	0.021	**0.241**
	Left Tilt	0.073	0.008	0.081		Left Tilt	0.076	0.008	0.084

The above tables represent 2.4 GHz WLAN client data simultaneously transmitting while being held to the ear during a LTE VoIP call.

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.230	0.094	0.324
	Right Tilt	0.138	0.063	0.201
	Left Cheek	0.269	0.136	**0.405**
	Left Tilt	0.163	0.085	0.248

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.087	0.094	0.181
	Right Tilt	0.064	0.063	0.127
	Left Cheek	0.120	0.136	**0.256**
	Left Tilt	0.050	0.085	0.135

Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.174	0.094	0.268
	Right Tilt	0.106	0.063	0.169
	Left Cheek	0.215	0.136	**0.351**
	Left Tilt	0.144	0.085	0.229

Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.154	0.094	0.248
	Right Tilt	0.107	0.063	0.170
	Left Cheek	0.161	0.136	**0.297**
	Left Tilt	0.078	0.085	0.163

The above tables represent 5 GHz WLAN client data simultaneously transmitting while being held to the ear during a circuit switched voice call.

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17.4 Body-Worn Simultaneous Transmission Analysis

Table 17-4
Simultaneous Transmission Scenario (Body-Worn)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.471	0.049	0.520
Back Side	GSM 1900	0.493	0.049	0.542
Back Side	WCDMA 850	0.361	0.049	0.410
Back Side	WCDMA 1900	1.040	0.049	**1.089**
Back Side	LTE Band 17	0.296	0.049	0.345
Back Side	LTE Band 4 (AWS)	0.578	0.049	0.627

The above tables represent 2.4 GHz WLAN client data simultaneously transmitting with a licensed voice service in a body-worn accessory exposure condition during a voice call.

Table 17-5
Simultaneous Transmission Scenario (Body-Worn)

Configuration	Mode	2G/3G SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.471	0.394	0.865
Back Side	GSM 1900	0.493	0.394	0.887
Back Side	WCDMA 850	0.361	0.394	0.755
Back Side	WCDMA 1900	1.040	0.394	**1.434**

The above tables represent 5 GHz WLAN client data simultaneously transmitting with a licensed voice service in a body-worn accessory exposure condition during a circuit switched voice call.

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17.5 Hotspot SAR Simultaneous Transmission Analysis

Table 17-6
Simultaneous Transmission Scenario (Hotspot)

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	0.645	0.049	**0.694**	Body SAR	Back	0.750	0.049	**0.799**
	Front	0.457	0.008	0.465		Front	0.428	0.008	0.436
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.503	-	0.503		Bottom	0.642	-	0.642
	Right	0.390	0.020	0.410		Right	0.217	0.020	0.237
	Left	0.493	-	0.493		Left	0.203	-	0.203
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	0.361	0.049	**0.410**	Body SAR	Back	1.040	0.049	**1.089**
	Front	0.254	0.008	0.262		Front	0.521	0.008	0.529
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.275	-	0.275		Bottom	0.762	-	0.762
	Right	0.236	0.020	0.256		Right	0.066	0.020	0.086
	Left	0.326	-	0.326		Left	0.228	-	0.228
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) (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.296	0.049	**0.345**	Body SAR	Back	0.578	0.049	**0.627**
	Front	0.191	0.008	0.199		Front	0.428	0.008	0.436
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.107	-	0.107		Bottom	0.494	-	0.494
	Right	0.252	0.020	0.272		Right	0.090	0.020	0.110
	Left	0.119	-	0.119		Left	0.280	-	0.280

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.

When the user utilizes multiple services in WCDMA 3G mode (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/Data + WLAN Hotspot scenario.

17.6 Simultaneous Transmission Conclusion

The above numerical summed SAR for all simultaneous transmission scenarios was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and that 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	7/6/2011	Annual	7/6/2012	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	N/A		N/A	N/A
Pasternack	PE2209-10	Bidirectional Coupler	N/A		N/A	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	D1900V2	1900 MHz SAR Dipole	2/17/2011	Annual	2/17/2012	502
SPEAG	D2450V2	2450 MHz SAR Dipole	2/8/2011	Annual	2/8/2012	797
SPEAG	D5GHzV2	5 GHz SAR Dipole	7/26/2011	Annual	7/26/2012	1007
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/11/2011	Annual	2/11/2012	1057
SPEAG	D835V2	835 MHz SAR Dipole	2/9/2011	Annual	2/9/2012	4d047
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	EX3DV4	SAR Probe	2/14/2011	Annual	2/14/2012	3550
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	2/7/2011	Annual	2/7/2012	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	7/6/2011	Annual	7/6/2012	GB43304447
Agilent	E5515C	Wireless Communications Tester	4/21/2011	Annual	4/21/2012	US41140256
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	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	N/A		N/A	R8979500903
Narda	4772-3	Attenuator (3dB)	N/A		N/A	9406
Narda	BW-S3W2	Attenuator (3dB)	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	N/A		N/A	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	N/A		N/A	N/A
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
MiniCircuits	VLF-6000+	Low Pass Filter	N/A			N/A
MiniCircuits	VLF-6000+	Low Pass Filter	N/A			N/A

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19 MEASUREMENT UNCERTAINTIES

Applicable for < 3 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	6.0	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 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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PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

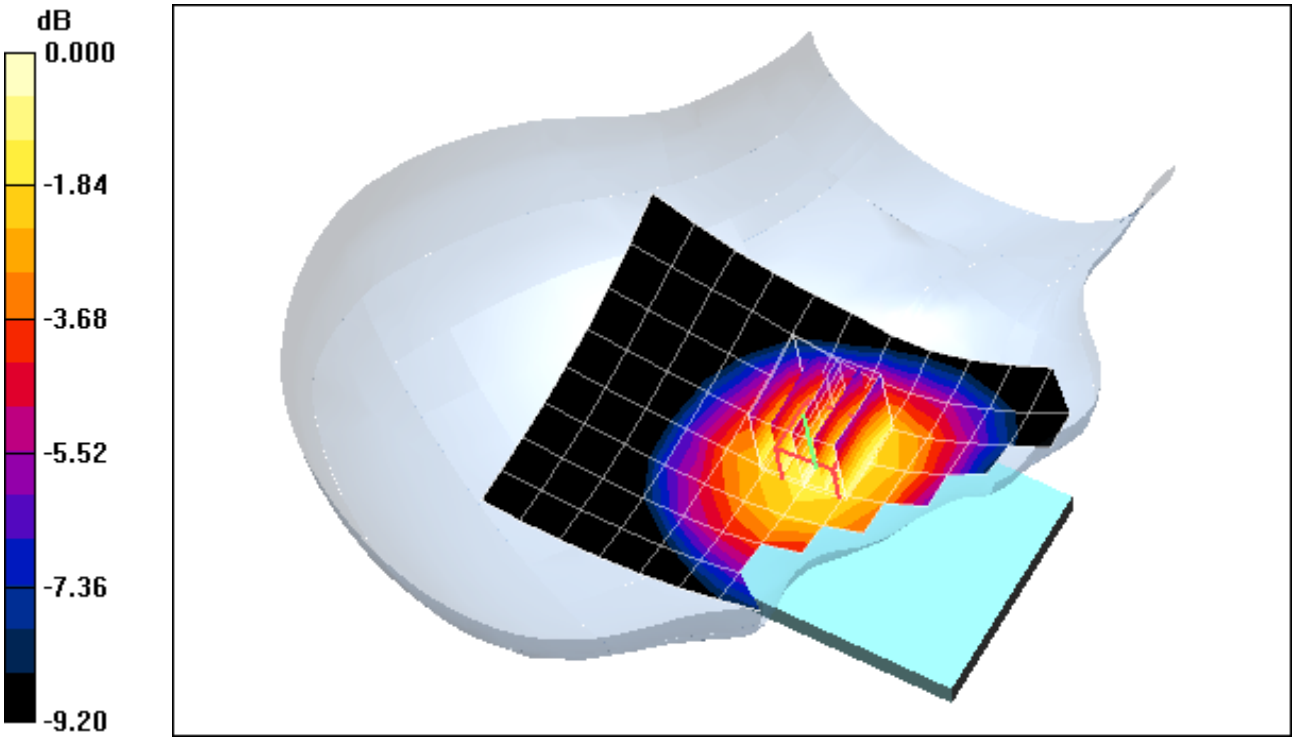
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.879 mho/m; ε_r = 43.56; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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 17, Right Head, Touch, Mid.ch, QPSK, 10 MHz BW, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.190 dB
Peak SAR (extrapolated) = 0.136 W/kg
SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.091 mW/g



0 dB = 0.116mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

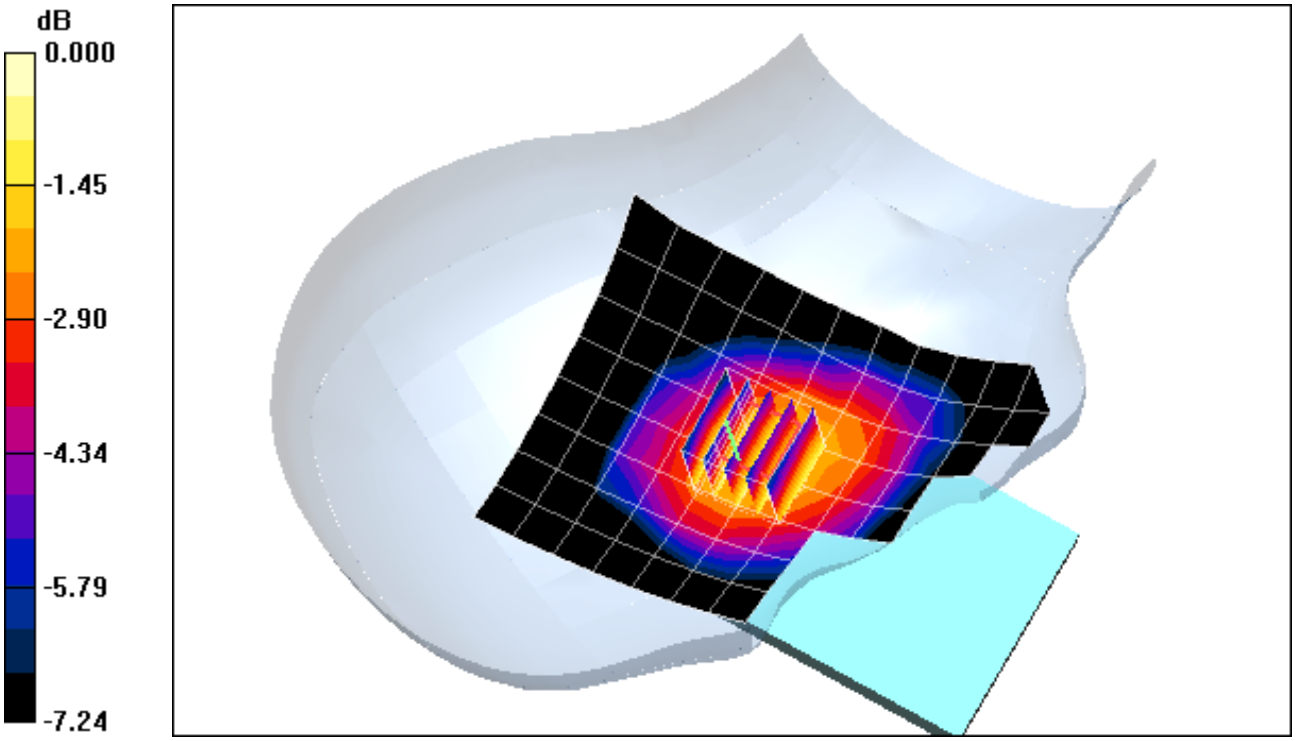
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.879 mho/m; ε_r = 43.56; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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 17, Right Head, Tilt, Mid.ch, QPSK, 10 MHz BW, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.24 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.085 W/kg
SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.056 mW/g



0 dB = 0.073mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

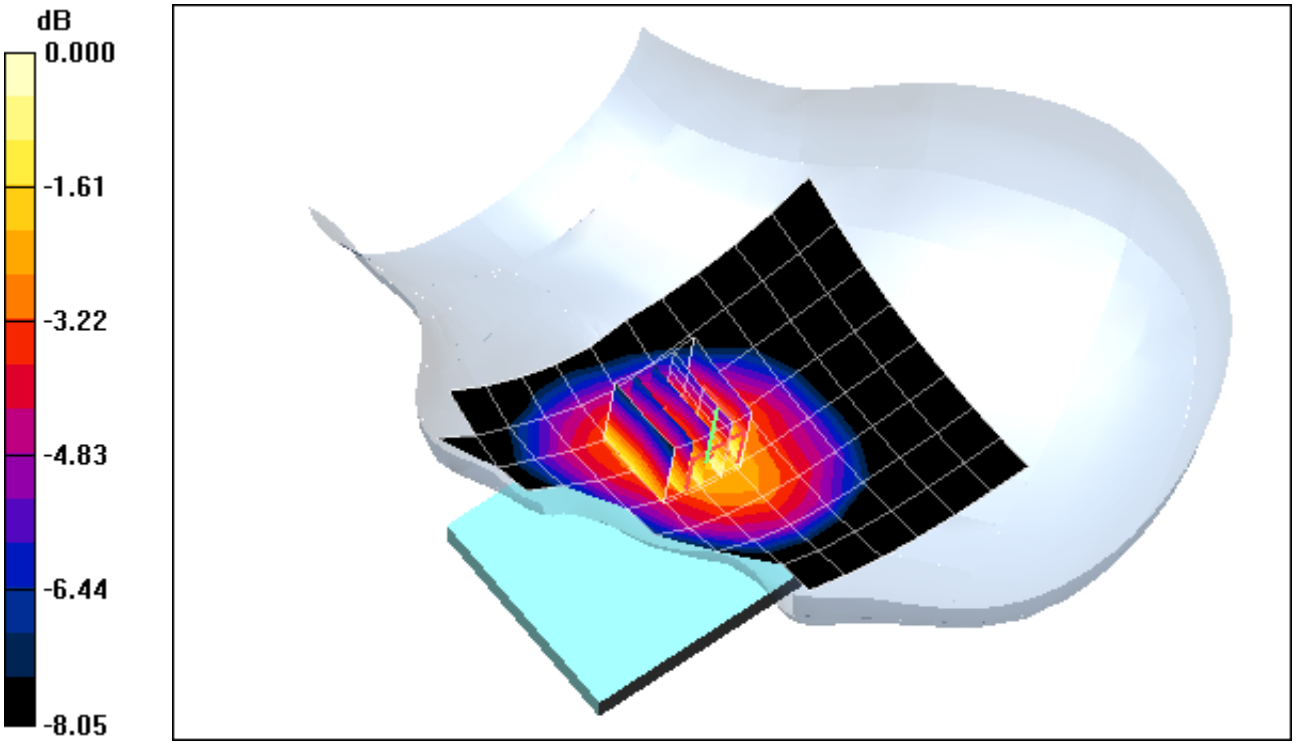
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.879 mho/m; ε_r = 43.56; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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 17, Left Head, Touch, Mid. Ch, QPSK, 10 MHz BW, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = -0.208 dB
Peak SAR (extrapolated) = 0.186 W/kg
SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.116 mW/g



0 dB = 0.157mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

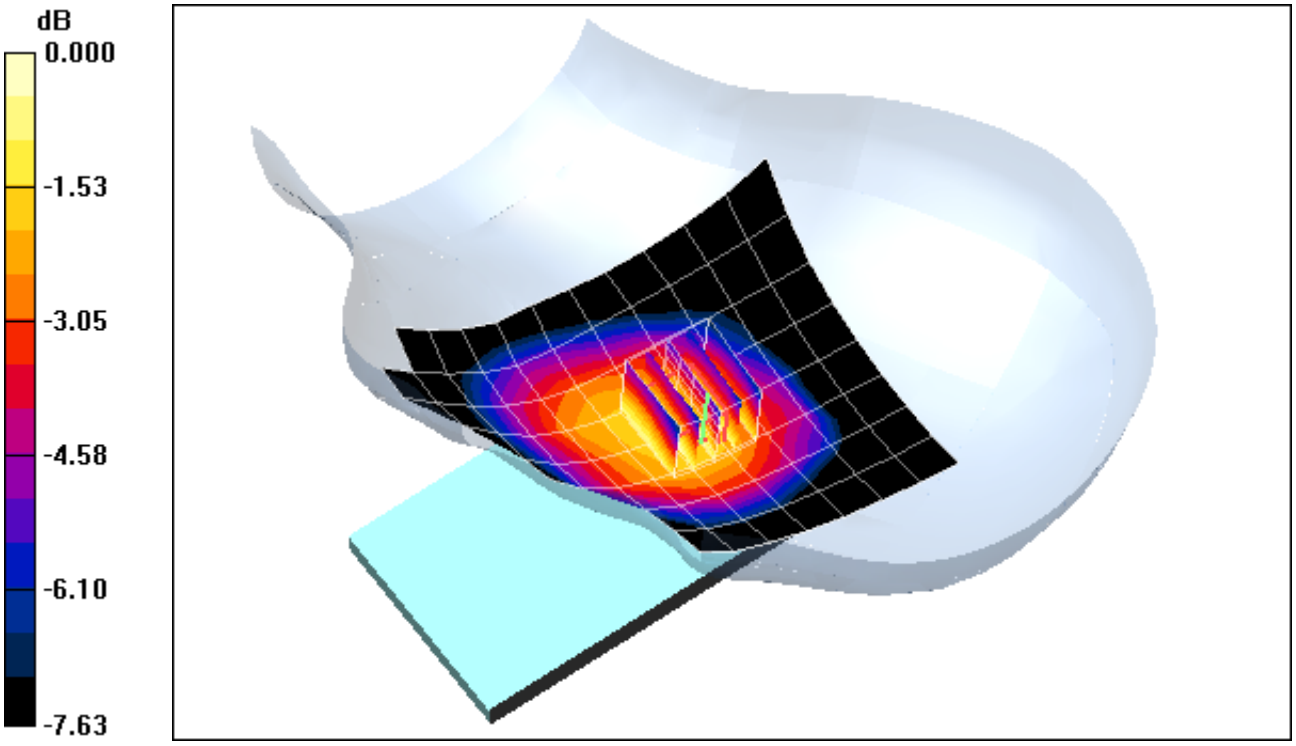
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.879 mho/m; ε_r = 43.56; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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 17, Left Head, Tilt, Mid.ch, QPSK, 10 MHz BW, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.29 V/m; Power Drift = 0.194 dB
Peak SAR (extrapolated) = 0.090 W/kg
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.058 mW/g



0 dB = 0.076mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

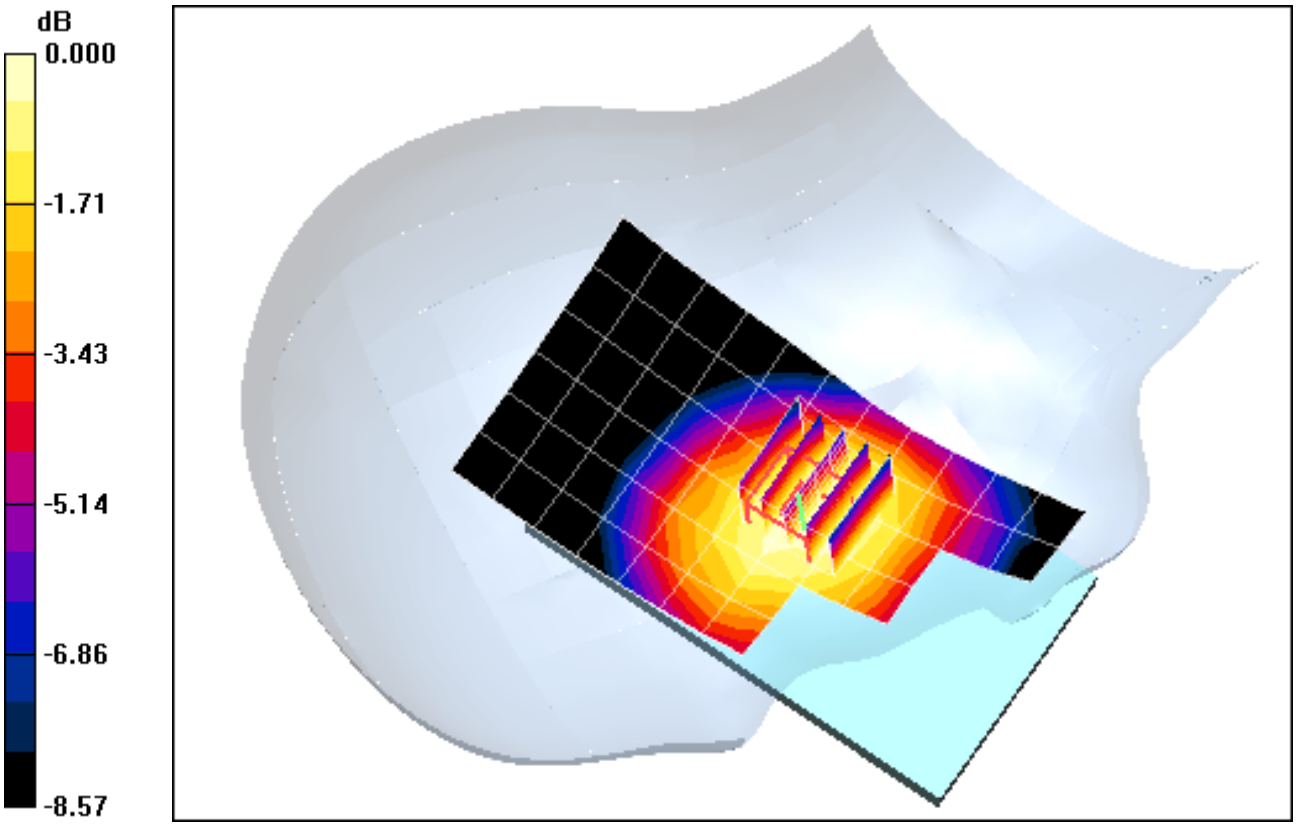
Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.39 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.181 mW/g



0 dB = 0.238mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

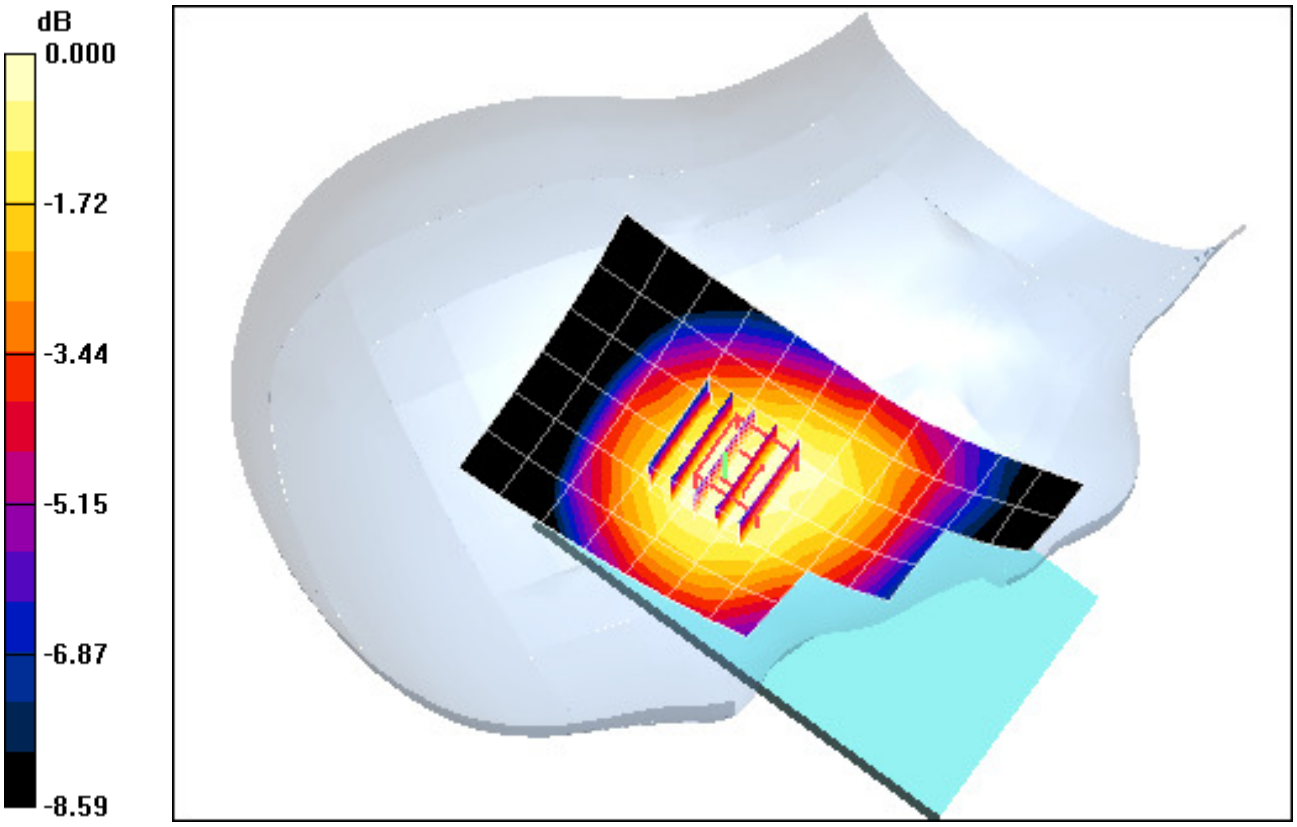
Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.85 V/m; Power Drift = 0.091 dB
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.110 mW/g



0 dB = 0.145mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

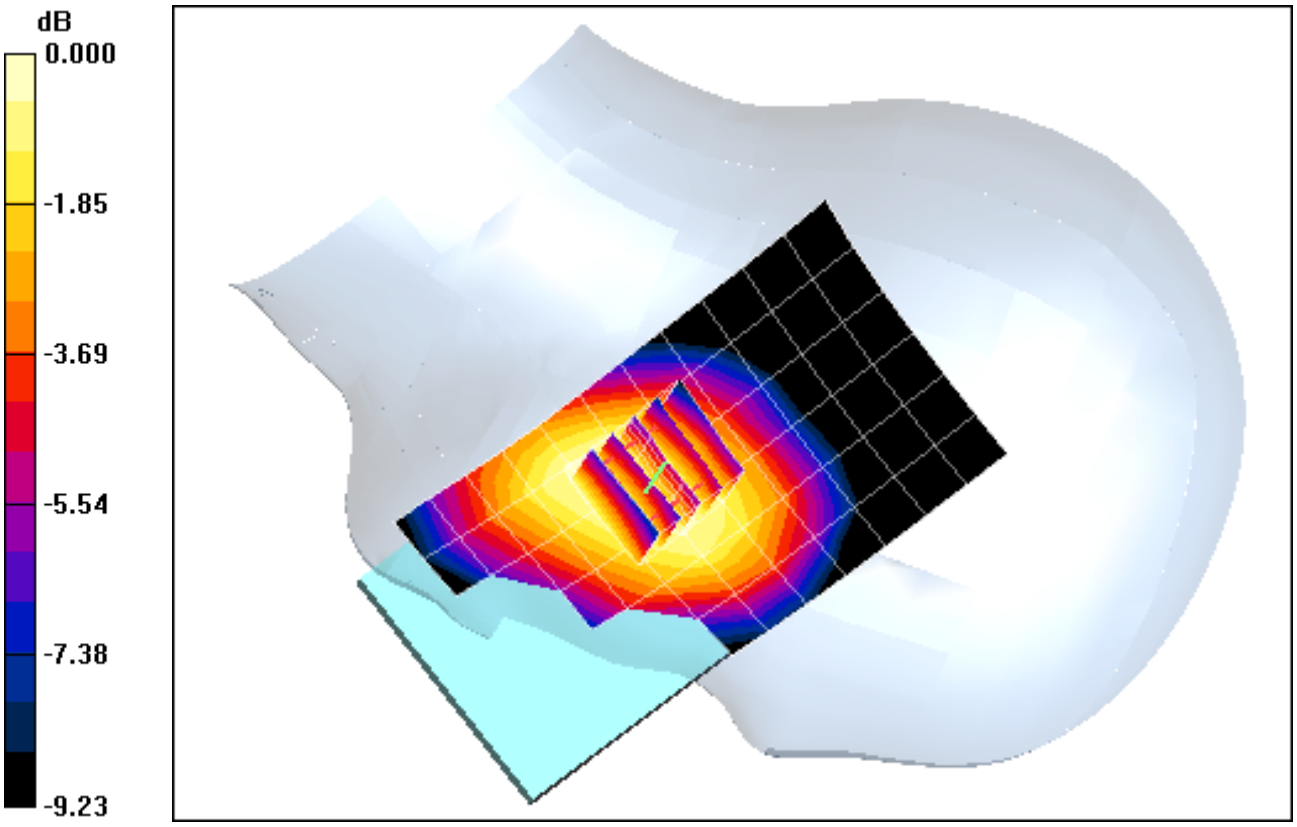
Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.38 V/m; Power Drift = 0.071 dB
Peak SAR (extrapolated) = 0.338 W/kg
SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.208 mW/g



0 dB = 0.278mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

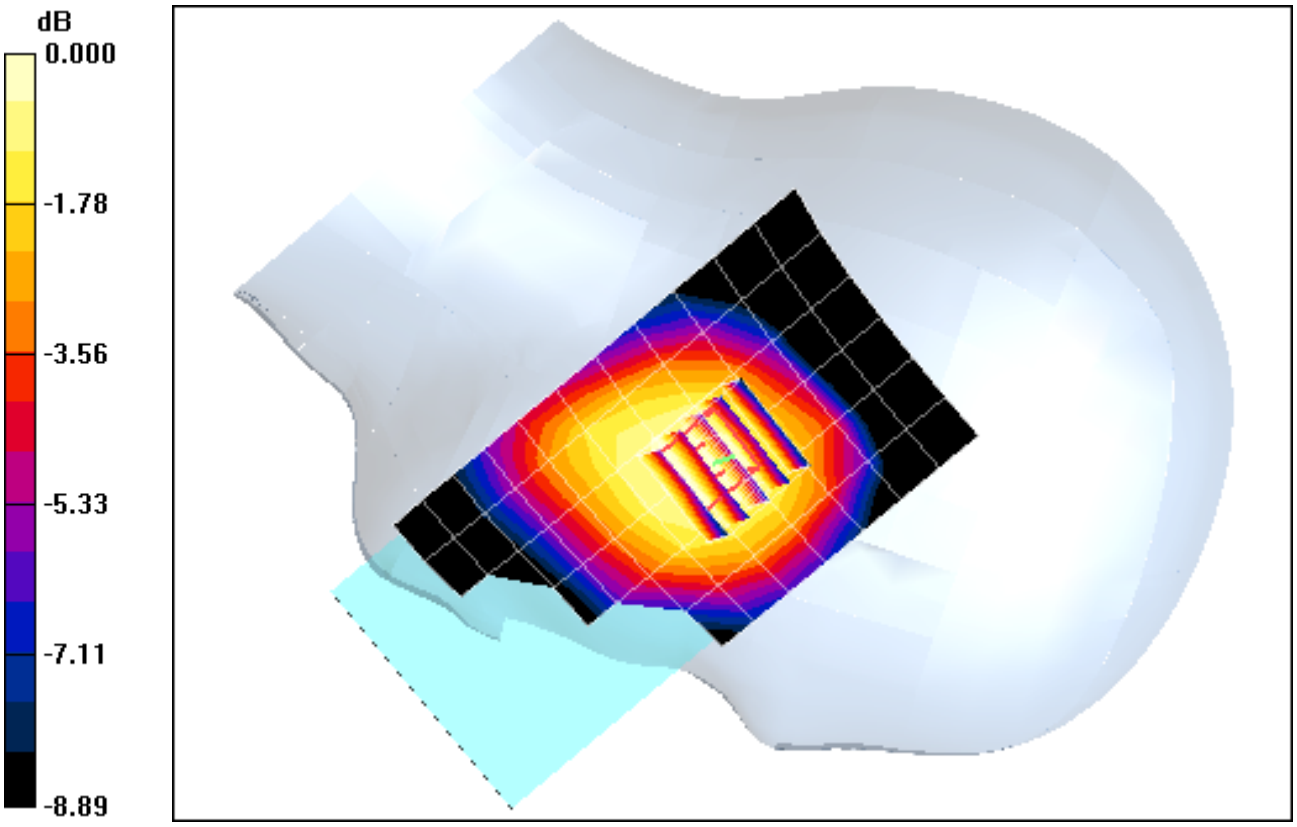
Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.89 V/m; Power Drift = 0.052 dB
Peak SAR (extrapolated) = 0.203 W/kg
SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.127 mW/g



0 dB = 0.170mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

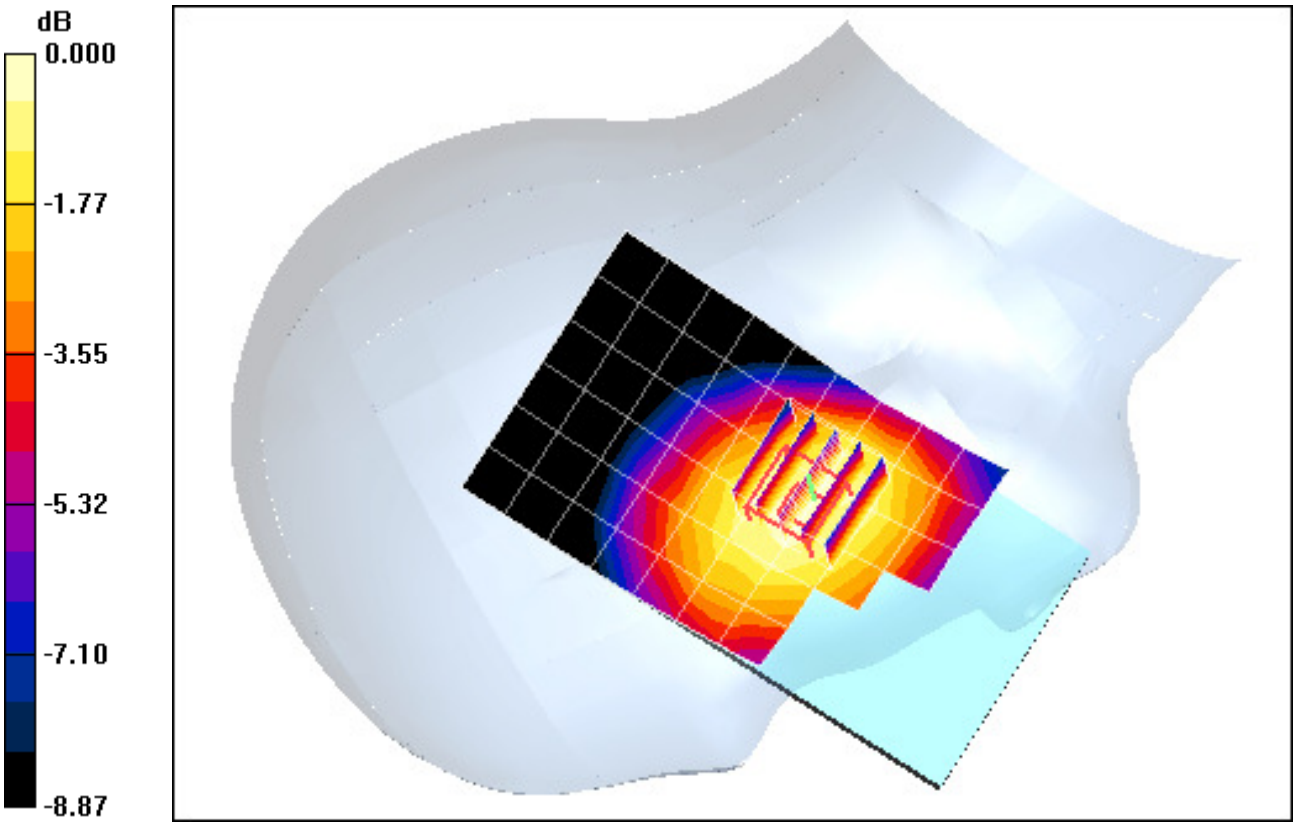
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.211 W/kg
SAR(1 g) = 0.174 mW/g; SAR(10 g) = 0.136 mW/g



0 dB = 0.183mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

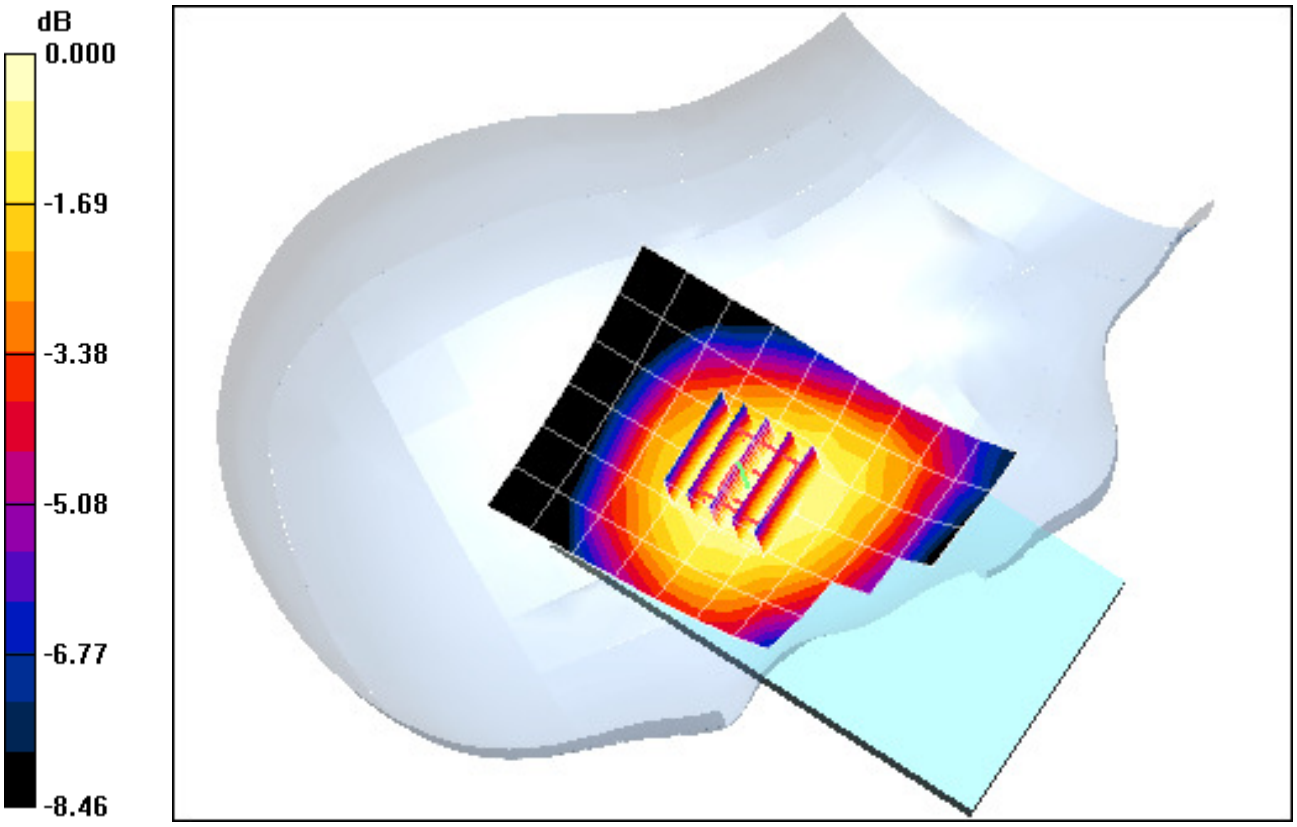
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x10x1): 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 = -0.087 dB
Peak SAR (extrapolated) = 0.129 W/kg
SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.084 mW/g



0 dB = 0.111mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

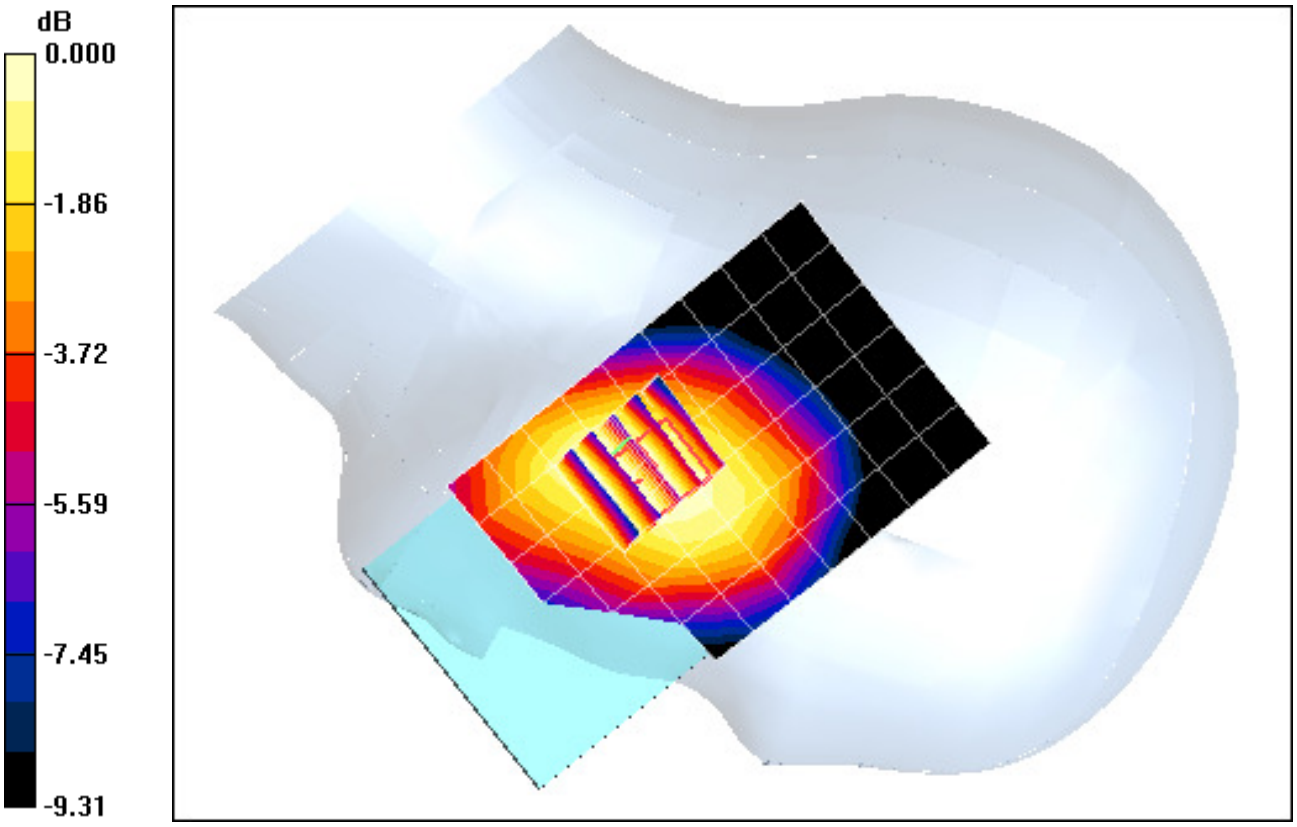
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.07 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.269 W/kg
SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.167 mW/g



0 dB = 0.224mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

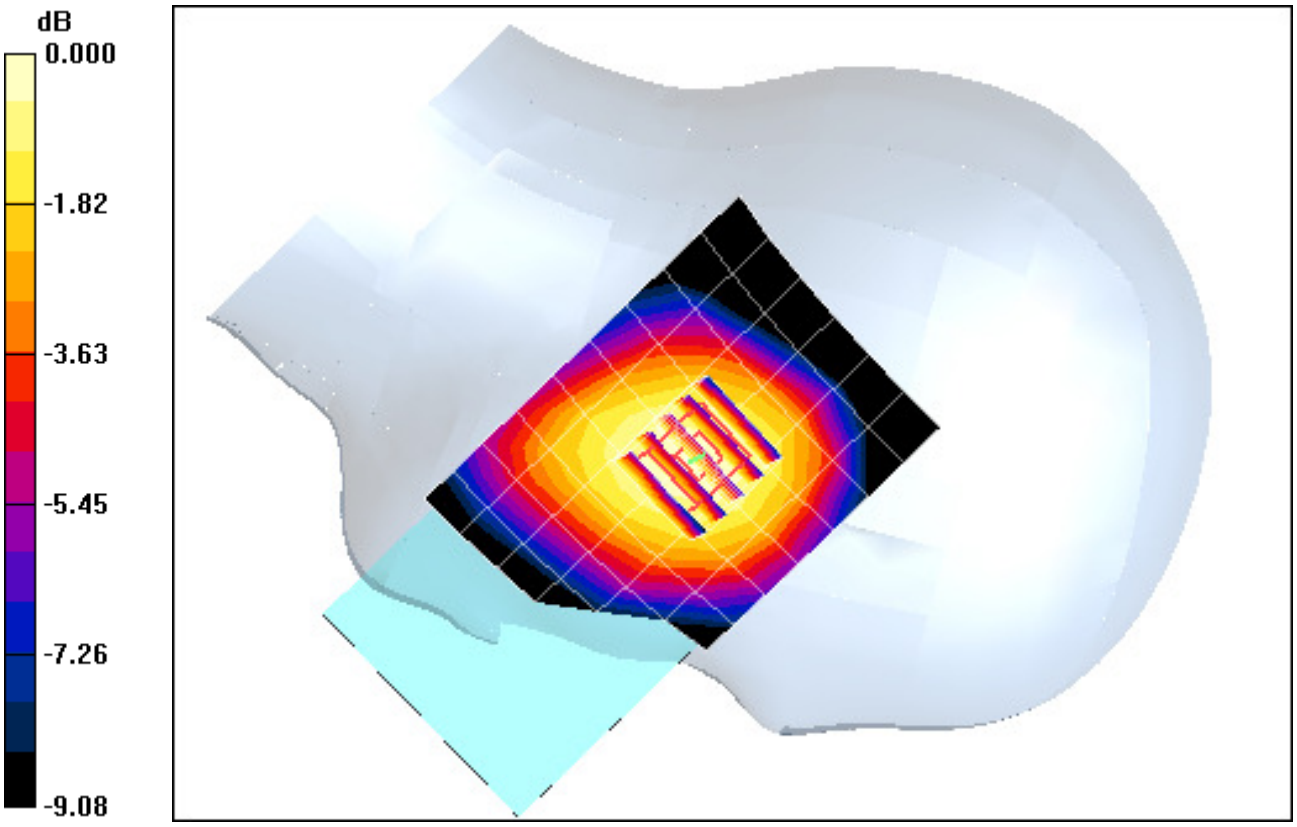
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.59 V/m; Power Drift = 0.158 dB
Peak SAR (extrapolated) = 0.178 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.112 mW/g



0 dB = 0.151mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-085-A

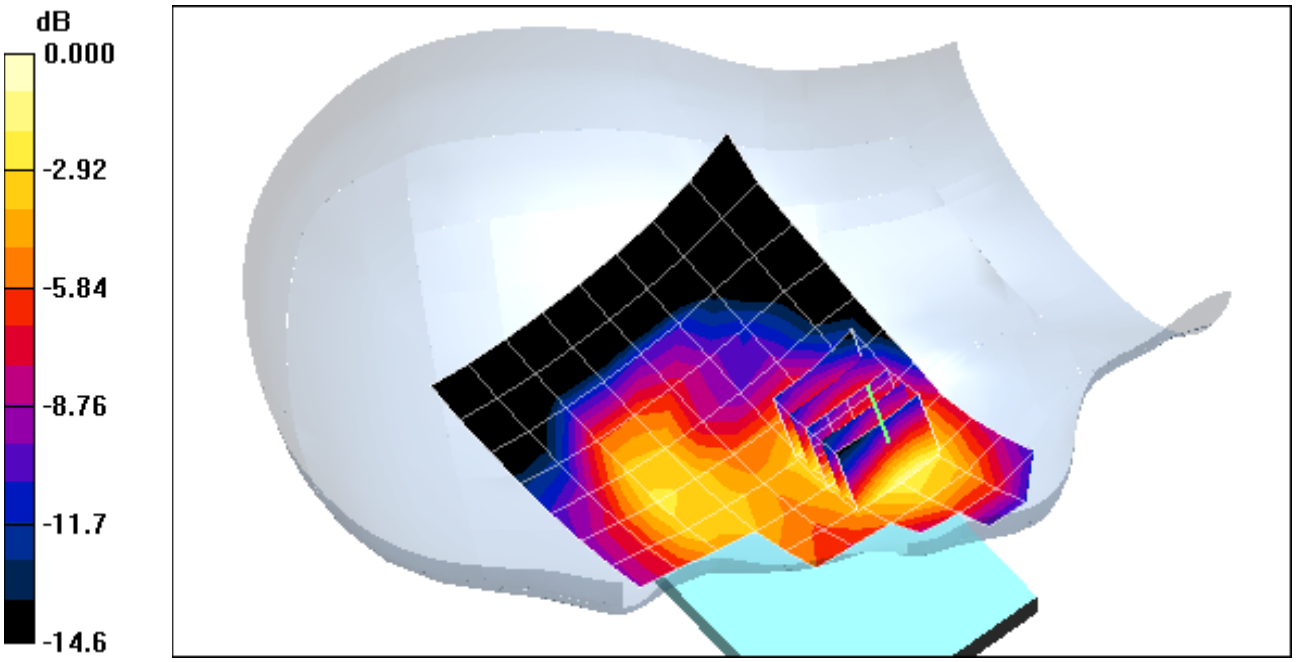
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.35 mho/m; ε_r = 38.46; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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), Right Head, Touch, Low.ch
QPSK, 10 MHz, 1 RBs, 49 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 0.282 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.122 mW/g



0 dB = 0.202mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-085-A

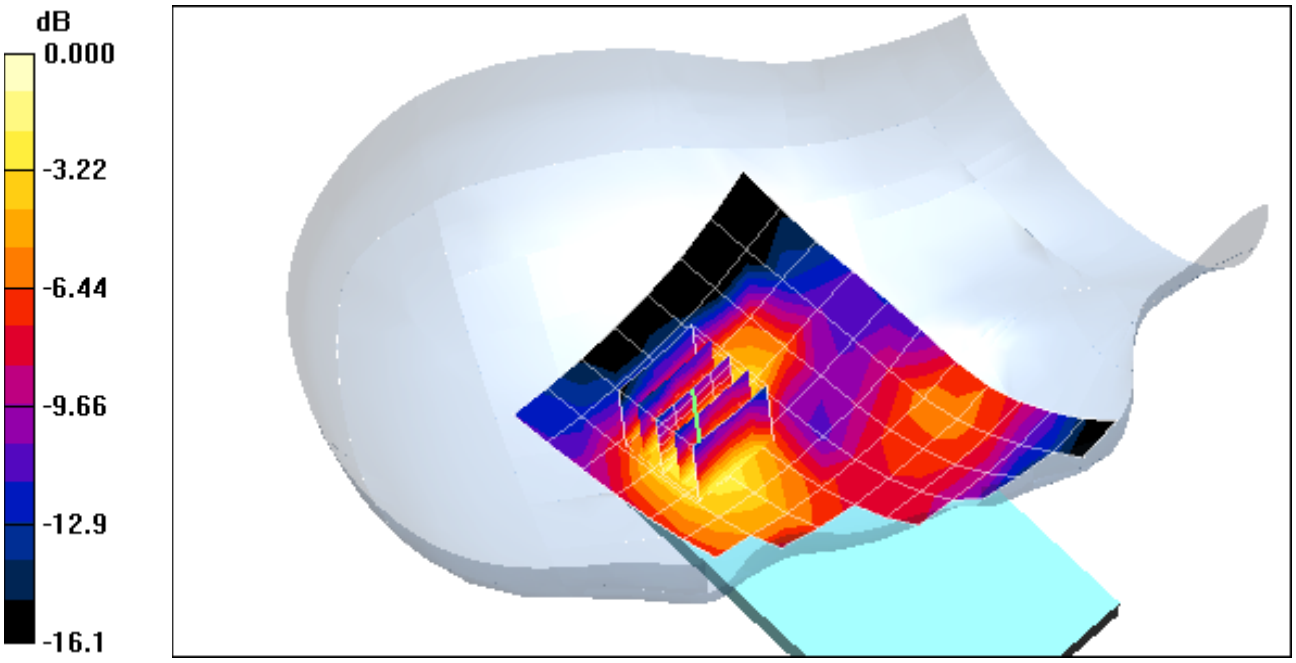
Communication System: LTE RF; MHzFrequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.35 mho/m; ε_r = 38.46; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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), Right Head, Tilt, Low.ch
QPSK, 10 MHz, 1 RBs, 49 RB Offset

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.23 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.124 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.047 mW/g



0 dB = 0.084mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-085-A

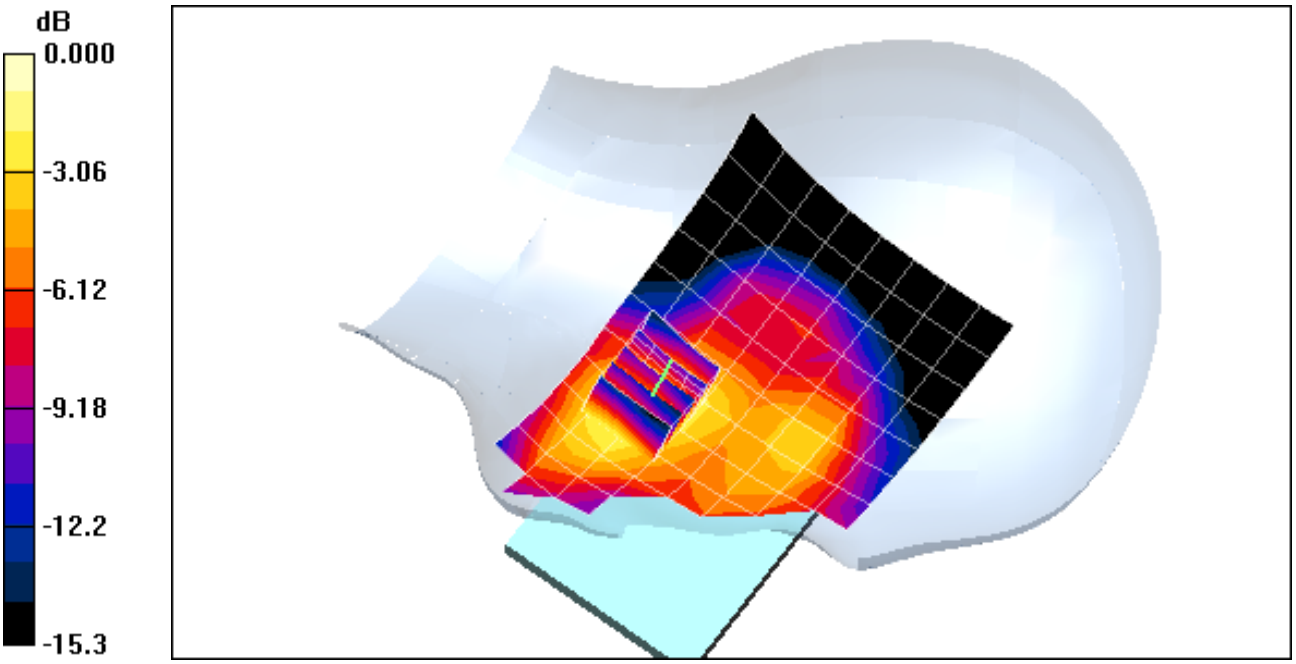
Communication System: LTE RF; MHzFrequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.35 mho/m; ε_r = 38.46; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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), Left Head, Touch, Low.Ch
QPSK, 10 MHz, 1 RBs, 49 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.336 W/kg
SAR(1 g) = 0.220 mW/g; SAR(10 g) = 0.137 mW/g



0 dB = 0.239mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-085-A

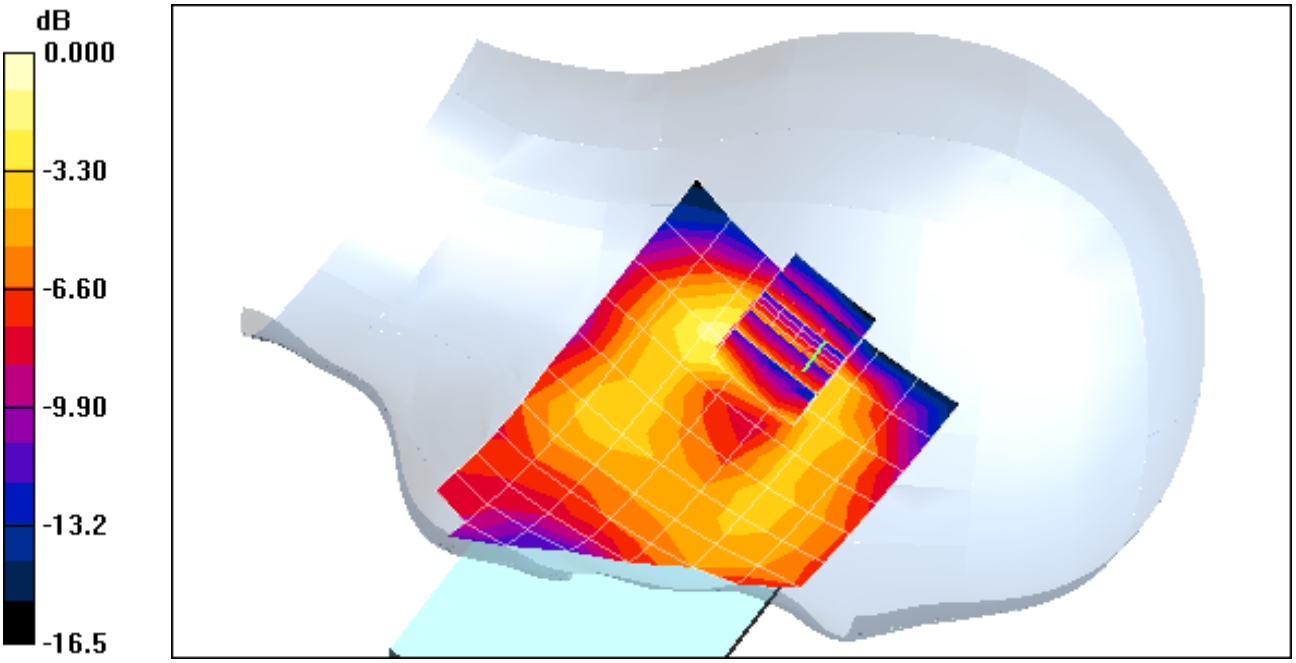
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.35 mho/m; ε_r = 38.46; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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), Left Head, Tilt, Low.ch
QPSK, 10 MHz, 1 RBs, 49 RB Offset

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.15 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.136 W/kg
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.044 mW/g



0 dB = 0.087mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

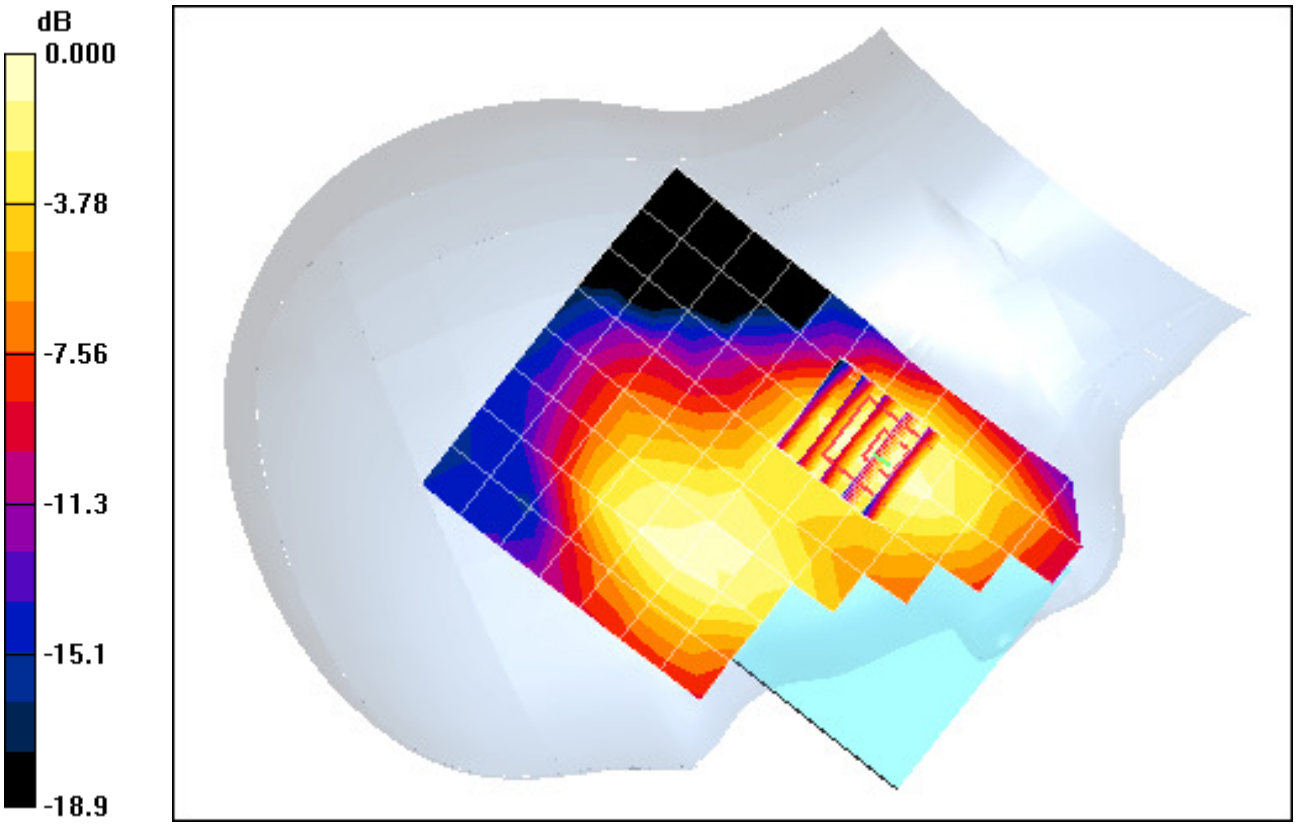
Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.10 V/m; Power Drift = 0.092 dB
Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.054 mW/g



0 dB = 0.093mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

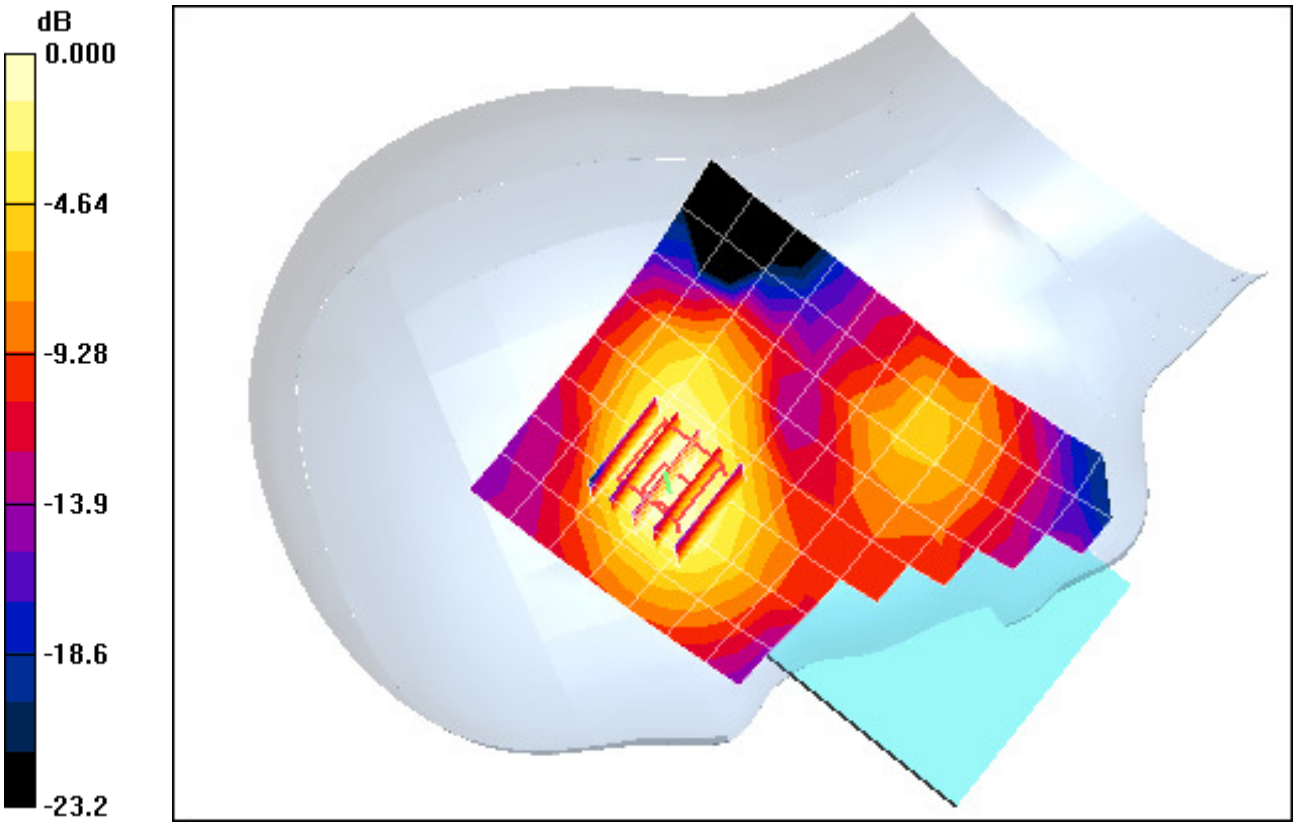
Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.89 V/m; Power Drift = -0.092 dB
Peak SAR (extrapolated) = 0.102 W/kg
SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.039 mW/g



0 dB = 0.070mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

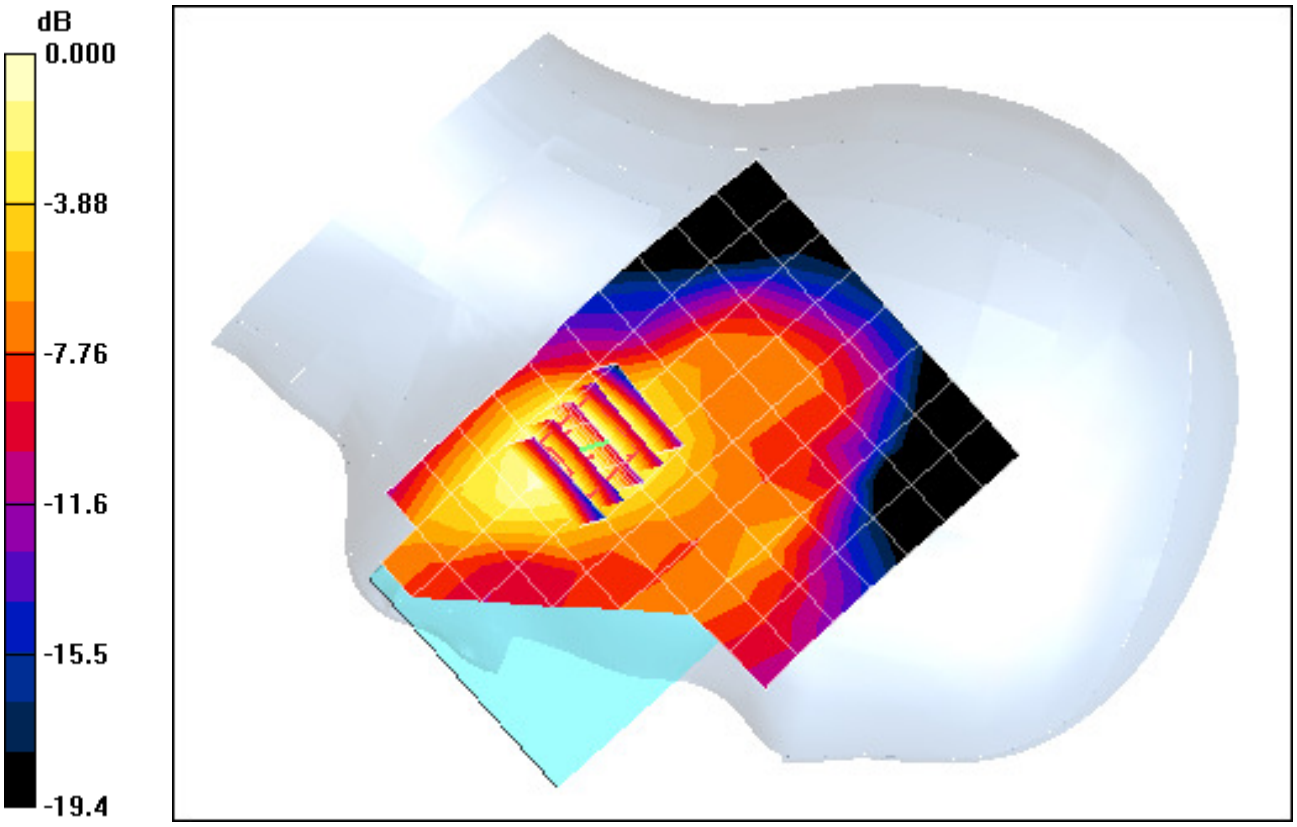
Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Left Head, Touch, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.58 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.189 W/kg
SAR(1 g) = 0.120 mW/g; SAR(10 g) = 0.074 mW/g



0 dB = 0.128mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

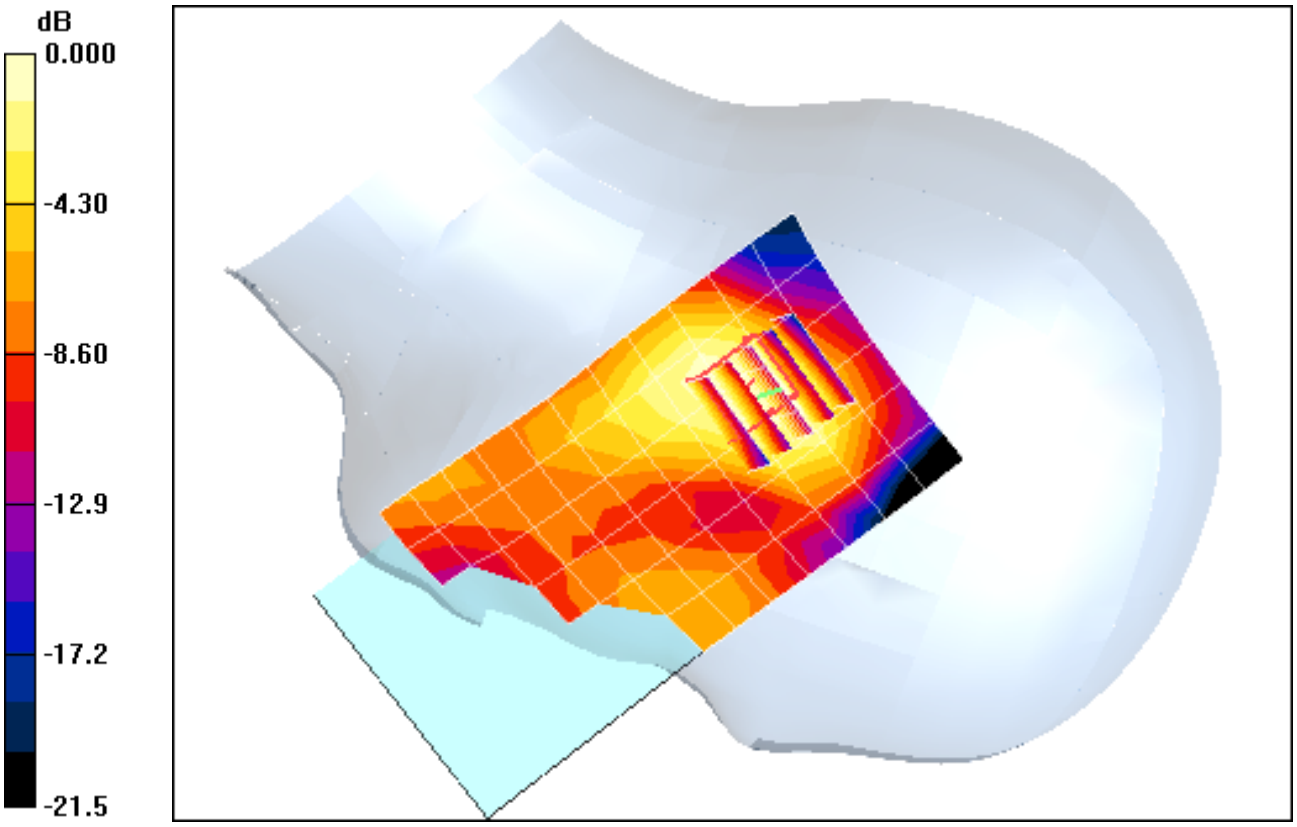
Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Left Head, Tilt, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.12 V/m; Power Drift = 0.123 dB
Peak SAR (extrapolated) = 0.081 W/kg
SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.055mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

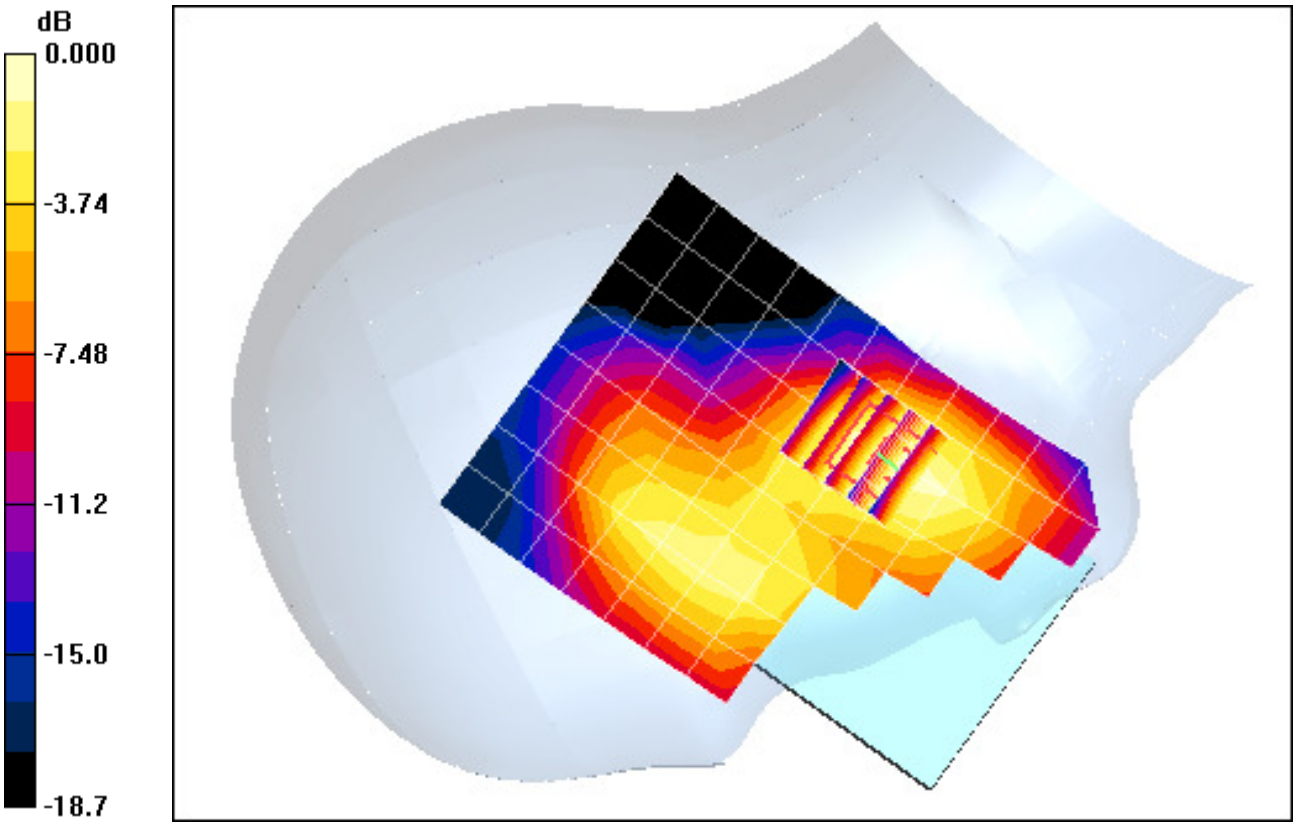
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Right Head, Touch, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.167mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

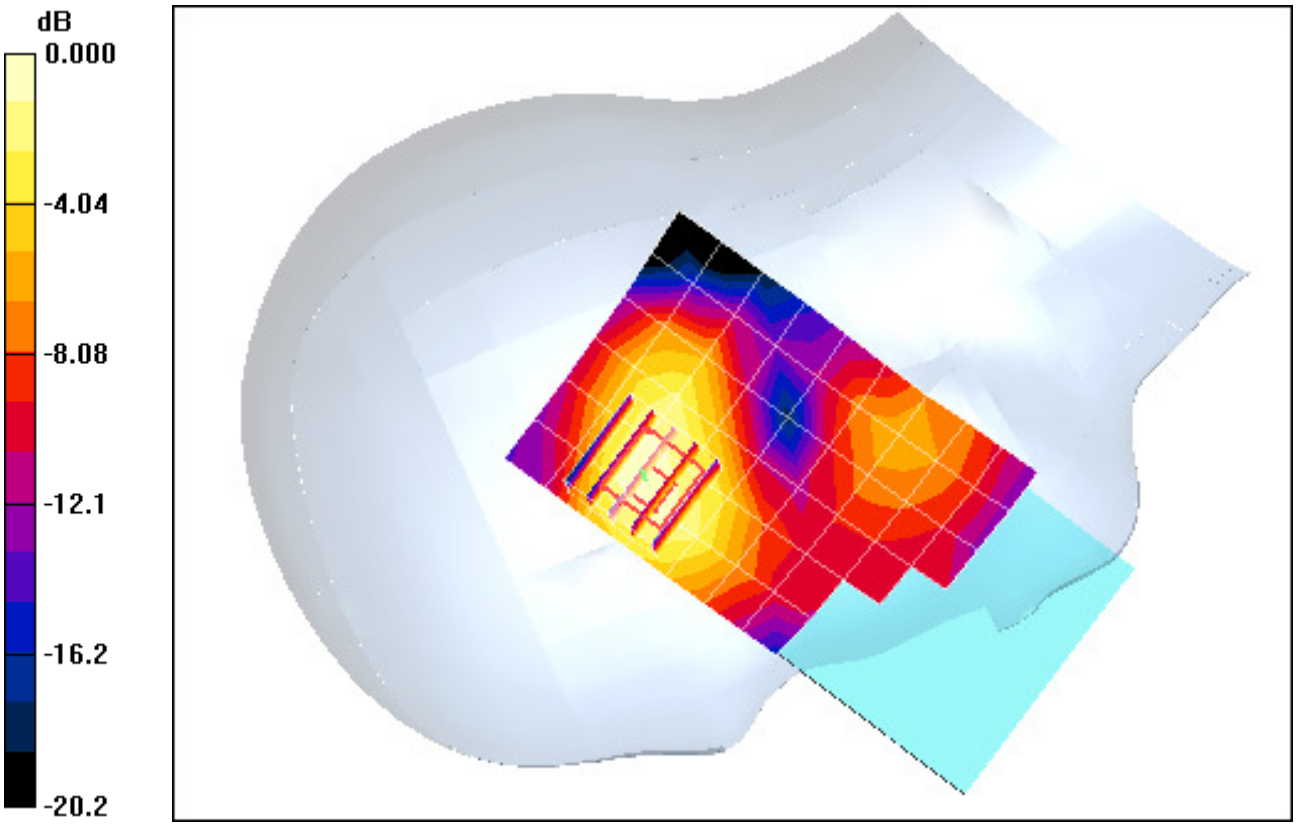
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Right Head, Tilt, Mid.ch

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.96 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.065 mW/g



0 dB = 0.116mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

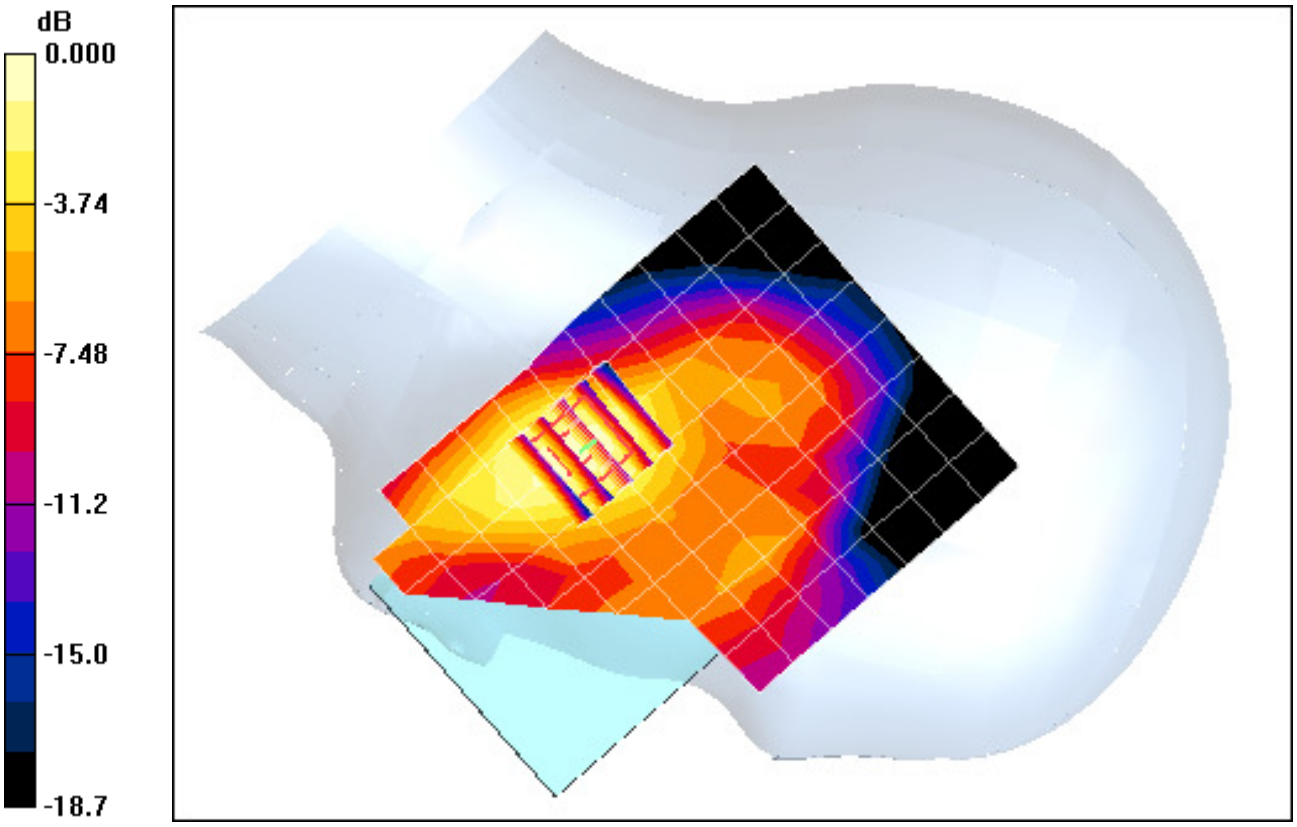
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Left Head, Touch, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.157 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.100 mW/g



0 dB = 0.175mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

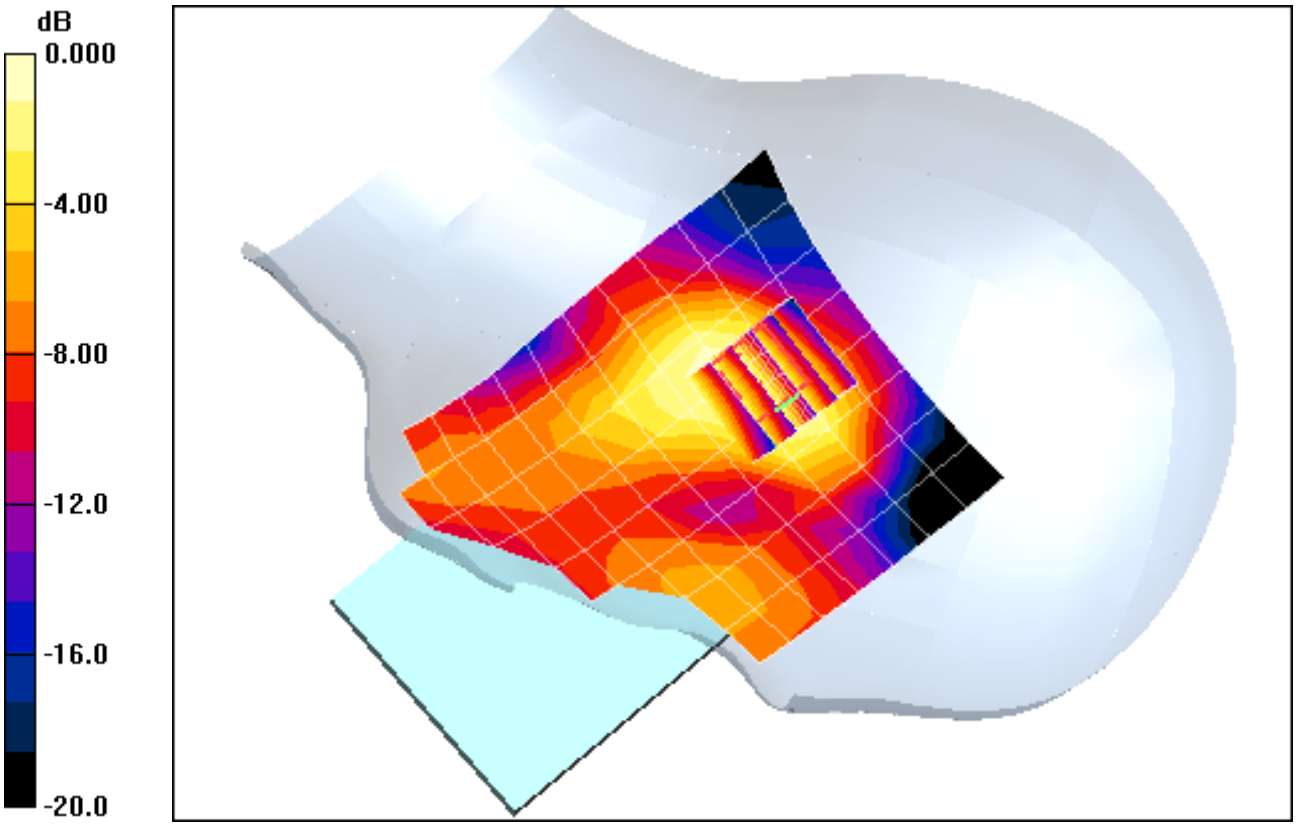
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Left Head, Tilt, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.57 V/m; Power Drift = 0.136 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.048 mW/g



0 dB = 0.083mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

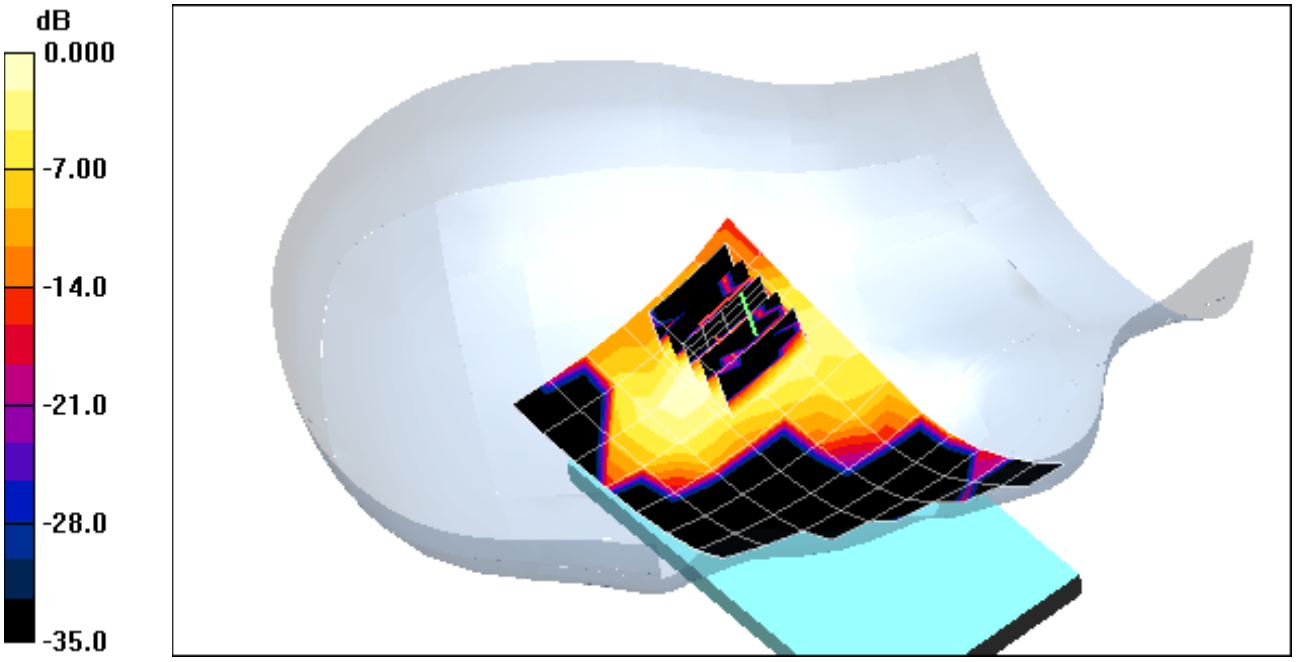
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.83 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 6, 1 Mbps

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.24 V/m; Power Drift = 0.180 dB
Peak SAR (extrapolated) = 0.037 W/kg
SAR(1 g) = 0.00942 mW/g; SAR(10 g) = 0.00359 mW/g



0 dB = 0.013mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

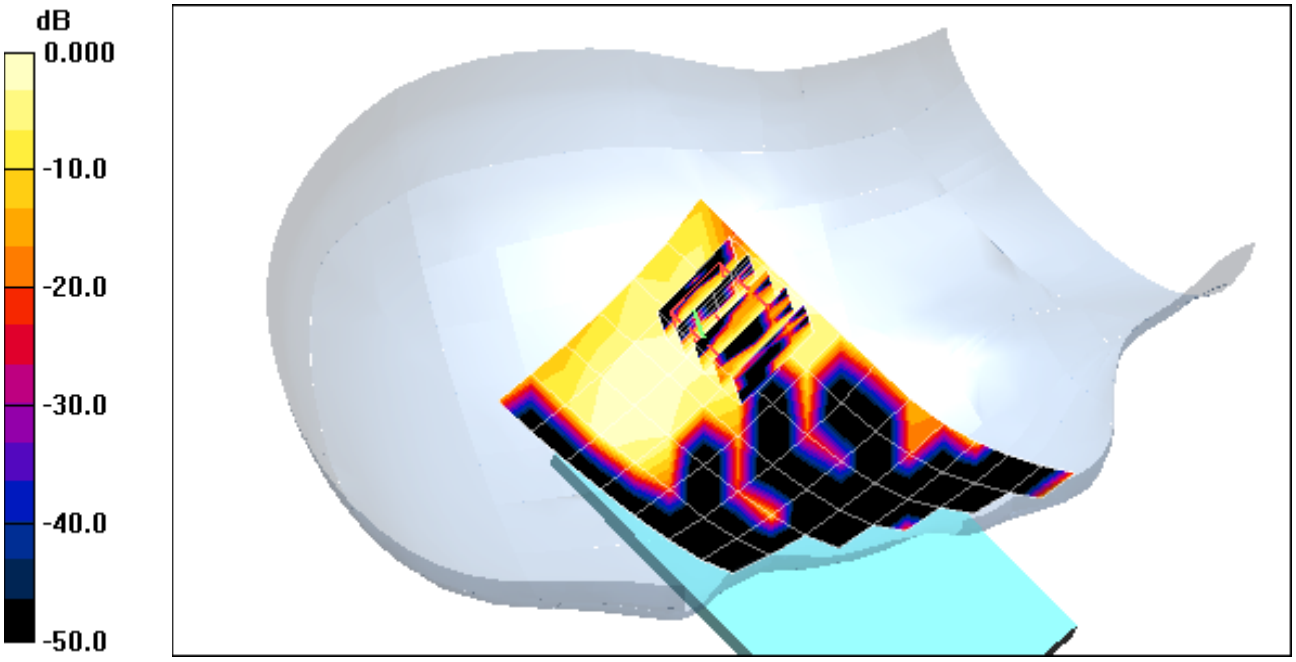
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.83 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 6, 1 Mbps

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.67 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 0.014 W/kg
SAR(1 g) = 0.00478 mW/g; SAR(10 g) = 0.00199 mW/g



0 dB = 0.007mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

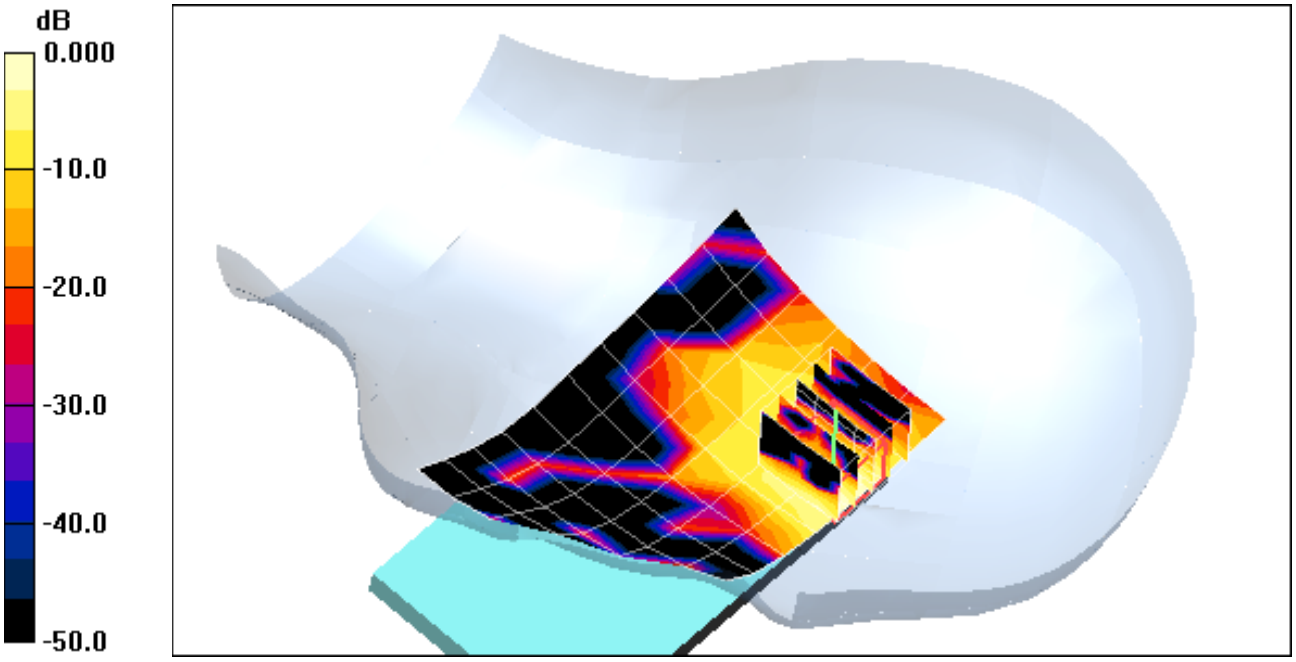
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.83 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 6, 1 Mbps

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.51 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 0.035 W/kg
SAR(1 g) = 0.021 mW/g; SAR(10 g) = 0.00889 mW/g



0 dB = 0.026mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

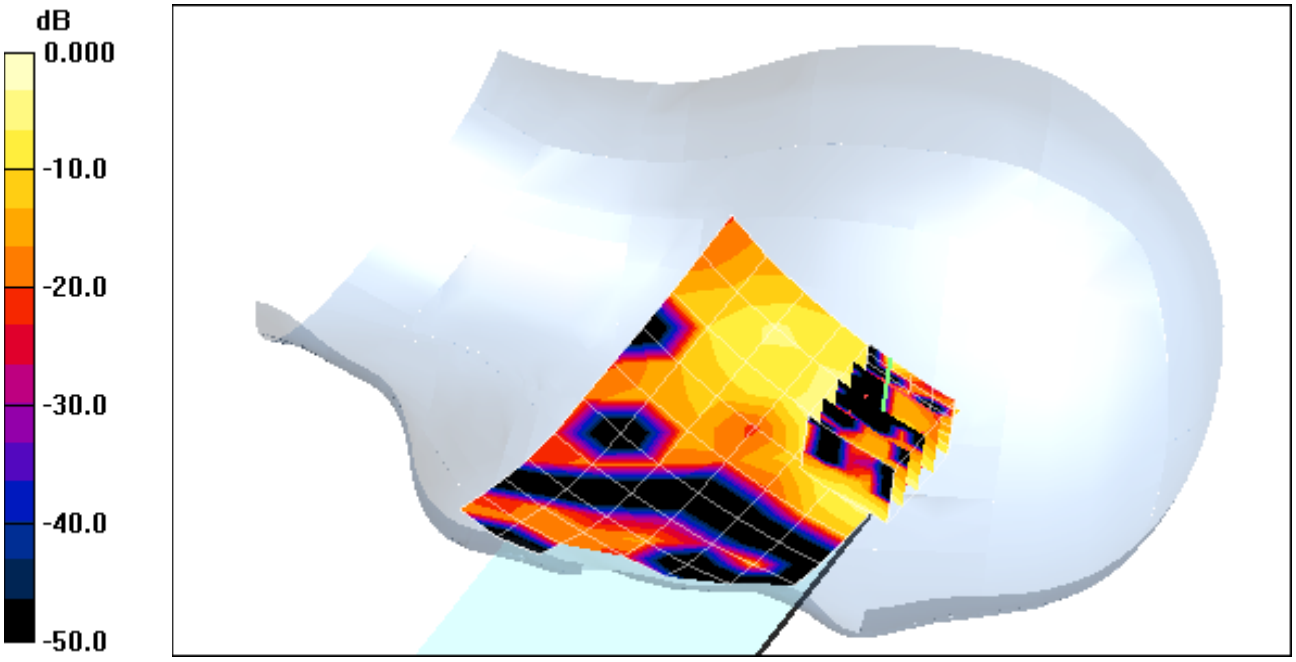
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.83 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 6, 1 Mbps

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.33 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.041 W/kg
SAR(1 g) = 0.0078 mW/g; SAR(10 g) = 0.00209 mW/g



0 dB = 0.016mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

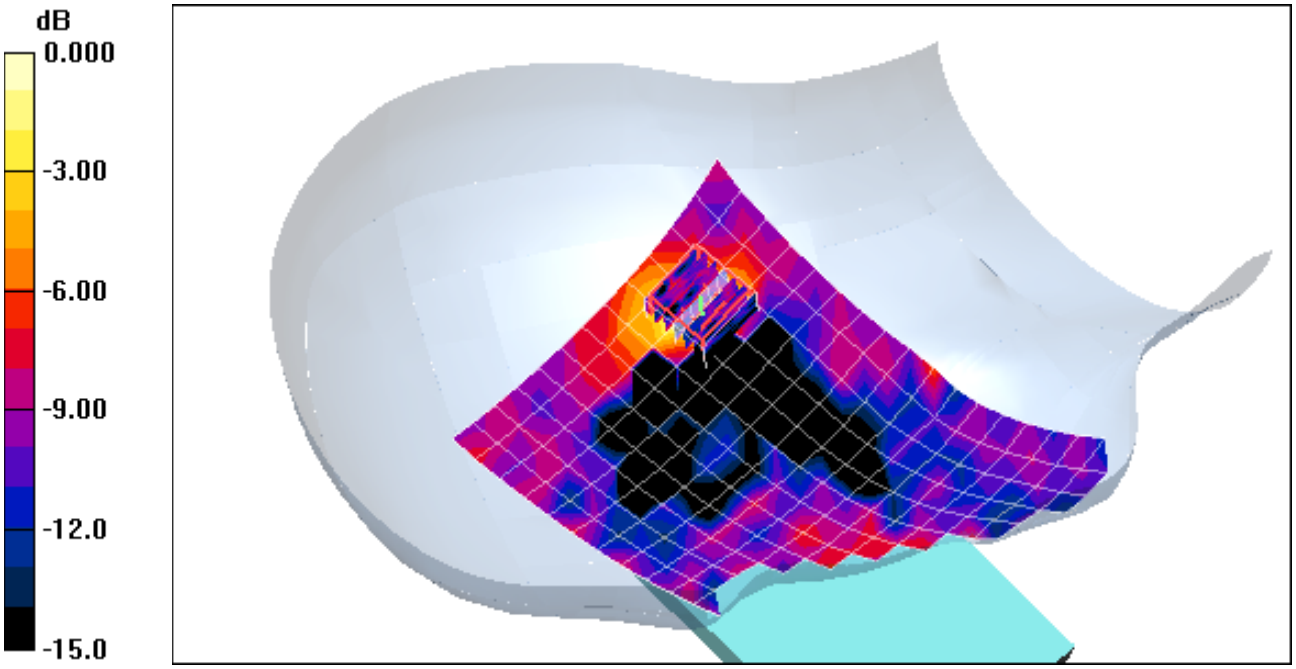
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.789 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-02-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.3 °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

Mode: IEEE 802.11a 5.2 GHz, Right Head, Tilt, Ch 40, 6 Mbps

Area Scan (13x20x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.89 V/m; Power Drift = 0.165 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.063 mW/g; SAR(10 g) = 0.026 mW/g



0 dB = 0.122mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

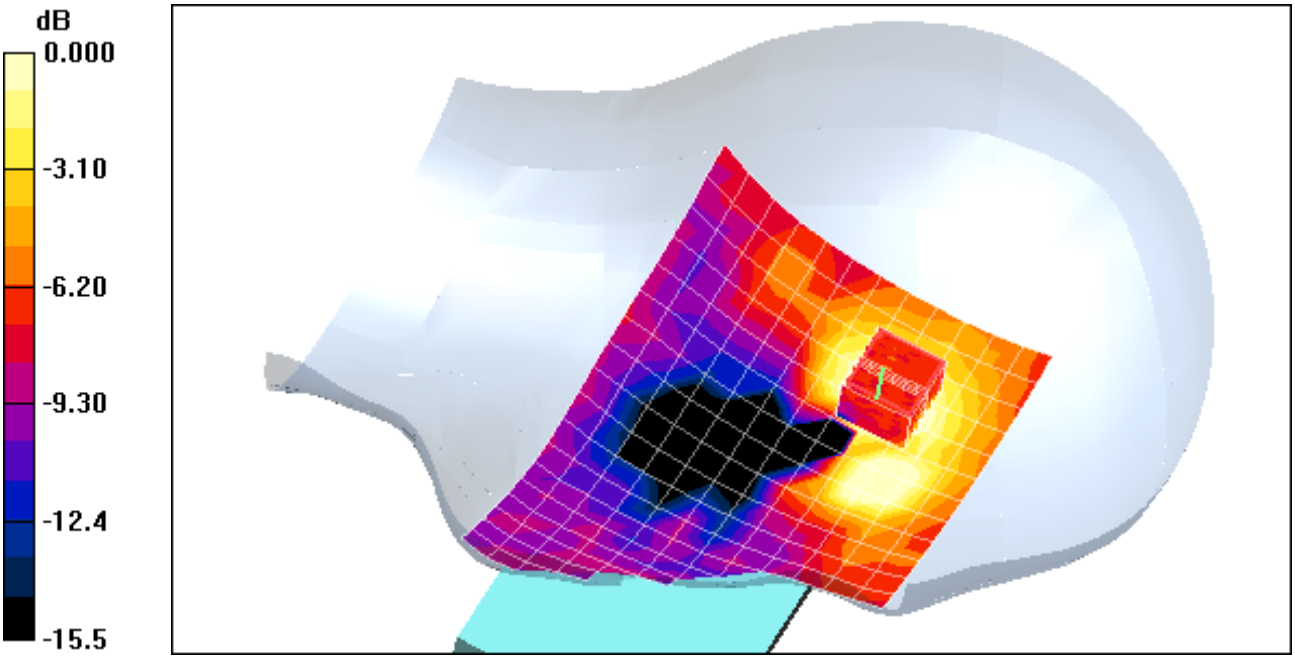
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.789 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-02-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.3 °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

Mode: IEEE 802.11a, 5.2 GHz Left Head, Touch, Ch 40, 6 Mbps

Area Scan (13x20x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.70 V/m; Power Drift = 0.154 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.072 mW/g



0 dB = 0.221mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

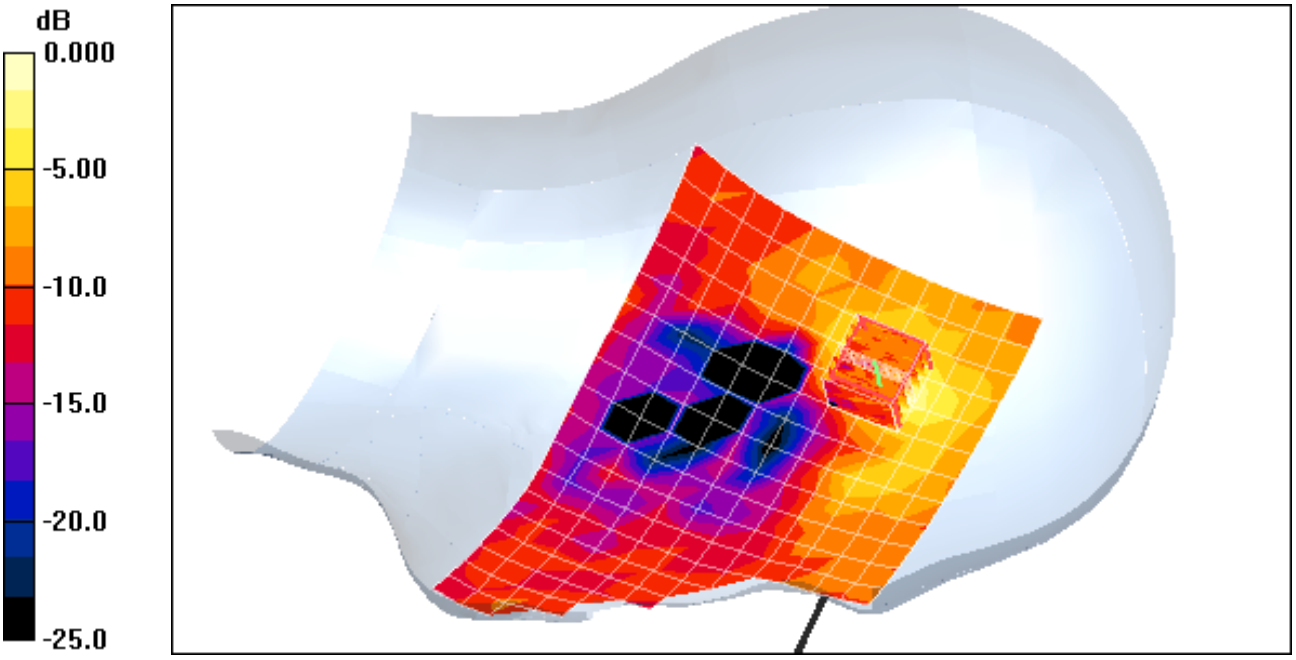
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.789 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-02-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.3 °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

Mode: IEEE 802.11a, 5.2 GHz Left Head, Tilt, Ch 40, 6 Mbps

Area Scan (13x20x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.66 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.163mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

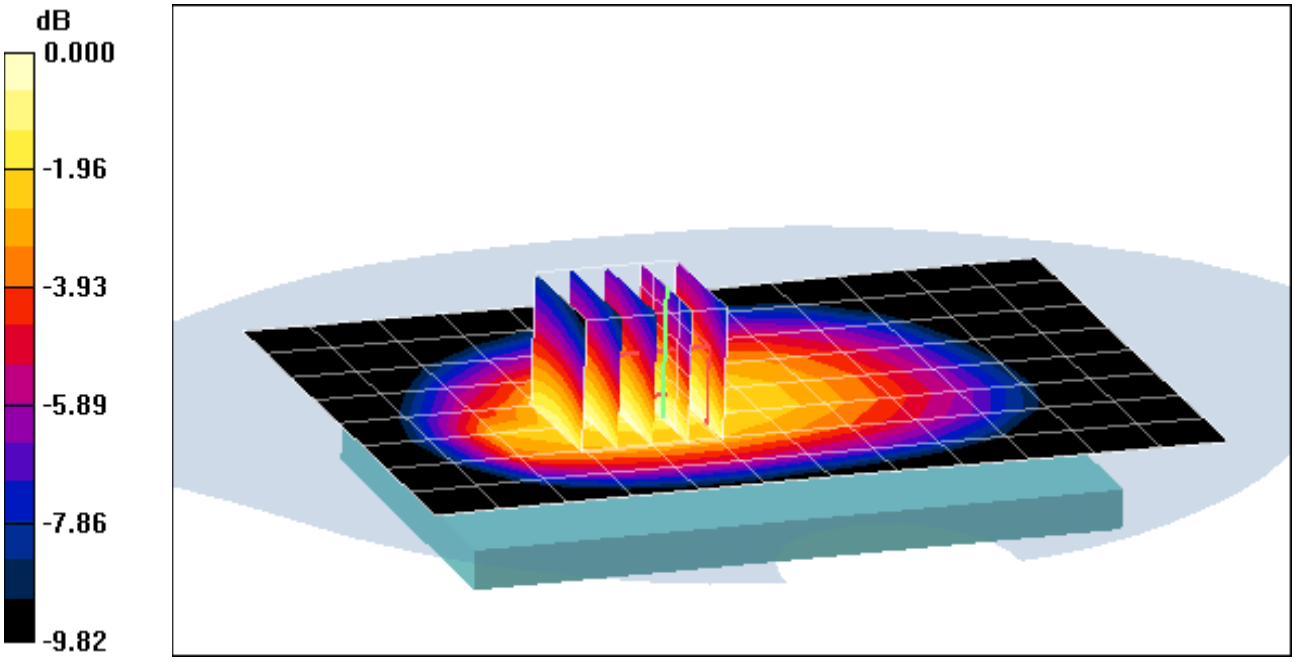
Communication System: LTE RF; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.938 mho/m; ε_r = 56.48; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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, BW 10, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.1 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.390 W/kg
SAR(1 g) = 0.296 mW/g; SAR(10 g) = 0.222 mW/g



0 dB = 0.308mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

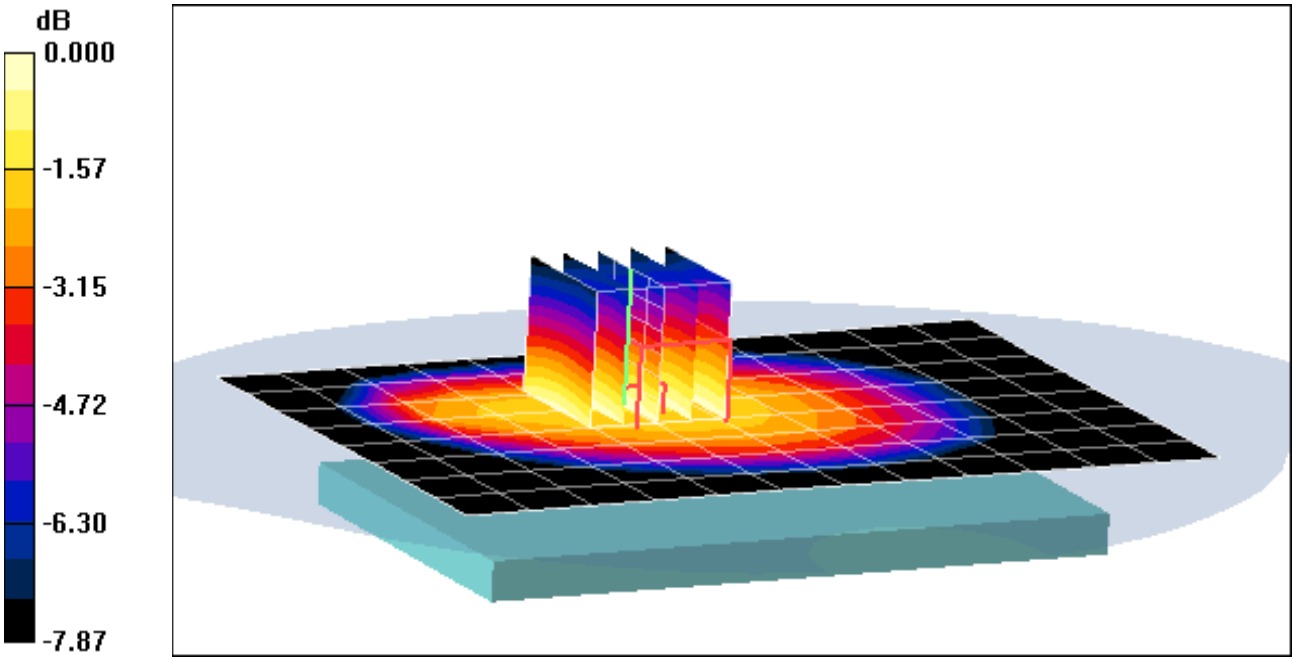
Communication System: LTE RF; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.938 mho/m; ε_r = 56.48; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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, BW 10, 1 RB, RB Offset 0

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = -0.131 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.147 mW/g



0 dB = 0.200mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

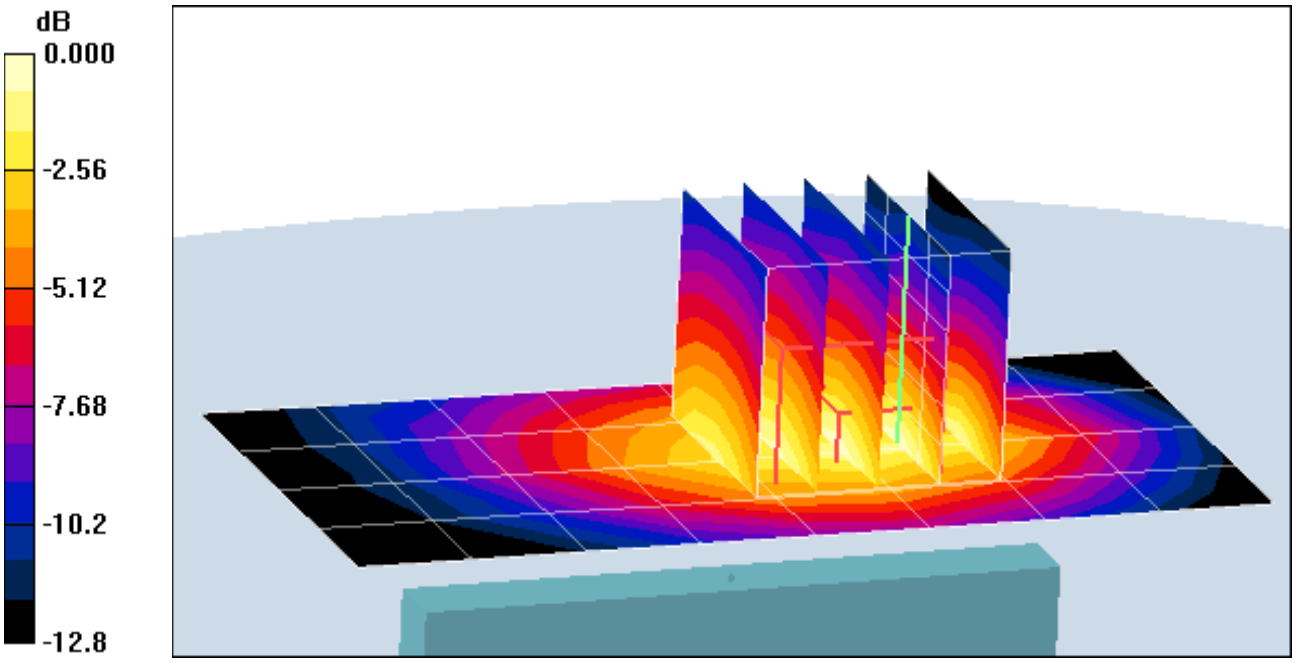
Communication System: LTE RF; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.938 mho/m; ε_r = 56.48; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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, BW 10, 1 RB, RB Offset 0

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.064 dB
Peak SAR (extrapolated) = 0.188 W/kg
SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.066 mW/g



0 dB = 0.116mW/g

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DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

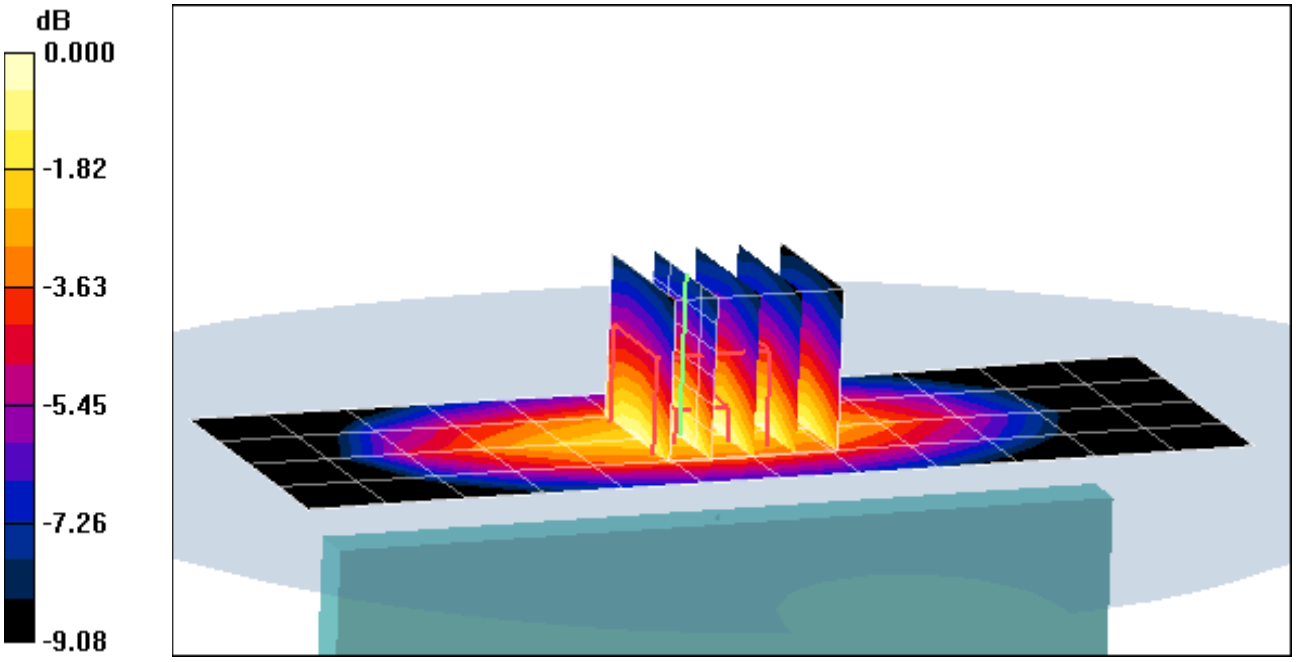
Communication System: LTE RF; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.938 mho/m; ε_r = 56.48; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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, BW 10, 1 RB, RB Offset 0

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.193 dB
Peak SAR (extrapolated) = 0.353 W/kg
SAR(1 g) = 0.252 mW/g; SAR(10 g) = 0.175 mW/g



0 dB = 0.271mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

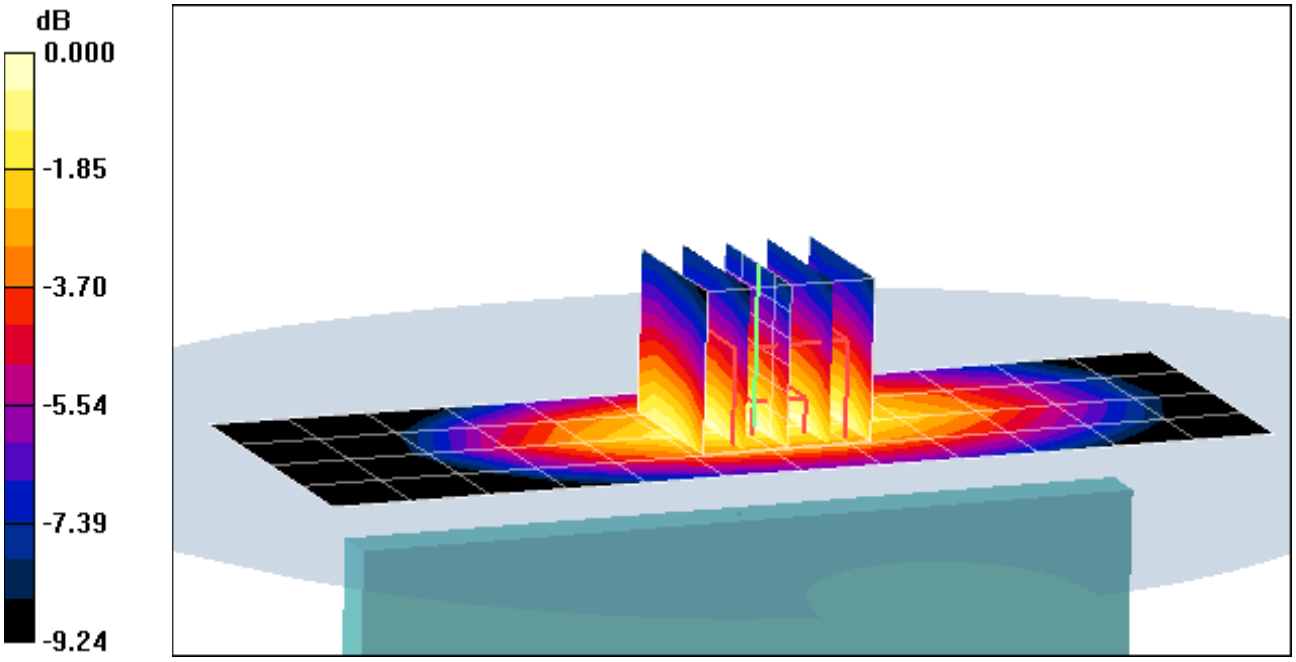
Communication System: LTE RF; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.938 mho/m; ε_r = 56.48; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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, Left Edge, Mid.ch, QPSK, BW 10, 1 RB, RB Offset 0

Area Scan (5x13x1): 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 = 0.137 dB
Peak SAR (extrapolated) = 0.164 W/kg
SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.084 mW/g



0 dB = 0.127mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

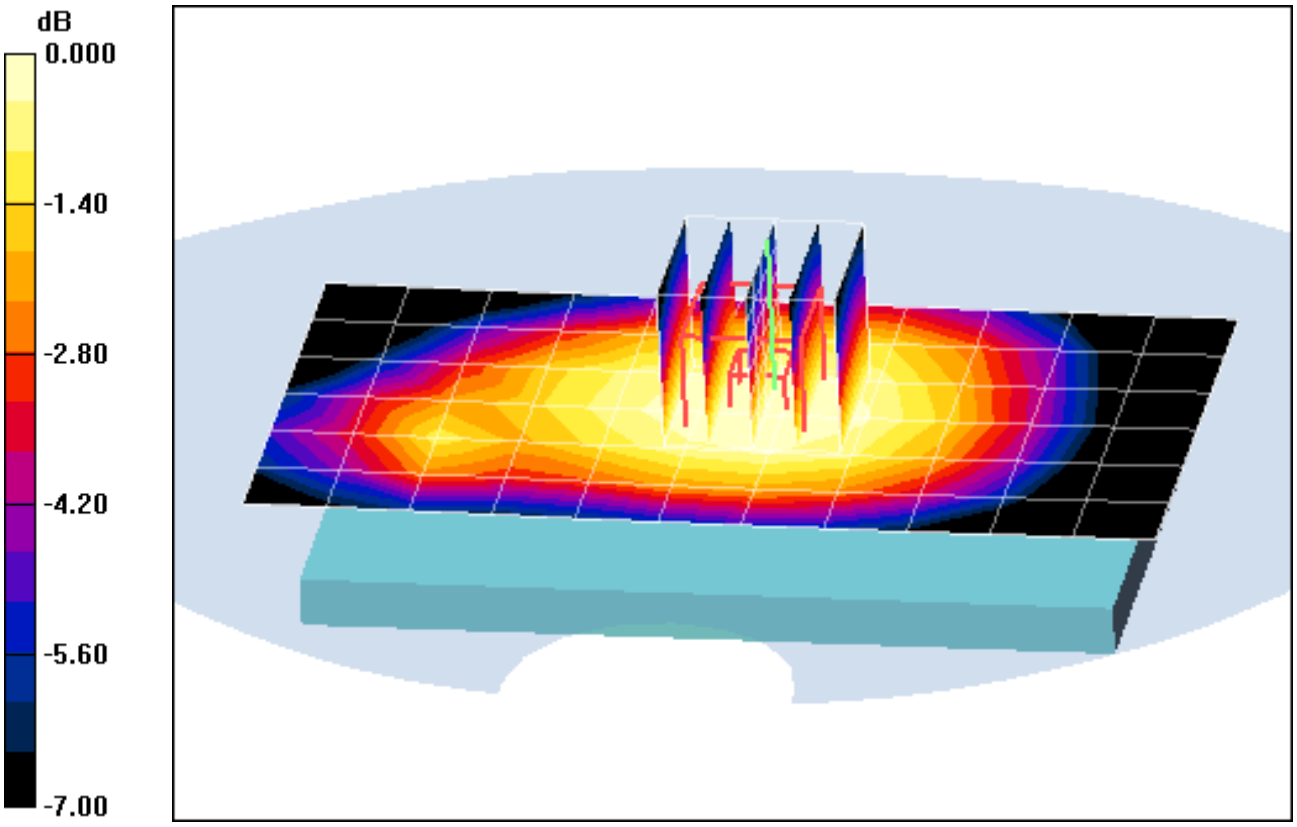
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.9 V/m; Power Drift = 0.164 dB
Peak SAR (extrapolated) = 0.814 W/kg
SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.499 mW/g



0 dB = 0.674mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

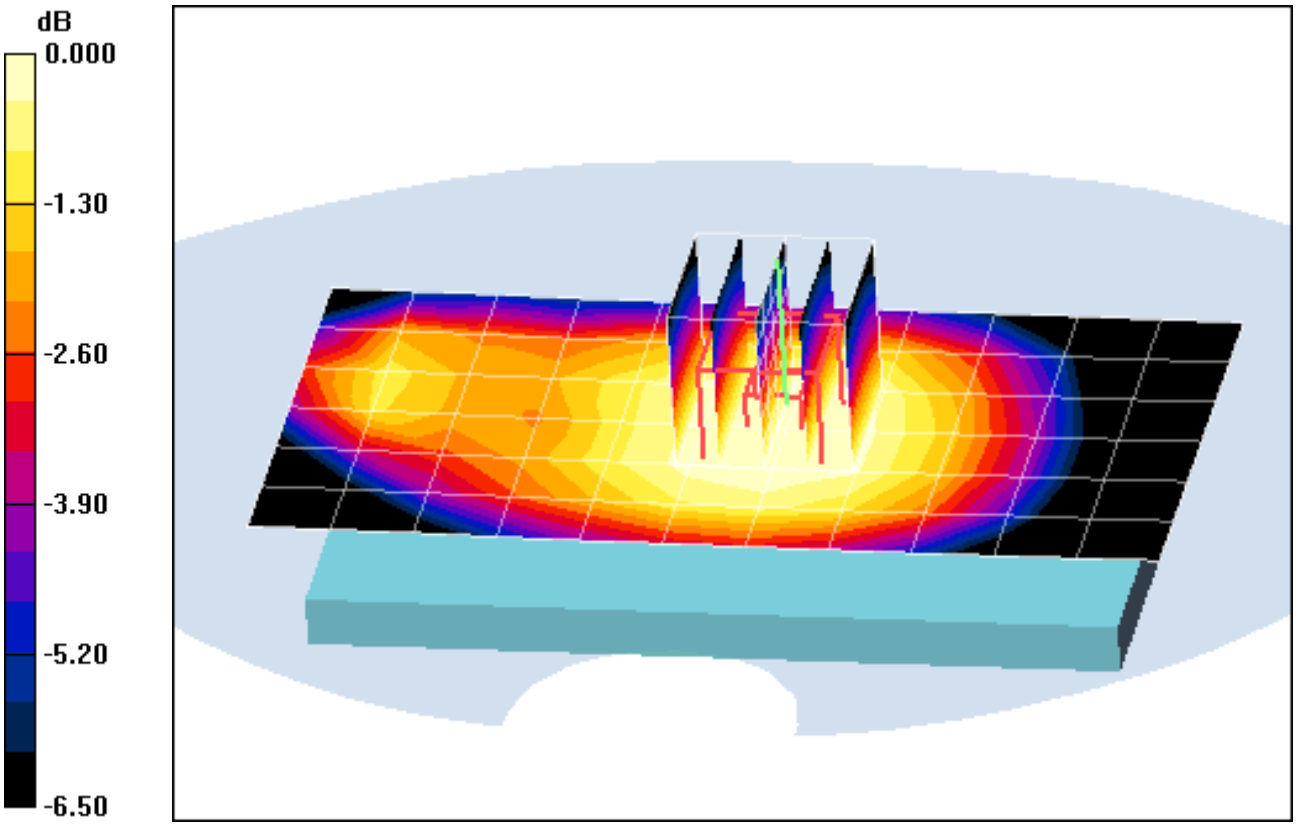
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.572 W/kg
SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.358 mW/g



0 dB = 0.478mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

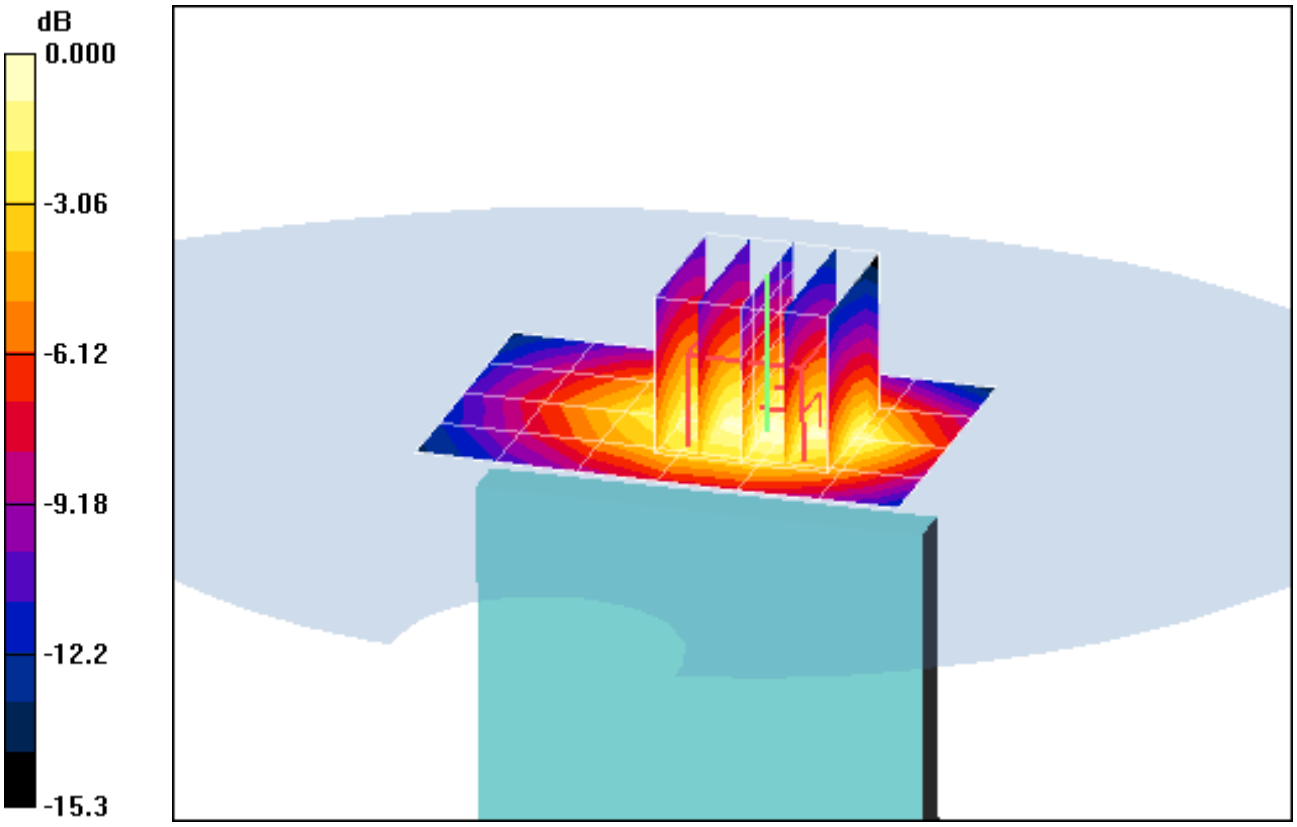
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.3 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.868 W/kg
SAR(1 g) = 0.503 mW/g; SAR(10 g) = 0.298 mW/g



0 dB = 0.549mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

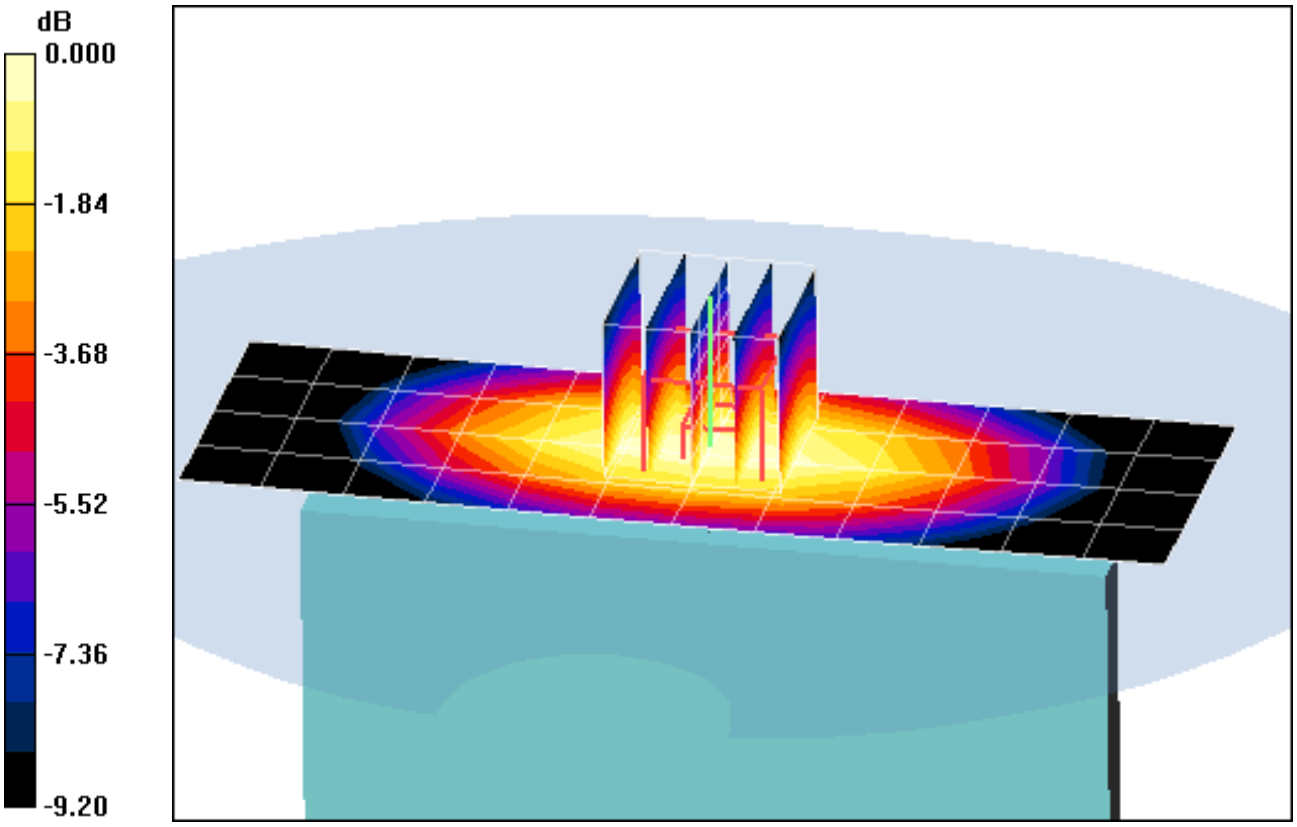
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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, Right Edge, Mid.ch, 2 Tx Slots

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.7 V/m; Power Drift = -0.083 dB
Peak SAR (extrapolated) = 0.539 W/kg
SAR(1 g) = 0.390 mW/g; SAR(10 g) = 0.273 mW/g



0 dB = 0.415mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

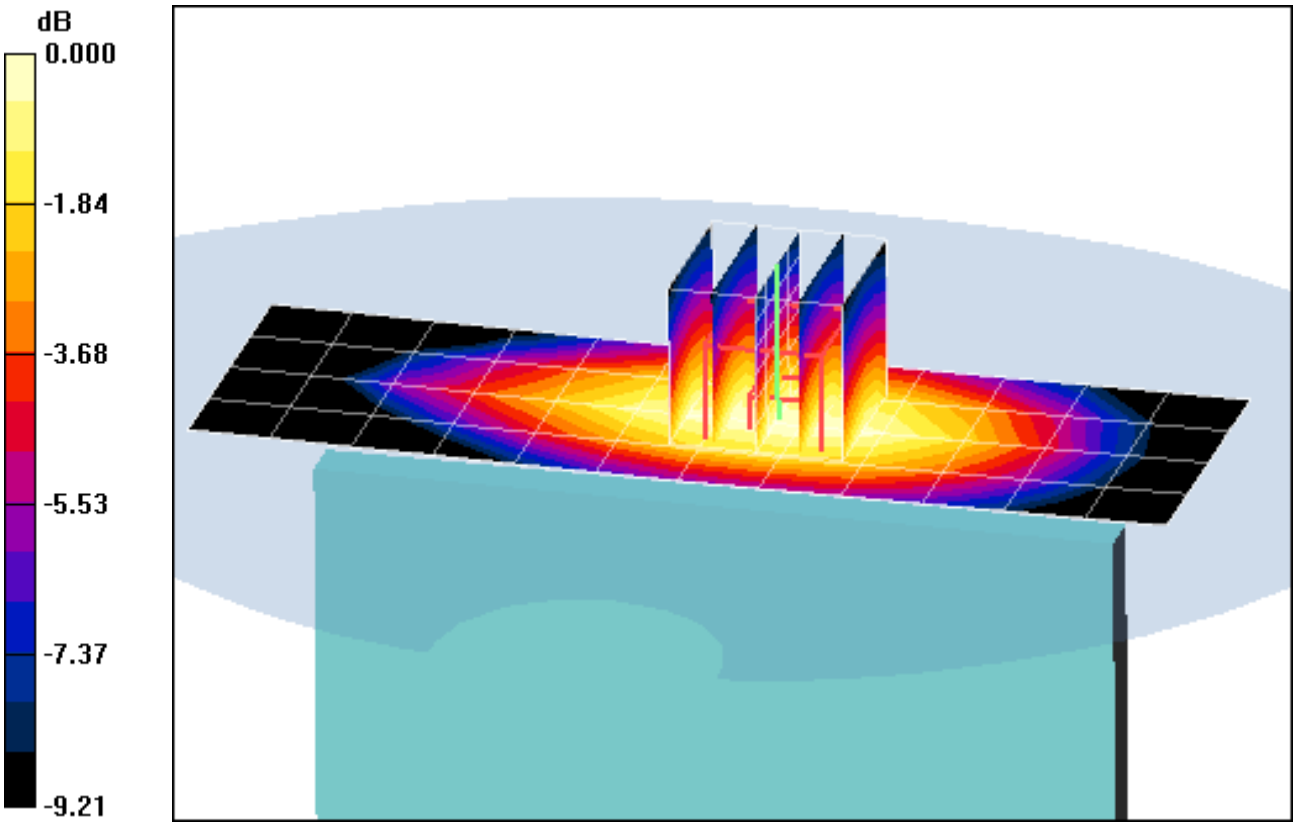
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.3 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 0.680 W/kg
SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.344 mW/g



0 dB = 0.527mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

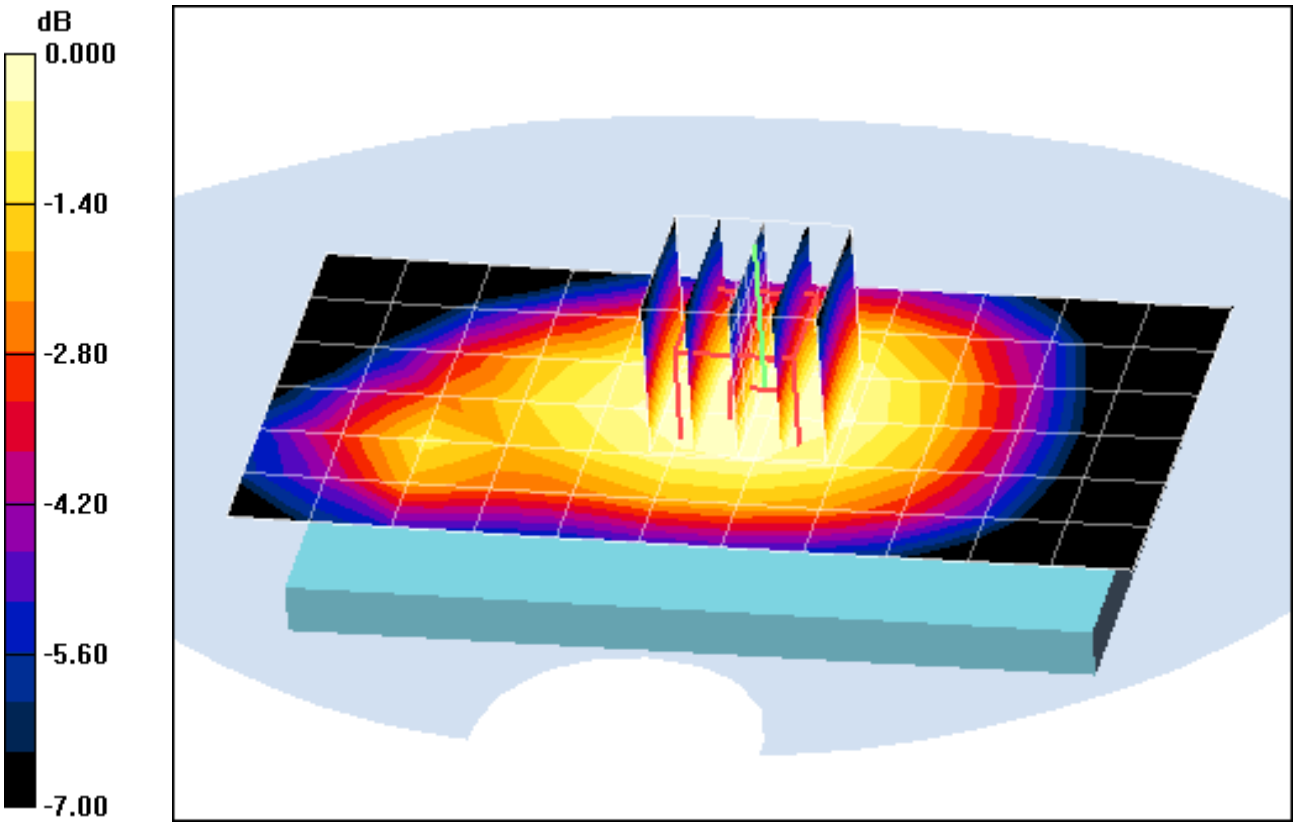
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.7 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.448 W/kg
SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.280 mW/g



0 dB = 0.376mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

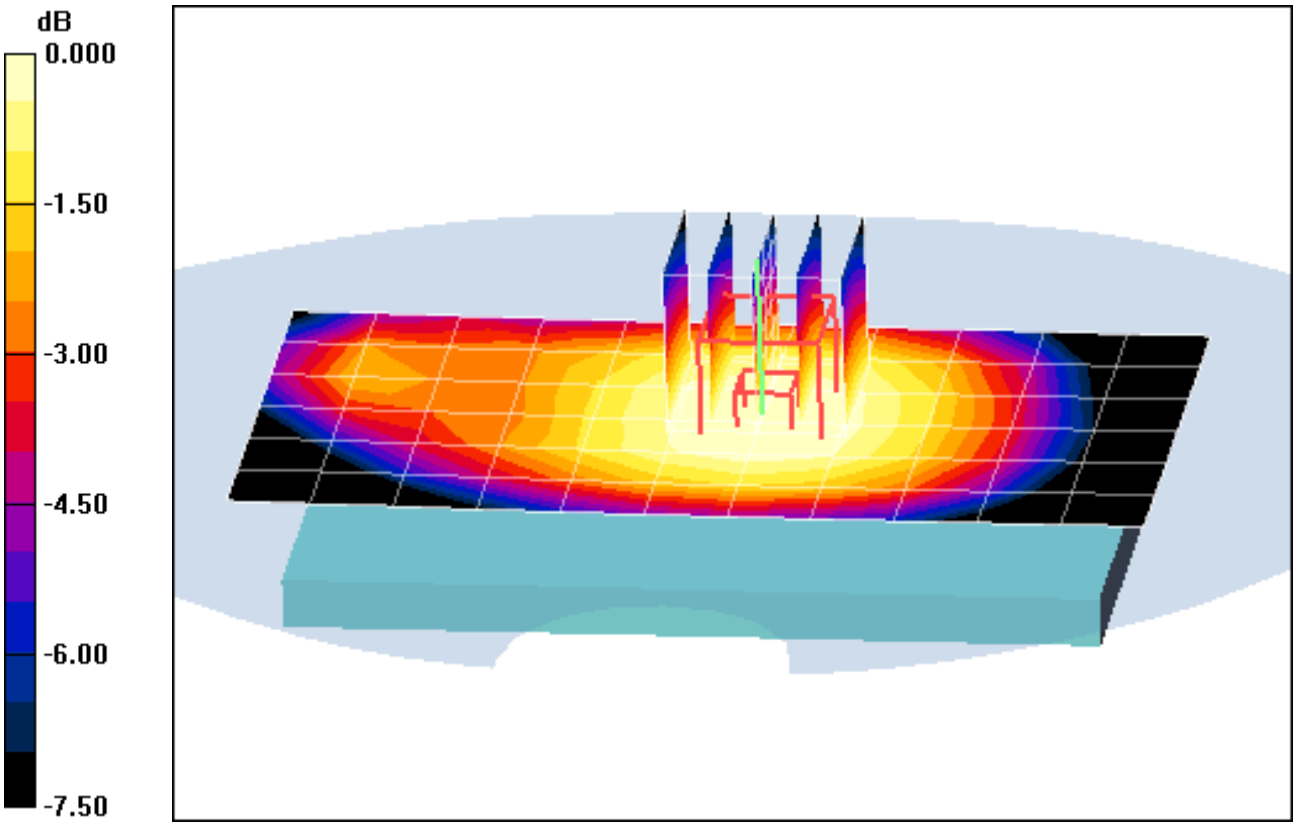
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.003 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.198 mW/g



0 dB = 0.265mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

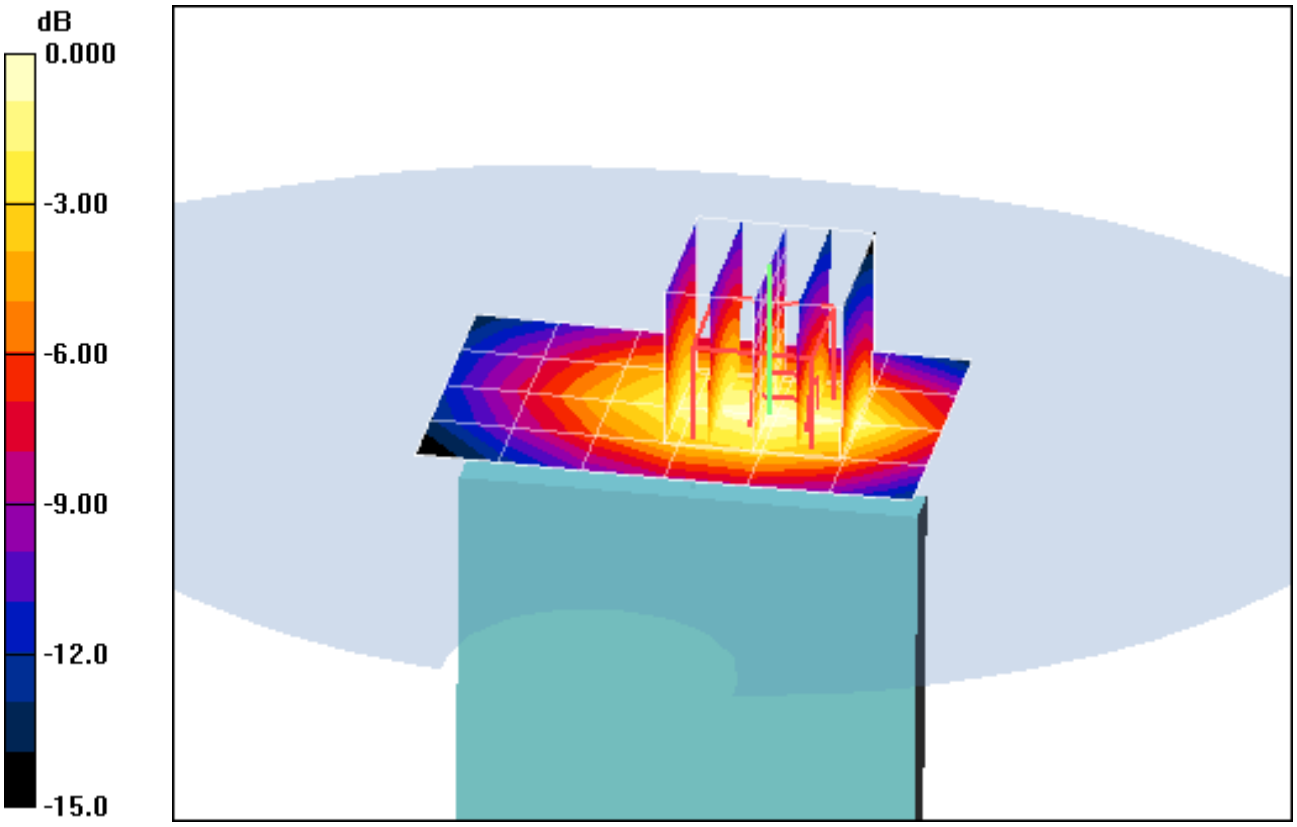
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = -0.047 dB
Peak SAR (extrapolated) = 0.470 W/kg
SAR(1 g) = 0.275 mW/g; SAR(10 g) = 0.162 mW/g



0 dB = 0.301mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

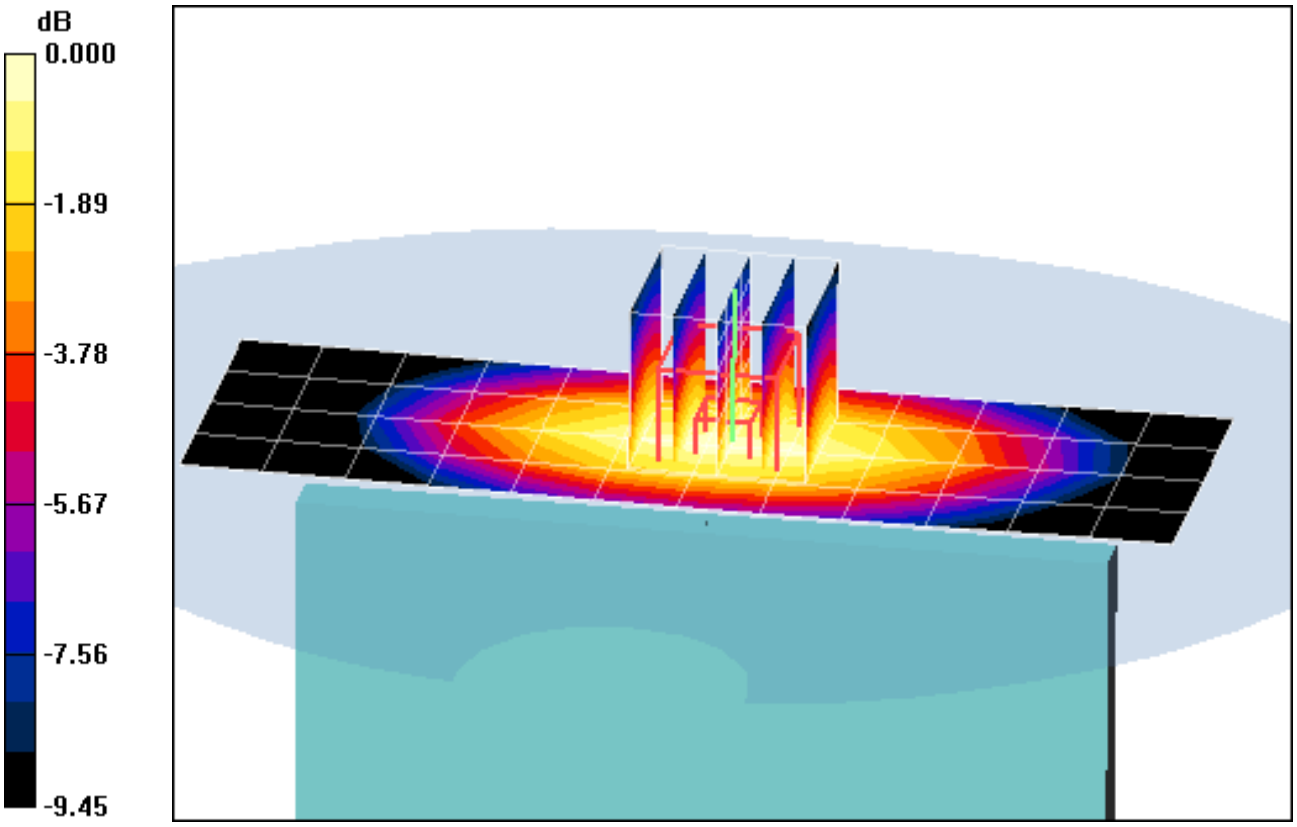
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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, Right Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.164 mW/g



0 dB = 0.254mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

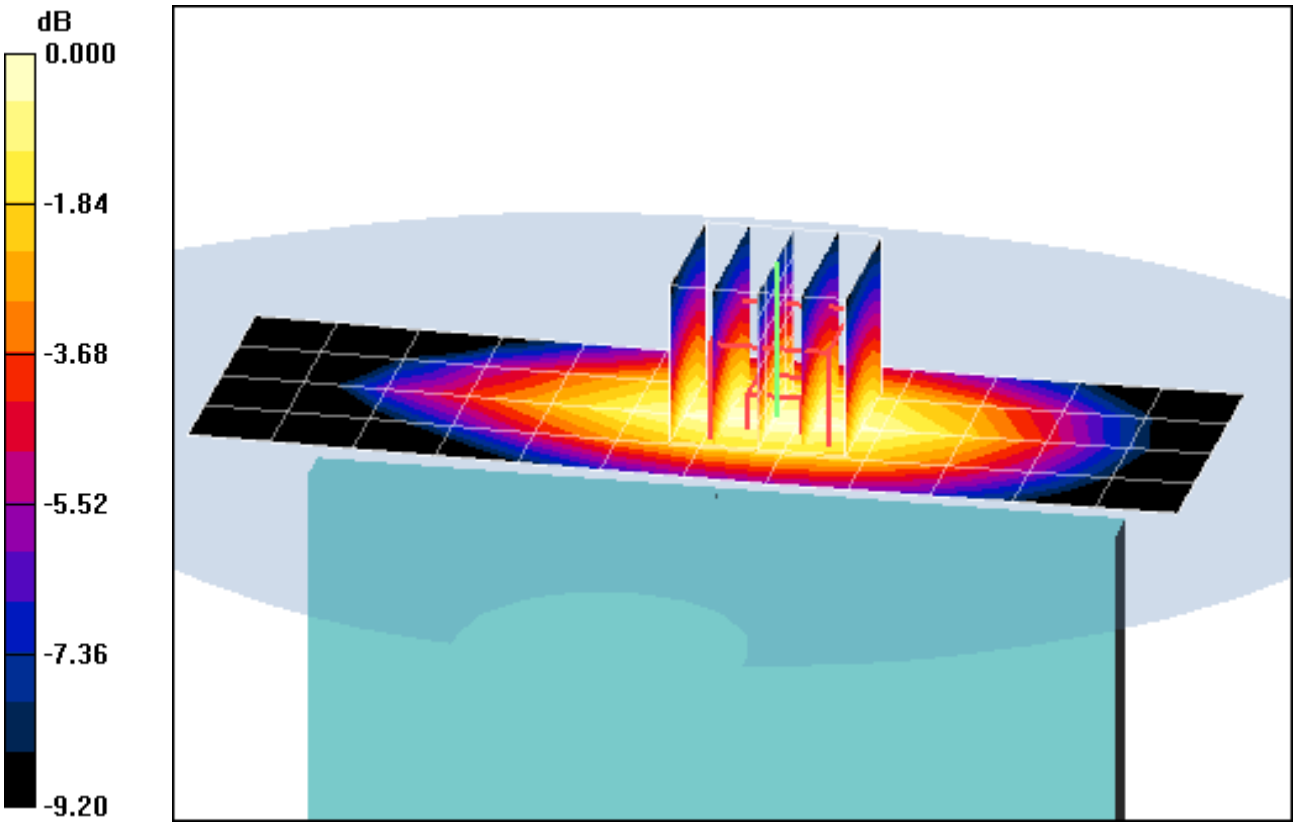
Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.976 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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

Area Scan (5x13x1): 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 = -0.058 dB
Peak SAR (extrapolated) = 0.452 W/kg
SAR(1 g) = 0.326 mW/g; SAR(10 g) = 0.229 mW/g



0 dB = 0.346mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

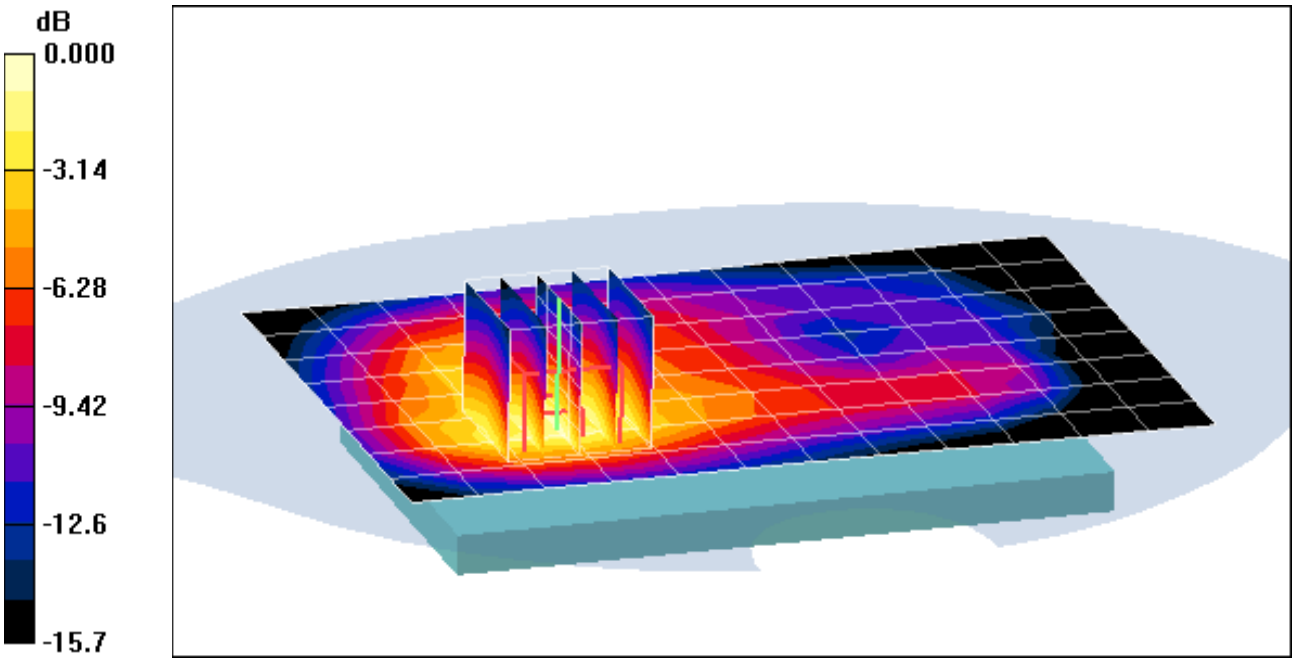
Communication System: LTE RF;Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 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 4 (AWS), Body SAR, Back side, Low.ch
QPSK, 10 MHz, 1 RB, 49 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.331 mW/g



0 dB = 0.638mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

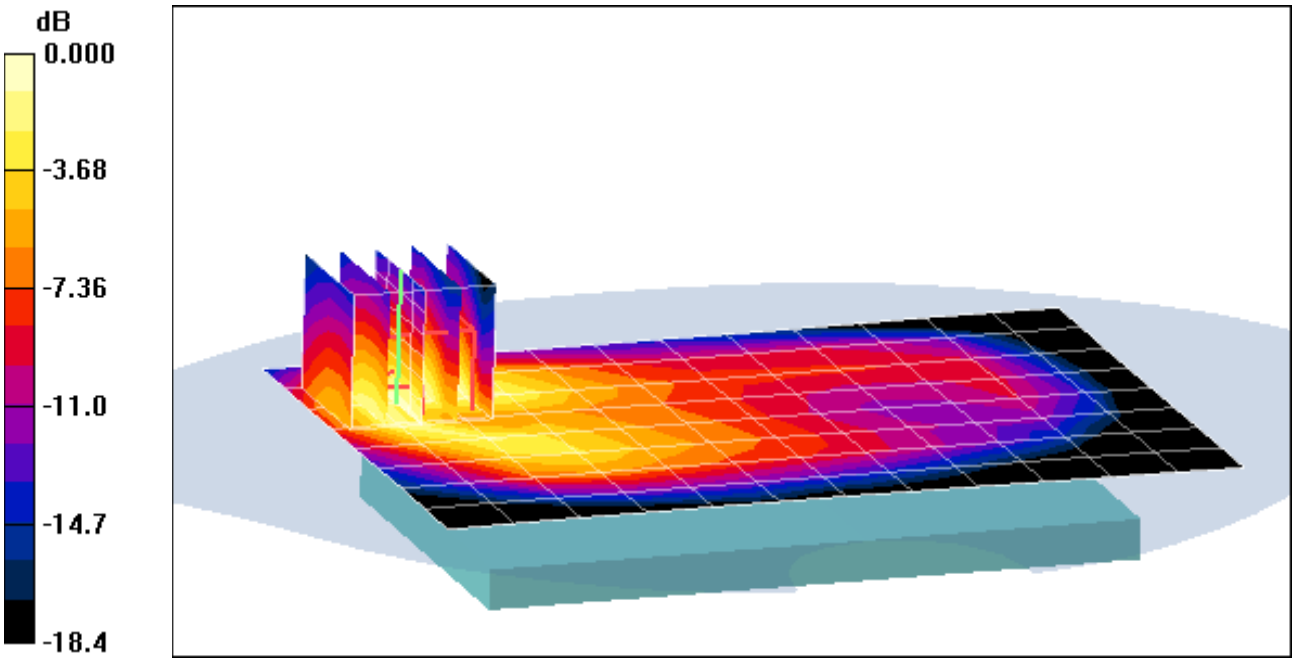
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 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 4 (AWS), Body SAR, Front side, Low.ch
QPSK, 10 MHz, 1 RB, 49 RB Offset

Area Scan (9x13x1): 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 = 0.027 dB
Peak SAR (extrapolated) = 0.742 W/kg
SAR(1 g) = 0.428 mW/g; SAR(10 g) = 0.236 mW/g



0 dB = 0.487mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

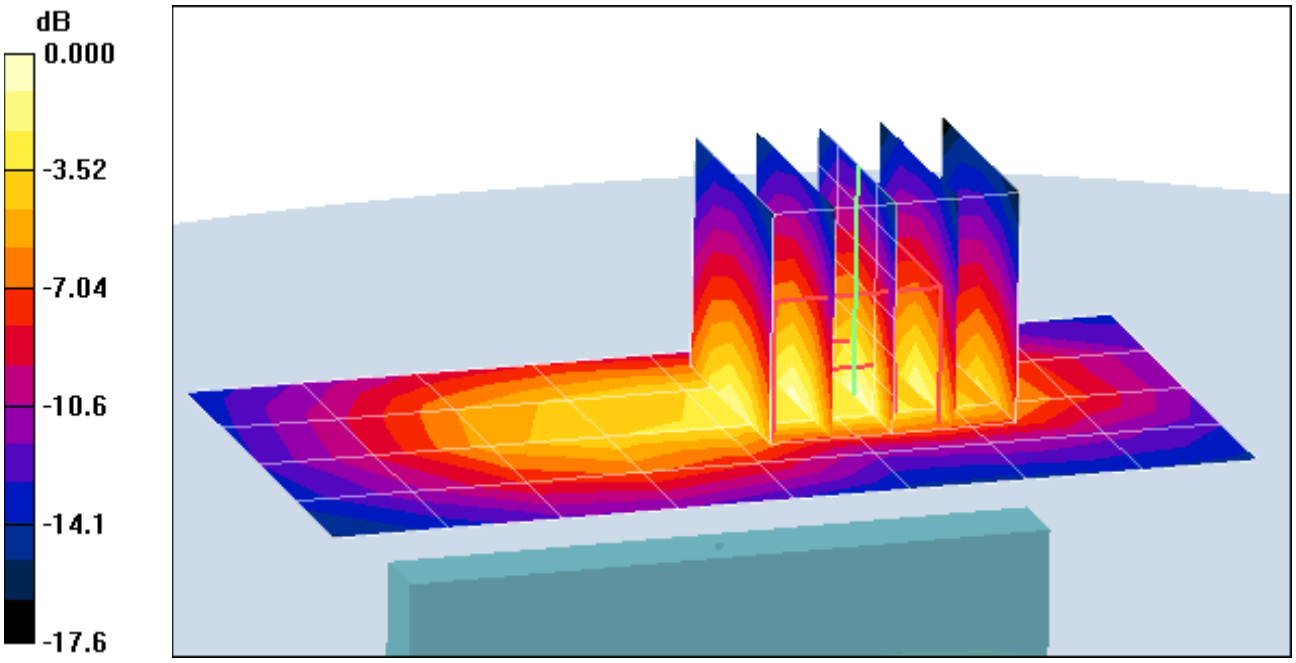
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 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 4 (AWS), Body SAR, Bottom Edge, Low.ch
QPSK, 10 MHz, 1 RB, 0 RB Offset

Area Scan (5x9x1): 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 = -0.173 dB
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.255 mW/g



0 dB = 0.550mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

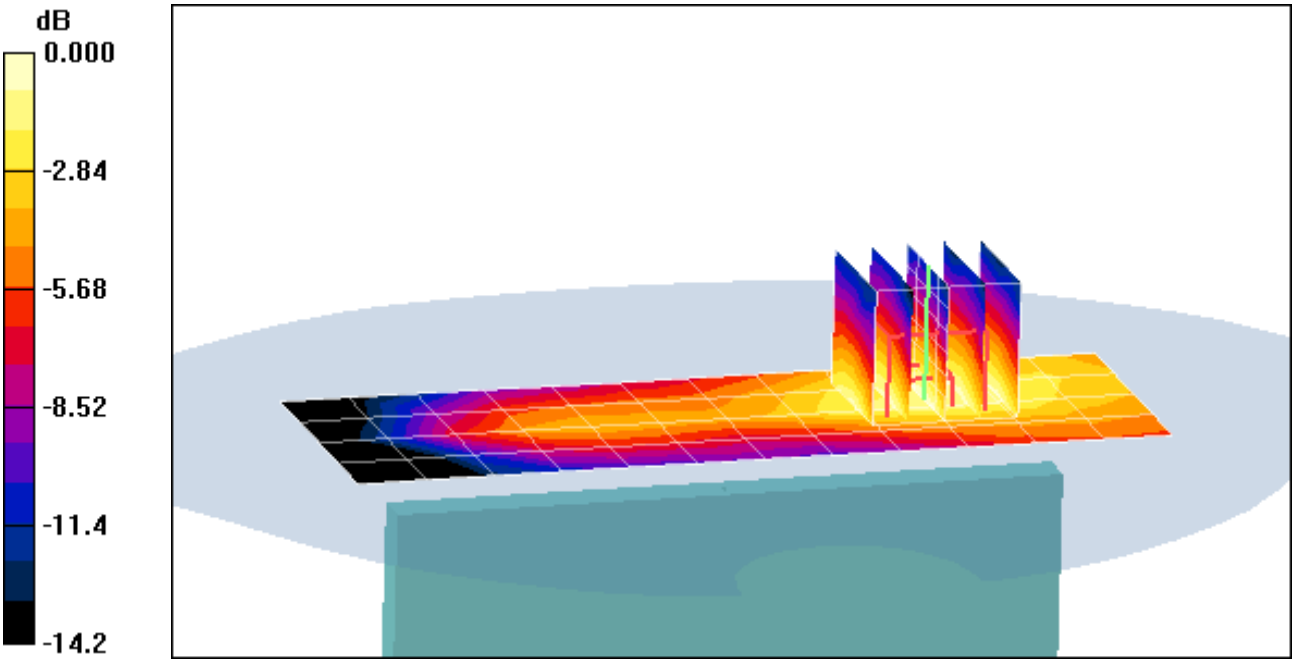
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 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 4 (AWS), Body SAR, Right Edge, Low.ch
QPSK, 10 MHz, 1 RB, 49 RB Offset

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.13 V/m; Power Drift = 0.059 dB
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.090 mW/g; SAR(10 g) = 0.056 mW/g



0 dB = 0.097mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

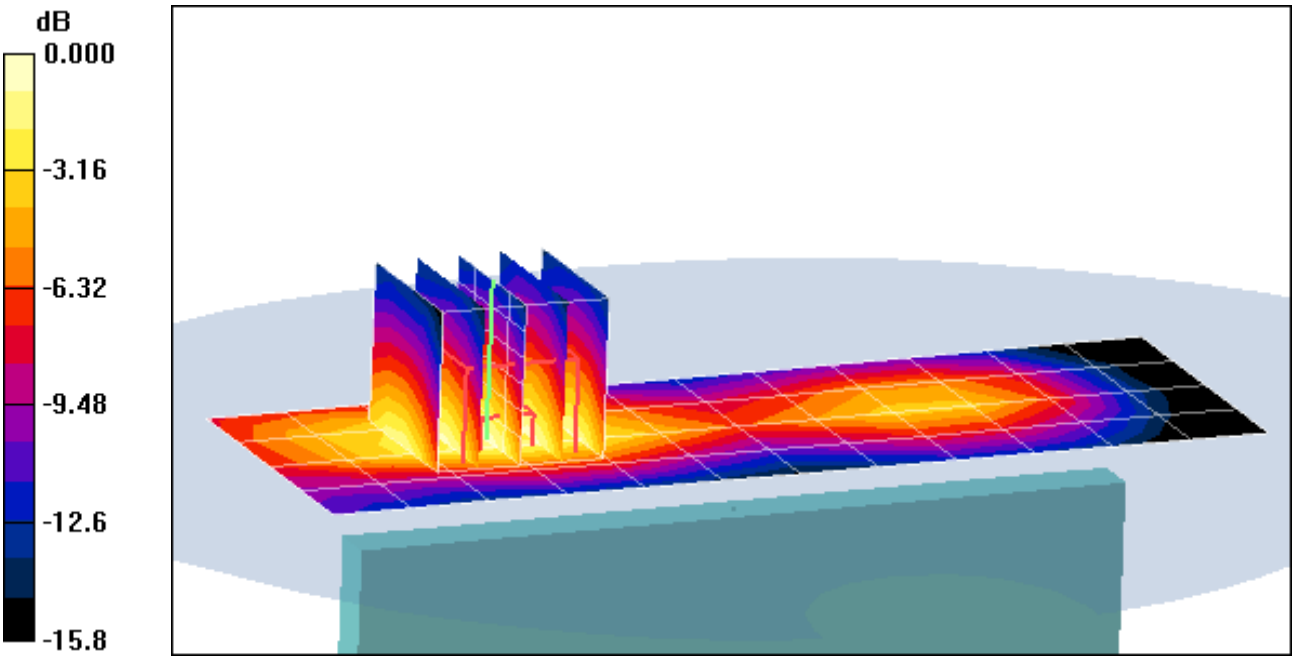
Communication System: LTE RF; Frequency: 1715 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1715 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 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 4 (AWS), Body SAR, Left Edge, Low.ch
QPSK, 10 MHz, 1 RB, 49 RB Offset

Area Scan (5x13x1): 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 = 0.184 dB
Peak SAR (extrapolated) = 0.480 W/kg
SAR(1 g) = 0.280 mW/g; SAR(10 g) = 0.161 mW/g



0 dB = 0.307mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

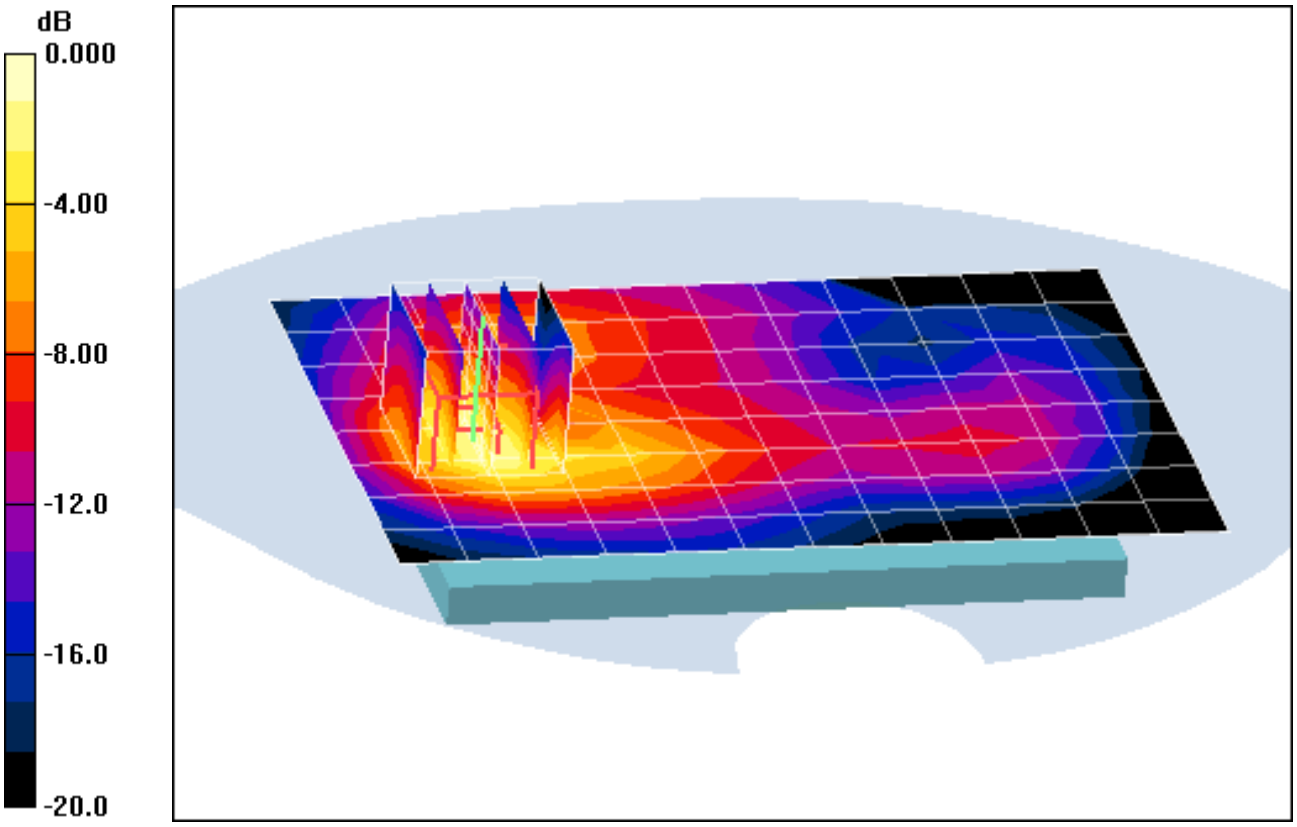
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.61 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.391 mW/g



0 dB = 0.859mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

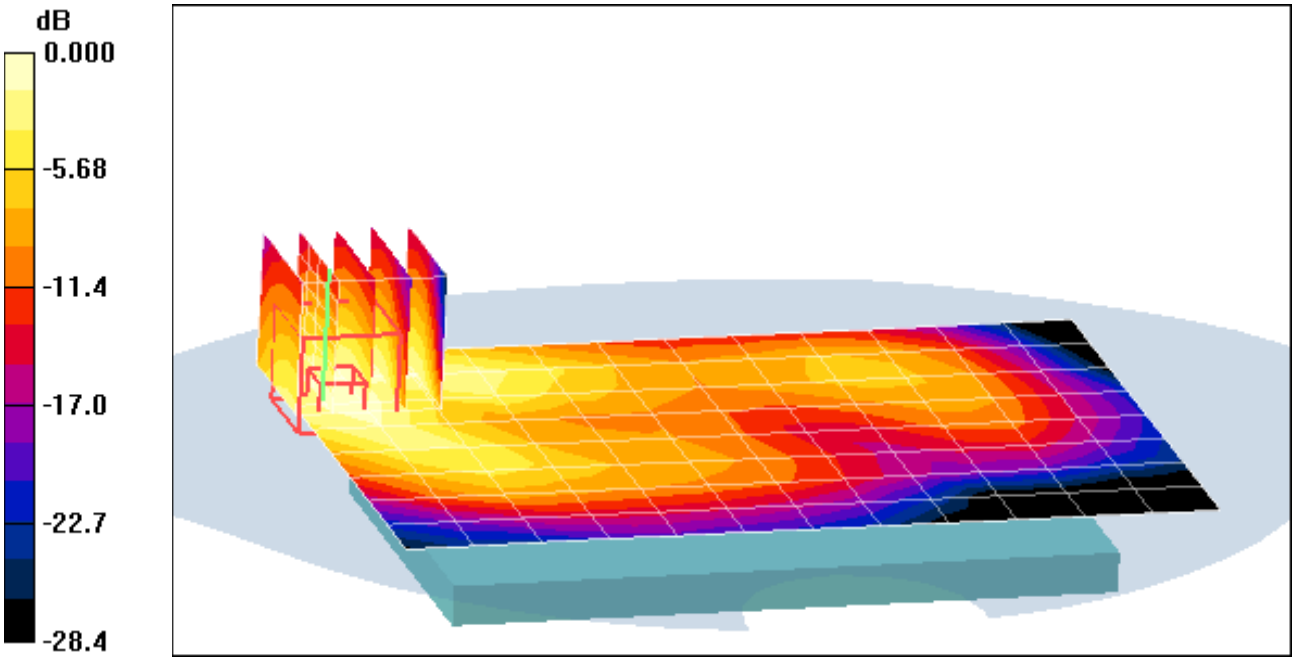
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.3 °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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 0.782 W/kg
SAR(1 g) = 0.428 mW/g; SAR(10 g) = 0.224 mW/g



0 dB = 0.441mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

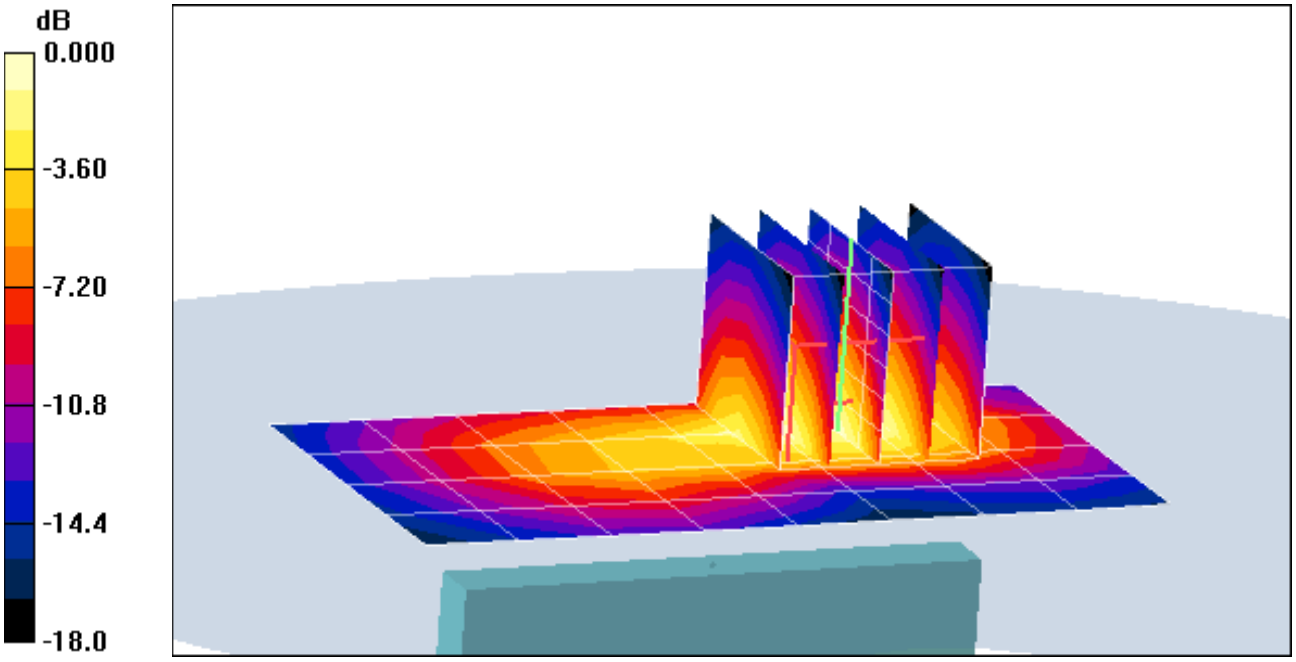
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0cm

Test Date: 12-05-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.3 °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

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.642 mW/g; SAR(10 g) = 0.324 mW/g



0 dB = 0.730mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

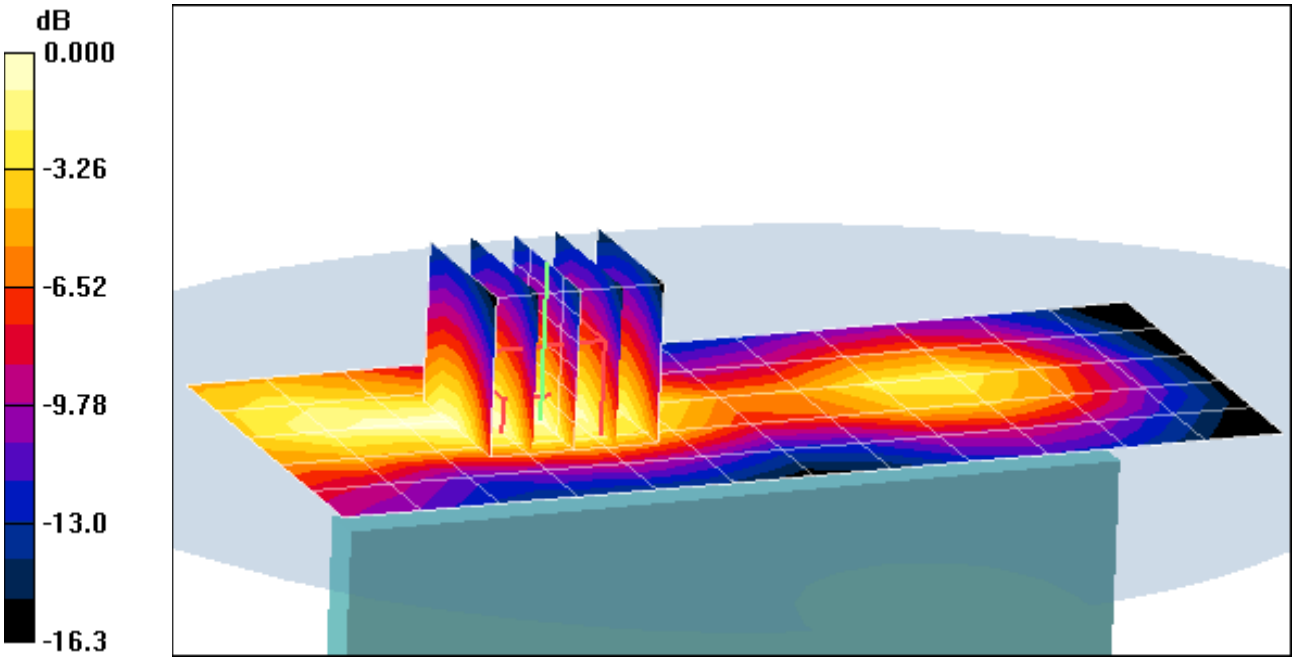
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.3 °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, Right Edge, Mid.ch, 2 Tx Slots

Area Scan (6x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.34 V/m; Power Drift = 0.171 dB
Peak SAR (extrapolated) = 0.364 W/kg
SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.124 mW/g



0 dB = 0.233mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

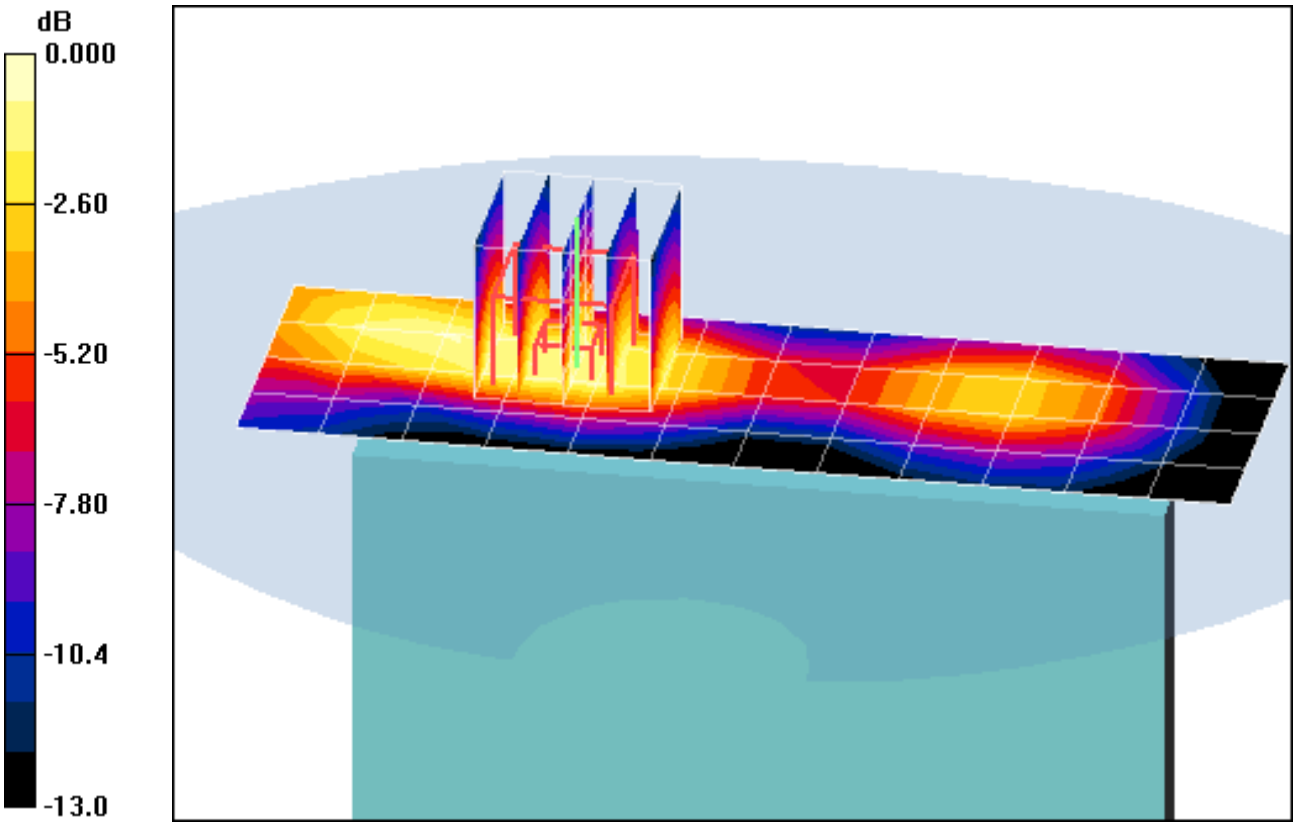
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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

Area Scan (5x13x1): 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 = 0.000 dB
Peak SAR (extrapolated) = 0.332 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.117 mW/g



0 dB = 0.223mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

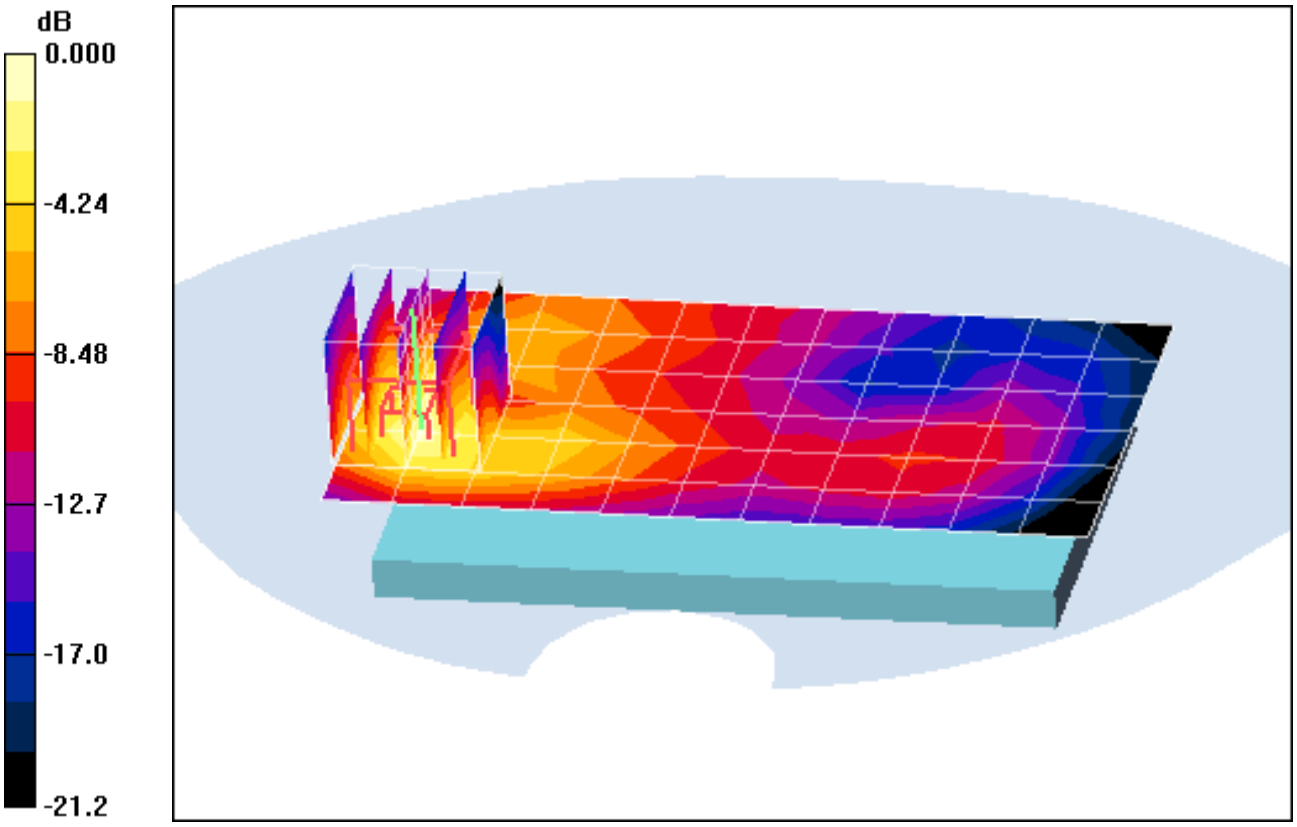
Communication System: WCDMA1900; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1907.6 MHz; σ = 1.54 mho/m; ε_r = 52.32; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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, High ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.9 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.522 mW/g



0 dB = 1.18mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

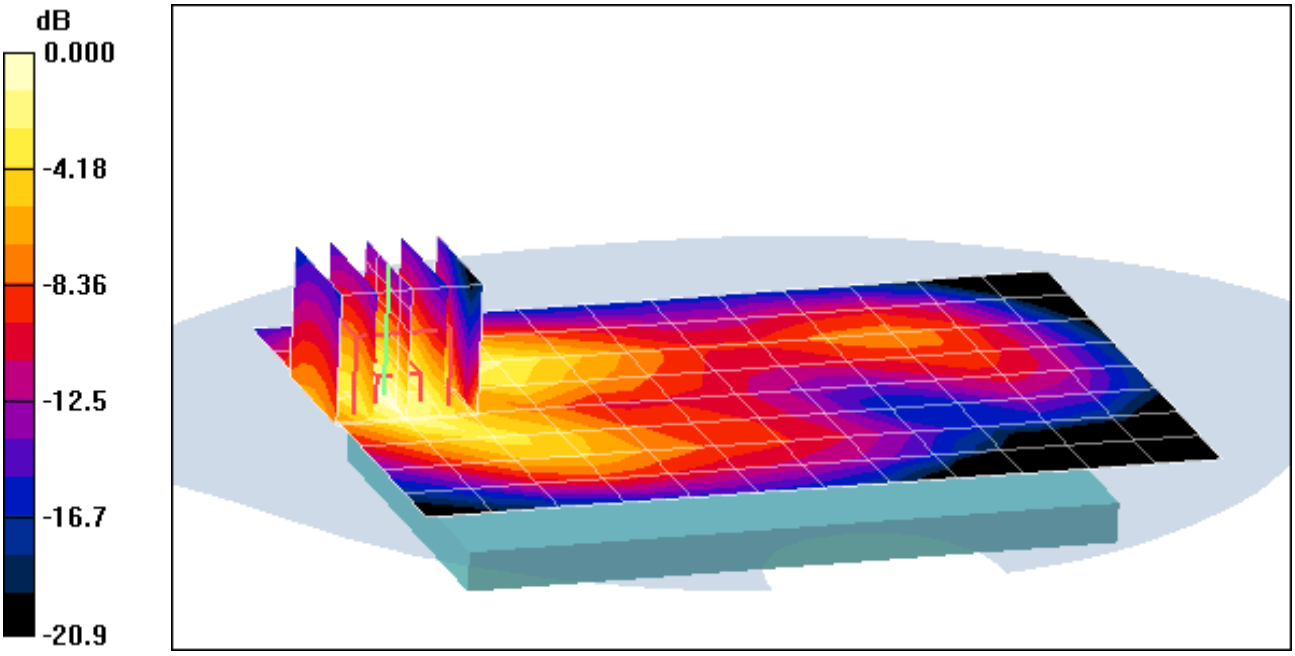
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.3 °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

Area Scan (9x13x1): 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 = 0.016 dB
Peak SAR (extrapolated) = 0.949 W/kg
SAR(1 g) = 0.521 mW/g; SAR(10 g) = 0.272 mW/g



0 dB = 0.576mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

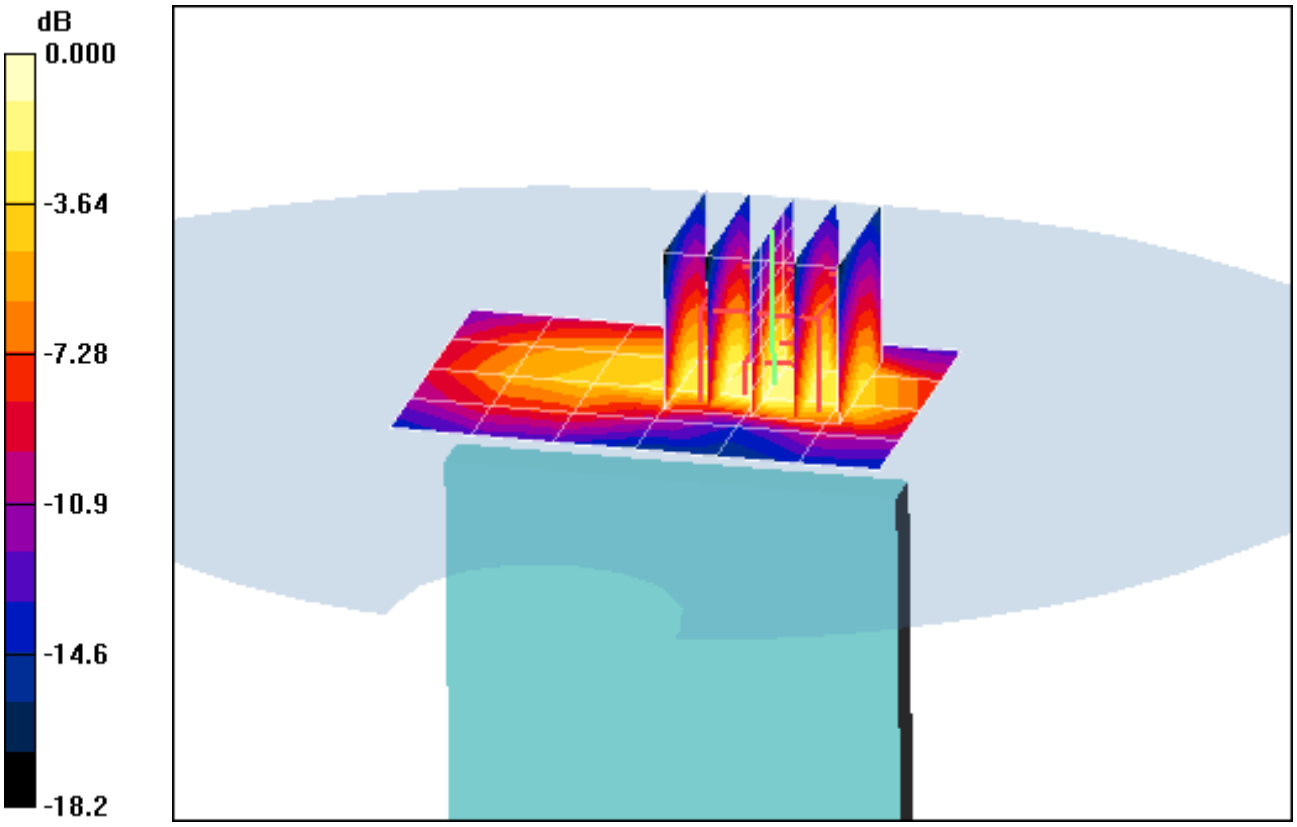
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.762 mW/g; SAR(10 g) = 0.387 mW/g



0 dB = 0.870mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

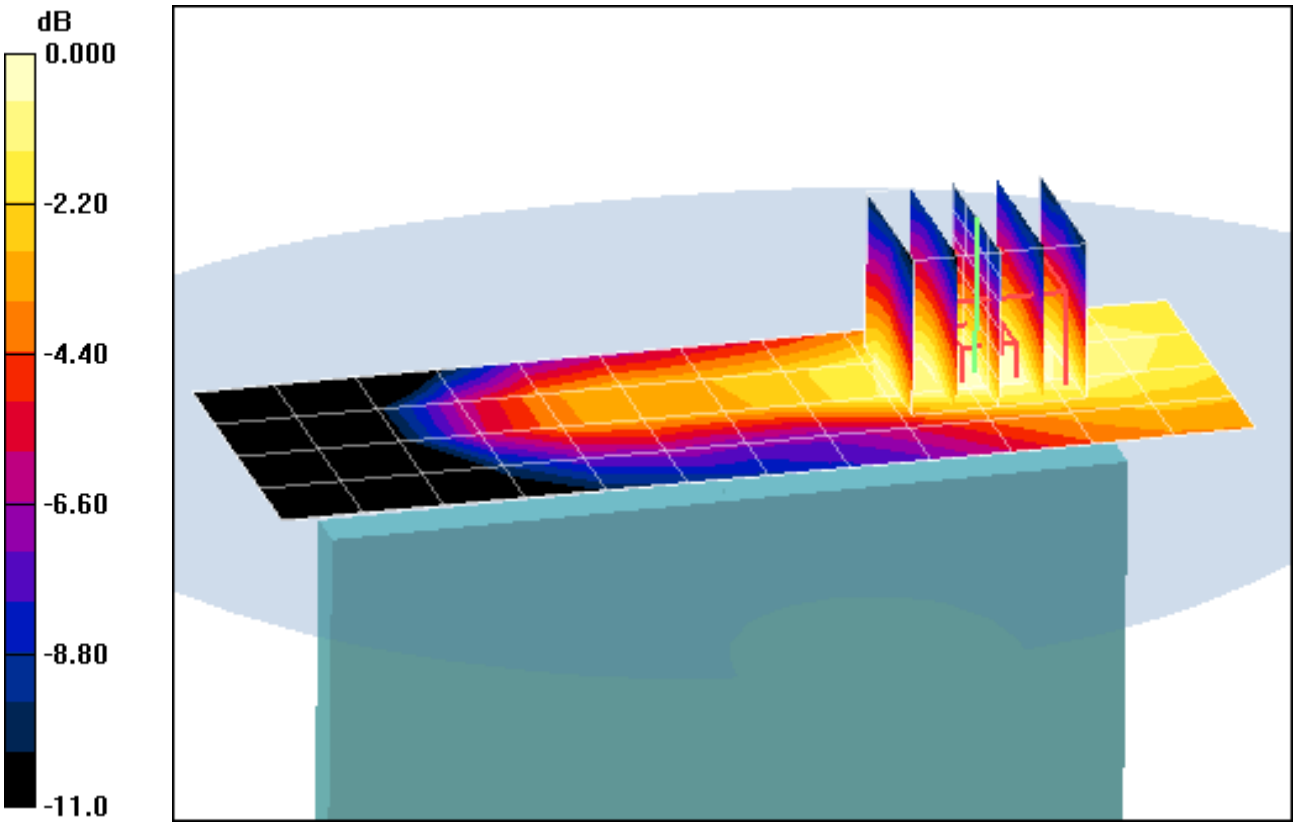
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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, Right Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.59 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 0.104 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.041 mW/g



0 dB = 0.072mW/g

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

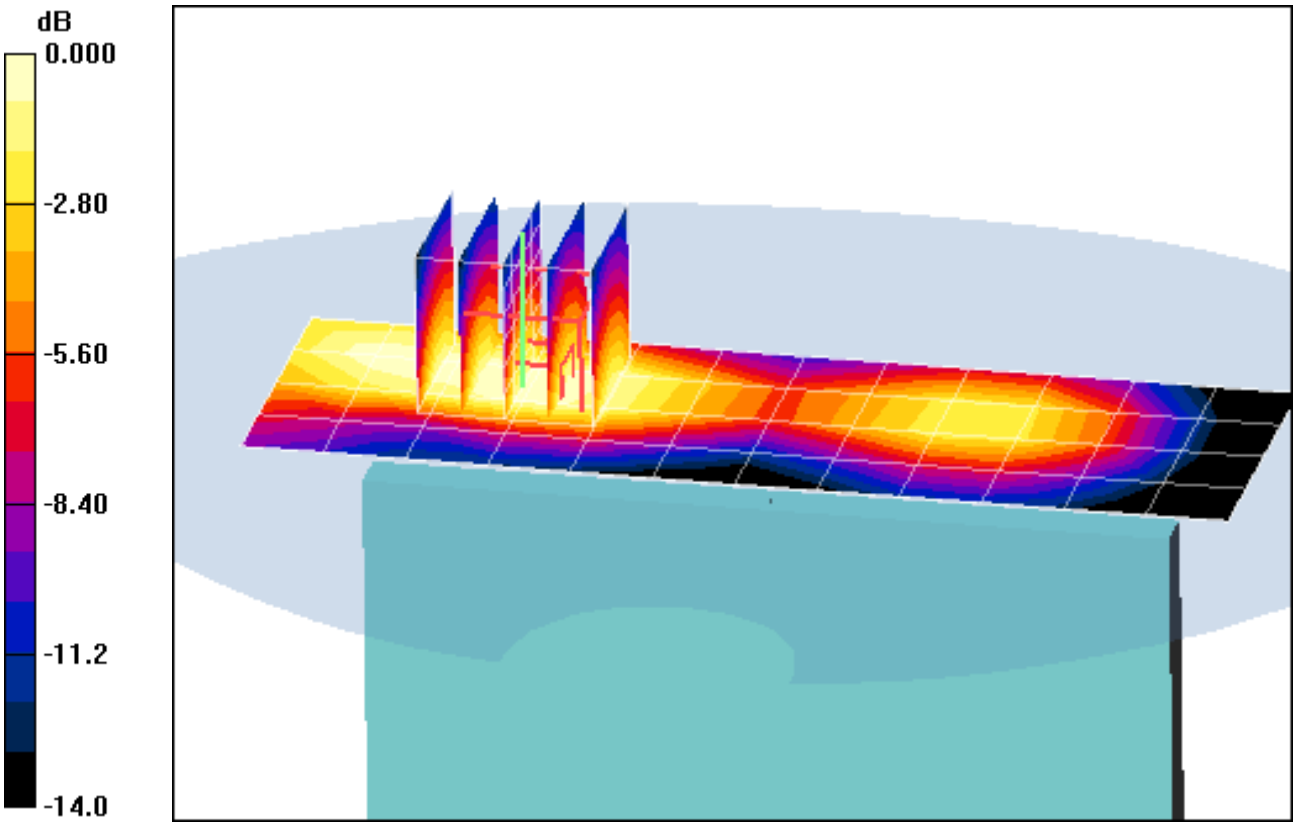
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6 °C; Tissue Temp: 21.9 °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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.378 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.133 mW/g



0 dB = 0.214mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

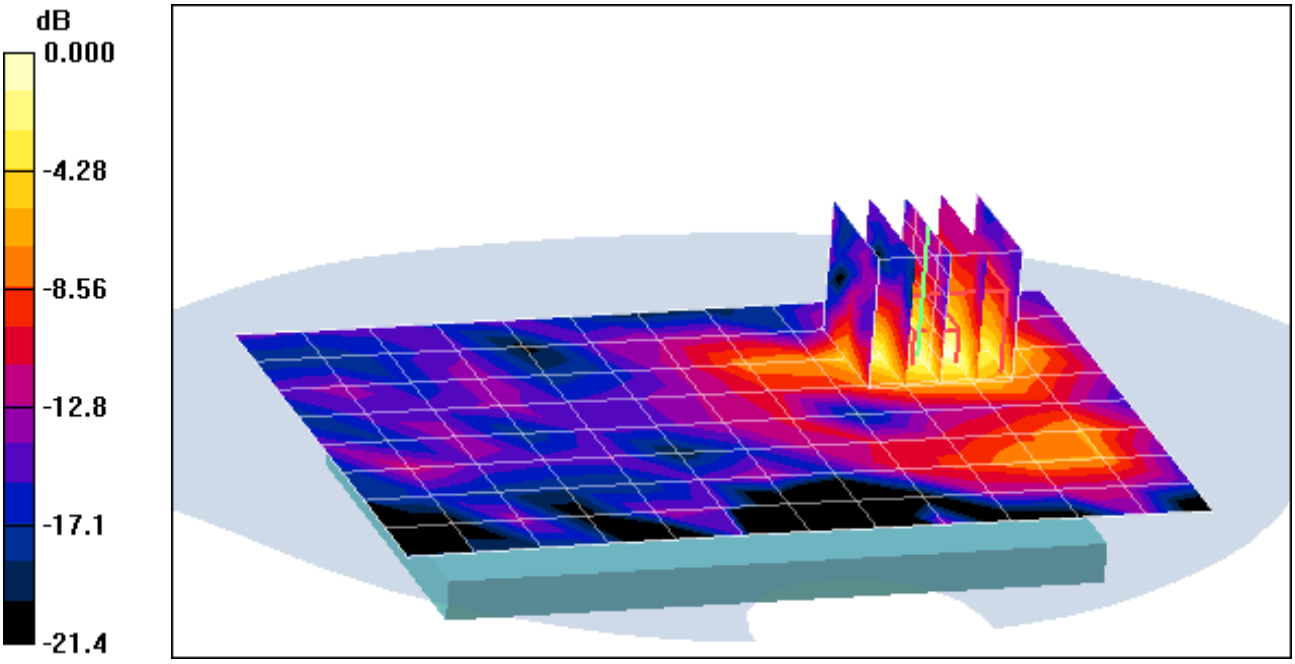
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.93 mho/m; ε_r = 50.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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 802.11b, Body SAR, Ch 6, 1 Mbps, Back Side

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.19 V/m; Power Drift = 0.114 dB
Peak SAR (extrapolated) = 0.101 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.023 mW/g



0 dB = 0.062mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

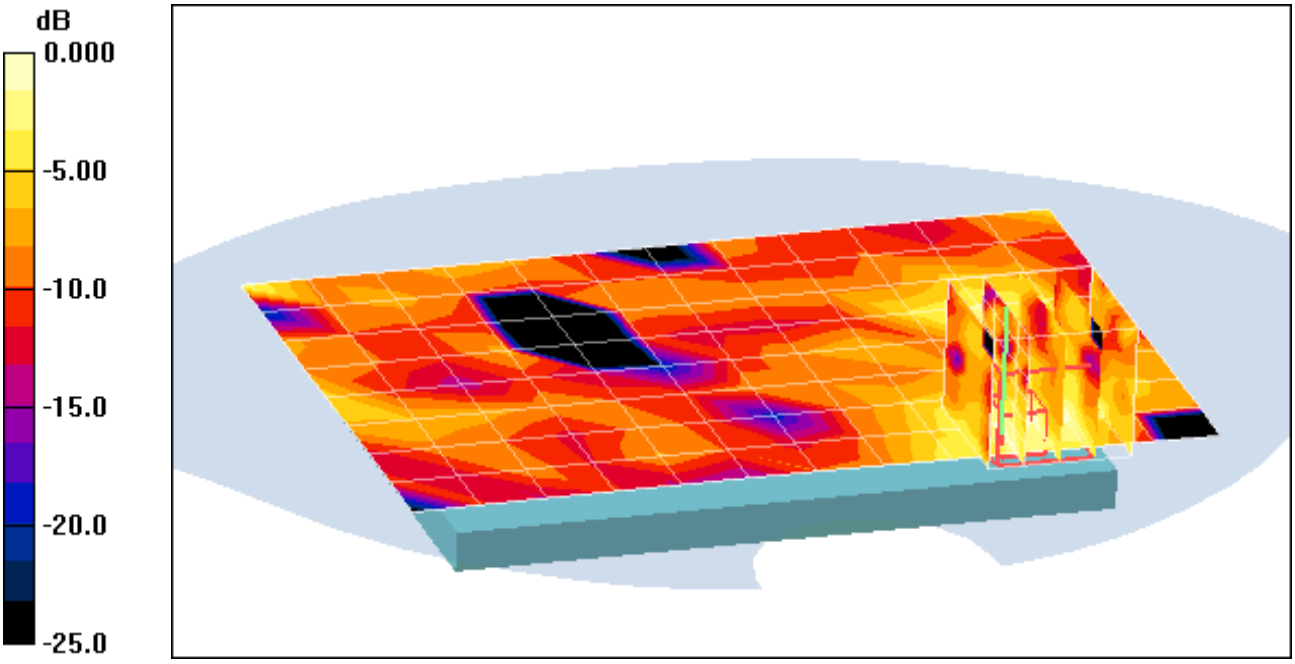
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.93 mho/m; ε_r = 50.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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 802.11b, Body SAR, Ch 6, 1 Mbps, Front Side

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.91 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.017 W/kg
SAR(1 g) = 0.00766 mW/g; SAR(10 g) = 0.0033 mW/g



0 dB = 0.010mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

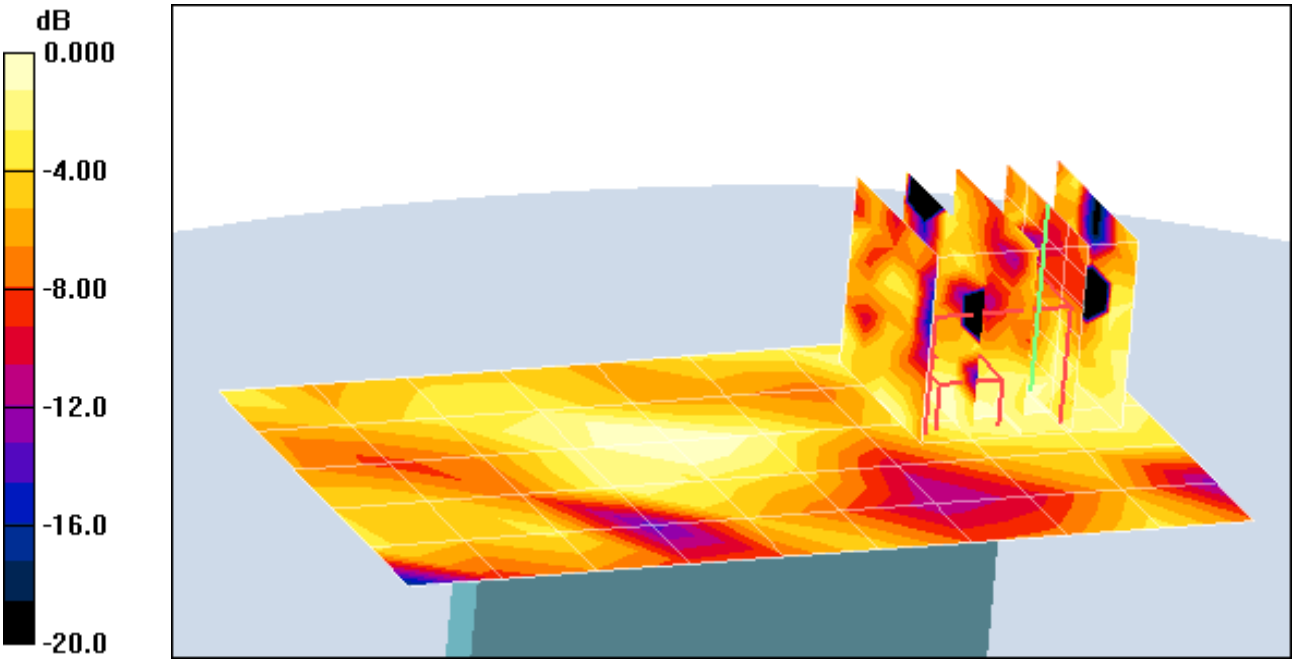
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.93 mho/m; ε_r = 50.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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 802.11b, Body SAR, Ch 6, 1 Mbps, Top Edge

Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.60 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.011 W/kg
SAR(1 g) = 0.0039 mW/g; SAR(10 g) = 0.00149 mW/g



0 dB = 0.005mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: FI-296-A

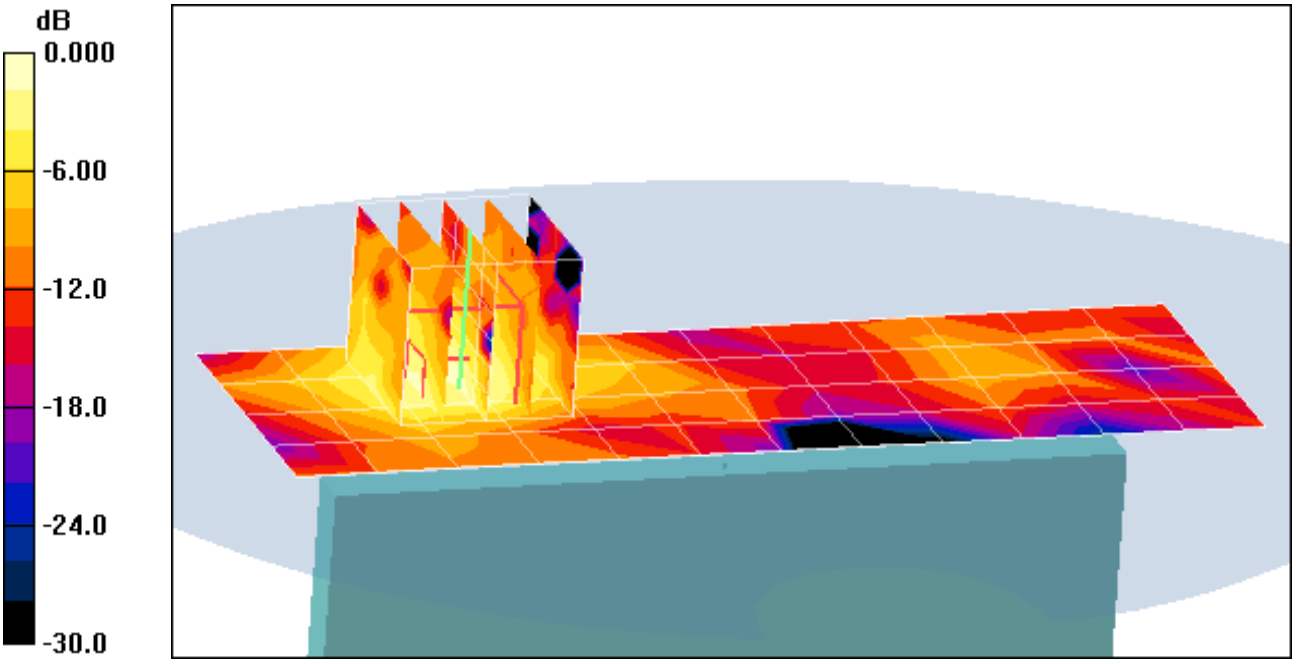
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.93 mho/m; ε_r = 50.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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 802.11b, Body SAR, Ch 6, 1 Mbps, Right Edge

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.08 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.034 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.010 mW/g



0 dB = 0.025mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI717; Type: Portable Handset; Serial: AI-065-A

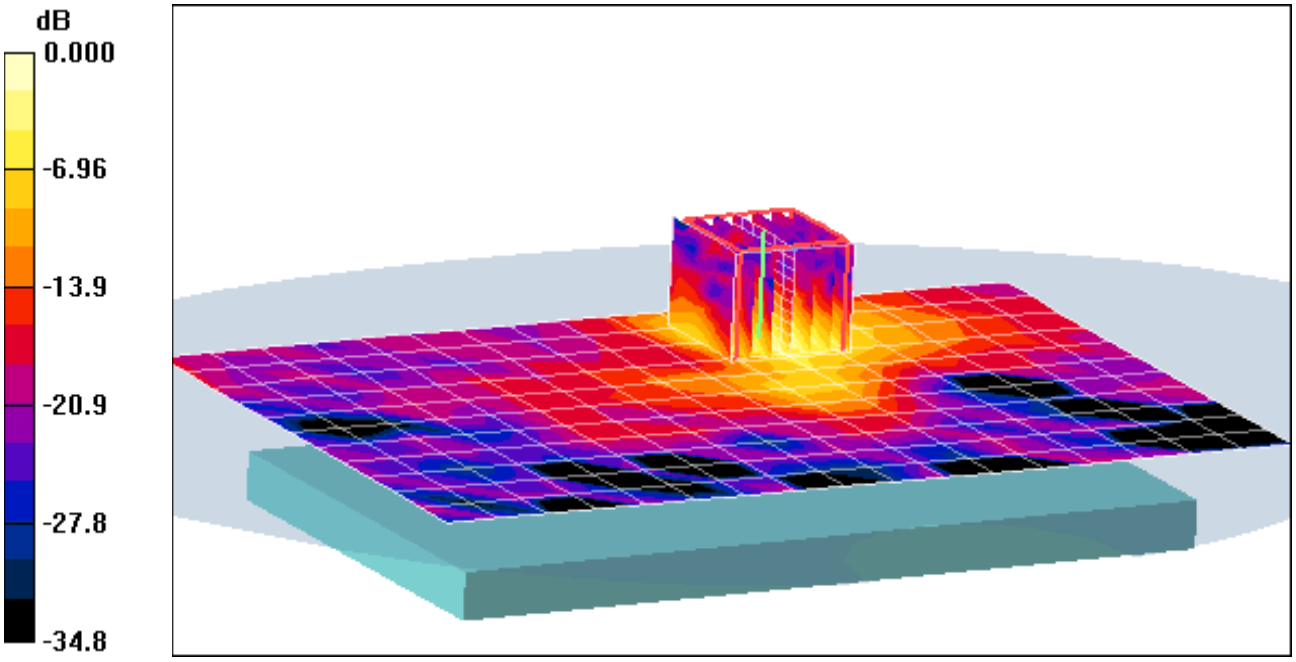
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.383 mho/m; ε_r = 47.39; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 23.7°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 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, 5.2 GHz, Body SAR, Ch 40, 6 Mbps, Back Side

Area Scan (12x18x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.40 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.122 mW/g



0 dB = 0.747mW/g

APPENDIX B: DIPOLE VALIDATION

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PCTEST ENGINEERING LABORATORY, INC.

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

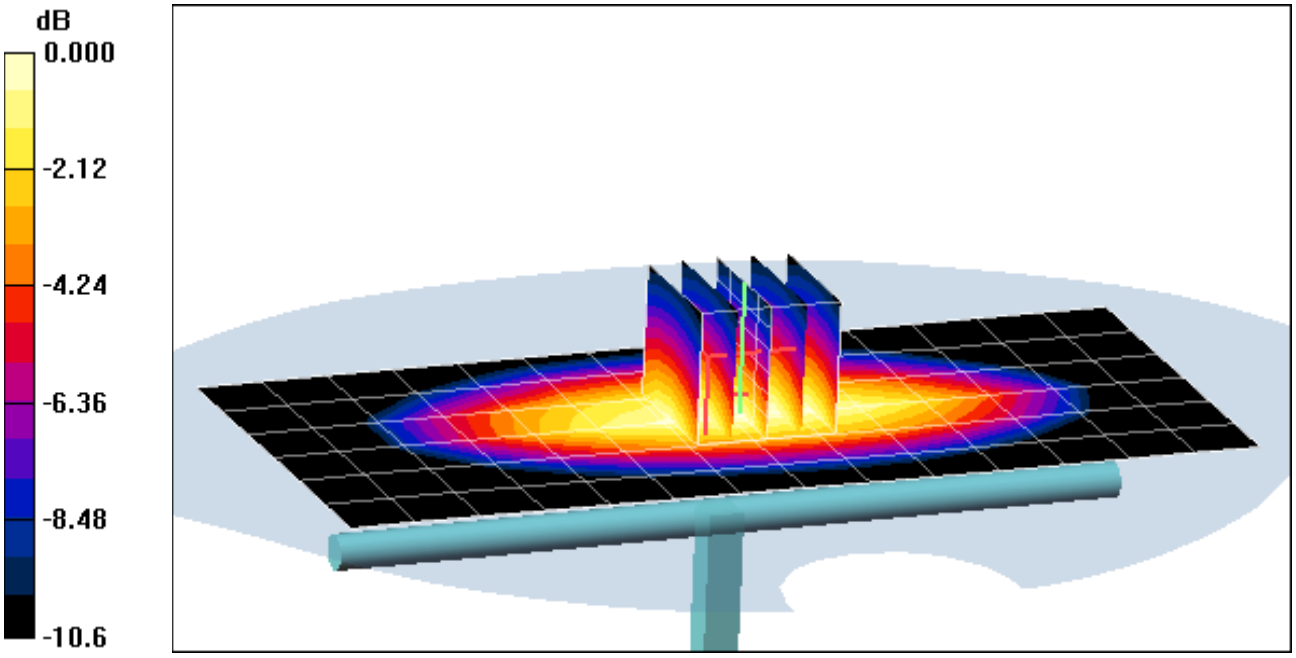
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.908 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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

750MHz System Verification

Area Scan (7x15x1): 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) = 0.840 mW/g; SAR(10 g) = 0.547 mW/g
Deviation = 0.36 %



0 dB = 0.908mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

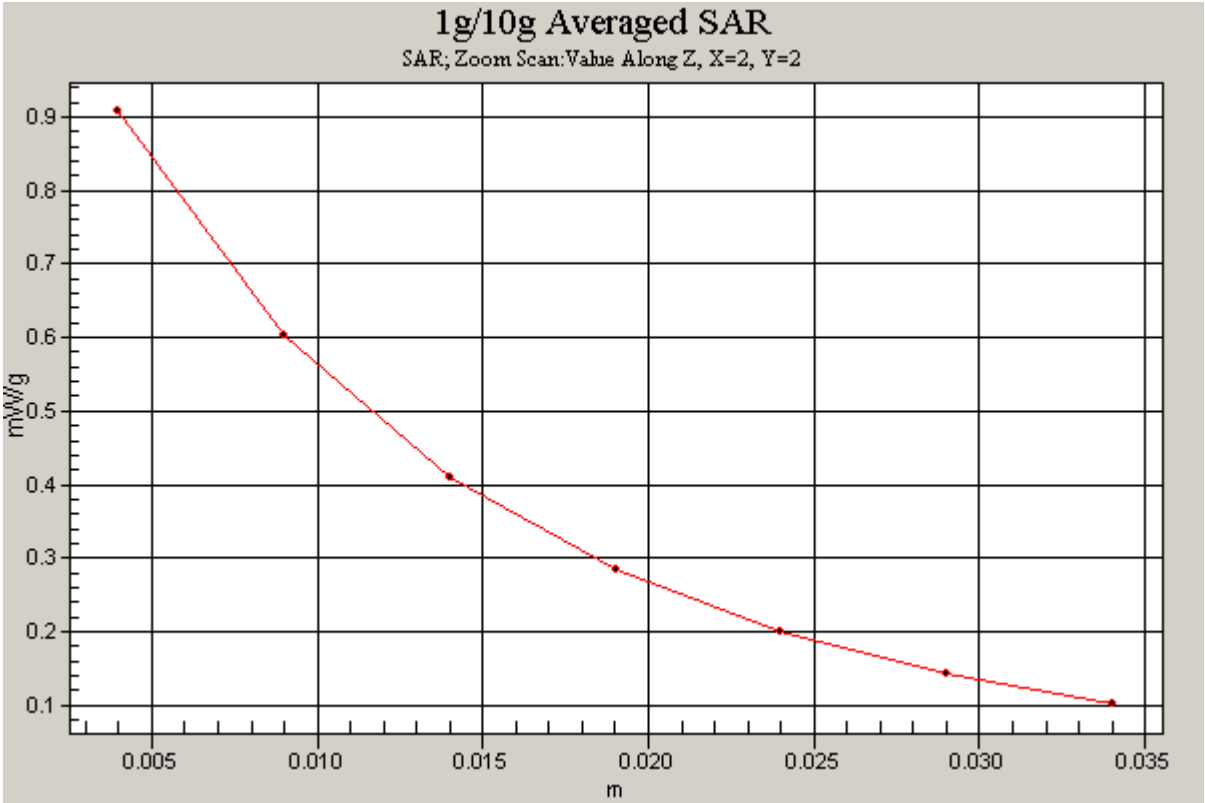
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.908 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-29-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.9 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); 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

750MHz System Verification

Area Scan (7x15x1): 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) = 0.840 mW/g; SAR(10 g) = 0.547 mW/g
Deviation = 0.36 %



DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

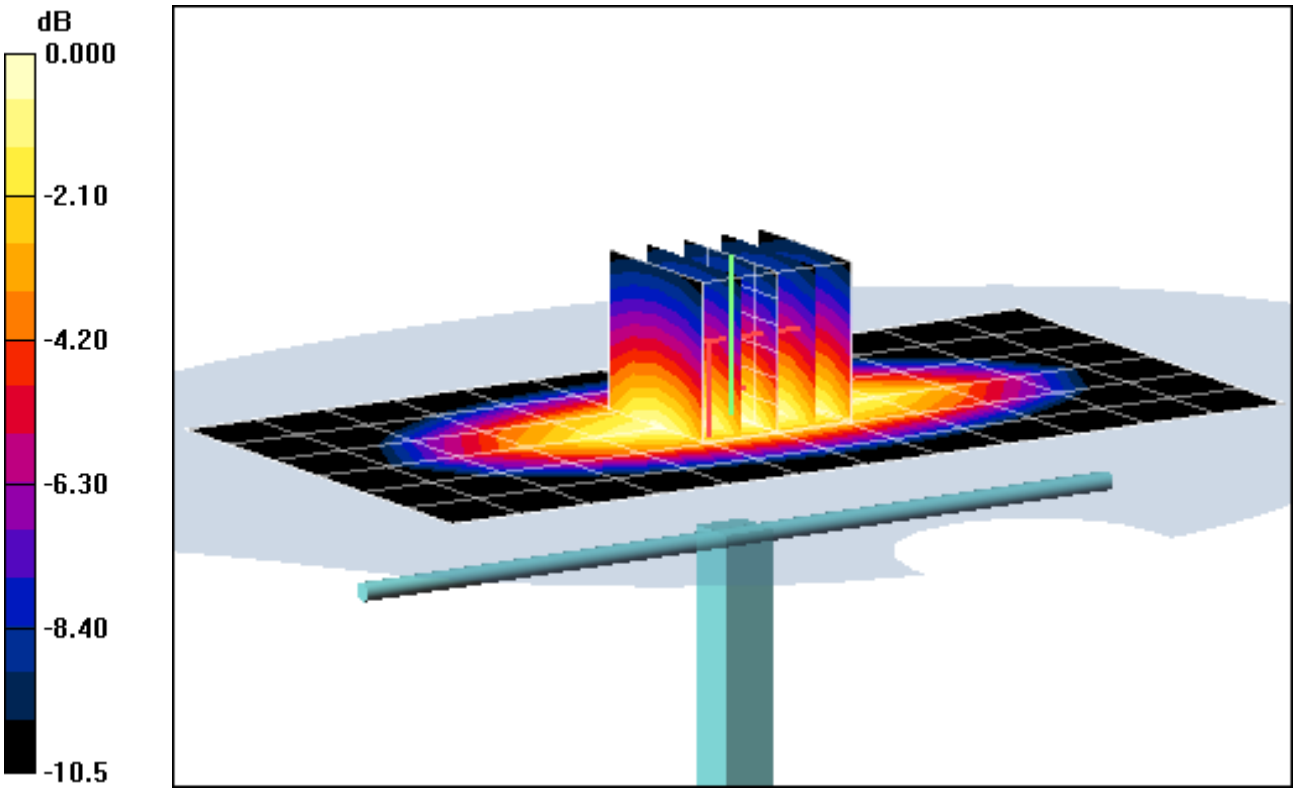
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.871 mho/m; ε_r = 41.89; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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) = 0.915 mW/g; SAR(10 g) = 0.600 mW/g
Deviation = -3.99 %



0 dB = 0.985mW/g

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

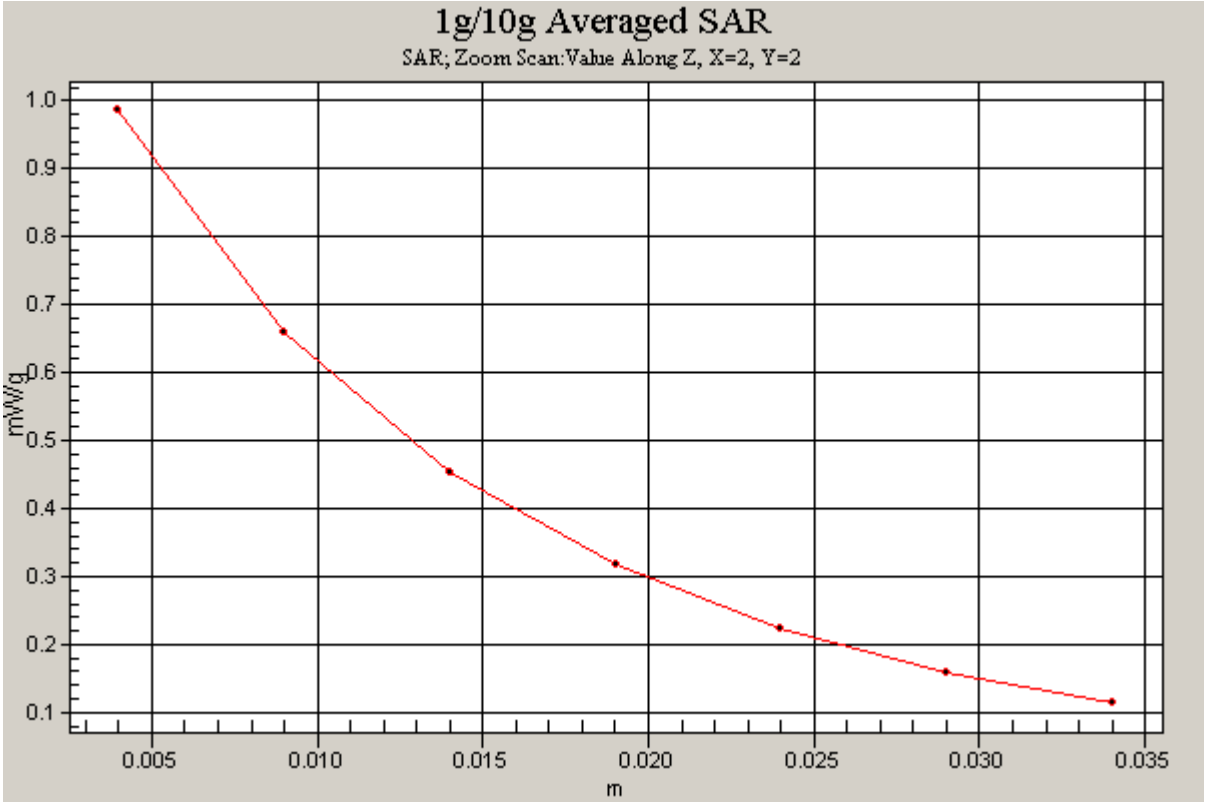
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.871 mho/m; ε_r = 41.89; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-22-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.4 °C

Probe: EX3DV4 - SN3550; ConvF(8.04, 8.04, 8.04); Calibrated: 2/14/2011
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) = 0.915 mW/g; SAR(10 g) = 0.600 mW/g
Deviation = -3.99 %



PCTEST ENGINEERING LABORATORY, INC.

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

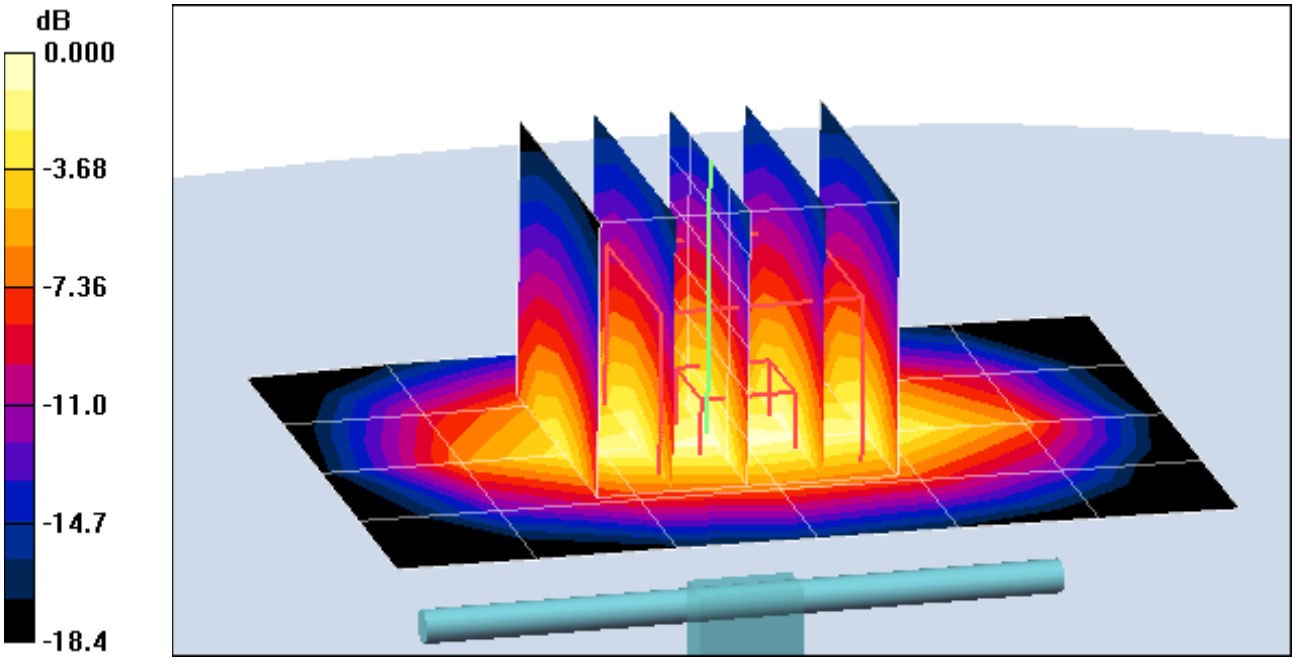
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.39 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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 (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) = 1.46 mW/g; SAR(10 g) = 0.748 mW/g
Deviation = -1.35 %



0 dB = 1.63mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

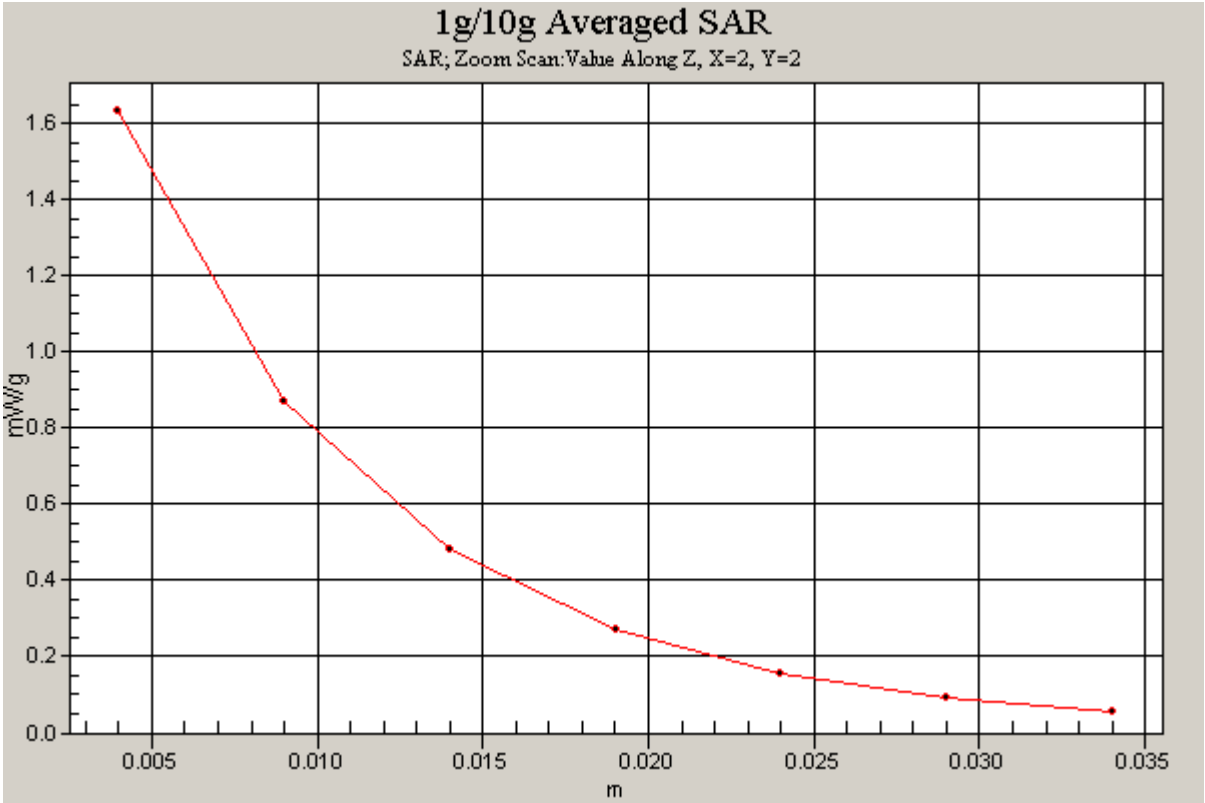
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.39 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-16-2011; Ambient Temp: 23.2 °C; Tissue Temp: 21.6 °C

Probe: EX3DV4 - SN3561; ConvF(7.37, 7.37, 7.37); 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 (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) = 1.46 mW/g; SAR(10 g) = 0.748 mW/g
Deviation = -1.35 %



PCTEST ENGINEERING LABORATORY, INC.

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

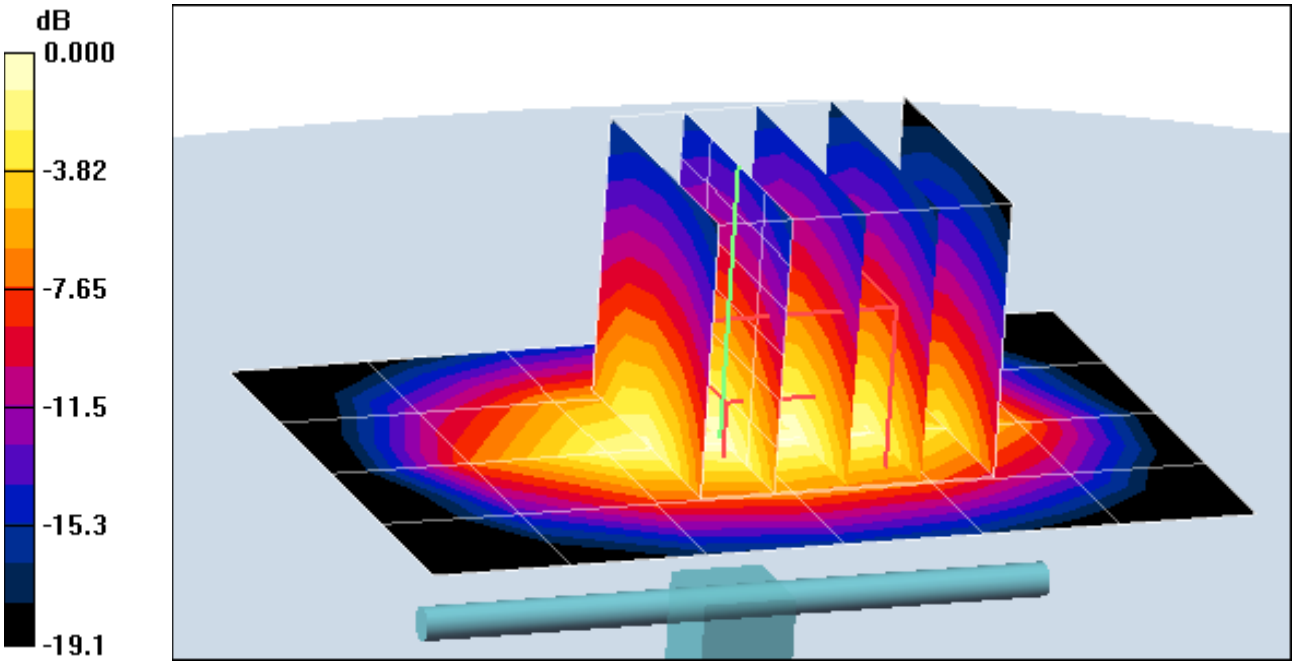
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.44 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; 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) = 3.96 mW/g; SAR(10 g) = 2.03 mW/g
Deviation = -1.49 %



0 dB = 4.40mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

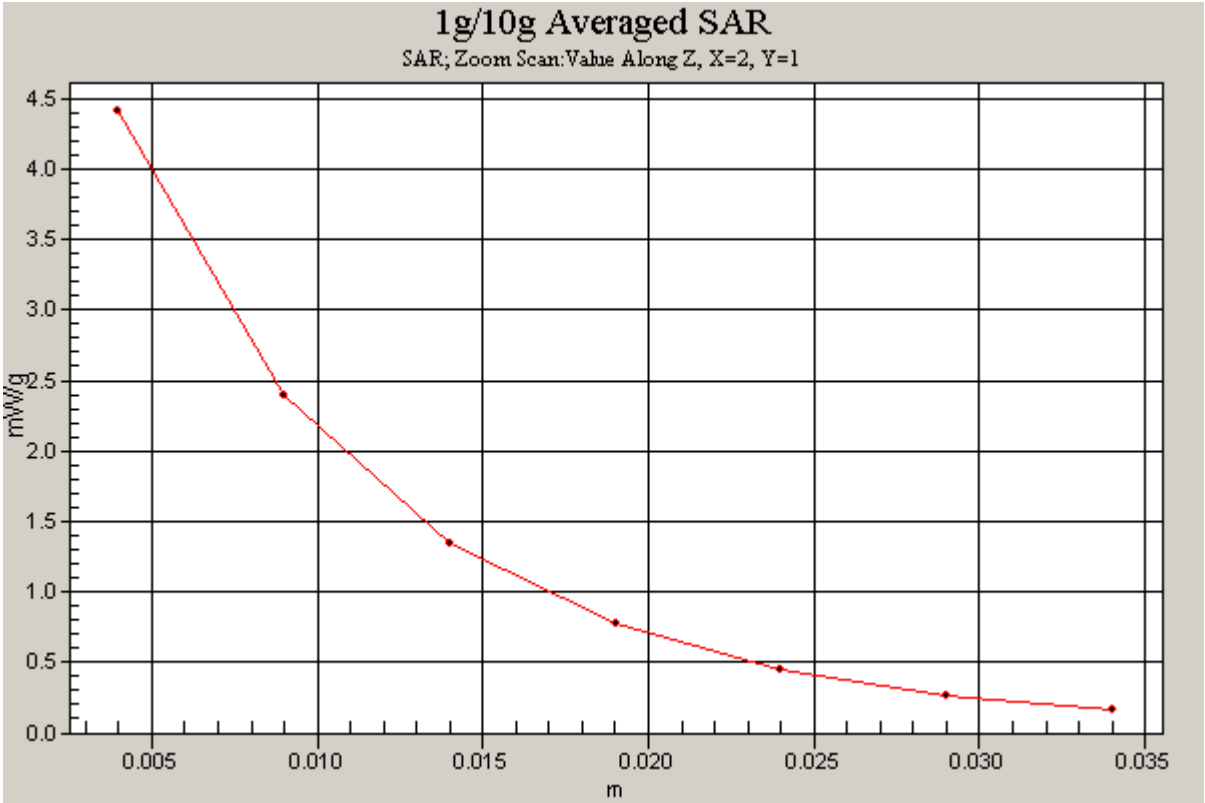
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.44 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.1 °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; 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) = 3.96 mW/g; SAR(10 g) = 2.03 mW/g
Deviation = -1.49 %



PCTEST ENGINEERING LABORATORY, INC.

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

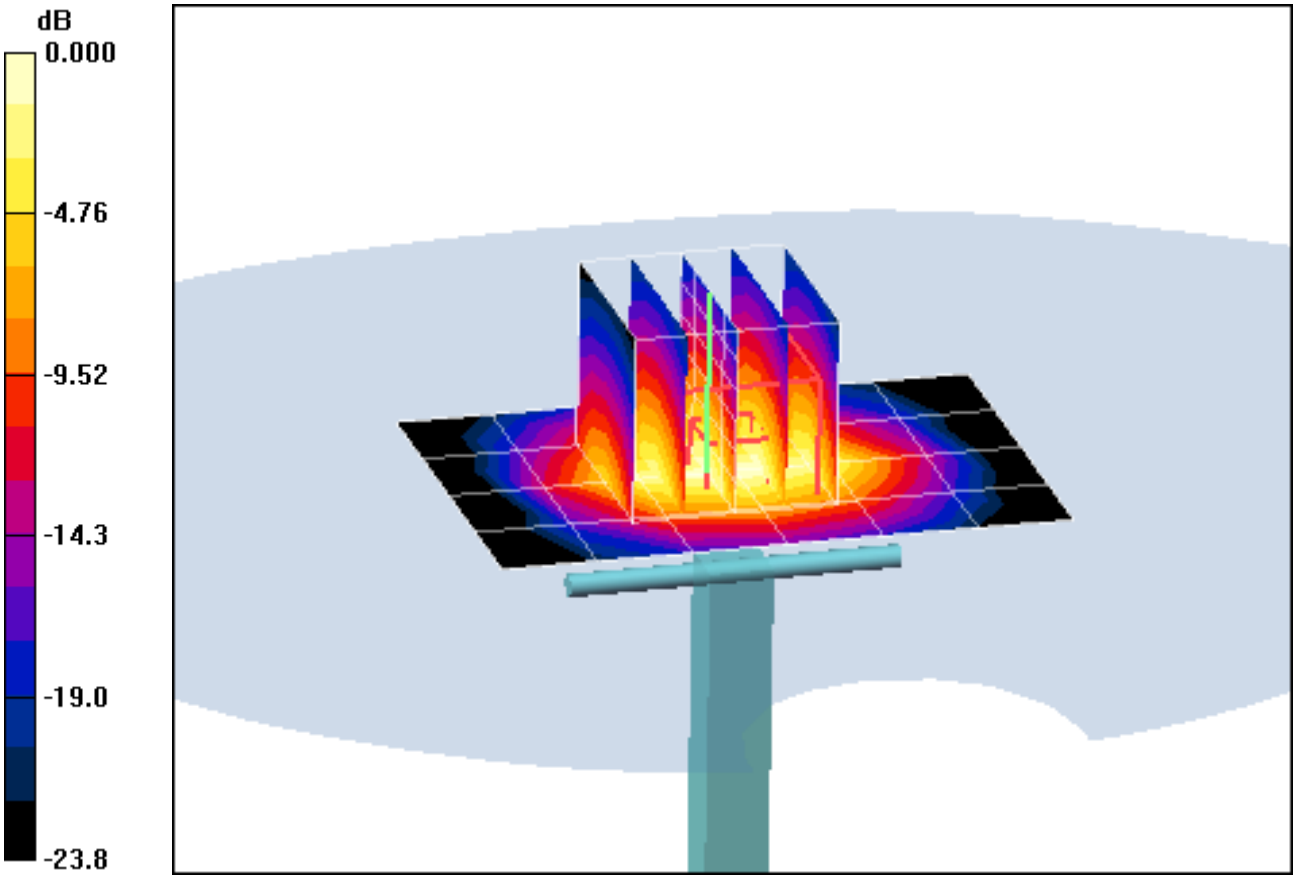
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used:
f = 2450 MHz; σ = 1.842 mho/m; ε_r = 39.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 dBm (40 mW)
SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.03 mW/g
Deviation = 4.13%



0 dB = 2.85mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

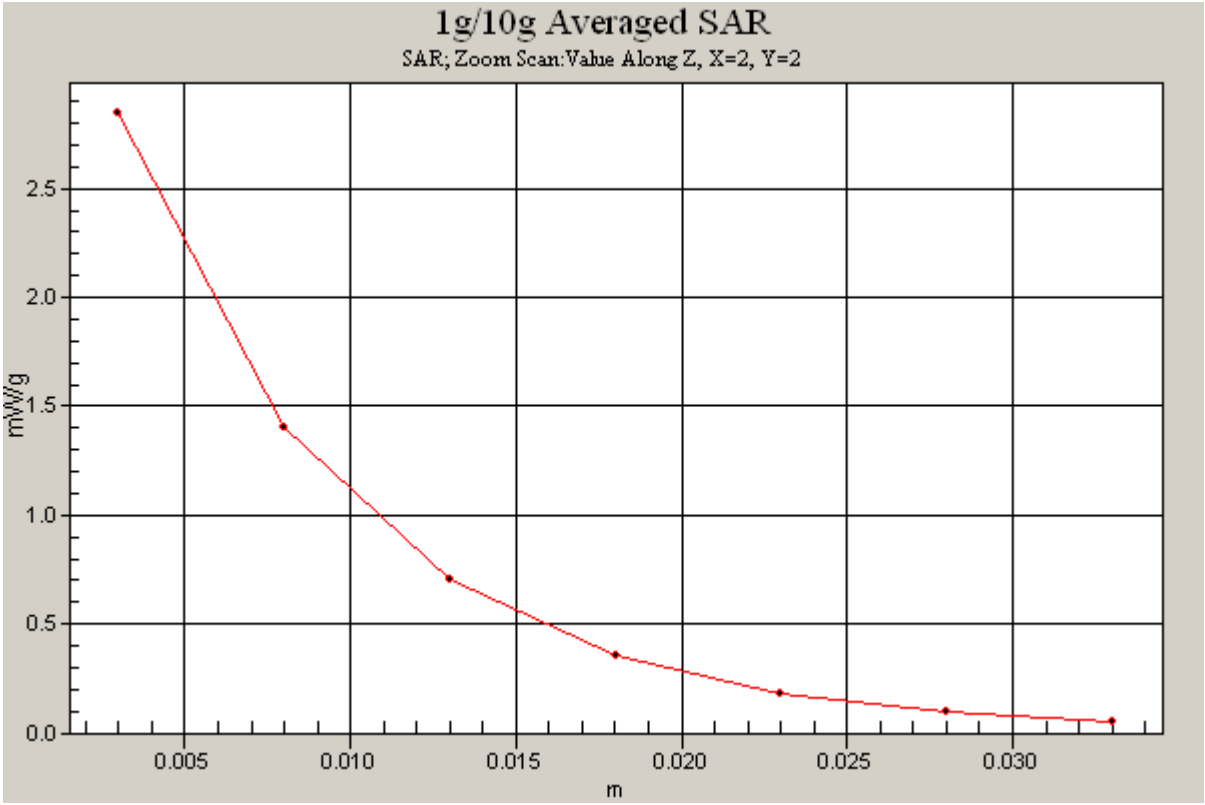
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used:
f = 2450 MHz; σ = 1.842 mho/m; ε_r = 39.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.1°C; Tissue Temp: 21.6°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 dBm (40 mW)
SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.03 mW/g
Deviation = 4.13%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1057

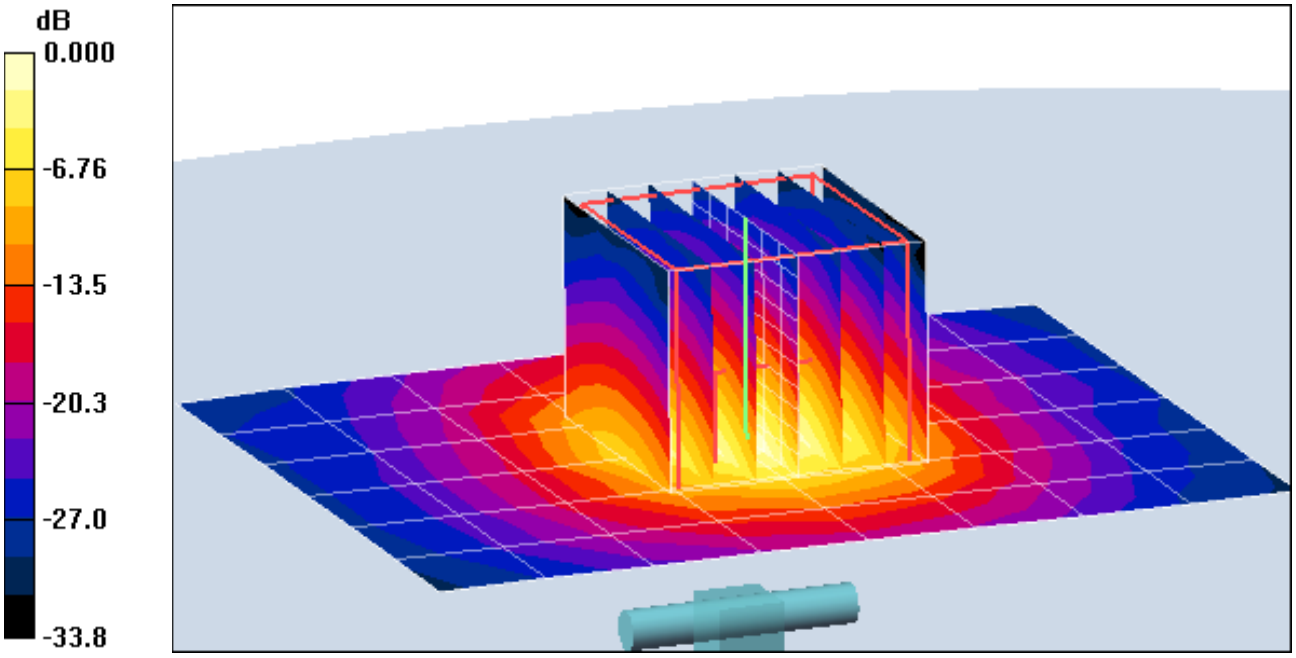
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.789 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.3 °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) = 8.89 mW/g; SAR(10 g) = 2.53 mW/g
Deviation = 6.98 %



0 dB = 18.4mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1057

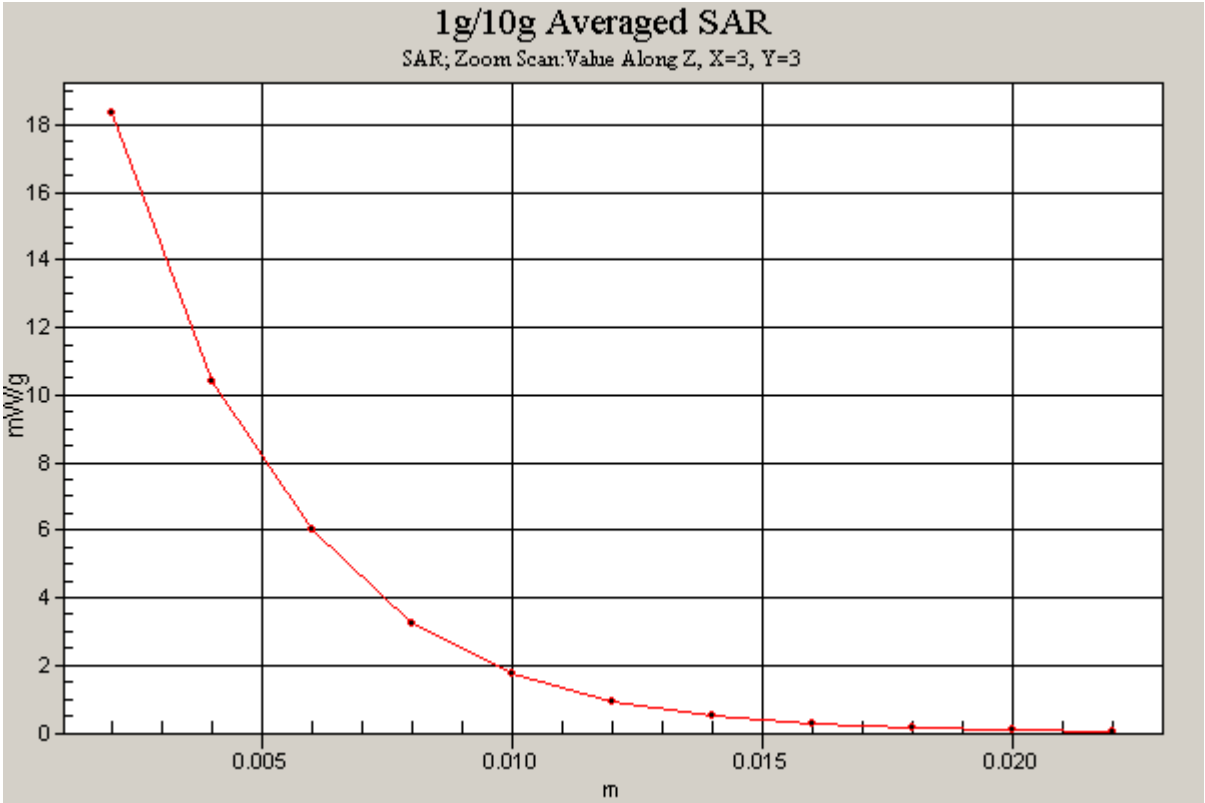
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.789 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.3 °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) = 8.89 mW/g; SAR(10 g) = 2.53 mW/g
Deviation = 6.98 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1057

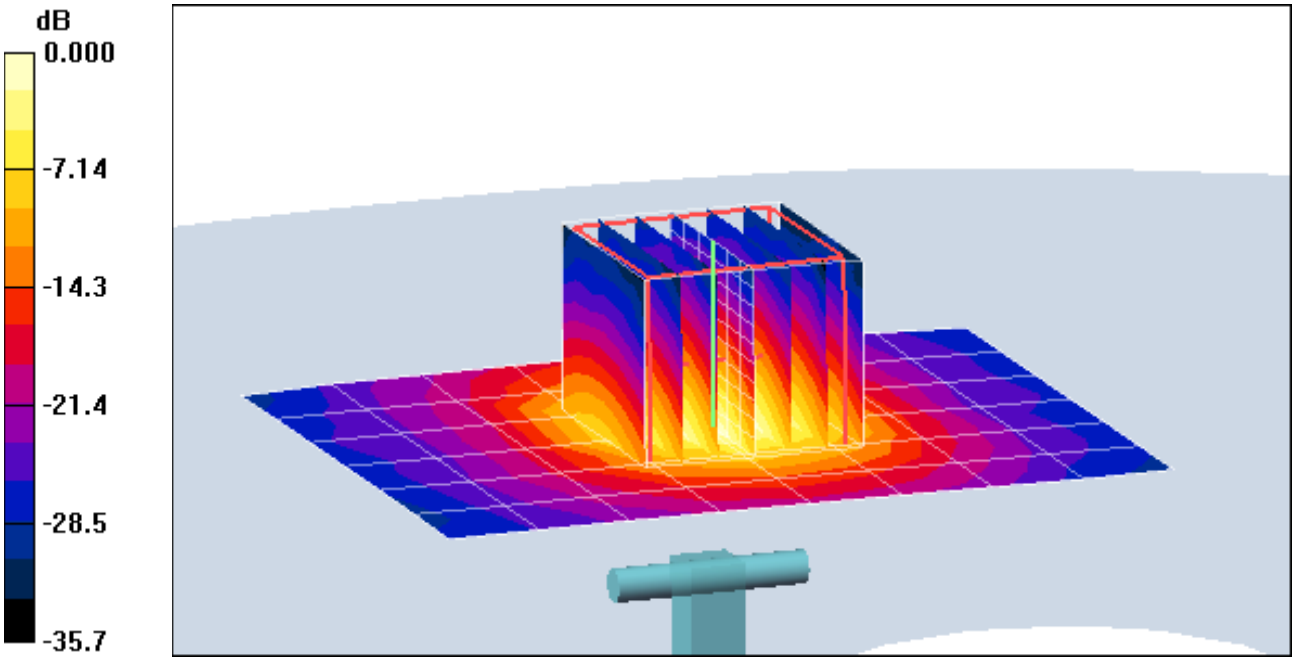
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5500 MHz; σ = 5.089 mho/m; ε_r = 35.73; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.7 °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) = 8.98 mW/g; SAR(10 g) = 2.53 mW/g
Deviation = -0.33 %



0 dB = 17.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1057

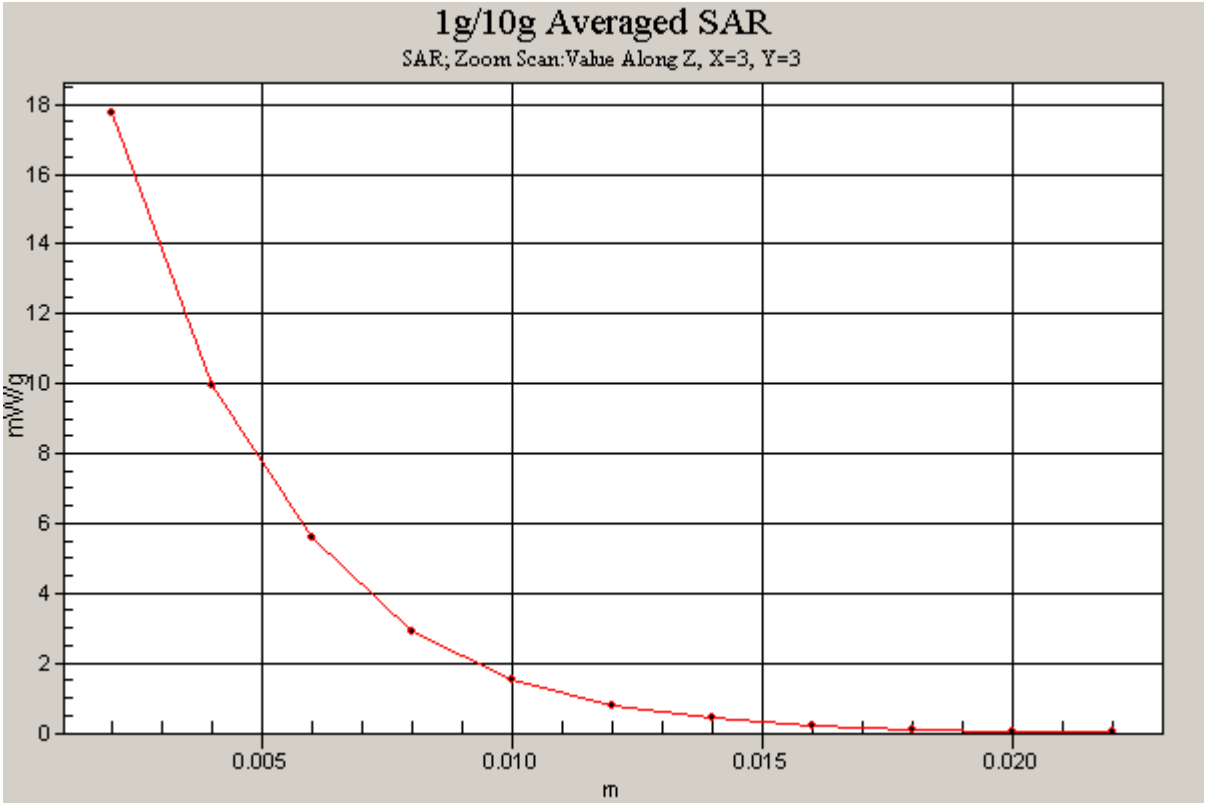
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5500 MHz; σ = 5.089 mho/m; ε_r = 35.73; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.7 °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) = 8.98 mW/g; SAR(10 g) = 2.53 mW/g
Deviation = -0.33 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1057

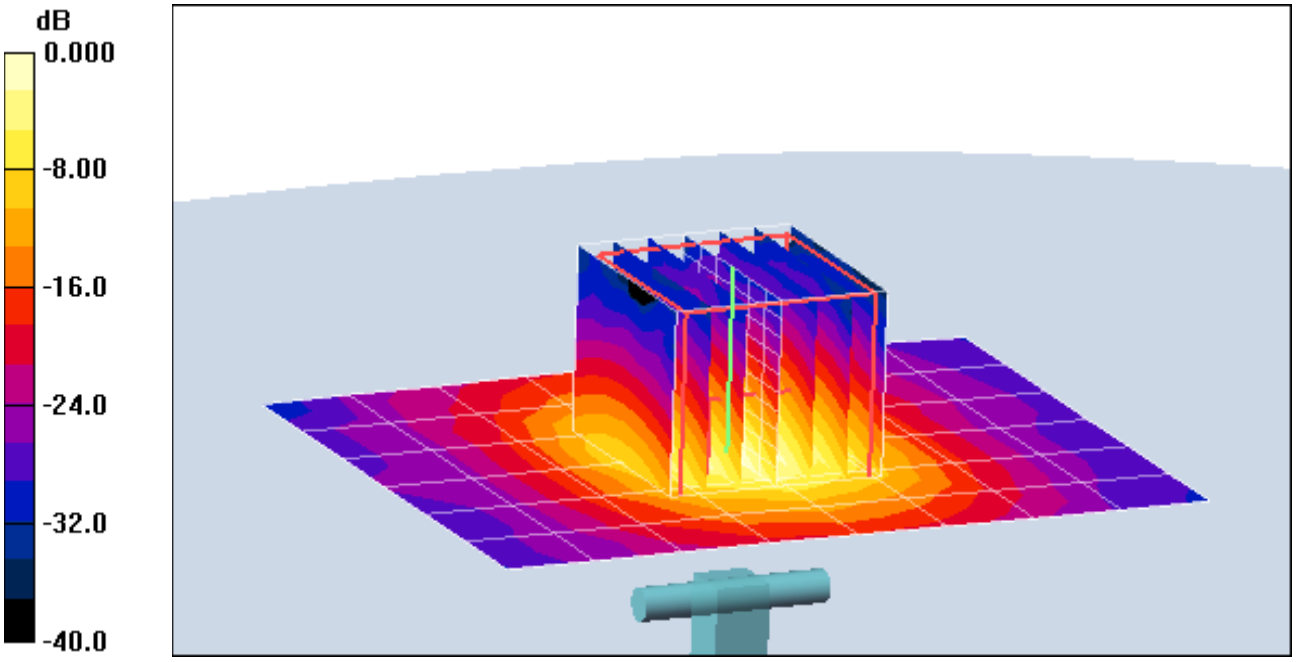
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5800 MHz; σ = 5.462 mho/m; ε_r = 35.13; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.9 °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) = 8.83 mW/g; SAR(10 g) = 2.48 mW/g
Deviation = 6.51 %



0 dB = 18.3mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1057

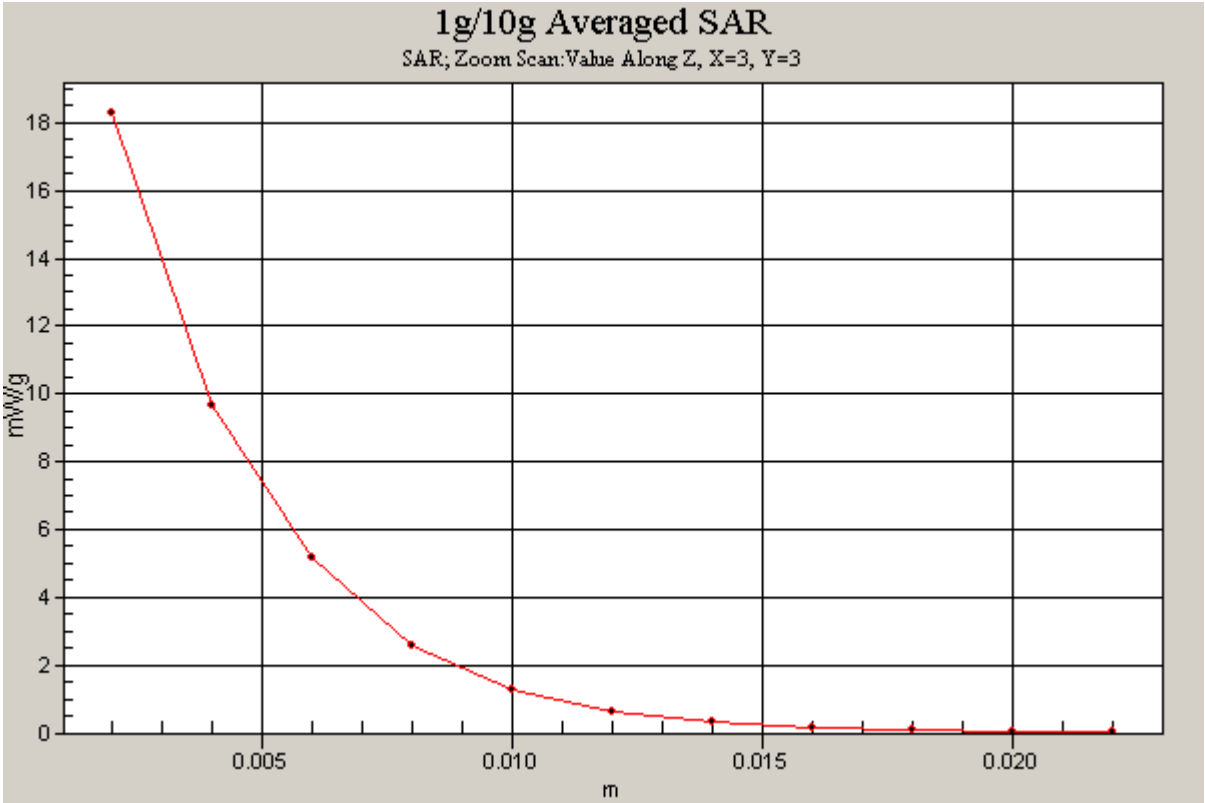
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5800 MHz; σ = 5.462 mho/m; ε_r = 35.13; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-02-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.9 °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) = 8.83 mW/g; SAR(10 g) = 2.48 mW/g
Deviation = 6.51 %



PCTEST ENGINEERING LABORATORY, INC.

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

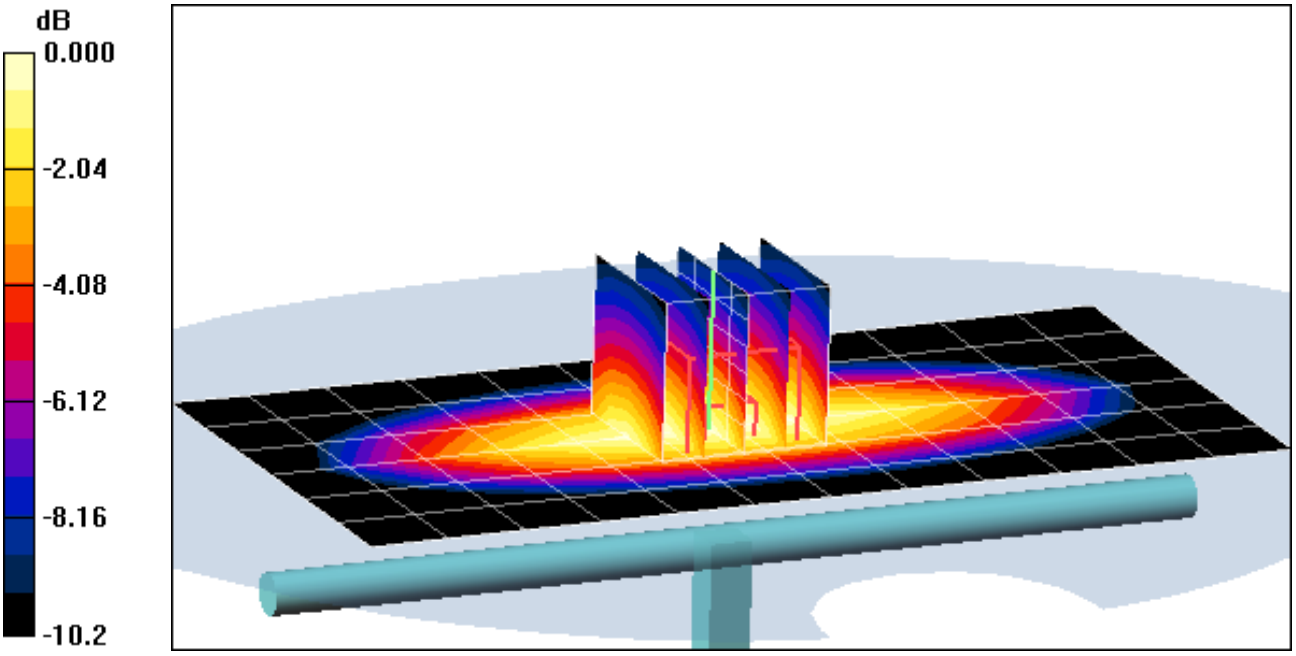
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.969 mho/m; ε_r = 56.12; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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) = 0.832 mW/g; SAR(10 g) = 0.550 mW/g
Deviation = -5.99 %



0 dB = 0.898mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

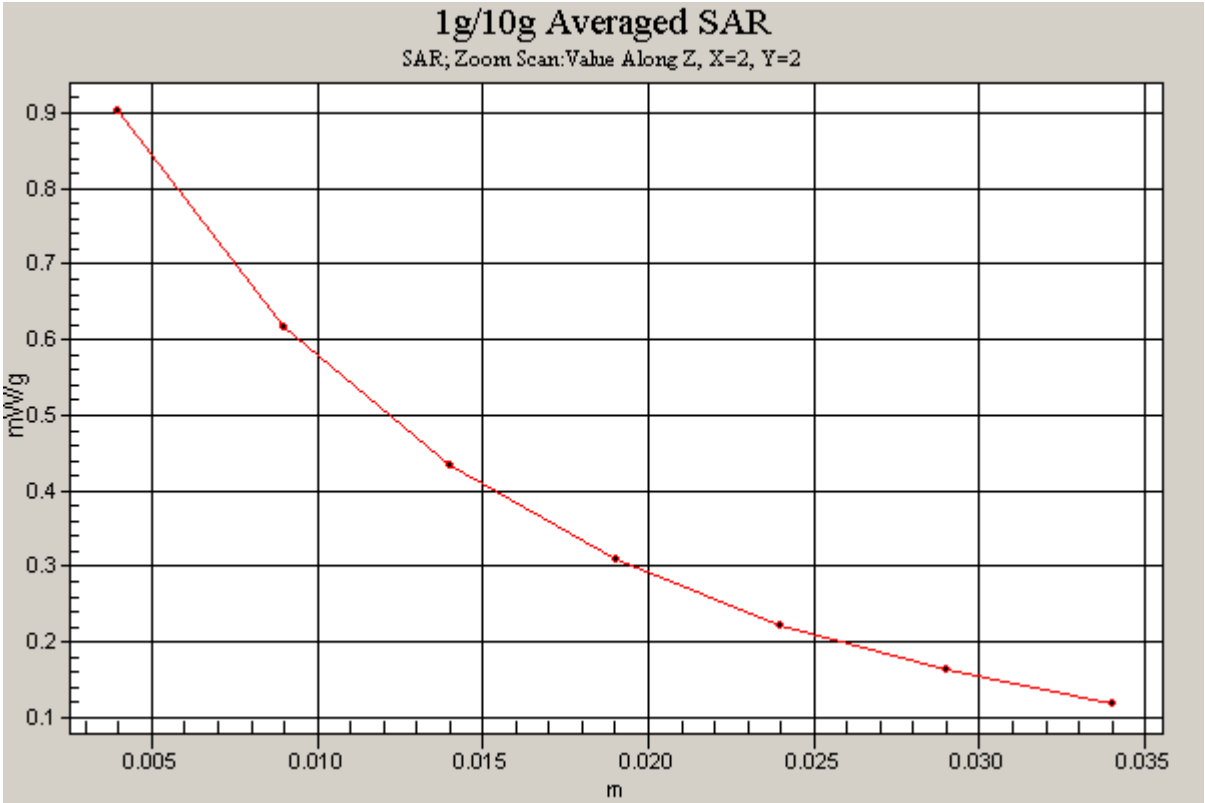
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.969 mho/m; ε_r = 56.12; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-30-2011; Ambient Temp: 23.4 °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) = 0.832 mW/g; SAR(10 g) = 0.550 mW/g
Deviation = -5.99 %



DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

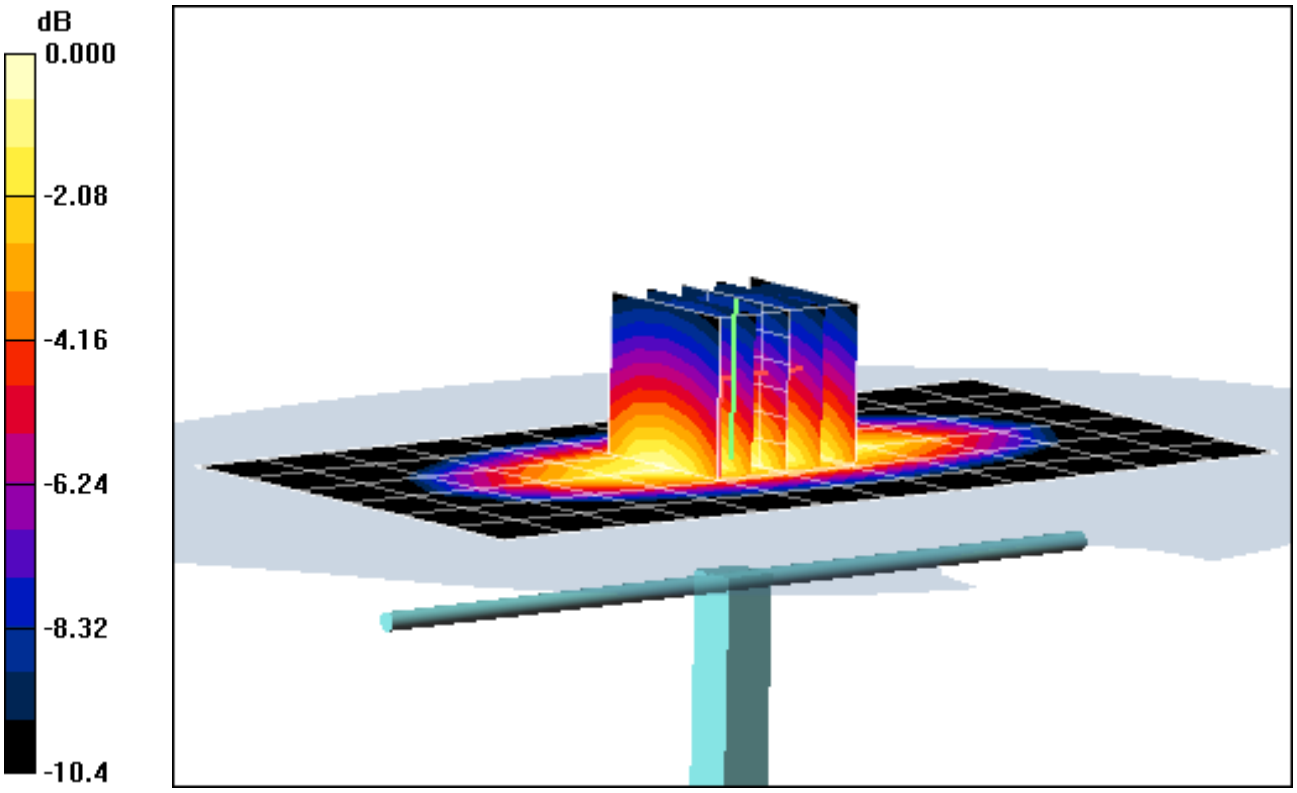
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.975 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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 = 20.0 dBm (100 mW)
SAR(1 g) = 0.954 mW/g; SAR(10 g) = 0.625 mW/g
Deviation = -3.15 %



0 dB = 1.03mW/g

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

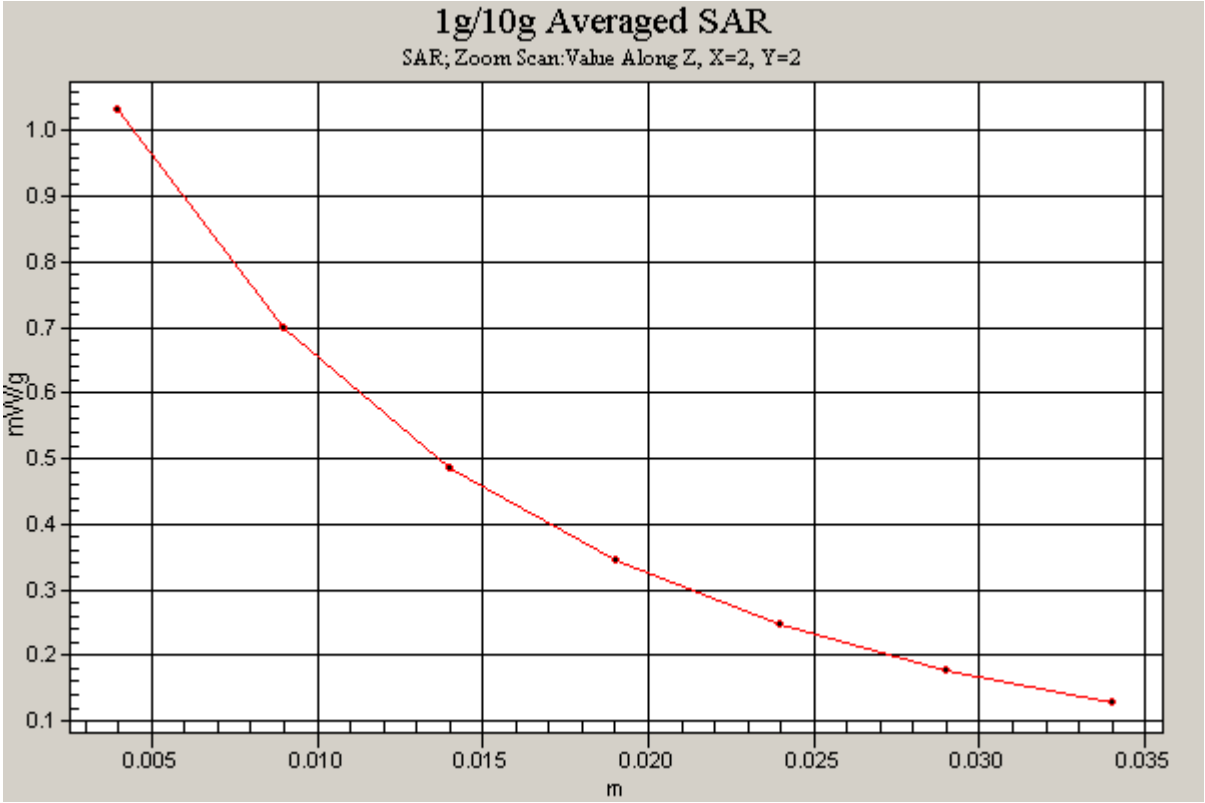
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.975 mho/m; ε_r = 54.66; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-22-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.1 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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 = 20.0 dBm (100 mW)
SAR(1 g) = 0.954 mW/g; SAR(10 g) = 0.625 mW/g
Deviation = -3.15 %



PCTEST ENGINEERING LABORATORY, INC.

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

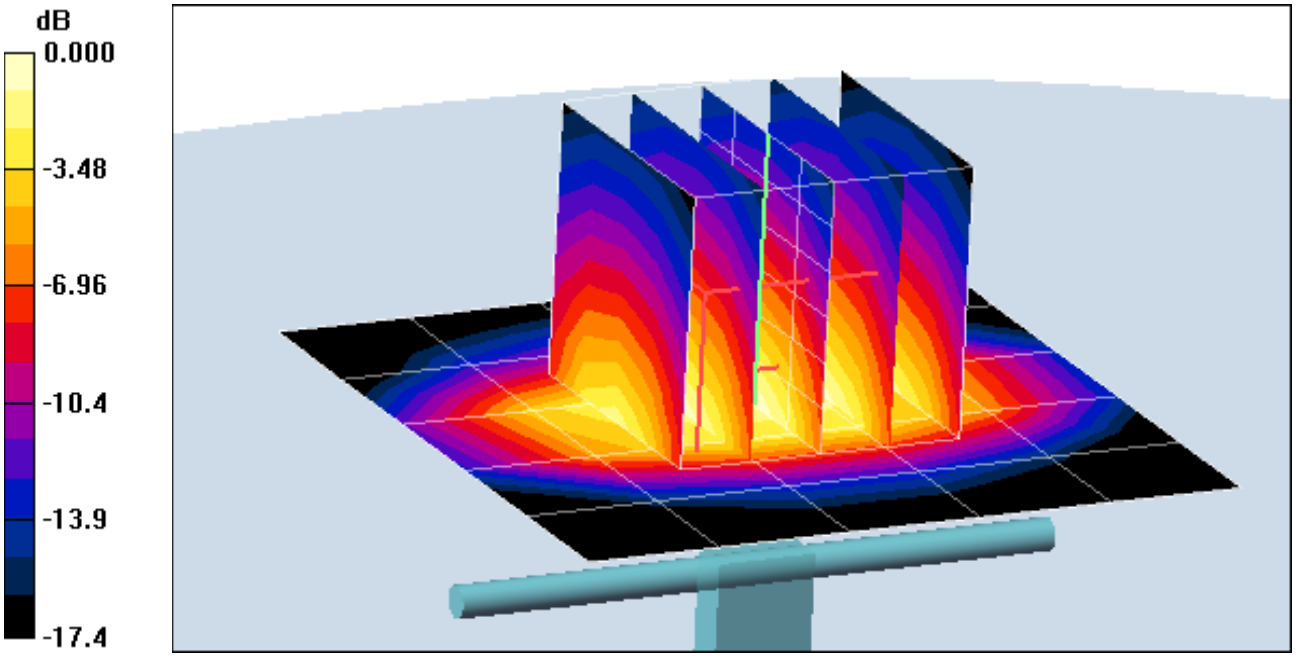
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.54 mho/m; ε_r = 52.04; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 Sub; Type: SAM 4.0; Serial: TP-1357
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 = 16.0 dBm (40 mW)
SAR(1 g) = 1.54 mW/g; SAR(10 g) = 0.794 mW/g
Deviation = 4.05 %



0 dB = 1.74mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

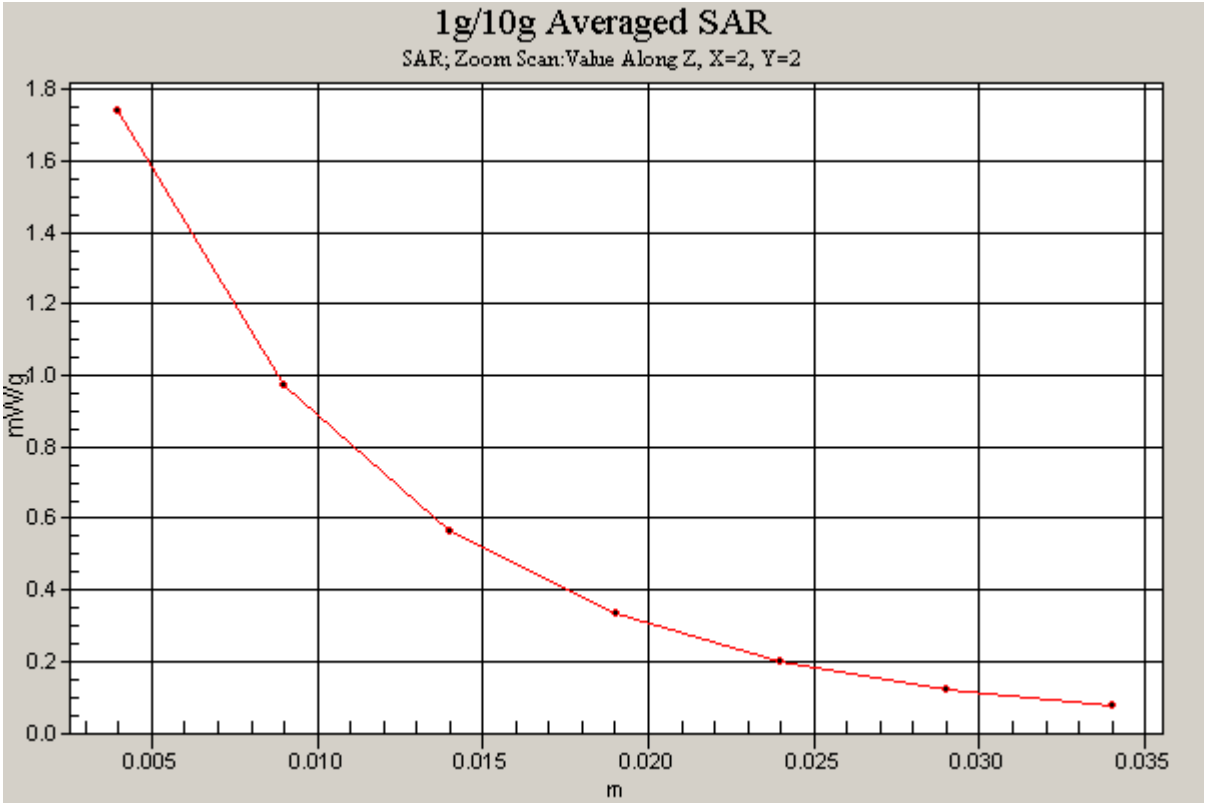
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.54 mho/m; ε_r = 52.04; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-28-2011; Ambient Temp: 24.8 °C; Tissue Temp: 23.5 °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 Sub; Type: SAM 4.0; Serial: TP-1357
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 = 16.0 dBm (40 mW)
SAR(1 g) = 1.54 mW/g; SAR(10 g) = 0.794 mW/g
Deviation = 4.05 %



PCTEST ENGINEERING LABORATORY, INC.

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

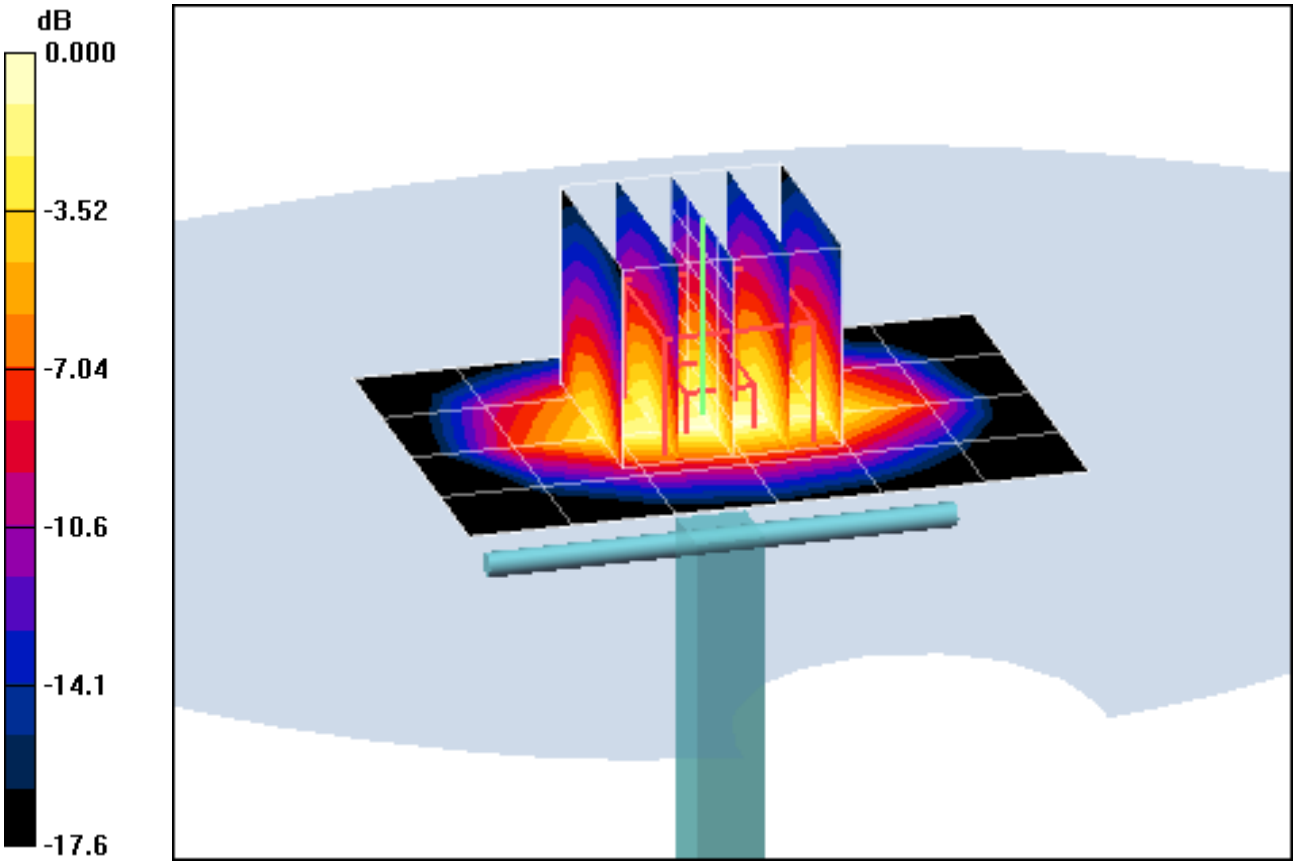
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6°C; Tissue Temp: 21.9°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 dBm (100 mW)
SAR(1 g) = 4.1 mW/g; SAR(10 g) = 2.16 mW/g
Deviation = -0.24%



0 dB = 4.58mW/g

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

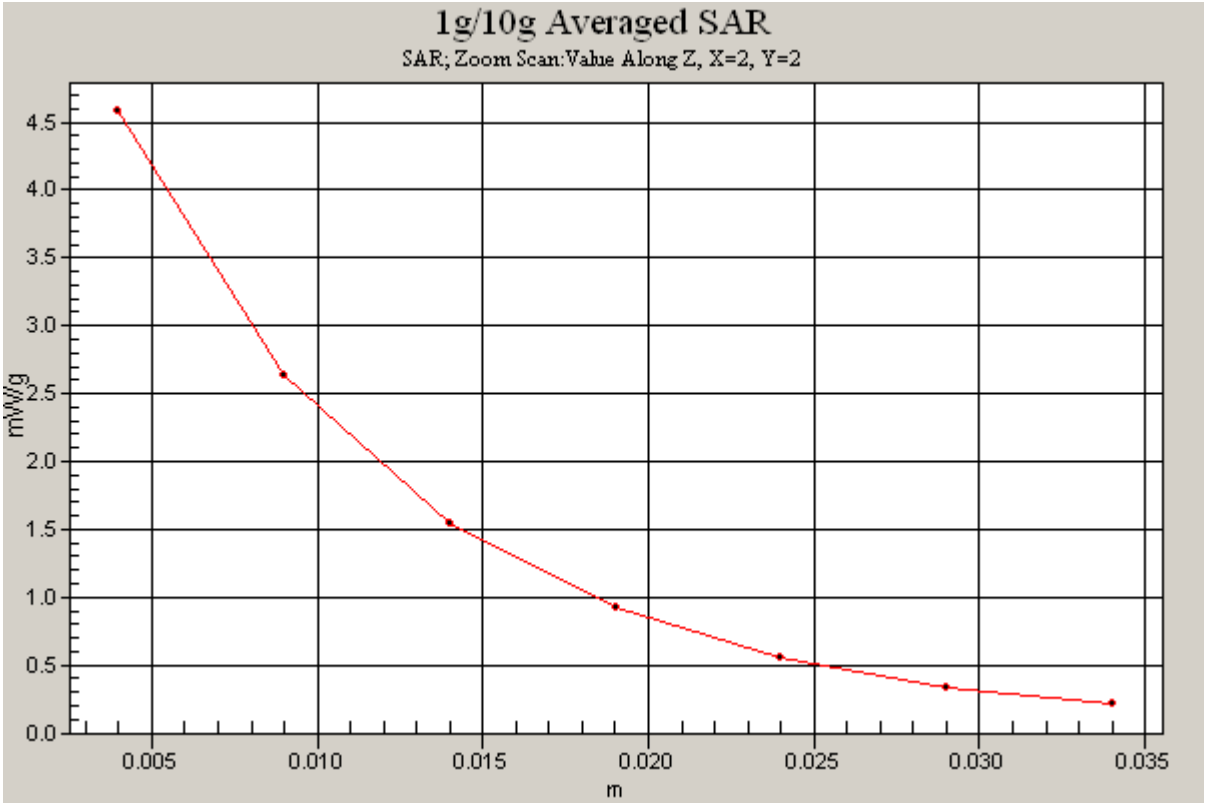
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-21-2011; Ambient Temp: 23.6°C; Tissue Temp: 21.9°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 dBm (100 mW)
SAR(1 g) = 4.1 mW/g; SAR(10 g) = 2.16 mW/g
Deviation = -0.24%



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

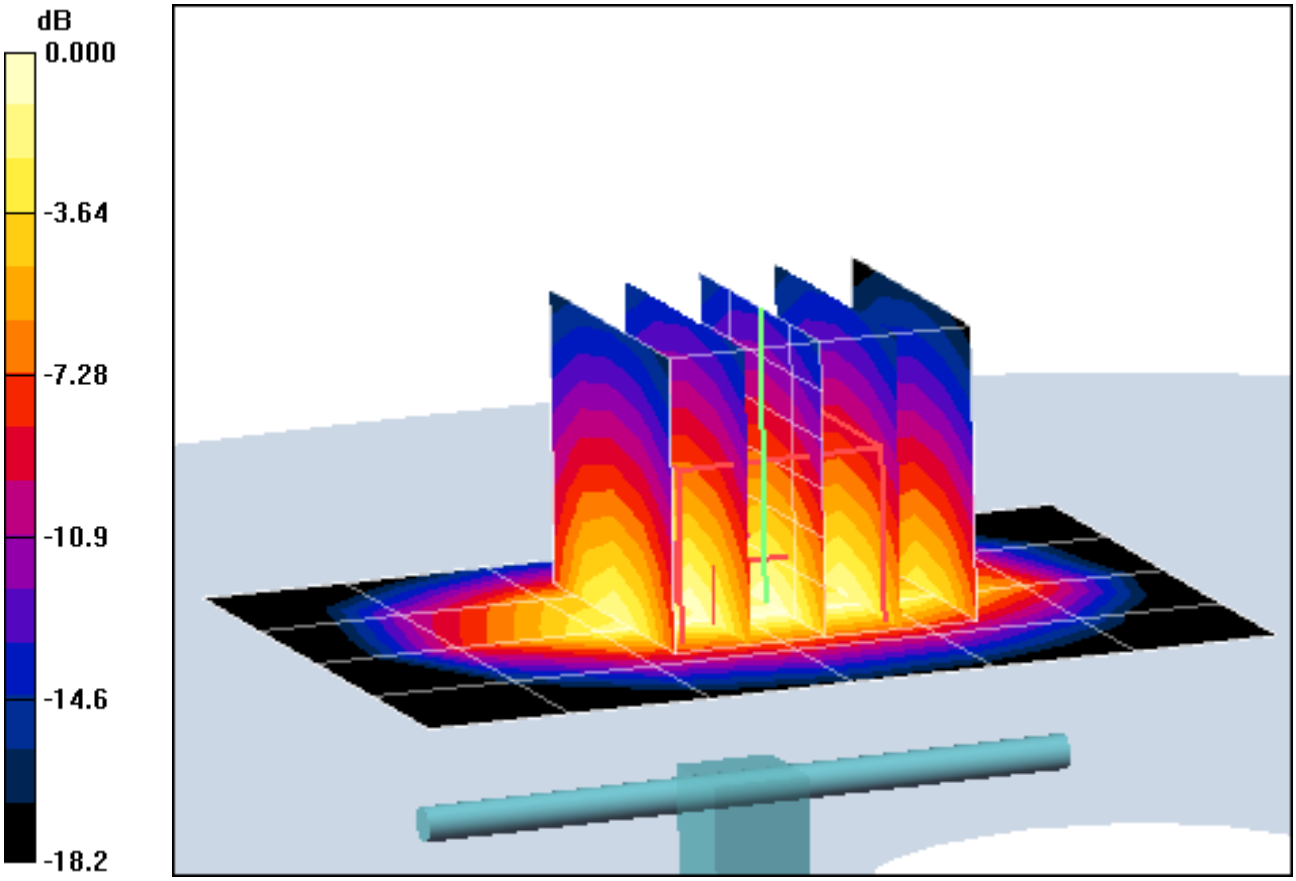
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2011; Ambient Temp: 23.7°C; Tissue Temp: 21.3°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) = 4.41 mW/g; SAR(10 g) = 2.31 mW/g
Deviation = 7.30 %



0 dB = 4.89mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

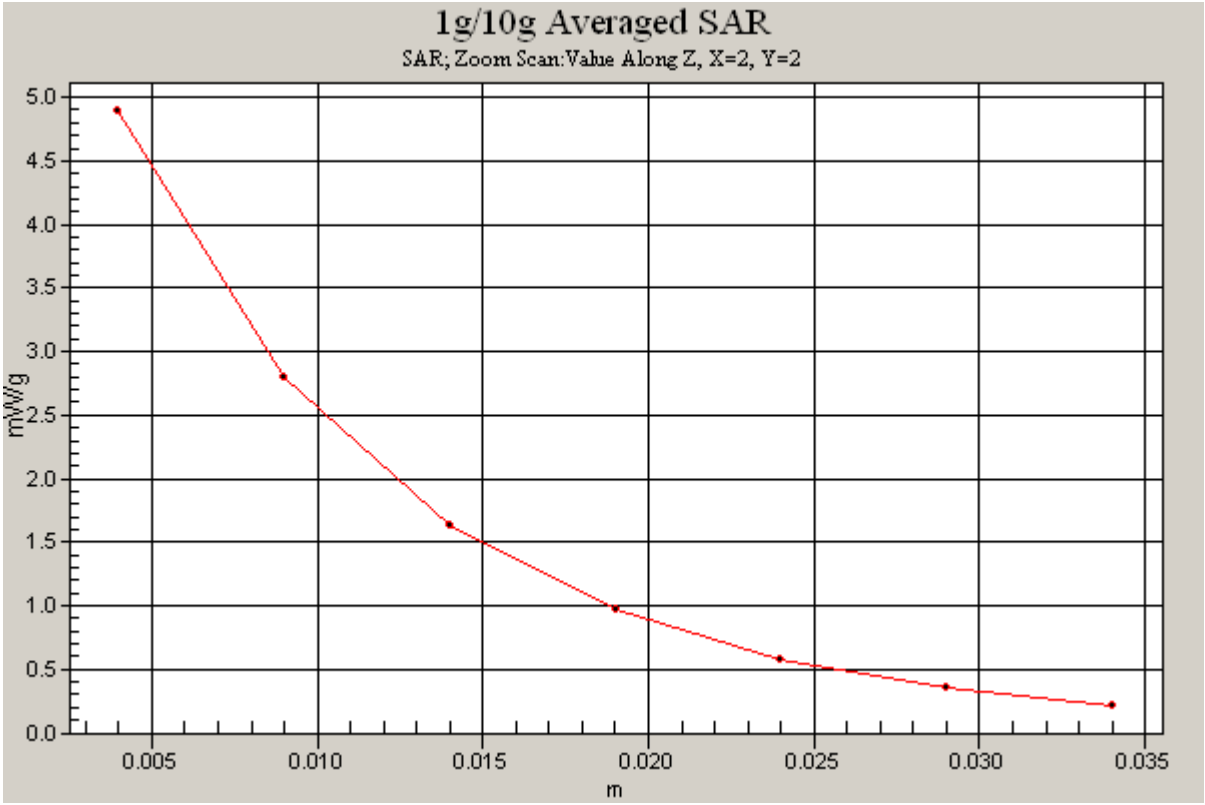
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2011; Ambient Temp: 23.7°C; Tissue Temp: 21.3°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) = 4.41 mW/g; SAR(10 g) = 2.31 mW/g
Deviation = 7.30 %



PCTEST ENGINEERING LABORATORY, INC.

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

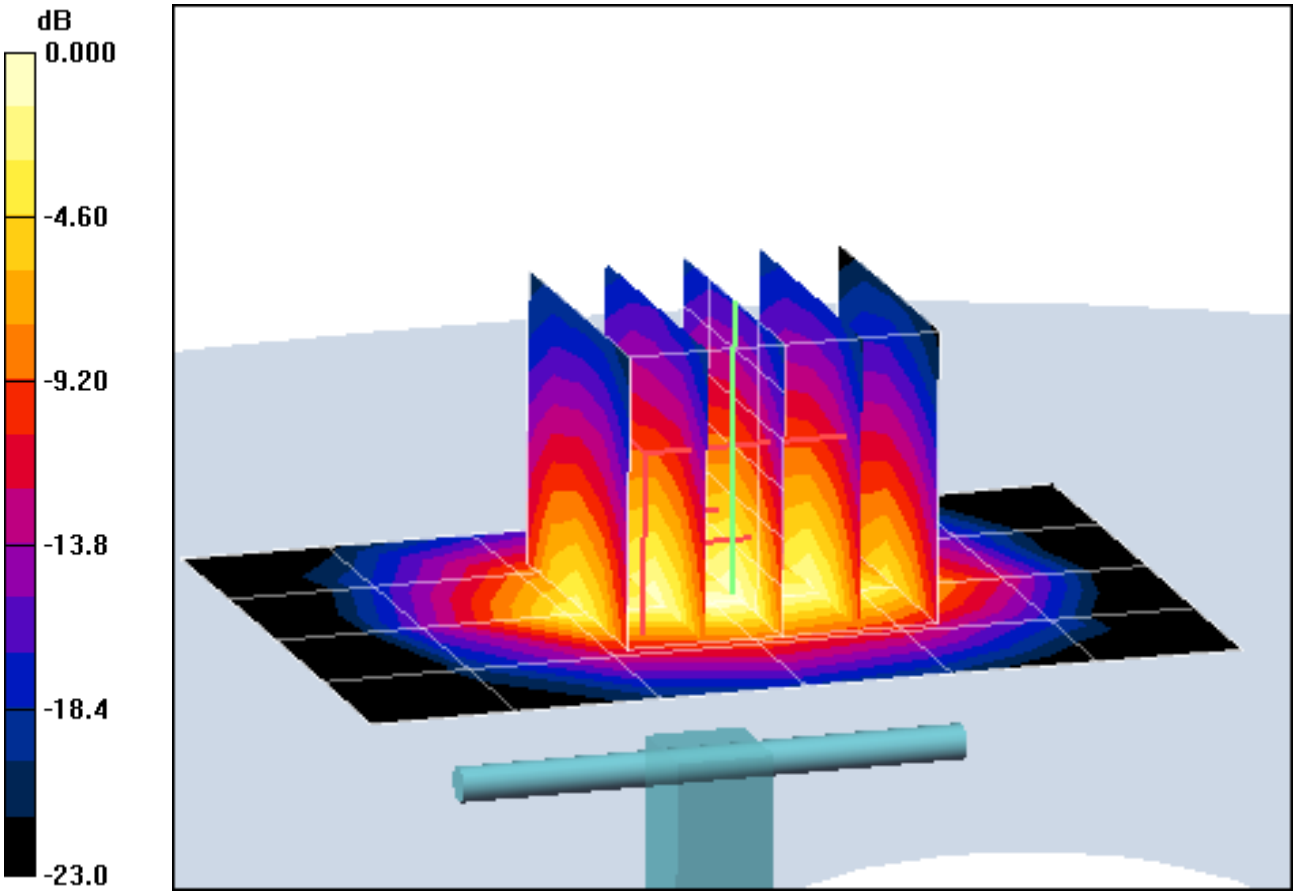
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0° C; Tissue Temp: 22.5° C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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

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 = 14 dBm (25 mW)
SAR(1 g) = 1.35 mW/g; SAR(10 g) = 0.616 mW/g
Deviation = 3.25 %



0 dB = 1.78mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

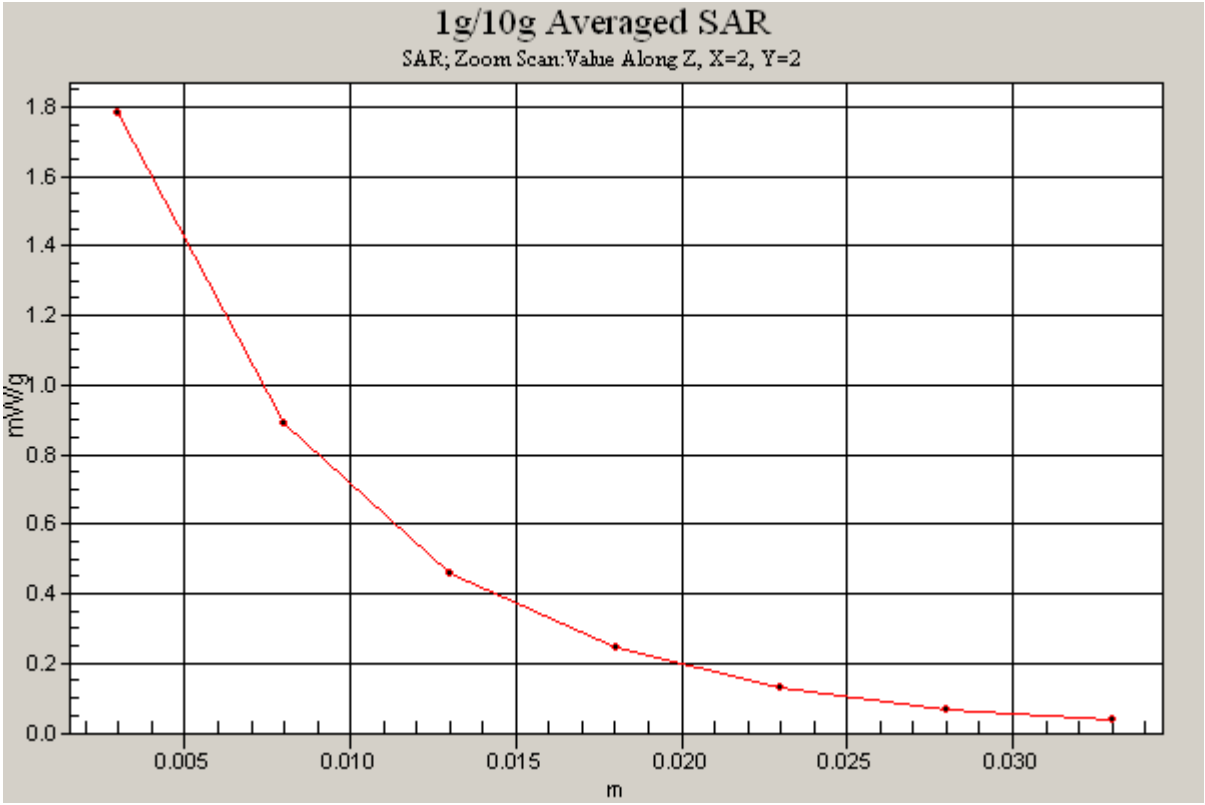
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.95 mho/m; ε_r = 50.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-17-2011; Ambient Temp: 24.0° C; Tissue Temp: 22.5° C

Probe: EX3DV4 - SN3561; ConvF(6.26, 6.26, 6.26); Calibrated: 7/27/2011
Sensor-Surface: 3mm (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

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 = 14 dBm (25 mW)
SAR(1 g) = 1.35 mW/g; SAR(10 g) = 0.616 mW/g
Deviation = 3.25 %



PCTEST ENGINEERING LABORATORY, INC.

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

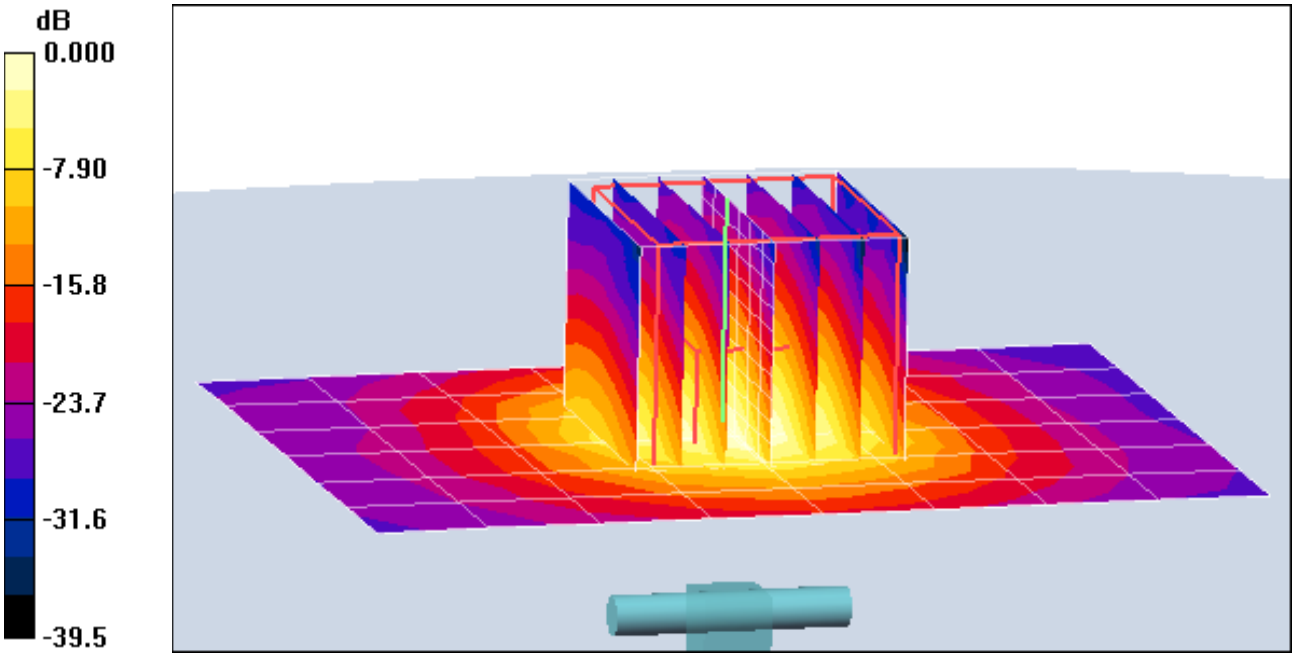
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.383 mho/m; ε_r = 47.39; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 23.7 °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 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) = 7.79 mW/g; SAR(10 g) = 2.16 mW/g
Deviation = 3.18 %



0 dB = 15.9mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

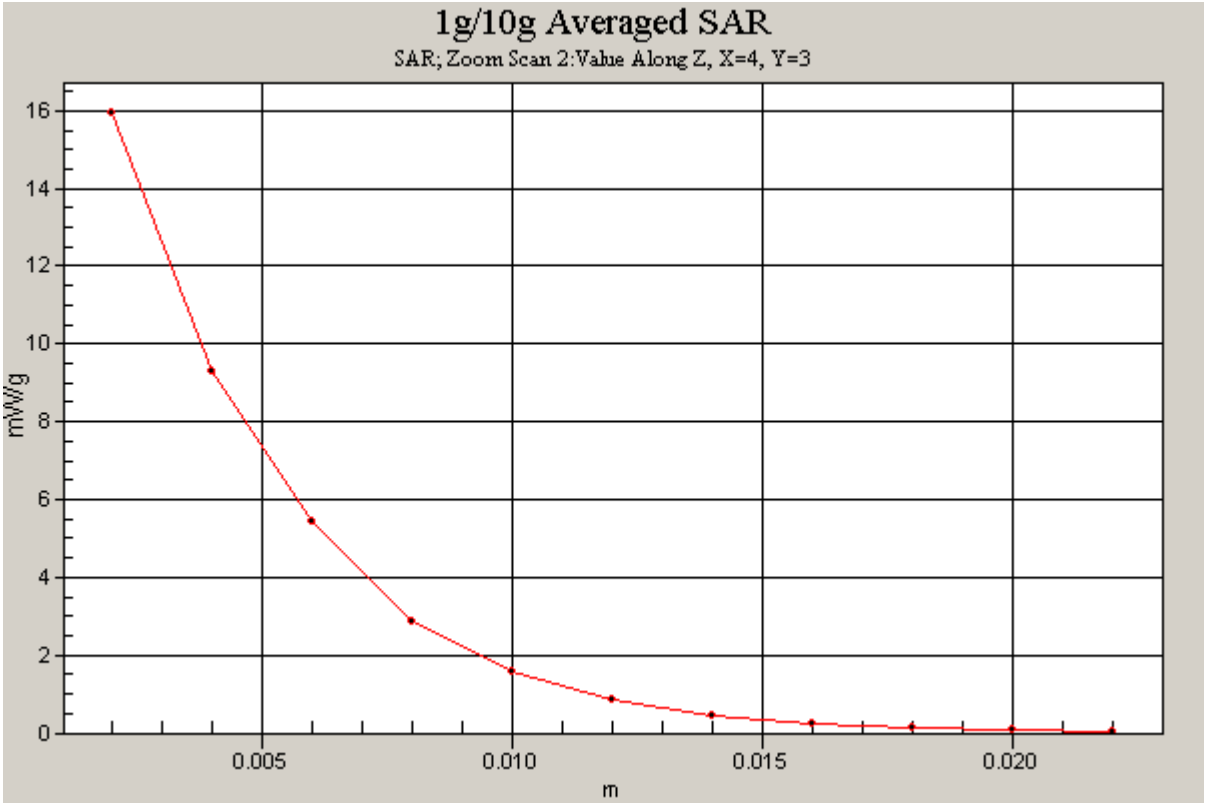
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.383 mho/m; ε_r = 47.39; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 23.7 °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 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) = 7.79 mW/g; SAR(10 g) = 2.16 mW/g
Deviation = 3.18 %



PCTEST ENGINEERING LABORATORY, INC.

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

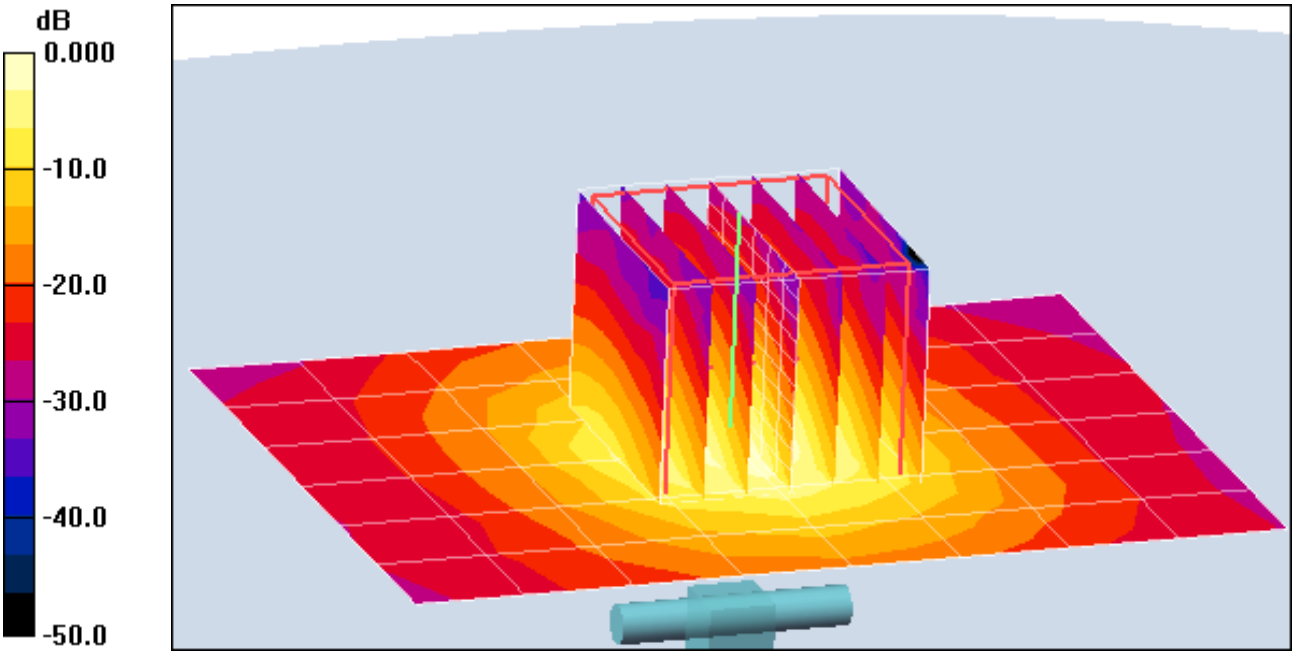
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.787 mho/m; ε_r = 46.85; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.6 °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 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) = 8.52 mW/g; SAR(10 g) = 2.32 mW/g
Deviation = 4.80 %



0 dB = 18.3mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

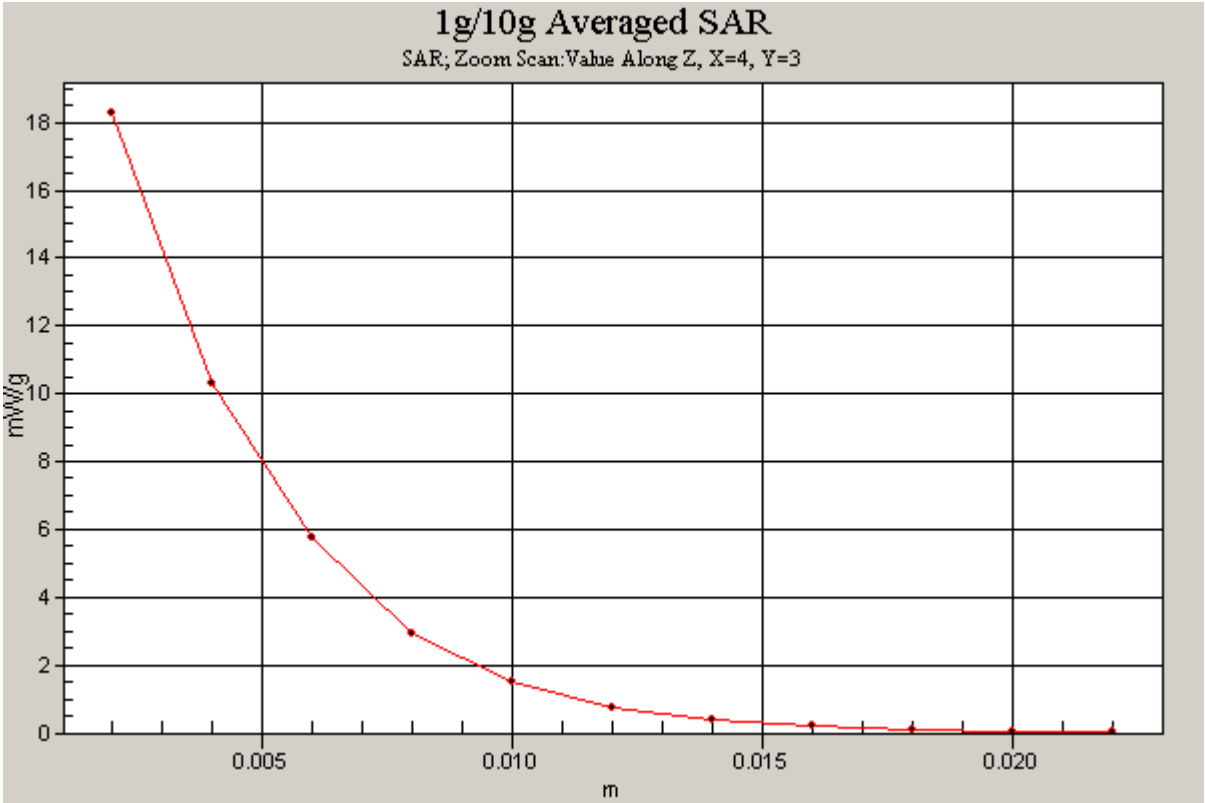
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.787 mho/m; ε_r = 46.85; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.6 °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 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) = 8.52 mW/g; SAR(10 g) = 2.32 mW/g
Deviation = 4.80 %



PCTEST ENGINEERING LABORATORY, INC.

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

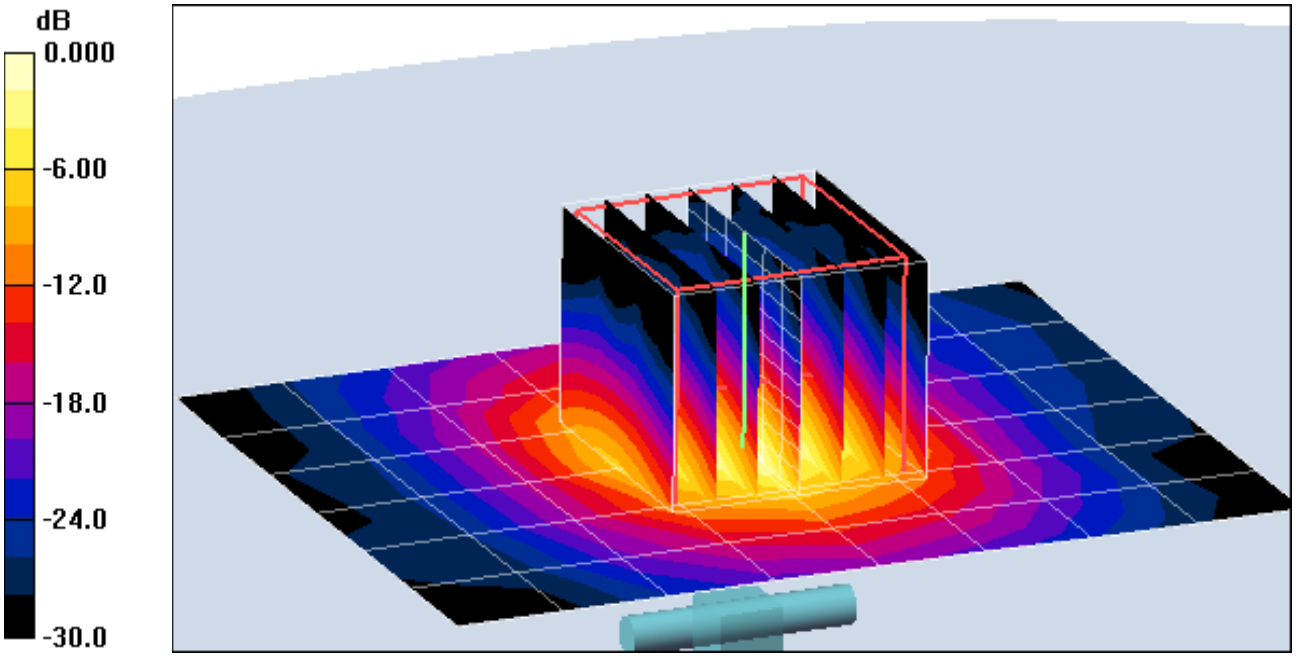
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.204 mho/m; ε_r = 46.36; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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 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) = 7.68 mW/g; SAR(10 g) = 2.14 mW/g
Deviation = 1.99 %



0 dB = 16.5mW/g

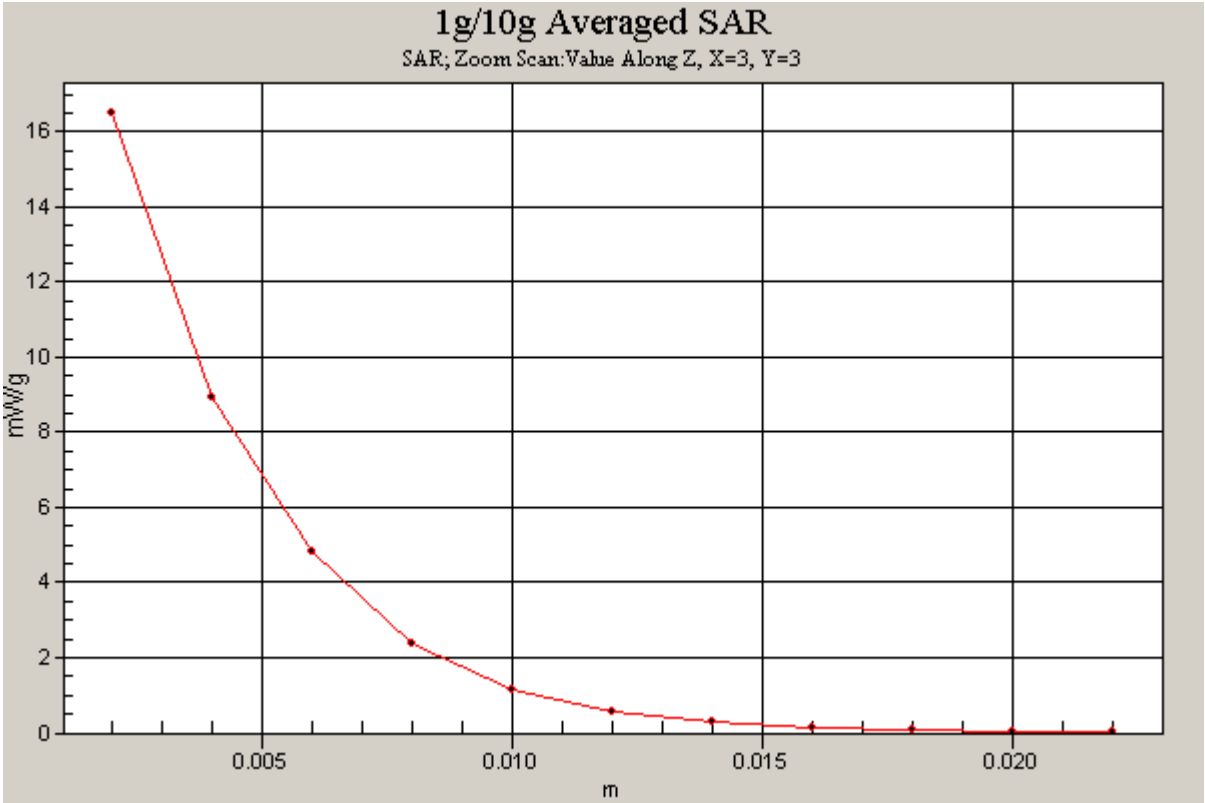
PCTEST ENGINEERING LABORATORY, INC.

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 = 6.204 mho/m; ε_r = 46.36; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-23-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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 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) = 7.68 mW/g; SAR(10 g) = 2.14 mW/g
Deviation = 1.99 %