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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:
07/11/11 - 09/13/11
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1109061553.A3L

FCC ID: **A3LSPHD710**

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

EUT Type:	Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Application Type:	Class II Permissive Change
FCC Rule Part(s):	CFR §2.1093; FCC/OET Bulletin 65 Supplement C [June 2001]
Model(s):	SPH-D710
Test Device Serial No.:	Pre-Production [S/N: 94, 90]
Permissive Change:	Adding 1X-RTT Voice + WIMAX WIFI Hotspot and EVDO Capabilities
Original Grant Date:	7/26/2011

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
Cell. CDMA - FCC Rule Part 90S	817.90 - 823.10 MHz	24.75	0.24	0.42	0.52
Cell. CDMA - FCC Rule Part 22H	824.70 - 848.31 MHz	24.77	0.31	0.32	0.44
PCS CDMA - FCC Rule Part 24E	1851.25 - 1908.75 MHz	24.78	0.40	0.53	0.54
WIMAX - FCC Rule Part 27M	2498.5 - 2687.5 MHz (5MHz BW) 2501 -- 2685 MHz (10MHz BW)	23.39	0.40	0.61	0.61
2.4 GHz WLAN - FCC Rule Part 15C	2412 - 2462 MHz	13.54	0.10	0.08	0.08
5.2 GHz WLAN - FCC Rule Part 15E	5180 - 5240 MHz	10.51	0.03	0.03	
5.3 GHz WLAN - FCC Rule Part 15E	5260 - 5320 MHz	10.35	0.03	0.03	
5.5 GHz WLAN - FCC Rule Part 15E	5500 - 5700 MHz	10.42	0.07	0.09	
5.8 GHz WLAN - FCC Rule Part 15C	5745 - 5825 MHz	10.21	0.09	0.09	
Bluetooth	2402 - 2480 MHz	9.39			

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

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in FCC/OET Bulletin 65 Supplement C (2001), IEEE 1528-2003 and in applicable Industry Canada Radio Standards Specifications (RSS); for North American frequency bands only.

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.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

TABLE OF CONTENTS

1	WIMAX FCC SUMMARY	3
2	INTRODUCTION	4
3	TEST SITE LOCATION	5
4	SAR MEASUREMENT SETUP	6
5	DASY E-FIELD PROBE SYSTEM	8
6	PROBE CALIBRATION PROCESS	9
7	PHANTOM AND EQUIVALENT TISSUES	10
8	DOSIMETRIC ASSESSMENT & PHANTOM SPECS	11
9	DEFINITION OF REFERENCE POINTS	12
10	TEST CONFIGURATION POSITIONS	13
11	FCC RF EXPOSURE LIMITS	16
12	FCC 3G MEASUREMENT PROCEDURES	17
13	SAR TESTING WITH IEEE 802.11 TRANSMITTERS	20
14	4G WIMAX LINEARITY & SAR CONSIDERATIONS	23
15	FCC PERSONAL WIRELESS ROUTER CONFIGURATIONS	29
16	SYSTEM VERIFICATION	31
17	SAR DATA SUMMARY	34
18	FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS	50
19	MULTIPLE TRANSMITTER SAR EVALUATION	51
20	EQUIPMENT LIST	56
21	MEASUREMENT UNCERTAINTIES	57
22	CONCLUSION	59
23	REFERENCES	60

1 WIMAX FCC SUMMARY

Based on 802.1e/WiMAX Permit-But-Ask and SAR Guidance, November 2009
615233 D01 802.16e WiMAX SAR Guidance v01

Description	Parameter
FCC ID	A3LSPHD710
Radio Service	Part 27 Subpart - M
Transmit Frequency Range (MHz)	2498.5-2687.5 (5 MHz) 2501.0-2685.0 (10 MHz)
System/Channel Bandwidth (MHz)	5 MHz 10 MHz
System Profile	WiMAX Profile 3A
Modulation Schemes	QPSK 16QAM
Number of DL OFDMA Symbols per Frame	29
Number of UL OFDMA Symbols per Frame	18
DL:UL Symbol Ratio	29:18
Power Class (dBm)	Power Class 2: 23 dBm +/- 1.0 dB
UL Burst Maximum Average Power	24 dBm
Number and type of UL Control Symbols	3 PUSC symbols (used for ranging, CQICH and ACK/NACK)

Note: The complete WIMAX Operating Parameters are included in the operational description.

2 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.

2.1 SAR Definition

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

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

Figure 2-1
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]

3 TEST SITE LOCATION

3.1 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.

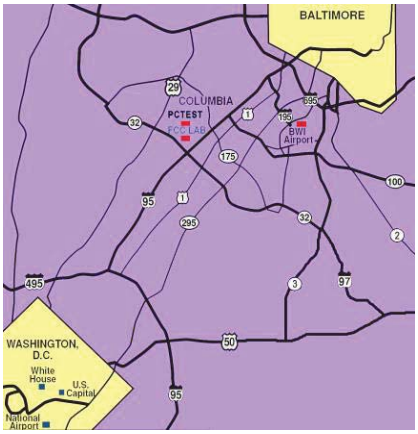


Figure 3-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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.

3.2 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

4 SAR MEASUREMENT SETUP

4.1 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 4-1).

4.2 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.

4.3 System Electronics

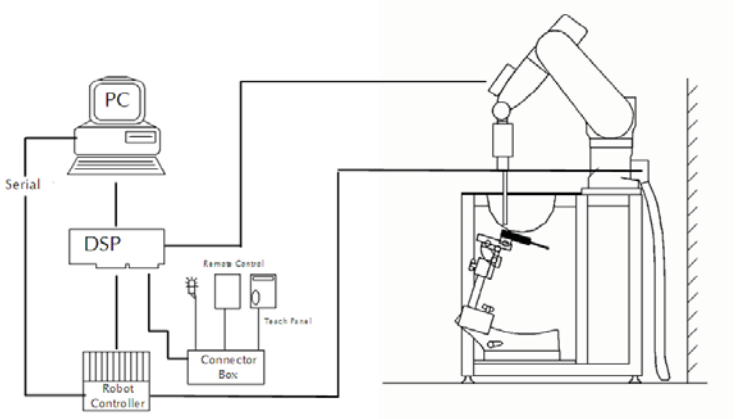


Figure 4-1
SAR Measurement System Setup

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.

4.4 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 (V4.0)
Shell Material:	Composite
Thickness:	2.0 ± 0.2 mm

Figure 4-2
SAR Measurement System

5 DASY E-FIELD PROBE SYSTEM

5.1 Probe Measurement System

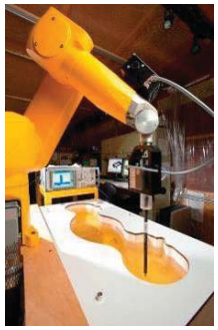


Figure 5-1
SAR System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration (see Figure 5-3) 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 (see Figure 6-1). The approach is stopped at reaching the maximum.

5.2 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 5-2
Near-Field Probe

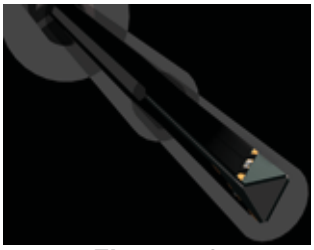


Figure 5-3
Triangular Probe Configuration

6 PROBE CALIBRATION PROCESS

6.1 Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

6.2 Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

6.3 Temperature Assessment

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

where:

Δt = exposure time (30 seconds),
C = heat capacity of tissue (brain or muscle),
ΔT = temperature increase due to RF exposure.

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

where:

σ = simulated tissue conductivity,
ρ = Tissue density (1.25 g/cm^3 for brain tissue)

SAR is proportional to $\Delta T/\Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

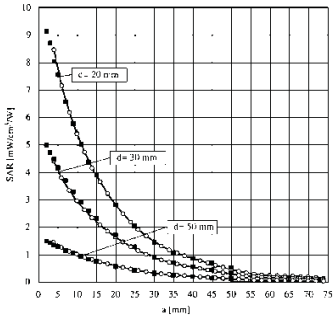


Figure 6-1 E-Field and Temperature measurements at 900MHz [9]

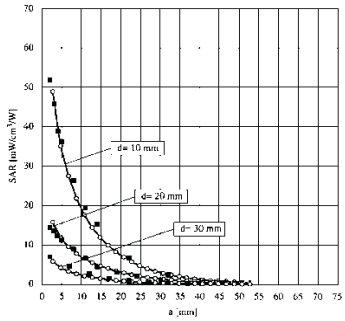


Figure 6-2 E-Field and temperature measurements at 1.9GHz [9]

7 PHANTOM AND EQUIVALENT TISSUES

7.1 SAM Phantoms

Figure 6-1
SAM Phantoms

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

7.2 Tissue Simulating Mixture Characterization

Figure 6-2
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	1900	1900	2450-2600	2450-2600	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)								
Bactericide	0.1	0.1						
DGBE			44.92	29.44	7.99	26.7		
HEC	1	1						
NaCl	1.45	0.94	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	54.9	70.17	71.88	73.2	65.52	78.66

8 DOSIMETRIC ASSESSMENT & PHANTOM SPECS

8.1 Measurement Procedure

The evaluation was performed using the following procedure:

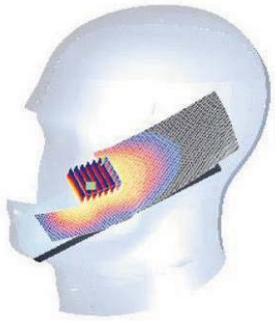


Figure 8-1
Sample SAR Area Scan

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. If the value deviated by more than 5%, the evaluation was repeated.
5. For 5 GHz testing finer resolution zoom scans were preformed 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.

8.2 Specific Anthropomorphic Mannequin (SAM) Specifications

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 8-2). The perimeter sidewalls of each phantom halves are extended to allow filling 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.

Figure 8-2
SAM Twin Phantom Shell

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].

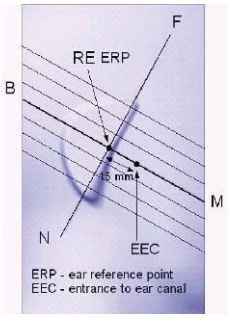


Figure 9-1
Close-Up Side view of ERP

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.

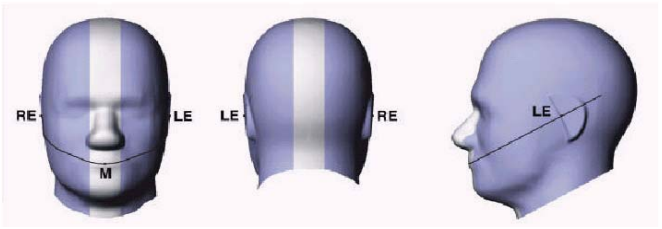


Figure 9-2
Front, back and side view of SAM Twin Phantom

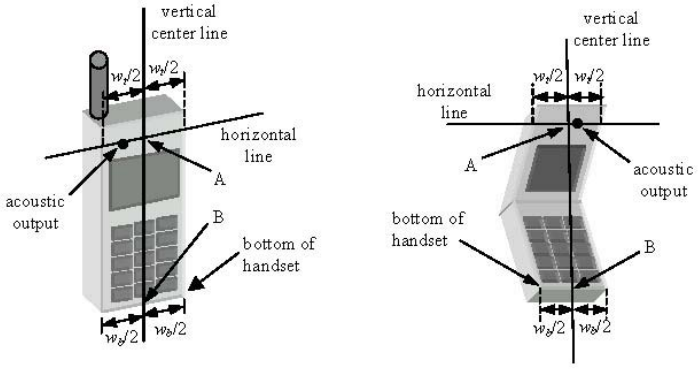


Figure 9-3
Handset Vertical Center & Horizontal Line Reference Points

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).

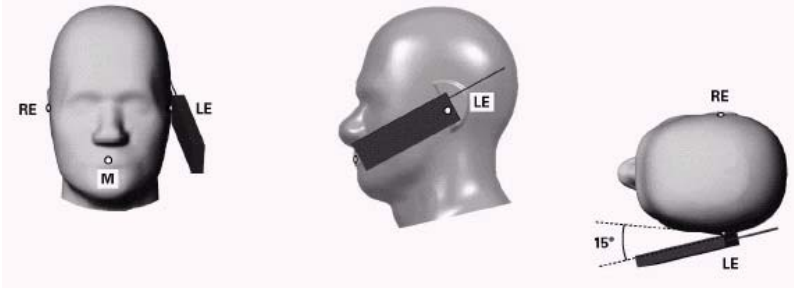


Figure 10-2 Front, Side and Top View of Ear/15º Tilt Position

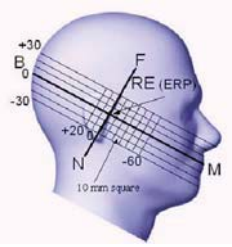


Figure 10-3
Side view w/ relevant markings

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.

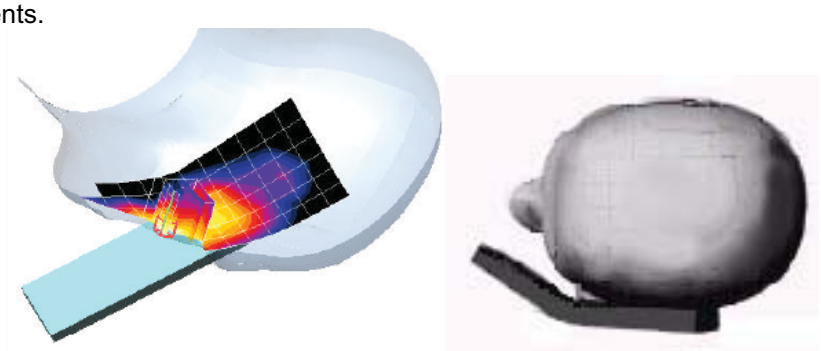


Figure 10-5
SAR Scans near the Jaw/Mouth

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, 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.

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.

12 FCC 3G MEASUREMENT PROCEDURES

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

12.1 Procedures Used to Establish RF Signal for SAR

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

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. Any power drifts of greater than 5% were repeated.

12.2 SAR Measurement Conditions for CDMA2000

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

12.2.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "SAR Measurement Procedures for 3G Devices" v02, October 2007. Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the "All Up" condition.

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 12-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 13-2 was applied.
5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

Table 12-1
Parameters for Max. Power for RC1

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{\hat{I}_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{\hat{I}_{or}}$	dB	-7.4

Table 12-2
Parameters for Max. Power for RC3

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-86
$\frac{\text{Pilot } E_c}{\hat{I}_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{\hat{I}_{or}}$	dB	-7.4

12.2.2 Head SAR Measurements

SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. SAR for RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1 using the exposure configuration that results in the highest SAR for that channel in RC3.

12.2.3 Body SAR Measurements

SAR for body exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCH_n) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH + SCH_n) with FCH at full rate and SCH_0 enabled at 9600 bps using the exposure configuration that results in the highest SAR for that channel with FCH only. When multiple code channels are enabled, the DUT output may shift by more than 0.5 dB and lead to higher SAR drifts and SCH dropouts. Body SAR was measured using TDSO / SO32 with power control bits in the "All Up"

Body SAR in RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

12.2.4 Handsets with EVDO

For handsets with Ev-Do capabilities, when the maximum average output of each channel in Rev. 0 is less than ¼ dB higher than that measured in RC3 (1x RTT), body SAR for EV-DO is not required. Otherwise, SAR for Rev. 0 is measured on the maximum output channel at 153.6 kbps using the body exposure configuration that results in the highest SAR for that channel in RC3. SAR for Rev. A is not required when the maximum average output of each channel is less than that measured in Rev. 0 or less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel for Rev. A using a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations. A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots would be configured in the downlink for both Rev. 0 and Rev. A.

12.2.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. AT power control should be in "All Bits Up" conditions for TAP/ETAP.

12.3 RF Conducted Powers

12.3.1 CDMA Conducted Powers

Band	FCC Rule Part	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
		F-RC	MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	90S	564	820.1	24.65	24.65	24.65	24.66	24.67	24.75
	22H	1013	824.7	24.72	24.69	24.64	24.69	24.76	24.75
	22H	384	835.52	24.72	24.66	24.64	24.66	24.77	24.72
	22H	777	848.31	24.68	24.60	24.60	24.60	24.68	24.74
PCS	24E	25	1851.25	24.59	24.64	24.54	24.66	24.78	24.70
	24E	600	1880	24.52	24.59	24.58	24.57	24.73	24.63
	24E	1175	1908.75	24.66	24.69	24.64	24.68	24.76	24.64

Note: RC1 is only applicable for IS-95 compatibility.

Per KDB Publication 941225 D01:
1. Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. Body-Worn SAR was tested with TDSO32 FCH. EVDO and TDSO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO32 FCH powers.
3. Hotspot SAR was tested with EVDO Rev 0. EVDO Rev A and TDSO32 SAR tests were not required since the average output power was not more than 0.25 dB higher than the EVDO Rev. 0 powers.
4. EVDO was tested for Head SAR due to the DUT's capability of third party applications that support VOIP through per Applicant's request. EVDO was tested with Rev. A since the maximum average output of each channel in Rev. 0 and RC3 (1x RTT) was not more than ¼ dB higher than that measured Rev A.
5. TDSO32 was tested additionally to cover the scenario of WIMAX Hotspot simultaneously transmitting with a CDMA voice call.

Figure 12-1
Power Measurement Setup

13 SAR TESTING WITH IEEE 802.11 TRANSMITTERS

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

13.1 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.

13.2 Frequency Channel Configurations [27]

802.11 a/b/g and 5 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g/n modes are tested on channels 1, 6 and 11. 802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; channels 104, 116, 124 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz §15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. These are referred to as the “default test channels”. 2.4 GHz 802.11g/n and 5 GHz 802.11n modes were evaluated only if the output power was 0.25 dB higher than the 2.4 GHz 802.11b and 5 GHz 802.11a modes respectively.

Table 13-1
802.11 Test Channels per FCC Requirements

Mode		GHz	Channel	Turbo Channel	“Default Test Channels” §15.247 802.11b	“Default Test Channels” §15.247 802.11g	“Default Test Channels” 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		√			

Table 13-2
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	13.12	13.11	13.17	13.17
802.11b	2437	6	**13.54**	13.53	13.52	13.57
802.11b	2462	11	13.37	13.34	13.36	13.35

Table 13-3
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	12.19	12.18	12.19	12.18	12.15	12.14	12.16	12.17
802.11g	2437	6	12.51	12.56	12.56	12.58	12.58	12.45	12.57	12.52
802.11g	2462	11	12.38	12.37	12.39	12.41	12.46	12.39	12.38	12.39

Table 13-4
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	11.17	11.08	11.23	11.26	11.14	11.16	11.21	11.11
802.11n	2437	6	11.64	11.57	11.64	11.63	11.56	11.57	11.62	11.52
802.11n	2462	11	11.38	11.29	11.34	11.46	11.51	11.42	11.43	11.47

Table 13-5
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*	**10.51**	10.49	10.53	10.49	10.44	10.46	10.56	10.47
802.11a	5200	40	10.27	10.34	10.36	10.36	10.33	10.27	10.29	10.21
802.11a	5220	44	10.38	10.31	10.37	10.41	10.34	10.37	10.42	10.43
802.11a	*5240*	*48*	10.31	10.38	10.34	10.31	10.38	10.41	10.42	10.35
802.11a	*5260*	*52*	**10.35**	10.33	10.31	10.36	10.28	10.34	10.41	10.38
802.11a	5280	56	10.34	10.28	10.37	10.41	10.37	10.38	10.42	10.32
802.11a	5300	60	10.33	10.35	10.31	10.37	10.34	10.31	10.38	10.35
802.11a	*5320*	*64*	10.29	10.37	10.31	10.33	10.32	10.28	10.35	10.26
802.11a	5500	100	10.37	10.42	10.32	10.39	10.29	10.27	10.31	10.26
802.11a	*5520*	*104*	10.28	10.31	10.24	10.41	10.29	10.33	10.27	10.28
802.11a	5540	108	10.31	10.36	10.37	10.33	10.31	10.27	10.36	10.38
802.11a	5560	112	10.35	10.31	10.28	10.29	10.37	10.34	10.34	10.28
802.11a	*5580*	*116*	10.32	10.28	10.34	10.38	10.28	10.32	10.36	10.41
802.11a	5660	132	10.35	10.41	10.38	10.27	10.31	10.34	10.38	10.41
802.11a	*5680*	*136*	10.37	10.31	10.32	10.37	10.37	10.42	10.29	10.37
802.11a	5700	140	**10.42**	10.39	10.37	10.41	10.35	10.31	10.36	10.39
802.11a	*5745*	*149*	**10.21**	10.11	10.07	10.23	10.06	10.12	10.04	10.03
802.11a	5765	153	10.04	10.07	10.11	10.04	10.02	10.02	10.04	10.02
802.11a	*5785*	*157*	9.96	9.94	10.02	10.02	10.04	9.94	9.91	10.01
802.11a	*5805*	*161*	10.03	9.94	10.01	9.95	9.93	10.04	10.06	10.02
802.11a	5825	165	10.11	9.98	10.12	10.05	10.02	10.04	10.11	10.17

Note: Per the manufacturer's NII DFS attestation and the DFS report, this device does not transmit any beacons or initiate any transmissions in the 5500-5700 MHz band.

Table 13-6
IEEE 802.11n Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	*5180*	*36*	10.13	9.98	9.95	10.00	10.03	10.02	10.10	10.02
802.11n	5200	40	10.02	9.95	10.07	10.01	10.03	10.04	10.05	10.01
802.11n	5220	44	9.99	9.93	10.05	10.04	10.10	9.99	10.03	10.05
802.11n	*5240*	*48*	9.94	9.90	10.01	10.00	10.05	9.96	10.09	10.04
802.11n	*5260*	*52*	10.02	9.89	10.07	10.06	10.04	9.96	10.05	10.04
802.11n	5280	56	9.94	9.89	10.01	10.07	9.99	9.96	10.07	10.03
802.11n	5300	60	9.99	9.97	10.02	10.01	10.03	10.05	10.06	10.02
802.11n	*5320*	*64*	10.01	9.96	10.01	10.03	10.04	10.01	10.02	10.08
802.11n	5500	100	10.09	10.06	10.14	10.15	10.14	10.08	10.12	10.12
802.11n	*5520*	*104*	10.08	10.02	10.17	10.16	10.11	10.08	10.13	10.15
802.11n	5540	108	10.03	10.01	10.10	10.15	10.11	10.10	10.11	10.12
802.11n	5560	112	10.09	10.04	10.13	10.12	10.04	10.08	10.16	10.16
802.11n	*5580*	*116*	10.13	10.06	10.14	10.15	10.17	10.12	10.16	10.18
802.11n	5660	132	10.17	10.19	10.24	10.23	10.19	10.21	10.19	10.17
802.11n	*5680*	*136*	10.18	10.09	10.21	10.25	10.23	10.22	10.24	10.27
802.11n	5700	140	10.22	10.15	10.20	10.22	10.21	10.20	10.25	10.24
802.11n	*5745*	*149*	10.09	10.04	10.13	10.08	10.05	10.11	10.09	10.04
802.11n	5765	153	10.02	9.84	10.12	10.09	9.96	10.01	10.07	9.98
802.11n	*5785*	*157*	10.04	10.13	10.09	10.03	10.14	10.02	10.08	9.97
802.11n	*5805*	*161*	10.17	9.99	9.95	9.86	9.77	9.73	9.84	9.70
802.11n	5825	165	10.04	9.88	10.07	9.96	9.83	9.86	9.78	9.87

Note: Per the manufacturer's NII DFS attestation and the DFS report, this device does not transmit any beacons or initiate any transmissions in the 5500-5700 MHz band.

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

- For 2.4 GHz WLAN, Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
- For 5 GHz WLAN, Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
- The bolded configurations were tested for SAR.

Figure 13-1
Power Measurement Setup

14 4G WIMAX LINEARITY & SAR CONSIDERATIONS

14.1 WIMAX Measured Maximum RF Output Conducted Powers

1. This device is capable of two different Channel Bandwidths (5MHz, 10 MHz).

2. SAR Test configurations for WIMAX per FCC KDB Publication 615223 and April/Oct. 2010 FCC/TCB Workshop Notes :
   a. This device supports two coding rates (1/2 and 3/4) that are rated to the same maximum output power. Since the higher rates were not more than 0.25 dB from the lowest coding rate, only the lowest coding rate (1/2) was tested.
   b. 16 QAM was not required to be tested since the output power for 16-QAM was not more than 0.25 higher than QPSK and the QPSK SAR was less than 0.8 W/kg.
   c. This device supports PUSC Zone type only.
   d. WIMAX SAR was scaled according to FCC WIMAX requirements (See Section 14.7). The device was configured to operate with 15 traffic symbols active and the 3 control symbols inactive for SAR testing purposes. The SAR result was then scaled up to the maximum tune up power for both the maximum output power for 15 traffic symbols and 3 control symbols. The SAR plots reflect measured SAR values.
   e. The scaled SAR was used to determine test reduction scenarios.

Table 14-1
Measured WIMAX RF Output Powers

Channel	Modulation	Coding Rate	PUSC					
			5 MHz BW			10 MHz BW		
			Avg	Peak	PAR	Avg	Peak	PAR
Low	QPSK	1/2	23.14	32.26	9.12	23.08	32.28	9.20
		3/4	23.04	32.15	9.11	23.12	32.46	9.34
	16QAM	1/2	23.12	31.97	8.85	23.06	32.48	9.42
		3/4	23.02	32.17	9.15	23.18	32.48	9.30
Mid	QPSK	1/2	23.38	31.84	8.46	23.39	32.02	8.63
		3/4	23.26	31.76	8.50	23.38	32.02	8.64
	16QAM	1/2	23.32	31.83	8.51	23.40	32.10	8.70
		3/4	23.51	32.00	8.49	23.39	32.17	8.78
High	QPSK	1/2	23.53	32.68	9.15	23.58	33.19	9.61
		3/4	23.48	32.67	9.19	23.54	33.17	9.63
	16QAM	1/2	23.54	32.76	9.22	23.66	33.29	9.63
		3/4	23.48	32.64	9.16	23.62	33.26	9.64

The WIMAX powers measured represent the traffic symbol burst average power.

Figure 14-1
Power Measurement Setup

14.2 SAR Probe Linearity Considerations for WIMAX Signals

For each modulation, and BW tested for SAR, the probe was moved to an arbitrary location with the EUT touching the flat phantom in order to be able to achieve SAR values over the range of linearity measurements. Then the point SAR readings from the DASY software were measured using the multi-meter function and recorded with decreasing the RF powers starting from the highest maximum output power to a level closest to 10 mW.

14.3 Variation from Expected SAR to do WIMAX PAR

The error due to the PAR of WIMAX was between 7-10%. See Table Table 14-1 for PAR data.

14.4 Probe Linearity Data and Linearity Graphs

SAR linearity was measured for the all bandwidths, channels and modes that were tested for SAR per April 2010 TCB Workshop guidance. See notes for in Section 17 for description of test configurations used for the SAR assessment.

In order to achieve the appropriate SAR levels for linearity for this handset since the measured SAR was low, the EUT was positioned at 0.0 cm from the flat phantom. For each channel, modulation, and BW tested for SAR, the probe was moved to the peak SAR location. Then the point SAR readings from the DASY software were measured using the multi-meter function and recorded while decreasing the RF powers starting from the highest maximum output power to a power level closest to 10 mW according to the FCC Publication KDB 615223 publication guidance for testing WIMAX for SAR.

Table 14-2
WIMAX PUSC QPSK Linearity for 5 MHz Bandwidth

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	13.552	27.542	54.702	88.716	133.35	228.03
5 MHz	point SAR	0.1450	0.3050	0.6290	1.0300	1.54	2.580
	linear line	0.1450	0.2947	0.5853	0.9492	1.4268	2.440
	ε	0.0%	3.5%	7.5%	8.5%	7.9%	5.7%

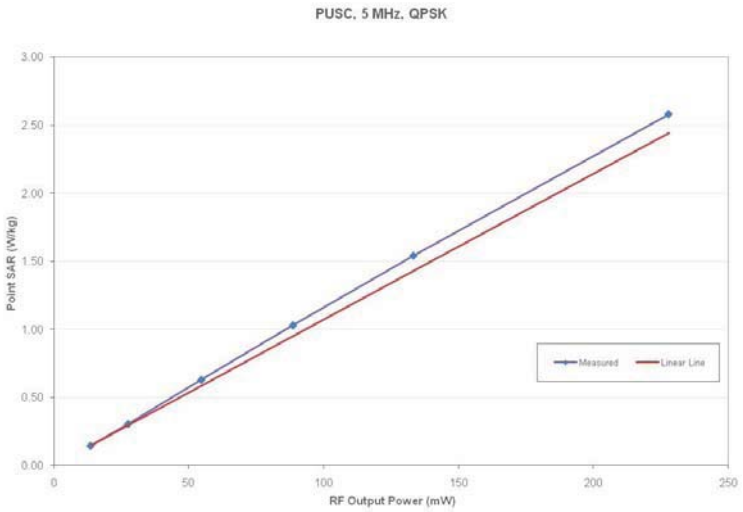
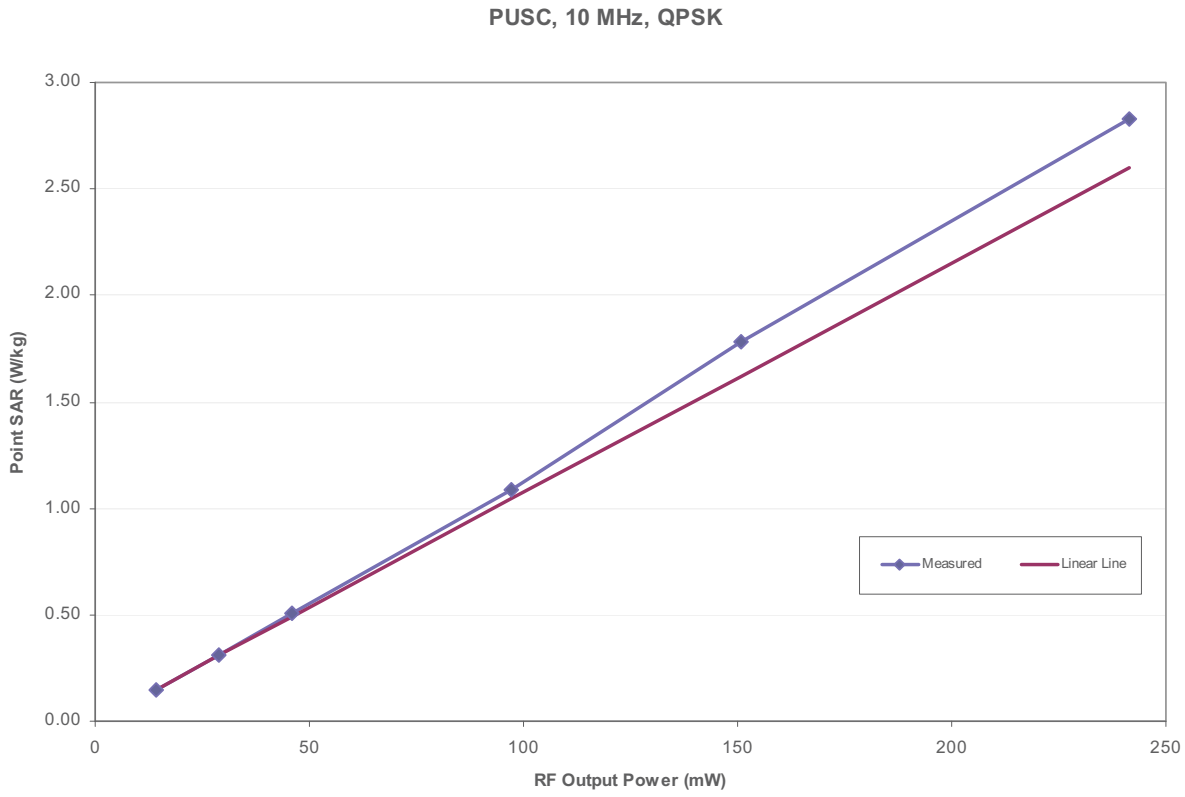


Table 14-3
WIMAX PUSC QPSK Linearity for 10 MHz Bandwidth

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	14.028	28.973	45.92	97.051	150.66	241.55
10 MHz	point SAR	0.1510	0.3140	0.5100	1.0900	1.780	2.830
	linear line	0.1510	0.3119	0.4943	1.0447	1.6217	2.6000
	ε	0.0%	0.7%	3.2%	4.3%	9.8%	8.8%



Note: Per October 2010 TCBC Workshop notes, 16-QAM SAR tests were not required given the conducted power measurements and SAR measurements. Therefore 16-QAM linearity plots were not required.

14.5 Spectrum Analyzer Plots for WIMAX

Timing plots for the signal were analyzed to confirm control and traffic symbol duration. The below plots represent the 10 MHz PUSC QPSK mode. Both 5 MHz and 10 MHz Bandwidths and QPSK and 16-QAM Modulations have identical timing plots.

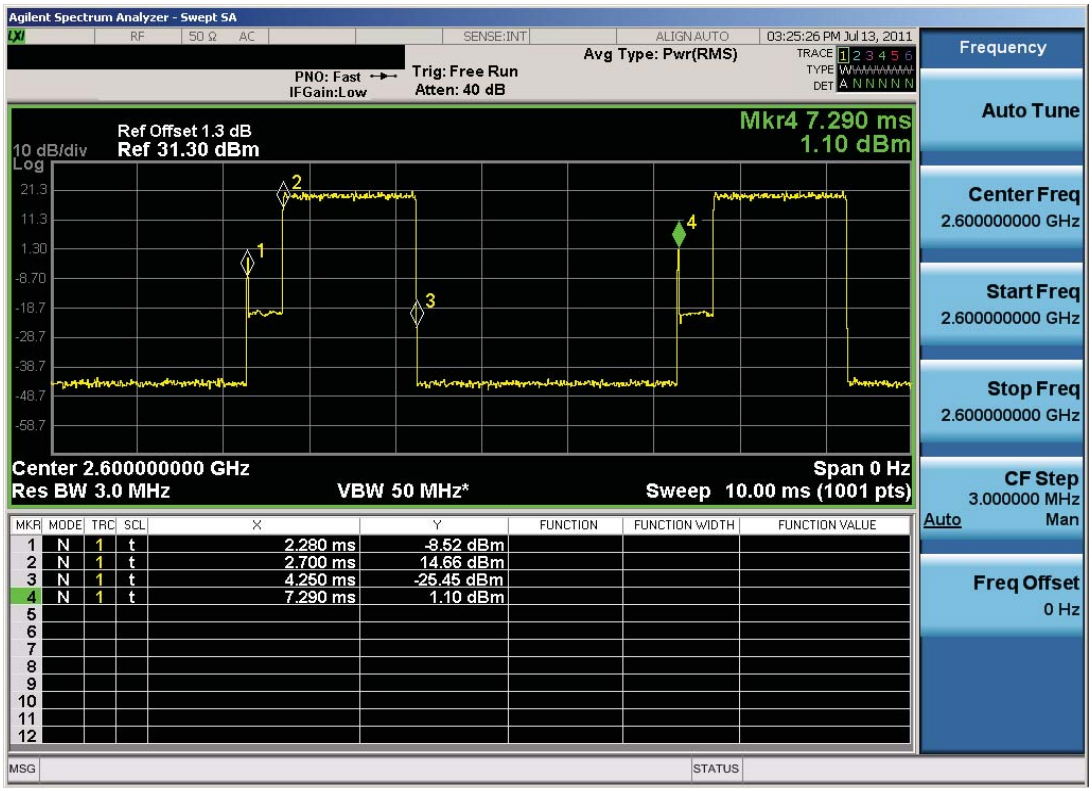


Figure 14-2
Timing Plot for WIMAX Signal

Note: Although the "spike" at the onset of the signal has no significant contribution to the output power (and SAR) the instant pulse is caused by RX/TX transition in TDD system. Visually, the switching noise on the plot is determined by the spectrum analyzer settings (i.e. changing the sweep time or changing the number of points will cause the spike to not be visible).

14.6 DASY Crest Factor Calculations

For 5 MHz and 10 MHz:

Frame Averaged Duty Cycle: 15/48 = 0.3125
Duty Factor (DF): 1/0.3125 = **3.2**

The duty factor is the same for all bandwidths, channels, and modulations.

14.7 WIMAX Error Correction Scaling Factors

The WIMAX scaling factors below in Table 14-4 and Table 14-5 were applied to the measured SAR results per April 2010 TCB Workshop Guidance.

The maximum rated power for WIMAX is 251.19 mW. The control symbol power is calculated from this level, to be 35.88 mW for 10 MHz BW and 73.88 for 5 MHz BW.

Control channels for PUSC occupy 5 slots for operations in the 5MHz and 10MHz bandwidths. For the 10 MHz bandwidth, there are 35 total slots. For the 5 MHz bandwidth, there are 17 total slots. This device transmits 15 traffic symbols and 3 control symbols for all modulations and bandwidths.

Error Correction Scaling Factors were calculated based on the following equation.

$$SAR\ Scaling\ Factor = \frac{\left(P_{Max} * \frac{\#\ of\ Control\ Slots\ Occupied}{\#\ of\ Slots\ (total)}\right) * \#\ of Control\ Symbols + P_{Max} * \#\ of\ Traffic\ Symbols}{P * \#\ of\ Traffic\ Symbols}$$

Given:
P_{Max} = Maximum Rated Power (mW)
P = Measured Maximum Output Power (mW)

The following is a sample calculation of the SAR Scaling factors:

$$\boldsymbol{SAR\ Scaling\ Factor(Mid\ Ch, 10MHz\ BW, QPSK) = \frac{\left(251.19 * \frac{5}{35}\right) * 3 - 25.19 * 15}{218.27 * 15} = 1.18}$$

Table 14-4
WIMAX Scaling Factors (10 MHz Bandwidth)

Frequency [MHz]	Zone Type	Modulation	BW	Tune Up Max in mW	CS+TS Slots	CS Slots	1 Control Symbol Power [a*c/b] (mW)	Combined power of CS [d*3] (mW)	Measured Average RF Output Power		SAR Scaling Factor
									dBm	mW	
Low	PUSC	QPSK	10 MHz	251.19	35	5	35.88	107.65	23.08	203.24	1.27
	PUSC	16QAM	10 MHz	251.19	35	5	35.88	107.65	23.06	202.30	1.28
Mid	PUSC	QPSK	10 MHz	251.19	35	5	35.88	107.65	23.39	218.27	1.18
	PUSC	16QAM	10 MHz	251.19	35	5	35.88	107.65	23.40	218.78	1.18
High	PUSC	QPSK	10 MHz	251.19	35	5	35.88	107.65	23.58	228.03	1.13
	PUSC	16QAM	10 MHz	251.19	35	5	35.88	107.65	**23.66**	**232.27**	1.11

Note:
The rated power for each zone is within the tune-up range of 23.0 – 24.0 dBm. The rated maximum power is the same for all higher coding rates.

Table 14-5
WIMAX Scaling Factors (5 MHz Bandwidth)

Frequency [MHz]	Zone Type	Modulation	BW	Tune Up Max in mW	CS+TS Slots	CS Slots	1 Control Symbol Power [a*c/b] (mW)	Combined power of CS [d*3] (mW)	Measured Average RF Output Power		SAR Scaling Factor
									dBm	mW	
Low	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	23.14	206.06	1.29
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	23.12	205.12	1.30
Mid	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	23.38	217.77	1.22
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	23.32	214.78	1.24
High	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	23.53	225.42	1.18
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	**23.54**	**225.94**	1.18

Note:
The rated power for each zone is within the tune-up range of 23.0 – 24.0 dBm. The rated maximum power is the same for all higher coding rates.

15 FCC PERSONAL WIRELESS ROUTER CONFIGURATIONS

15.1 Personal Wireless Router Considerations

Some battery-operated handsets have the capability to transmit and receive internet connectivity through simultaneous transmission of WIFI in conjunction with a separate licensed transmitter. The FCC has provided guidance in KDB Publication 941225 D06 for handsets greater than 9cm x 5 cm where SAR test considerations are based on a composite test separation distance of 10 mm from the edges, front and back of the device with antennas 2.5 cm or closer to the edge of the device, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

15.2 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. Therefore, the measurements were performed for each standalone transmitter for the required exposure conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were valid within a single transmission frequency.

15.3 Power Reduction for Portable Hotspot Mode

This model does not support any power reduction for portable hotspot mode.

15.4 SAR Test Configurations

Table 15-1
Mobile Hotspot Sides for SAR Testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
Cell. CDMA - FCC Rule Part 90S	Yes	Yes	No	Yes	No	Yes
Cell. CDMA - FCC Rule Part 22H	Yes	Yes	No	Yes	No	Yes
PCS CDMA - FCC Rule Part 24E	Yes	Yes	No	Yes	No	Yes
WIMAX - FCC Rule Part 27M	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN - FCC Rule Part 15C	Yes	Yes	No	Yes	No	Yes

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

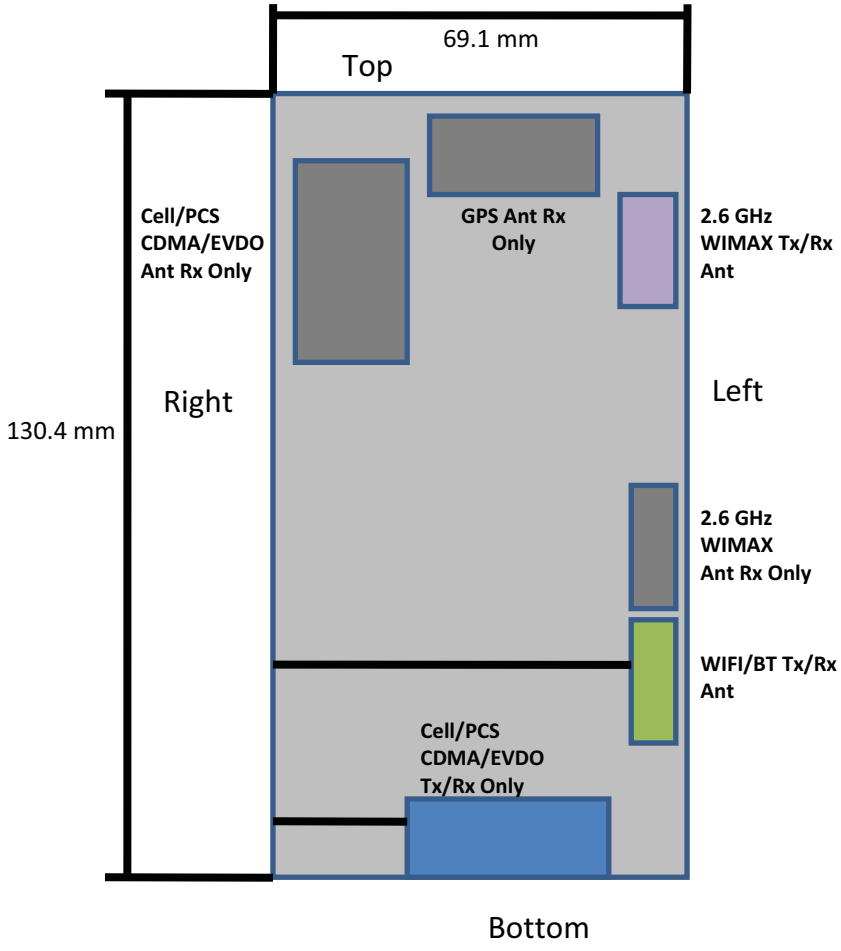


Figure 15-1 Identification of Sides for SAR Testing (Back View)

Note: Per FCC KDB Publication 941225 D06, the edges with antennas within 2.5 cm are required to be evaluated for SAR. See Antenna Document for distances of the antennas from the edges of the device.

16 SYSTEM VERIFICATION

16.1 Tissue Verification

Table 16-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	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
07/12/2011	835H	820	0.855	40.17	0.898	41.571	-4.79%	-3.37%
		835	0.863	40.12	0.900	41.500	-4.11%	-3.33%
		850	0.879	39.97	0.916	41.500	-4.04%	-3.69%
09/13/2011	835H	820	0.911	43.31	0.898	41.571	1.45%	4.18%
		835	0.927	43.35	0.900	41.500	3.00%	4.46%
		850	0.942	43.03	0.916	41.500	2.84%	3.69%
07/11/2011	835B	820	0.984	53.84	0.969	55.284	1.55%	-2.61%
		835	0.989	53.82	0.970	55.200	1.96%	-2.50%
		850	1.003	53.68	0.988	55.154	1.52%	-2.67%
08/09/2011	835B	820	0.959	55.00	0.969	55.284	-1.03%	-0.51%
		835	0.970	54.93	0.970	55.200	0.00%	-0.49%
		850	0.991	54.74	0.988	55.154	0.30%	-0.75%
07/12/2011	1900H	1850	1.401	38.70	1.400	40.000	0.07%	-3.25%
		1880	1.428	38.59	1.400	40.000	2.00%	-3.52%
		1910	1.458	38.47	1.400	40.000	4.14%	-3.83%
09/13/2011	1900H	1850	1.388	40.94	1.400	40.000	-0.86%	2.35%
		1880	1.403	40.73	1.400	40.000	0.21%	1.82%
		1910	1.450	40.74	1.400	40.000	3.57%	1.85%
07/11/2011	1900B	1850	1.456	52.08	1.520	53.300	-4.21%	-2.29%
		1880	1.483	51.83	1.520	53.300	-2.43%	-2.76%
		1910	1.534	51.83	1.520	53.300	0.92%	-2.76%
07/12/2011	1900B	1850	1.456	52.81	1.520	53.300	-4.21%	-0.92%
		1880	1.485	52.71	1.520	53.300	-2.30%	-1.11%
		1910	1.518	52.52	1.520	53.300	-0.13%	-1.46%
07/25/2011	1900B	1850	1.463	53.14	1.520	53.300	-3.75%	-0.30%
		1880	1.496	53.15	1.520	53.300	-1.58%	-0.28%
		1910	1.526	53.26	1.520	53.300	0.39%	-0.08%
07/11/2011	2450H	2401	1.756	38.75	1.758	39.298	-0.11%	-1.39%
		2450	1.819	38.52	1.800	39.200	1.06%	-1.73%
		2499	1.878	38.38	1.852	39.135	1.40%	-1.93%
07/11/2011	2450B	2401	1.842	51.54	1.903	52.765	-3.21%	-2.32%
		2450	1.899	51.32	1.950	52.700	-2.62%	-2.62%
		2499	1.963	51.20	2.019	52.638	-2.77%	-2.73%
07/13/2011	2600H	2600	1.994	38.03	1.960	39.000	1.73%	-2.49%
07/12/2011	2600B	2600	2.114	50.83	2.163	52.509	-2.27%	-3.20%
07/12/2011	5200H-5800H	5170	4.518	34.88	4.629	36.030	-2.40%	-3.19%
		5210	4.538	34.75	4.670	35.990	-2.83%	-3.45%
		5250	4.616	34.66	4.710	35.950	-2.00%	-3.59%
		5270	4.621	34.68	4.730	35.930	-2.30%	-3.48%
		5310	4.659	34.51	4.770	35.890	-2.33%	-3.85%
		5350	4.742	34.57	4.810	35.850	-1.41%	-3.57%
		5470	4.871	34.27	4.934	35.695	-1.28%	-3.99%
		5510	4.900	34.28	4.976	35.635	-1.53%	-3.80%
		5550	4.948	34.11	5.018	35.575	-1.39%	-4.12%
		5570	4.975	34.10	5.039	35.545	-1.27%	-4.07%
		5610	4.991	34.07	5.080	35.490	-1.75%	-4.00%
		5650	5.062	33.93	5.120	35.450	-1.13%	-4.29%
		5670	5.108	34.04	5.140	35.430	-0.62%	-3.92%
		5710	5.120	33.86	5.180	35.390	-1.16%	-4.32%
		5750	5.183	33.74	5.220	35.350	-0.71%	-4.55%
		5770	5.192	33.59	5.240	35.330	-0.92%	-4.92%
		5810	5.246	33.72	5.281	35.290	-0.66%	-4.45%
		5850	5.292	33.64	5.323	35.250	-0.58%	-4.57%
07/12/2011	5200B-5800B	5170	5.375	47.14	5.264	49.055	2.11%	-3.90%
		5210	5.399	47.04	5.311	49.001	1.66%	-4.00%
		5250	5.485	46.94	5.358	48.946	2.37%	-4.10%
		5270	5.531	47.03	5.381	48.919	2.79%	-3.86%
		5310	5.567	46.82	5.428	48.865	2.56%	-4.18%
		5350	5.646	46.80	5.470	48.811	3.22%	-4.12%
		5470	5.824	46.63	5.615	48.648	3.72%	-4.15%
		5510	5.822	46.50	5.661	48.594	2.84%	-4.31%
		5550	5.913	46.38	5.708	48.539	3.59%	-4.45%
		5570	5.941	46.34	5.731	48.512	3.66%	-4.48%
		5610	5.996	46.27	5.778	48.458	3.77%	-4.52%
		5650	6.077	46.24	5.825	48.404	4.33%	-4.47%
		5670	6.116	46.21	5.848	48.376	4.58%	-4.48%
		5710	6.157	46.01	5.895	48.322	4.44%	-4.78%
		5750	6.224	46.01	5.942	48.268	4.75%	-4.68%
		5770	6.246	45.98	5.965	48.241	4.71%	-4.69%
		5810	6.299	45.91	6.012	48.186	4.77%	-4.72%
		5850	6.338	45.79	6.058	48.132	4.62%	-4.87%

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

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.

The 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.

16.2 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):

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

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 $j = \sqrt{-1}$.

16.3 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 16-2
System Verification Results

System Verification TARGET & MEASURED										
Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Tissue Frequency (MHz)	Dipole SN	Tissue Type	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	Deviation (%)
07/12/2011	23.5	21.8	0.100	835	4d047	Head	0.933	9.530	9.330	-2.10%
07/11/2011	24.0	23.5	0.250	835	4d047	Body	2.45	9.850	9.800	-0.51%
07/12/2011	23.1	22.0	0.040	1900	502	Head	1.63	40.200	40.750	1.37%
07/11/2011	23.8	22.6	0.040	1900	502	Body	1.63	41.100	40.750	-0.85%
07/12/2011	23.2	23.0	0.040	1900	502	Body	1.51	41.100	37.750	-8.15%
07/11/2011	24.2	22.5	0.025	2450	797	Head	1.39	53.300	55.600	4.32%
07/11/2011	23.8	22.0	0.025	2450	797	Body	1.31	52.300	52.400	0.19%
07/13/2011	23.5	22.1	0.0158	2600	1004	Head	0.85	58.500	53.797	-8.04%
07/12/2011	24.1	22.2	0.0158	2600	1004	Body	0.871	58.900	55.127	-6.41%
07/12/2011	23.8	22.5	0.025	5200	1057	Head	2.15	83.100	86.000	3.49%
07/12/2011	23.5	22.8	0.025	5200	1057	Body	1.96	77.700	78.400	0.90%
07/12/2011	24.1	22.6	0.025	5500	1057	Head	2.29	90.100	91.600	1.66%
07/12/2011	23.9	22.7	0.025	5500	1057	Body	1.99	84.400	79.600	-5.69%
07/12/2011	24.2	22.8	0.025	5800	1057	Head	2.22	82.900	88.800	7.12%
07/12/2011	23.9	22.8	0.025	5800	1057	Body	1.94	75.000	77.600	3.47%
08/09/2011	23.9	22.2	0.100	835	4d047	Body	0.939	9.850	9.390	-4.67%
09/13/2011	24.5	22.9	0.100	1900	5d080	Head	4.02	40.100	40.200	0.25%
07/25/2011	23.7	21.8	0.100	1900	502	Body	4.12	41.100	41.200	0.24%

Note: Per FCC 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.

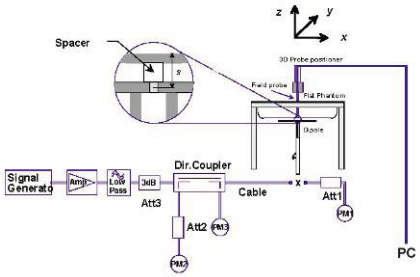


Figure 16-1
System Verification Setup Diagram

Figure 16-2
System Verification Setup Photo

17 SAR DATA SUMMARY

Table 17-1
Cell. CDMA - FCC Rule Part 90S Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		FCC Rule Part	Service	Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	SAR (1g)
MHz	Ch.									(W/kg)
820.10	564	90S	SO55	Cell.CDMA	24.65	-0.06	Right	Touch	94	0.216
820.10	564	90S	SO55	Cell.CDMA	24.65	0.03	Right	Tilt	94	0.165
820.10	564	90S	SO55	Cell.CDMA	24.65	-0.03	Left	Touch	94	0.242
820.10	564	90S	SO55	Cell.CDMA	24.65	0.00	Left	Tilt	94	0.185
820.10	564	90S	EVDO	Cell.CDMA	24.75	0.06	Right	Touch	94	0.115
820.10	564	90S	EVDO	Cell.CDMA	24.75	0.06	Right	Tilt	94	0.091
820.10	564	90S	EVDO	Cell.CDMA	24.75	0.09	Left	Touch	94	0.115
820.10	564	90S	EVDO	Cell.CDMA	24.75	0.03	Left	Tilt	94	0.097
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram			

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. CDMA2000 mode was tested under RC3/SO55 per KDB Publication 941225 D01.
7. All samples tested were electrically identical per the applicant.
8. Per KDB 447498 D01 6c), only one channel is tested for Cell CDMA FCC Rule Part 90S.
9. EVDO was tested for Head SAR due to the DUT's capability of third party applications that support VOIP through per Applicant's request. EVDO was tested with Rev. A.
10. Differences were confirmed in SAR and power levels between EVDO and RC3/SO55 from the original grant data.

Table 17-2
Cell. CDMA - FCC Rule Part 22H Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		FCC Rule Part	Service	Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	SAR (1g)
MHz	Ch.									(W/kg)
836.52	384	22H	SO55	Cell. CDMA	24.66	-0.04	Right	Touch	94	**0.300**
836.52	384	22H	SO55	Cell. CDMA	24.66	-0.05	Right	Tilt	94	0.223
836.52	384	22H	SO55	Cell. CDMA	24.66	0.03	Left	Touch	94	0.310
836.52	384	22H	SO55	Cell. CDMA	24.66	0.01	Left	Tilt	94	0.246
836.52	384	22H	EVDO	Cell. CDMA	24.72	0.09	Right	Touch	94	0.101
836.52	384	22H	EVDO	Cell. CDMA	24.72	0.03	Right	Tilt	94	0.072
836.52	384	22H	EVDO	Cell. CDMA	24.72	0.08	Left	Touch	94	0.101
836.52	384	22H	EVDO	Cell. CDMA	24.72	0.06	Left	Tilt	94	0.072
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram			

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. 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).
7. CDMA2000 mode was tested under RC3/SO55 per KDB Publication 941225 D01.
8. All samples tested were electrically identical per the applicant.
9. EVDO was tested for Head SAR due to the DUT's capability of third party applications that support VOIP through per Applicant's request. EVDO was tested with Rev. A.
10. Differences were confirmed in SAR and power levels between EVDO and RC3/SO55 from the original grant data.

Table 17-3
PCS CDMA - FCC Rule Part 24E Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		FCC Rule Part	Service	Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	SAR (1g)
MHz	Ch.									(W/kg)
1880.00	600	24E	SO55	PCS CDMA	24.59	0.01	Right	Touch	94	**0.402**
1880.00	600	24E	SO55	PCS CDMA	24.59	0.02	Right	Tilt	94	0.117
1880.00	600	24E	SO55	PCS CDMA	24.59	-0.05	Left	Touch	94	0.342
1880.00	600	24E	SO55	PCS CDMA	24.59	-0.02	Left	Tilt	94	0.127
1880.00	600	24E	EVDO	PCS CDMA	24.63	-0.03	Right	Touch	94	0.173
1880.00	600	24E	EVDO	PCS CDMA	24.63	0.02	Right	Tilt	94	0.044
1880.00	600	24E	EVDO	PCS CDMA	24.63	-0.02	Left	Touch	94	0.108
1880.00	600	24E	EVDO	PCS CDMA	24.63	0.05	Left	Tilt	94	0.041
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram			

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. 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).
7. CDMA2000 mode was tested under RC3/SO55 per KDB Publication 941225 D01.
8. All samples tested were electrically identical per the applicant.
9. EVDO was tested for Head SAR due to the DUT's capability of third party applications that support VOIP through per Applicant's request. EVDO was tested with Rev. A.
10. Differences were confirmed in SAR and power levels between EVDO and RC3/SO55 from the original grant data.

Table 17-4
2.4 GHz WLAN - FCC Rule Part 15C Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
2437	6	15C	IEEE 802.11b	DSSS	13.54	-0.04	Right	Touch	94	1	0.042
2437	6	15C	IEEE 802.11b	DSSS	13.54	0.07	Right	Tilt	94	1	0.035
2437	6	15C	IEEE 802.11b	DSSS	13.54	0.09	Left	Touch	94	1	0.096
2437	6	15C	IEEE 802.11b	DSSS	13.54	0.03	Left	Tilt	94	1	0.025
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.

Table 17-5
5.2 GHz WLAN - FCC Rule Part 15E Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
5180	36	15E	IEEE 802.11a	OFDM	10.51	0.06	Right	Touch	90	6	0.025
5180	36	15E	IEEE 802.11a	OFDM	10.51	-0.07	Right	Tilt	90	6	0.002
5180	36	15E	IEEE 802.11a	OFDM	10.51	0.06	Left	Touch	90	6	0.001
5180	36	15E	IEEE 802.11a	OFDM	10.51	0.09	Left	Tilt	90	6	0.001
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.
9. 5 GHz SAR and zoom scan requirements were tested according to KDB 865664 publication.

Table 17-6
5.3 GHz WLAN - FCC Rule Part 15E Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
5260	52	15E	IEEE 802.11a	OFDM	10.35	0.02	Right	Touch	90	6	0.025
5260	52	15E	IEEE 802.11a	OFDM	10.35	0.07	Right	Tilt	90	6	0.006
5260	52	15E	IEEE 802.11a	OFDM	10.35	0.08	Left	Touch	90	6	0.007
5260	52	15E	IEEE 802.11a	OFDM	10.35	0.06	Left	Tilt	90	6	0.001
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.
9. 5 GHz SAR and zoom scan requirements were tested according to KDB 865664 publication.

Table 17-7
5.5 – 5.7 GHz WLAN - FCC Rule Part 15E Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
5700	140	15E	IEEE 802.11a	OFDM	10.42	0.08	Right	Touch	90	6	0.065
5700	140	15E	IEEE 802.11a	OFDM	10.42	-0.09	Right	Tilt	90	6	0.047
5700	140	15E	IEEE 802.11a	OFDM	10.42	0.10	Left	Touch	90	6	0.043
5700	140	15E	IEEE 802.11a	OFDM	10.42	0.09	Left	Tilt	90	6	0.003
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.
9. 5 GHz SAR and zoom scan requirements were tested according to KDB 865664 publication.

Table 17-8
5.8 GHz WLAN - FCC Rule Part 15C Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
5745	149	15C	IEEE 802.11a	OFDM	10.21	0.10	Right	Touch	90	6	0.085
5745	149	15C	IEEE 802.11a	OFDM	10.21	0.06	Right	Tilt	90	6	0.066
5745	149	15C	IEEE 802.11a	OFDM	10.21	0.09	Left	Touch	90	6	0.041
5745	149	15C	IEEE 802.11a	OFDM	10.21	0.05	Left	Tilt	90	6	0.003
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth was at least 15.0 cm.
6. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.
9. 5 GHz SAR and zoom scan requirements were tested according to KDB 865664 publication.

Table 17-9
WIMAX Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY MHz	FCC Rule Part	Mode	Zone Type	Modulation	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Measured SAR (1g) (W/kg)	Scaling Factor	Calculated SAR (1g) (W/kg)
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.10	Right	Touch	94	0.325	1.221	0.397
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.02	Right	Touch	94	0.337	1.184	0.399
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.02	Right	Tilt	94	0.153	1.221	0.187
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.04	Right	Tilt	94	0.129	1.184	0.153
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.08	Left	Touch	94	0.134	1.221	0.164
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.02	Left	Touch	94	0.120	1.184	0.142
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.02	Left	Tilt	94	0.095	1.221	0.116
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.05	Left	Tilt	94	0.094	1.184	0.111
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram					

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. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings. Standard battery was used.
5. Liquid tissue depth was at least 15.0 cm.
6. 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).
7. All samples tested were electrically identical per the applicant.
8. SAR Test configurations for WIMAX per FCC KDB Publication 615223 and April/Oct. 2010 FCC/TCB Workshop Notes :
   a. This device supports two coding rates (1/2 and 3/4) that are rated to the same maximum output power. Since the higher rates were not more than 0.25 dB from the lowest coding rate, only the lowest coding rate (1/2) was tested.
   b. 16 QAM was not required to be tested since the output power for 16-QAM was not more than 0.25 higher than QPSK and the QPSK SAR was less than 0.8 W/kg.
   c. This device supports PUSC Zone type only.
   d. WIMAX SAR was scaled according to FCC WIMAX requirements (See Section 14.7). The device was configured to operate with 15 traffic symbols active and the 3 control symbols inactive for SAR testing purposes. The SAR result was then scaled up to the maximum tune up power for both the maximum output power for 15 traffic symbols and 3 control symbols. The SAR plots reflect measured SAR values.
   e. Crest Factor used for the SAR sdystem for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
   f. The scaled SAR was used to determine test reduction scenarios.

Table 17-10
CDMA Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Side	SAR (1g)
MHz	Ch.									(W/kg)
820.10	564	90S	Cell. CDMA	TDSO32	24.66	0.07	1.0 cm	94	back	0.415
836.52	384	22H	Cell. CDMA	TDSO32	24.66	-0.03	1.0 cm	94	back	0.315
1880.00	600	24E	PCS CDMA	TDSO32	24.57	-0.01	1.0 cm	94	back	0.528
820.10	564	90S	Cell. CDMA	EVDO	24.67	0.00	1.0 cm	94	back	0.515
836.52	384	22H	Cell. CDMA	EVDO	24.77	0.02	1.0 cm	94	back	**0.435**
1880.00	600	24E	PCS CDMA	EVDO	24.73	-0.06	1.0 cm	94	back	**0.543**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram			

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. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings. Standard battery was used.
5. Liquid tissue depth was at least 15.0 cm.
6. A separation distance of 10 mm is chosen because the applicant has determined that it supports the types of body-worn accessories available in the marketplace to users for this handset.
7. Body-Worn SAR was tested under RC3/SO32 with FCH only since FCH+SCH modes are not greater than 0.25 dB of the FCH only mode per KDB Publication 941225 D01.
8. Justification for reduced test configurations for FCC Rule Parts 22H and 24E: 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).
9. All samples tested were electrically identical per the applicant.
10. Per KDB 447498 D01 6c), only one channel is tested for Cell CDMA FCC Rule Part 90S.
11. EVDO was tested for Body-Worn SAR due to the DUT's capability of EVDO VOIP applications. EVDO was testing with Rev. 0 since the maximum average output of each channel in Rev. A and RC3 (1x RTT) was not more than ¼ dB higher than that measured Rev 0.

Table 17-11
Body-Worn WLAN SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	6	15C	IEEE 802.11b	DSSS	13.54	0.10	1.0 cm	94	1	back	0.077
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram				

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
5180	36	15E	IEEE 802.11a	OFDM	10.51	0.09	1.0 cm	90	6	back	0.034
5260	52	15E	IEEE 802.11a	OFDM	10.35	0.07	1.0 cm	90	6	back	0.034
5700	140	15E	IEEE 802.11a	OFDM	10.42	0.05	1.0 cm	90	6	back	0.093
5745	149	15C	IEEE 802.11a	OFDM	10.21	0.09	1.0 cm	90	6	back	0.089
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth is was at least 15.0 cm.
6. A separation distance of 10 mm is chosen because the applicant has determined that it supports the types of body-worn accessories available in the marketplace to users for this handset.
7. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
8. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a mode.
9. WLAN transmission was verified using a spectrum analyzer.
10. All samples tested were electrically identical per the applicant.
11. When hotspot is enabled, all 5 GHz bands are disabled.

Table 17-12
Body-Worn WIMAX SAR Results

MEASUREMENT RESULTS													
FREQUENCY MHz	FCC Rule Part	Mode	Zone Type	Modulation	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Side	Measured SAR (1g) (W/kg)	Scaling Factor	Calculated SAR (1g) (W/kg)
2600	27M	WIMAX	PUSC	QPSK	5	23.38	-0.05	1.0 cm	94	back	0.499	1.221	0.609
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.00	1.0 cm	94	back	0.461	1.184	0.546
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram					

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. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings. Standard battery was used.
5. Liquid tissue depth was at least 15.0 cm.
6. A separation distance of 10 mm is chosen because the applicant has determined that it supports the types of body-worn accessories available in the marketplace to users for this handset.
7. 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).
8. All samples tested were electrically identical per the applicant.
9. SAR Test configurations for WIMAX per FCC KDB Publication 615223 and April/Oct. 2010 FCC/TCB Workshop Notes :
    a. This device supports two coding rates (1/2 and 3/4) that are rated to the same maximum output power. Since the higher rates were not more than 0.25 dB from the lowest coding rate, only the lowest coding rate (1/2) was tested.
    b. 16 QAM was not required to be tested since the output power for 16-QAM was not more than 0.25 higher than QPSK and the QPSK SAR was less than 0.8 W/kg.
    c. This device supports PUSC Zone type only.
    d. WIMAX SAR was scaled according to FCC WIMAX requirements (See Section 14.7). The device was configured to operate with 15 traffic symbols active and the 3 control symbols inactive for SAR testing purposes. The SAR result was then scaled up to the maximum tune up power for both the maximum output power for 15 traffic symbols and 3 control symbols. The SAR plots reflect measured SAR values.
    e. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    f. The scaled SAR was used to determine test reduction scenarios.
10. All samples tested were electrically identical per the applicant.

Table 17-13
CDMA Hotspot SAR Results

MEASUREMENT RESULTS										
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Side	SAR (1g)
MHz	Ch.									(W/kg)
#N/A	564	90S	Cell. CDMA	TDSO32	24.66	0.07	1.0 cm	94	back	0.415
820.10	564	90S	Cell. CDMA	TDSO32	24.66	0.00	1.0 cm	94	front	0.187
820.10	564	90S	Cell. CDMA	TDSO32	24.66	-0.01	1.0 cm	94	bottom	0.065
820.10	564	90S	Cell. CDMA	TDSO32	24.66	-0.04	1.0 cm	94	left	0.258
820.10	564	90S	Cell. CDMA	EVDO	24.67	0.00	1.0 cm	94	back	0.515
820.10	564	90S	Cell. CDMA	EVDO	24.67	0.00	1.0 cm	94	front	0.165
820.10	564	90S	Cell. CDMA	EVDO	24.67	0.04	1.0 cm	94	bottom	0.078
820.10	564	90S	Cell. CDMA	EVDO	24.67	0.01	1.0 cm	94	left	0.186
836.52	384	22H	Cell. CDMA	TDSO32	24.66	-0.03	1.0 cm	94	back	0.315
836.52	384	22H	Cell. CDMA	TDSO32	24.66	0.03	1.0 cm	94	front	0.159
836.52	384	22H	Cell. CDMA	TDSO32	24.66	-0.05	1.0 cm	94	bottom	0.060
836.52	384	22H	Cell. CDMA	TDSO32	24.66	-0.03	1.0 cm	94	left	0.207
836.52	384	22H	Cell. CDMA	EVDO	24.77	0.02	1.0 cm	94	back	0.435
836.52	384	22H	Cell. CDMA	EVDO	24.77	0.00	1.0 cm	94	front	0.137
836.52	384	22H	Cell. CDMA	EVDO	24.77	-0.01	1.0 cm	94	bottom	0.074
836.52	384	22H	Cell. CDMA	EVDO	24.77	0.00	1.0 cm	94	left	0.140
1880.00	600	24E	PCS CDMA	TDSO32	24.57	-0.01	1.0 cm	94	back	0.528
1880.00	600	24E	PCS CDMA	TDSO32	24.57	0.02	1.0 cm	94	front	0.166
1880.00	600	24E	PCS CDMA	TDSO32	24.57	0.05	1.0 cm	94	bottom	0.326
1880.00	600	24E	PCS CDMA	TDSO32	24.57	0.03	1.0 cm	94	left	0.050
1880.00	600	24E	PCS CDMA	EVDO	24.73	-0.06	1.0 cm	94	back	0.543
1880.00	600	24E	PCS CDMA	EVDO	24.73	0.04	1.0 cm	94	front	0.201
1880.00	600	24E	PCS CDMA	EVDO	24.73	0.08	1.0 cm	94	bottom	0.263
1880.00	600	24E	PCS CDMA	EVDO	24.73	-0.07	1.0 cm	94	left	0.052
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram			

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. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings. Standard battery was used.
5. Liquid tissue depth was at least 15.0 cm.
6. Device was tested using a fixed spacing.
7. Justification for reduced test configurations for FCC Rule Part 22H and 24E: 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).
8. Per FCC KDB Publication 941225 D01, CDMA Hotspot Body SAR was tested under EVDO Rev. 0 per FCC 3G Guidance (See Section 12.2.5). Rev. A tests were not required since the maximum average output of each channel in Rev. A was not more than ¼ dB higher than that measured Rev 0.
9. All samples tested were electrically identical per the applicant.
10. Top and Right Edges were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 15.4).
11. 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 15).
12. Per KDB 447498 D01 6c), only one channel is tested for Cell CDMA FCC Rule Part 90S.
13. TDSO32 was tested additionally to cover the scenario of WIMAX Hotspot simultaneously transmitting with a CDMA voice call.

Table 17-14
Hotspot 2.4 GHz Body SAR Results

MEASUREMENT RESULTS											
FREQUENCY		FCC Rule Part	Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	6	15C	IEEE 802.11b	DSSS	13.54	0.10	1.0 cm	94	1	back	0.077
2462	6	15C	IEEE 802.11b	DSSS	13.54	-0.01	1.0 cm	94	1	front	0.018
2462	6	15C	IEEE 802.11b	DSSS	13.54	0.03	1.0 cm	94	1	bottom	0.006
2462	6	15C	IEEE 802.11b	DSSS	13.54	0.07	1.0 cm	94	1	left	0.046
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram				

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. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings. Standard battery was used.
4. Tissue parameters and temperatures are listed on the SAR plots.
5. Liquid tissue depth is was at least 15.0 cm.
6. Device was tested with a fixed spacing.
7. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
8. WLAN transmission was verified using a spectrum analyzer.
9. All samples tested were electrically identical per the applicant.
10. Top and Right Edges were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 15.4).
11. 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.

Table 17-15
WIMAX Hotspot Body SAR Results

MEASUREMENT RESULTS													
FREQUENCY MHz	FCC Rule Part	Mode	Zone Type	Modulation	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Side	Measured SAR (1g) (W/kg)	Scaling Factor	Calculated SAR (1g) (W/kg)
2600	27M	WIMAX	PUSC	QPSK	5	23.38	-0.05	1.0 cm	94	back	0.499	1.221	0.609
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.00	1.0 cm	94	back	0.461	1.184	0.546
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.05	1.0 cm	94	front	0.062	1.221	0.075
2600	27M	WIMAX	PUSC	QPSK	10	23.39	-0.03	1.0 cm	94	front	0.068	1.184	0.081
2600	27M	WIMAX	PUSC	QPSK	5	23.38	0.01	1.0 cm	94	top	0.053	1.221	0.064
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.07	1.0 cm	94	top	0.051	1.184	0.060
2600	27M	WIMAX	PUSC	QPSK	5	23.38	-0.02	1.0 cm	94	left	0.232	1.221	0.283
2600	27M	WIMAX	PUSC	QPSK	10	23.39	0.00	1.0 cm	94	left	0.278	1.184	0.329
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram					

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. All modes of operation were investigated, and worst-case results are reported.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Batteries are fully charged for all readings. Standard battery was used.
5. Liquid tissue depth was at least 15.0 cm.
6. Device was tested with a fixed spacing.
7. 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).
8. All samples tested were electrically identical per the applicant.
9. SAR Test configurations for WIMAX per FCC KDB Publication 615223 and April/Oct. 2010 FCC/TCB Workshop Notes :
    a. This device supports two coding rates (1/2 and 3/4) that are rated to the same maximum output power. Since the higher rates were not more than 0.25 dB from the lowest coding rate, only the lowest coding rate (1/2) was tested.
    b. 16 QAM was not required to be tested since the output power for 16-QAM was not more than 0.25 higher than QPSK and the QPSK SAR was less than 0.8 W/kg.
    c. This device supports PUSC Zone type only.
    d. WIMAX SAR was scaled according to FCC WIMAX requirements (See Section 14.7). The device was configured to operate with 15 traffic symbols active and the 3 control symbols inactive for SAR testing purposes. The SAR result was then scaled up to the maximum tune up power for both the maximum output power for 15 traffic symbols and 3 control symbols. The SAR plots reflect measured SAR values.
    e. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    f. The scaled SAR was used to determine test reduction scenarios.
10. All samples tested were electrically identical per the applicant.
11. Bottom and Right Edges were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 15.4).
12. 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 13).
13. 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.

18 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

18.1 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 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

18.2 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 18-1
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 18-2
SAR Evaluation Requirements for Multiple Transmitter Handsets

18.3 Multiple Antenna/Transmission Information

RF Conducted Power of Bluetooth Tx is 9.386 mW. RF Conducted Power of WLAN is 22.75 mW

Based on the output power, antenna separation distance and the Body SAR of the dominant transmitter, a stand-alone Bluetooth SAR test is not required while for WLAN it is required.

19 MULTIPLE TRANSMITTER SAR EVALUATION

These following sections include multiple transmitter SAR calculations and measurement in accordance with KDB 648474 publication FCC guidance.

19.1 Simultaneous Transmission Scenarios

All possible simultaneous transmission scenarios are shown in Table 19-1. Bluetooth, 2.4 GHz WIFI and 5 GHz WIFI cannot transmit with WIFI (same RF path) but can transmit simultaneously with CDMA. Additionally, 2.4 GHz WIFI and Bluetooth can transmit simultaneously with WIMAX. Bluetooth was not required to be required to be measured and is 0 W/kg for all summation analysis. WIMAX and WLAN can transmit simultaneously as a hotspot condition.

CDMA and EVDO cannot transmit simultaneously. EVDO and WIMAX cannot transmit simultaneously.

CDMA supports voice and data modes. WIFI and WIMAX support data communication only. VoIP is supported for EVDO, WIFI and WIMAX.

Table 19-1
Possible Simultaneous Transmission Scenarios

No.	Capable Tx Configurations	Head SAR	Body SAR	Hotspot SAR	Note
1	CDMA+WIMAX	√ Table 19-2	√ Table 19-5	-	1X Voice + WIMAX Data
2	CDMA + 2.4 GHz WIFI	√ Table 19-2	√ Table 19-5	√ Table 19-8	1X Voice + WIFI Data or 1X Data + WIFI Data Hotspot
3	CDMA + 5 GHz WIFI	√ Table 19-3	√ Table 19-6	-	1X Voice + WIFI Data (client)
4	WIMAX + 2.4 GHz WIFI	√ Table 19-2	√ Table 19-5	√ Table 19-8	WIMAX + WIFI Hotspot or WIMAX + WIFI Hotspot with WIMAX VoIP
5	EVDO + 2.4 GHz WIFI	√ Table 19-4	√ Table 19-7	√ Table 19-9	EVDO+WIFI Hotspot or EVDO+WIFI Hotspot with EVDO VoIP
6	CDMA+WIMAX+2.4 GHz WIFI	√ Table 19-2	√ Table 19-5	√ Table 19-8	1X Voice + WIMAX + 2.4 GHz WIFI Hotspot

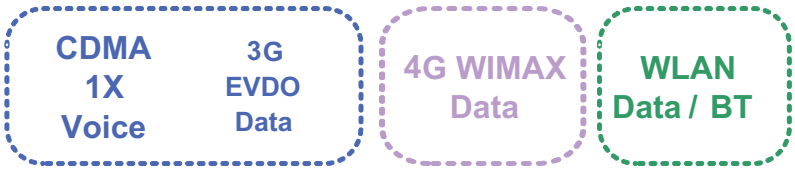


Figure 19-1
Simultaneous Transmission Paths

Table 19-2
Held to Ear Simultaneous Transmission (CDMA, 2.4 GHz WIFI, WIMAX)

Simult Tx	Configuration	1x Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	Σ SAR (W/kg)				SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	3	1+2	1+3	2+3	1+2+3		
Head SAR	Right Cheek	0.216	0.042	0.399	0.258	0.615	0.441	0.657	N/A	N/A
	Right Tilt	0.165	0.035	0.187	0.200	0.352	0.222	0.387	N/A	N/A
	Left Cheek	0.242	0.096	0.164	0.338	0.406	0.260	0.502	N/A	N/A
	Left Tilt	0.185	0.025	0.116	0.210	0.301	0.141	0.326	N/A	N/A

Simult Tx	Configuration	1x Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	Σ SAR (W/kg)				SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	3	1+2	1+3	2+3	1+2+3		
Head SAR	Right Cheek	0.300	0.042	0.399	0.342	0.699	0.441	0.741	N/A	N/A
	Right Tilt	0.223	0.035	0.187	0.258	0.410	0.222	0.445	N/A	N/A
	Left Cheek	0.310	0.096	0.164	0.406	0.474	0.260	0.570	N/A	N/A
	Left Tilt	0.246	0.025	0.116	0.271	0.362	0.141	0.387	N/A	N/A

Simult Tx	Configuration	1x PCS CDMA - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	Σ SAR (W/kg)				SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	3	1+2	1+3	2+3	1+2+3		
Head SAR	Right Cheek	0.402	0.042	0.399	0.444	0.801	0.441	0.843	N/A	N/A
	Right Tilt	0.117	0.035	0.187	0.152	0.304	0.222	0.339	N/A	N/A
	Left Cheek	0.342	0.096	0.164	0.438	0.506	0.260	0.602	N/A	N/A
	Left Tilt	0.127	0.025	0.116	0.152	0.243	0.141	0.268	N/A	N/A

Table 19-3
Held to Ear Simultaneous Transmission (CDMA, 5 GHz WIFI, WIMAX)

Simult Tx	Configuration	1x Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.216	0.085	0.301	N/A	N/A
	Right Tilt	0.165	0.066	0.231	N/A	N/A
	Left Cheek	0.242	0.043	0.285	N/A	N/A
	Left Tilt	0.185	0.003	0.188	N/A	N/A

Simult Tx	Configuration	1x Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.300	0.085	0.385	N/A	N/A
	Right Tilt	0.223	0.066	0.289	N/A	N/A
	Left Cheek	0.310	0.043	0.353	N/A	N/A
	Left Tilt	0.246	0.003	0.249	N/A	N/A

Simult Tx	Configuration	1x PCS CDMA - FCC Rule Part 24E SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.402	0.085	0.487	N/A	N/A
	Right Tilt	0.117	0.066	0.183	N/A	N/A
	Left Cheek	0.342	0.043	0.385	N/A	N/A
	Left Tilt	0.127	0.003	0.130	N/A	N/A

Table 19-4
Held to Ear Simultaneous Transmission (EVDO, 2.4 GHz WIFI)

Simult Tx	Configuration	EVDO Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.115	0.042	0.157	N/A	N/A
	Right Tilt	0.091	0.035	0.126	N/A	N/A
	Left Cheek	0.115	0.096	0.211	N/A	N/A
	Left Tilt	0.097	0.025	0.122	N/A	N/A

Simult Tx	Configuration	EVDO Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.101	0.042	0.143	N/A	N/A
	Right Tilt	0.072	0.035	0.107	N/A	N/A
	Left Cheek	0.101	0.096	0.197	N/A	N/A
	Left Tilt	0.072	0.025	0.097	N/A	N/A

Simult Tx	Configuration	EVDO PCS CDMA - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Head SAR	Right Cheek	0.173	0.042	0.215	N/A	N/A
	Right Tilt	0.044	0.035	0.079	N/A	N/A
	Left Cheek	0.108	0.096	0.204	N/A	N/A
	Left Tilt	0.041	0.025	0.066	N/A	N/A

Table 19-5
Body-Worn Simultaneous Transmission (CDMA, WIMAX, 2.4 GHz WIFI)

Configuration	Mode	CDMA SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	Σ SAR (W/kg)				SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	3	1+2	1+3	2+3	1+2+3		
Back Side	1x Cell. CDMA - FCC Rule Part 90S	0.415	0.077	0.609	0.492	1.024	0.686	1.101	N/A	N/A
Back Side	1x Cell. CDMA - FCC Rule Part 22H	0.315	0.077	0.609	0.392	0.924	0.686	1.001	N/A	N/A
Back Side	1x PCS CDMA - FCC Rule Part 24E	0.528	0.077	0.609	0.605	1.137	0.686	1.214	N/A	N/A

Table 19-6
Body-Worn Simultaneous Transmission (CDMA, 5 GHz WIFI)

Configuration	Mode	CDMA SAR (W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Back Side	1x Cell. CDMA - FCC Rule Part 90S	0.415	0.093	**0.508**	N/A	N/A
Back Side	1x Cell. CDMA - FCC Rule Part 22H	0.315	0.093	**0.408**	N/A	N/A
Back Side	1x PCS CDMA - FCC Rule Part 24E	0.528	0.093	**0.621**	N/A	N/A

Table 19-7
Body-Worn Simultaneous Transmission (EVDO, 2.4 GHz WIFI)

Configuration	Mode	EVDO CDMA SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Back Side	EVDO Cell. CDMA - FCC Rule Part 90S	0.515	0.077	**0.592**	N/A	N/A
Back Side	EVDO Cell. CDMA - FCC Rule Part 22H	0.435	0.077	**0.512**	N/A	N/A
Back Side	EVDO PCS CDMA - FCC Rule Part 24E	0.543	0.077	**0.620**	N/A	N/A

Table 19-8
Hotspot Simultaneous Transmission (CDMA, WIMAX, 2.4 GHz WIFI)

Configuration	1x Cell CDMA - FCC Rule Part 90S SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)			SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	1	2	3	1+3	2+3	1+2+3		
Back	0.415	0.609	0.077	**0.492**	**0.686**	**1.101**	N/A	N/A
Front	0.187	0.081	0.018	**0.205**	**0.099**	**0.286**	N/A	N/A
Top	-	0.064	-	**0.000**	**0.064**	**0.064**	N/A	N/A
Bottom	0.065	-	0.006	**0.071**	**0.006**	**0.071**	N/A	N/A
Right	-	-	-	**0.000**	**0.000**	**0.000**	N/A	N/A
Left	0.258	0.329	0.046	**0.304**	**0.375**	**0.633**	N/A	N/A

Configuration	1x Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)			SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	1	2	3	1+3	2+3	1+2+3		
Back	0.315	0.609	0.077	**0.392**	**0.686**	**1.001**	N/A	N/A
Front	0.159	0.081	0.018	**0.177**	**0.099**	**0.258**	N/A	N/A
Top	-	0.064	-	**0.000**	**0.064**	**0.064**	N/A	N/A
Bottom	0.060	-	0.006	**0.066**	**0.006**	**0.066**	N/A	N/A
Right	-	-	-	**0.000**	**0.000**	**0.000**	N/A	N/A
Left	0.207	0.329	0.046	**0.253**	**0.375**	**0.582**	N/A	N/A

Simult Tx	Configuration	1x PCS CDMA - FCC Rule Part 24E SAR (W/kg)	WIMAX SAR (scaled) (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)			SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	3	1+3	2+3	1+2+3		
Body SAR	Back	0.528	0.609	0.077	**0.605**	**0.686**	**1.214**	N/A	N/A
	Front	0.166	0.081	0.018	**0.184**	**0.099**	**0.265**	N/A	N/A
	Top	-	0.064	-	**0.000**	**0.064**	**0.064**	N/A	N/A
	Bottom	0.326	-	0.006	**0.332**	**0.006**	**0.332**	N/A	N/A
	Right	-	-	-	**0.000**	**0.000**	**0.000**	N/A	N/A
	Left	0.050	0.329	0.046	**0.096**	**0.375**	**0.425**	N/A	N/A

Table 19-9
Hotspot Simultaneous Transmission (EVDO, 2.4 GHz WIFI)

Simult Tx	Configuration	EVDO Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Body SAR	Back	0.515	0.077	**0.592**	**N/A**	**N/A**
	Front	0.165	0.018	**0.183**	**N/A**	**N/A**
	Top	-	-	**0.000**	**N/A**	**N/A**
	Bottom	0.078	0.006	**0.084**	**N/A**	**N/A**
	Right	-	-	**0.000**	**N/A**	**N/A**
	Left	0.186	0.046	**0.232**	**N/A**	**N/A**

Simult Tx	Configuration	EVDO Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Body SAR	Back	0.435	0.077	**0.512**	**N/A**	**N/A**
	Front	0.137	0.018	**0.155**	**N/A**	**N/A**
	Top	-	-	**0.000**	**N/A**	**N/A**
	Bottom	0.074	0.006	**0.080**	**N/A**	**N/A**
	Right	-	-	**0.000**	**N/A**	**N/A**
	Left	0.140	0.046	**0.186**	**N/A**	**N/A**

Simult Tx	Configuration	EVDO PCS CDMA - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	SPLS Ratios per FCC KDB Pub. 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
		1	2	1+2		
Body SAR	Back	0.543	0.077	**0.620**	**N/A**	**N/A**
	Front	0.201	0.018	**0.219**	**N/A**	**N/A**
	Top	-	-	**0.000**	**N/A**	**N/A**
	Bottom	0.263	0.006	**0.269**	**N/A**	**N/A**
	Right	-	-	**0.000**	**N/A**	**N/A**
	Left	0.052	0.046	**0.098**	**N/A**	**N/A**

Note: Per FCC KDB Publication 941225 D06, the edges with antennas more than 2.5 cm are not required to be evaluated for SAR ("-"). When Hotspot is enabled, all 5 GHz bands are disabled.

19.2 Simultaneous Transmission Conclusion

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

20 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/13/2010	Annual	10/13/2011	3613A00315
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/21/2011	Annual	4/21/2012	JP38020182
Agilent	E5515C	Wireless Communications Test Set	10/11/2010	Annual	10/11/2011	GB46110872
Agilent	E5515C	Wireless Communications Test Set	10/8/2010	Annual	10/8/2011	GB46310798
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/8/2011	Annual	4/8/2012	MY45470194
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/11/2010	Annual	10/11/2011	1833460
Gigatronics	8651A	Universal Power Meter	10/11/2010	Annual	10/11/2011	8650319
Rohde & Schwarz	CMU200	Base Station Simulator	11/11/2010	Annual	11/11/2011	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	4/19/2011	Annual	4/19/2012	107826
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
SPEAG	D1765V2	1765 MHz SAR Dipole	6/16/2011	Annual	6/16/2012	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/17/2011	Annual	2/17/2012	502
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2011	Biennial	7/22/2012	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	2/8/2011	Annual	2/8/2012	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/15/2011	Annual	4/15/2012	1004
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	3/17/2011	Annual	3/17/2012	704
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	ES3DV2	SAR Probe	9/21/2010	Annual	9/21/2011	3022
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
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 Tester	4/21/2011	Annual	4/21/2012	US41140256
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	N/A			21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	N/A			N/A
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
SPEAG	D3700V2	3700 MHz SAR Dipole	2/16/2011	Annual	2/16/2012	1002
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/11/2011	Annual	3/11/2012	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
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			R8979500903
Narda	4772-3	Attenuator (3dB)	N/A			9406
Narda	BW-S3W2	Attenuator (3dB)	N/A			120

21 MEASUREMENT UNCERTAINTIES

Applicable for 750 – 3000 MHz.

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

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

Applicable for 5GHz.

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

22 CONCLUSION

22.1 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]

23 REFERENCES

[1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Aug. 1996.

[2] ANSI/IEEE C95.1-2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300kHz to 100GHz, New York: IEEE, 2006.

[3] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300kHz to 100GHz, New York: IEEE, Sept. 1992.

[4] ANSI/IEEE C95.3-2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, December 2002.

[5] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, June 2001.

[6] IEEE Standards Coordinating Committee 34 – IEEE Std. 1528-2003, Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices.

[7] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for RadioFrequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.

[8] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.

[9] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 120-124.

[10] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.

[11] Schmid & Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.

[12] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Head Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct. 1996, pp. 1865-1873.

[13] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[14] G. Hartsgrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bioelectromagnetics, Canada: 1987, pp. 29-36.

[15] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.

[16] W. Gander, Computermathematick, Birkhaeuser, Basel, 1992.

[17] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.

[18] Federal Communications Commission, OET Bulletin 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. Supplement C, Dec. 1997.

[19] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

[20] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10kHz-300GHz, Jan. 1995.

[21] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hoschschule Zürich, Dosimetric Evaluation of the Cellular Phone.

[22] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz), Feb. 2005.

[23] Industry Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 4, March 2010.

[24] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2009

[25] FCC Public Notice DA-02-1438. Office of Engineering and Technology Announces a Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65, June 19, 2002

[26] FCC SAR Measurement Procedures for 3G Devices KDB Publication 941225

[27] SAR Measurement procedures for IEEE 802.11a/b/g KDB Publication 248227

[28] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publication 648474

[29] FCC Application Note for SAR Probe Calibration and System Verification Consideration for Measurements at 150 MHz – 3 GHz, KDB Publication 450824

[30] FCC SAR Evaluation Considerations for Laptop Computers with Antennas Built-in on Display Screens, KDB Publication 616217

[31] FCC SAR Measurement Requirements for 3 – 6 GHz, KDB Publication 865664

[32] FCC Mobile Portable RF Exposure Procedure, KDB Publication 447498

[33] FCC SAR Procedures for Dongle Transmitters, KDB Publication 447498

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

[35] FCC SAR Test Considerations for LTE Handsets and Data Modems, KDB Publication 941225.

[36] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz), Mar. 2010.

[37] FCC Hot Spot SAR v01, KDB Publication 941225 D06.

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

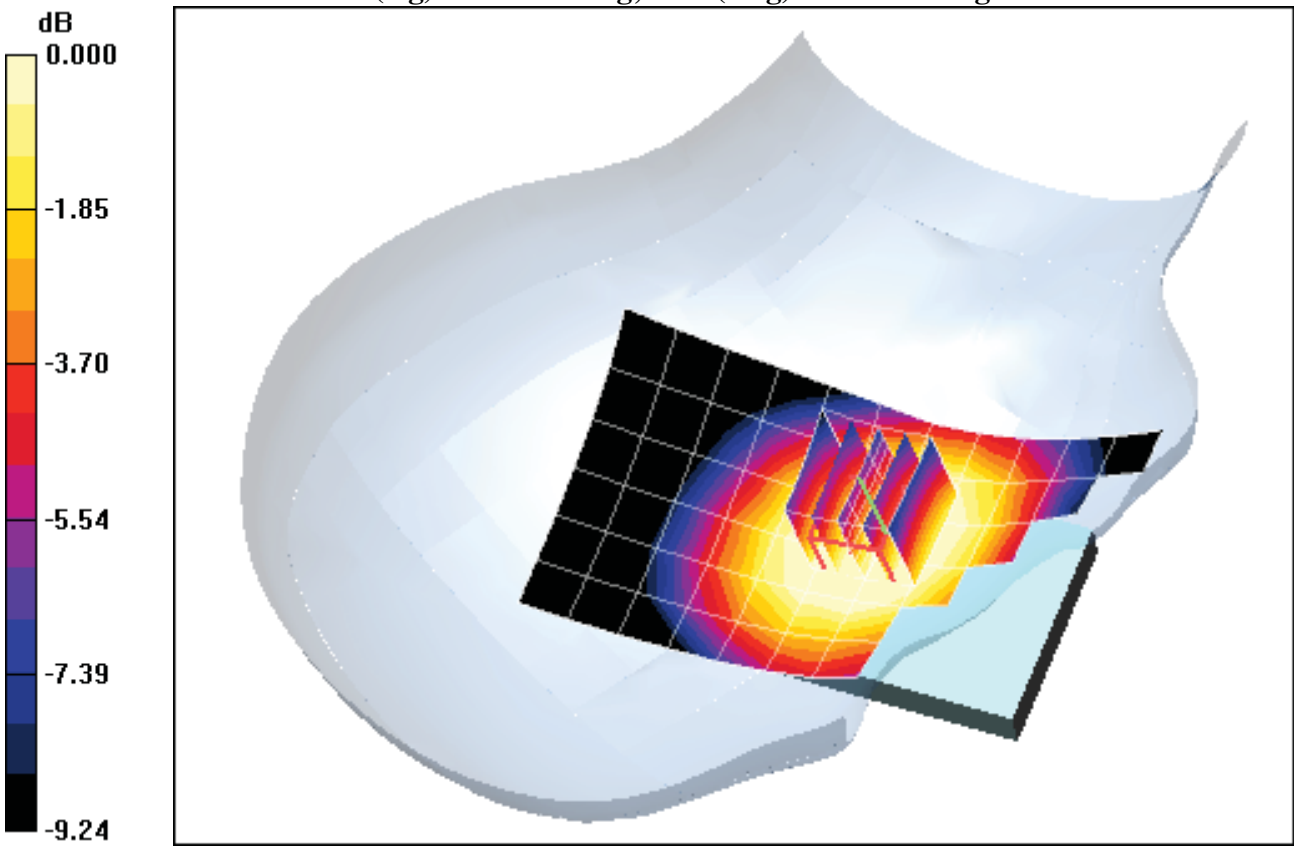
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.855 mho/m; ε_r = 40.17; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 90S, 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 = 17.4 V/m
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.164 mW/g



0 dB = 0.224mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

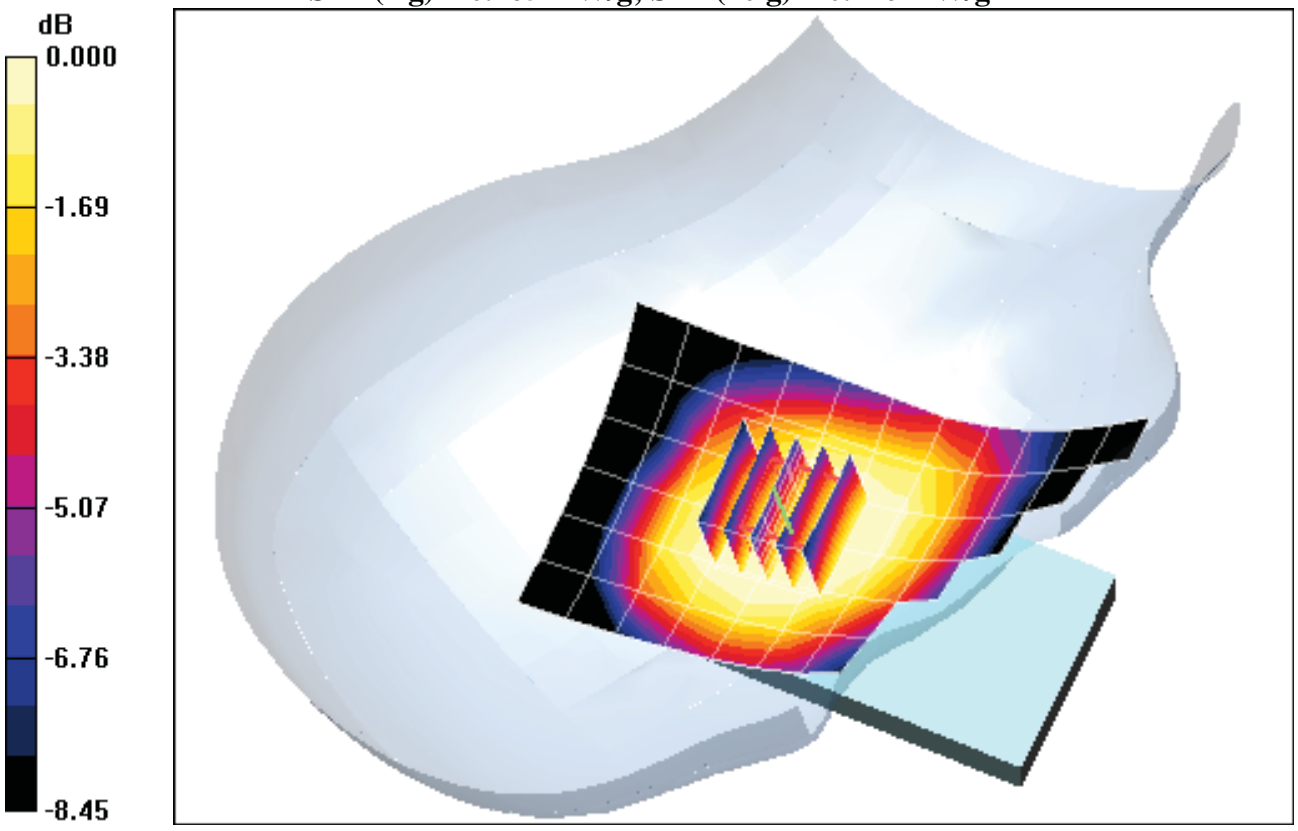
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.855 mho/m; ε_r = 40.17; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 90S, 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 = 15.0 V/m
Peak SAR (extrapolated) = 0.209 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.126 mW/g



0 dB = 0.174mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

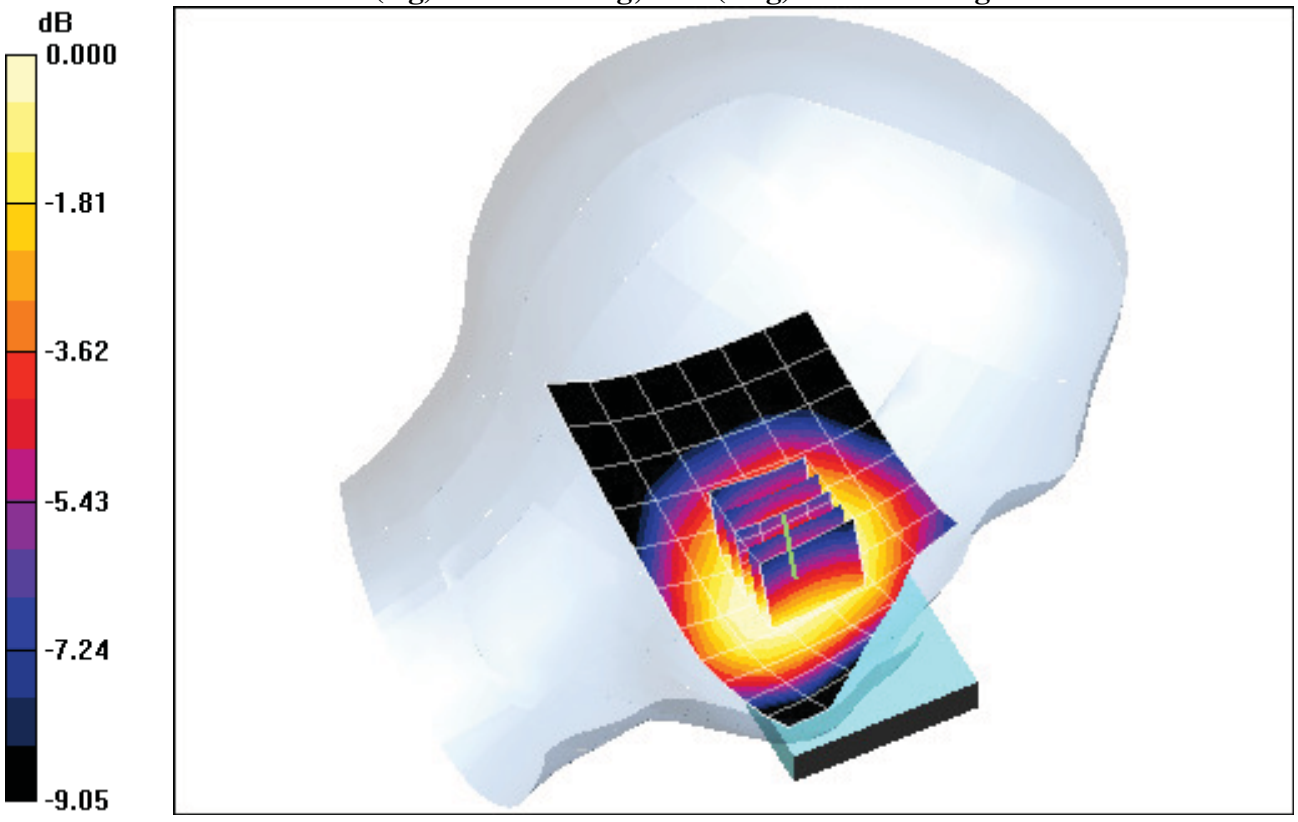
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.855 mho/m; ε_r = 40.17; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 90S, 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 = 18.3 V/m
Peak SAR (extrapolated) = 0.305 W/kg
SAR(1 g) = 0.242 mW/g; SAR(10 g) = 0.182 mW/g



0 dB = 0.257mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

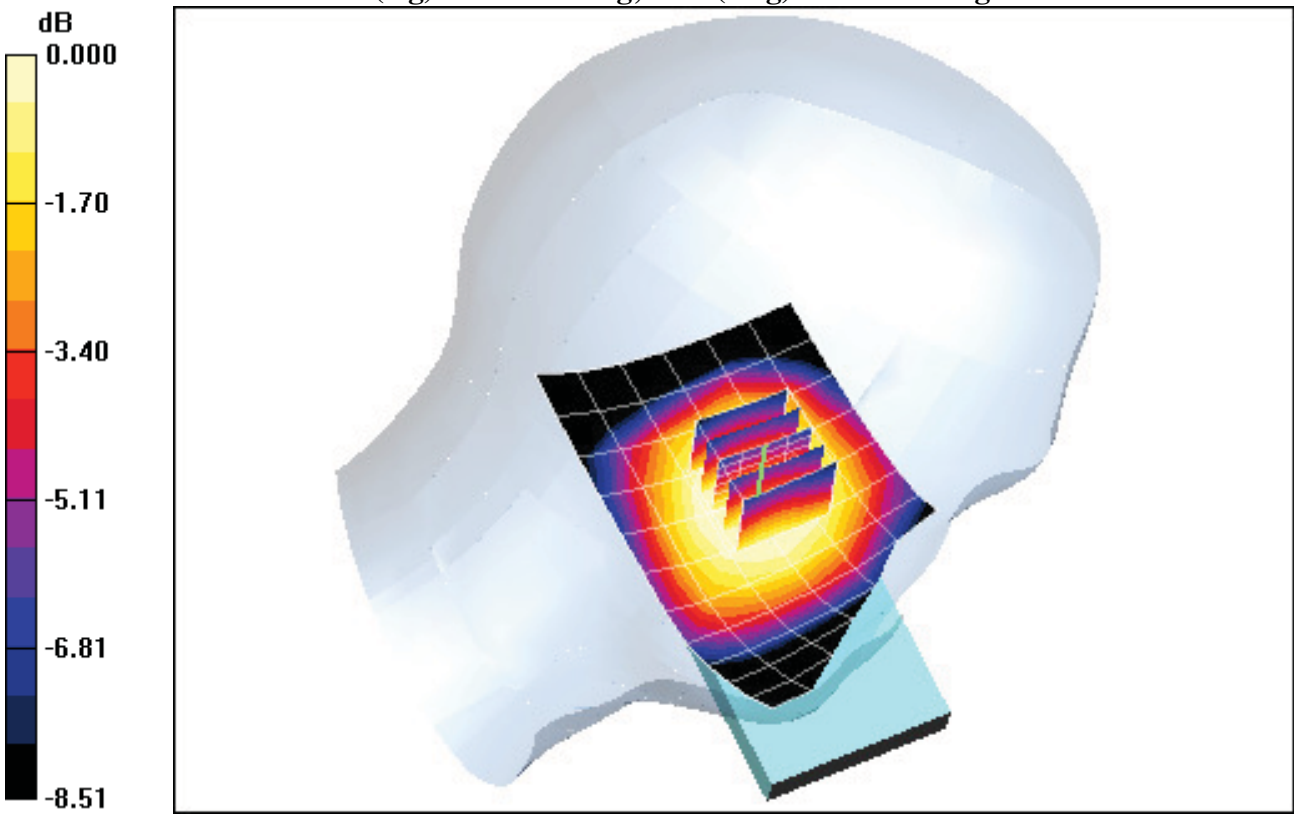
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.855 mho/m; ε_r = 40.17; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 90S, 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 = 16.0 V/m
Peak SAR (extrapolated) = 0.233 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.141 mW/g



0 dB = 0.194mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

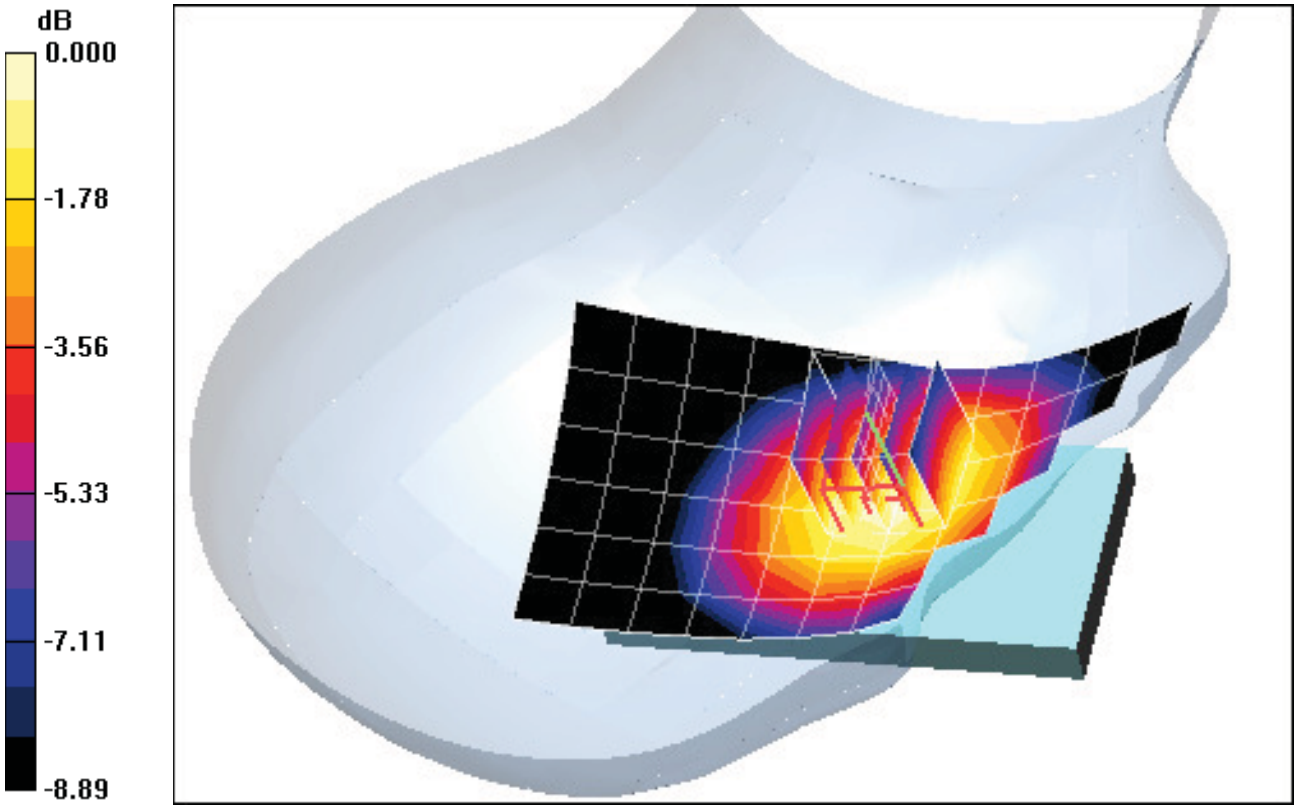
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.911 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev. A-FCC Rule Part 90S, 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 = 3.87 V/m
Peak SAR (extrapolated) = 0.144 W/kg
SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.088 mW/g



0 dB = 0.120mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

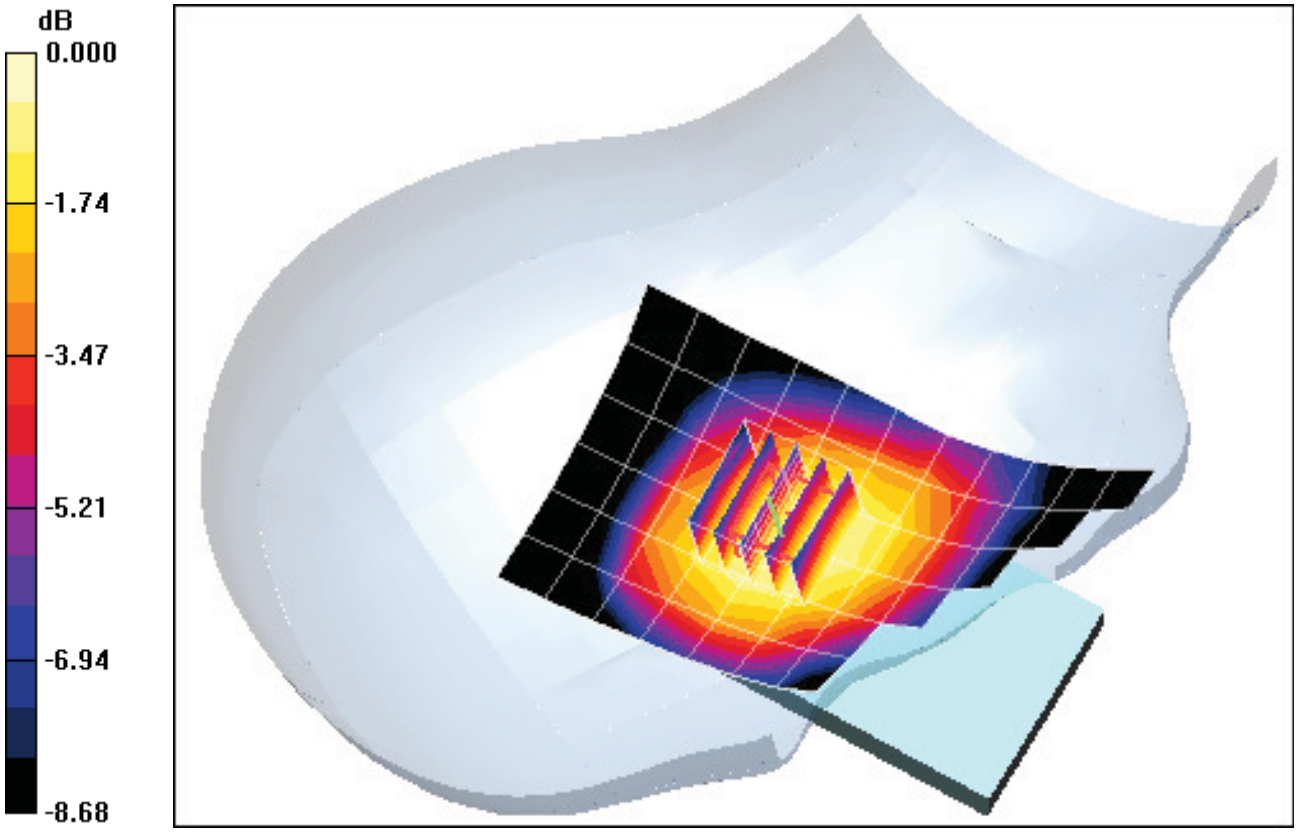
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.911 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev A-FCC Rule Part 90S, 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 = 7.07 V/m
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.070 mW/g



0 dB = 0.096mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

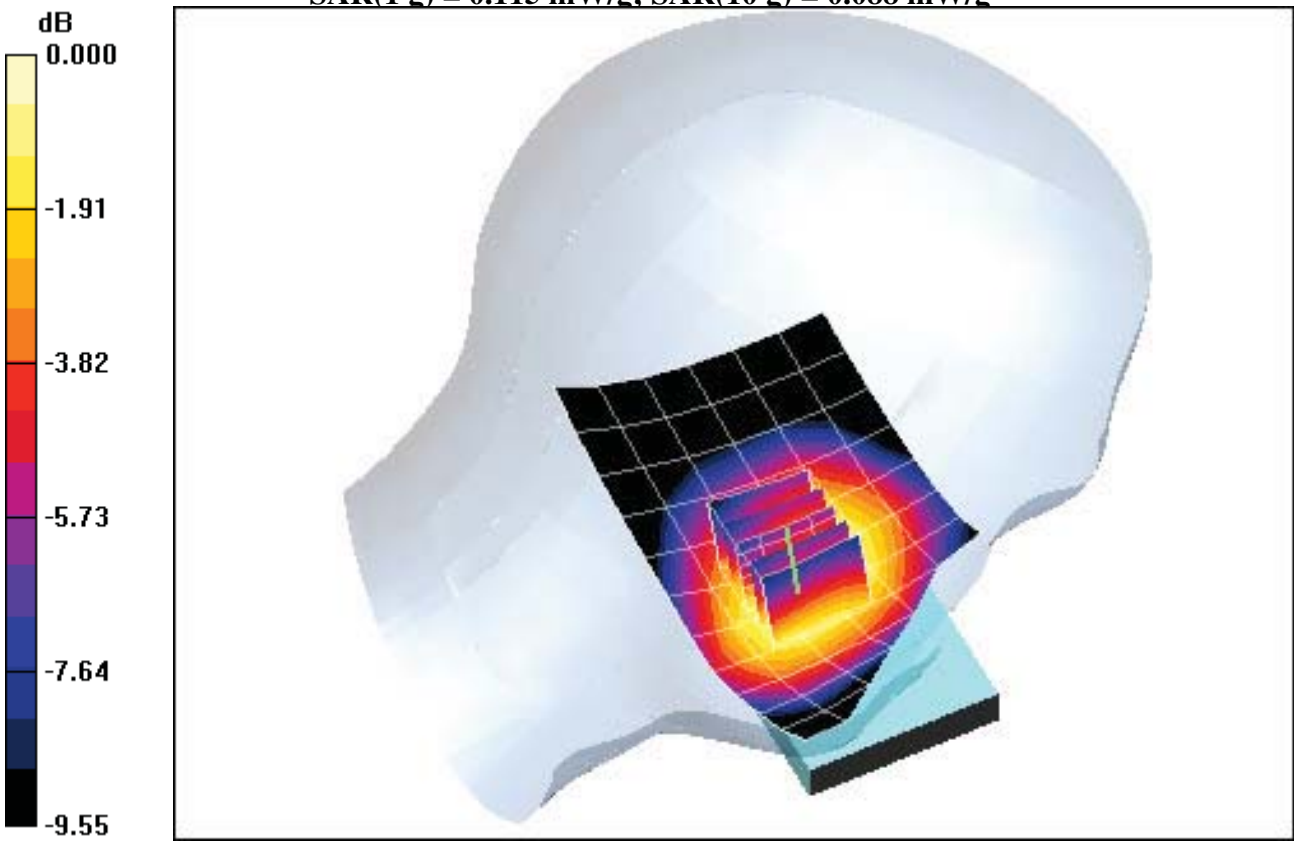
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.911 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev A-FCC Rule Part 90S, 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 = 4.14 V/m
Peak SAR (extrapolated) = 0.145 W/kg
SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.088 mW/g



0 dB = 0.121mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

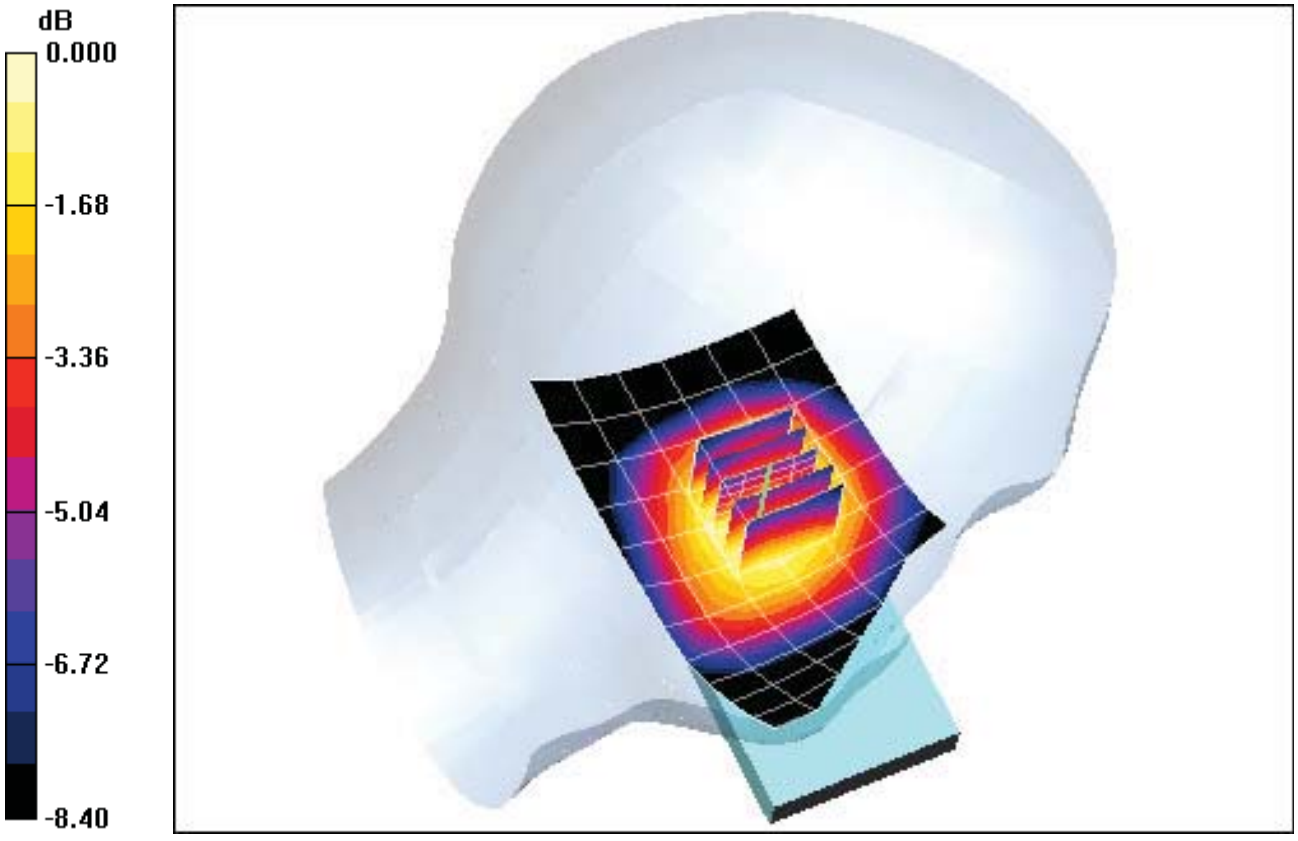
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.911 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev A-FCC Rule Part 90S, 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 = 7.63 V/m
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.074 mW/g



0 dB = 0.101mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

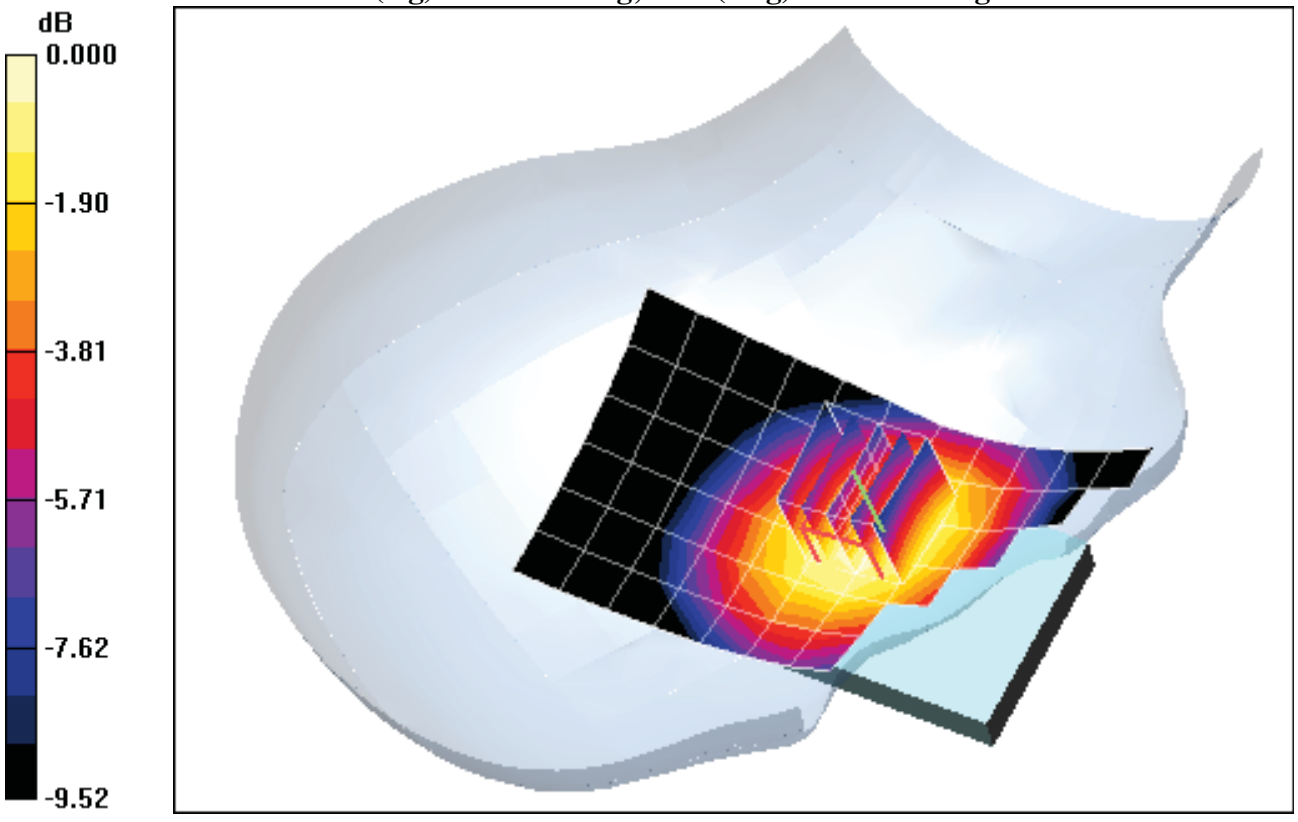
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.865 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 22H, 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 = 19.8 V/m
Peak SAR (extrapolated) = 0.374 W/kg
SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.227 mW/g



0 dB = 0.315mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

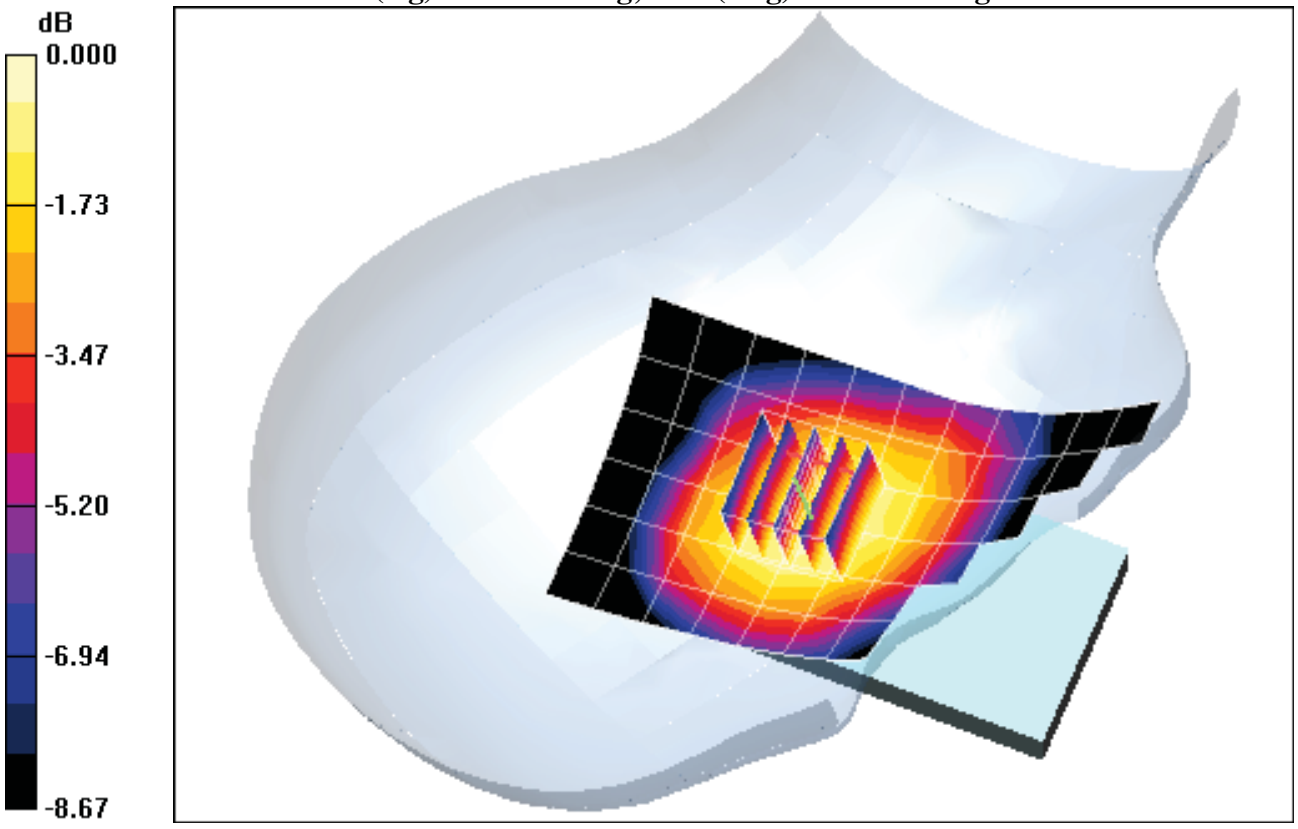
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.865 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 22H, 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 = 17.5 V/m
Peak SAR (extrapolated) = 0.290 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.169 mW/g



0 dB = 0.233mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

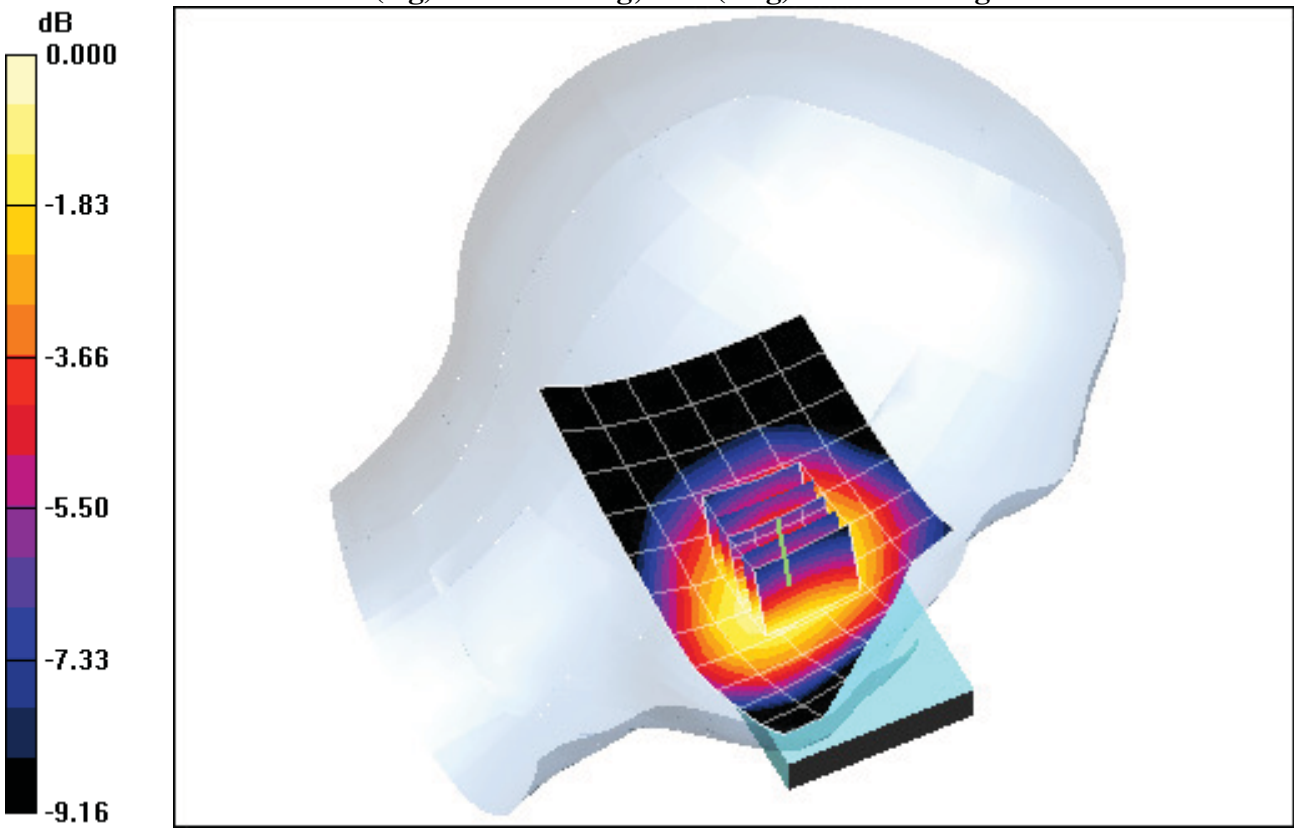
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.865 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial:TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 22H, 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 = 20.3 V/m
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.232 mW/g



0 dB = 0.327mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

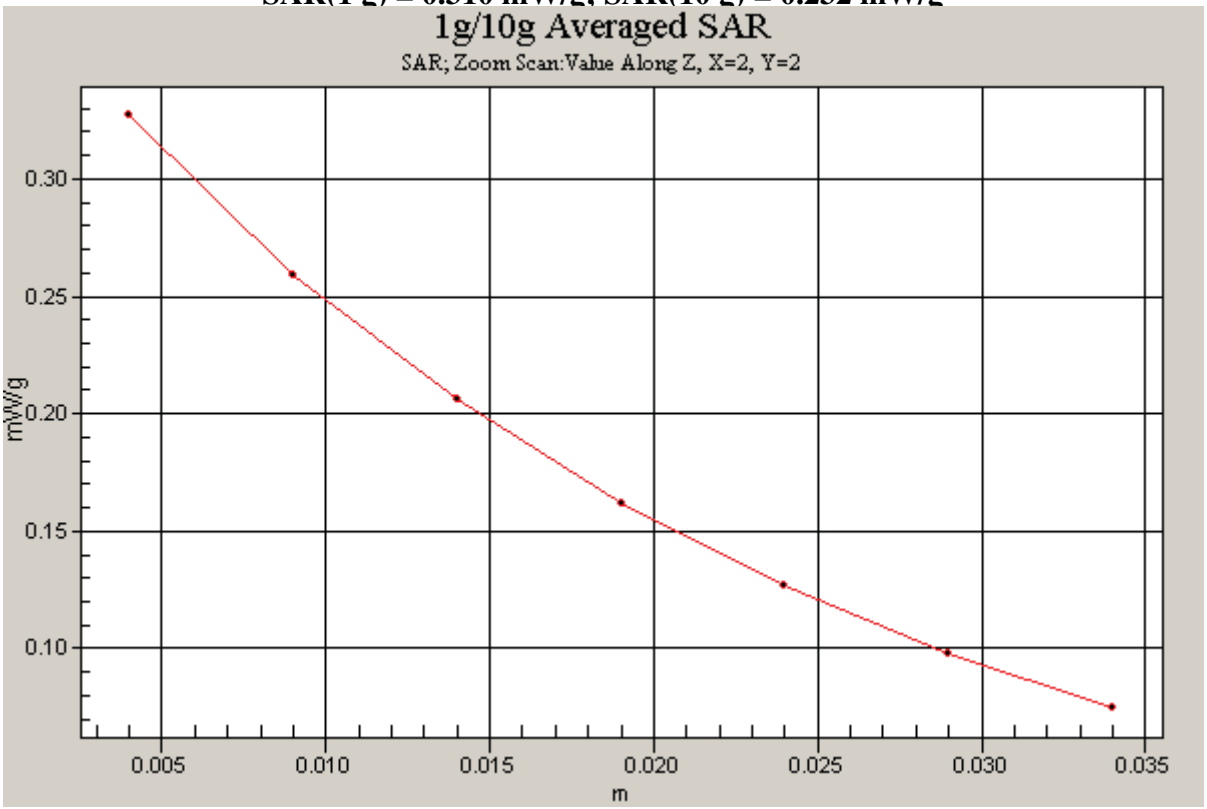
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.865 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 22H, 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 = 20.3 V/m
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.232 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

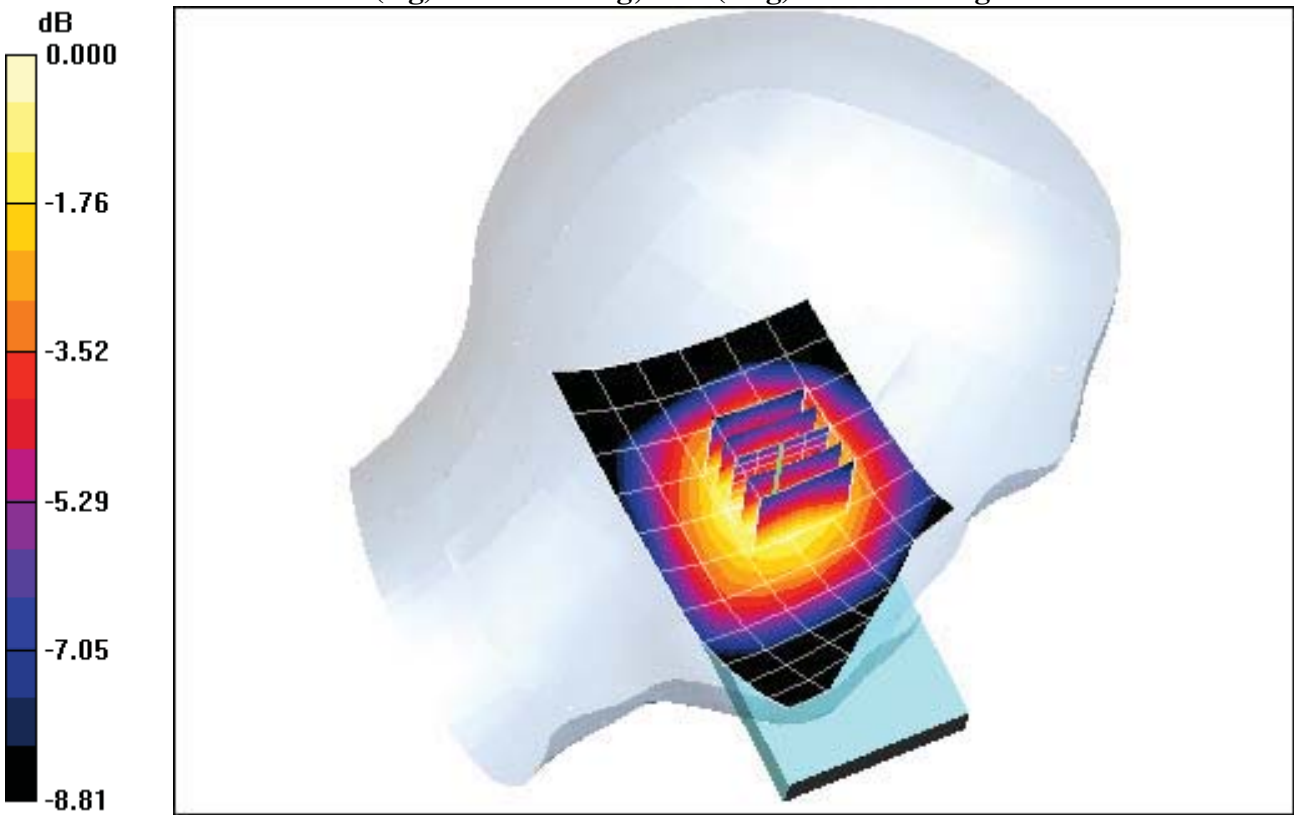
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.865 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA-FCC Rule Part 22H, 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 = 17.7 V/m
Peak SAR (extrapolated) = 0.313 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.184 mW/g



0 dB = 0.260mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

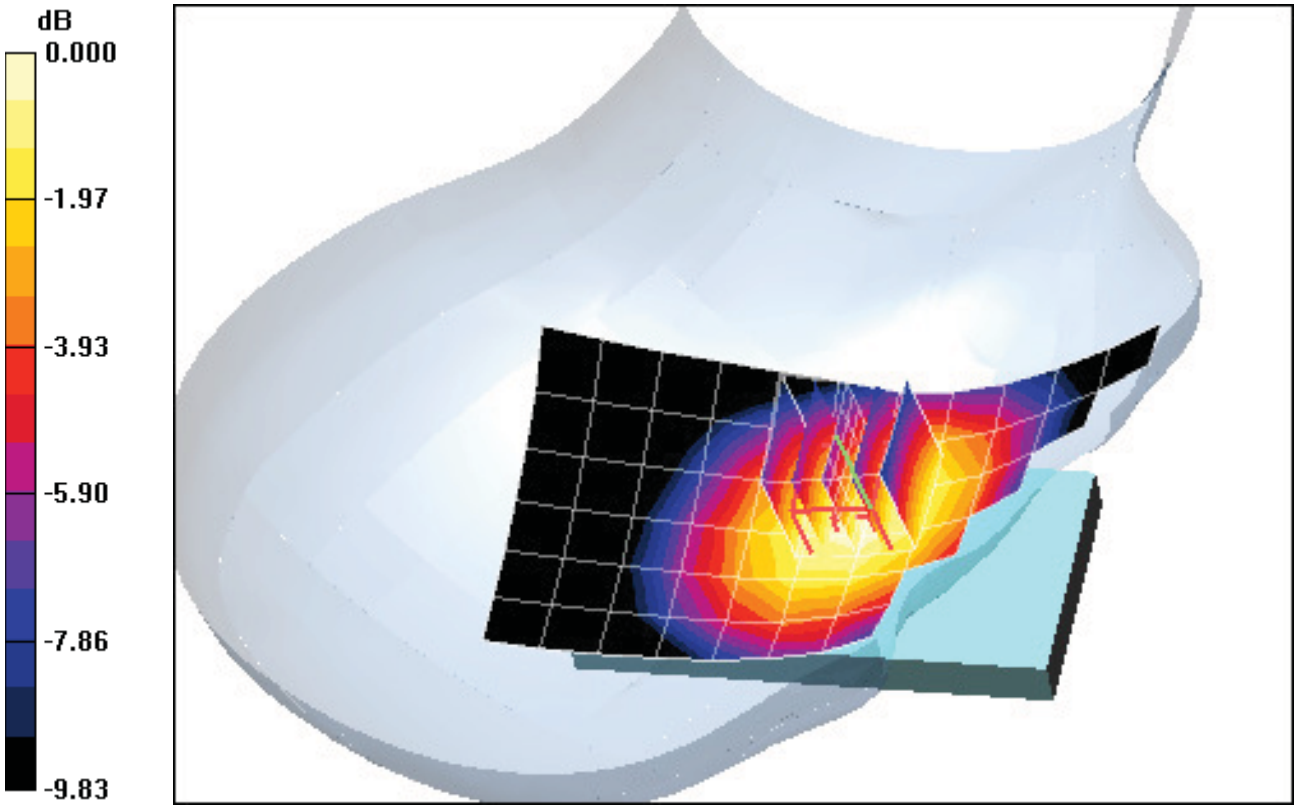
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.929 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev. A-FCC Rule Part 22H, 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 = 3.33 V/m
Peak SAR (extrapolated) = 0.128 W/kg
SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.076 mW/g



0 dB = 0.106mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

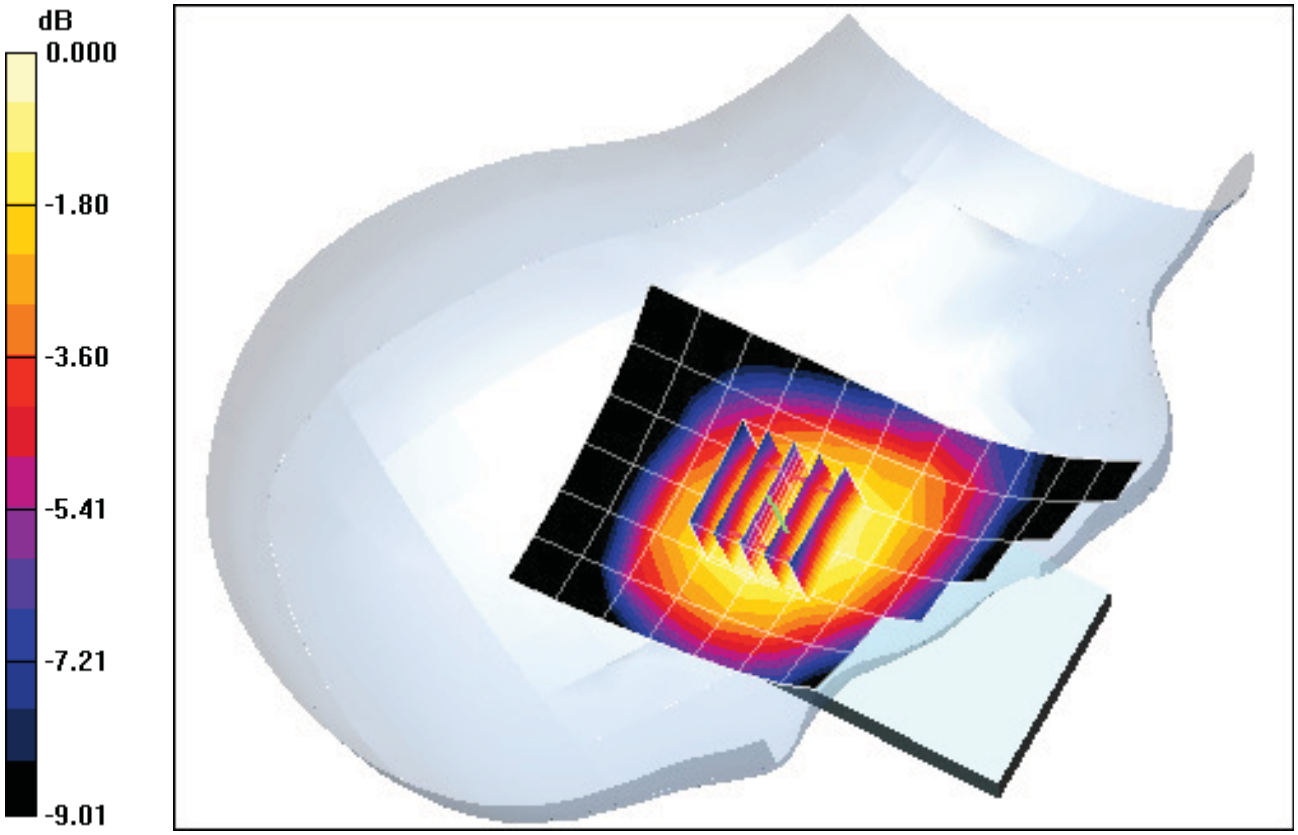
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.929 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev. A-FCC Rule Part 22H, 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 = 6.42 V/m
Peak SAR (extrapolated) = 0.091 W/kg
SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.055 mW/g



0 dB = 0.076mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

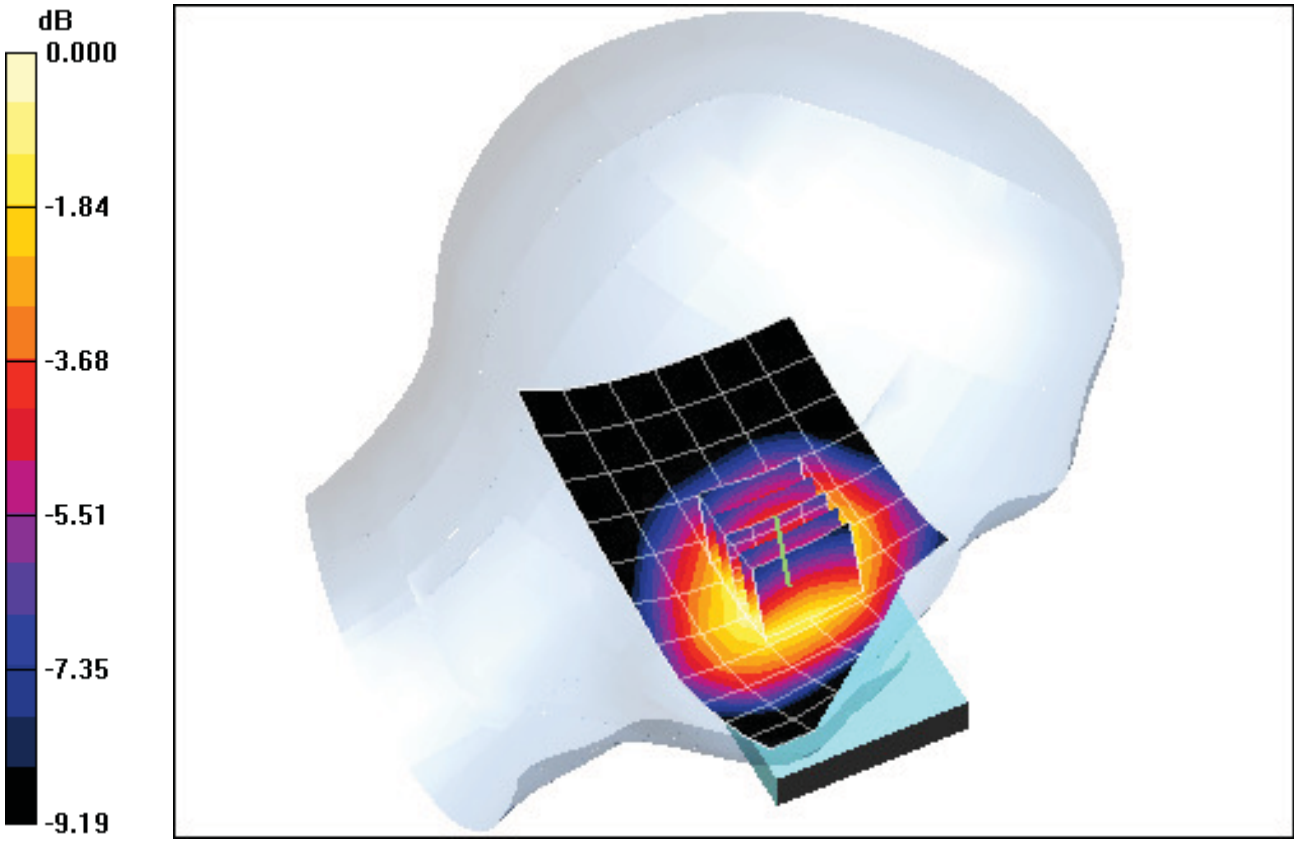
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.929 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev. A-FCC Rule Part 22H, 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 = 3.21 V/m
Peak SAR (extrapolated) = 0.125 W/kg
SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.076 mW/g



0 dB = 0.105mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

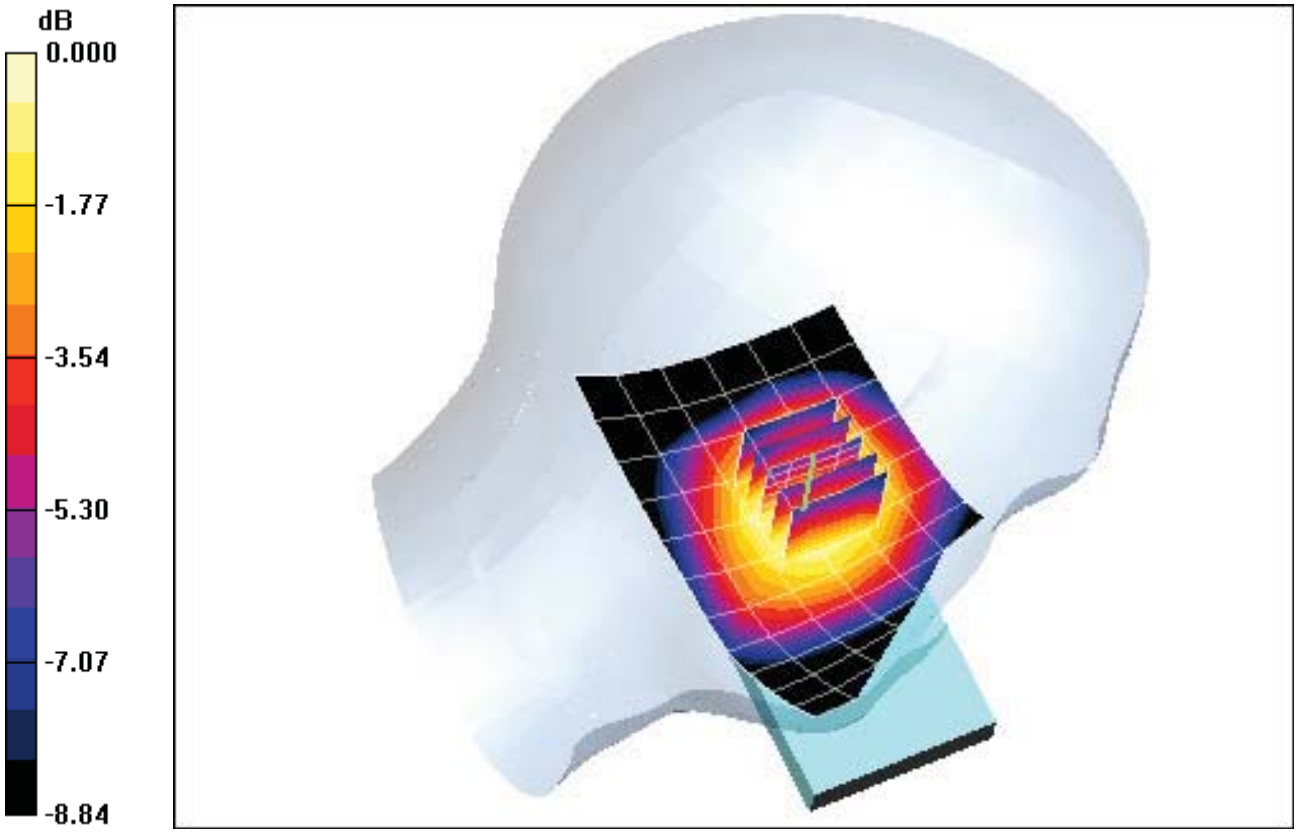
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.929 mho/m; ε_r = 43.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

Mode: Cellular EVDO Rev. A-FCC Rule Part 22H, 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 = 6.28 V/m
Peak SAR (extrapolated) = 0.089 W/kg
SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.054 mW/g



0 dB = 0.074mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

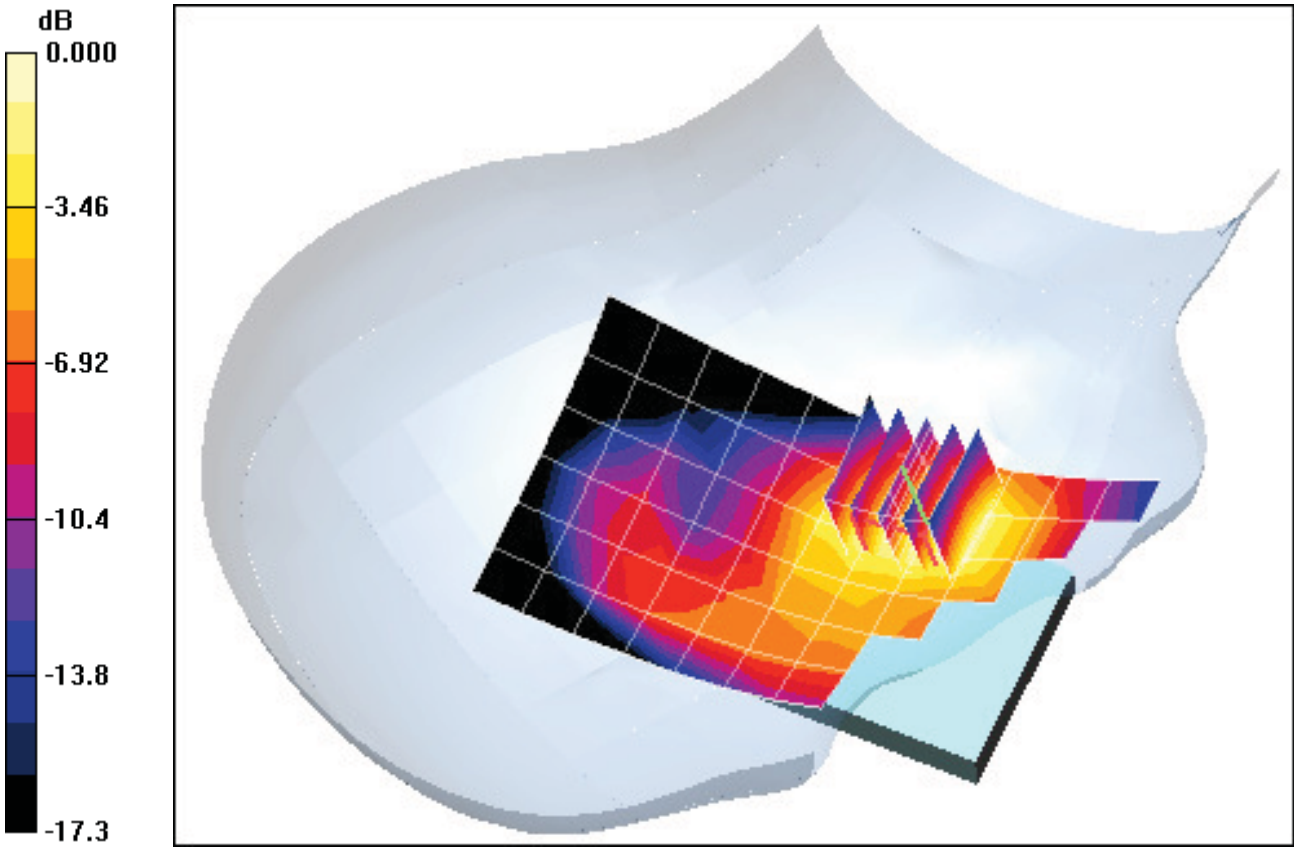
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.1 °C; Tissue Temp: 22.0 °C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS CDMA, 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 = 17.6 V/m
Peak SAR (extrapolated) = 0.634 W/kg
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.244 mW/g



0 dB = 0.440mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

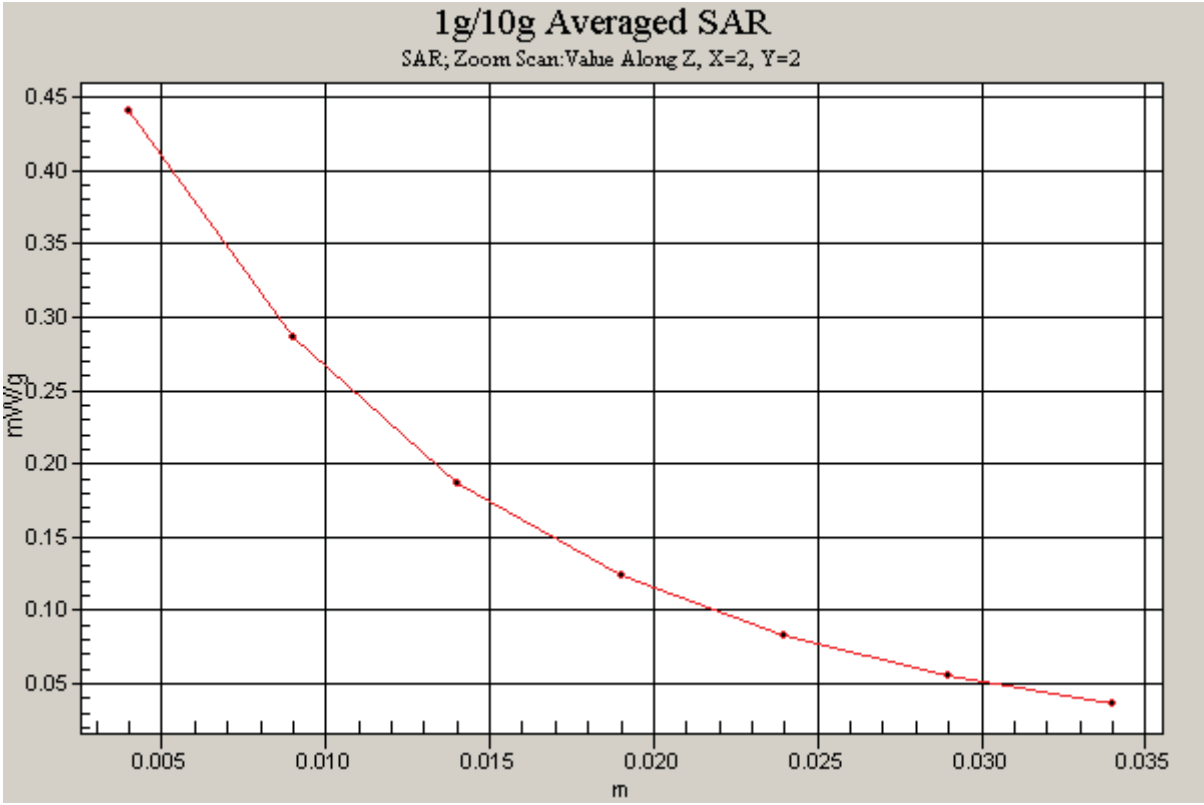
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.1 °C; Tissue Temp: 22.0 °C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS CDMA, 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 = 17.6 V/m
Peak SAR (extrapolated) = 0.634 W/kg
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.244 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

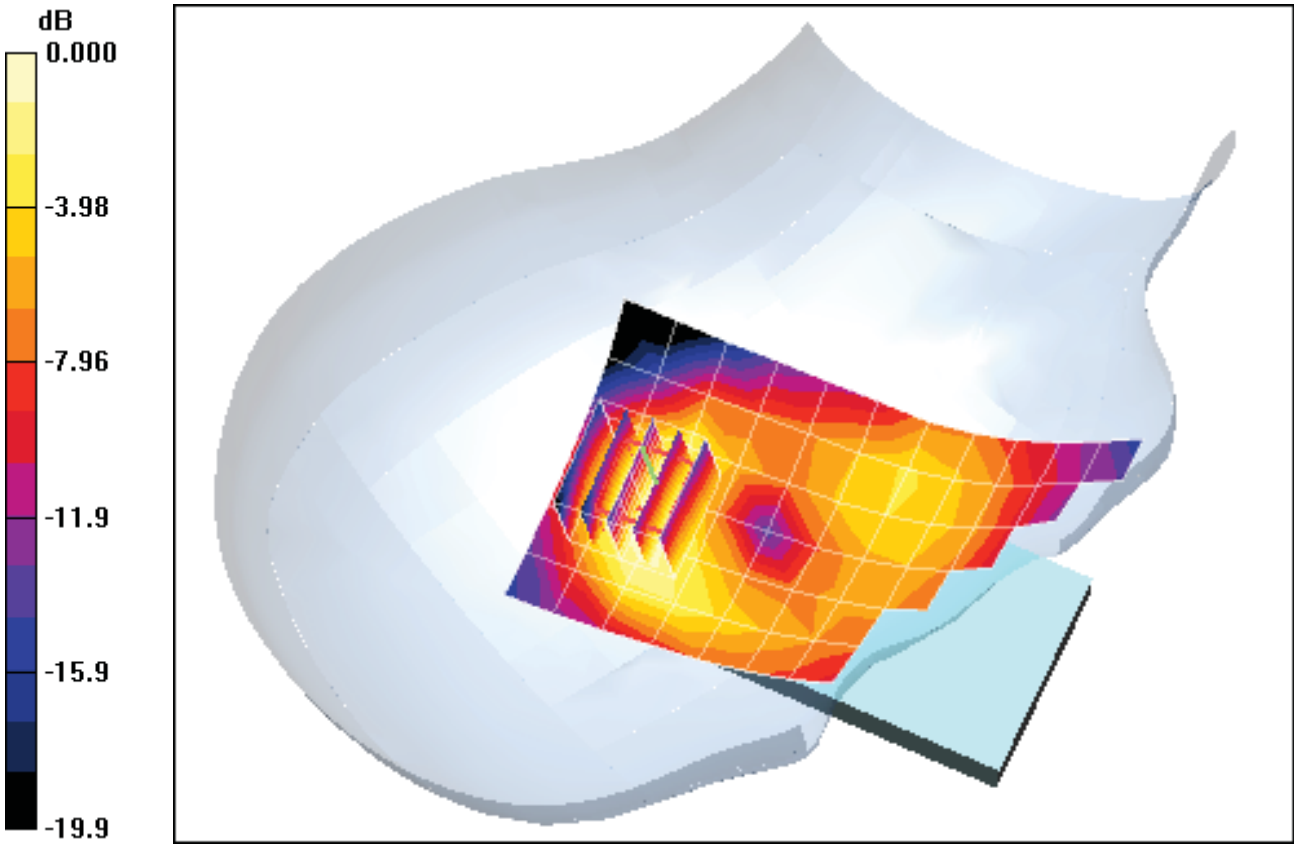
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.1 °C; Tissue Temp: 22.0 °C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS CDMA, 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 = 9.84 V/m
Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.066 mW/g



0 dB = 0.126mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

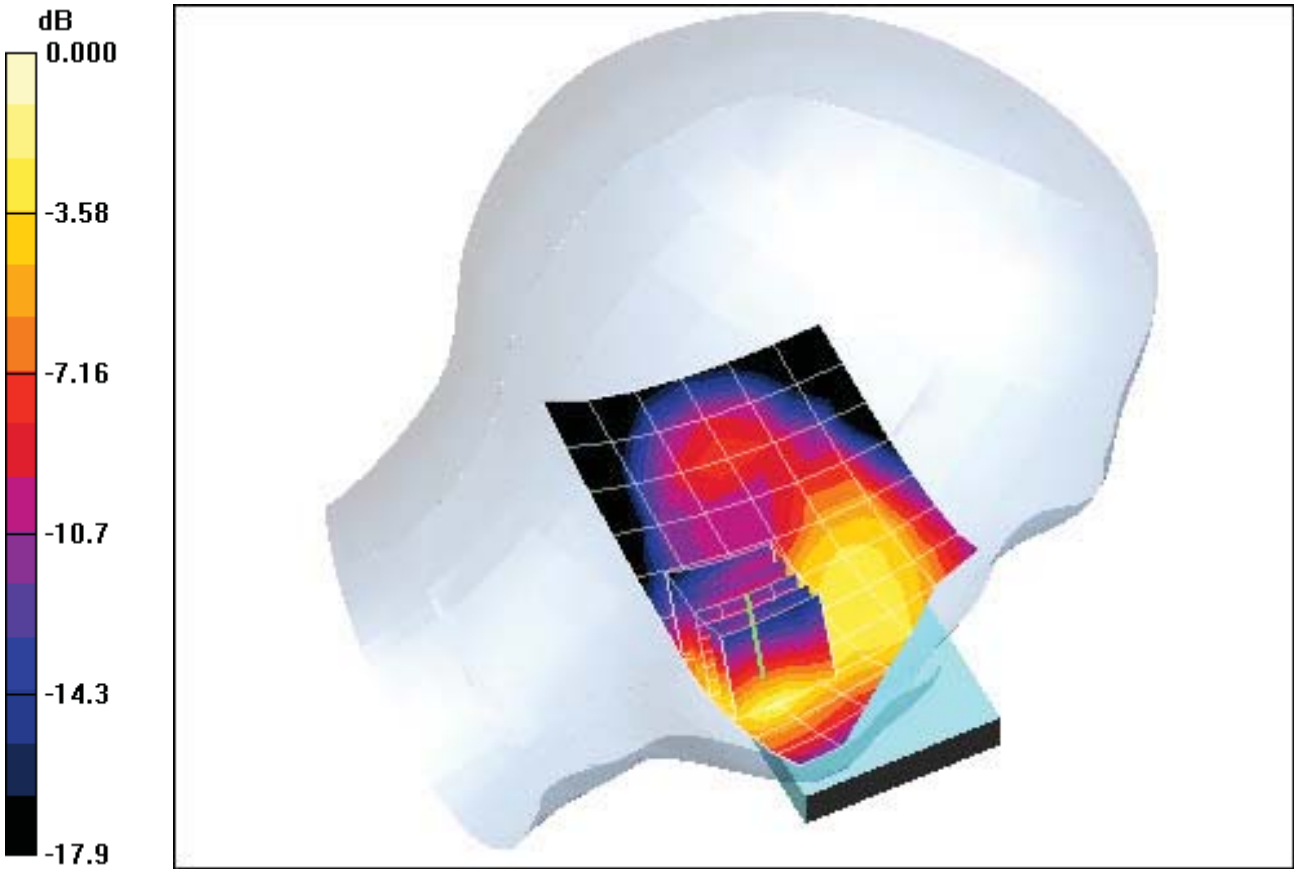
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.1 °C; Tissue Temp: 22.0 °C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS CDMA, 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 = 17.2 V/m
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.342 mW/g; SAR(10 g) = 0.199 mW/g



0 dB = 0.377mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

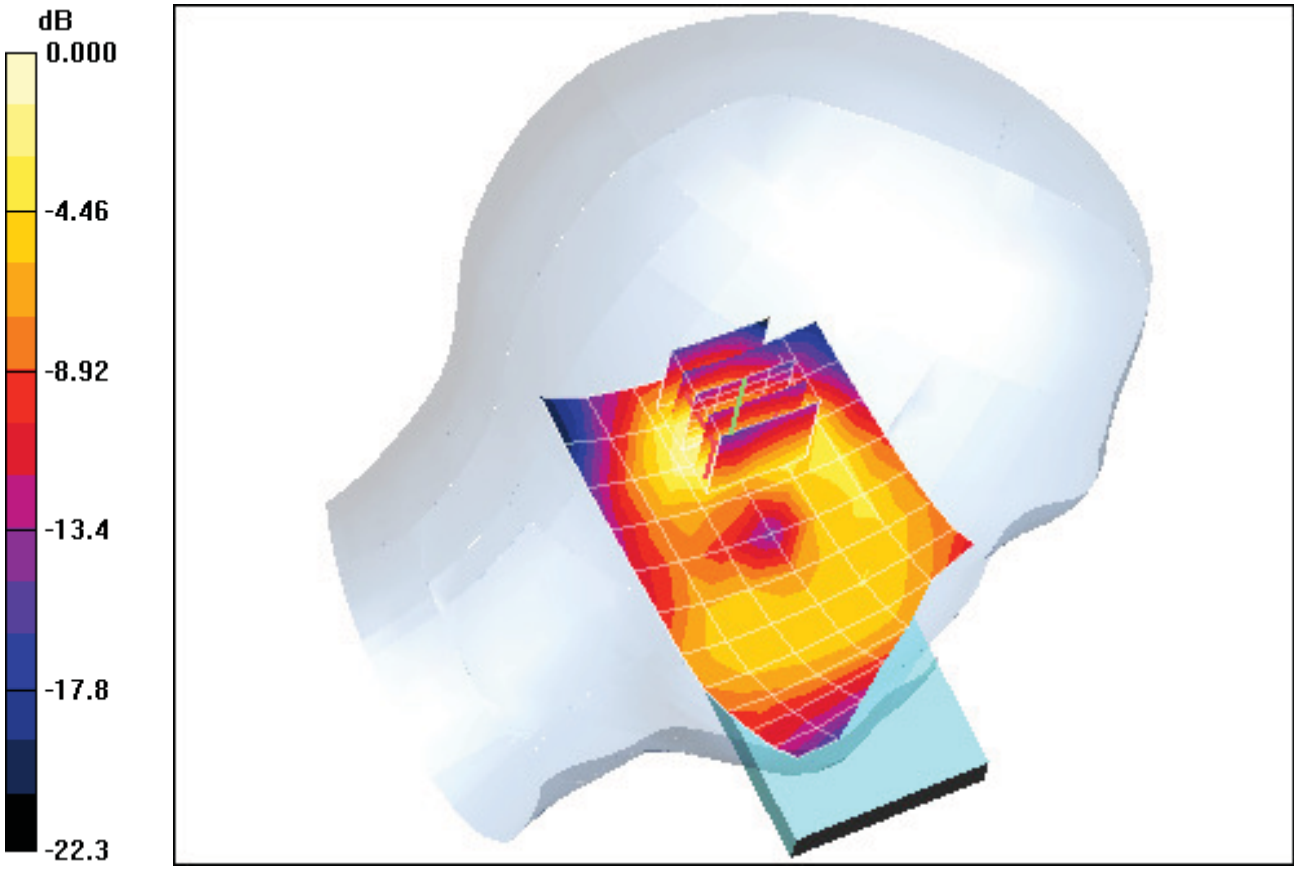
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.1 °C; Tissue Temp: 22.0 °C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS CDMA, 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 = 9.58 V/m
Peak SAR (extrapolated) = 0.216 W/kg
SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.070 mW/g



0 dB = 0.139mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

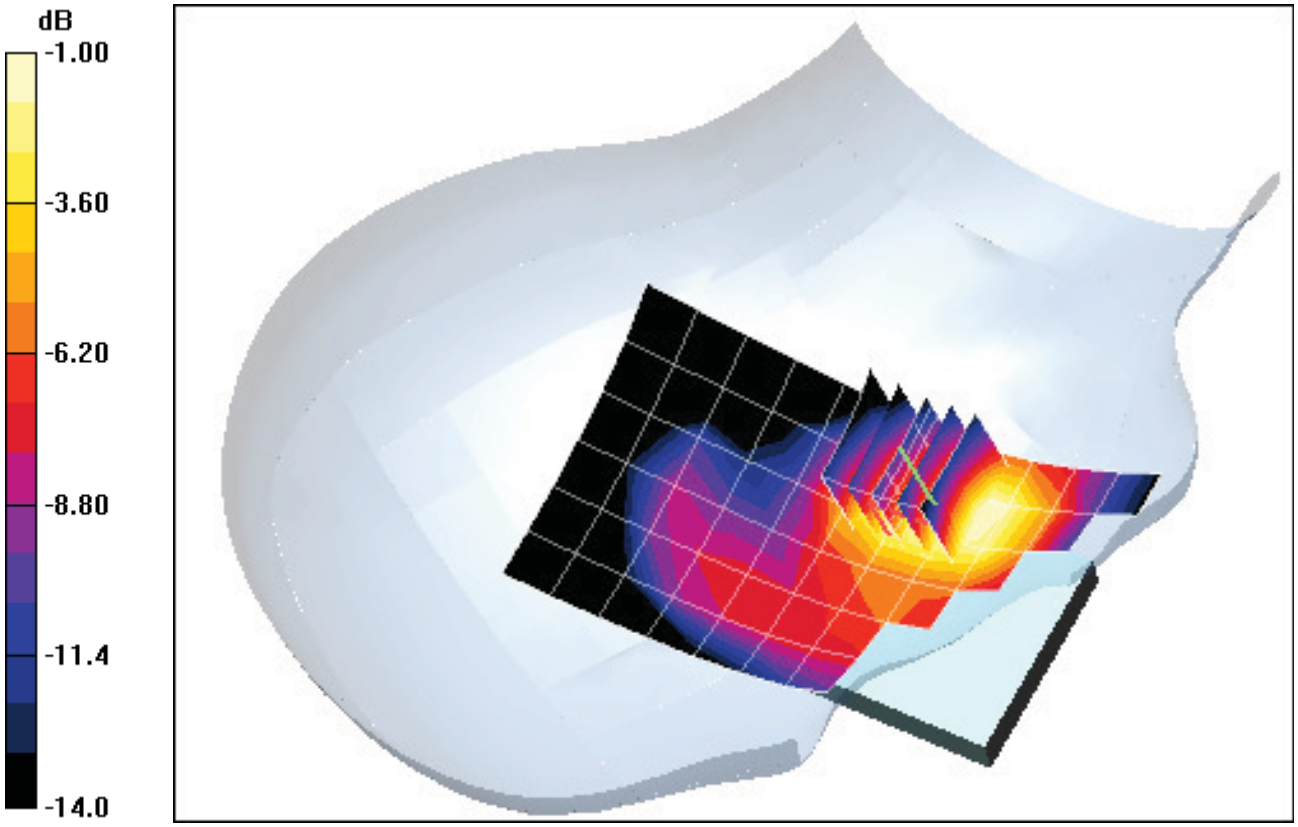
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

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

Mode: PCS CDMA EVDO Rev A, Right Head, Touch, 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 = 11.8 V/m
Peak SAR (extrapolated) = 0.274 W/kg
SAR(1 g) = 0.173 mW/g; SAR(10 g) = 0.106 mW/g



0 dB = 0.188mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

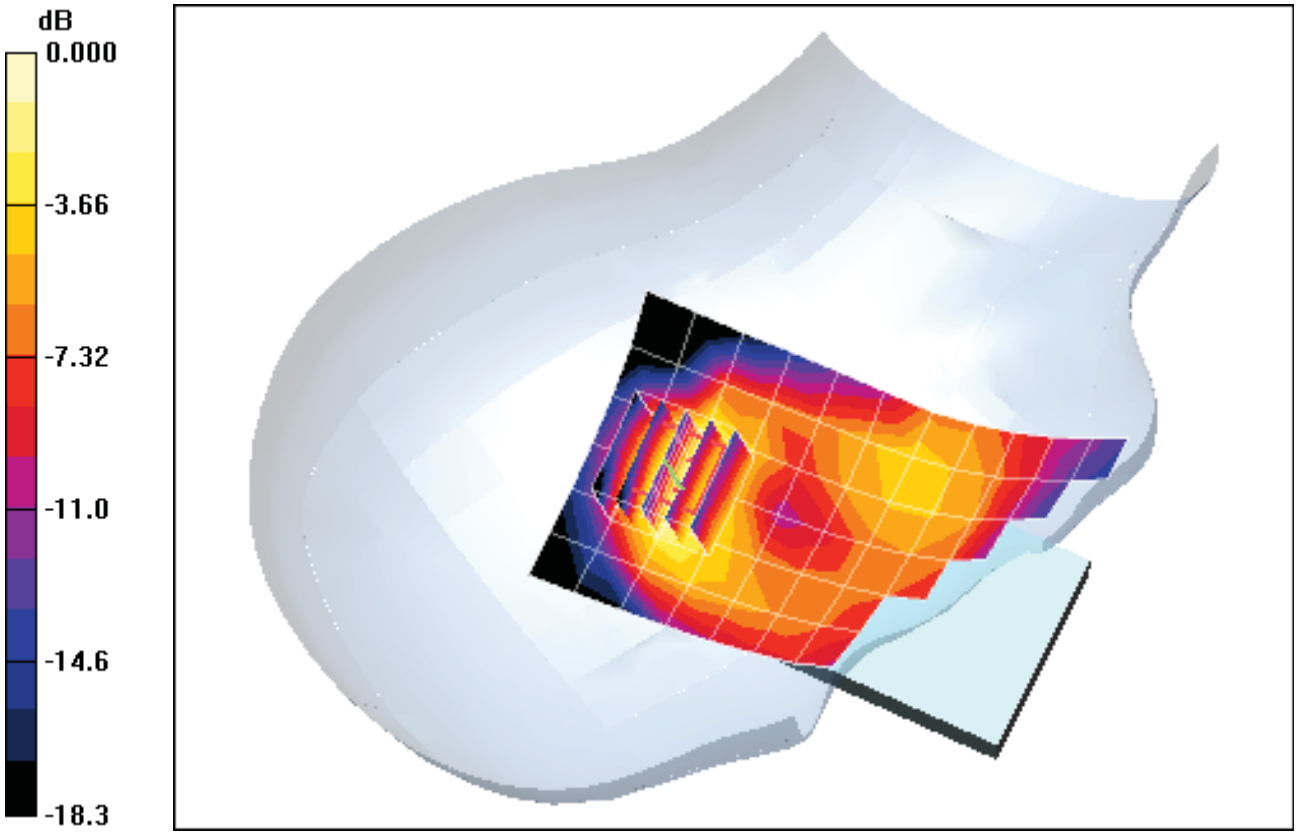
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-13-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

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

Mode: PCS CDMA EVDO Rev A, Right Head, Tilt, 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 = 6.38 V/m
Peak SAR (extrapolated) = 0.075 W/kg
SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.025 mW/g



0 dB = 0.049mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

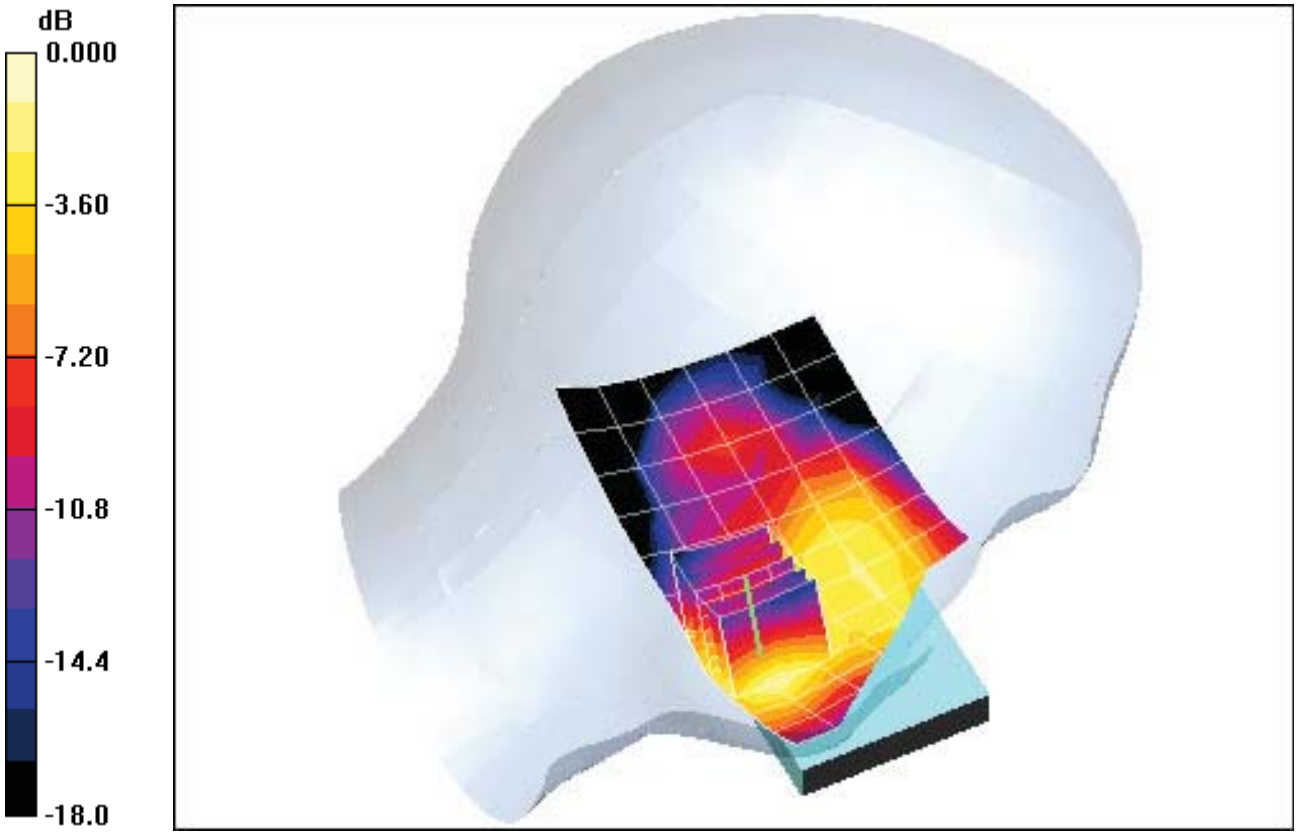
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

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

Mode: PCS CDMA EVDO Rev A, 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 = 9.44 V/m
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.066 mW/g



0 dB = 0.118mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

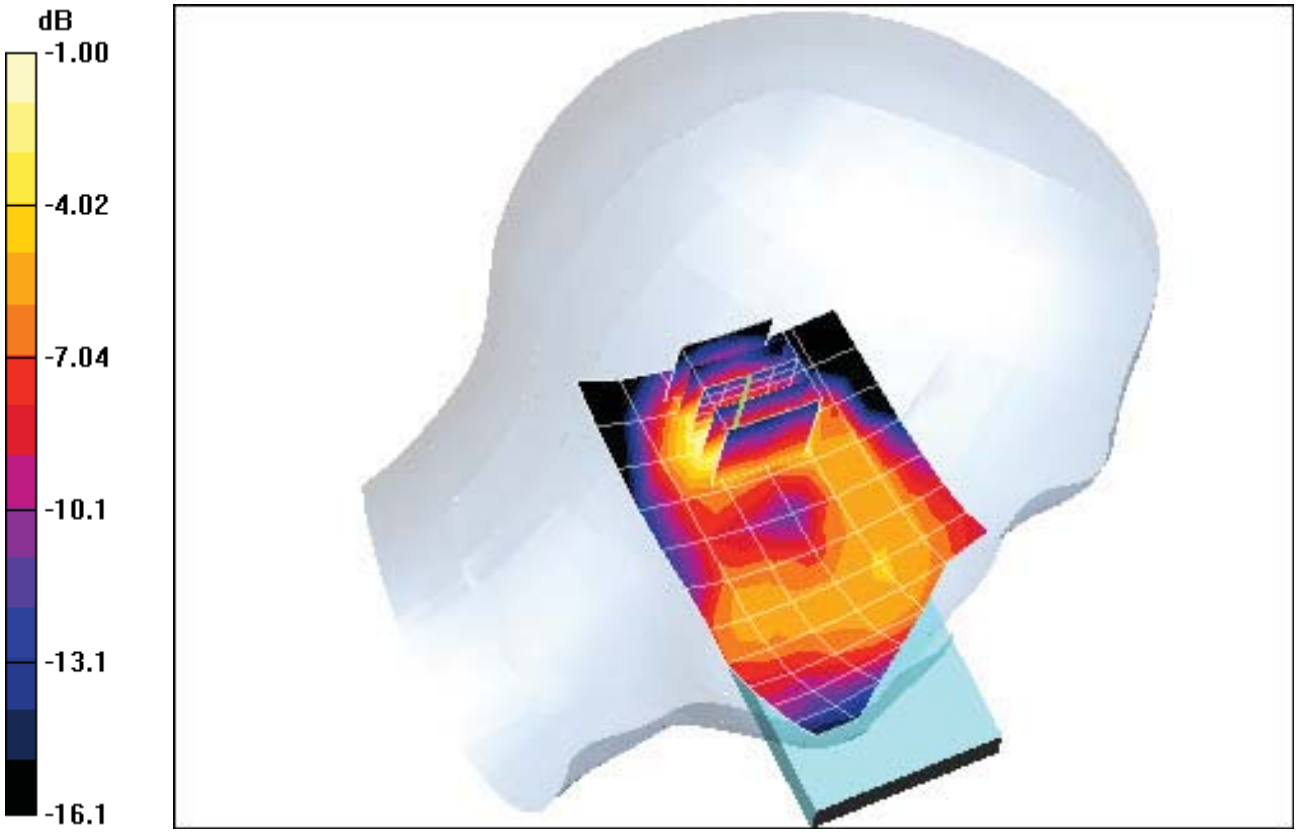
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-13-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

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

Mode: PCS CDMA EVDO Rev A, 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 = 5.71 V/m
Peak SAR (extrapolated) = 0.071 W/kg
SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.022 mW/g



0 dB = 0.046mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

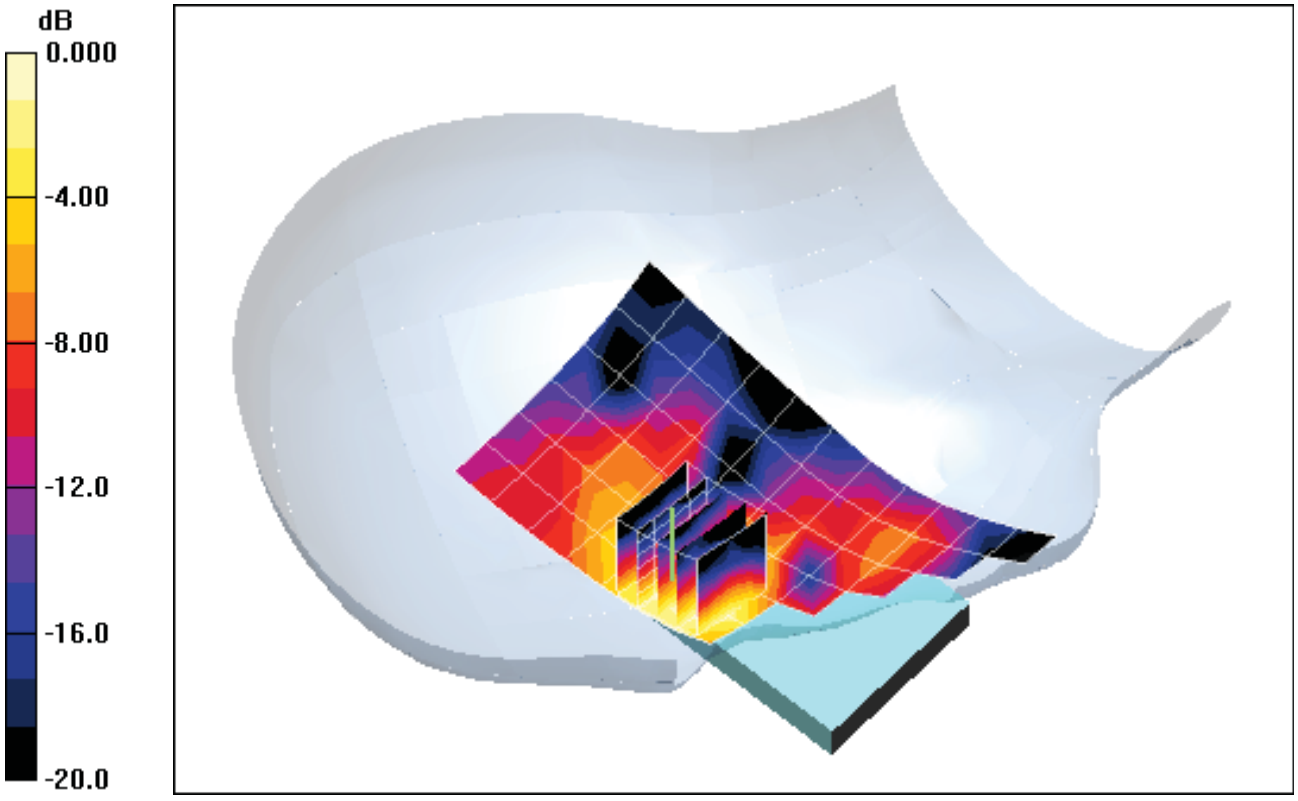
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.8 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-11-2011; Ambient Temp: 24.2 °C; Tissue Temp: 22.5 °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 06, 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 = 4.86 V/m
Peak SAR (extrapolated) = 0.077 W/kg
SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.022 mW/g



0 dB = 0.049mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 94

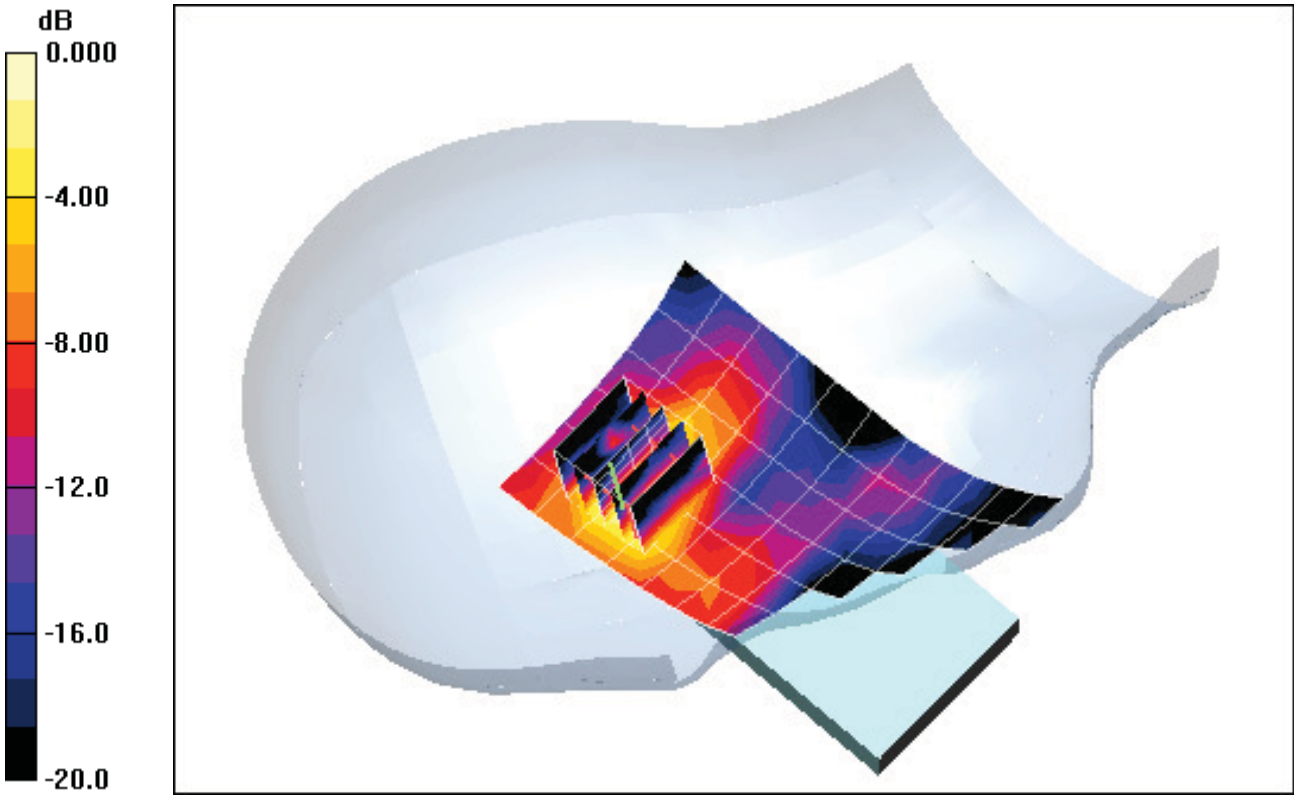
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.8 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-11-2011; Ambient Temp: 24.2 °C; Tissue Temp: 22.5 °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 06, 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 = 4.69 V/m
Peak SAR (extrapolated) = 0.063 W/kg
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.015 mW/g



0 dB = 0.044mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

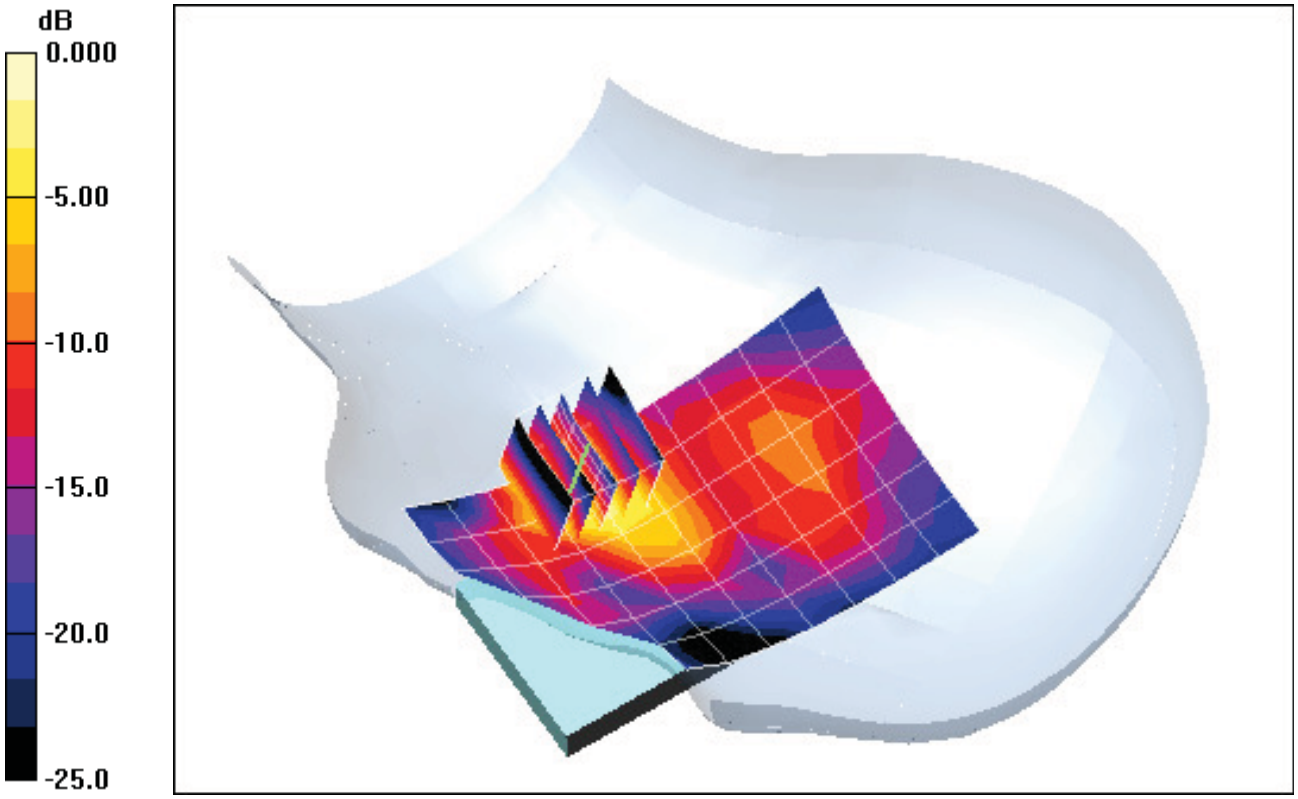
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.8 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-11-2011; Ambient Temp: 24.2 °C; Tissue Temp: 22.5 °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 06, 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 = 2.60 V/m
Peak SAR (extrapolated) = 0.201 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.044 mW/g



0 dB = 0.124mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

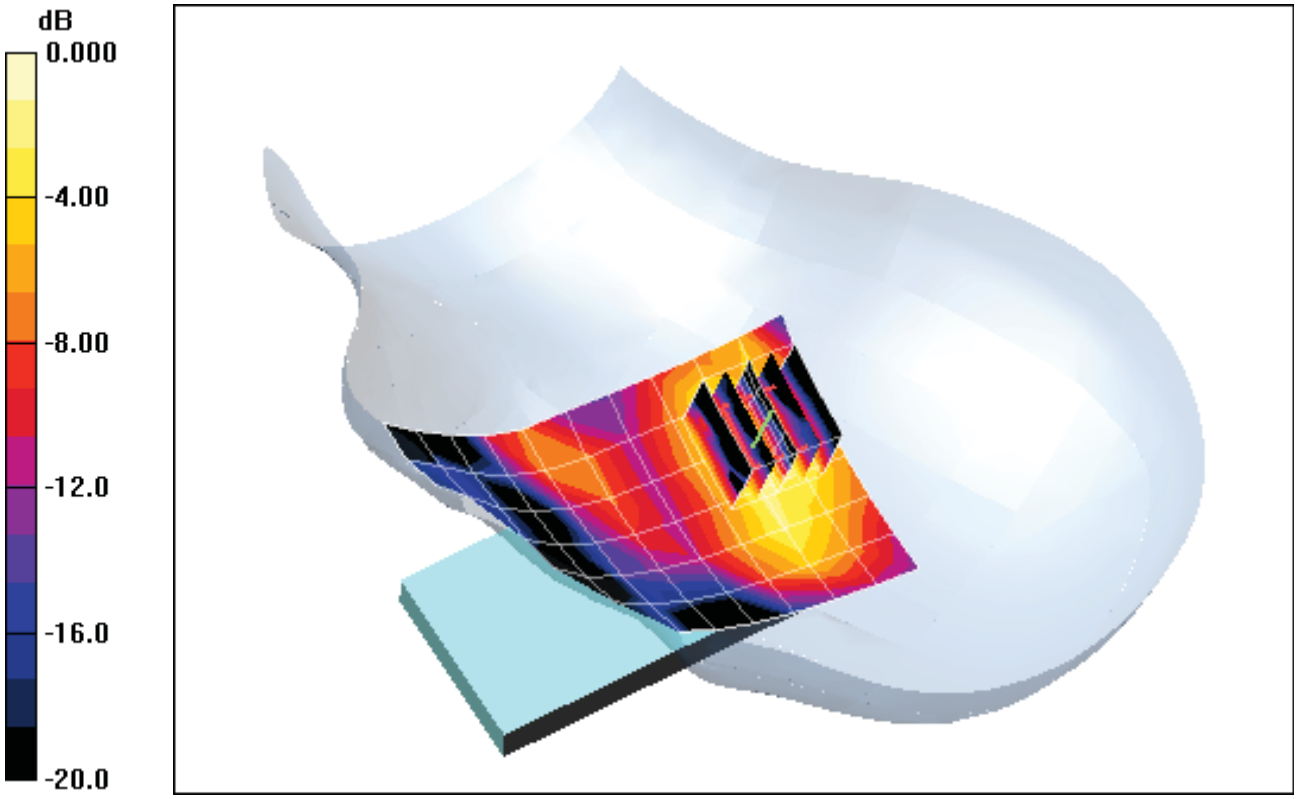
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.8 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-11-2011; Ambient Temp: 24.2 °C; Tissue Temp: 22.5 °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 06, 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 = 3.72 V/m
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.010 mW/g



0 dB = 0.035mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

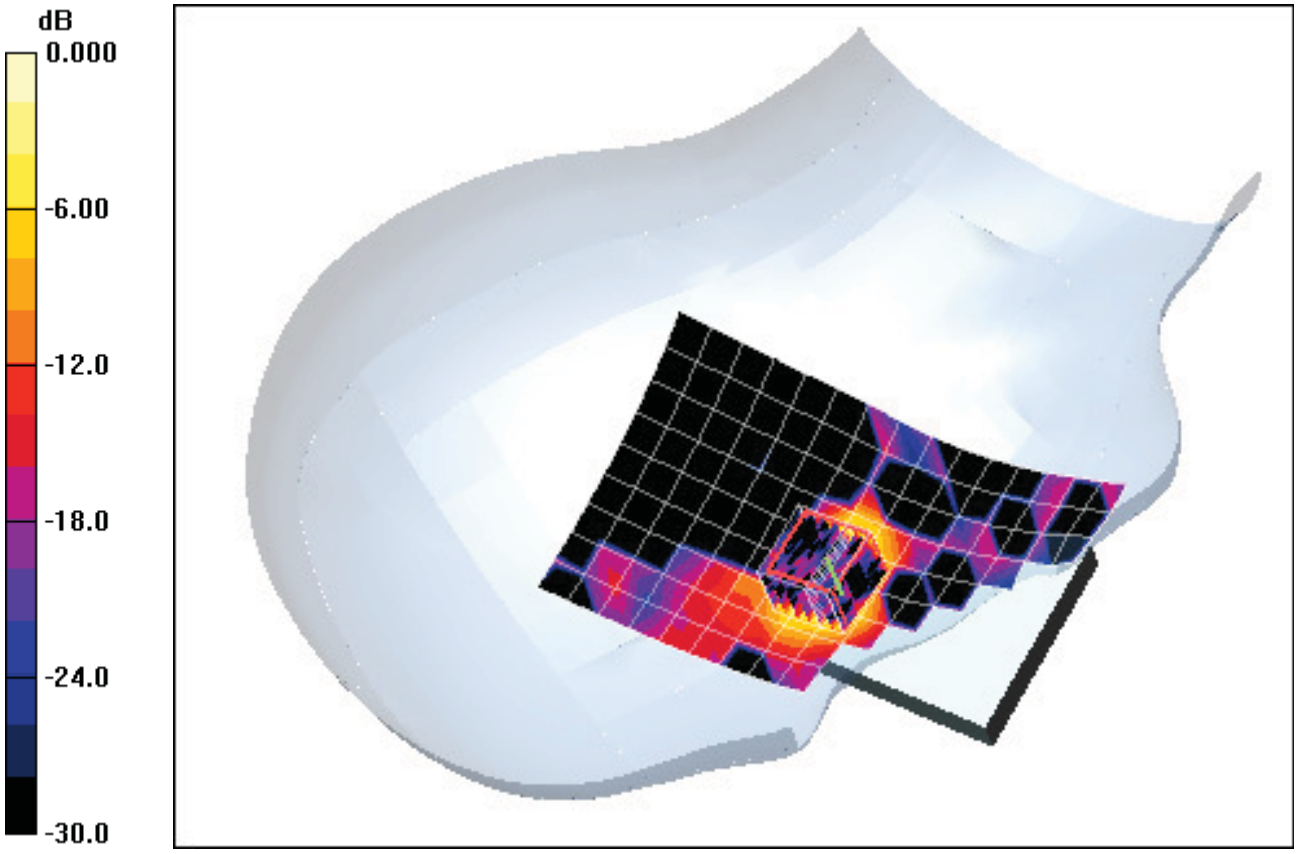
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5180 MHz; σ = 4.52 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(4.06, 4.06, 4.06); Calibrated: 2/14/2011
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, Touch, Ch 36, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.81 V/m
Peak SAR (extrapolated) = 0.355 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.00501 mW/g



0 dB = 0.222mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

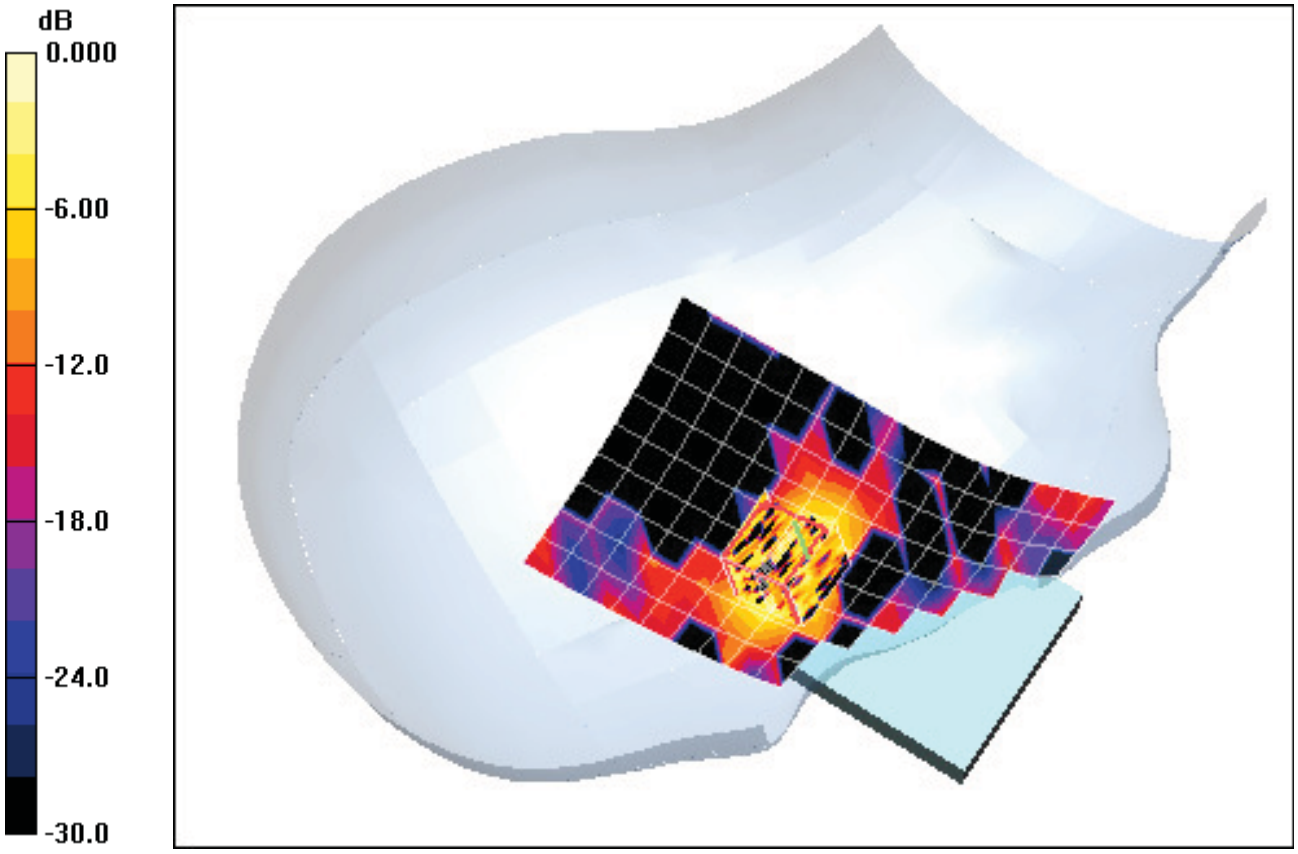
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5180 MHz; σ = 4.52 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(4.06, 4.06, 4.06); Calibrated: 2/14/2011
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 36, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.00 V/m
Peak SAR (extrapolated) = 0.049 W/kg
SAR(1 g) = 0.002 mW/g; SAR(10 g) = 0.000317 mW/g



0 dB = 0.122mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

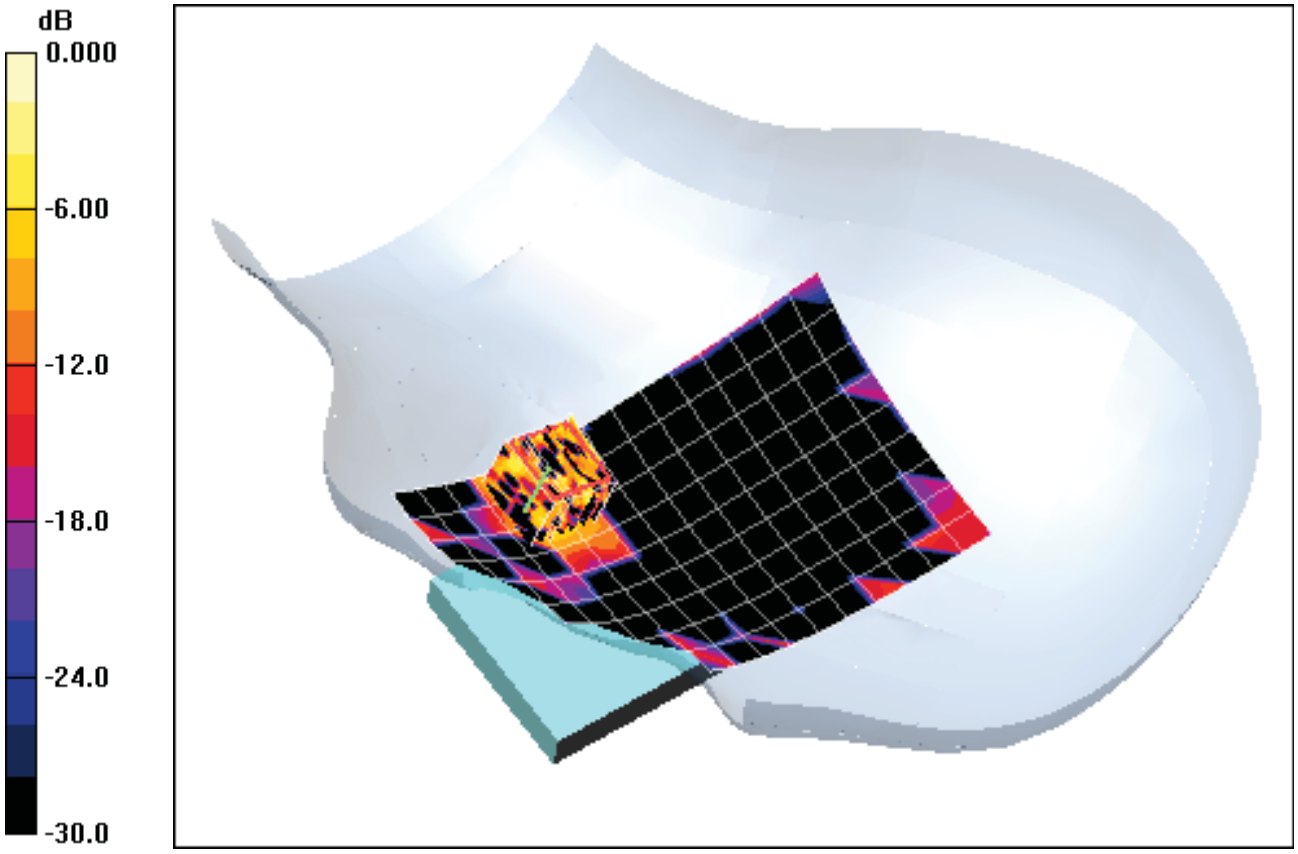
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5180 MHz; σ = 4.52 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(4.06, 4.06, 4.06); Calibrated: 2/14/2011
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 36, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.44 V/m
Peak SAR (extrapolated) = 0.036 W/kg
SAR(1 g) = 0.00106 mW/g; SAR(10 g) = 9.99e-005 mW/g



0 dB = 0.090mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

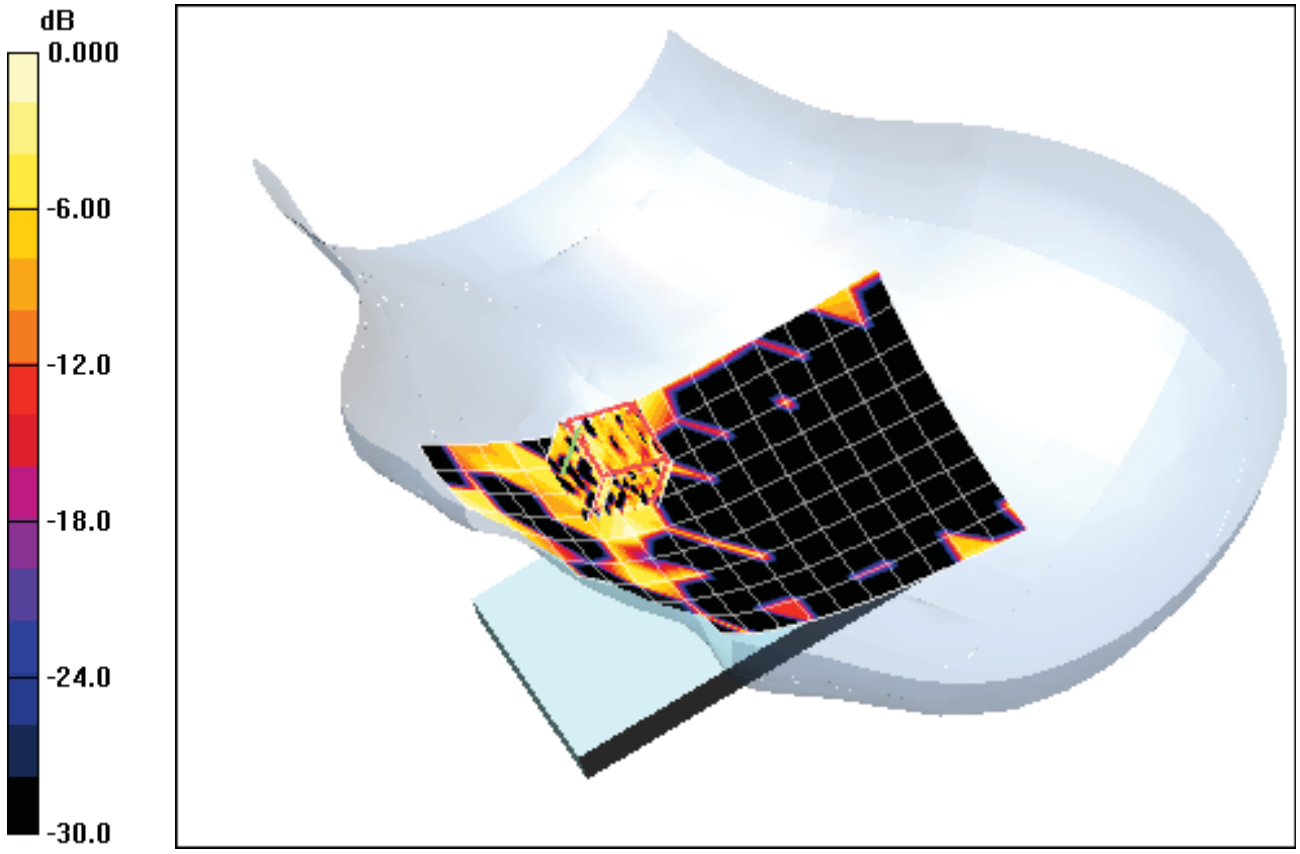
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5180 MHz; σ = 4.52 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(4.06, 4.06, 4.06); Calibrated: 2/14/2011
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 36, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.518 V/m
Peak SAR (extrapolated) = 0.013 W/kg
SAR(1 g) = 0.00105 mW/g; SAR(10 g) = 0.000348 mW/g



0 dB = 0.006mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

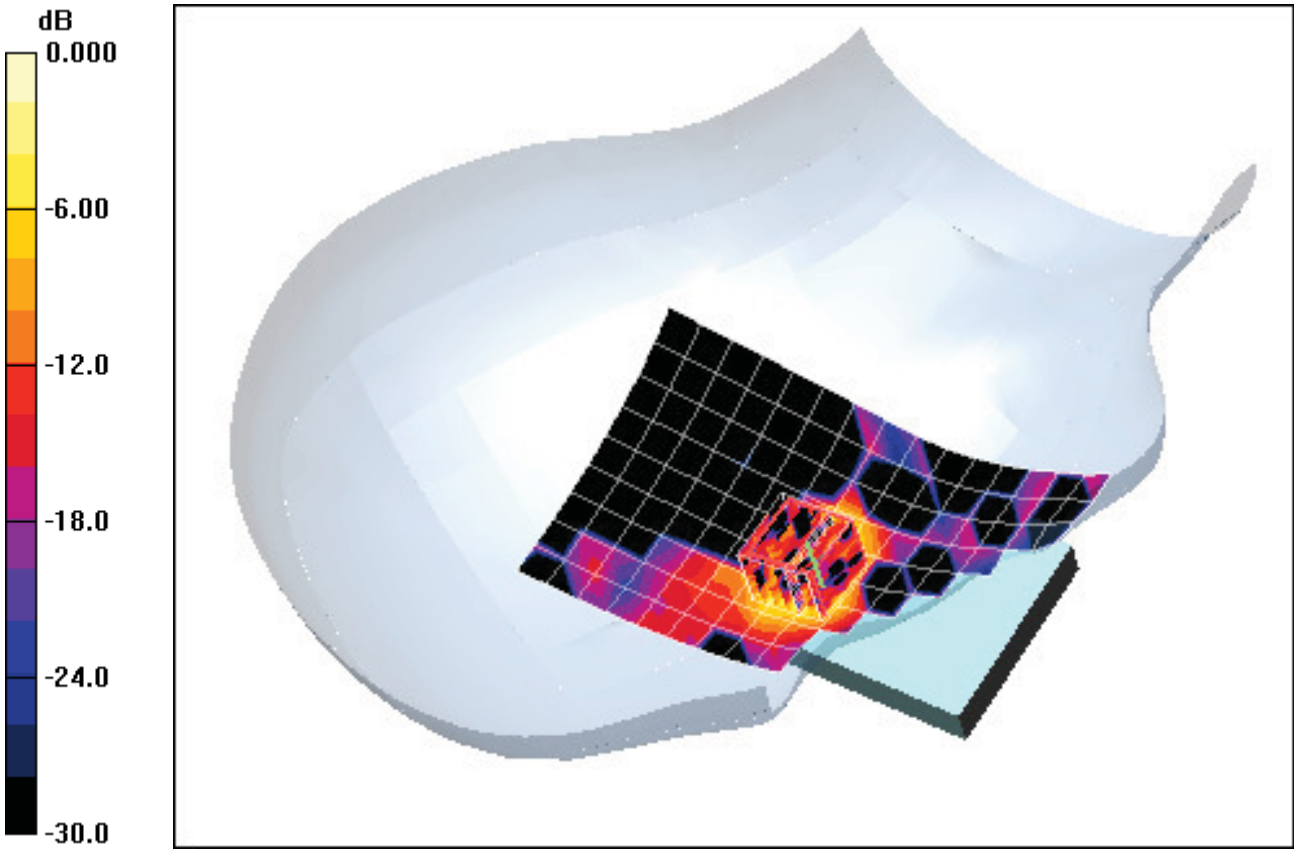
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5260 MHz; σ = 4.62 mho/m; ε_r = 34.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(3.92, 3.92, 3.92); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.3 GHz, Right Head, Touch, Ch 52, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.18 V/m
Peak SAR (extrapolated) = 0.272 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.00485 mW/g



0 dB = 0.222mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

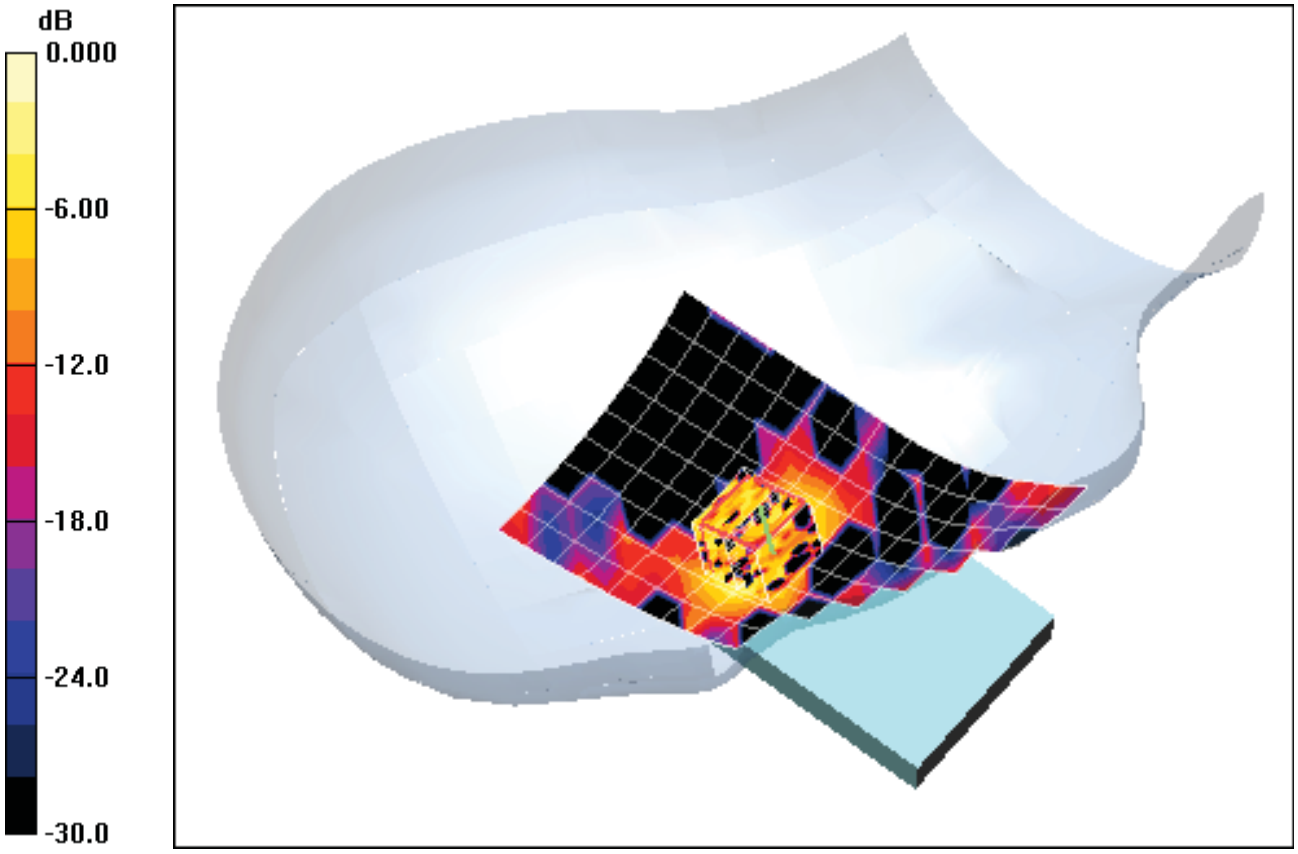
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5260 MHz; σ = 4.62 mho/m; ε_r = 34.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(3.92, 3.92, 3.92); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.3 GHz, Right Head, Tilt, Ch 52, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.16 V/m
Peak SAR (extrapolated) = 0.113 W/kg
SAR(1 g) = 0.00569 mW/g; SAR(10 g) = 0.00114 mW/g



0 dB = 0.122mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

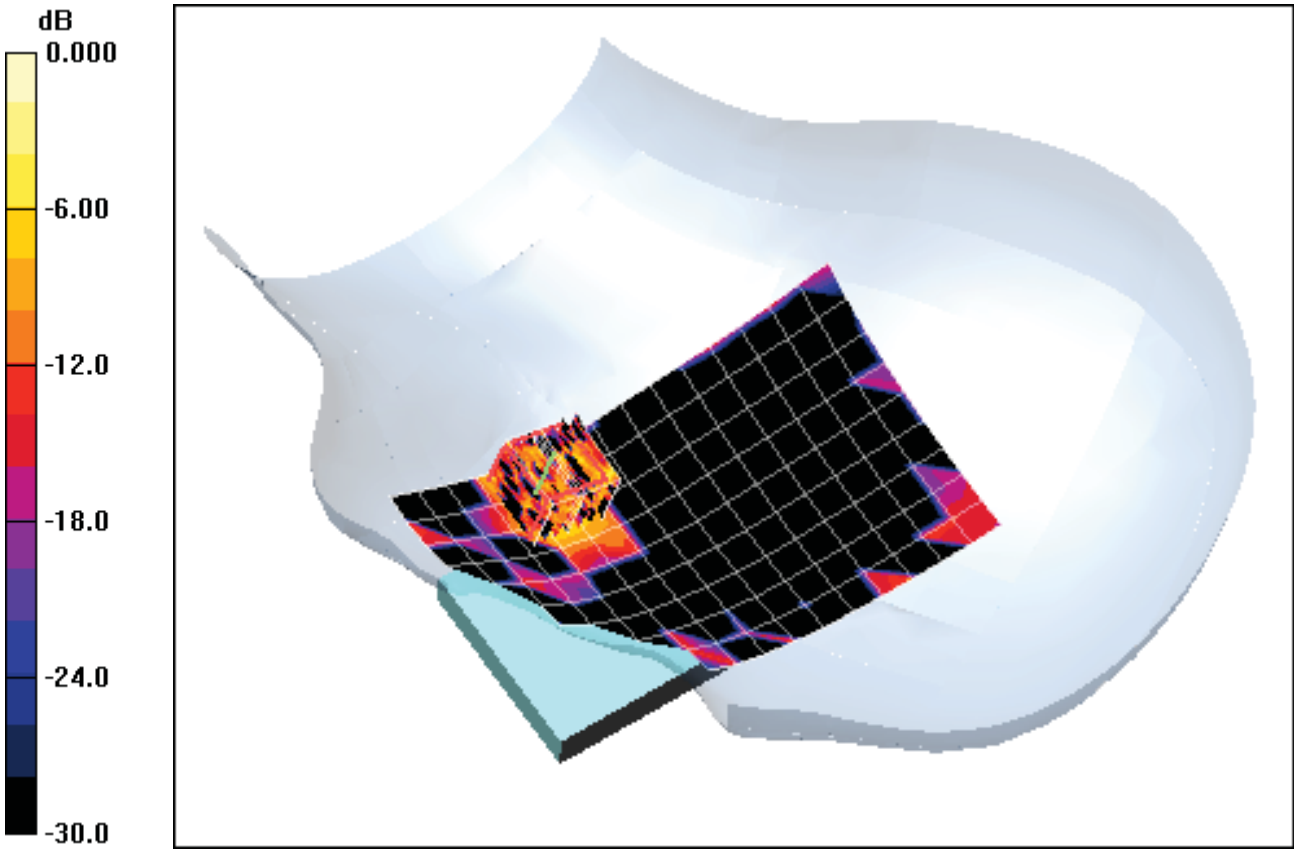
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5260 MHz; σ = 4.62 mho/m; ε_r = 34.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(3.92, 3.92, 3.92); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.3 GHz Left Head, Touch, Ch 52, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.57 V/m
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.00671 mW/g; SAR(10 g) = 0.00123 mW/g



0 dB = 0.090mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

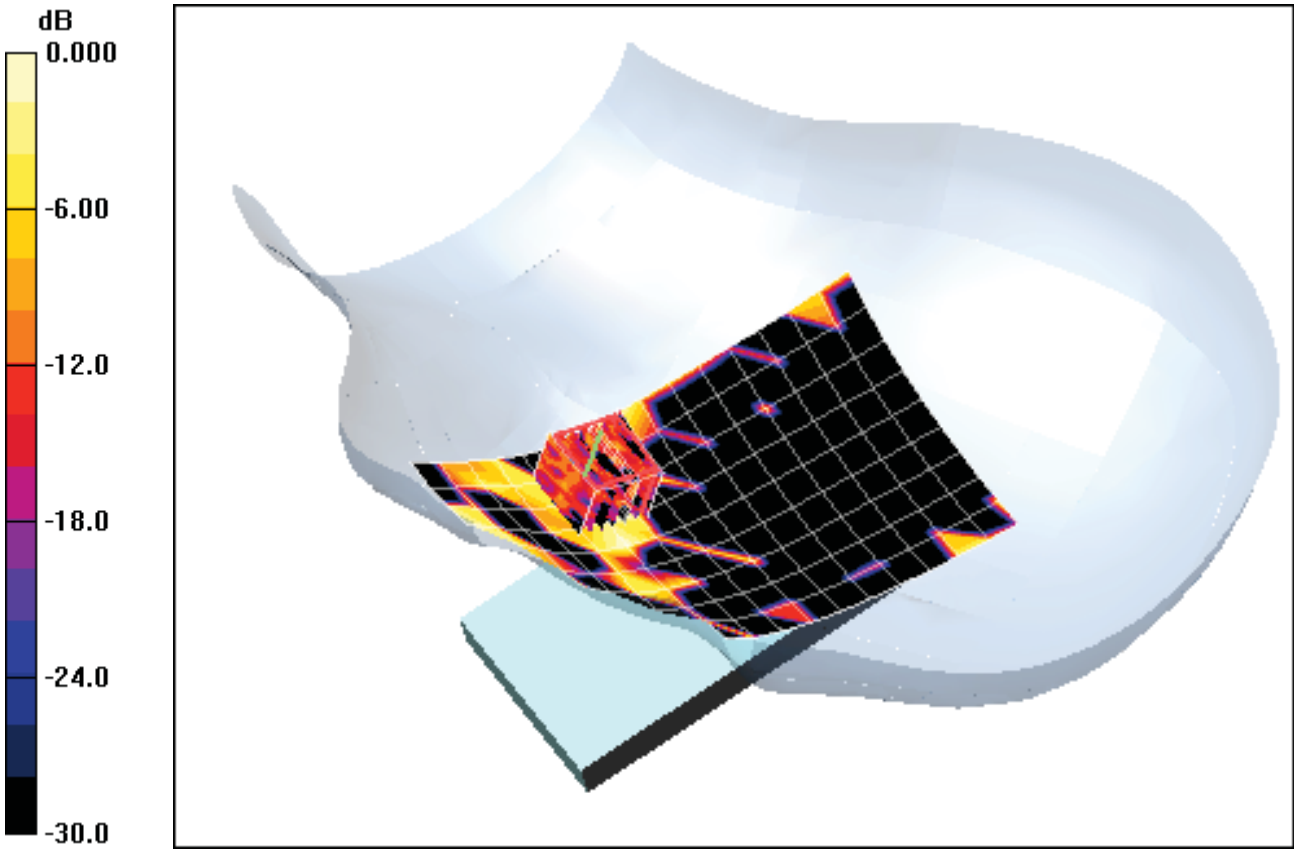
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5260 MHz; σ = 4.62 mho/m; ε_r = 34.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(3.92, 3.92, 3.92); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.3 GHz Left Head, Tilt, Ch 52, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.030 V/m
Peak SAR (extrapolated) = 0.062 W/kg
SAR(1 g) = 0.000682 mW/g; SAR(10 g) = 8.06e-005 mW/g



0 dB = 0.006mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

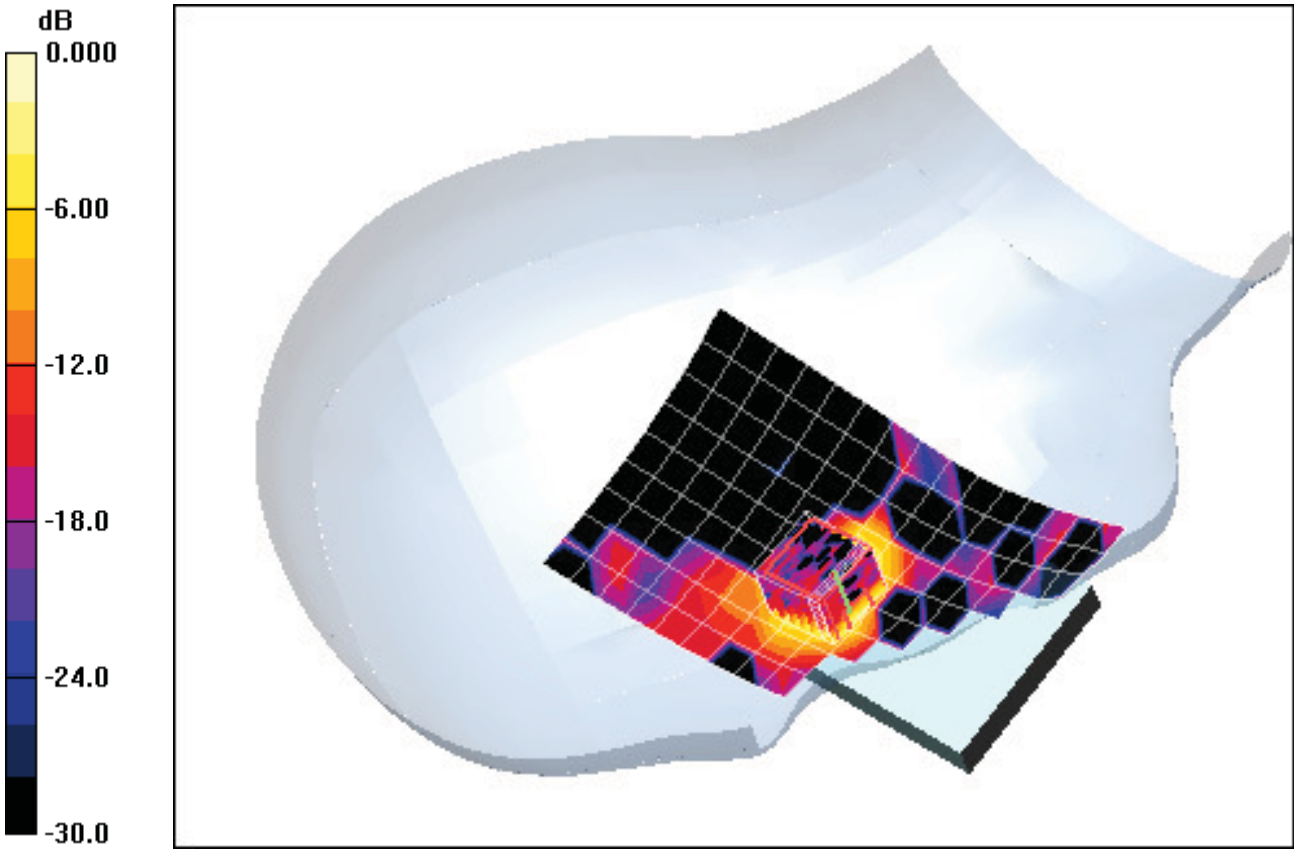
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5700 MHz; σ = 5.12 mho/m; ε_r = 33.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3550; ConvF(3.5, 3.5, 3.5); Calibrated: 2/14/2011
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 5.5 GHz, Right Head, Touch, Ch 140, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.43 V/m
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.016 mW/g



0 dB = 0.181mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

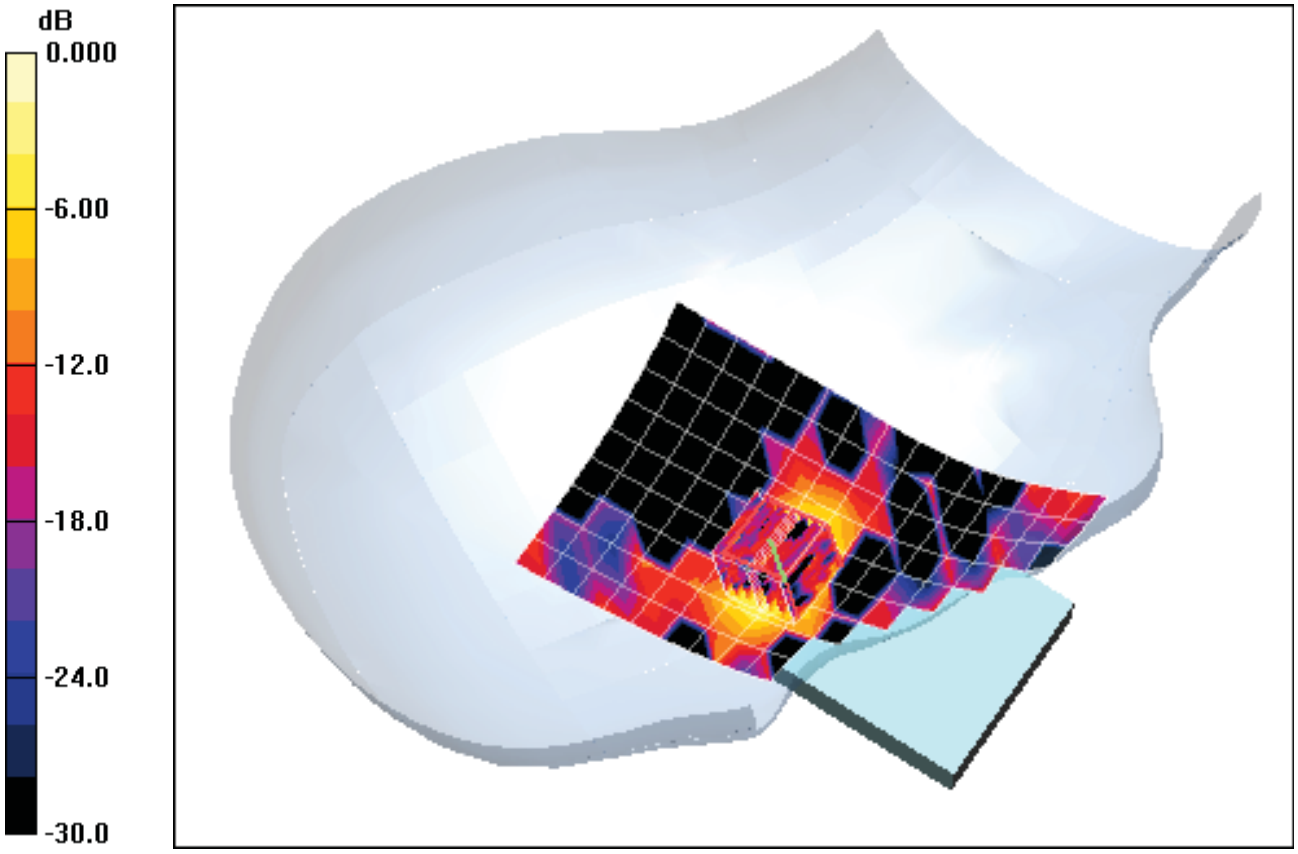
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5700 MHz; σ = 5.12 mho/m; ε_r = 33.9; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3550; ConvF(3.5, 3.5, 3.5); Calibrated: 2/14/2011
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 5.5 GHz, Right Head, Tilt, Ch 140, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.60 V/m
Peak SAR (extrapolated) = 0.234 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.015 mW/g



0 dB = 0.122mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial:90

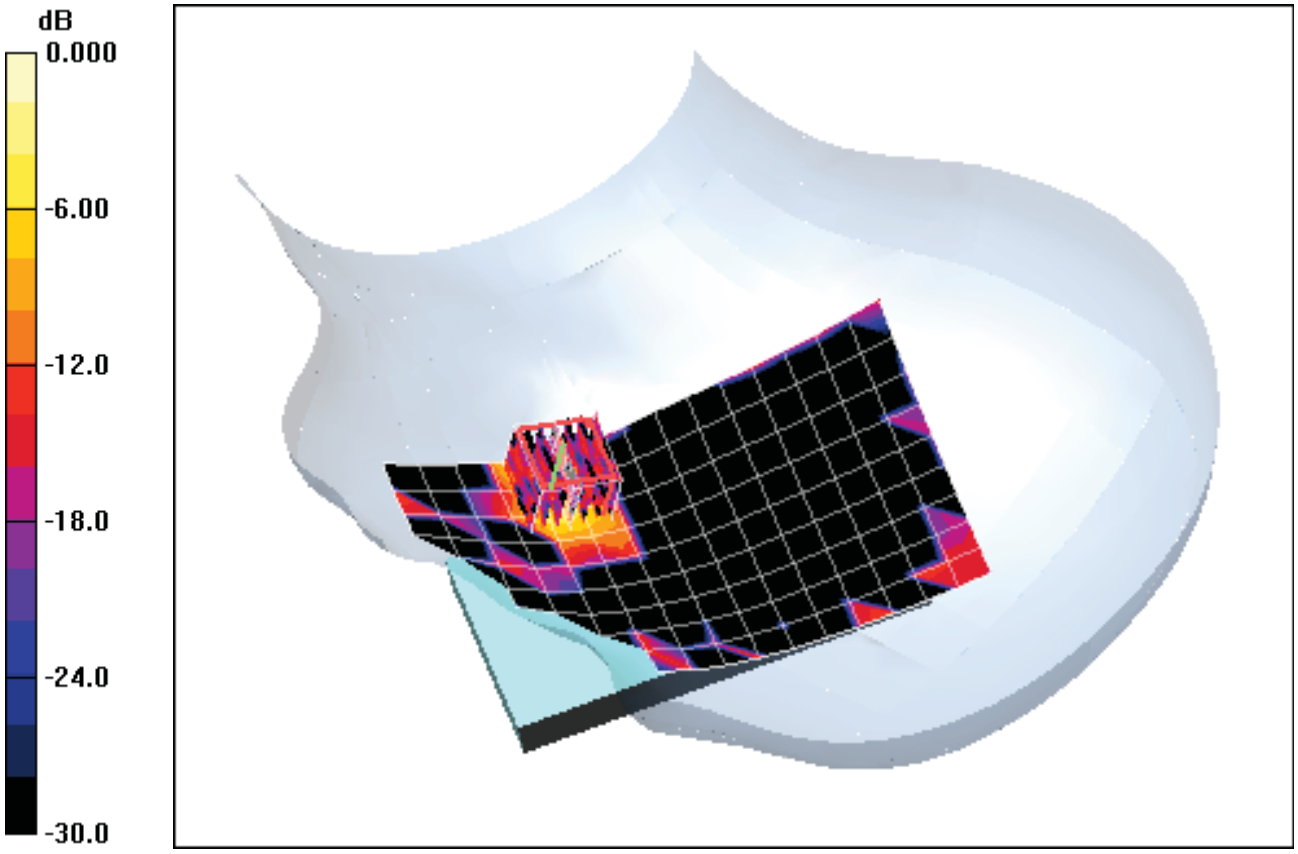
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5700 MHz; σ = 5.12 mho/m; ε_r = 33.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3550; ConvF(3.5, 3.5, 3.5); Calibrated: 2/14/2011
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, 5.5 GHz Left Head, Touch, Ch 140, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.14 V/m
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.013 mW/g



0 dB = 0.090mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

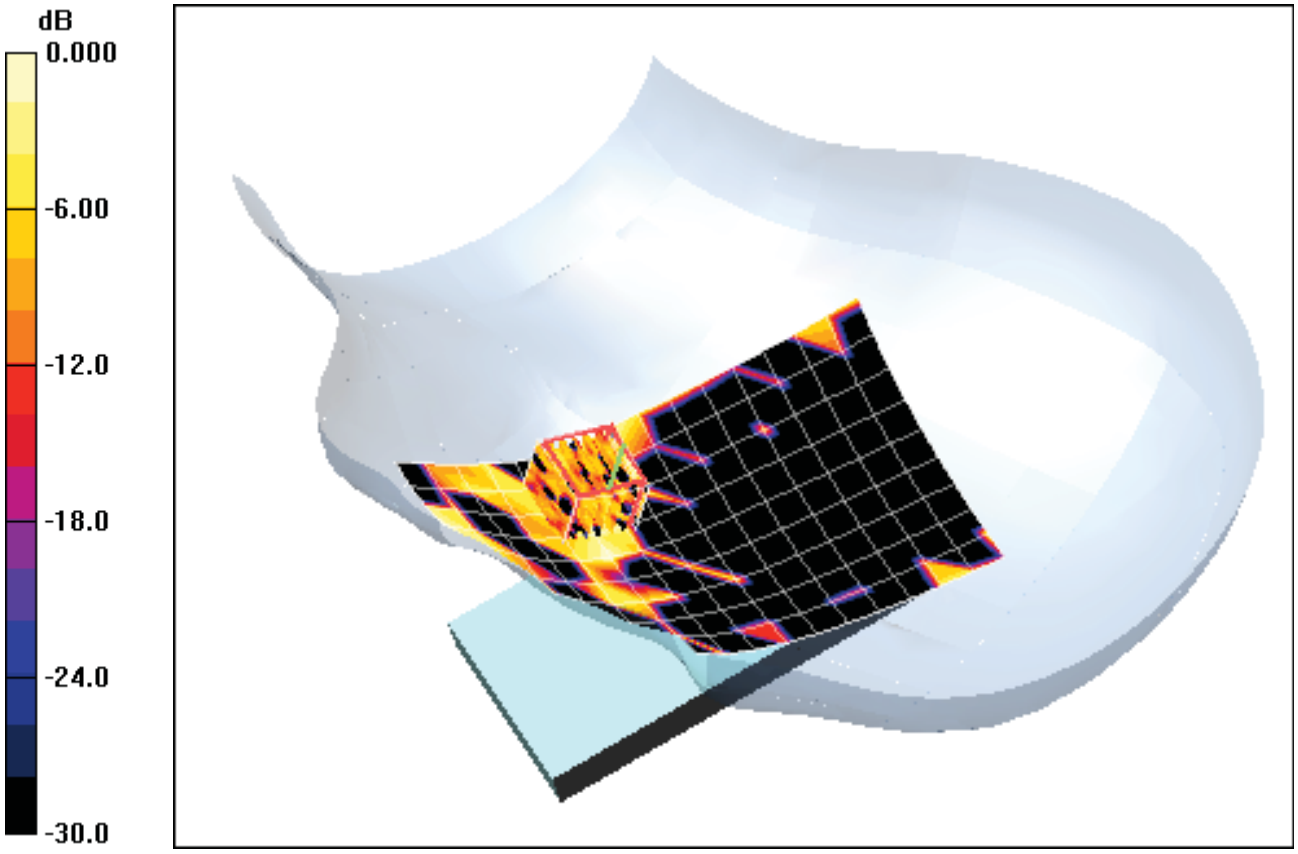
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5700 MHz; σ = 5.12 mho/m; ε_r = 33.9; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3550; ConvF(3.5, 3.5, 3.5); Calibrated: 2/14/2011
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, 5.5 GHz Left Head, Tilt, Ch 140, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.313 V/m
Peak SAR (extrapolated) = 0.099 W/kg
SAR(1 g) = 0.00293 mW/g; SAR(10 g) = 0.000406 mW/g



0 dB = 0.006mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

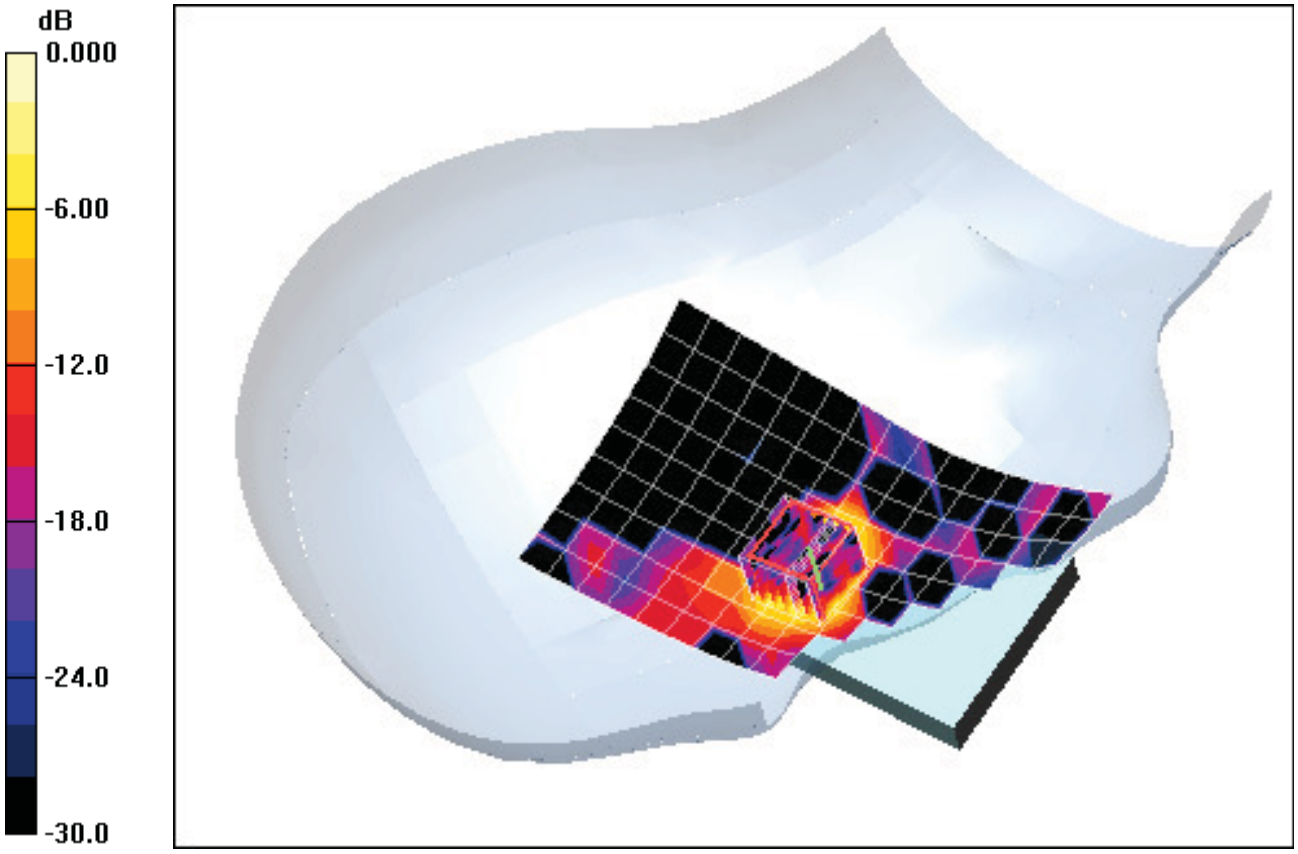
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5745 MHz; σ = 5.18 mho/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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 5.8 GHz, Right Head, Touch, Ch 149, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.36 V/m
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.022 mW/g



0 dB = 0.206mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 90

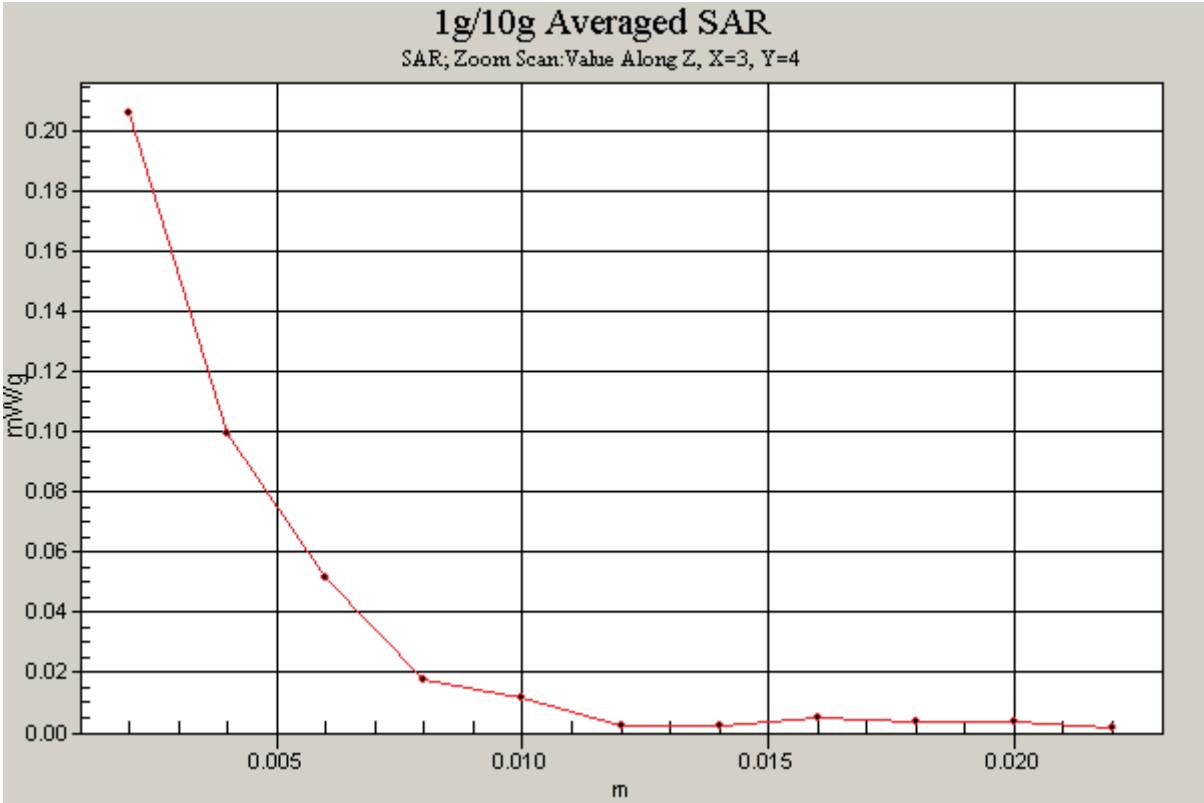
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5745 MHz; σ = 5.18 mho/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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 5.8 GHz, Right Head, Touch, Ch 149, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.36 V/m
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.022 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

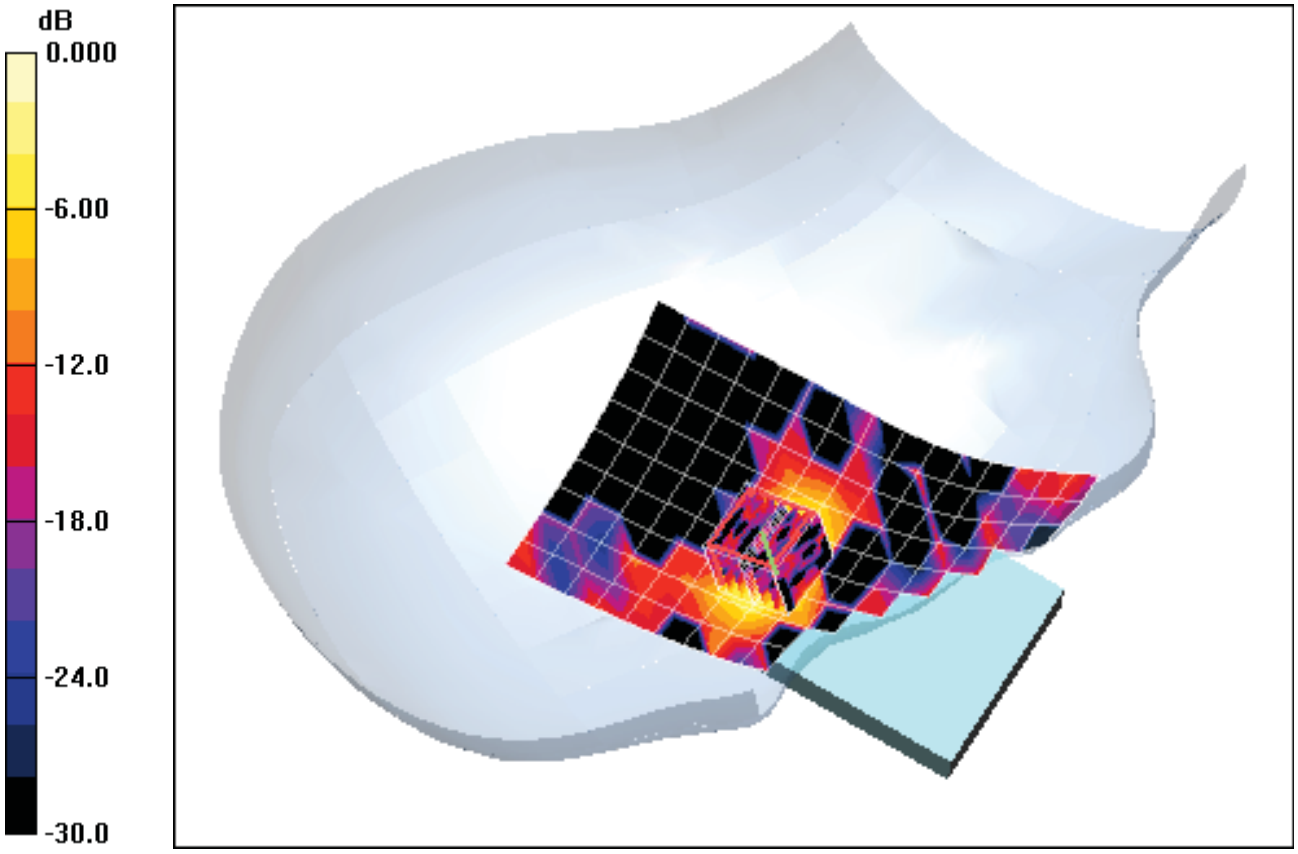
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5745 MHz; σ = 5.18 mho/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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 5.8 GHz, Right Head, Tilt, Ch 149, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.63 V/m
Peak SAR (extrapolated) = 0.297 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.019 mW/g



0 dB = 0.122mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

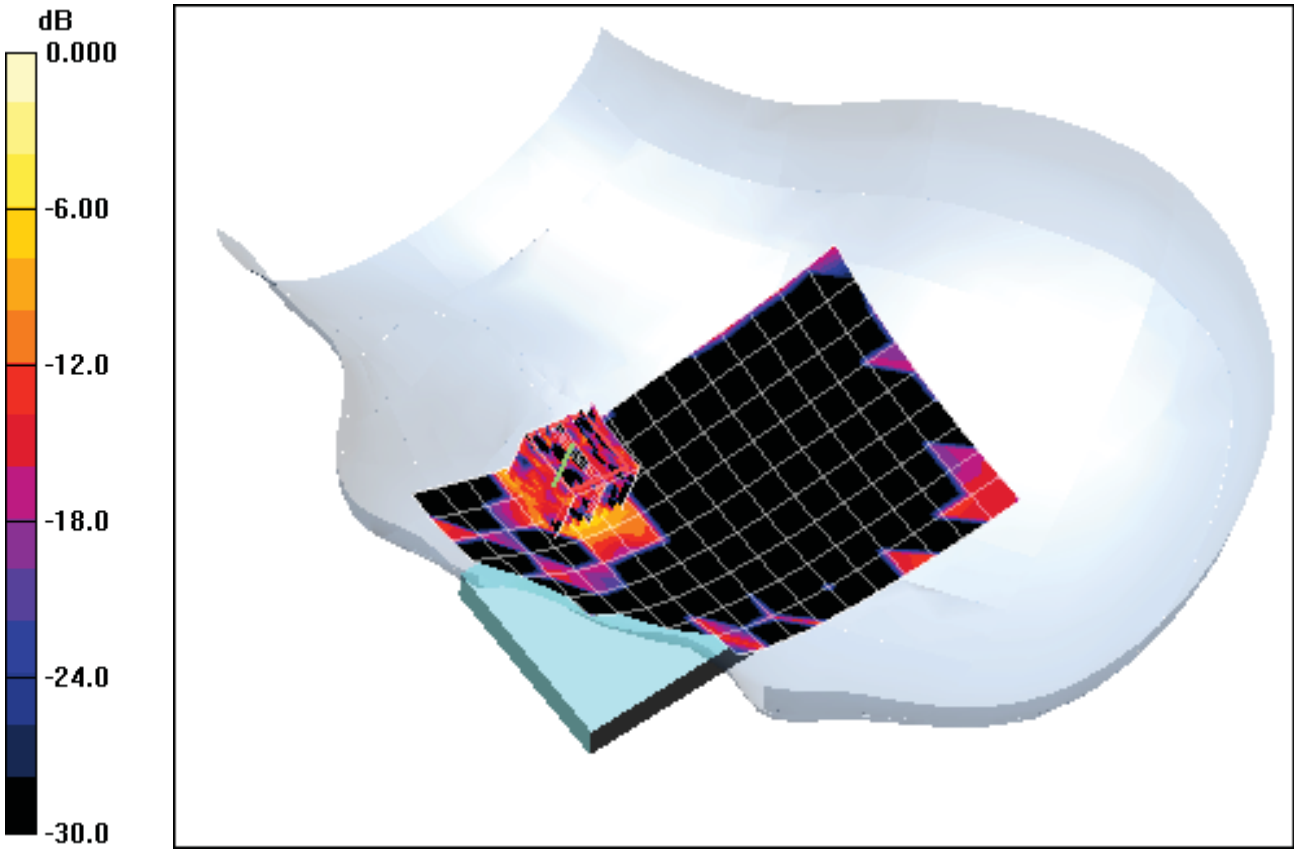
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5745 MHz; σ = 5.18 mho/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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, 5.8 GHz Left Head, Touch, Ch 149, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.84 V/m
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.012 mW/g



0 dB = 0.090mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

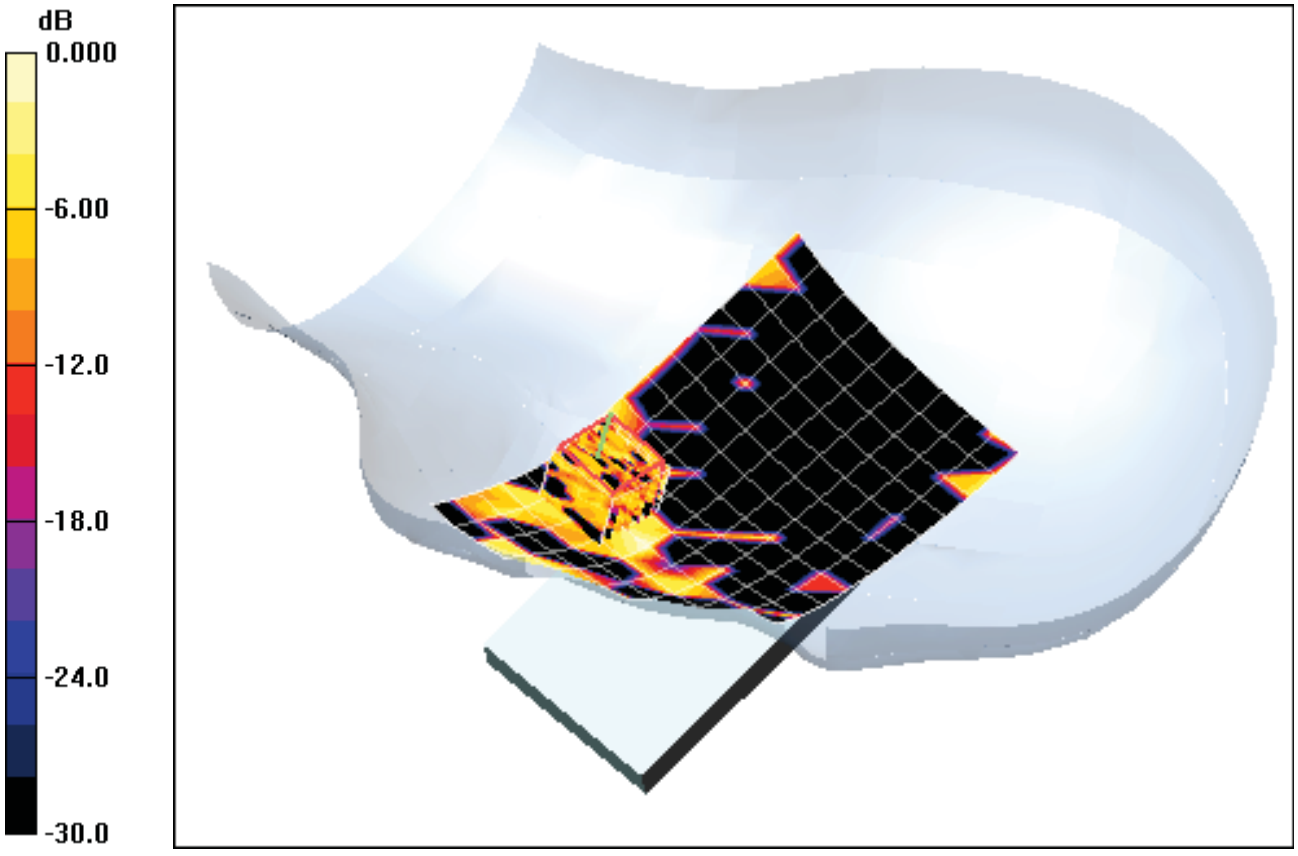
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5745 MHz; σ = 5.18 mho/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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, 5.8 GHz Left Head, Tilt, Ch 149, 6 Mbps

Area Scan (10x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.000 V/m
Peak SAR (extrapolated) = 0.022 W/kg
SAR(1 g) = 0.00292 mW/g; SAR(10 g) = 0.000694 mW/g



0 dB = 0.006mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

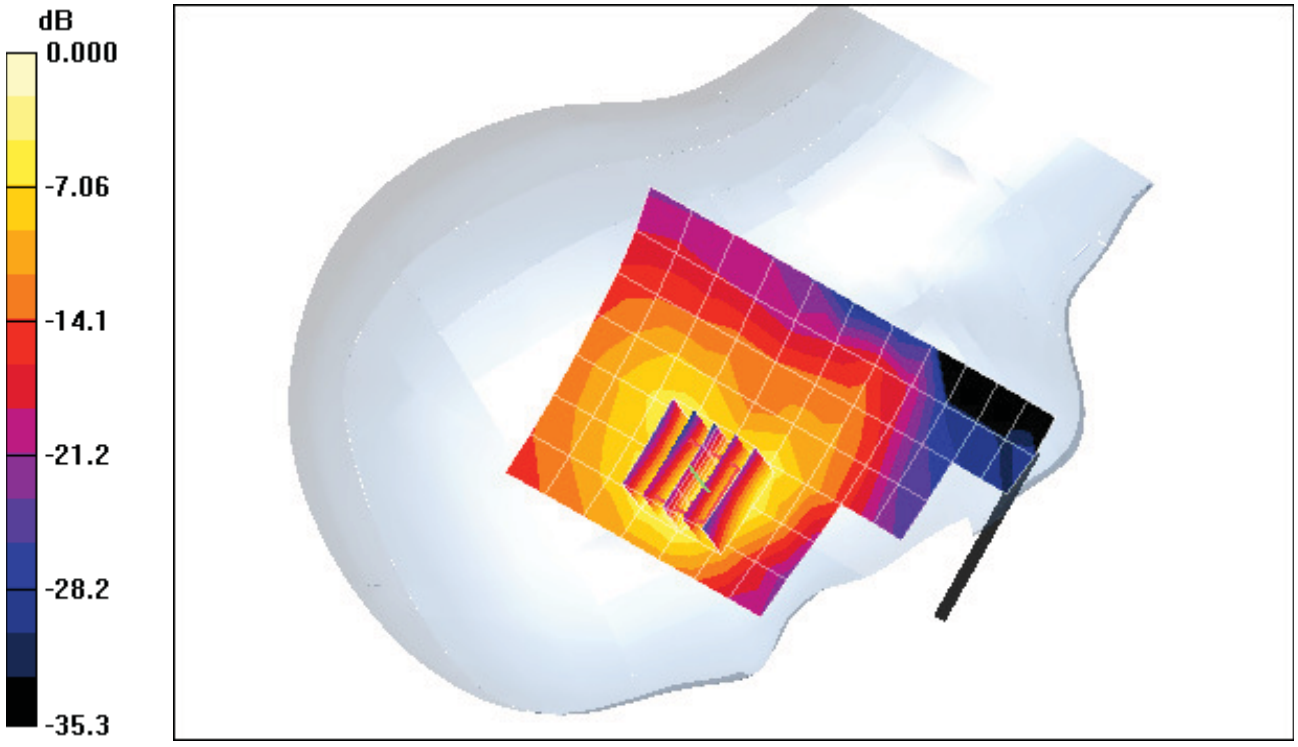
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Right Head, Touch, Mid.ch, PUSC, QPSK, 10 MHz BW

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.5 V/m
Peak SAR (extrapolated) = 0.830 W/kg
SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.145 mW/g



0 dB = 0.477mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

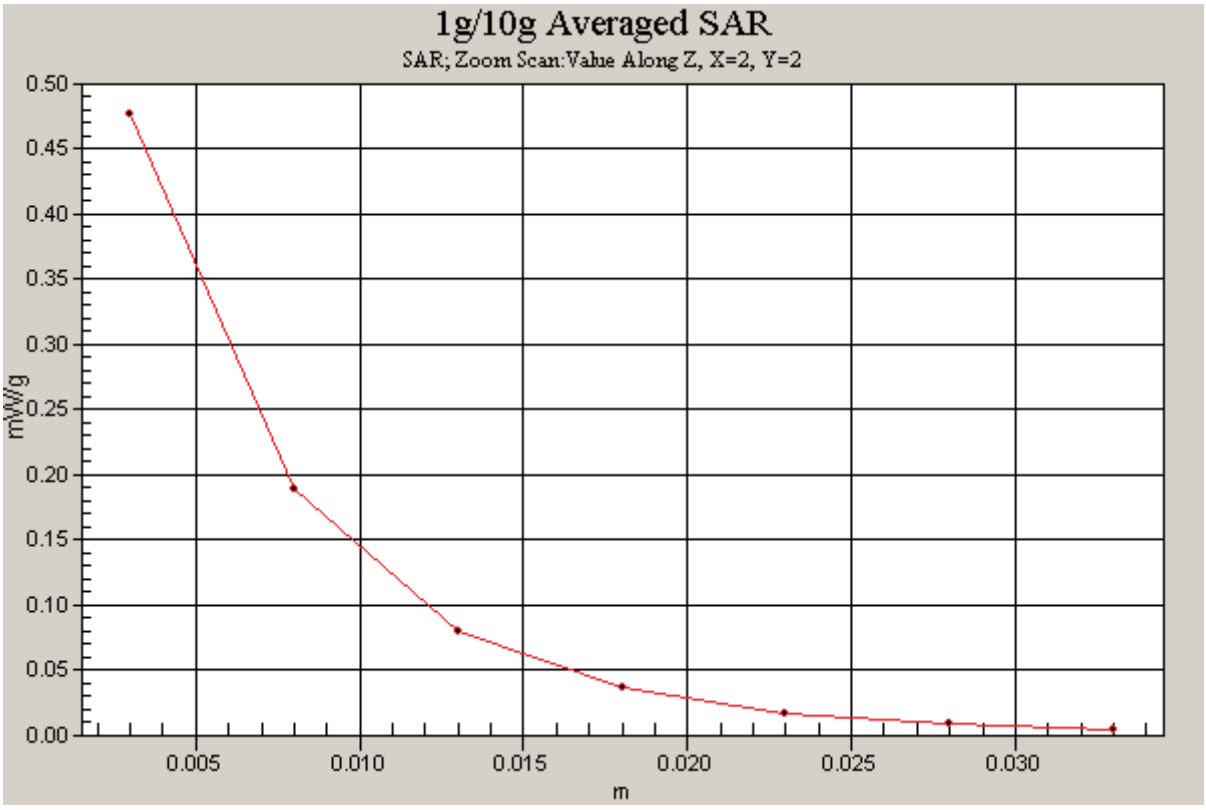
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Right Head, Touch, Mid.ch, PUSC, QPSK, 10 MHz BW

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.5 V/m
Peak SAR (extrapolated) = 0.830 W/kg
SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.145 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

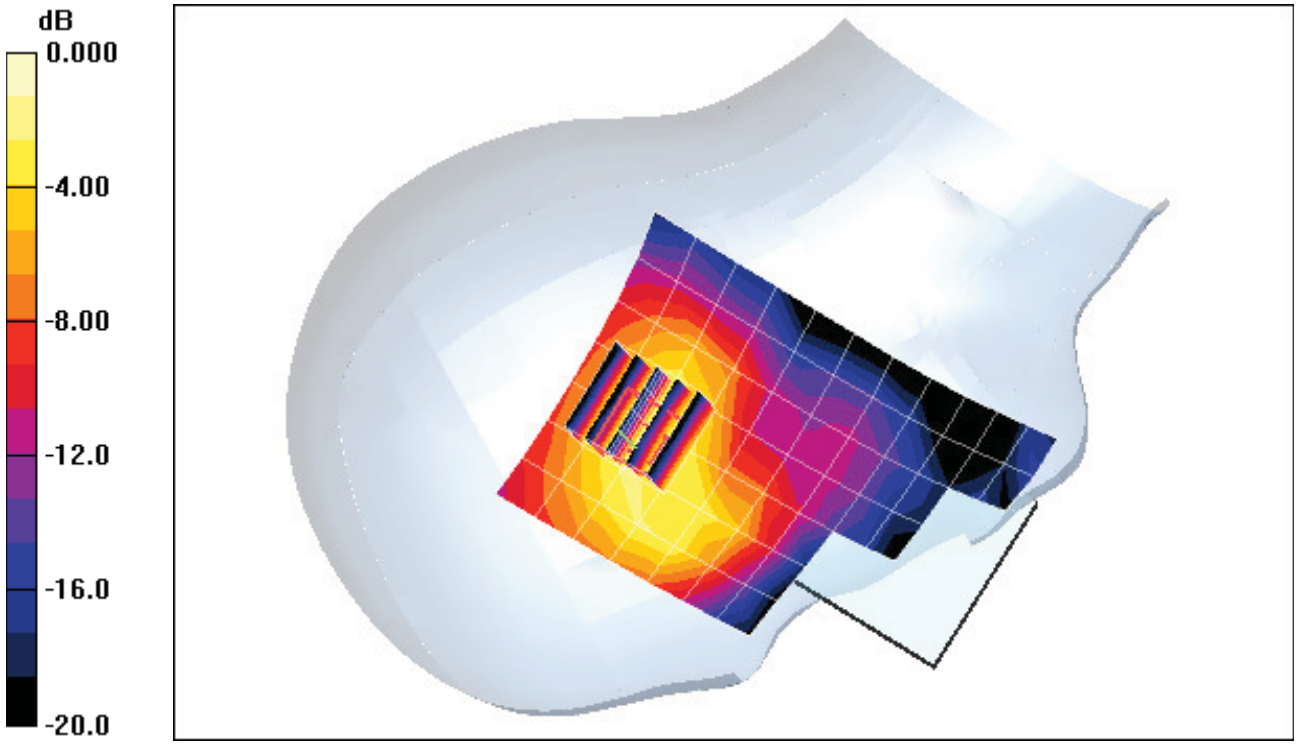
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Right Head, Tilt, Mid.ch, PUSC, QPSK, 5 MHz BW

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.07 V/m
Peak SAR (extrapolated) = 0.317 W/kg
SAR(1 g) = 0.153 mW/g; SAR(10 g) = 0.073 mW/g



0 dB = 0.191mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

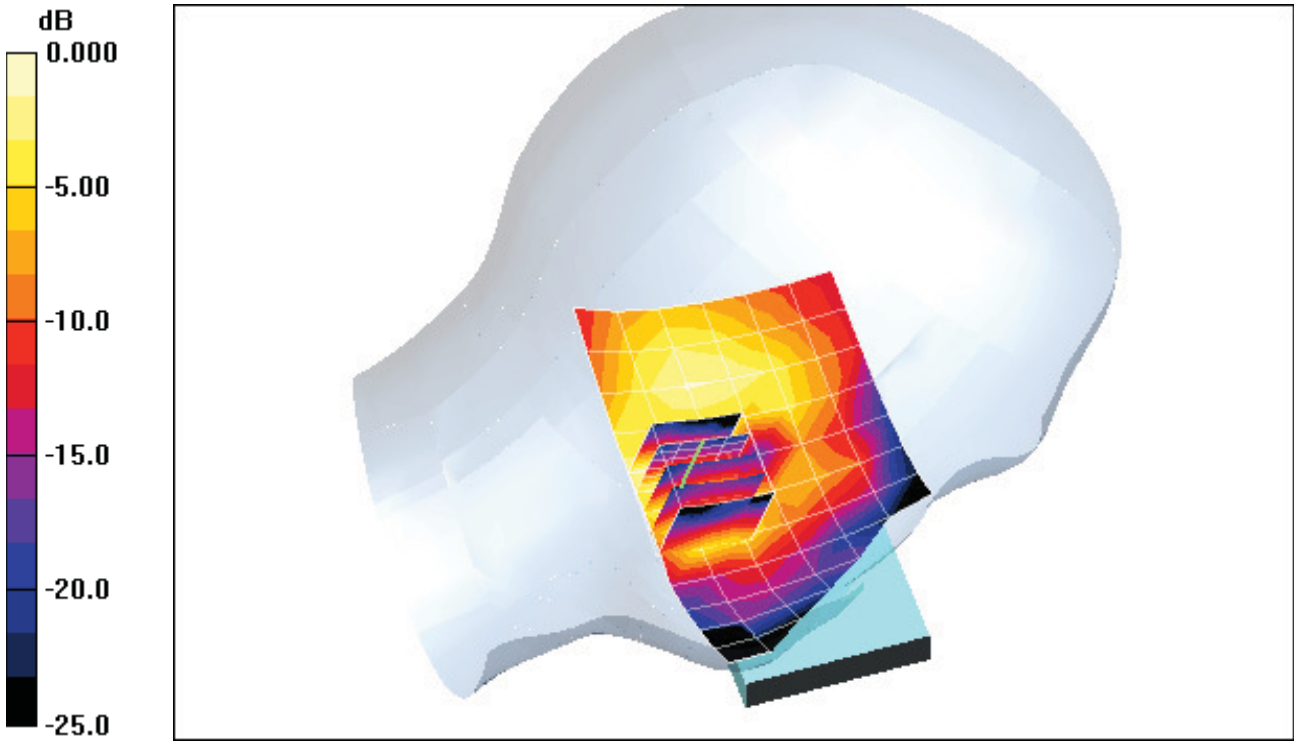
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Left Head, Touch, Mid. Ch, PUSC, QPSK, 5 MHz BW

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.60 V/m
Peak SAR (extrapolated) = 0.259 W/kg
SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.067 mW/g



0 dB = 0.170mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

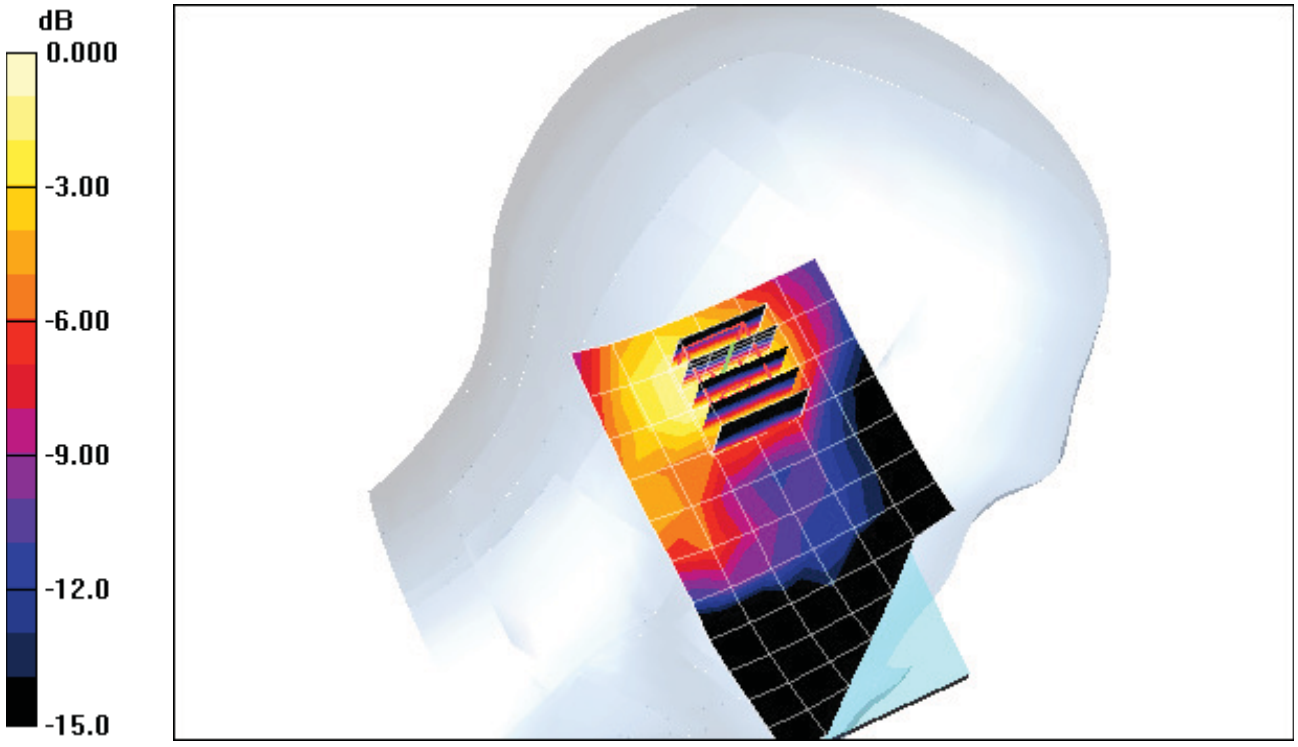
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Left Head, Tilt, Mid. Ch, PUSC, QPSK, 5 MHz BW

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.15 V/m
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.051 mW/g



0 dB = 0.117mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

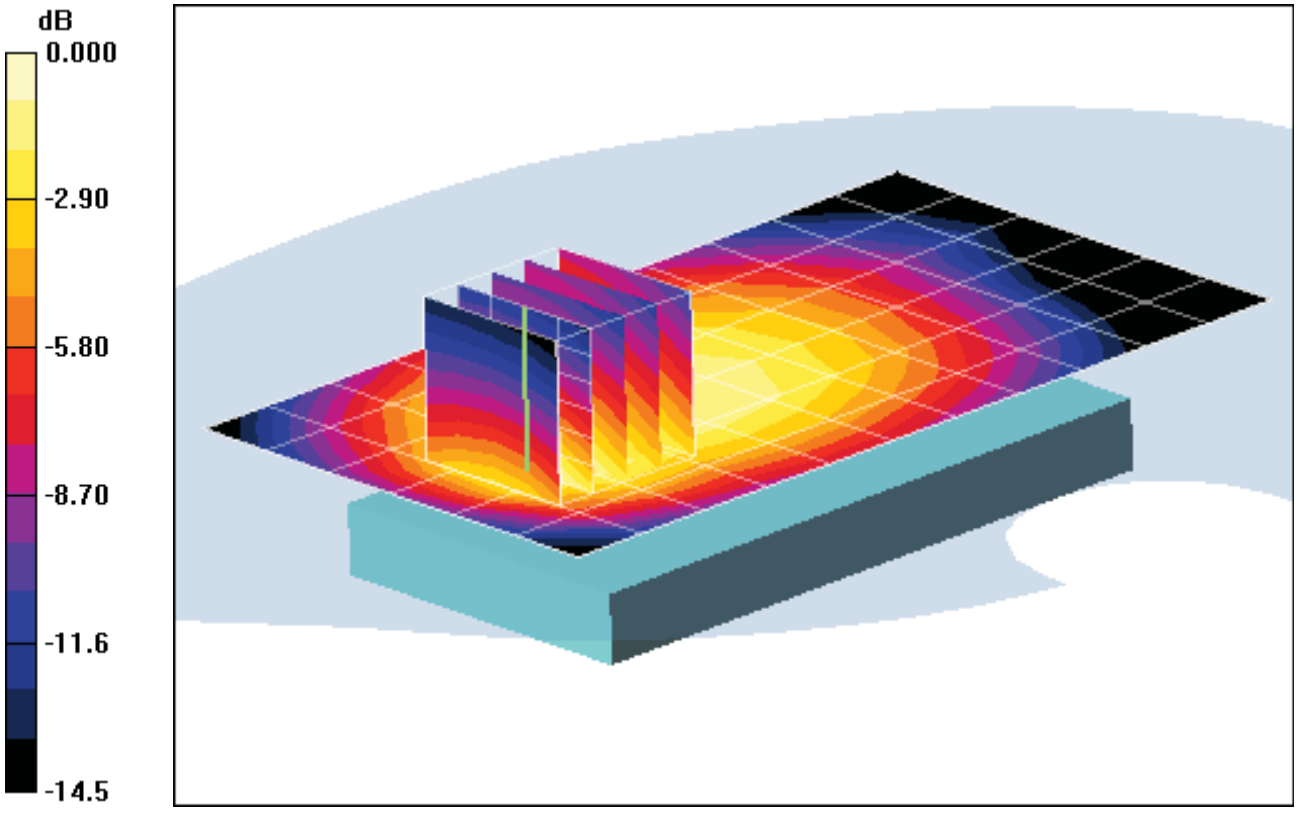
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO-FCC Rule Part 90S, 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 = 21.6 V/m
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.415 mW/g; SAR(10 g) = 0.262 mW/g



0 dB = 0.457mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR, #94

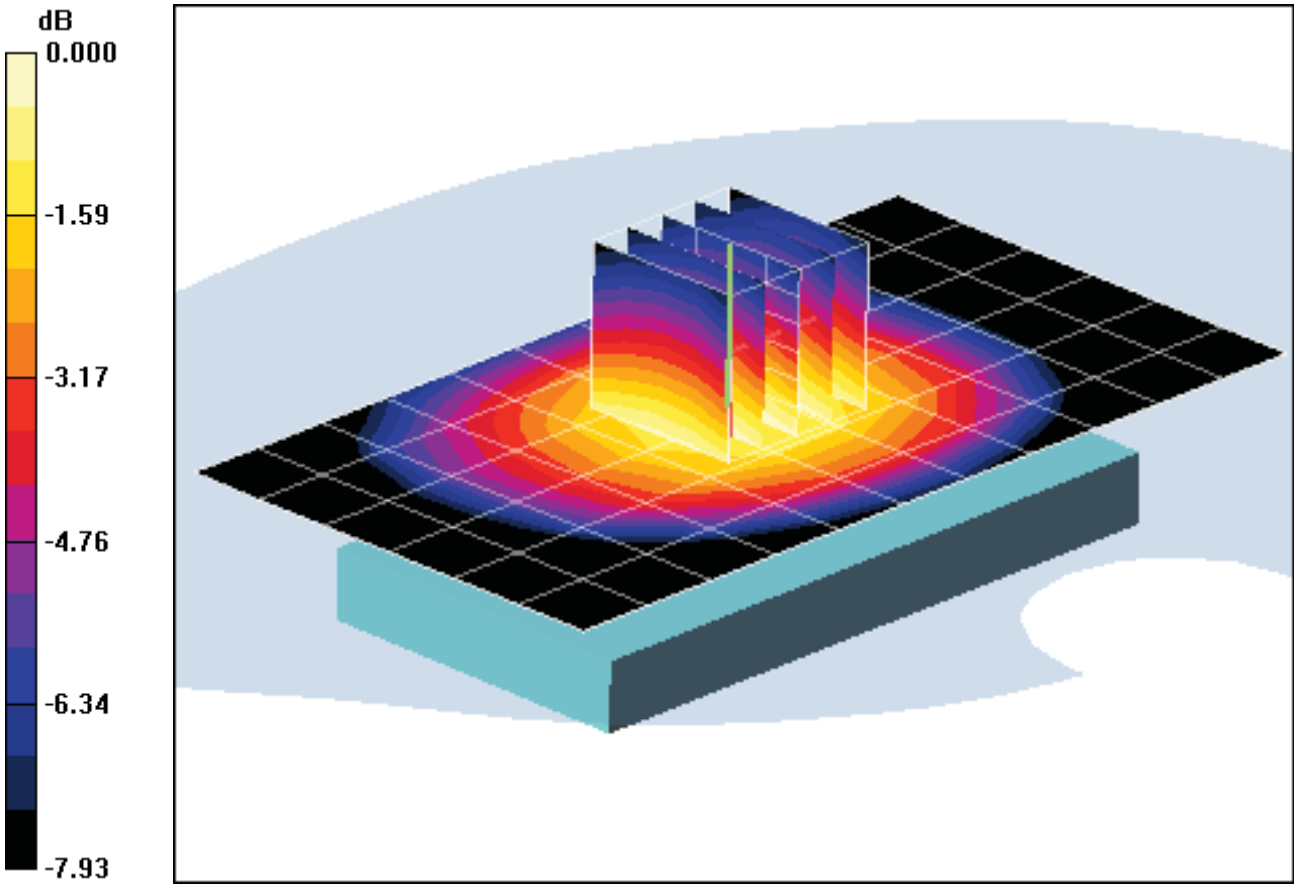
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
: f = 820.1 MHz; σ = 0.959 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 90S, 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 = 14.5 V/m
Peak SAR (extrapolated) = 0.229 W/kg
SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.144 mW/g



0 dB = 0.194mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR, #94

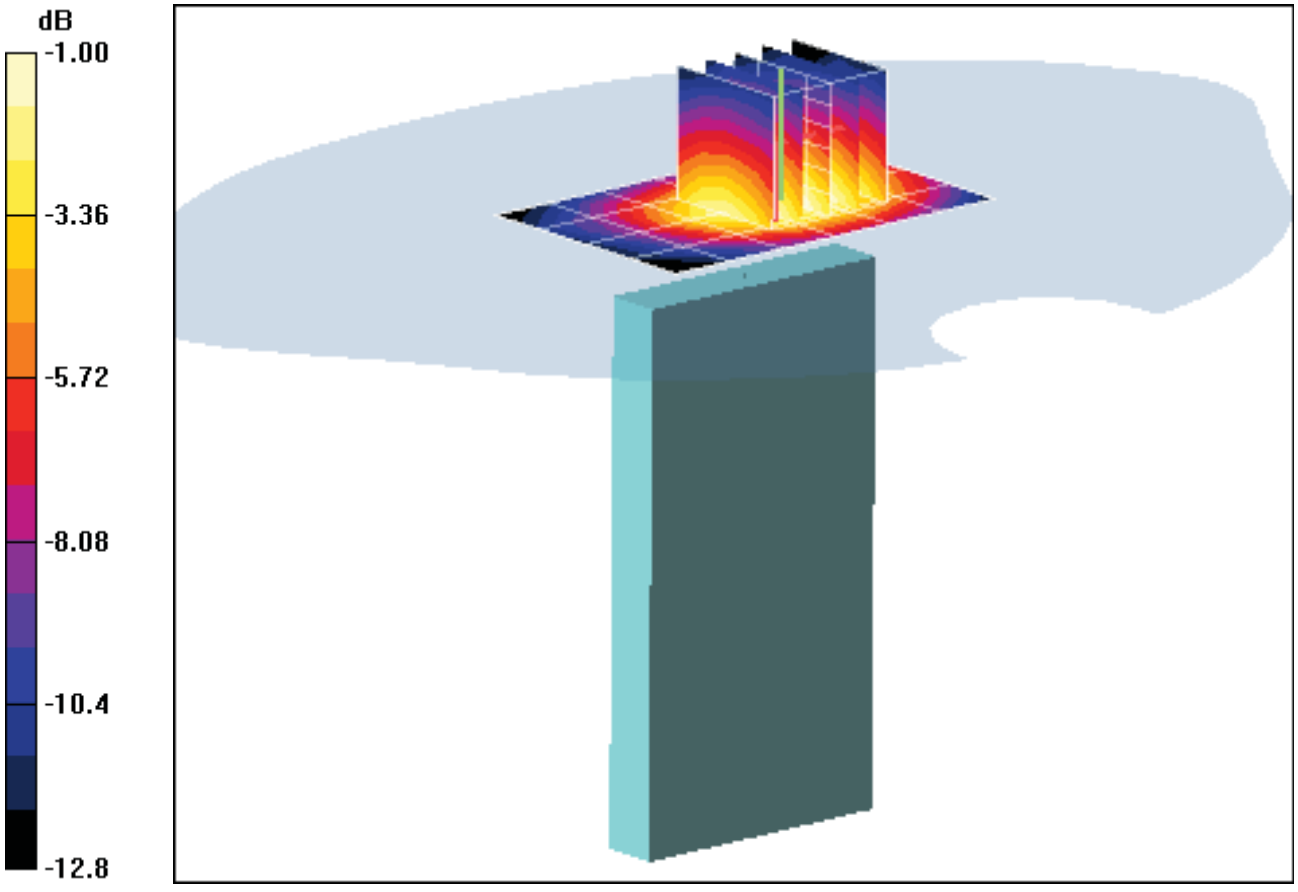
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.959 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 90S, 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 = 9.04 V/m
Peak SAR (extrapolated) = 0.104 W/kg
SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.040 mW/g



0 dB = 0.071mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR, #94

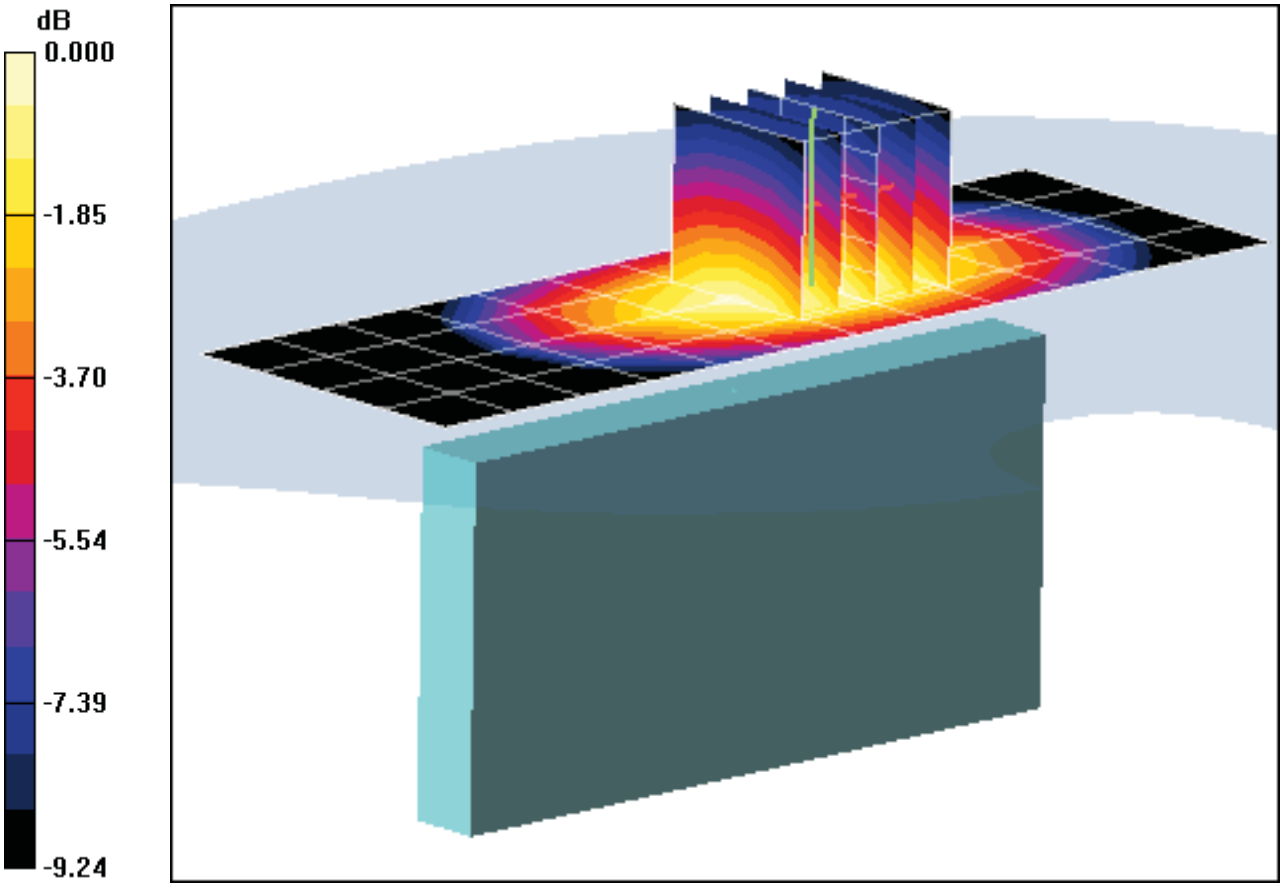
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.959 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 90S, 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 = 17.5 V/m
Peak SAR (extrapolated) = 0.358 W/kg
SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.181 mW/g



0 dB = 0.274mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

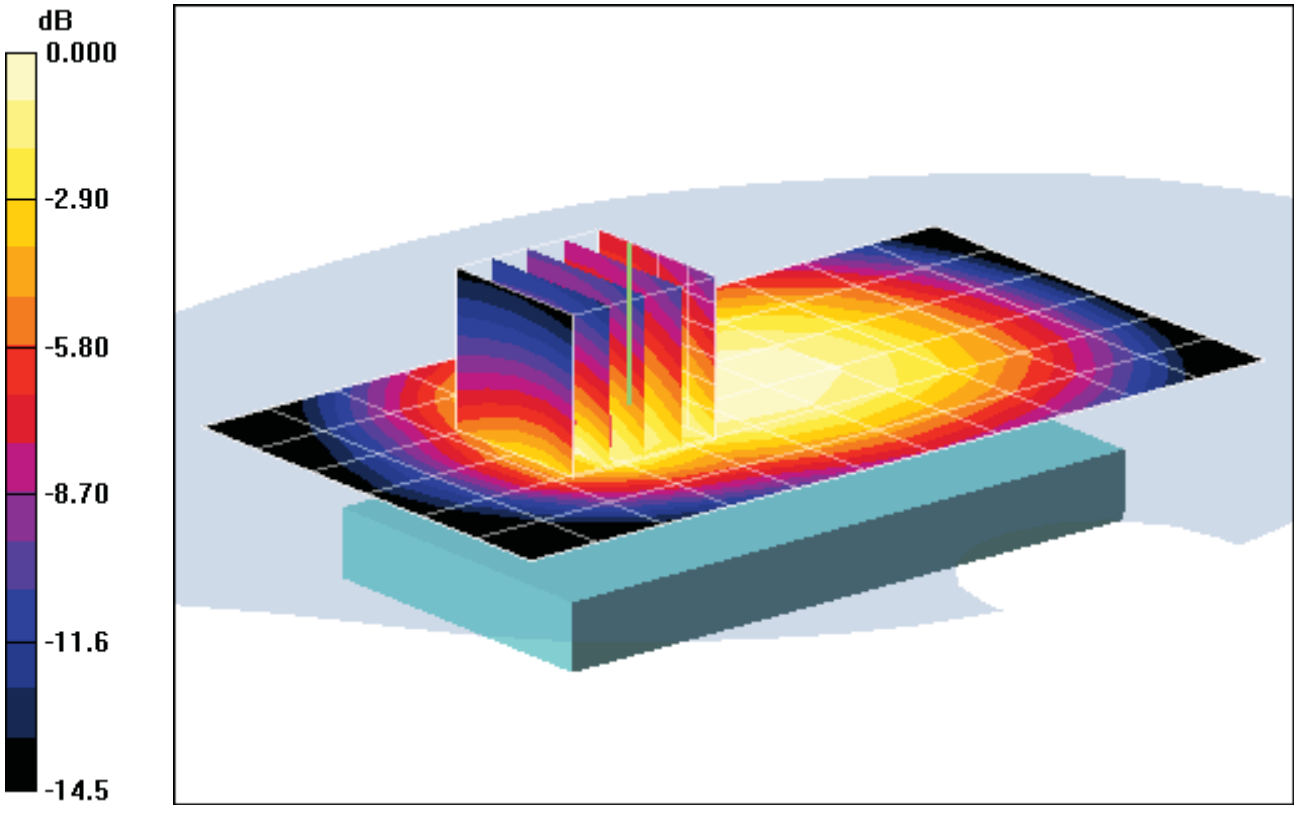
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 90S, 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 = 25.8 V/m
Peak SAR (extrapolated) = 0.905 W/kg
SAR(1 g) = 0.515 mW/g; SAR(10 g) = 0.347 mW/g



0 dB = 0.577mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 94

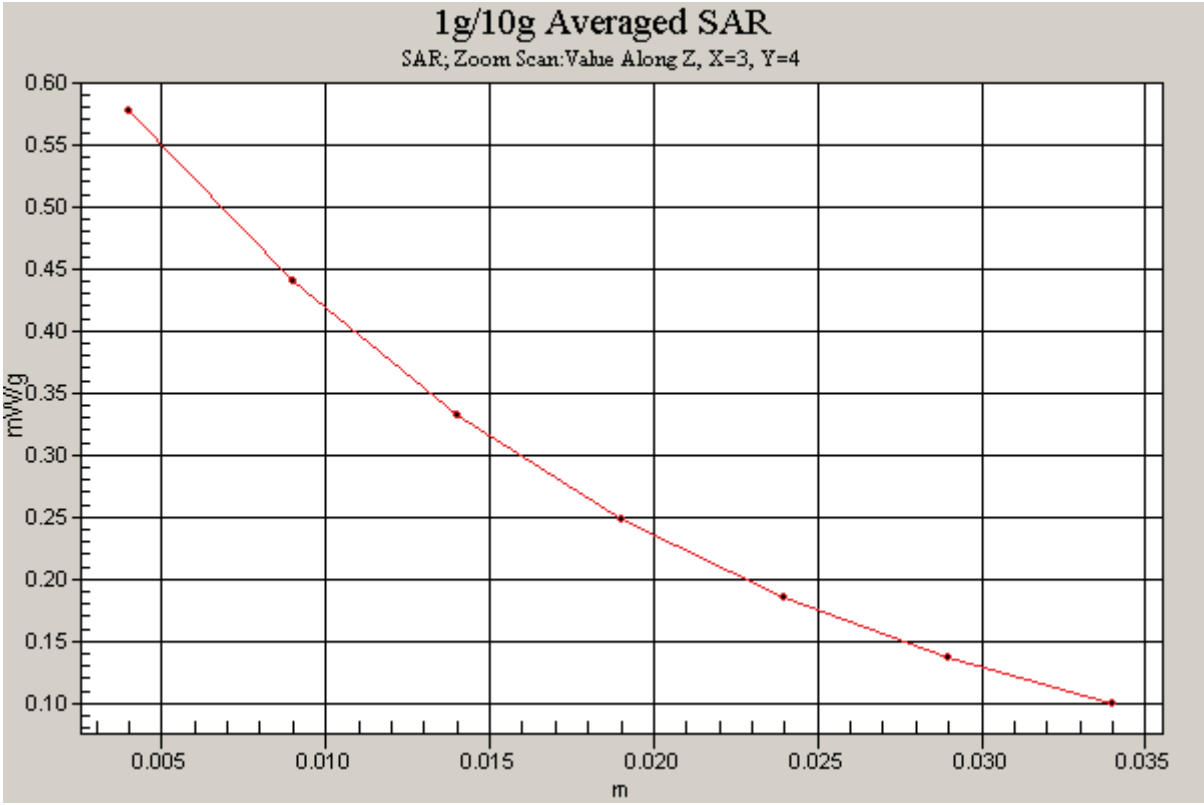
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 90S, 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 = 25.8 V/m
Peak SAR (extrapolated) = 0.905 W/kg
SAR(1 g) = 0.515 mW/g; SAR(10 g) = 0.347 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

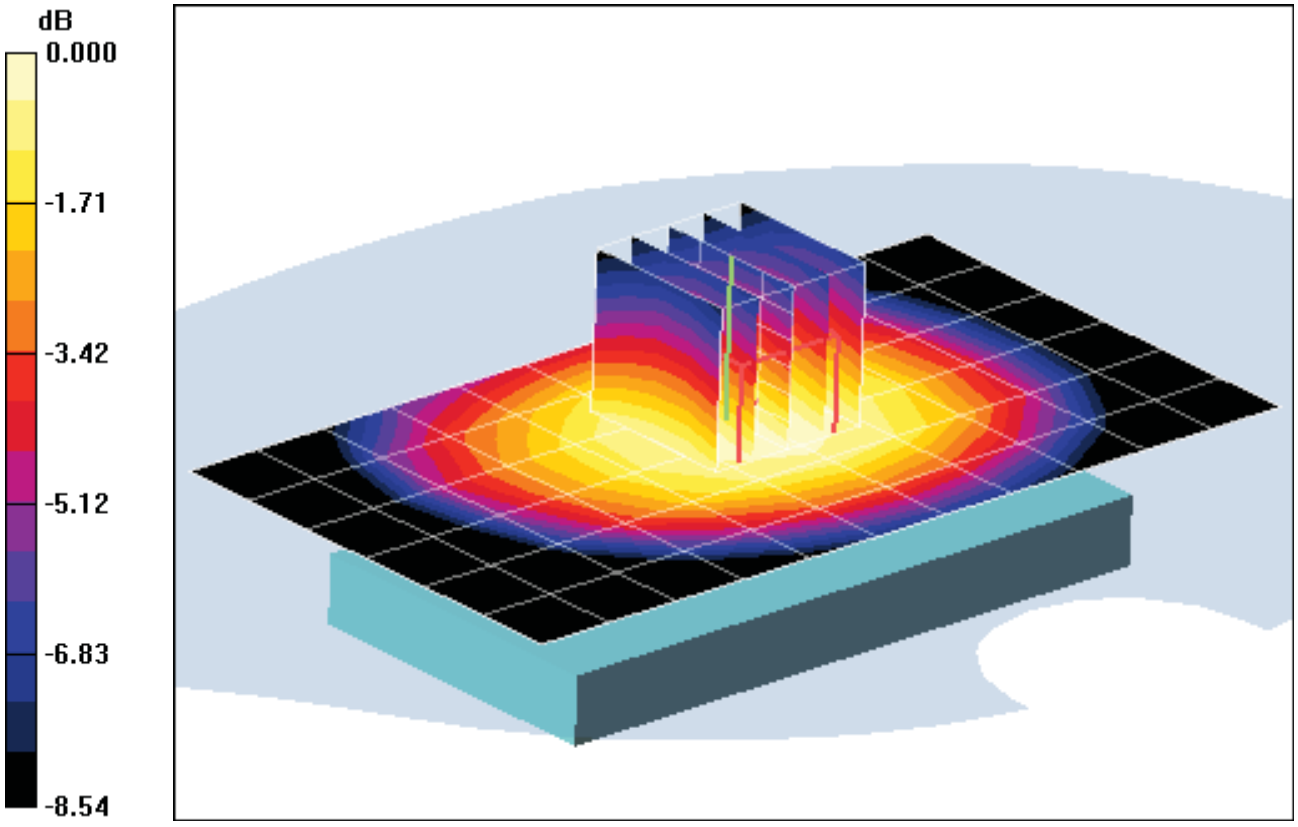
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 90S, 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 = 13.9 V/m
Peak SAR (extrapolated) = 0.204 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.126 mW/g



0 dB = 0.172mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

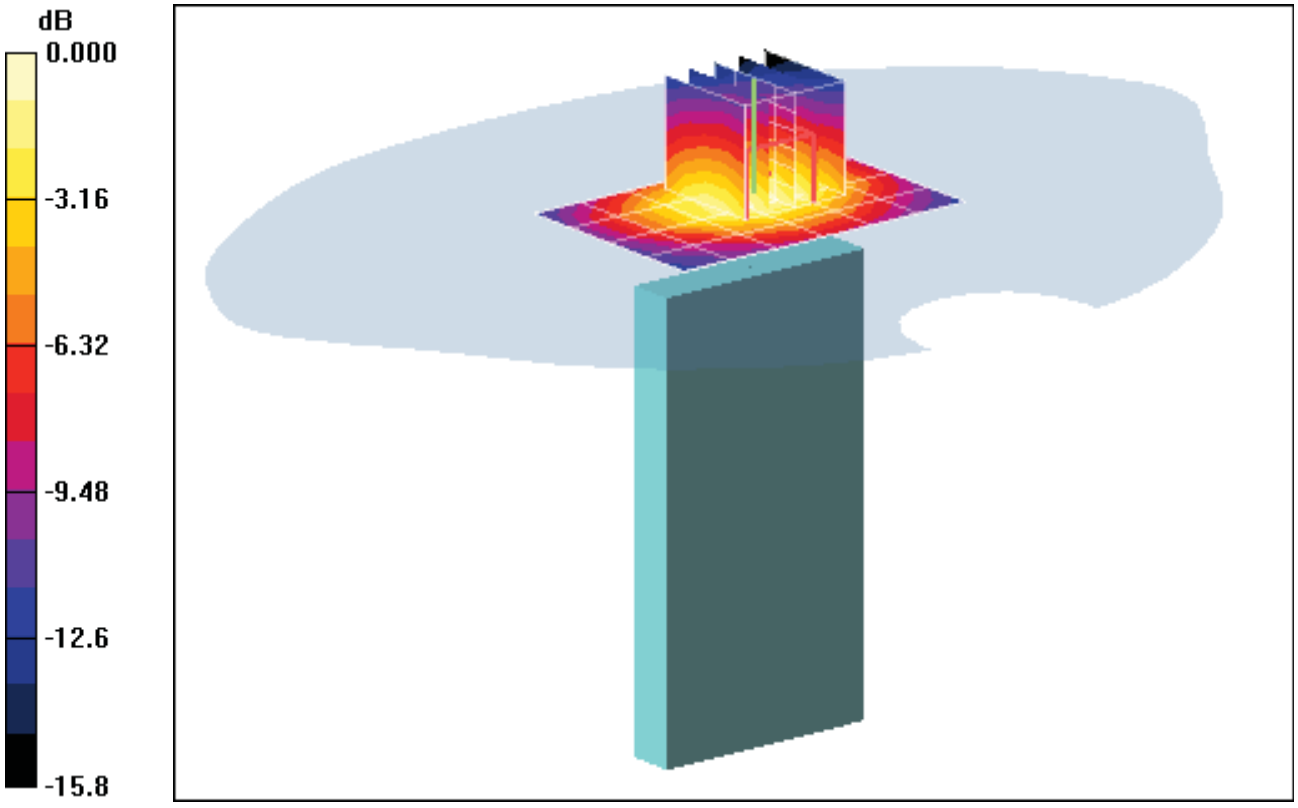
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 90S, 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 = 9.03 V/m
Peak SAR (extrapolated) = 0.141 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.046 mW/g



0 dB = 0.085mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 94

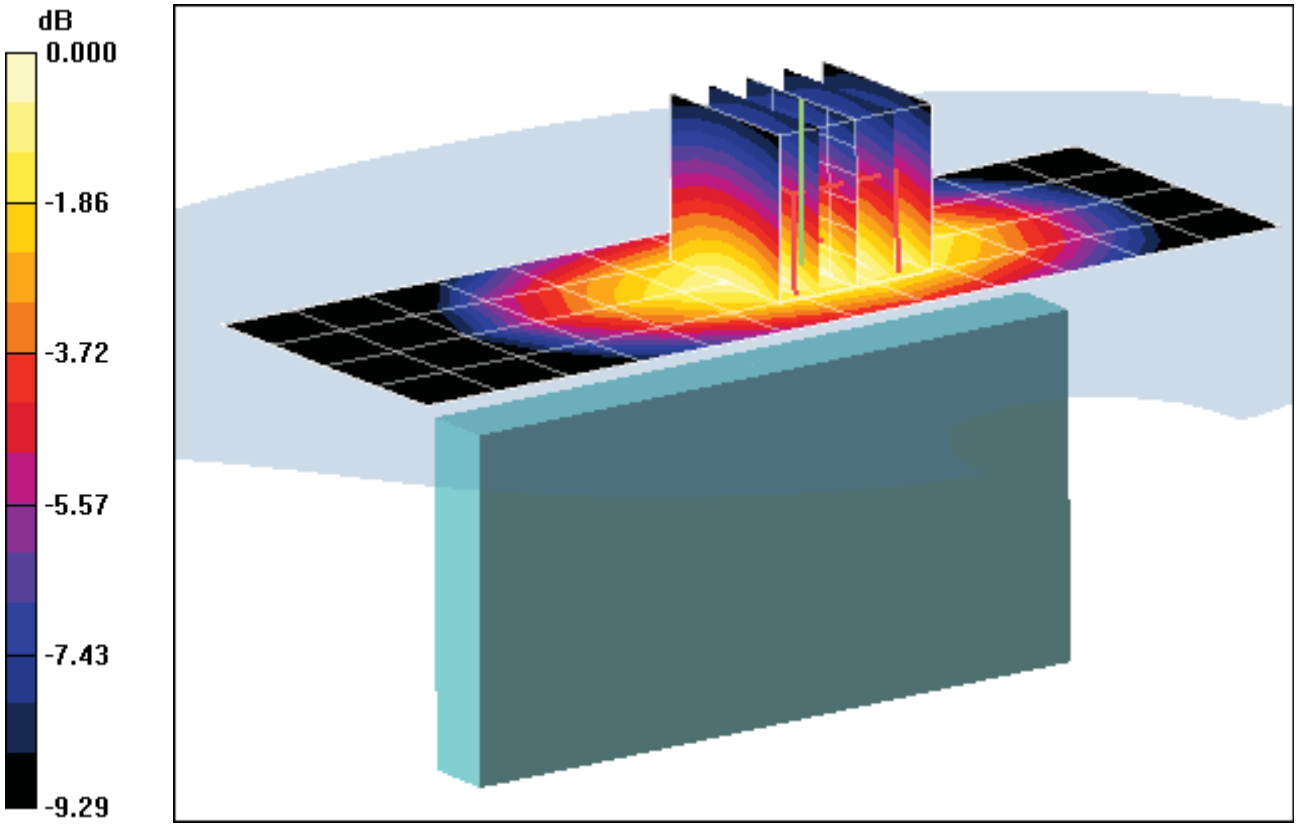
Communication System: Cellular CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.984 mho/m; ε_r = 53.84; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO -FCC Rule Part 90S, 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 = 15.1 V/m
Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.131 mW/g



0 dB = 0.199mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

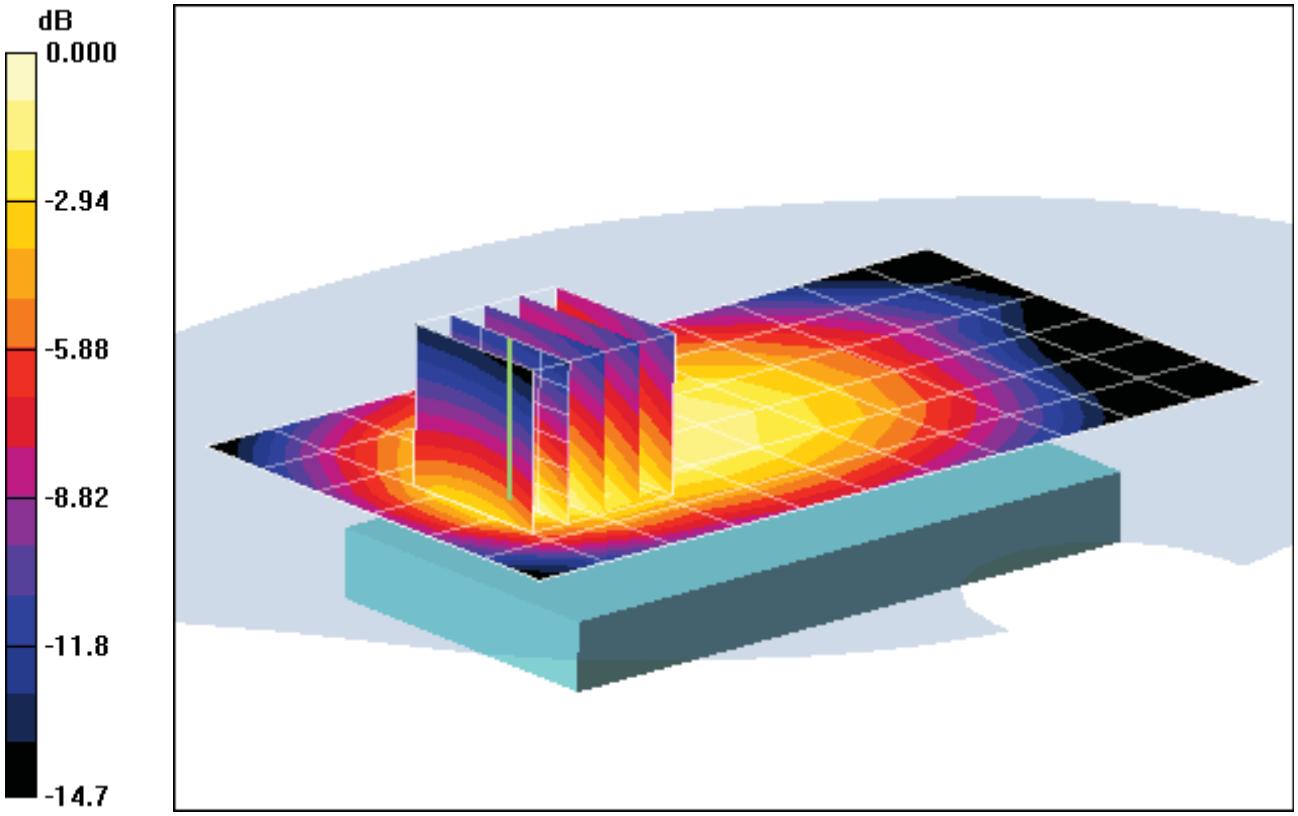
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO-FCC Rule Part 22H, 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 = 18.4 V/m
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.195 mW/g



0 dB = 0.347mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR, #94

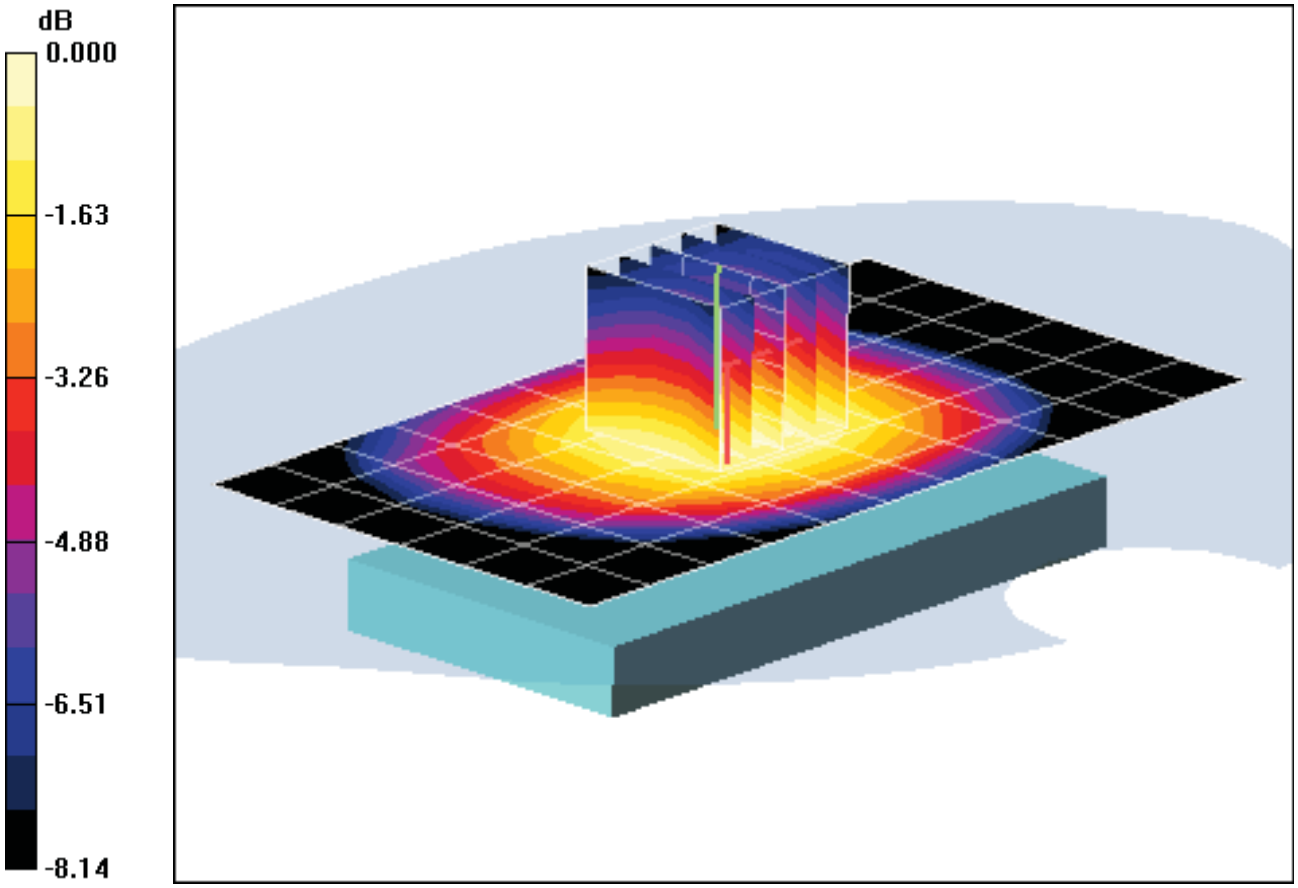
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.972 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 22H, 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 = 13.2 V/m
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.159 mW/g; SAR(10 g) = 0.122 mW/g



0 dB = 0.166mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

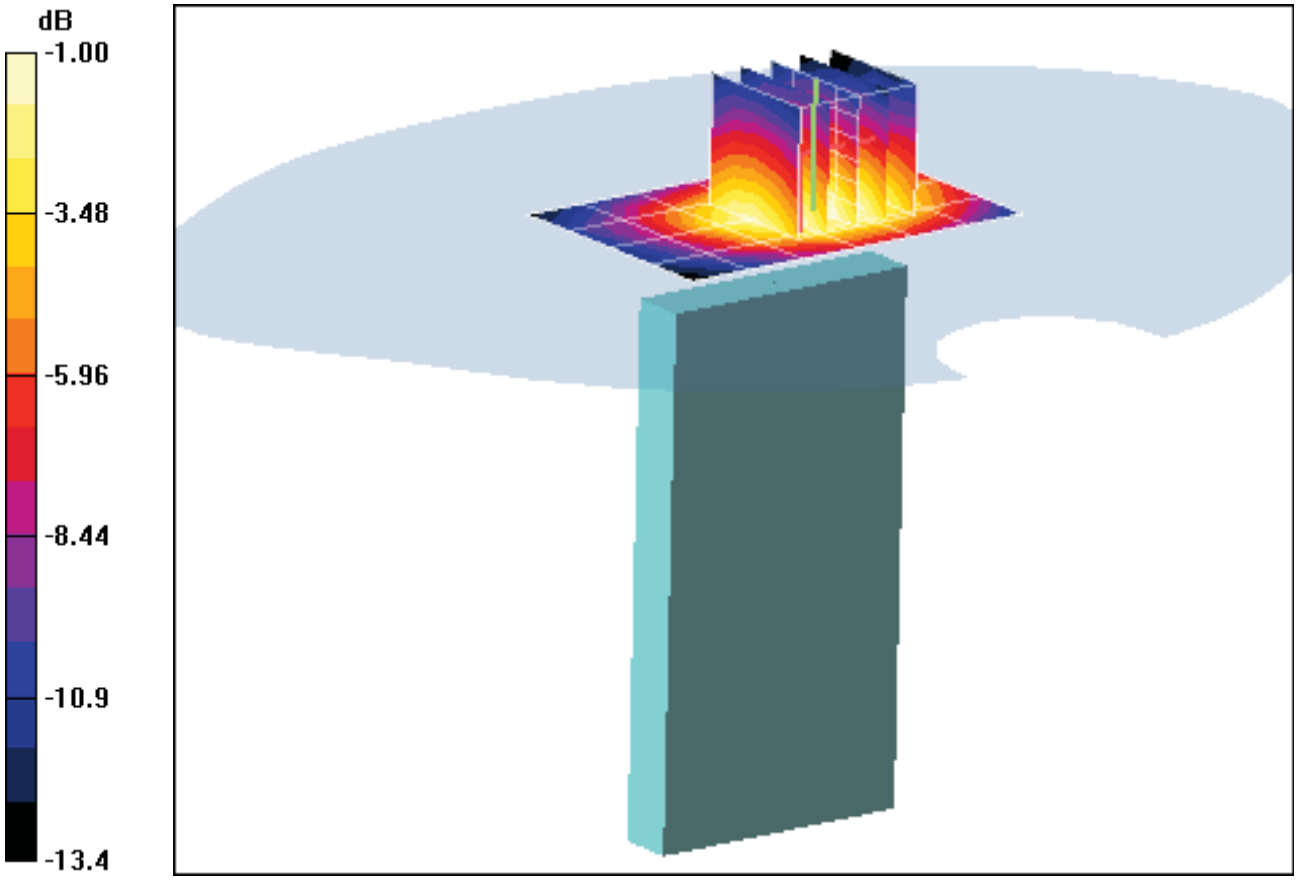
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.972 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 22H, 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 = 8.62 V/m
Peak SAR (extrapolated) = 0.094 W/kg
SAR(1 g) = 0.060 mW/g; SAR(10 g) = 0.037 mW/g



0 dB = 0.066mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR, #94

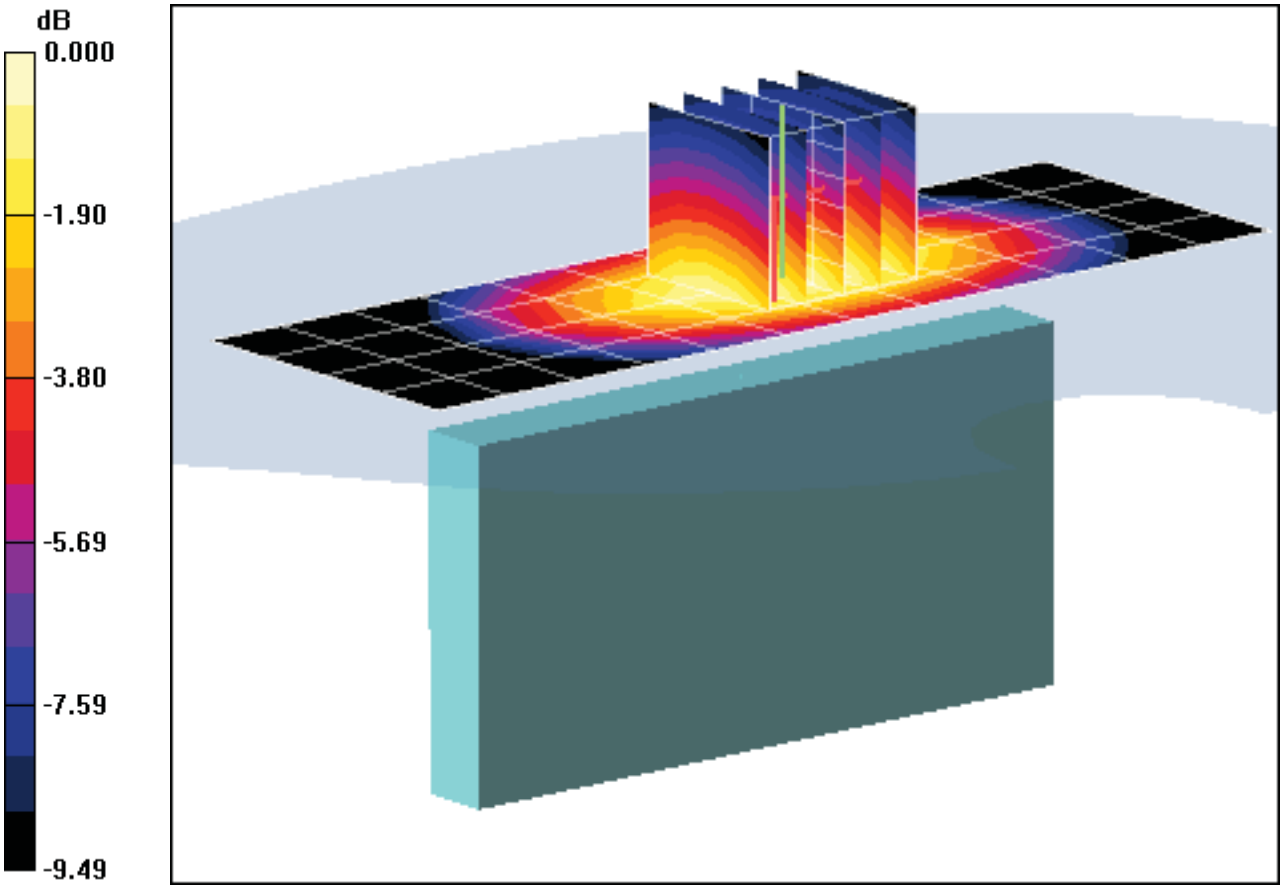
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.972 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3550; ConvF(8.11, 8.11, 8.11); Calibrated: 2/14/2011
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: Cellular TDSO-FCC Rule Part 22H, 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 = 15.6 V/m
Peak SAR (extrapolated) = 0.285 W/kg
SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.145 mW/g



0 dB = 0.220mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

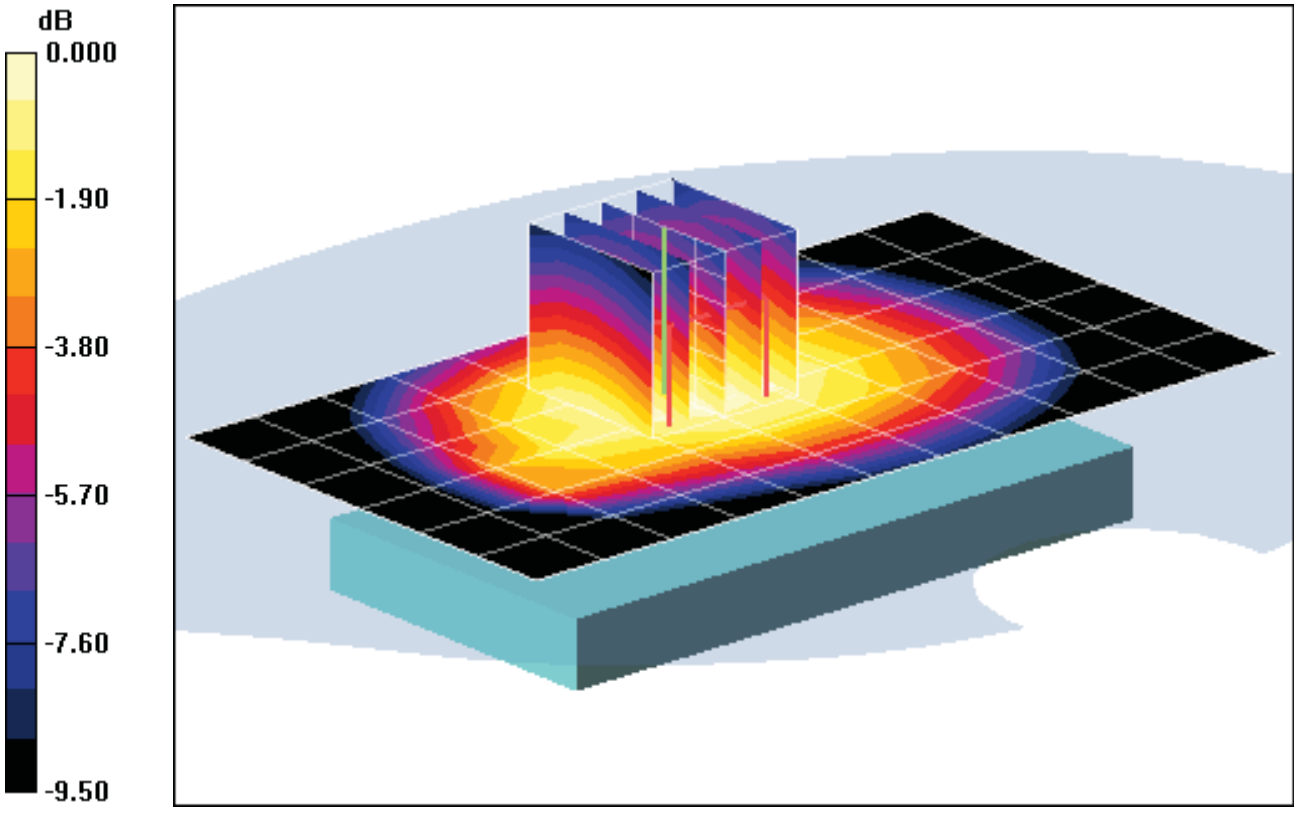
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 22H, 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 = 22.2 V/m
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.326 mW/g



0 dB = 0.458mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

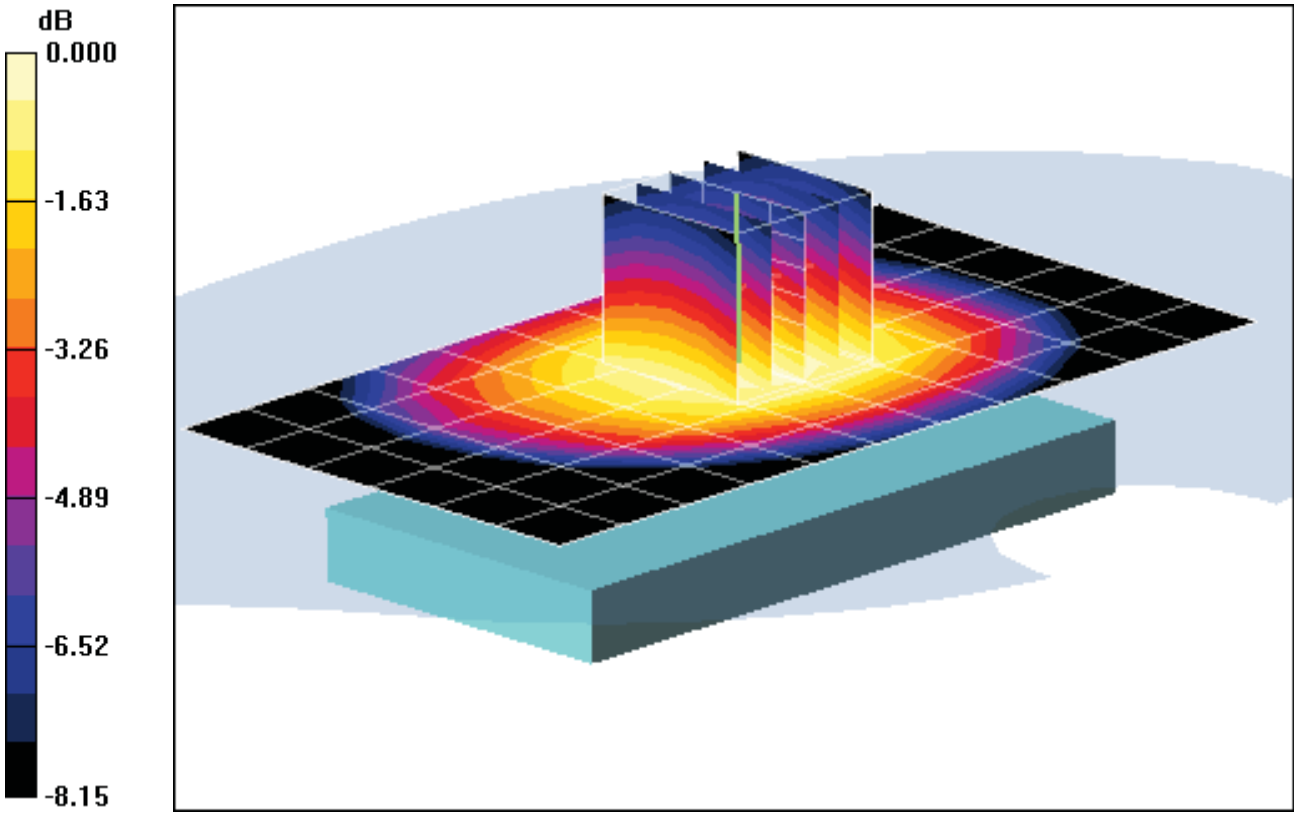
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 22H, 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 = 12.7 V/m
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.137 mW/g; SAR(10 g) = 0.105 mW/g



0 dB = 0.144mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

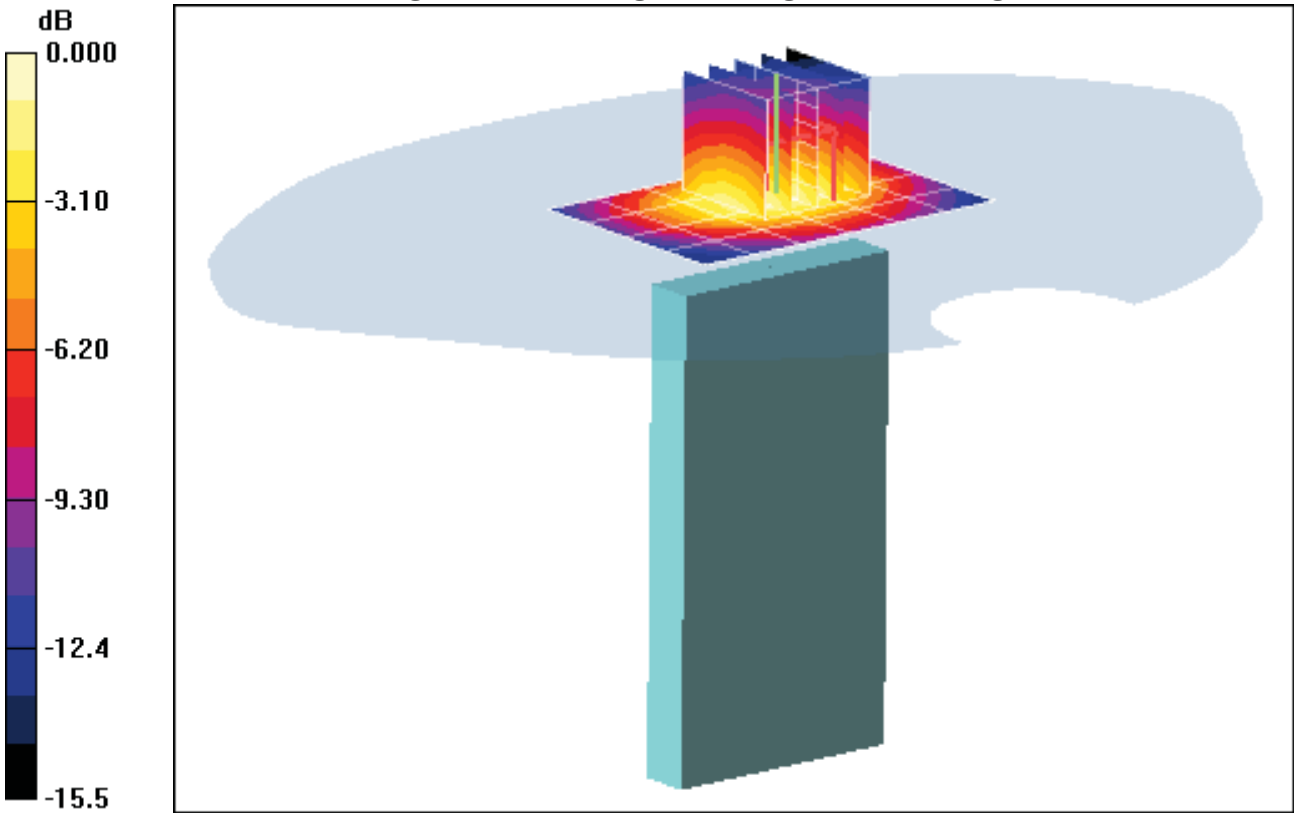
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 22H, 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 = 8.76 V/m
Peak SAR (extrapolated) = 0.132 W/kg
SAR(1 g) = 0.0735 mW/g; SAR(10 g) = 0.044 mW/g



0 dB = 0.080mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

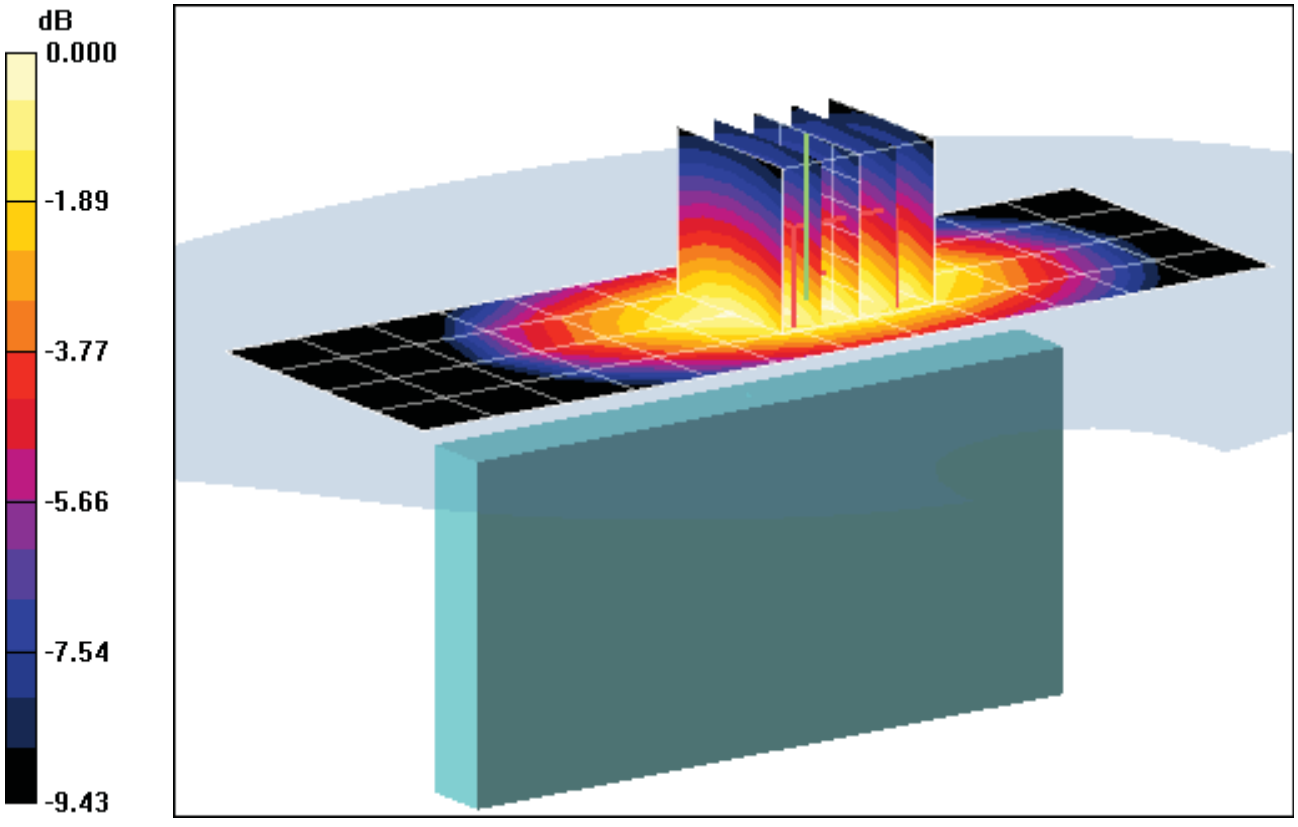
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO-FCC Rule Part 22H, 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 = 13.1 V/m
Peak SAR (extrapolated) = 0.193 W/kg
SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.149mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

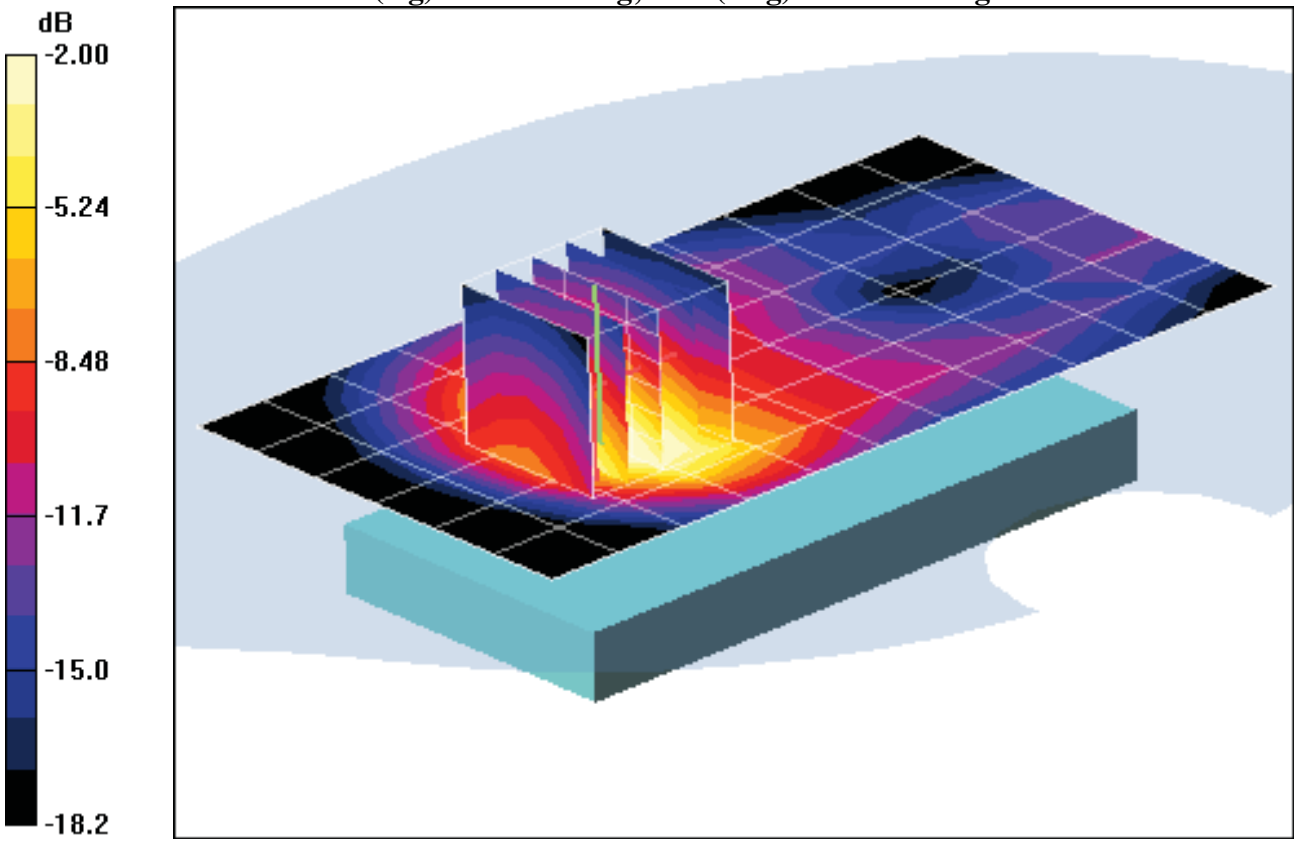
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.2 °C; Tissue Temp: 23.0 °C

Probe: ES3DV3 - SN3258; ConvF(4.75, 4.75, 4.75); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO, 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 = 21.3 V/m
Peak SAR (extrapolated) = 0.952 W/kg
SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.268 mW/g



0 dB = 0.609mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR

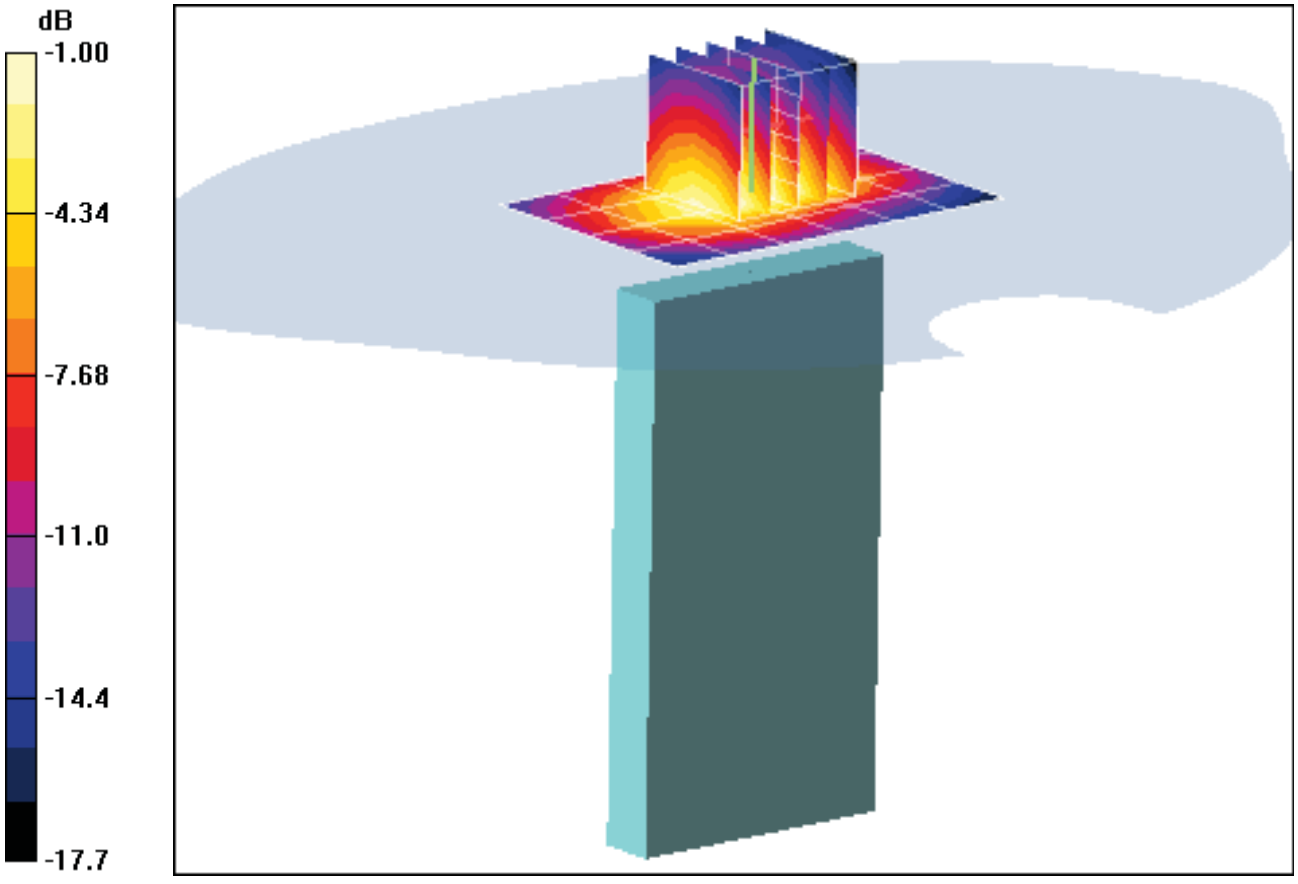
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.496 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-25-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.8 °C

Probe: ES3DV2 - SN3022; ConvF(4.34, 4.34, 4.34); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO, 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 = 15.3 V/m
Peak SAR (extrapolated) = 0.516 W/kg
SAR(1 g) = 0.326 mW/g; SAR(10 g) = 0.179 mW/g



0 dB = 0.368mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR

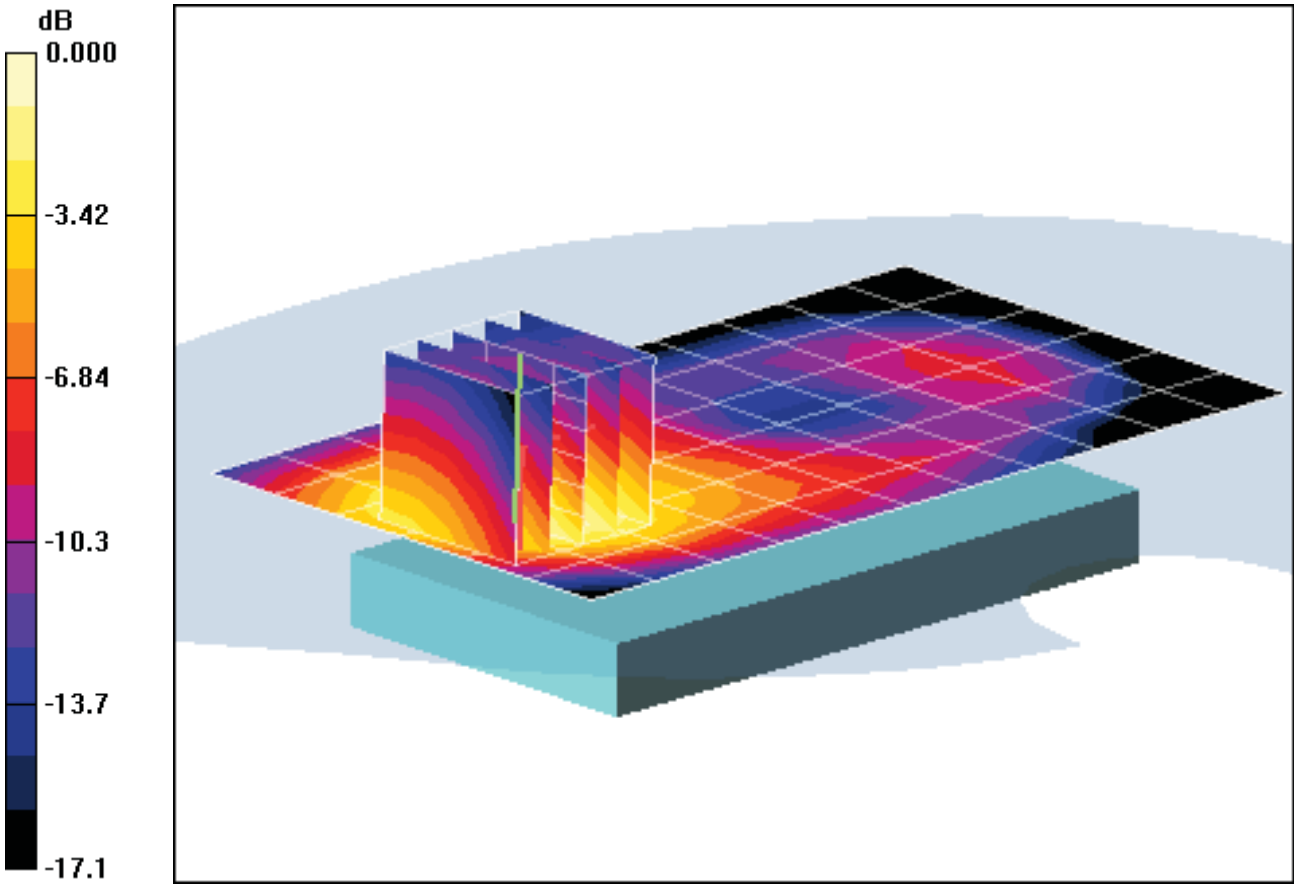
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.496 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-25-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.8 °C

Probe: ES3DV2 - SN3022; ConvF(4.34, 4.34, 4.34); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO, 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 = 11.8 V/m
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.183mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: SAR

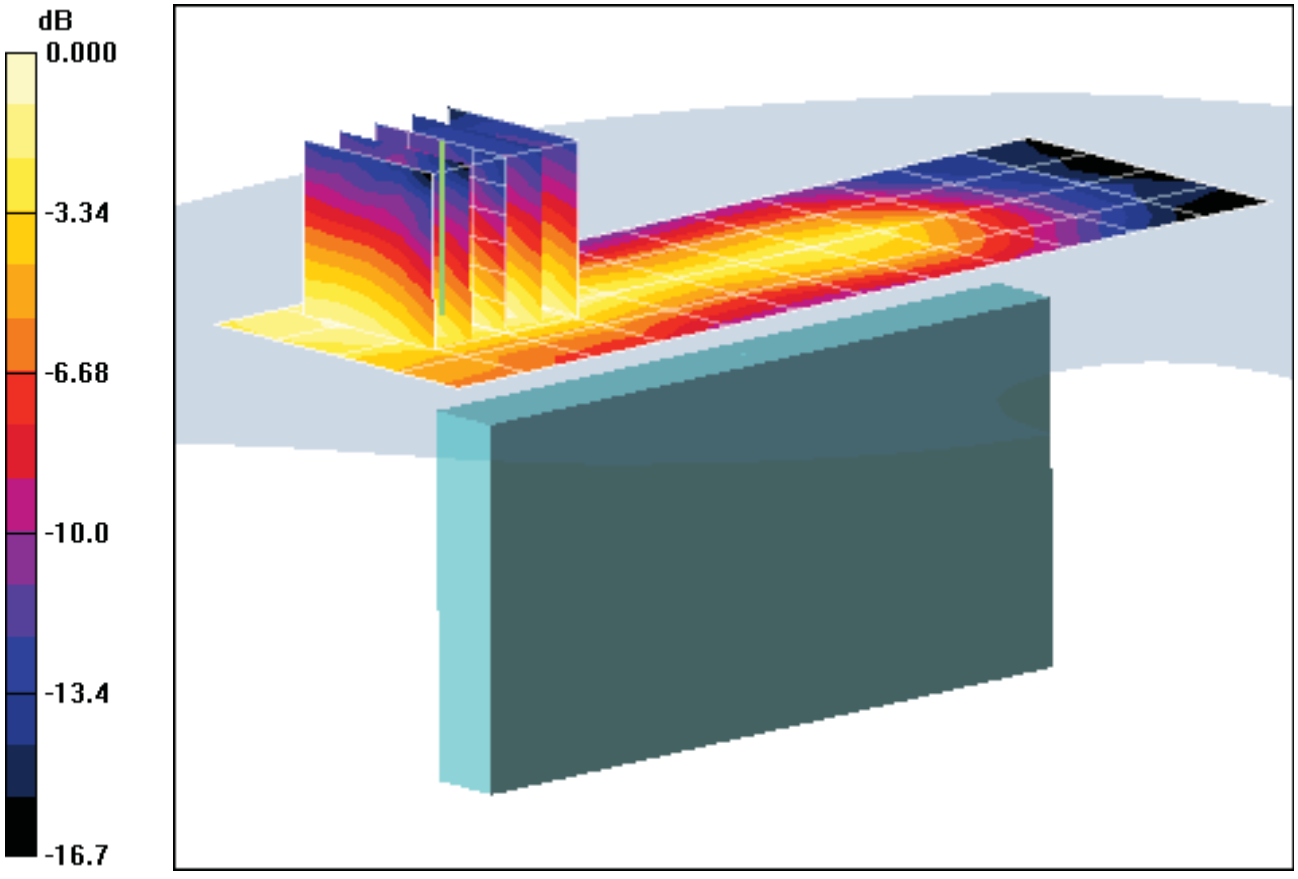
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.496 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-25-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.8 °C

Probe: ES3DV2 - SN3022; ConvF(4.34, 4.34, 4.34); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO, 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 = 6.49 V/m
Peak SAR (extrapolated) = 0.074 W/kg
SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.055mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

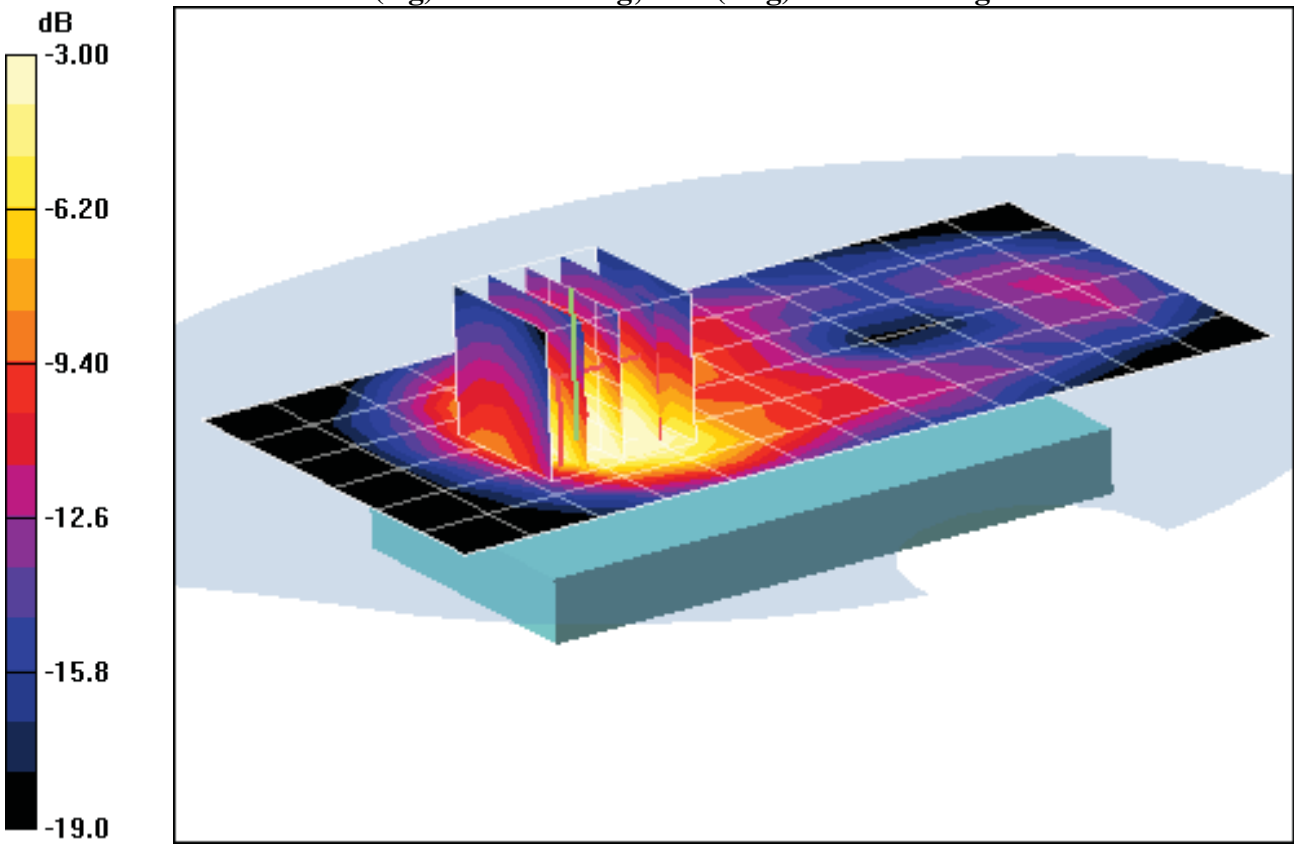
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.48 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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: PCS EVDO, Back side, Mid.ch

Area Scan (7x13x1): 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
Peak SAR (extrapolated) = 0.984 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.273 mW/g



0 dB = 0.614mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

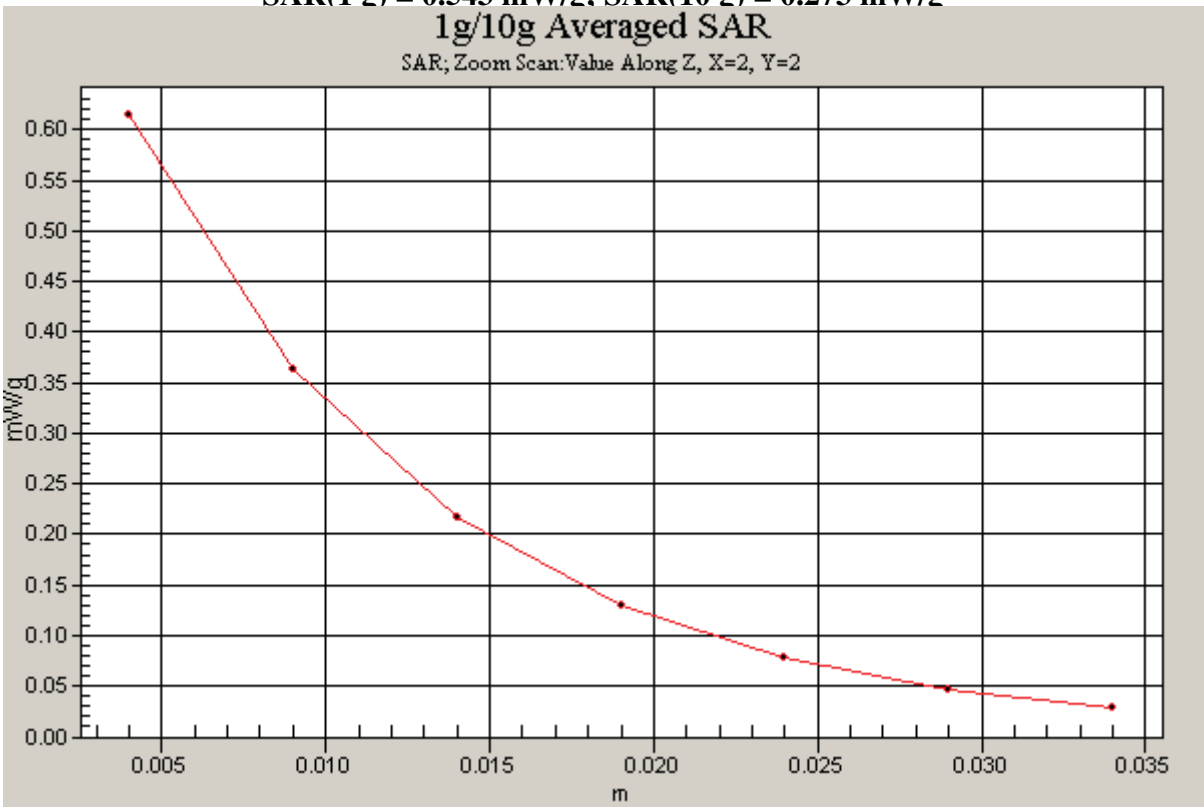
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.48 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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: PCS EVDO, Back side, Mid.ch

Area Scan (7x13x1): 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
Peak SAR (extrapolated) = 0.984 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.273 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

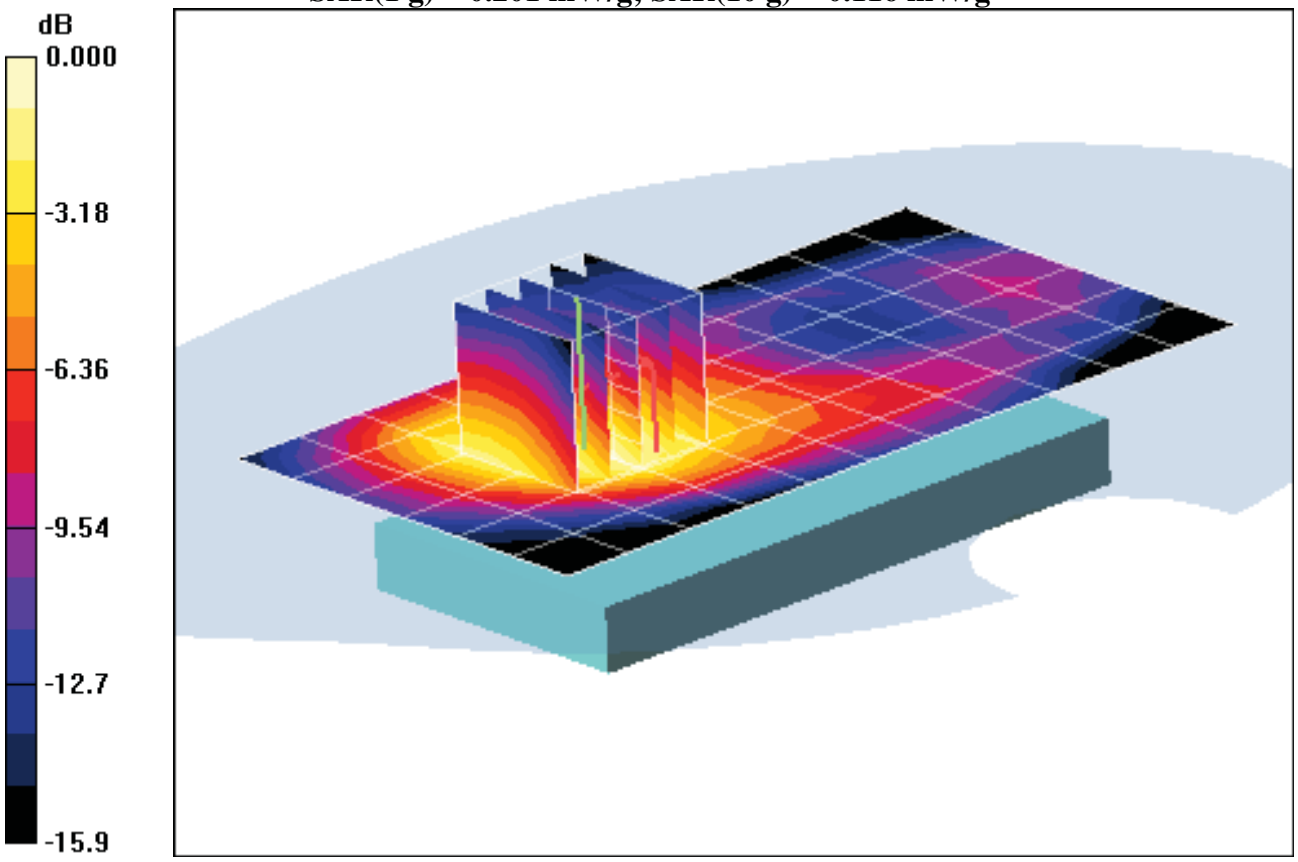
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.48 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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: PCS EVDO, 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 = 12.9 V/m
Peak SAR (extrapolated) = 0.331 W/kg
SAR(1 g) = 0.201 mW/g; SAR(10 g) = 0.116 mW/g



0 dB = 0.217mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

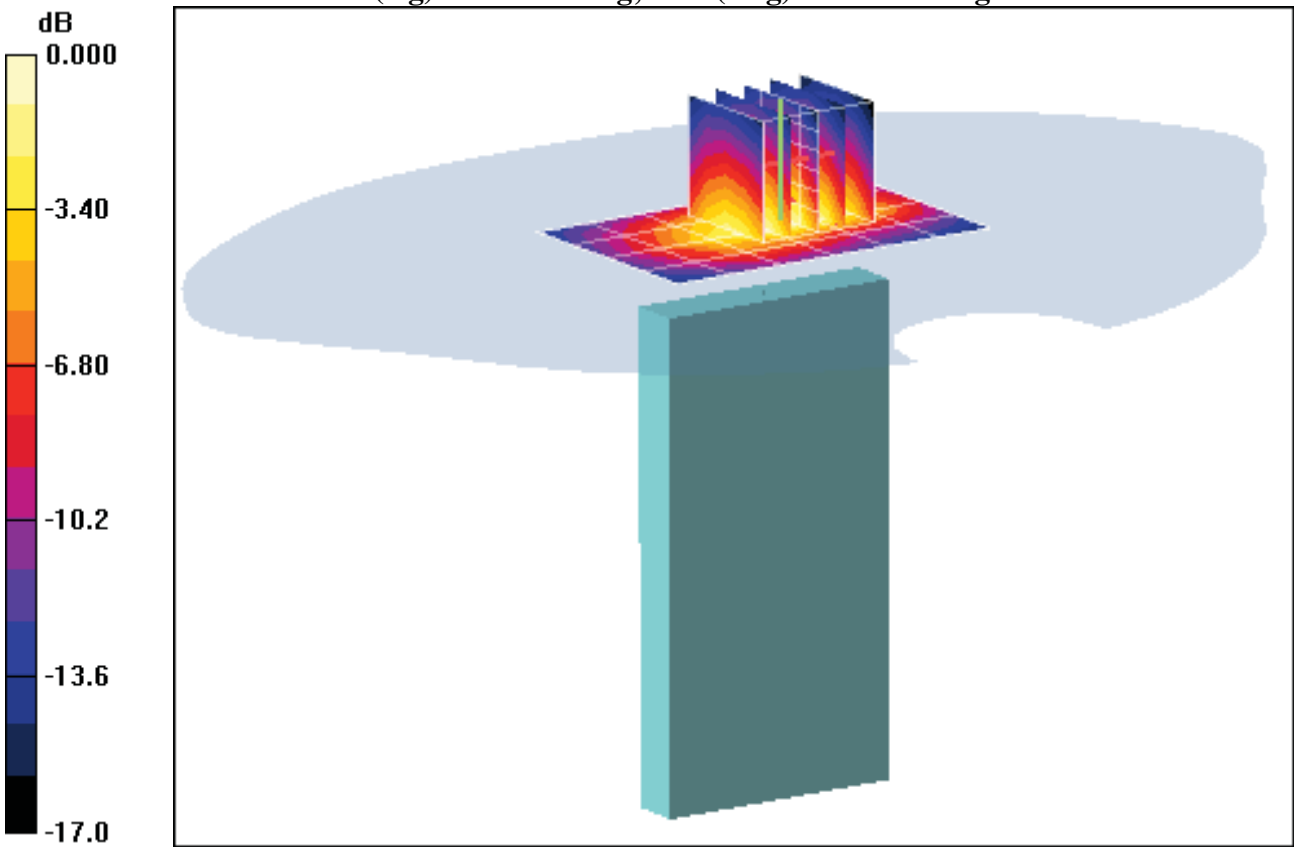
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.48 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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: PCS EVDO, 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 = 13.2 V/m
Peak SAR (extrapolated) = 0.445 W/kg
SAR(1 g) = 0.263 mW/g; SAR(10 g) = 0.144 mW/g



0 dB = 0.297mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

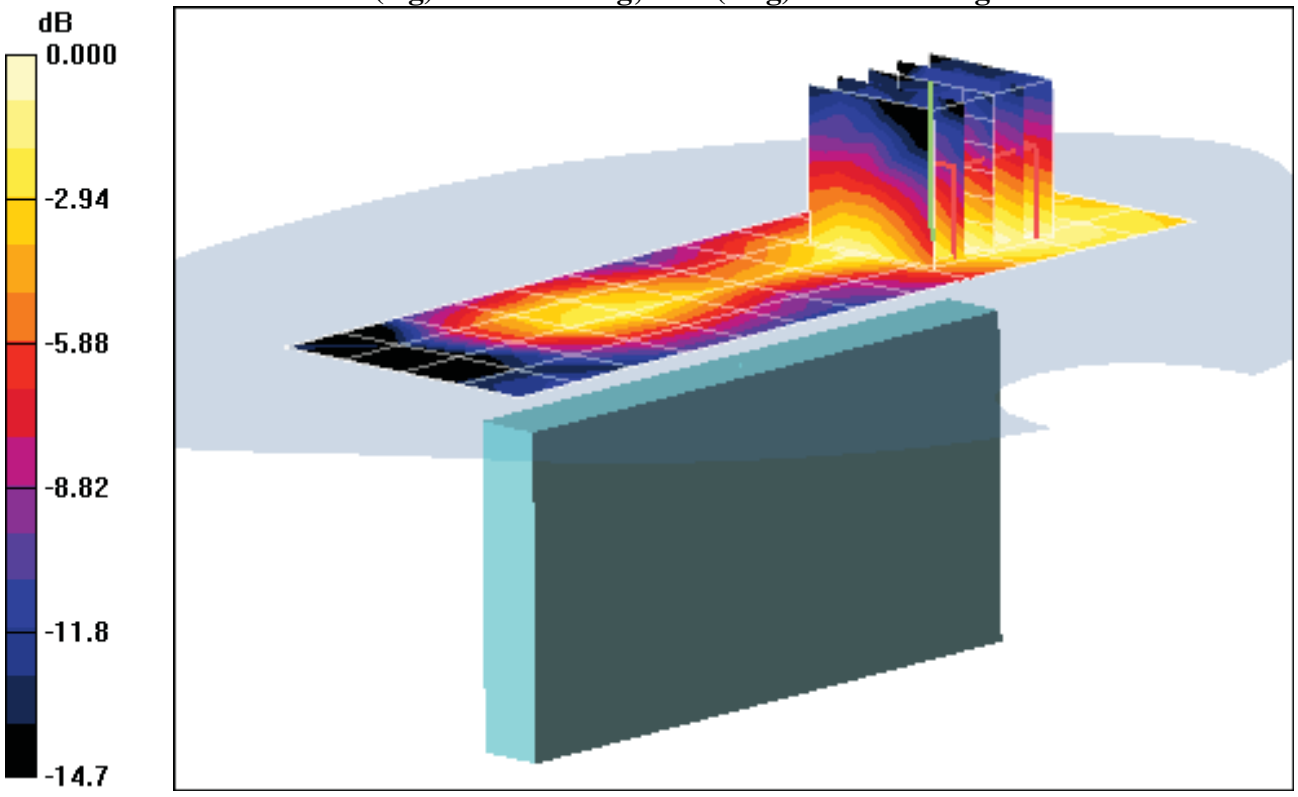
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.48 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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: PCS EVDO, 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 = 6.45 V/m
Peak SAR (extrapolated) = 0.085 W/kg
SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.057mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

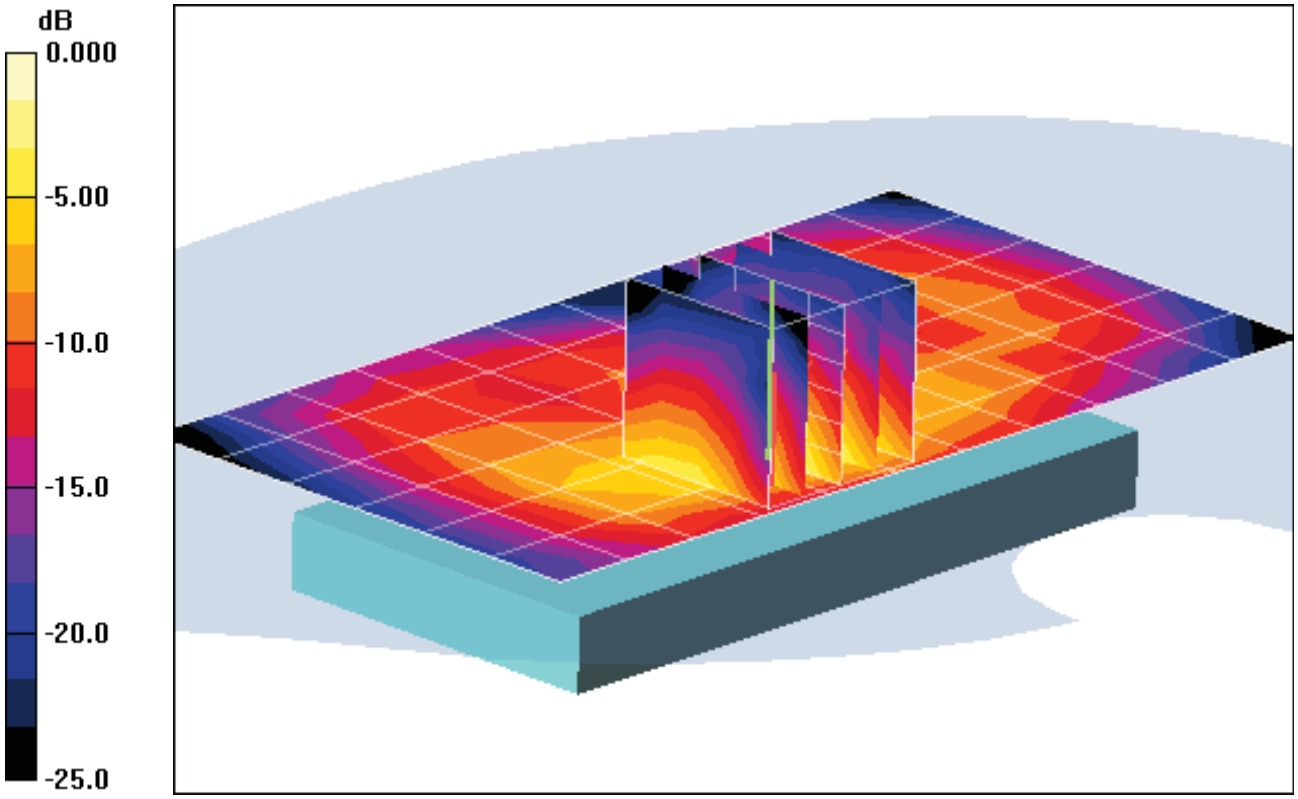
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.88 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.0 °C

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

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.78 V/m
Peak SAR (extrapolated) = 0.162 W/kg
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.036 mW/g



0 dB = 0.104mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

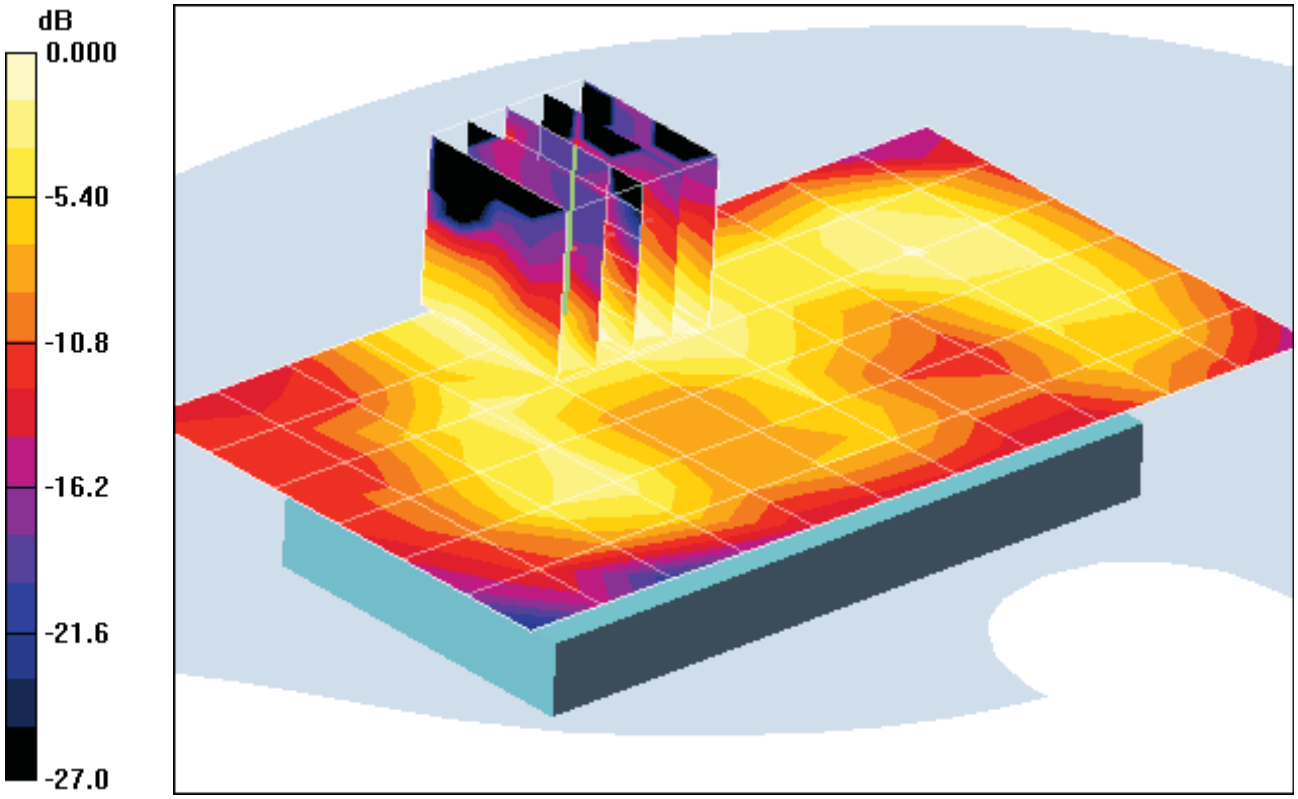
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.88 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.0 °C

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

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.32 V/m
Peak SAR (extrapolated) = 0.031 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00861 mW/g



0 dB = 0.022mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

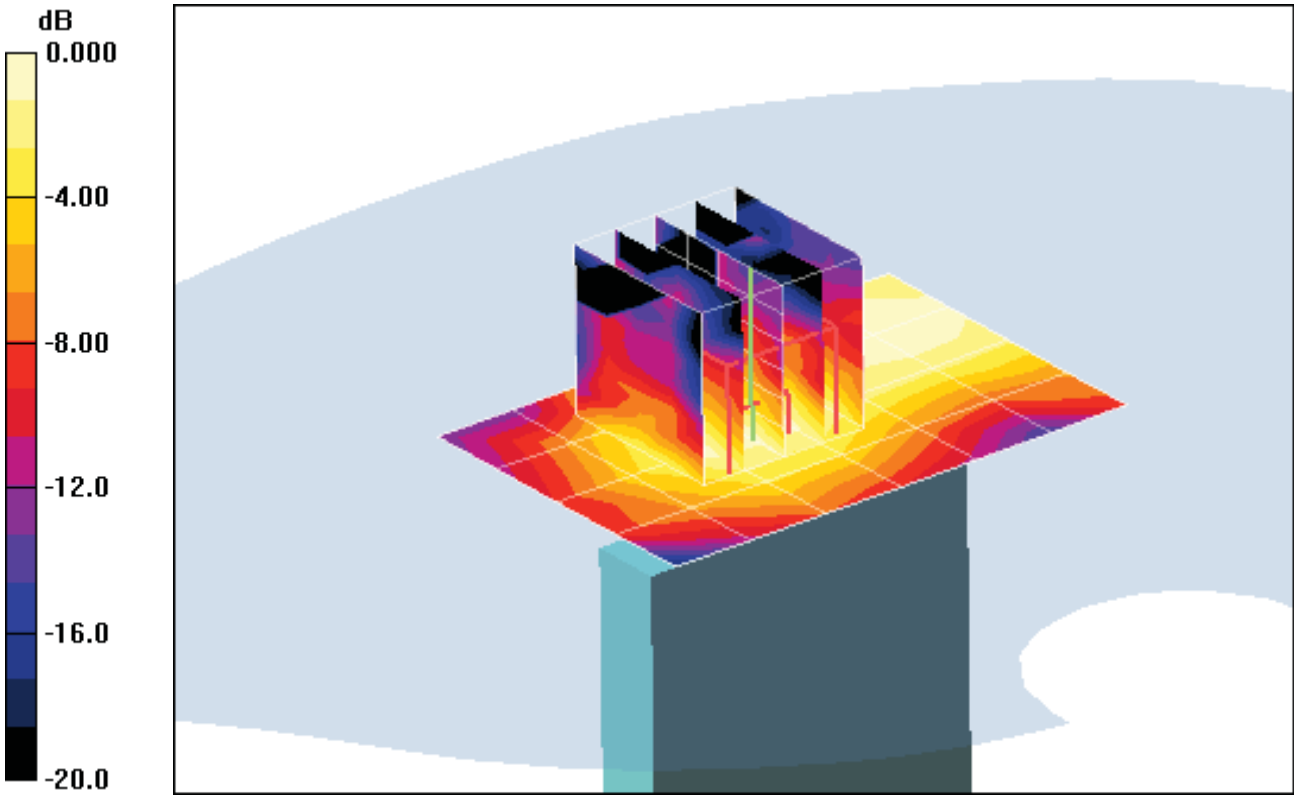
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.88 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.0 °C

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

Mode: IEEE 802.11b, Ch 06, 1 Mbps, Bottom Edge

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.90 V/m
Peak SAR (extrapolated) = 0.012 W/kg
SAR(1 g) = 0.00623 mW/g; SAR(10 g) = 0.00315 mW/g



0 dB = 0.008mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710 ; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

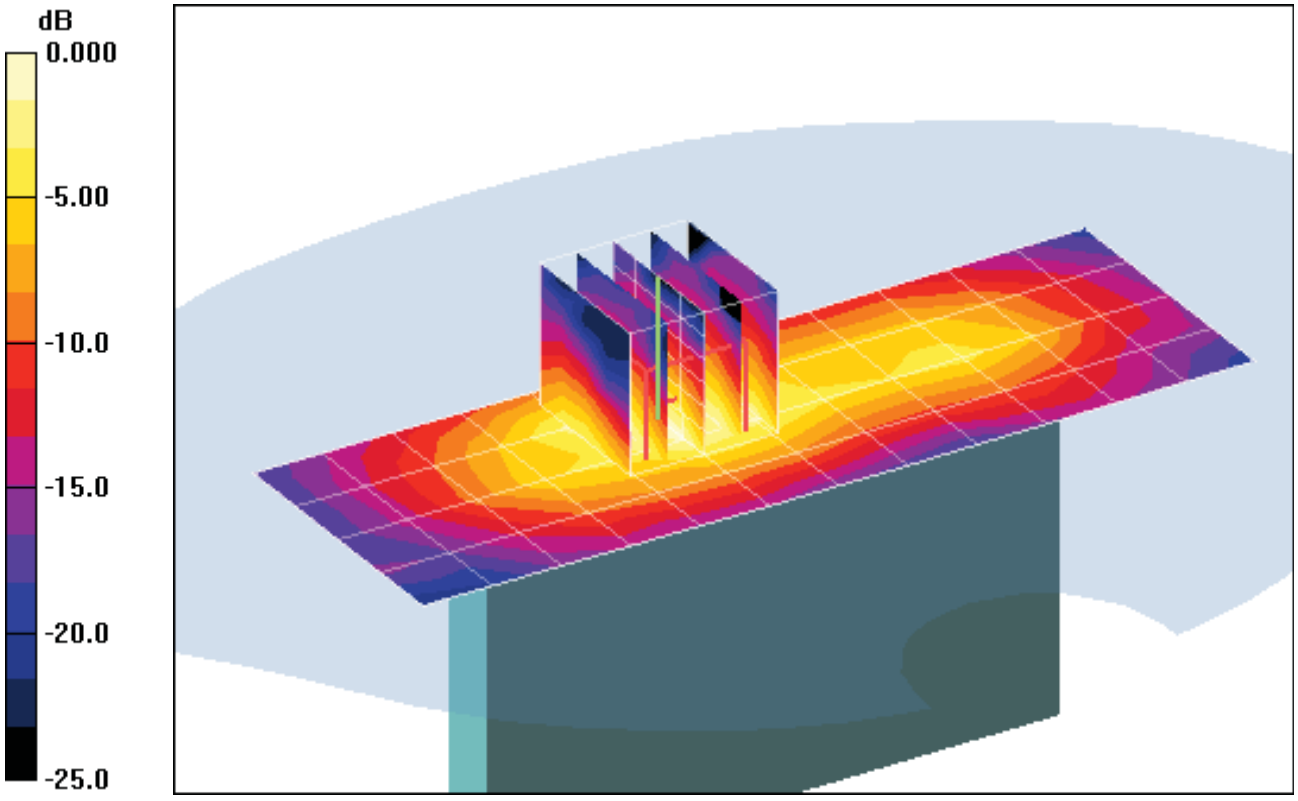
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.88 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.0 °C

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

Mode: IEEE 802.11b, Ch 06, 1 Mbps, Left 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 = 4.52 V/m
Peak SAR (extrapolated) = 0.093 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.022 mW/g



0 dB = 0.060mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

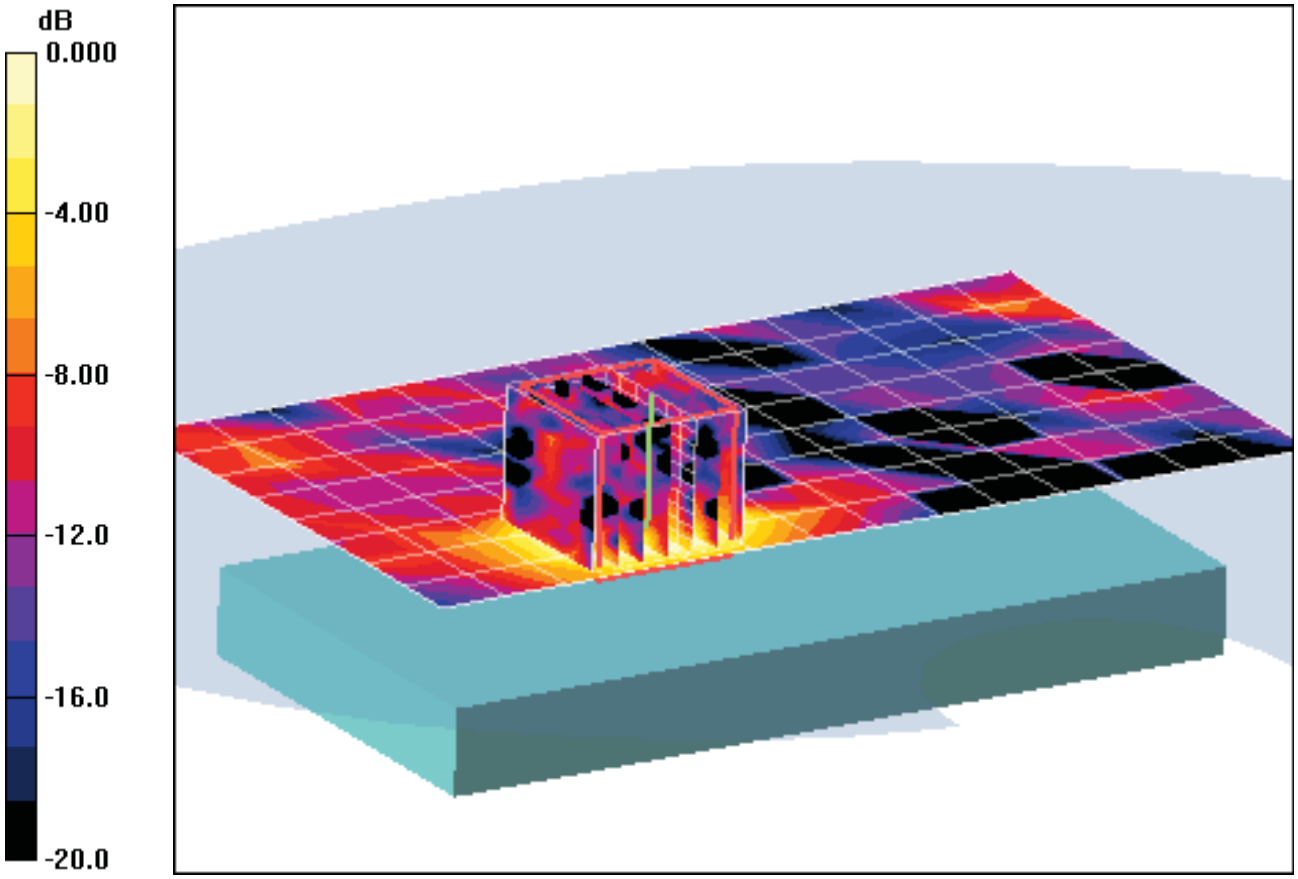
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5180 MHz; σ = 5.38 mho/m; ε_r = 47.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.58, 3.58, 3.58); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.2 GHz, Ch 36, 6 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.71 V/m
Peak SAR (extrapolated) = 0.319 W/kg
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.010 mW/g



0 dB = 0.072mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

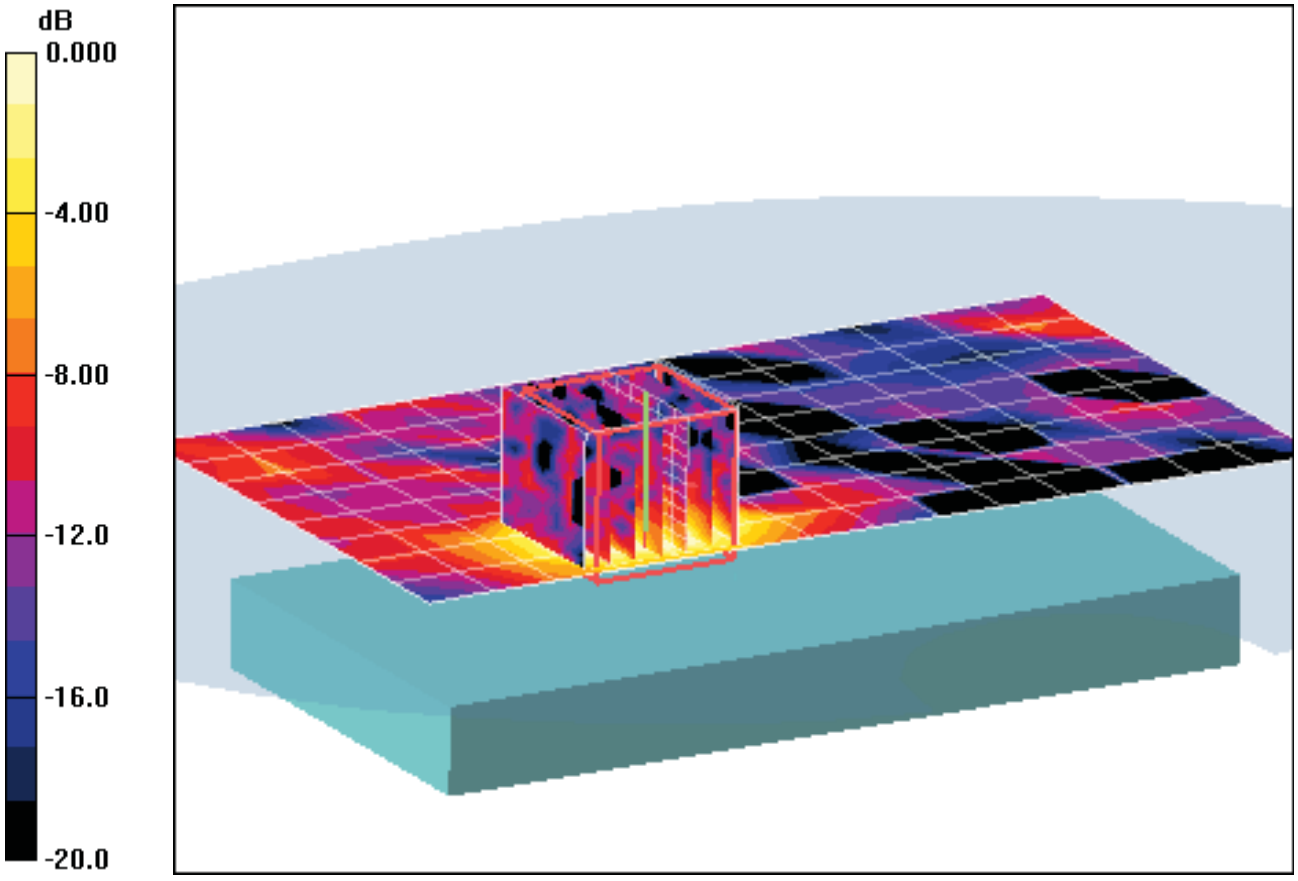
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5260 MHz; σ = 5.51 mho/m; ε_r = 47; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.31, 3.31, 3.31); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.3 GHz, Ch52, 6 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.52 V/m
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.00877 mW/g



0 dB = 0.077mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

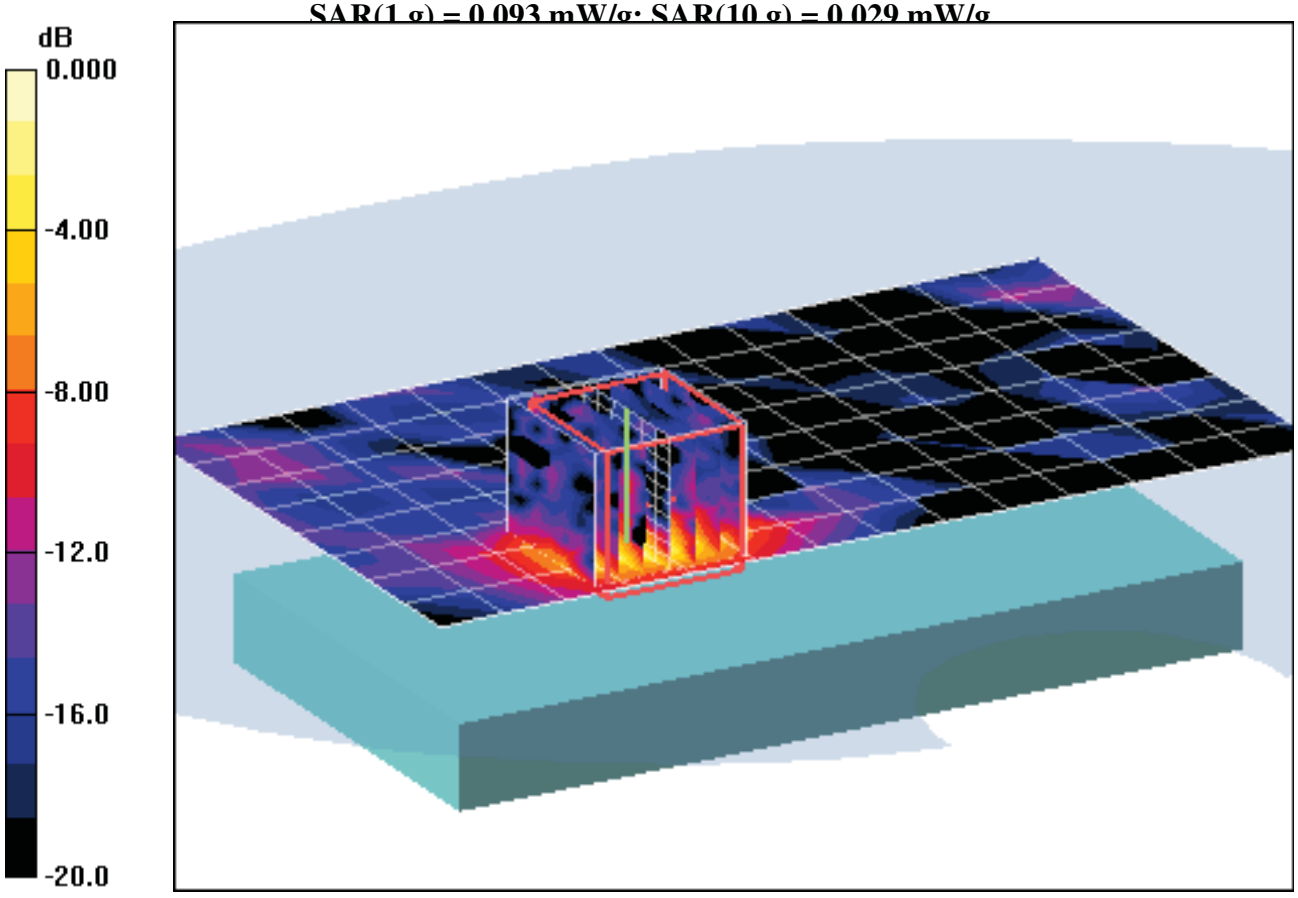
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5700 MHz; σ = 6.15 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.5 GHz, Ch 140, 6 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.57 V/m
Peak SAR (extrapolated) = 0.376 W/kg
SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.029 mW/g



0 dB = 0.213mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

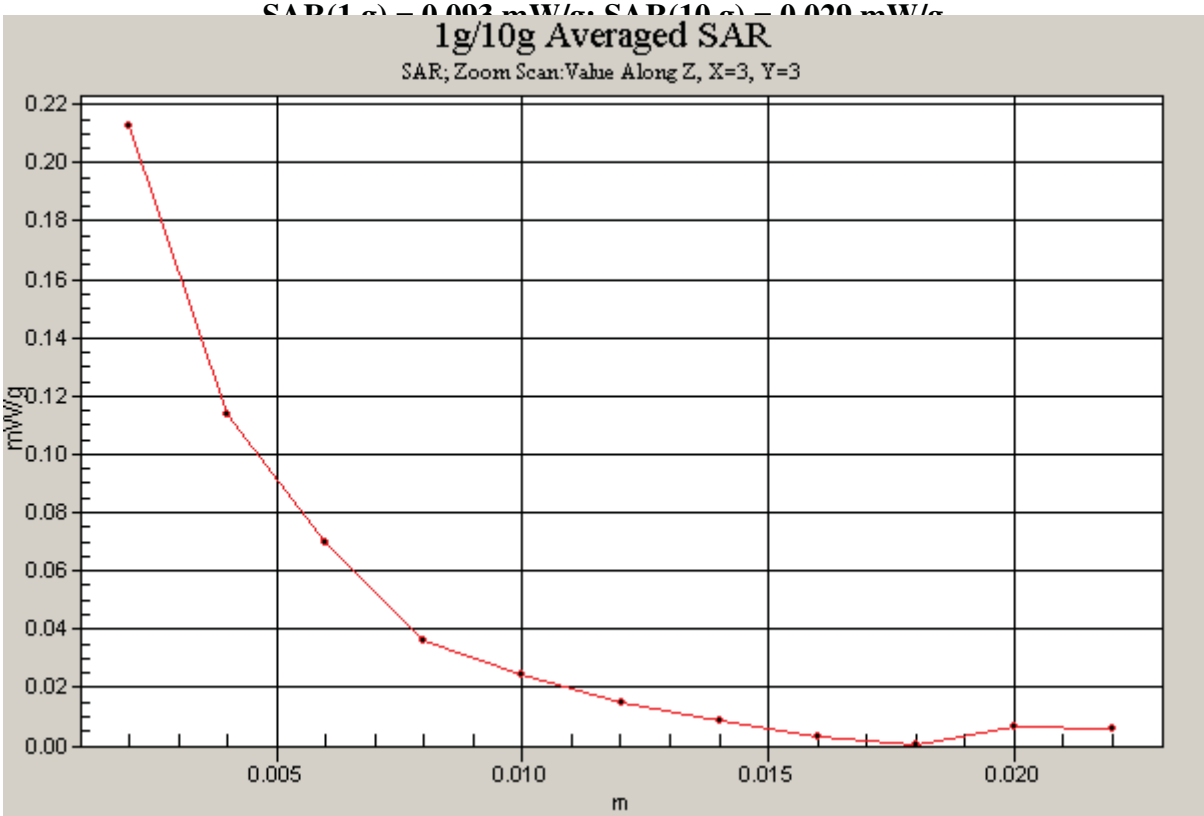
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5700 MHz; σ = 6.15 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.5 GHz, Ch 140, 6 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.57 V/m
Peak SAR (extrapolated) = 0.376 W/kg
SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.029 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone
with WLAN, WIMAX and Bluetooth; Serial: 90

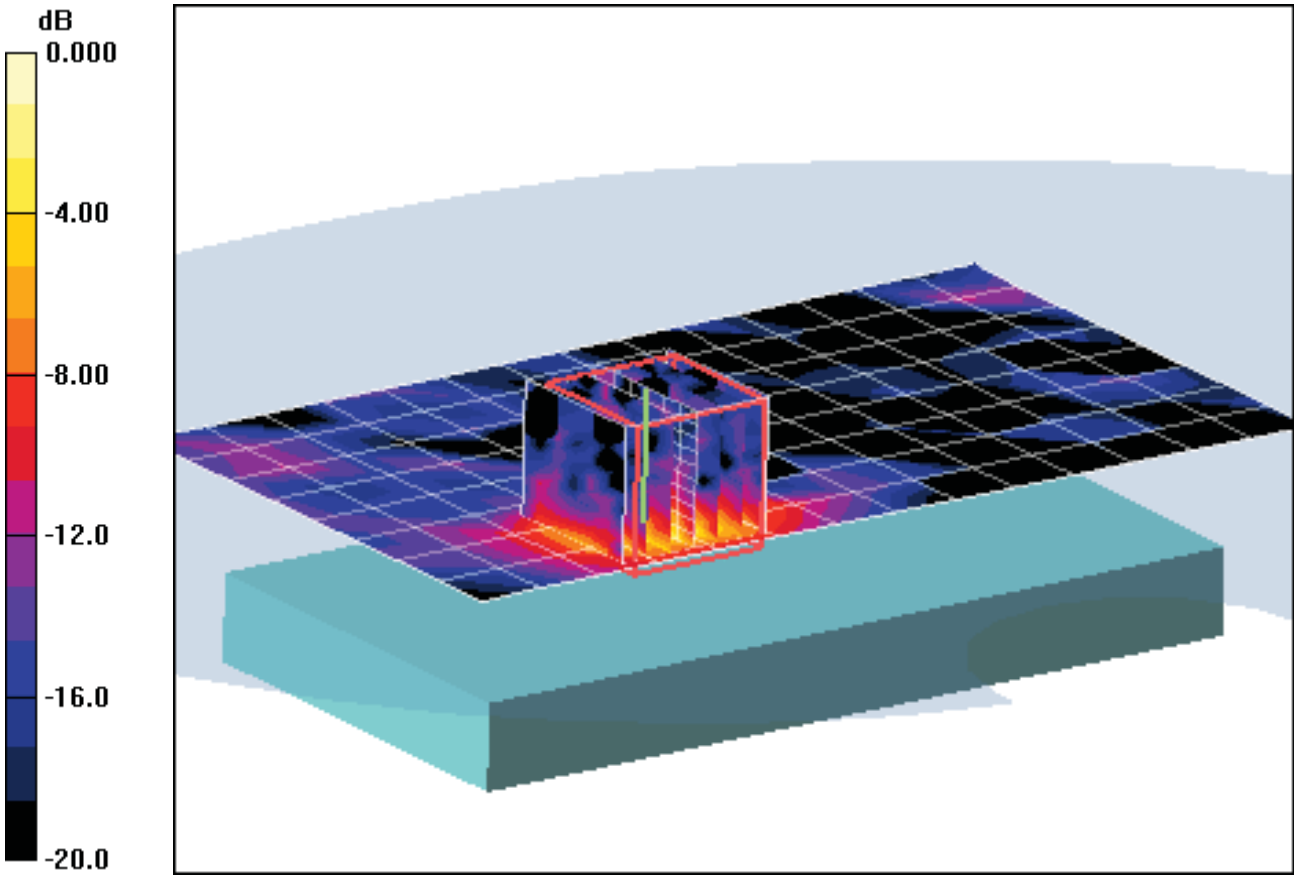
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5745 MHz; σ = 6.22 mho/m; ε_r = 46; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.29, 3.29, 3.29); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.8 GHz, Ch 149, 6 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.23 V/m
Peak SAR (extrapolated) = 0.529 W/kg
SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.029 mW/g



0 dB = 0.208mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

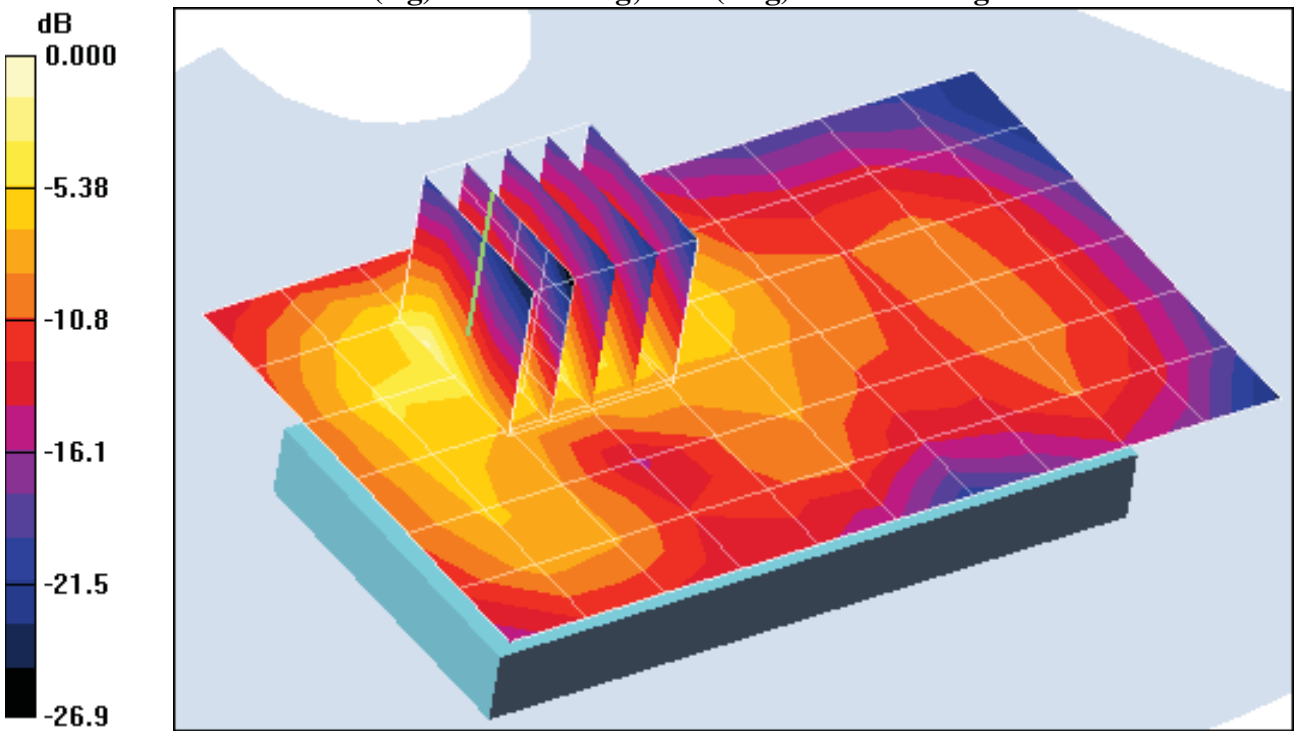
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Body; Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.2 °C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Mid Ch., PUSC, QPSK, 5MHz BW, Back Side

Area Scan (7x11x1): 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
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.499 mW/g; SAR(10 g) = 0.231 mW/g



0 dB = 0.683mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

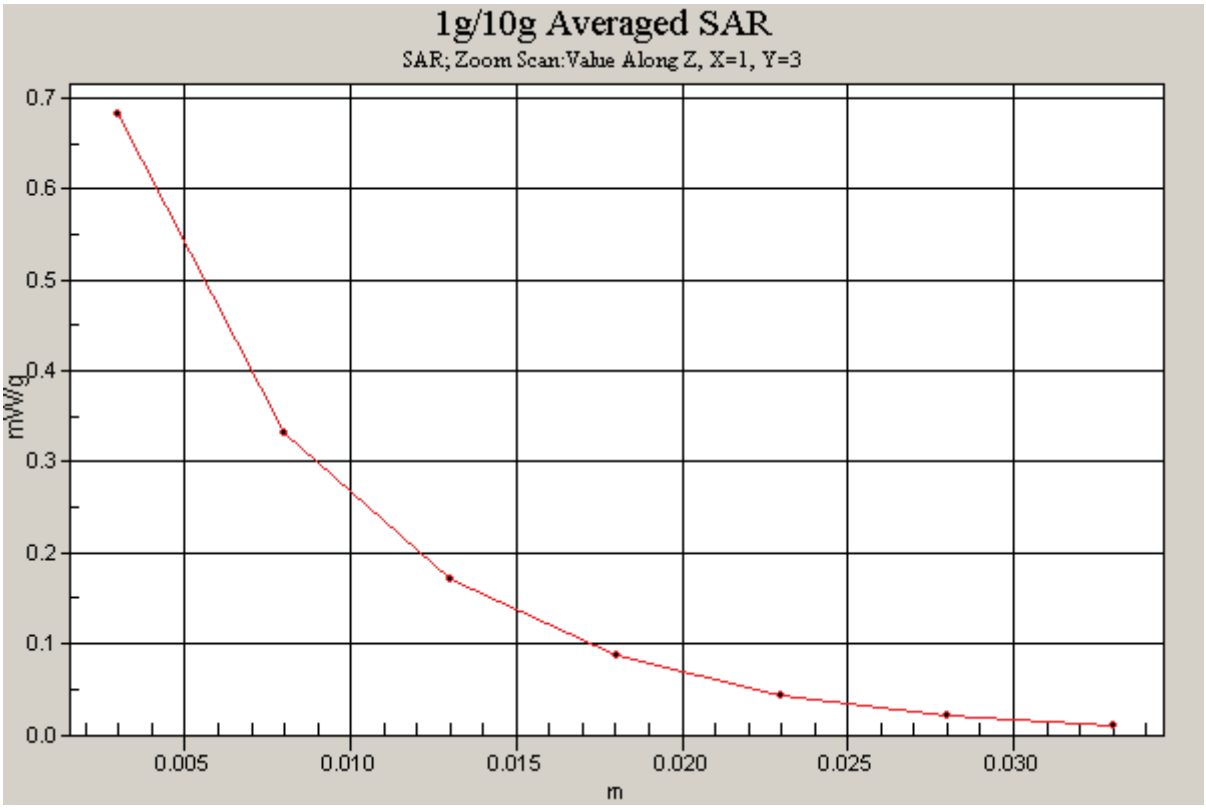
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.2 °C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Mid Ch., PUSC, QPSK, 5 MHz BW, Back Side

Area Scan (7x11x1): 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
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.499 mW/g; SAR(10 g) = 0.231 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

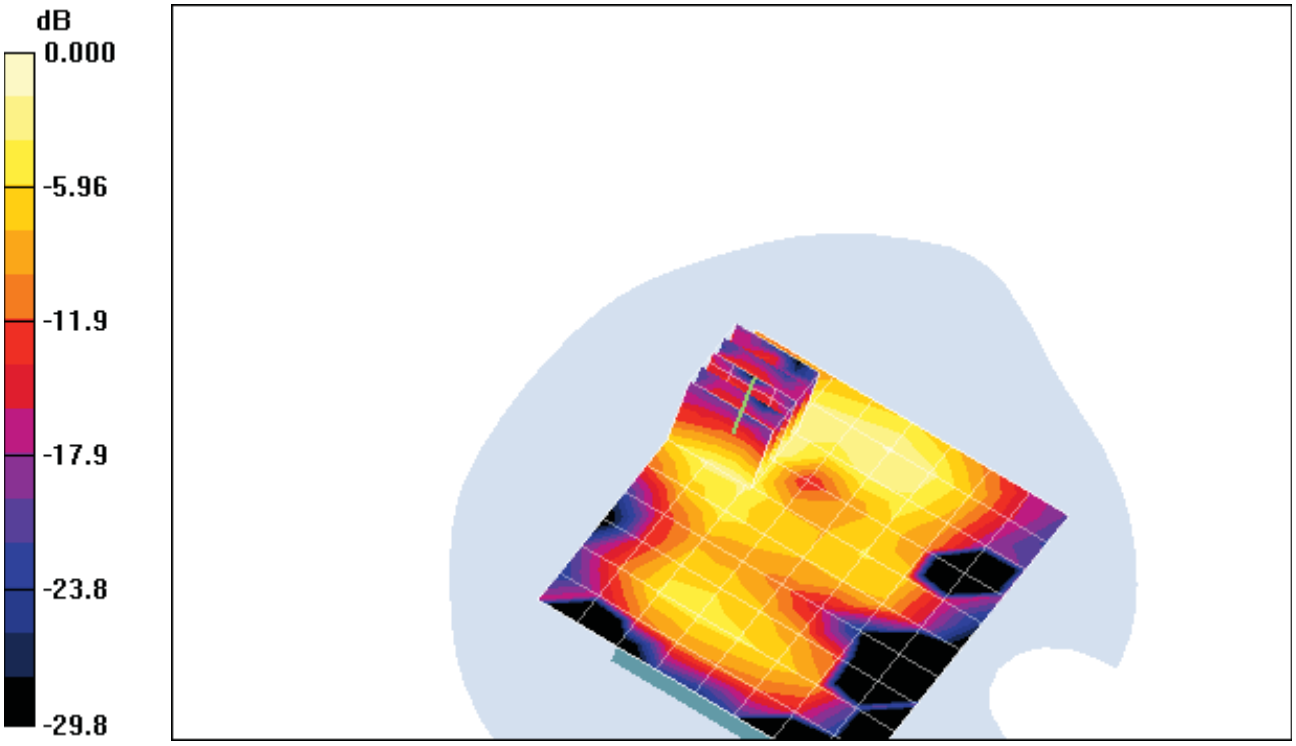
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.2 °C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Mid Ch., PUSC, QPSK, 10 MHz BW, Front Side

Area Scan (9x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.87 V/m
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.034 mW/g



0 dB = 0.088mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

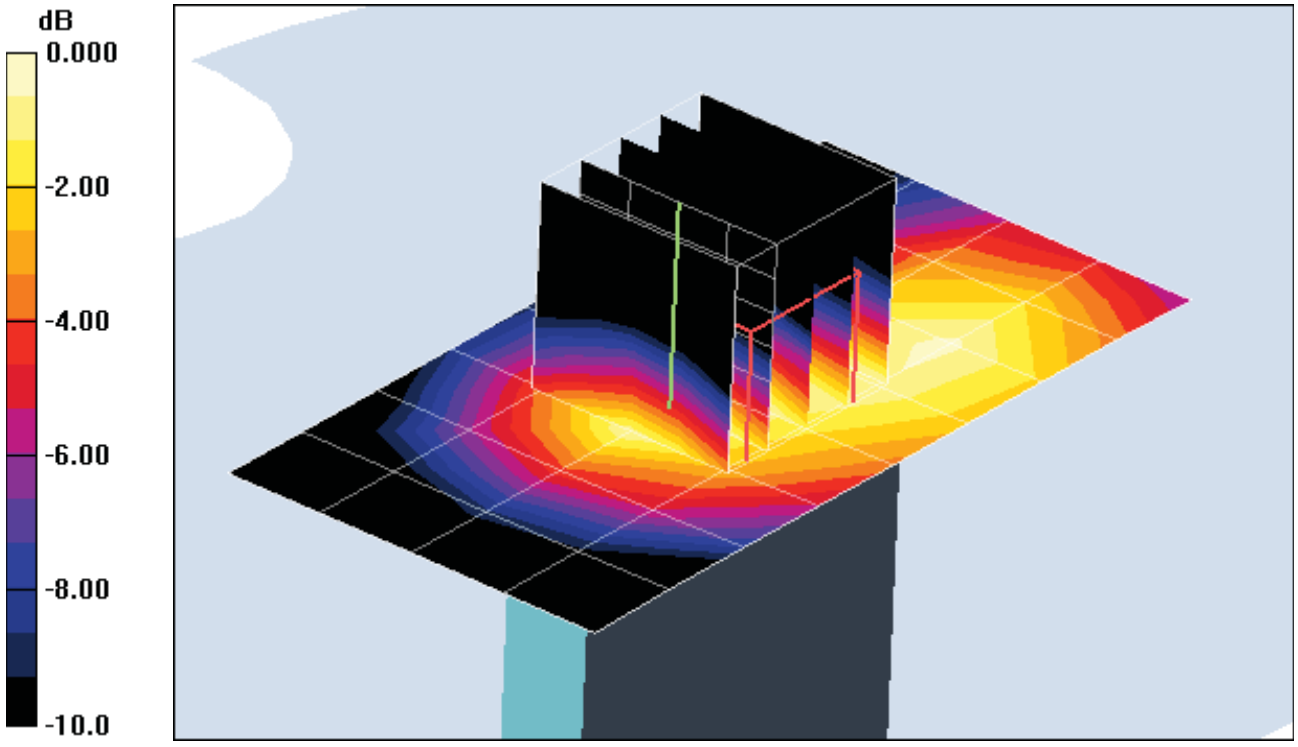
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.2 °C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Mid Ch., PUSC, QPSK, 5 MHz BW, Top Edge

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.12 V/m
Peak SAR (extrapolated) = 0.106 W/kg
SAR(1 g) = 0.053 mW/g; SAR(10 g) = 0.028 mW/g



0 dB = 0.063mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSPHD710; Type: Cellular/PCS CDMA/EVDO Phone with WLAN, WIMAX and Bluetooth; Serial: 94

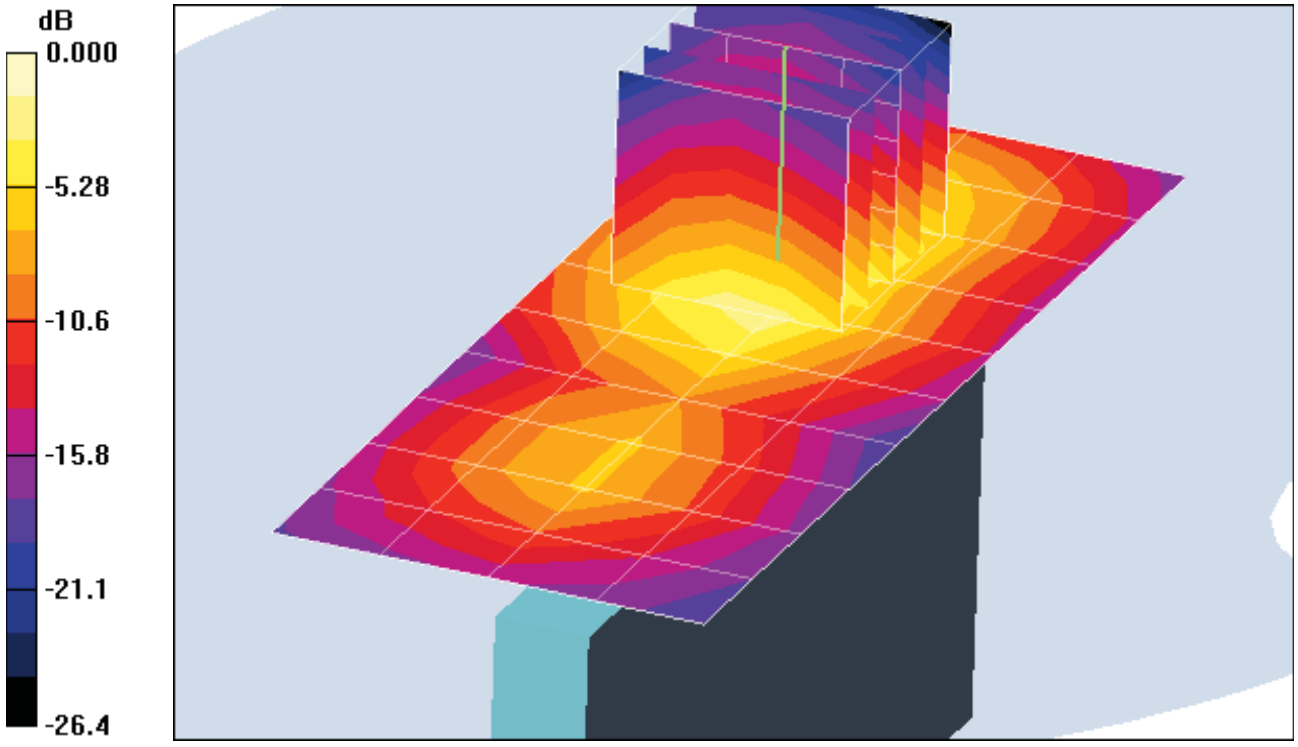
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.2 °C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WIMAX, Mid Ch., PUSC, QPSK, 10 MHz BW, Left Side

Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.0 V/m
Peak SAR (extrapolated) = 0.599 W/kg
SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.131 mW/g



0 dB = 0.350mW/g

APPENDIX B: DIPOLE VALIDATION

PCTEST ENGINEERING LABORATORY, INC.

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

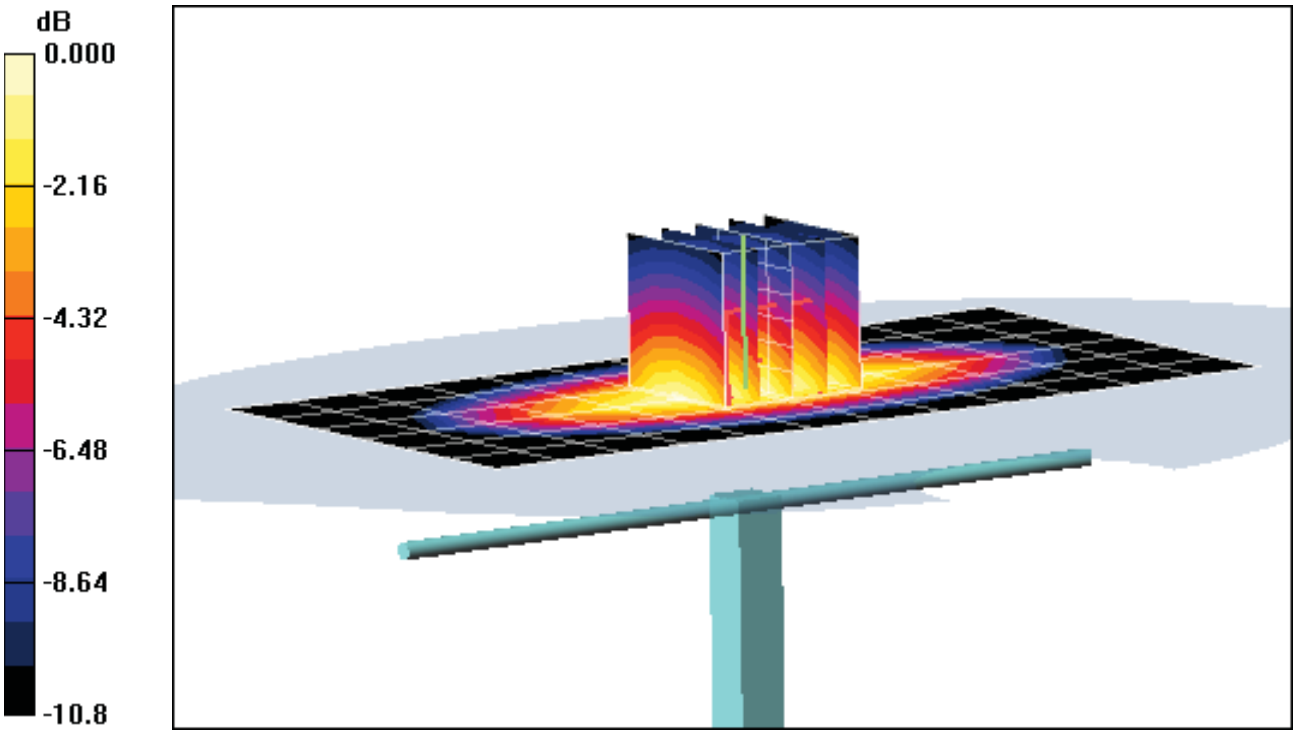
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.863 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-12-2011; Ambient Temp: 23.5 °C; Tissue Temp: 21.8 °C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM 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) = 0.933 mW/g; SAR(10 g) = 0.606 mW/g
Deviation = -2.10 %



0 dB = 1.01mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

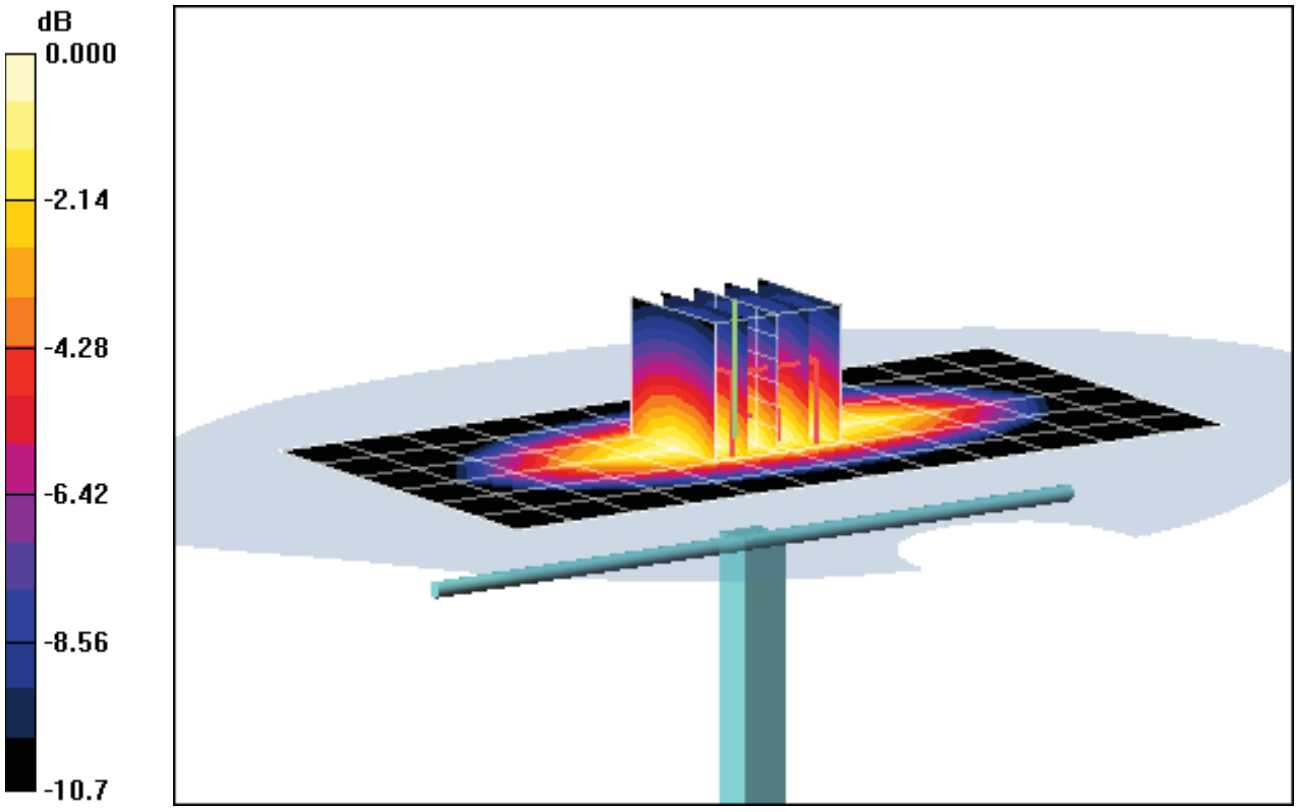
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.927 mho/m; ε_r = 43.35; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-13-2011; Ambient Temp: 24.0 °C; Tissue Temp: 22.2 °C

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

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 0.951 mW/g; SAR(10 g) = 0.621 mW/g
Deviation = -0.21 %



0 dB = 1.03mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

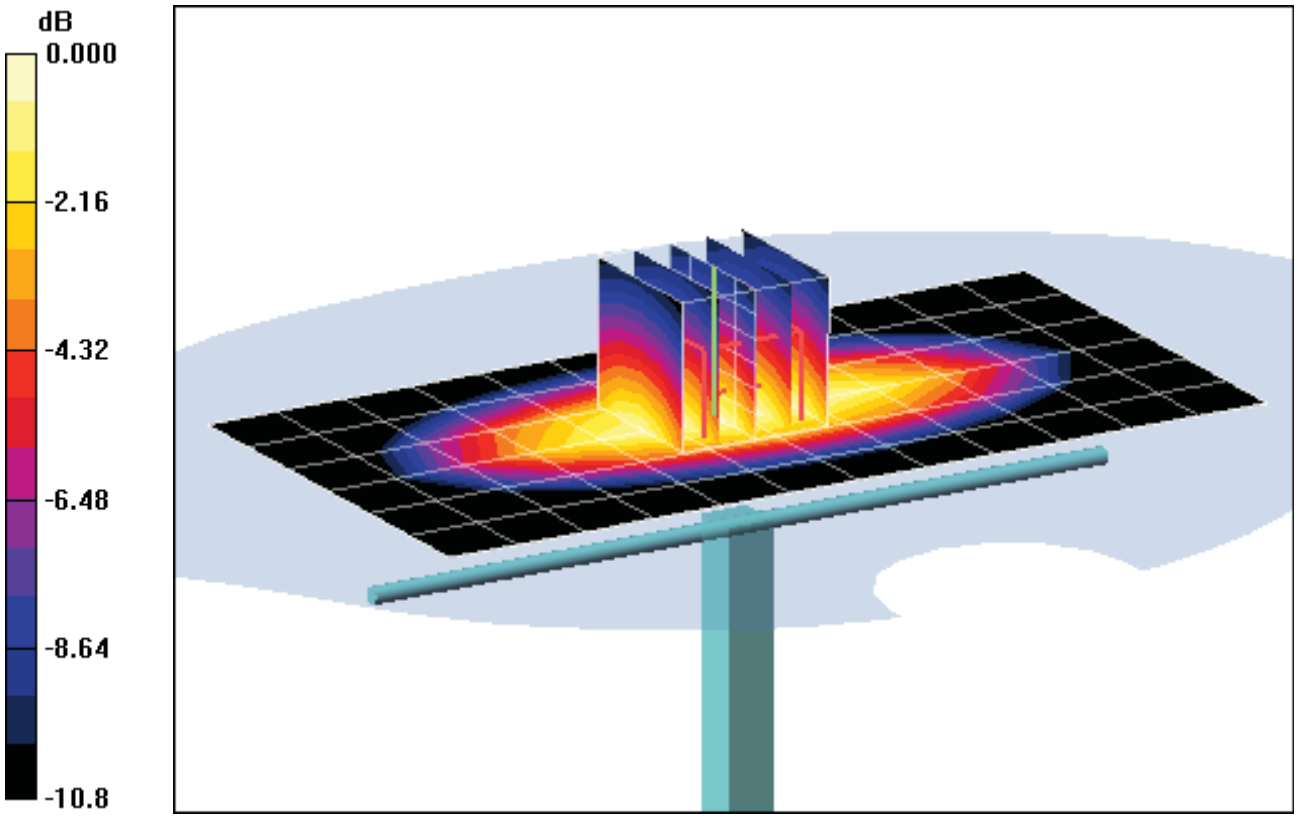
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used:
f = 835 MHz; σ = 0.989 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-11-2011; Ambient Temp: 24 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(5.89, 5.89, 5.89); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
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 = 24 dBm (250 mW)
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g
Deviation = -0.51 %



0 dB = 2.64mW/g

PCTEST ENGINEERING LABORATORY, INC.

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 = 0.97 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3

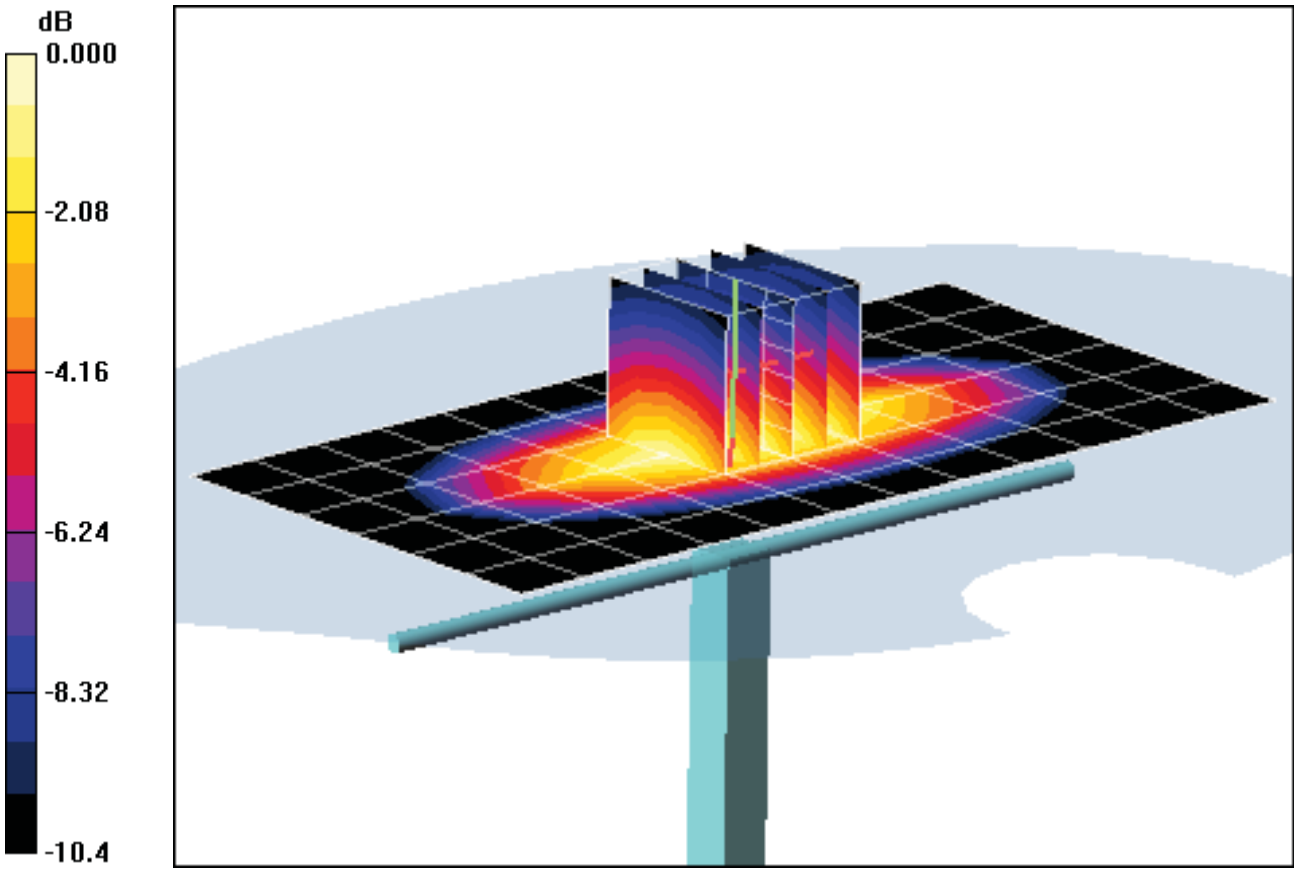
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-09-2011; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

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

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) = 0.939 mW/g; SAR(10 g) = 0.616 mW/g
Deviation = -4.67 %



0 dB = 1.02mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

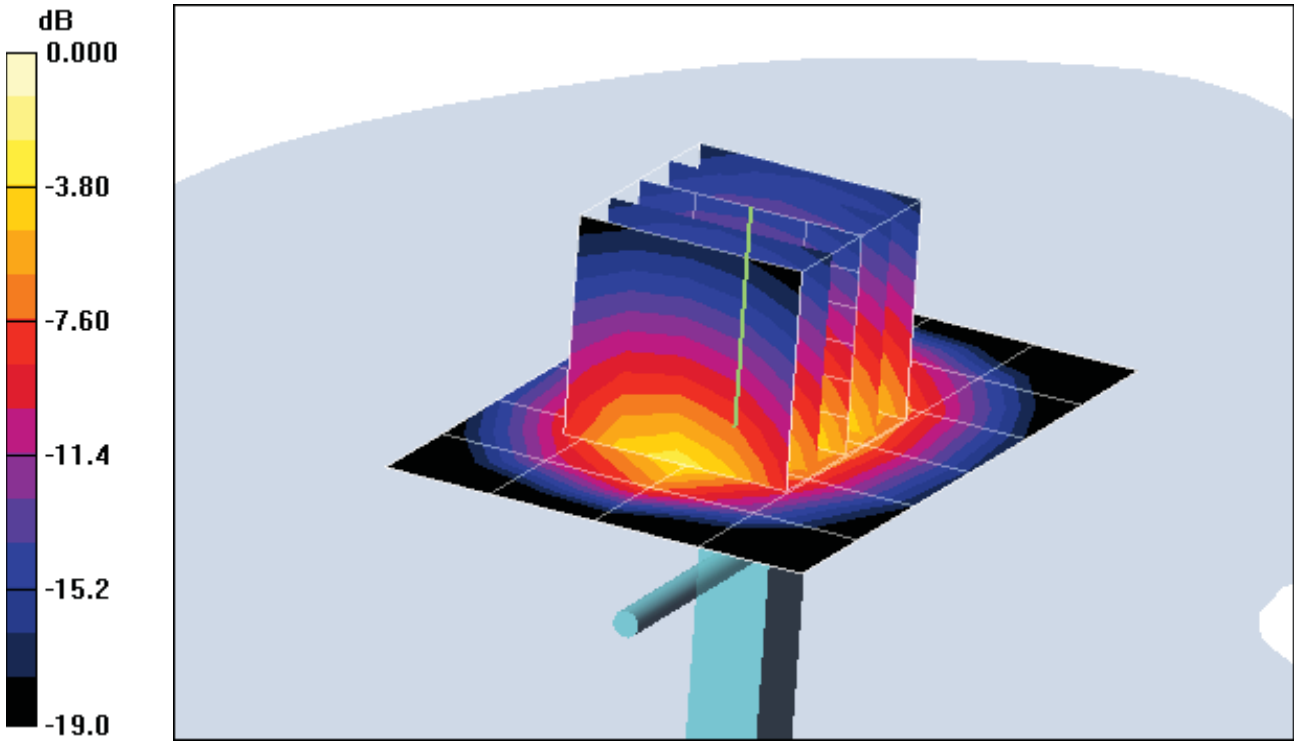
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.45 mho/m; ε_r = 38.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.1° C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3258; ConvF(5.15, 5.15, 5.15); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
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 = 16.0 dBm (40 mW)
SAR(1 g) = 1.63 mW/g; SAR(10 g) = 0.835 mW/g
Deviation = 1.37 %



0 dB = 1.80mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

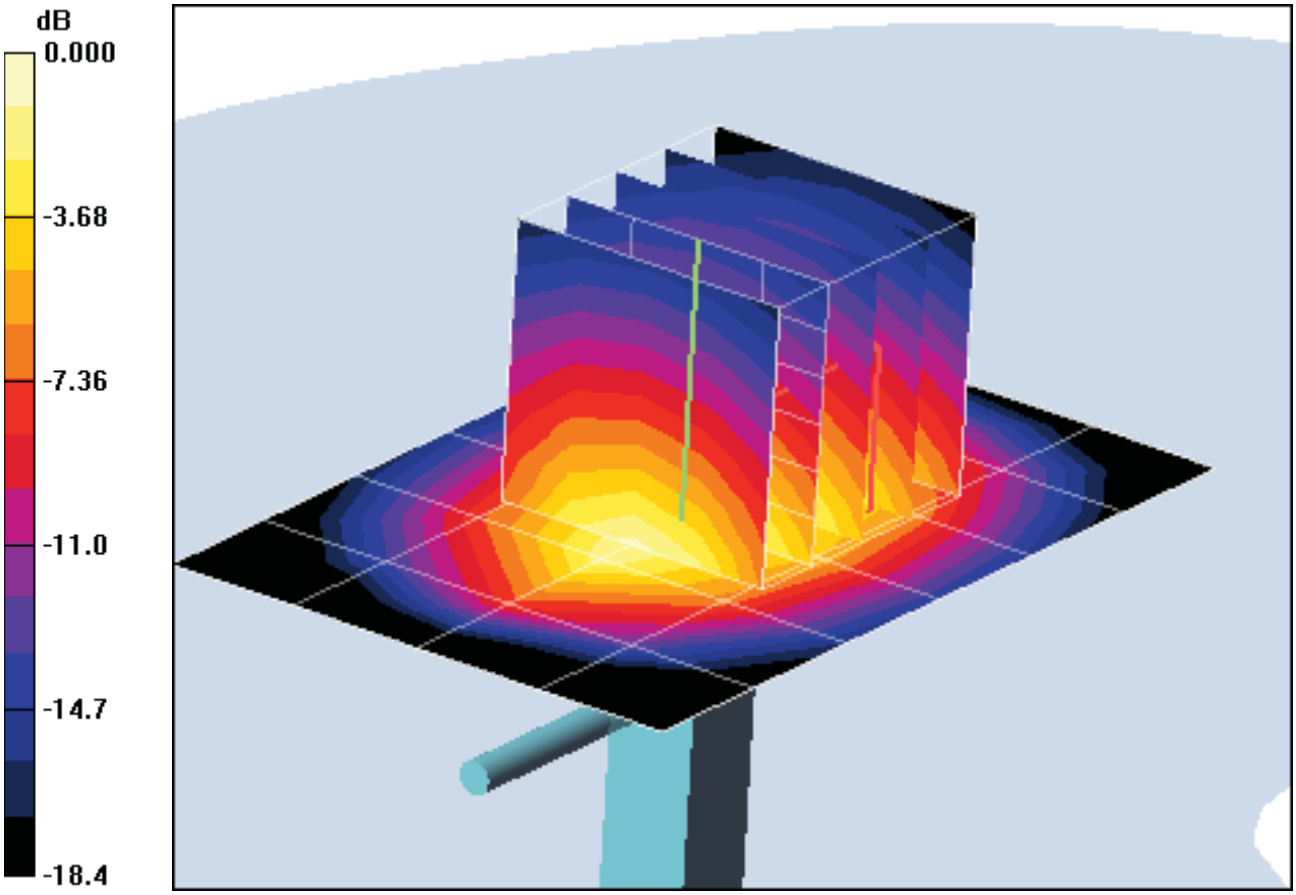
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.43 mho/m; ε_r = 40.74; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-13-2011; Ambient Temp: 24.5°C; Tissue Temp: 22.9°C

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

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 4.02 mW/g; SAR(10 g) = 2.1 mW/g
Deviation = 0.25 %



0 dB = 4.40mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

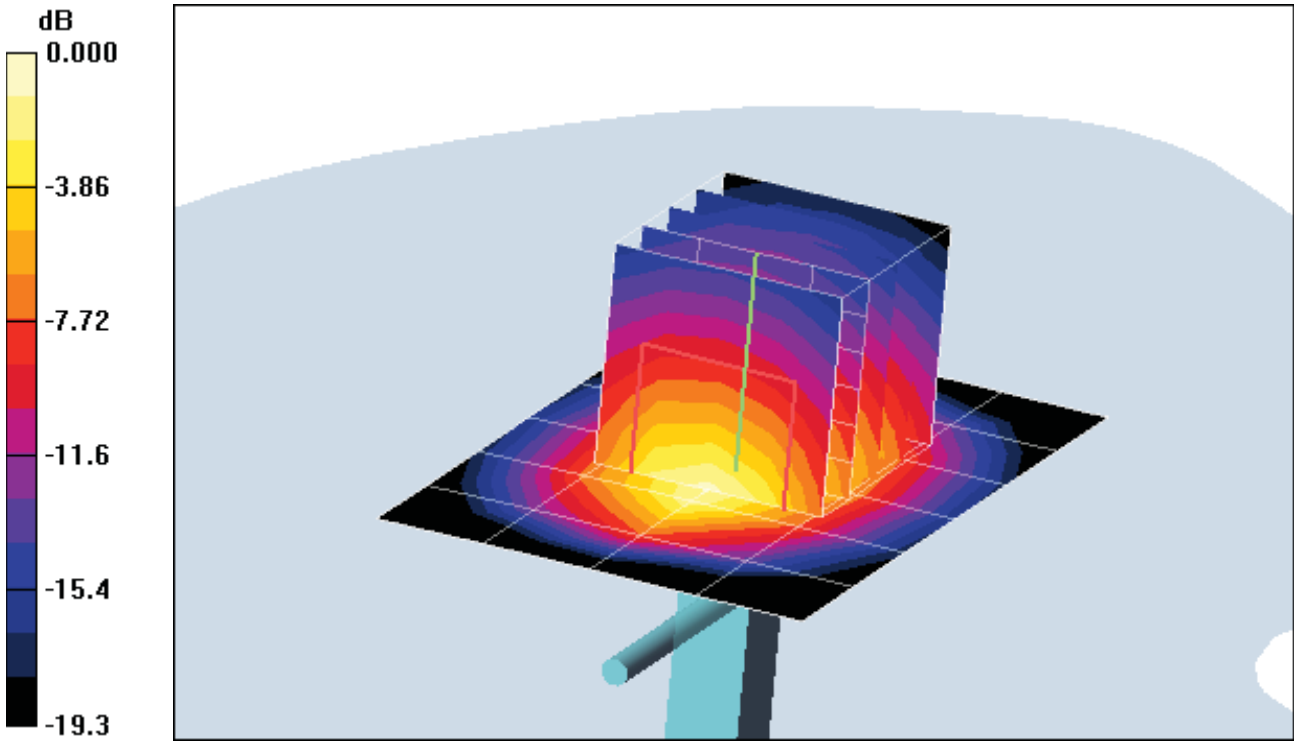
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.52 mho/m; ε_r = 51.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3550; ConvF(6.77, 6.77, 6.77); Calibrated: 2/14/2011
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

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 = 16.0 dBm (40 mW)
SAR(1 g) = 1.63 mW/g; SAR(10 g) = 0.841 mW/g
Deviation = -0.85 %



0 dB = 1.84mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

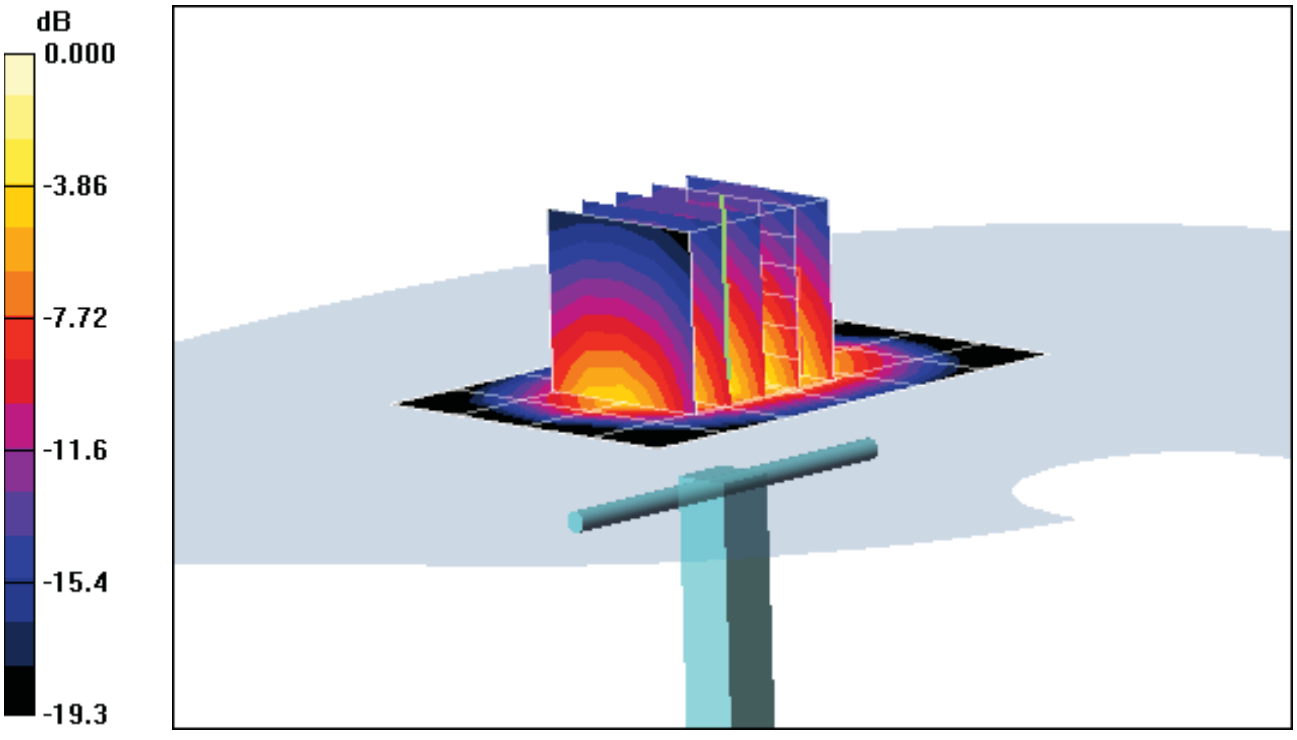
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.51 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.2 °C; Tissue Temp: 23.0 °C

Probe: ES3DV3 - SN3258; ConvF(4.75, 4.75, 4.75); Calibrated: 4/8/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/21/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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 = 16.0 dBm (40 mW)
SAR(1 g) = 1.51 mW/g; SAR(10 g) = 0.778 mW/g
Deviation = -8.15 %



0 dB = 1.65mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

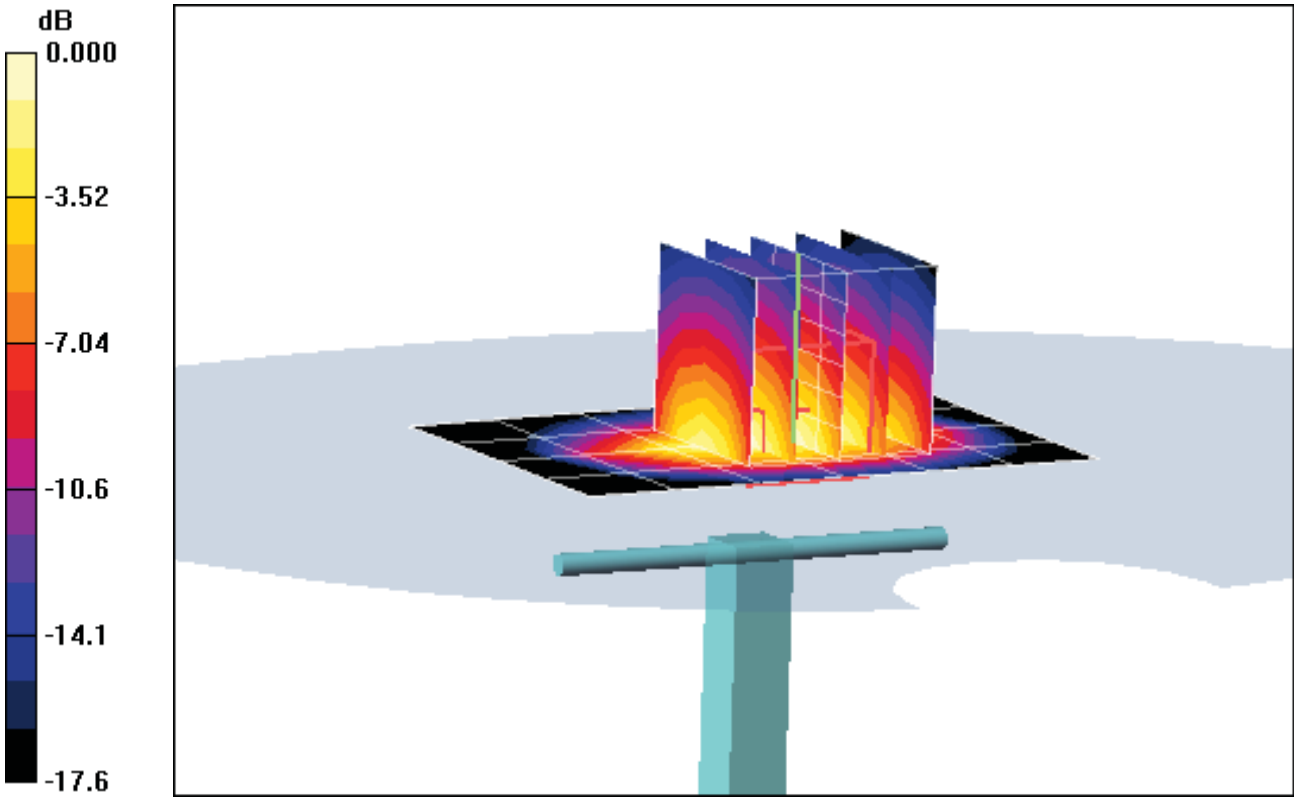
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.52 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-25-2011; Ambient Temp: 23.7 °C; Tissue Temp: 21.8 °C

Probe: ES3DV2 - SN3022; ConvF(4.34, 4.34, 4.34); Calibrated: 9/21/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
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 = 20.0 dBm (100 mW)
SAR(1 g) = 4.12 mW/g; SAR(10 g) = 2.2 mW/g
Deviation = 0.24 %



0 dB = 4.61mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

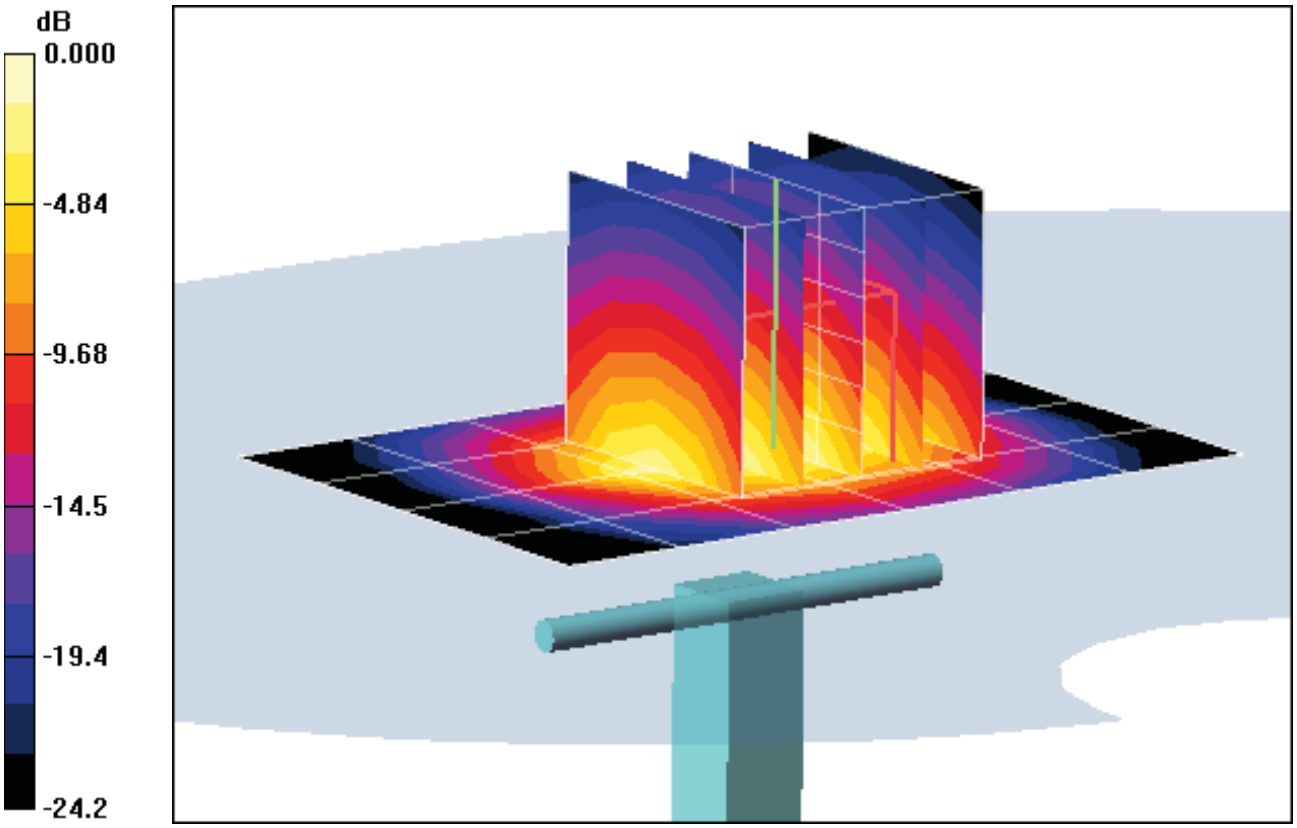
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.82 mho/m; ε_r = 38.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 24.2 °C; Tissue Temp: 22.5 °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 = 14 dBm (25 mW)
SAR(1 g) = 1.39 mW/g; SAR(10 g) = 0.638 mW/g
Deviation = 4.32 %



0 dB = 1.79mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

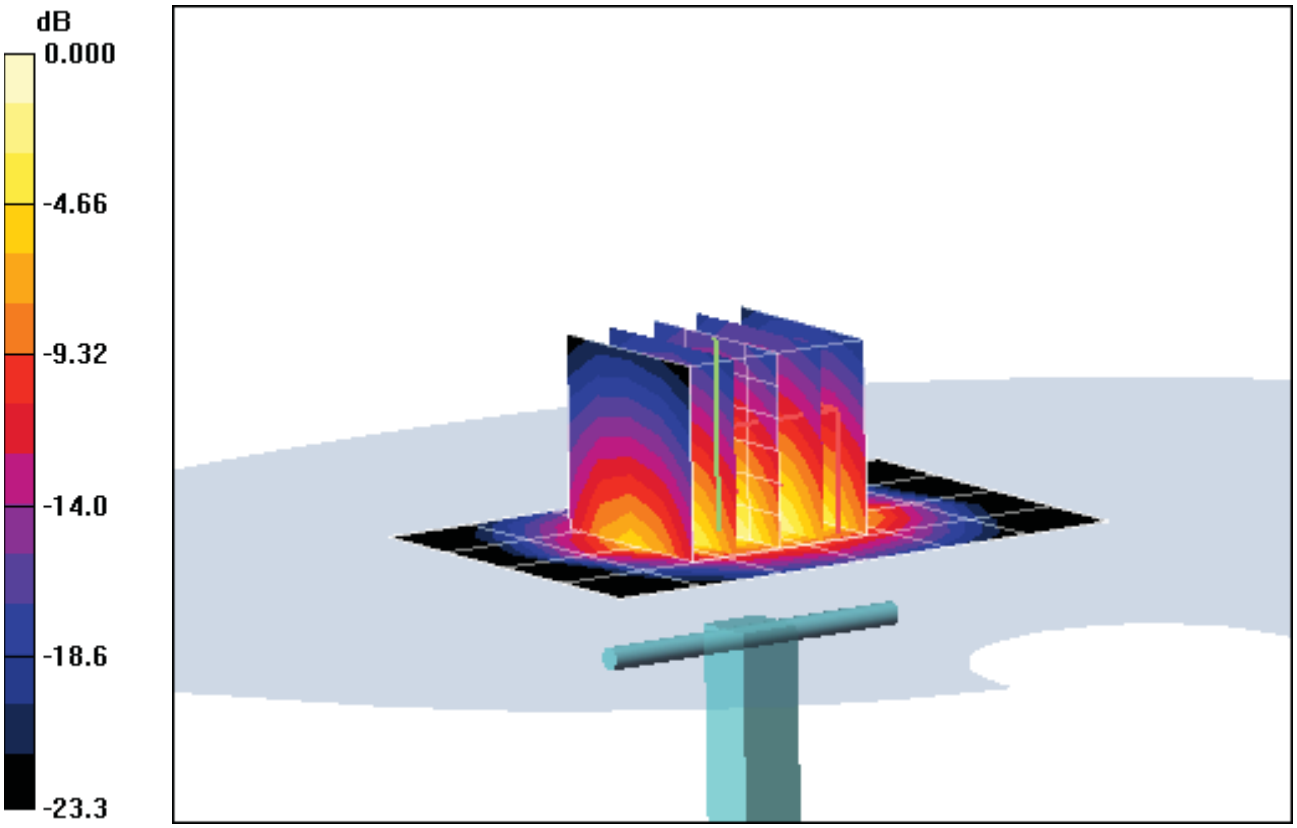
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.9 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.0 °C

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

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 14 dBm (25 mW)
SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.607 mW/g
Deviation = 0.19 %



0 dB = 1.70mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

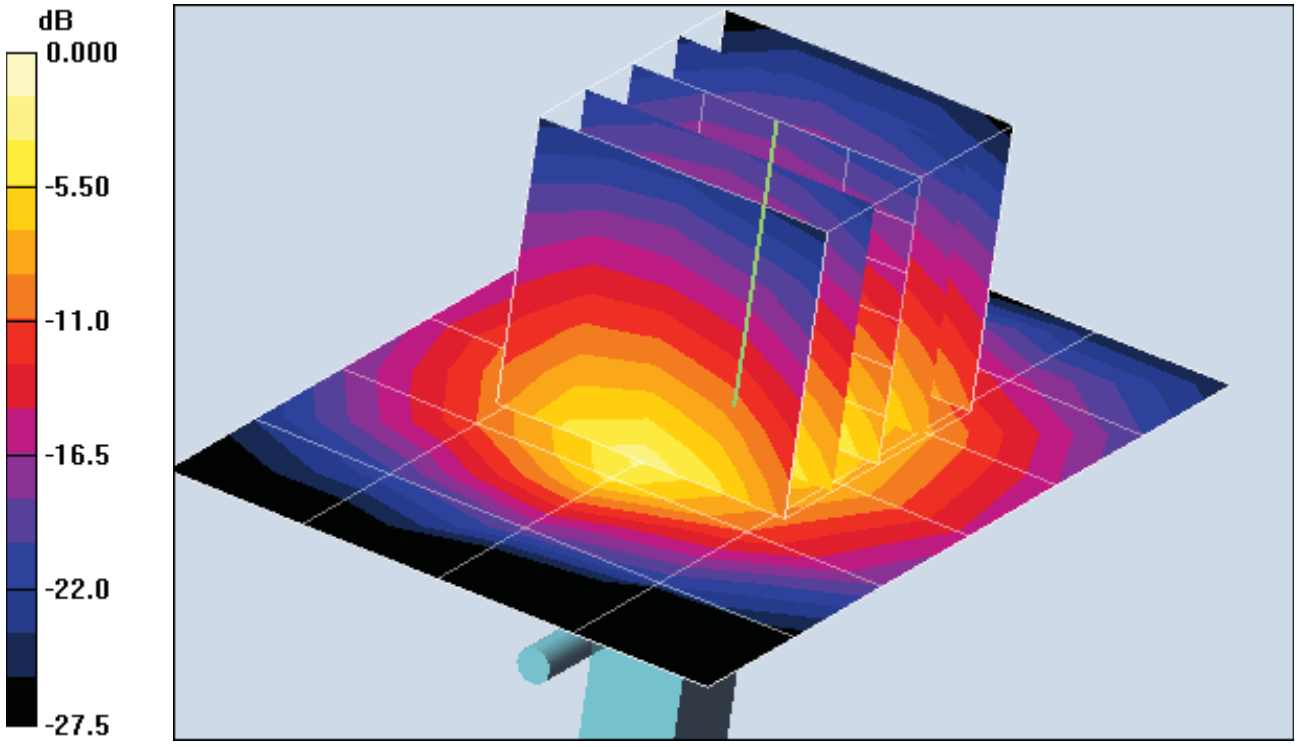
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 1.994 mho/m; ε_r = 38.03; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.14, 4.14, 4.14); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2600MHz 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 = 12.0 dBm (15.8 mW)
SAR(1 g) = 0.850 mW/g; SAR(10 g) = 0.374 mW/g
Deviation = -8.04 %



0 dB = 1.14mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

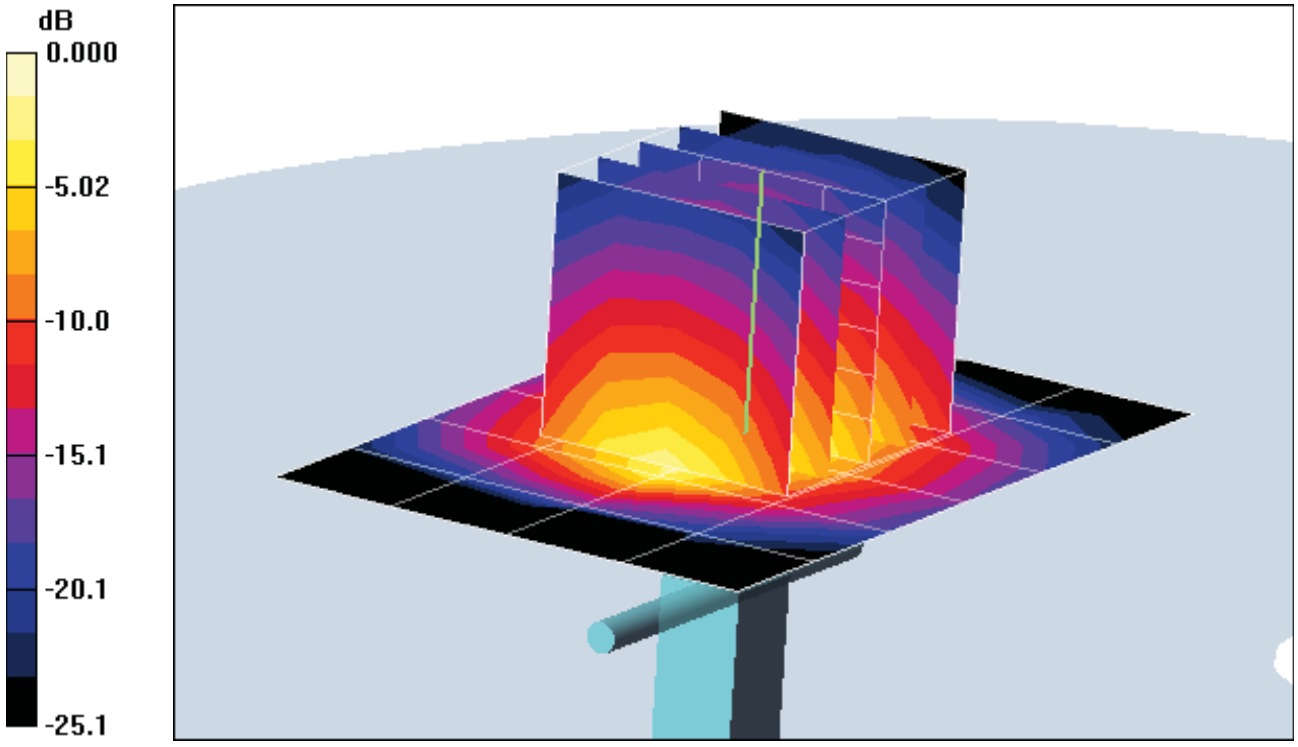
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.114 mho/m; ε_r = 50.83; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.06, 4.06, 4.06); Calibrated: 9/21/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/17/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2600MHz 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 = 12.0 dBm (15.8 mW)
SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.388 mW/g
Deviation = -6.41%



0 dB = 1.13mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

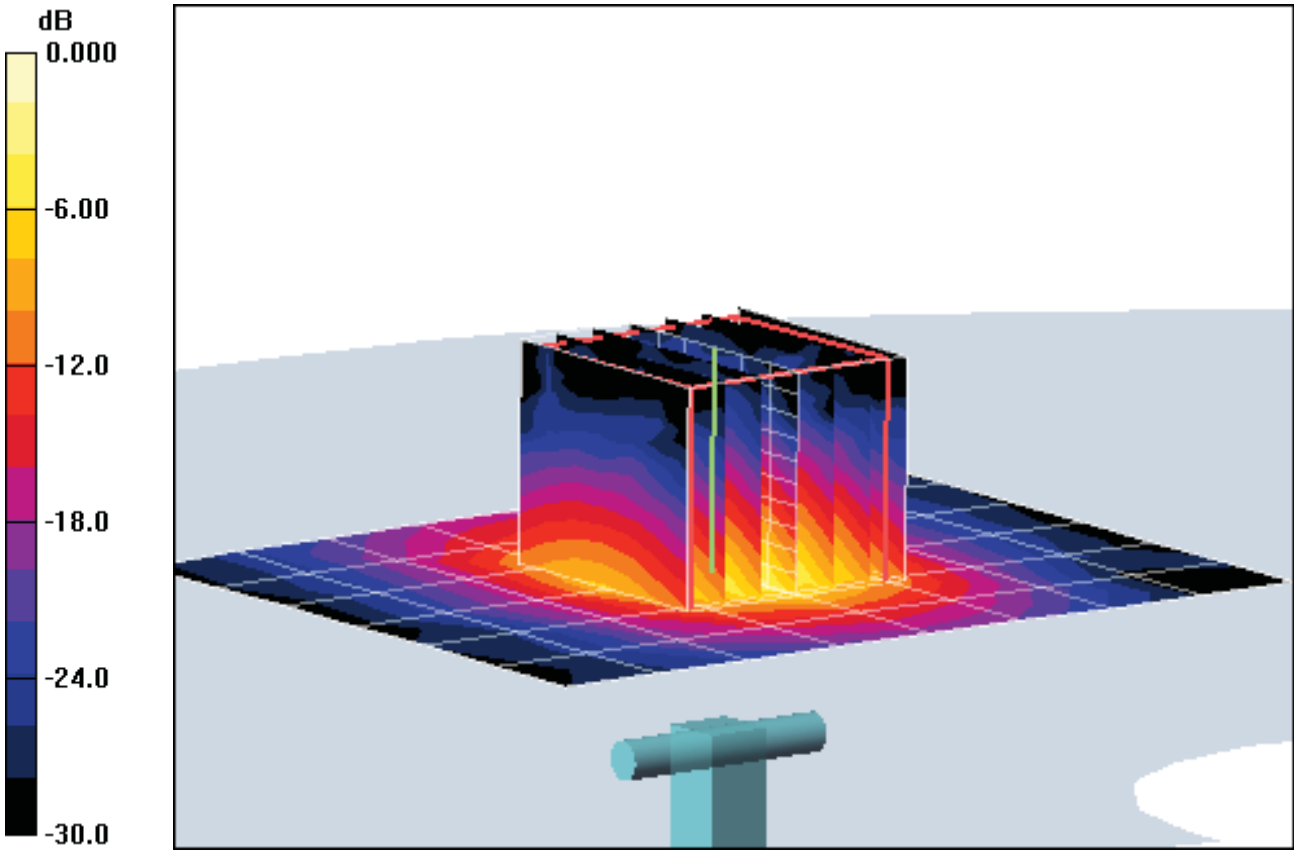
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5200 MHz; σ = 4.53 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.8°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3550; ConvF(4.06, 4.06, 4.06); Calibrated: 2/14/2011
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 = 14 dBm (25 mW)
SAR(1 g) = 2.15 mW/g; SAR(10 g) = 0.608 mW/g
Deviation = 3.49 %



0 dB = 4.50mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

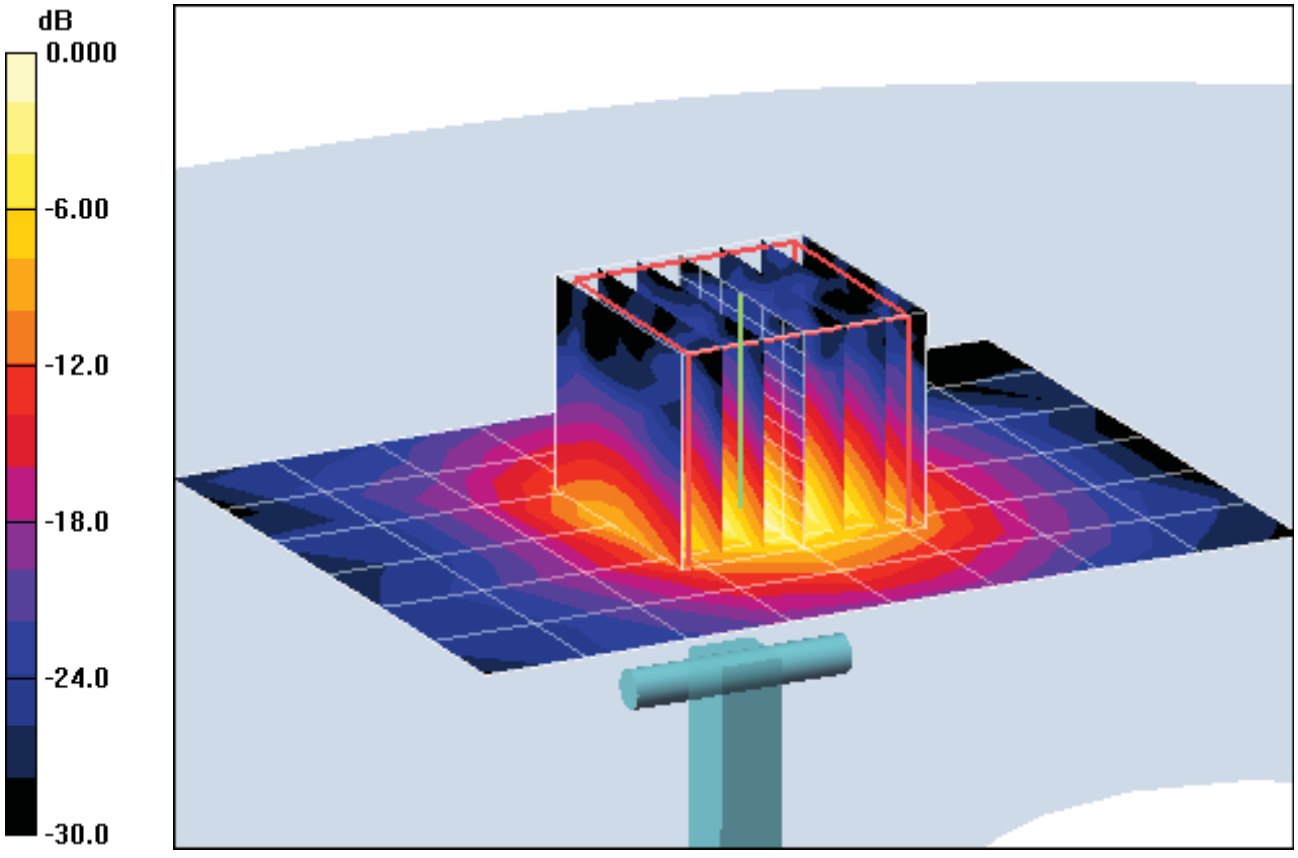
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5200 MHz; σ = 5.39 mho/m; ε_r = 47.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.5°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.58, 3.58, 3.58); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14 dBm (25 mW)
SAR(1 g) = 1.96 mW/g; SAR(10 g) = 0.543 mW/g
Deviation = 0.90 %



0 dB = 4.08mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

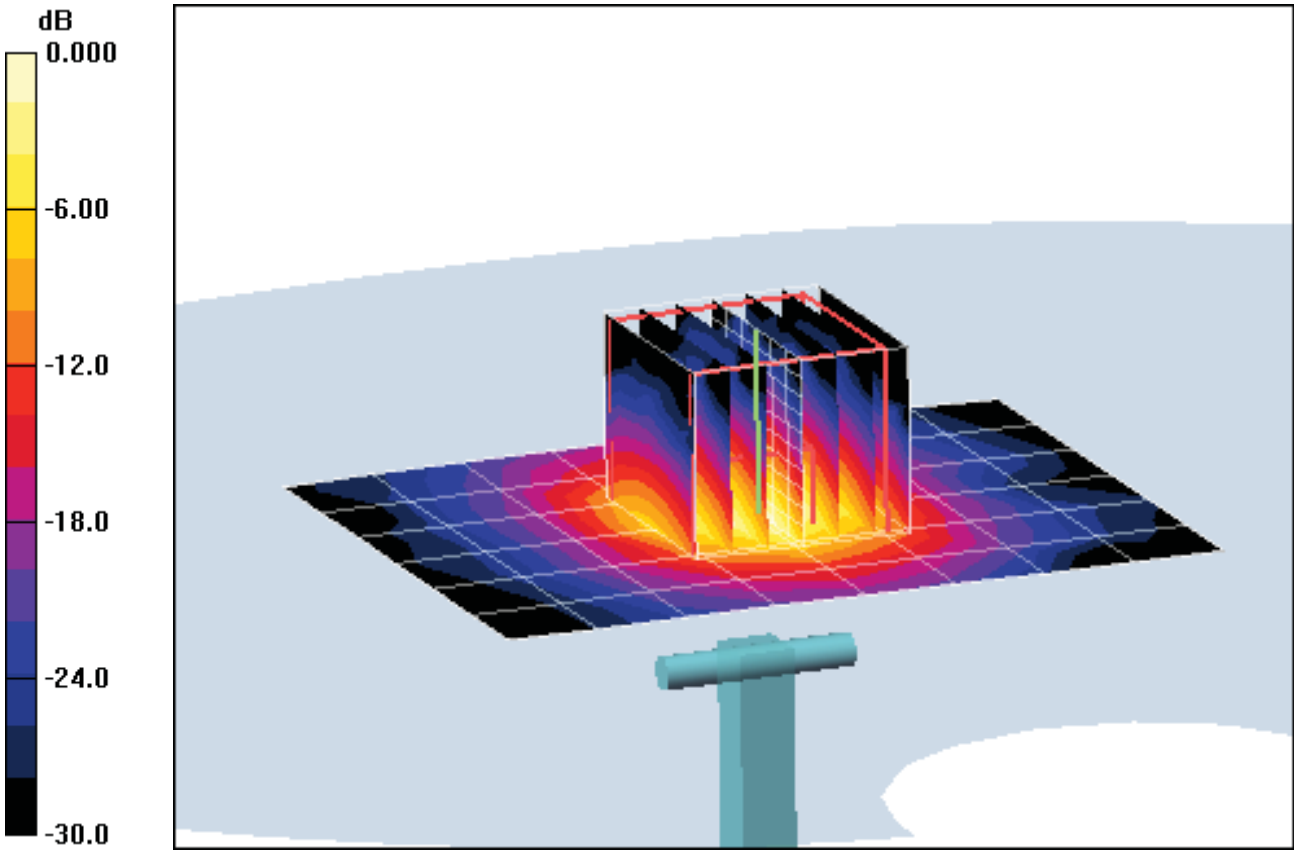
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5500 MHz; σ = 4.89 mho/m; ε_r = 34.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3550; ConvF(3.77, 3.77, 3.77); Calibrated: 2/14/2011
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 = 14 dBm (25 mW)
SAR(1 g) = 2.29 mW/g; SAR(10 g) = 0.639 mW/g
Deviation = 1.66 %



0 dB = 4.86mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

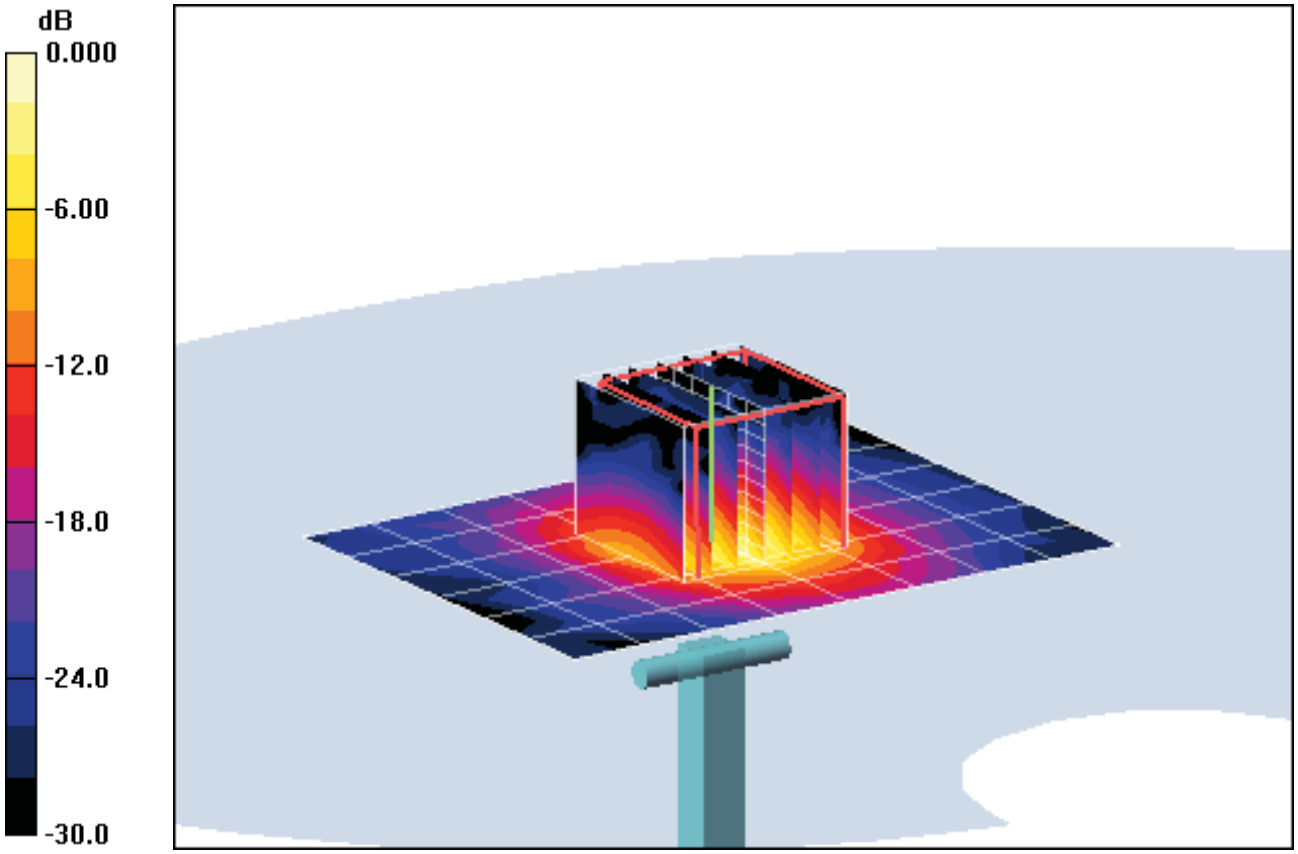
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5500 MHz; σ = 5.82 mho/m; ε_r = 46.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3550; ConvF(3.21, 3.21, 3.21); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14 dBm (25 mW)
SAR(1 g) = 1.99 mW/g; SAR(10 g) = 0.547 mW/g
Deviation = -5.69 %



0 dB = 4.17mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

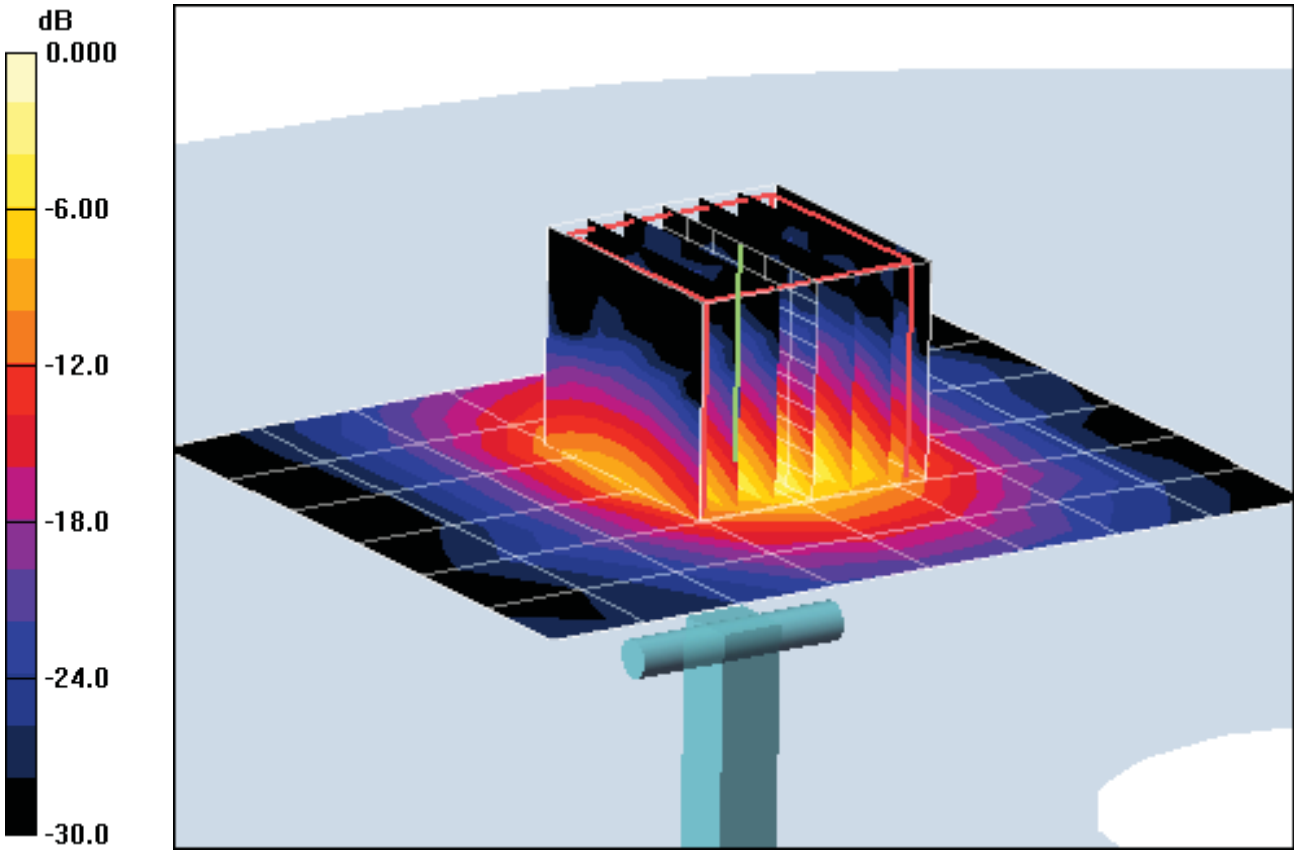
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used (interpolated):
f = 5800 MHz; σ = 5.23 mho/m; ε_r = 33.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.64, 3.64, 3.64); Calibrated: 2/14/2011
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 = 14 dBm (25 mW)
SAR(1 g) = 2.22 mW/g; SAR(10 g) = 0.621 mW/g
Deviation = 7.12 %



0 dB = 4.77mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

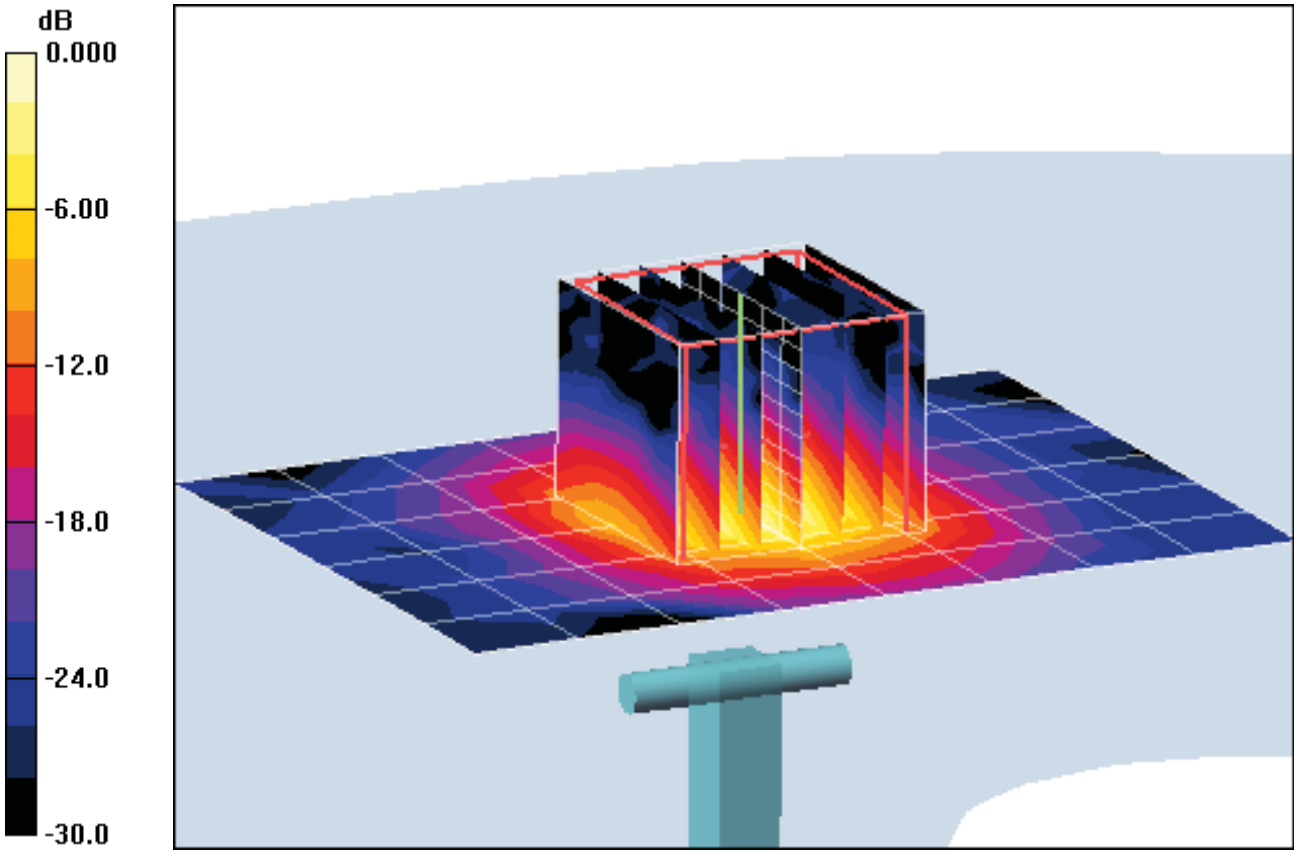
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5800 MHz; σ = 6.29 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-12-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3550; ConvF(3.29, 3.29, 3.29); Calibrated: 2/14/2011
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14 dBm (25 mW)
SAR(1 g) = 1.94 mW/g; SAR(10 g) = 0.526 mW/g
Deviation = 3.47 %



0 dB = 4.13mW/g