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SAR COMPLIANCE EVALUATION REPORT

Applicant Name:
Motorola Mobility, Inc.
8000 W. Sunrise Blvd.
Plantation, FL 33322 USA

Date of Testing:
04/18/11 - 04/29/11, 07/18/11-07/20/11
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1104110683-R7.IHD

FCC ID: **IHDP56MD1**

APPLICANT: **MOTOROLA MOBILITY, INC.**

EUT Type:	Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093; FCC/OET Bulletin 65 Supplement C [June 2001]
Tx Frequency:	824.70 - 848.31 MHz (Cellular CDMA) / 1851.25 - 1908.75 MHz (PCS CDMA) 2498.5 - 2687.5 MHz (WIMAX – 5MHz BW) 2501 - 2685 MHz (WIMAX – 10MHz BW) 2412 - 2462 MHz (WLAN)
Conducted Power:	25.19 dBm Cell. CDMA / 25.36 dBm PCS CDMA 23.27 dBm WIMAX - 10 MHz BW / 24.00 dBm WIMAX - 5 MHz BW 13.97 dBm 2.4 GHz WLAN
Max. SAR Measurement:	0.93 W/kg Cell. CDMA Head SAR / 0.70 W/kg Cell. CDMA Body-Worn SAR 0.22 W/kg Cell. CDMA Hotspot SAR / 0.87 W/kg PCS CDMA Head SAR 0.91 W/kg PCS CDMA Body-Worn SAR / 1.38 W/kg PCS CDMA Hotspot SAR 0.43 W/kg WIMAX Head SAR (scaled) / 0.11 W/kg WIMAX Body-Worn SAR (scaled) 0.56 W/kg WIMAX Hotspot SAR (scaled) / 0.26 W/kg 2.4 GHz WLAN Head SAR 0.18 W/kg 2.4 GHz WLAN Body-Worn SAR 0.31 W/kg 2.4 GHz WLAN Hotspot SAR
Test Device S/N:	Pre-Production [S/N: LSNW260017 SJUG6093AA, LSNW230069 SJUG6093AA, LSNW270089 SJUG6093AA, TA035000ZH]

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in FCC/OET Bulletin 65 Supplement C (2001), IEEE 1528-2003 and in applicable Industry Canada Radio Standards Specifications (RSS); for North American frequency bands only.
Note: This revised Test Report (S/N: 0Y1104110683-R7.IHD) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

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

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1 WIMAX FCC SUMMARY

Based on 802.16e/WIMAX Permit-But-Ask and SAR Guidance, November 2009
FCC KDB Publication 615223 D01 802.16e WIMAX SAR Guidance v01.

Description	Parameter		Comment
FCC ID	IHDP56MD1		Identify all related FCC ID
Radio Service	Part 27 subpart M		Rule parts
Transmit Frequency Range (MHz)	2496MHz-2690MHz		System parameter
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter
System Profile	Revision 1.7.0		Defined by WiMAX Forum
Modulation Schemes	QPSK,16QAM		Identify all applicable UL modulations
Number of DL OFDMA Symbols per Frame	29		Identify the allowed & maximum symbols, including both traffic & control symbols
Number of UL OFDMA Symbols per Frame	18		
DL:UL Symbol Ratio	29:18		For determining UL duty factor
Power Class (dBm)	Power Class 2, 23±1dBm		Identify power class and tolerance
UL Zone Types (FUSC, PUSC, OFUSC, OPUSC, AMC, TUSC1, TUSC2)	PUSC, Band AMC 2×3		Describe separately the symbol and sub-carrier/sub-channel structures applicable to each zone type
UL Burst Maximum Average Power	5MHz: 24dBm 10MHz: 23dBm		Identify the allowed and tested/to be tested parameters; include separate
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.

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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]

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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.

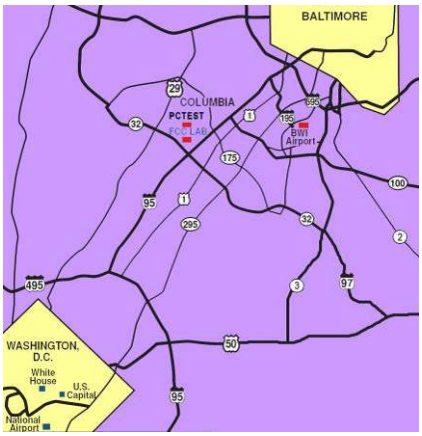

Figure 3-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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

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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

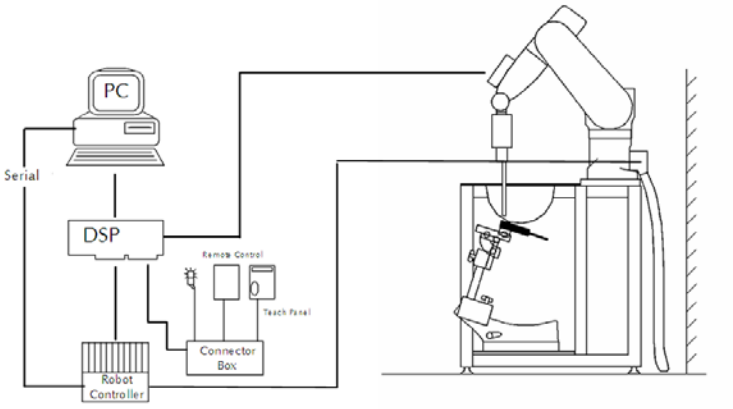

Figure 4-1
SAR Measurement System Setup

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.

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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

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5 DASY E-FIELD PROBE SYSTEM

5.1 Probe Measurement System

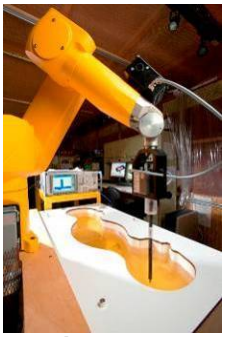

Figure 5-1
SAR System

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 (ES3DV2, ES3DV3)
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 ES3DV2, ES3DV3
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

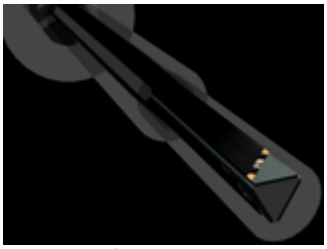

Figure 5-3
Triangular Probe Configuration

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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.

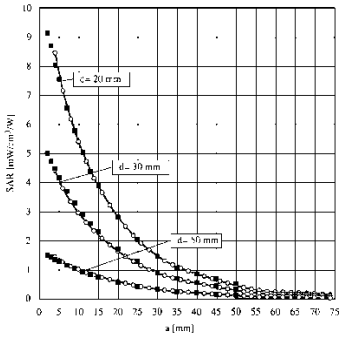

Figure 6-1 E-Field and Temperature measurements at 900MHz [9]

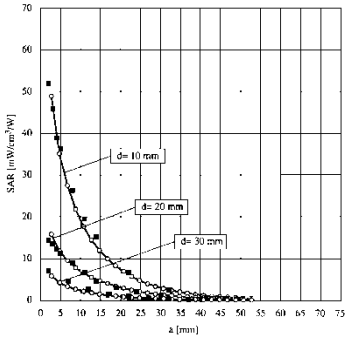

Figure 6-2 E-Field and temperature measurements at 1.9GHz [9]

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7 PHANTOM AND EQUIVALENT TISSUES

7.1 SAM Phantoms

Figure 7-1
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

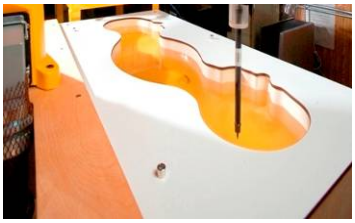

Figure 7-2
SAM Phantom with Simulating Tissue

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

Table 7-1
Composition of the Tissue Equivalent Matter

Frequency (MHz)	835	835	1900	1900	2450-2700	2450-2700
Tissue	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	
Water	40.45	53.06	54.9	70.17	71.88	73.2

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8 DOSIMETRIC ASSESSMENT & PHANTOM SPECS

8.1 Measurement Procedure

The evaluation was performed using the following procedure:

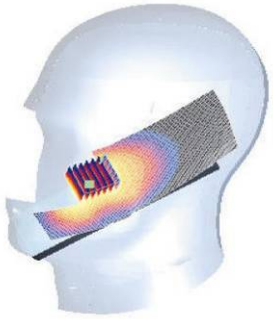

Figure 8-1
Sample SAR Area Scan

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.

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

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9 DEFINITION OF REFERENCE POINTS

9.1 EAR REFERENCE POINT

Figure 8-1 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 8-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 9-2). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

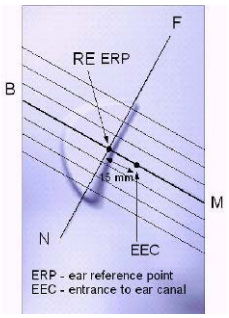

Figure 9-1
Close-Up Side view of ERP

9.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 9-3). The "test device reference point" was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at it's top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

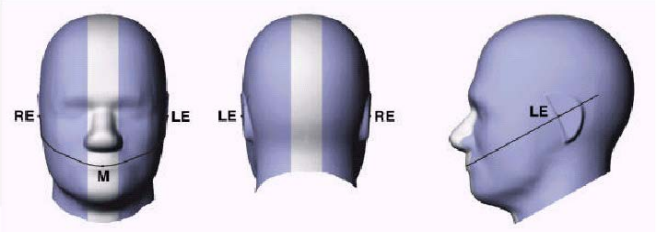

Figure 9-2
Front, back and side view of SAM Twin Phantom

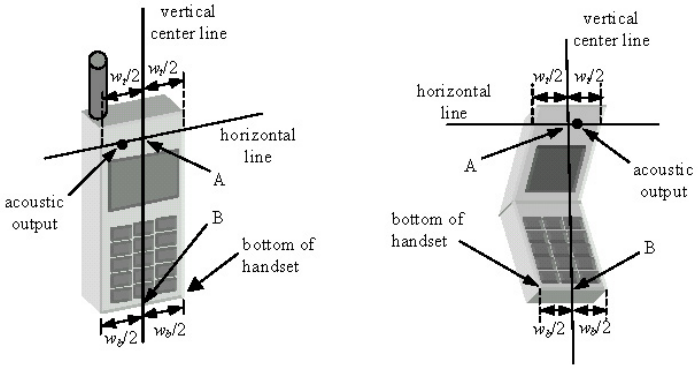

Figure 9-3
Handset Vertical Center & Horizontal Line Reference Points

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10 TEST CONFIGURATION POSITIONS

10.1 Device Holder

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

10.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 10-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

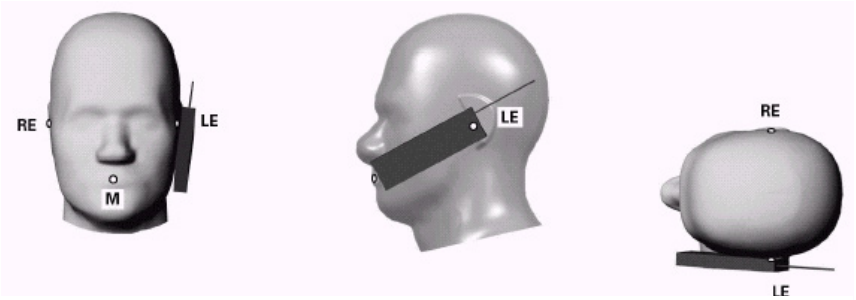

Figure 10-1 Front, Side and Top View of Cheek/Touch Position

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

10.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek/Touch Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 10-2).

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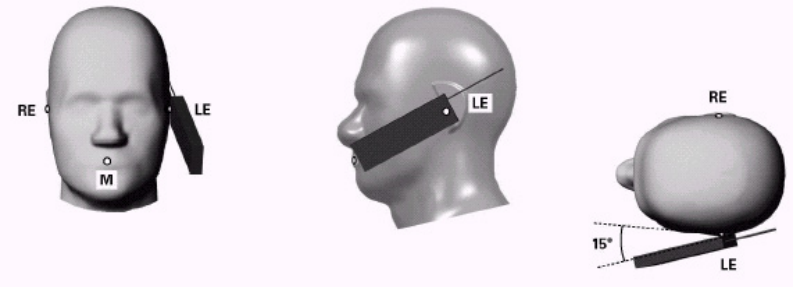

Figure 10-2 Front, Side and Top View of Ear/15º Tilt Position

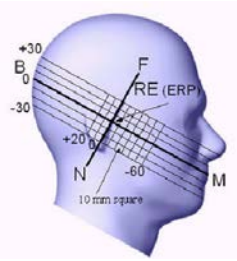

Figure 10-3
Side view w/ relevant markings

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

10.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. It has been known for some time that there are SAR measurement difficulties in these regions of the SAM phantom. SAR probes are calibrated in tissue equivalent liquids with sufficient separation between the probe sensors and nearby physical boundaries to ensure scattering does not affect probe calibration. When the probe tip is moved into tight regions with multiple boundaries surrounding its sensors, probe calibration and measurement accuracy can become questionable. In addition, these measurement locations often require a probe to be tilted at steep angles, where it may no longer comply with calibration requirements and measurement protocols, or satisfy the required measurement uncertainty. In some situations it is not feasible to tilt the probe or rotate the phantom, as suggested by measurement standards, to conduct these measurements.

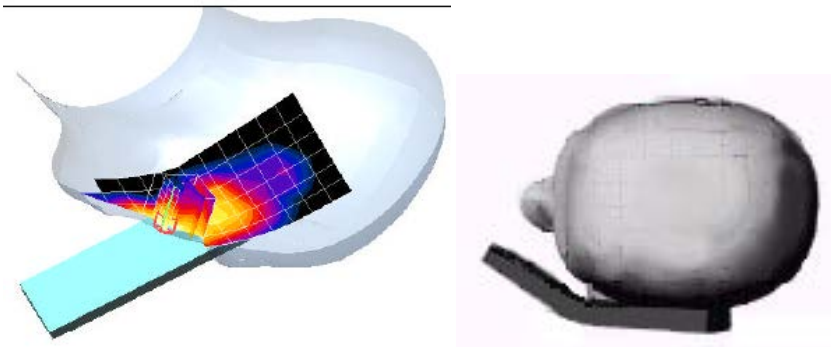

Figure 10-5
SAR Scans near the Jaw/Mouth

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

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

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

10.5 Body Holster /Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 10-4). A device with a headset output is tested with a headset connected to the device.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

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11 FCC RF EXPOSURE LIMITS

11.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

11.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 11-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
SPATIAL PEAK SAR Brain	1.6	8.0
SPATIAL AVERAGE SAR Whole Body	0.08	0.4
SPATIAL PEAK SAR Hands, Feet, Ankles, Wrists	4.0	20

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

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12 FCC 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 device was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR [4]. SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, it was configured with the base station simulator. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If SAR deviations of more than 5% occurred, the tests were repeated.

12.2 SAR Measurement Conditions for CDMA2000

The following procedures were performed according to FCC KDB Publication 941225 "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
I_{or}	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 12-2
Parameters for Max. Power for RC3

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

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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-worn 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.

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12.3 RF Conducted Powers

12.3.1 CDMA Conducted Powers

Band	Channel	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	25.18	25.17	25.19	25.18	25.15	25.18
	384	25.15	25.19	25.20	25.16	25.12	25.19
	777	25.08	24.96	25.05	25.14	25.19	25.18
PCS	25	25.32	25.30	25.32	25.29	25.33	25.37
	600	25.27	25.30	25.33	25.33	25.36	25.35
	1175	25.22	25.22	25.24	25.25	25.20	25.25

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.

12.3.2 Hotspot Active CDMA Conducted Powers

Band	Channel	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	17.16	17.12	17.09	17.10	17.20	17.27
	384	17.13	17.12	17.08	17.07	17.27	17.24
	777	17.25	17.13	17.13	17.14	17.28	17.34
PCS	25	19.36	19.39	19.42	19.37	19.52	19.56
	600	19.06	19.10	19.08	19.21	19.32	19.43
	1175	19.06	19.15	19.13	19.14	19.27	19.32

See Section 15.3 for power reduction details.

Note: Hardware modifications were not required to be made on the devices in order to obtain reduced output power devices and power measurements, which represented the reduced power levels as would be implemented in Hotspot Mode.

Per KDB Publication 941225 D01:

1. 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.

Table 12-3
Power Reduction Summary

Mode	Level of Power Reduction (dB)
CDMA/EVDO 850	8
CDMA/EVDO 1900	5.5

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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 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channels 1, 6 and 11. These are referred to as the “default test channels”. 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.

Table 13-1
802.11 Test Channels per FCC Requirements

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

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Table 13-2
IEEE 802.11b Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	1	13.6
		2	13.7
		5.5	13.6
		11	13.75
2437	6	1	**13.97**
		2	13.91
		5.5	13.97
		11	13.82
2462	11	1	13.82
		2	13.97
		5.5	13.92
		11	13.96

Table 13-3
IEEE 802.11g Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	6	10.73
		9	10.76
		12	10.72
		18	10.75
		24	10.70
		36	10.70
		48	10.67
		54	10.66
2437	6	6	10.92
		9	11.02
		12	10.73
		18	10.77
		24	10.90
		36	10.82
		48	10.91
		54	10.90
2462	11	6	10.84
		9	10.85
		12	10.87
		18	10.90
		24	10.81
		36	10.95
		48	10.75
		54	10.80

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Table 13-4
IEEE 802.11n (800ns) Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	6.5/7.2	9.50
		13/14.40	9.20
		19.5/21.70	9.20
		26/28.90	9.16
		29/43.3	9.20
		52/57.80	9.22
		58.50/65	9.15
		65/72.2	9.20
2437	6	6.5/7.2	9.50
		13/14.40	9.50
		19.5/21.70	9.50
		26/28.90	9.25
		29/43.3	9.45
		52/57.80	9.40
		58.50/65	9.45
		65/72.2	9.50
2462	11	6.5/7.2	9.70
		13/14.40	9.50
		19.5/21.70	9.40
		26/28.90	9.40
		29/43.3	9.45
		52/57.80	9.50
		58.50/65	9.40
		65/72.2	9.33

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Table 13-5
IEEE 802.11n (400ns) Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	6.5/7.2	9.40
		13/14.40	9.30
		19.5/21.70	9.20
		26/28.90	9.30
		29/43.3	9.25
		52/57.80	9.20
		58.50/65	9.20
		65/72.2	9.25
2437	6	6.5/7.2	9.45
		13/14.40	9.30
		19.5/21.70	9.30
		26/28.90	9.50
		29/43.3	9.50
		52/57.80	9.56
		58.50/65	9.30
		65/72.2	9.40
2462	11	6.5/7.2	9.50
		13/14.40	9.61
		19.5/21.70	9.50
		26/28.90	9.60
		29/43.3	9.52
		52/57.80	9.50
		58.50/65	9.60
		65/72.2	9.52

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 802.11b mode. The bolded powers in the above tables were tested for SAR.

Figure 13-1
Power Measurement Setup

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14 4G WIMAX LINEARITY & SAR CONSIDERATIONS

14.1 WIMAX Measured Maximum RF Output Conducted Powers

A. This device is capable of two different Channel Bandwidths (5MHz, 10 MHz), two zone types (PUSC and Band AMC) and two antennas.

B. Specific WIMAX configurations were selected for SAR testing according to WIMAX procedures in FCC KDB 615223 publication D01, and April & October 2010 FCC/TCB Workshop slides. Please see the notes following the SAR data in Section 17 for the determination of the required test configurations.

C. The devices were configured with proprietary test software. This software allows the user to fix the test frequency power. An external downlink signal was provided from a vector signal generator that contained a DL:UL ratio of 29:18 consisting of 15 traffic symbols and 3 inactive control symbols.

Table 14-1
Measured WIMAX RF Output Powers

	Bandwidth	Frequency [MHz]	QPSK (CTC) 1/2					
			Ant 1 Average	Ant 1 Peak	PAR	Ant 2 Average	Ant 2 Peak	PAR
			[dBm]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
PUSC	5MHz	2498.50	**23.87**	32.91	**9.04**	**23.82**	32.70	**8.88**
		2600.00	**23.94**	32.43	**8.49**	**23.86**	32.35	**8.49**
		2687.50	**24.00**	32.23	**8.23**	**23.66**	32.49	**8.83**
	10MHz	2501.00	**23.27**	32.04	**8.77**	**22.99**	31.84	**8.85**
		2600.00	**23.22**	31.70	**8.48**	**22.96**	31.55	**8.59**
		2685.00	**23.10**	31.66	**8.56**	**23.02**	31.51	**8.49**
BAMC	5MHz	2498.50	23.46	32.92	**9.46**	23.45	32.56	**9.11**
		2600.00	23.57	32.46	**8.89**	23.51	32.41	**8.90**
		2687.50	23.37	32.47	**9.10**	23.31	32.41	**9.10**
	10MHz	2501.00	22.95	32.68	**9.73**	22.91	32.39	**9.48**
		2600.00	22.93	32.13	**9.20**	22.61	32.10	**9.49**
		2685.00	22.81	32.24	**9.43**	22.82	32.27	**9.45**

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	Bandwidth	Frequency [MHz]	QPSK (CTC) 3/4					
			Ant 1 Average	Ant 1 Peak	PAR	Ant 2 Average	Ant 2 Peak	PAR
			[dBm]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
PUSC	5MHz	2498.50	23.60	32.64	**9.04**	23.58	32.42	**8.84**
		2600.00	23.45	31.95	**8.50**	23.61	32.05	**8.44**
		2687.50	23.46	32.22	**8.76**	23.43	32.27	**8.84**
	10MHz	2501.00	23.02	32.12	**9.10**	22.98	31.64	**8.66**
		2600.00	22.99	31.68	**8.69**	22.95	31.50	**8.55**
		2685.00	22.91	31.57	**8.66**	22.85	31.63	**8.78**
BAMC	5MHz	2498.50	23.39	32.85	**9.46**	23.38	32.65	**9.27**
		2600.00	23.49	32.40	**8.91**	23.61	32.33	**8.72**
		2687.50	23.51	32.37	**8.86**	23.48	32.42	**8.94**
	10MHz	2501.00	22.96	32.28	**9.32**	22.91	32.16	**9.25**
		2600.00	22.91	31.98	**9.07**	22.63	31.94	**9.31**
		2685.00	22.83	31.92	**9.09**	22.78	32.00	**9.22**

	Bandwidth	Frequency [MHz]	16QAM (CTC) 1/2					
			Ant 1 Average	Ant 1 Peak	PAR	Ant 2 Average	Ant 2 Peak	PAR
			[dBm]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
PUSC	5MHz	2498.50	**23.62**	32.64	**9.02**	**23.33**	32.49	**9.16**
		2600.00	**23.45**	32.11	**8.66**	**23.56**	32.10	**8.54**
		2687.50	**23.56**	32.14	**8.58**	**23.35**	32.23	**8.88**
	10MHz	2501.00	**23.01**	32.22	**9.21**	**22.98**	32.06	**9.08**
		2600.00	**23.01**	31.83	**8.82**	**22.94**	31.64	**8.70**
		2685.00	**23.04**	31.38	**8.34**	**22.86**	31.82	**8.96**
BAMC	5MHz	2498.50	23.43	32.92	**9.49**	23.58	32.71	**9.13**
		2600.00	23.45	32.47	**9.02**	23.46	32.40	**8.94**
		2687.50	23.56	32.44	**8.88**	23.49	32.50	**9.01**
	10MHz	2501.00	22.87	32.65	**9.78**	22.84	32.35	**9.51**
		2600.00	22.85	32.03	**9.18**	22.57	32.04	**9.47**
		2685.00	22.80	32.19	**9.39**	22.77	32.19	**9.42**

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	Bandwidth	Frequency [MHz]	16QAM (CTC) 3/4					
			Ant 1 Average	Ant 1 Peak	PAR	Ant 2 Average	Ant 2 Peak	PAR
			[dBm]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
PUSC	5MHz	2498.50	23.47	32.63	**9.16**	23.41	32.42	**9.01**
		2600.00	23.34	32.16	**8.82**	23.45	32.09	**8.64**
		2687.50	23.57	32.25	**8.68**	23.54	32.27	**8.73**
	10MHz	2501.00	22.95	32.08	**9.13**	22.93	31.82	**8.89**
		2600.00	22.99	31.54	**8.55**	22.88	31.44	**8.56**
		2685.00	23.02	31.60	**8.58**	22.99	31.63	**8.64**
BAMC	5MHz	2498.50	23.42	32.83	**9.41**	23.55	32.62	**9.07**
		2600.00	23.47	32.32	**8.85**	23.40	32.28	**8.88**
		2687.50	23.51	32.33	**8.82**	23.48	32.29	**8.81**
	10MHz	2501.00	22.85	32.38	**9.53**	22.81	32.06	**9.25**
		2600.00	23.02	32.04	**9.02**	22.51	31.93	**9.42**
		2685.00	22.92	32.00	**9.08**	22.92	31.91	**8.99**

Note: The conducted powers for WIMAX with a 5 MHz bandwidth differ from the conducted powers for WIMAX with 10 MHz bandwidth. The technical description contains more information about transceiver adjustment design levels.

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

There is no power reduction for WIMAX.

Figure 14-1
Power Measurement Setup

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14.2 SAR Probe Linearity Considerations for WIMAX Signals

Testing was performed using test software in order to simulate WIMAX transmission for the purpose of SAR testing; specifically with control symbols deactivated for proper SAR measurements according to the FCC WIMAX KDB Procedures. The operational description includes details regarding the operation of the software with WIMAX transmission characteristics.

14.3 Variation from Expected SAR to do WIMAX PAR

The error due to the PAR of WIMAX was between 7-10%.

14.4 Probe Linearity Data and Linearity Graphs

SAR linearity was measured for the zone type, bandwidth, channel and mode that was tested for SAR per April 2010 FCC/TCB Workshop guidance. Please note that, according to October 2010 FCC/TCB Workshop notes, 16-QAM test reduction was not required for SAR given the conducted power measurements and SAR measurements. Therefore 16-QAM linearity plots were not required. See the notes following the SAR data in Section 17 for the 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 modulation, BW, and zone type 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 KDB 615223 publication guidance for testing WIMAX for SAR.

Table 14-2
WIMAX PUSC QPSK Linearity for 5 MHz Bandwidth, Tx 1 Antenna

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	9.616	19.543	39.084	77.625	123.31	244.34
5 MHz	point SAR	0.0890	0.1845	0.3734	0.7585	1.21	2.470
	linear line	0.0890	0.1810	0.3619	0.7188	1.1418	2.263
	ε	0.0%	2.0%	3.2%	5.5%	6.1%	9.2%

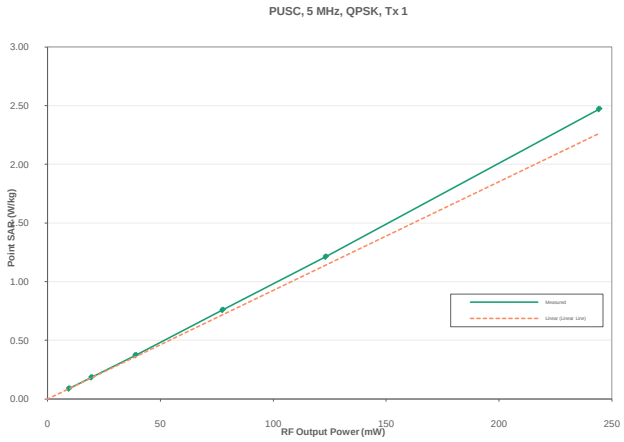

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Table 14-3
WIMAX PUSC QPSK Linearity for 10 MHz Bandwidth, Tx 1 Antenna

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	10.257	20.606	41.21	82.414	130.92	207.01
10 MHz	point SAR	0.0682	0.1424	0.2855	0.5881	0.943	1.506
	linear line	0.0682	0.1370	0.2740	0.5480	0.8705	1.3765
	ε	0.0%	3.9%	4.2%	7.3%	8.4%	9.4%

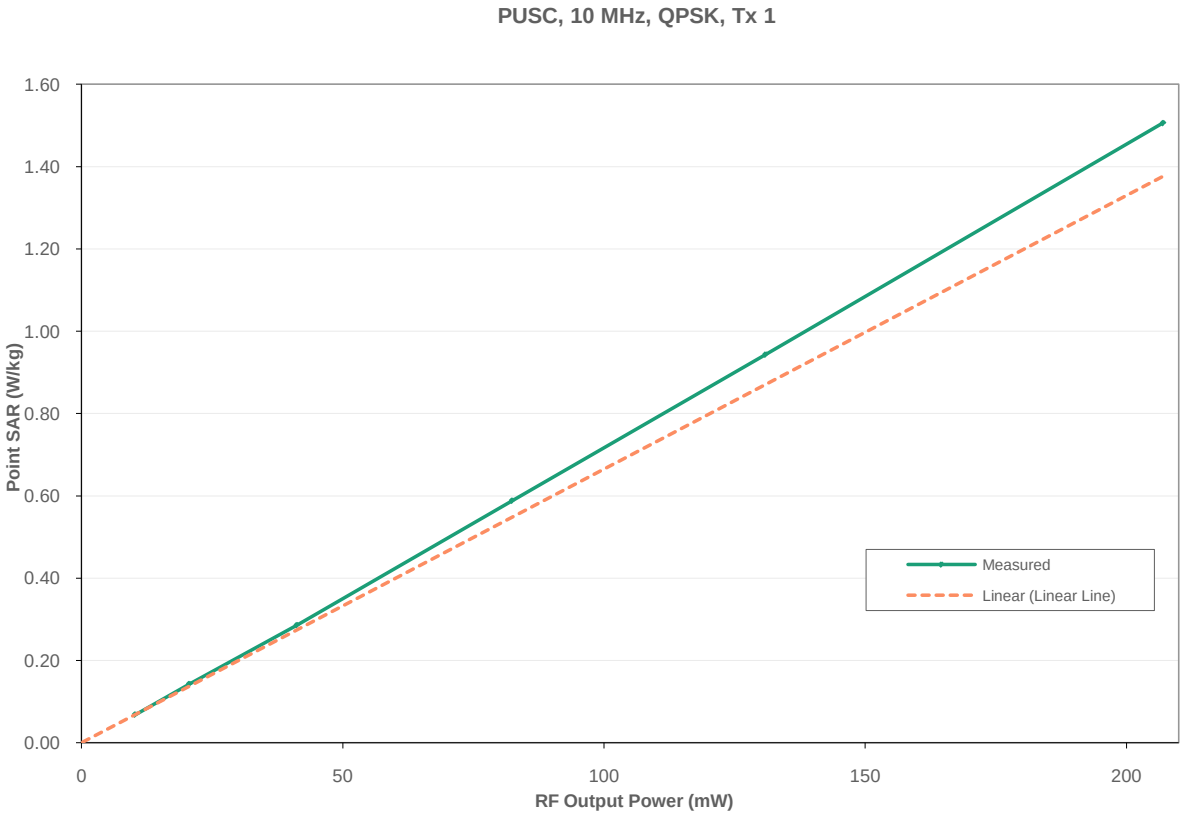

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Table 14-4
WIMAX BAMC QPSK Linearity for 5 MHz Bandwidth, Tx 1 Antenna

SAR (W/kg)	Zone	AMC					
	Modulation	QPSK					
	Power (mW)	10.495	21.135	41.976	84.333	134.28	234.963
5 MHz	point SAR	0.0969	0.197	0.401	0.820	1.322	2.3750
	linear line	0.0969	0.1950	0.3874	0.7782	1.2391	2.1683
	ε	0.0%	1.2%	3.5%	5.4%	6.7%	9.5%

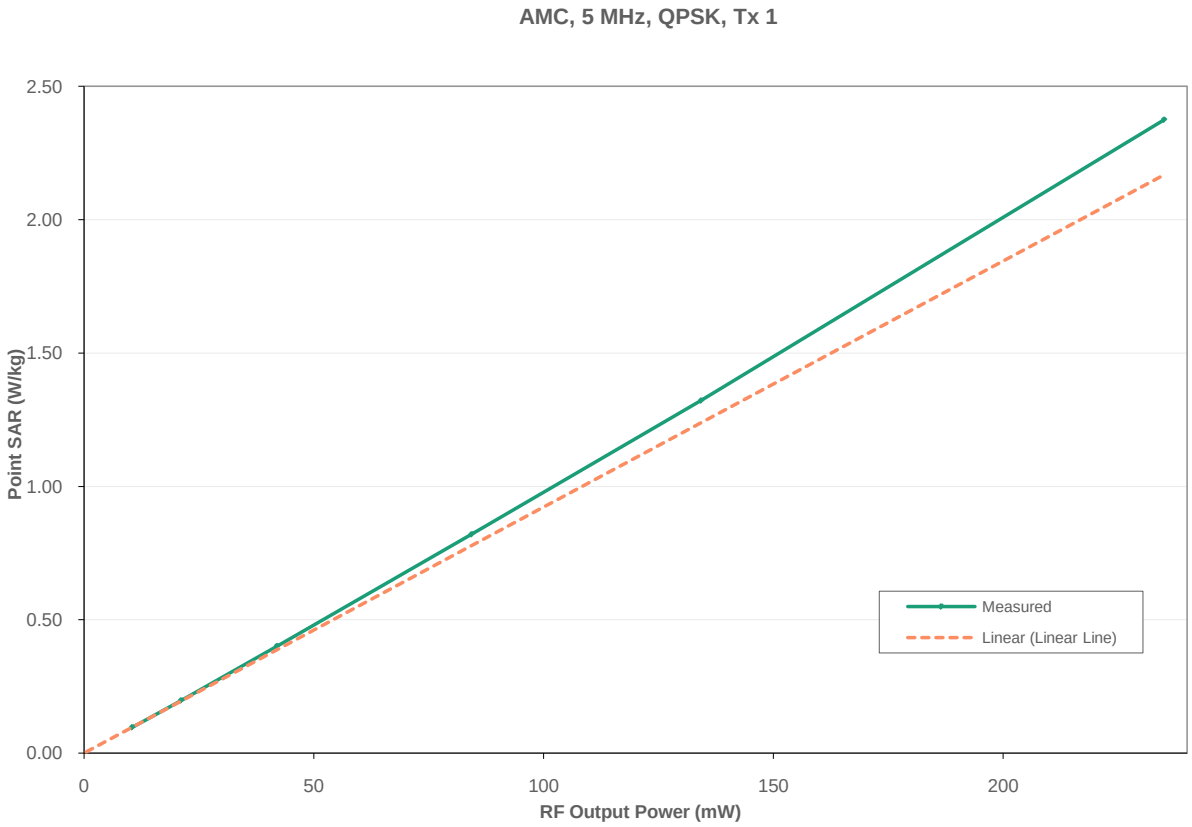

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Table 14-5
WIMAX BAMC QPSK Linearity for 10 MHz Bandwidth, Tx 1 Antenna

SAR (W/kg)	Zone	AMC					
	Modulation	QPSK					
	Power (mW)	11.298	22.646	45.29	89.536	142.23	222.331
10 MHz	point SAR	0.1056	0.2178	0.4402	0.8931	1.4420	2.2810
	linear line	0.1056	0.2117	0.4233	0.8369	1.3294	2.0781
	ε	0.0%	2.9%	4.0%	6.7%	8.5%	9.8%

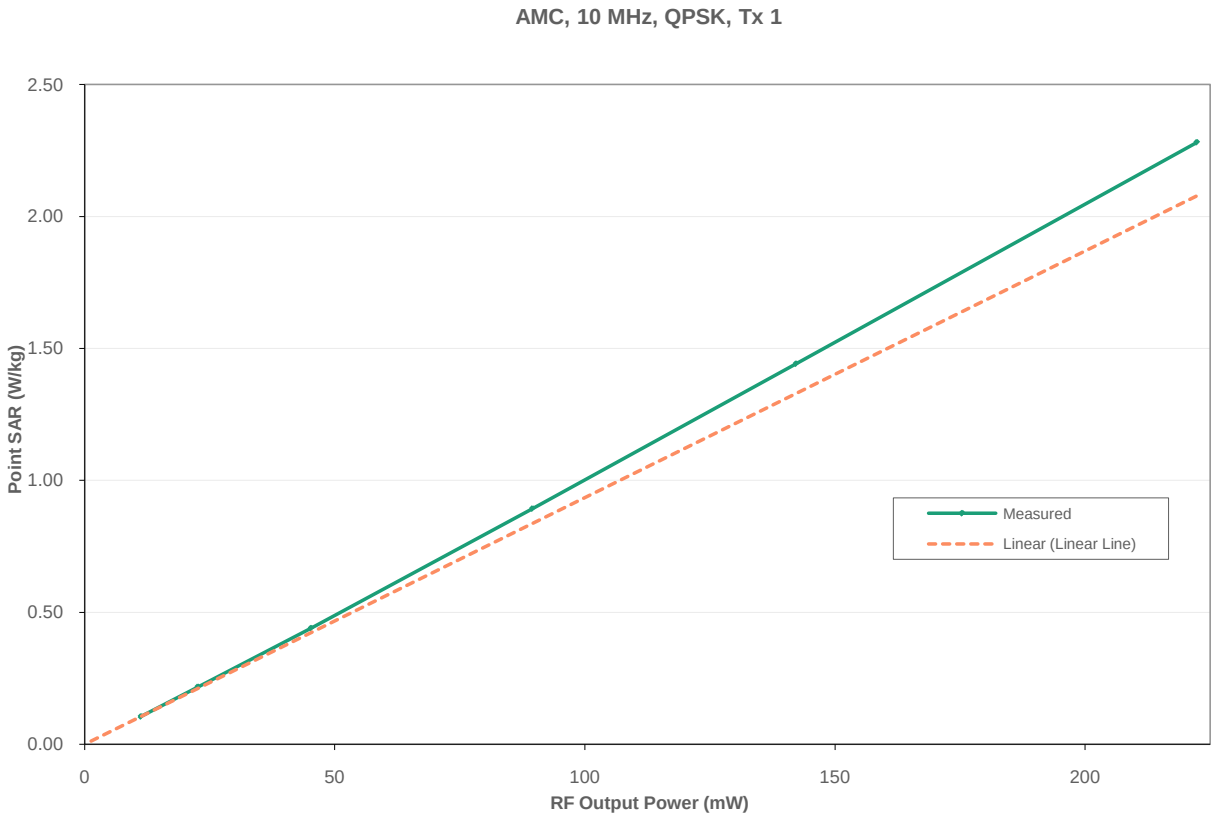

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Table 14-6
WIMAX PUSC QPSK Linearity for 5 MHz Bandwidth, Tx 2 Antenna

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	9.183	18.113	36.392	72.778	115.61	225.94
5 MHz	point SAR	0.1334	0.2724	0.5504	1.1230	1.80	3.607
	linear line	0.1334	0.2631	0.5287	1.0572	1.6795	3.282
	ε	0.0%	3.5%	4.1%	6.2%	7.4%	9.9%

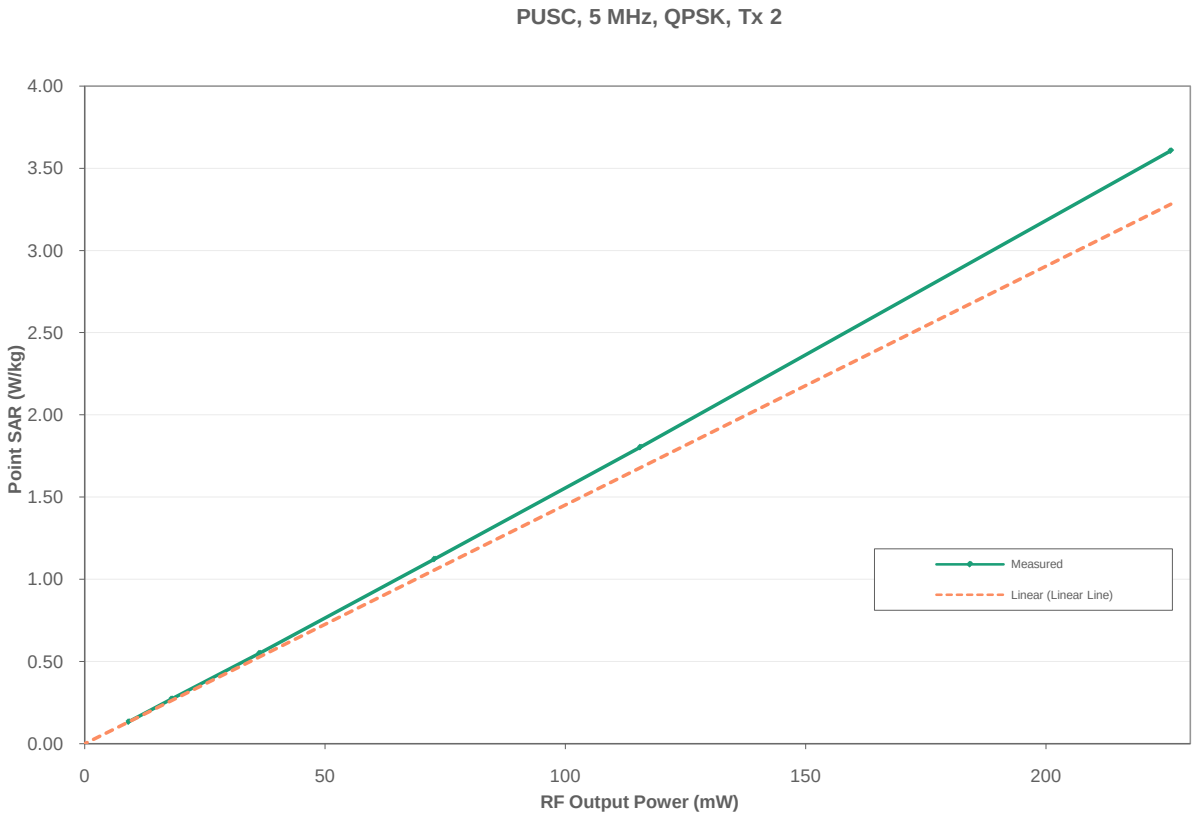

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Table 14-7
WIMAX PUSC QPSK Linearity for 10 MHz Bandwidth, Tx 2 Antenna

SAR (W/kg)	Zone	PUSC					
	Modulation	QPSK					
	Power (mW)	9.863	19.543	38.994	77.625	122.46	193.2
10 MHz	point SAR	0.1792	0.3643	0.7341	1.5020	2.414	3.855
	linear line	0.1792	0.3551	0.7085	1.4104	2.2250	3.5102
	ε	0.0%	2.6%	3.6%	6.5%	8.5%	9.8%

PUSC, 10 MHz, QPSK, Tx 2

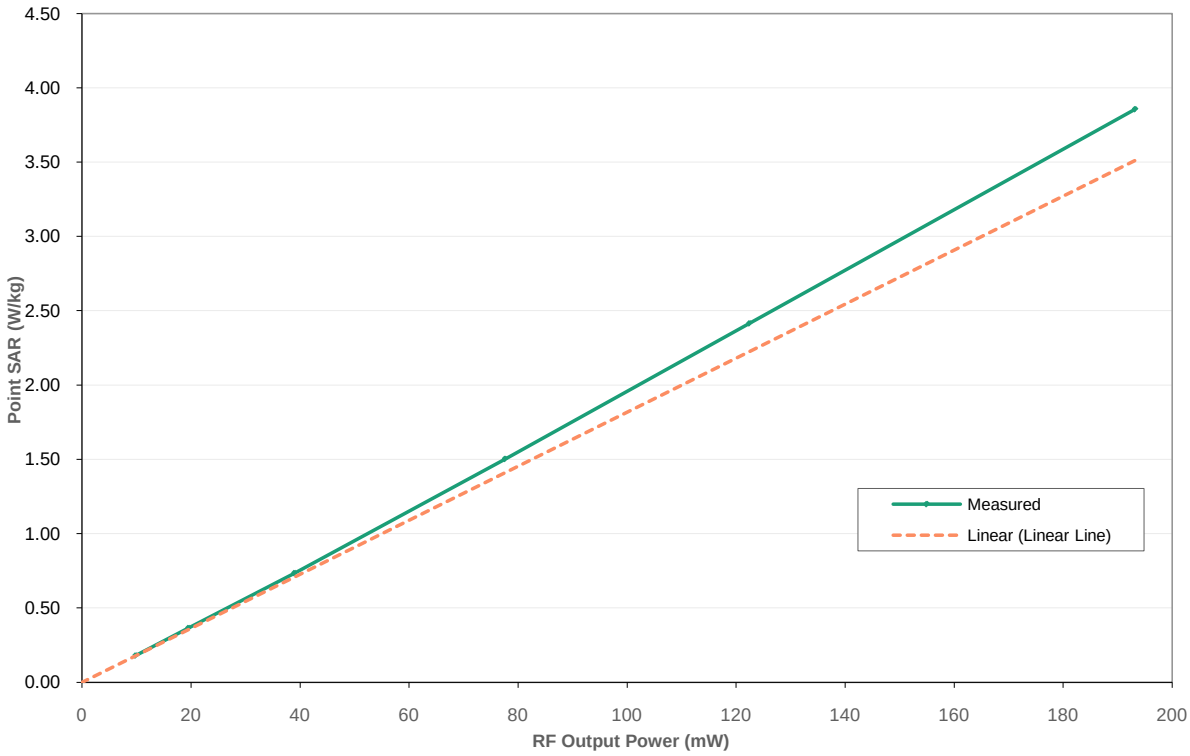

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Table 14-8
WIMAX BAMC QPSK Linearity for 5 MHz Bandwidth, Tx 2 Antenna

SAR (W/kg)	Zone	AMC					
	Modulation	QPSK					
	Power (mW)	9.817	19.543	39.355	78.343	123.88	243.22
5 MHz	point SAR	0.1448	0.295	0.602	1.211	1.951	3.9140
	linear line	0.1448	0.2883	0.5805	1.1556	1.8272	3.5875
	ε	0.0%	2.4%	3.8%	4.8%	6.8%	9.1%

AMC, 5 MHz, QPSK, Tx 2

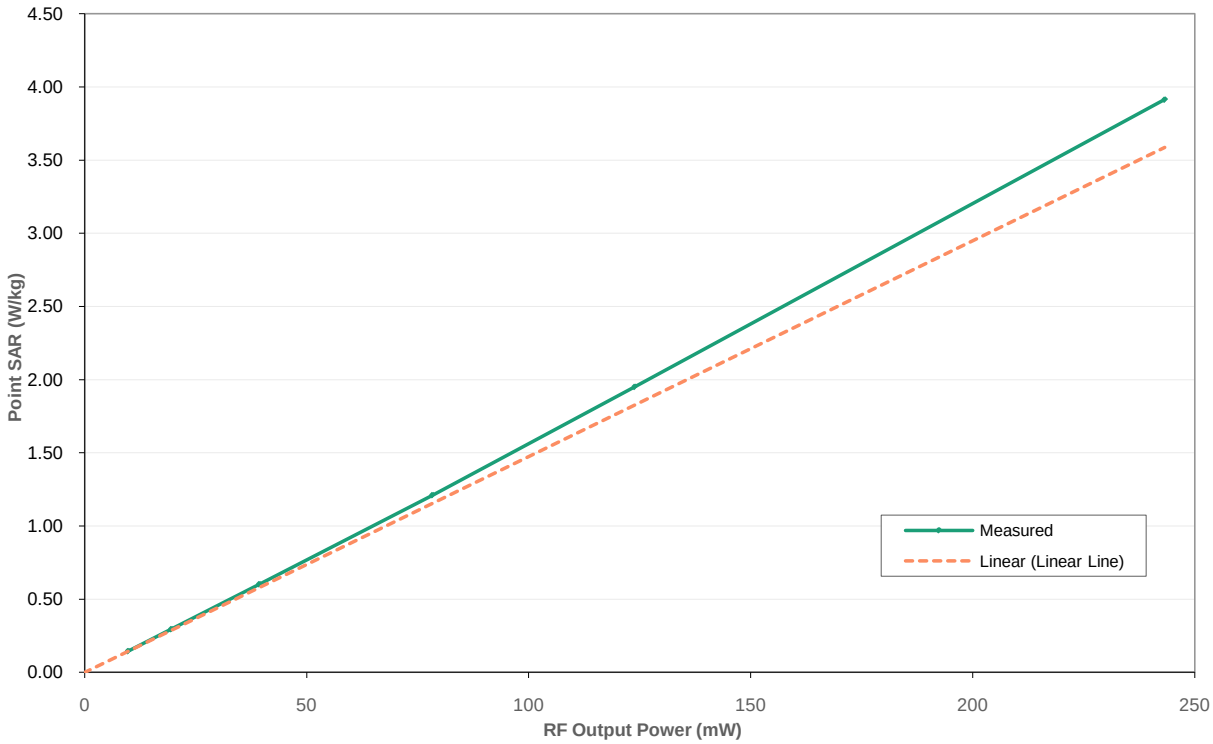

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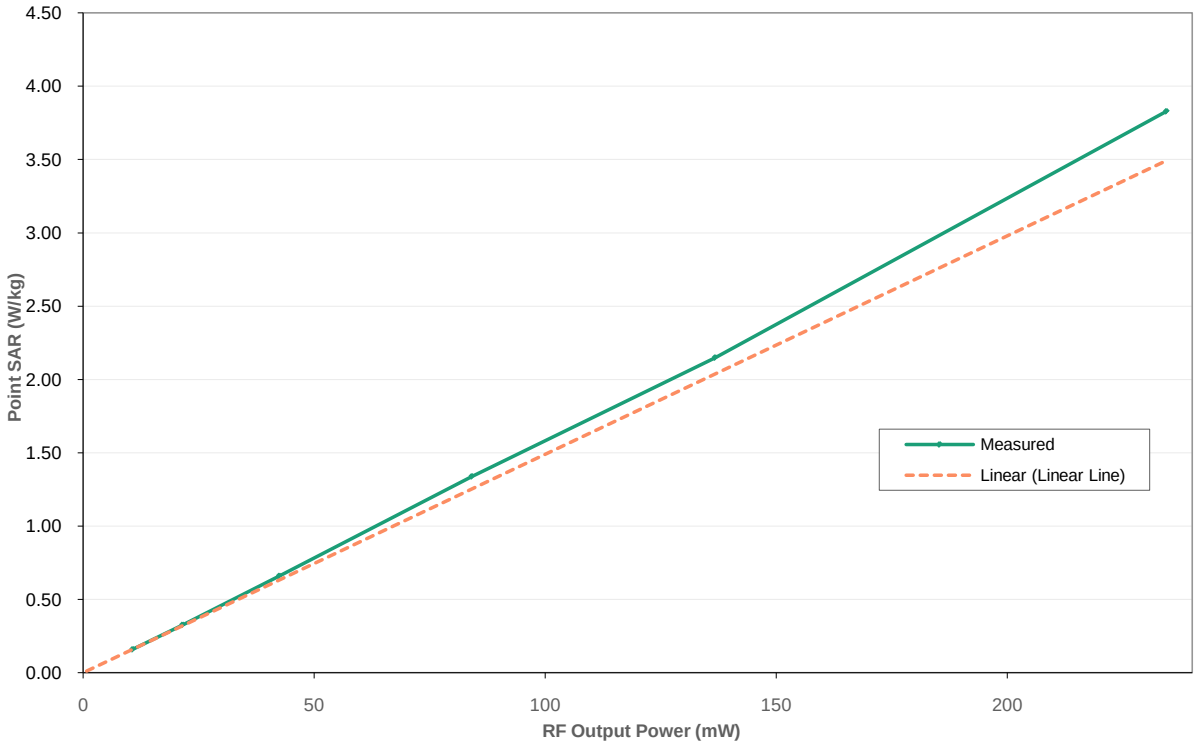
Table 14-9
WIMAX BAMC QPSK Linearity for 10 MHz Bandwidth, Tx 2 Antenna

SAR (W/kg)	Zone	AMC					
	Modulation	QPSK					
	Power (mW)	10.74	21.528	42.462	84.14	136.77	234.423
10 MHz	point SAR	0.1600	0.3269	0.6604	1.3390	2.1490	3.8280
	linear line	0.1600	0.3207	0.6326	1.2535	2.0376	3.4923
	ε	0.0%	1.9%	4.4%	6.8%	5.5%	9.6%

AMC, 10 MHz, QPSK, Tx 2



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14.5 Spectrum Analyzer Plots for WIMAX

Timing plots for the signal were analyzed to confirm control and traffic symbol duration.

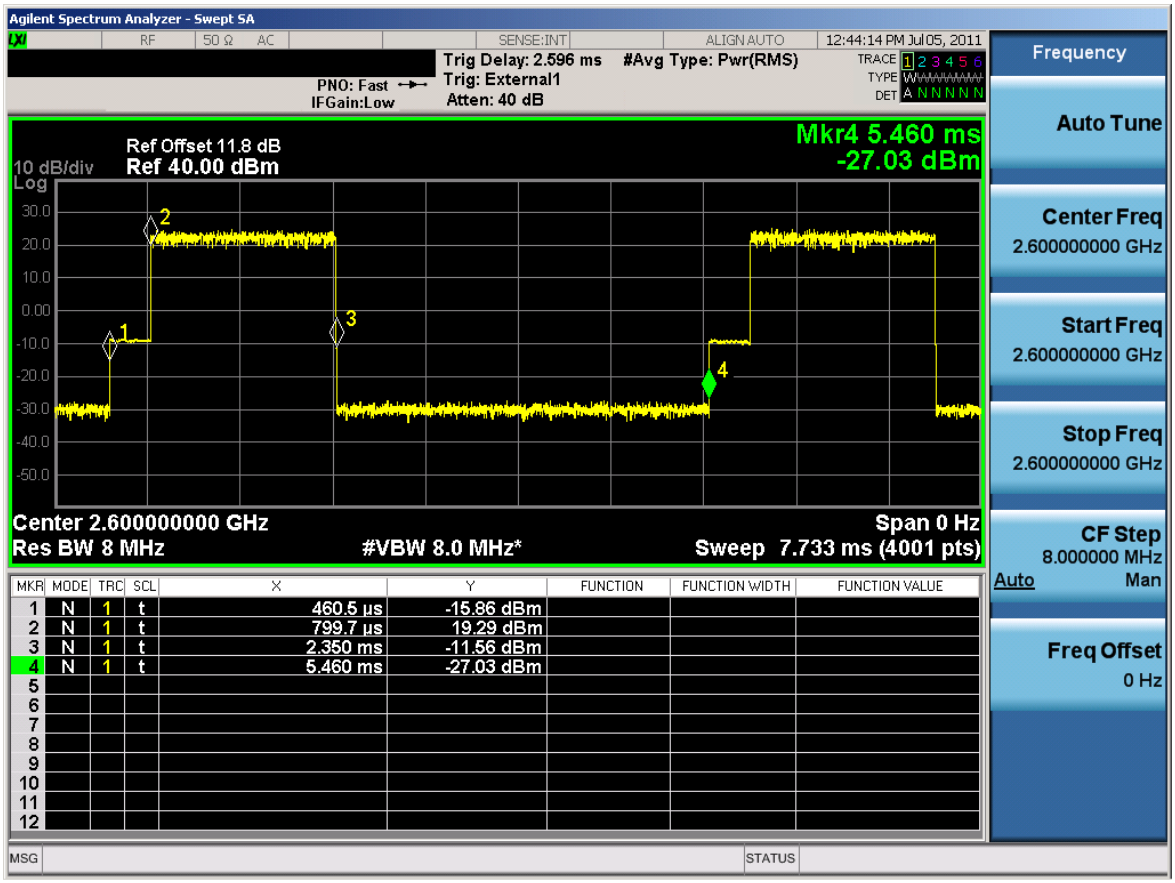

Figure 14-2
Timing Plot for WIMAX Signal – PUSC

Note: Both 5 MHz and 10 MHz Bandwidths and QPSK and 16-QAM Modulations have identical timing plots.

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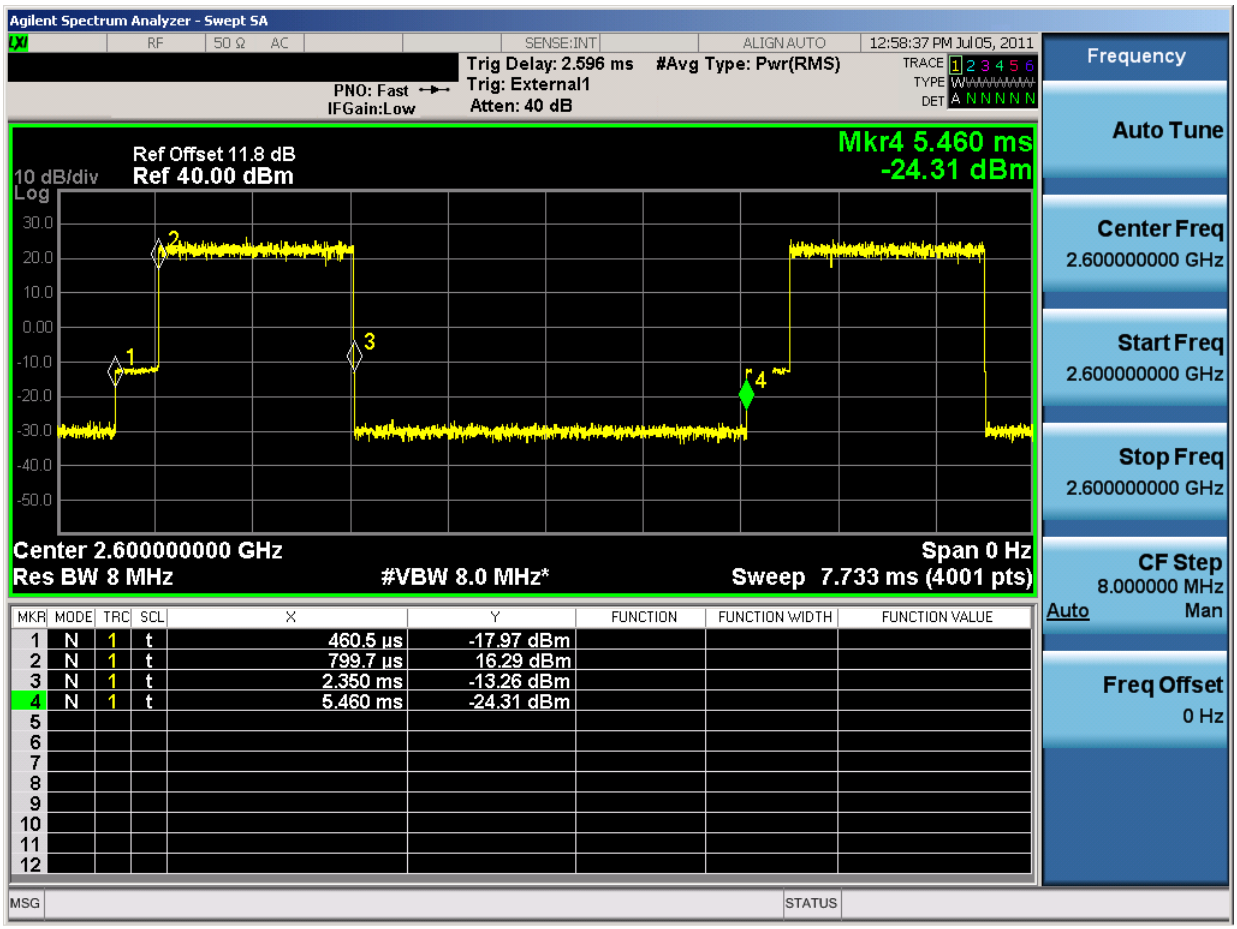

Figure 14-3
Timing Plot for WIMAX Signal – BAMC

Note: Both 5 MHz and 10 MHz Bandwidths and QPSK and 16-QAM Modulations have identical timing plots.

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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, modulations and zone-types.

14.7 WIMAX Error Correction Scaling Factors

The WIMAX error correction scaling factors below in Table 14-10 were applied to the measured SAR results per April 2010 FCC/TCB Workshop Guidance.

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.

The maximum rated power for WIMAX 10 MHz is 199.53 mW. The control symbol power is calculated from this level, to be 28.50 mW.

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

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

$$\frac{\left(P_{Max} * \frac{5}{35}\right) * 3 + P_{Max} * 15}{P * 15}$$

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

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

$$SAR\ Scaling\ Factor(Mid\ Ch, 10MHz\ BW, PUSC, QPSK, Tx\ 1) = \frac{\left(199.53\ mW * \frac{5}{35}\right) * 3 + 199.53\ mW * 15}{209.89\ mW * 15} = 0.98$$

$$SAR\ Scaling\ Factor(Mid\ Ch, 5MHz\ BW, BAMC, QPSK, Tx\ 2) = \frac{\left(251.19\ mW * \frac{5}{17}\right) * 3 + 251.19\ mW * 15}{247.74\ mW * 15} = 1.07$$

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Table 14-10
WIMAX Scaling Factors

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 Error Correction Scaling Factor
									Tx Antenna	dBm	mW	
Low	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	23.27	212.32	0.97
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	23.01	199.99	1.03
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	22.95	197.24	1.04
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	22.87	193.64	1.06
Mid	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	23.22	209.89	0.98
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	23.01	199.99	1.03
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	22.93	196.34	1.05
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	22.85	192.75	1.06
High	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	23.10	204.17	1.01
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	23.04	201.37	1.02
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	1	22.81	190.99	1.07
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	1	22.80	190.55	1.08
Low	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	23.87	243.78	1.09
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.62	230.14	1.16
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	23.46	221.82	1.20
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.43	220.29	1.21
Mid	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	23.94	247.74	1.07
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.45	221.31	1.20
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	23.57	227.51	1.17
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.45	221.31	1.20
High	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	24.00	251.19	1.06
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.56	226.99	1.17
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	1	23.37	217.27	1.22
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	1	23.56	226.99	1.17
Low	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	22.99	199.07	1.03
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.98	198.61	1.03
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	22.91	195.43	1.05
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.84	192.31	1.07
Mid	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	22.96	197.70	1.04
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.94	196.79	1.04
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	22.61	182.39	1.13
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.57	180.72	1.14
High	PUSC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	23.02	200.45	1.02
	PUSC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.86	193.20	1.06
	Band AMC	QPSK	10 MHz	199.53	35	5	28.50	85.51	2	22.82	191.43	1.07
	Band AMC	16QAM	10 MHz	199.53	35	5	28.50	85.51	2	22.77	189.23	1.08
Low	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.82	240.99	1.10
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.33	215.28	1.24
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.45	221.31	1.20
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.58	228.03	1.17
Mid	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.86	243.22	1.09
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.56	226.99	1.17
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.51	224.39	1.19
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.46	221.82	1.20
High	PUSC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.66	232.27	1.15
	PUSC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.35	216.27	1.23
	Band AMC	QPSK	5 MHz	251.19	17	5	73.88	221.64	2	23.31	214.29	1.24
	Band AMC	16QAM	5 MHz	251.19	17	5	73.88	221.64	2	23.49	223.36	1.19

The rated power for each zone is within the tune-up maximum of 24.0 dBm for 5 MHz BW and 23.0 dBm for 10 MHz BW. The rated maximum power is the same for all higher coding rates.

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15 PERSONAL WIRELESS ROUTER CONSIDERATIONS

15.1 Personal Wireless Router Considerations by the FCC

Some battery-operated handsets have the capability to transmit and receive internet connectivity through simultaneous transmission of WIFI in conjunction with a separate licensed transmitter. The FCC has provided guidance in KDB Publication 941225 D06 where SAR test considerations 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 device utilizes power reduction under some portable hotspot conditions for SAR compliance. There is an 8 dB power reduction for Cell CDMA and a 5.5 dB power reduction for PCS CDMA. There is no power reduction for WLAN or WIMAX. Additionally, there is no power reduction with a held-to-ear CDMA Voice call with WIMAX+WIFI Hotspot.

An additional sample was provided by the manufacturer with the reduced power enabled via manufacturer’s software in order to simulate the hotspot reduced power user scenario. The reduced powers were confirmed via conducted power measurements at the RF port. Detailed description of the Hotspot power reduction implementation is included on the operational description.

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15.4 Hotspot SAR Test Configurations

Table 15-1
Mobile Hotspot Side Exclusions

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
Cell. CDMA	Yes	Yes	No	Yes	Yes	Yes
PCS CDMA	Yes	Yes	No	Yes	Yes	Yes
WIMAX Tx 1	Yes	Yes	No	No	Yes	No
WIMAX Tx 2	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN	Yes	Yes	No	No	No	Yes

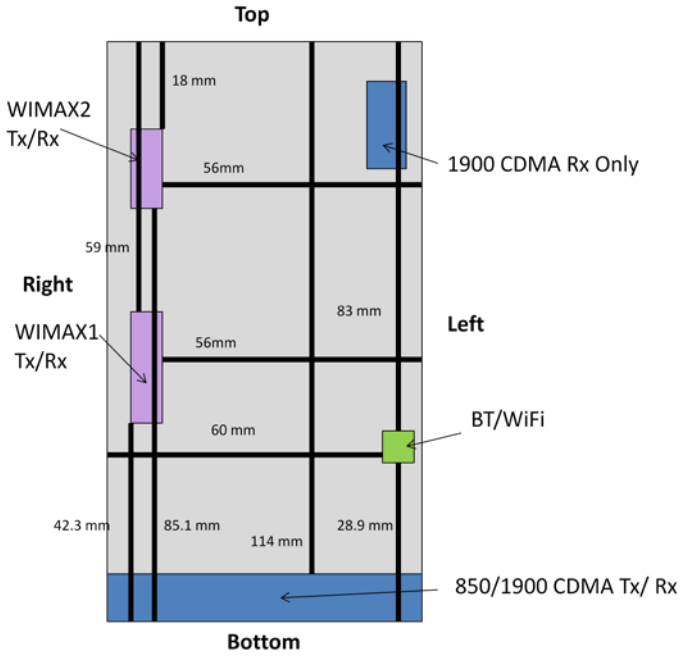

Figure 15-1
Identification of Sides for SAR Testing (Back View)

Note: Per FCC KDB Publication 941225 D06, the edges with antennas within 2.5 cm are required to be evaluated for SAR. See Figure 15-1 for distances of the actual device.

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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
04/20/2011	835H	820	0.868	40.58	0.898	41.571	-3.34%	-2.38%
		835	0.882	40.44	0.900	41.500	-2.00%	-2.55%
		850	0.896	40.26	0.916	41.500	-2.18%	-2.99%
04/25/2011	835B	820	0.924	52.55	0.969	55.284	-4.64%	-4.95%
		835	0.933	52.46	0.970	55.200	-3.81%	-4.96%
		850	0.967	52.55	0.988	55.154	-2.13%	-4.72%
04/29/2011	835B	820	0.945	52.93	0.969	55.284	-2.48%	-4.26%
		835	0.958	52.51	0.970	55.200	-1.24%	-4.87%
		850	0.970	52.59	0.988	55.154	-1.82%	-4.65%
04/21/2011	1900H	1850	1.399	41.01	1.400	40.000	-0.07%	2.52%
		1880	1.435	40.84	1.400	40.000	2.50%	2.10%
		1910	1.458	40.67	1.400	40.000	4.14%	1.68%
04/25/2011	1900B	1850	1.482	53.83	1.520	53.300	-2.50%	0.99%
		1880	1.503	52.76	1.520	53.300	-1.12%	-1.01%
		1910	1.547	52.52	1.520	53.300	1.78%	-1.46%
07/18/2011	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%
07/20/2011	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%
04/19/2011	2450H	2401	1.773	38.79	1.758	39.298	0.85%	-1.29%
		2450	1.829	38.74	1.800	39.200	1.61%	-1.17%
		2499	1.880	38.46	1.852	39.135	1.51%	-1.72%
04/18/2011	2450B	2401	1.955	50.98	1.903	52.765	2.73%	-3.38%
		2450	2.009	50.91	1.950	52.700	3.03%	-3.40%
		2499	2.064	50.50	2.019	52.638	2.23%	-4.06%
04/27/2011	2600H	2600	1.980	37.25	1.960	39.000	1.02%	-4.49%
04/26/2011	2600B	2600	2.227	49.92	2.163	52.509	2.96%	-4.93%

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

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

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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 Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 2 years ago but more than 1 year ago were confirmed in maintaining return loss (< - 20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB Publication 450824:

D2450V2 SN: 719								
	Head				Body			
Date of Measurement	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**
8/27/2009	-28.6		53.4		-27.2		48.2	**0.0**
3/2/2011	-28.6	**0.0%**	52	**-1.4**	-27.4	**0.7%**	49.9	**1.7**

The above tables represent RL and Impedance checks to ensure extended calibrations are acceptable per KDB Publication 450824 D02.

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16.4 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 (%)**
04/20/2011	24.5	22.9	0.250	835	4d047	Head	2.4	9.530	9.600	0.73%
04/25/2011	23.8	22.6	0.063	835	4d047	Body	0.634	9.850	10.0635	2.17%
04/29/2011	23.9	22.0	0.063	835	4d047	Body	0.651	9.850	10.3333	4.91%
04/21/2011	22.9	21.4	0.040	1900	502	Head	1.62	40.200	40.500	0.75%
04/25/2011	23.7	22.1	0.040	1900	502	Body	1.67	41.100	41.750	1.58%
07/18/2011	24.1	22.8	0.100	1900	502	Body	3.94	41.100	39.400	-4.14%
07/20/2011	24.8	23.2	0.100	1900	502	Body	4.3	41.100	43.000	4.62%
04/19/2011	24.1	23.5	0.0158	2450	719	Head	0.838	53.500	53.038	-0.86%
04/18/2011	24.1	23.0	0.0158	2450	719	Body	0.859	51.400	54.367	5.77%
04/27/2011	24.1	22.8	0.0158	2600	1027	Head	0.92	57.400	58.228	1.44%
04/26/2011	24.9	23.1	0.0158	2600	1027	Body	0.923	58.700	58.418	-0.48%

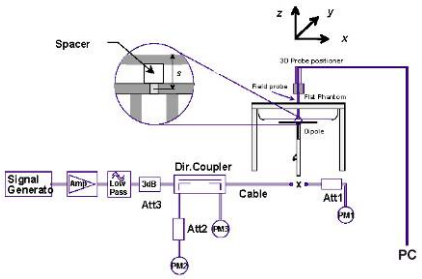

Figure 16-1
System Verification Setup Diagram

Figure 16-2
System Verification Setup Photo

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17 SAR DATA SUMMARY

Table 17-1
Cell. CDMA Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
824.70	1013	Cell. CDMA	25.17	-0.01	Right	Touch	LSNW230069 SJUG6093AA	**0.922**
836.52	384	Cell. CDMA	25.19	-0.02	Right	Touch	LSNW230069 SJUG6093AA	0.893
848.31	777	Cell. CDMA	24.96	0.04	Right	Touch	LSNW230069 SJUG6093AA	0.769
836.52	384	Cell. CDMA	25.19	0.01	Right	Tilt	LSNW230069 SJUG6093AA	**0.516**
824.70	1013	Cell. CDMA	25.17	0.00	Left	Touch	LSNW230069 SJUG6093AA	0.903
836.52	384	Cell. CDMA	25.19	0.00	Left	Touch	LSNW230069 SJUG6093AA	**0.930**
848.31	777	Cell. CDMA	24.96	0.00	Left	Touch	LSNW230069 SJUG6093AA	0.789
836.52	384	Cell. CDMA	25.19	0.00	Left	Tilt	LSNW230069 SJUG6093AA	**0.550**
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 (SNN5890A) 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 FCC KDB Publication 941225.
8. All samples tested were electrically identical per the applicant.

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Table 17-2
PCS CDMA Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	600	PCS CDMA	25.30	-0.05	Right	Touch	LSNW230069 SJUG6093AA	**0.424**
1880.00	600	PCS CDMA	25.30	0.04	Right	Tilt	LSNW230069 SJUG6093AA	**0.362**
1851.25	25	PCS CDMA	25.30	-0.04	Left	Touch	LSNW230069 SJUG6093AA	0.575
1880.00	600	PCS CDMA	25.30	0.00	Left	Touch	LSNW230069 SJUG6093AA	**0.870**
1908.75	1175	PCS CDMA	25.22	-0.09	Left	Touch	LSNW230069 SJUG6093AA	0.760
1880.00	600	PCS CDMA	25.30	0.02	Left	Tilt	LSNW230069 SJUG6093AA	**0.301**
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 (SNN5890A) 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 FCC KDB Publication 941225.
8. All samples tested were electrically identical per the applicant.

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Table 17-3
2.4 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	13.97	0.03	Right	Touch	LSNW230069 SJUG6093AA	1	**0.102**
2437	6	IEEE 802.11b	DSSS	13.97	0.05	Right	Tilt	LSNW230069 SJUG6093AA	1	**0.038**
2437	6	IEEE 802.11b	DSSS	13.97	0.10	Left	Touch	LSNW230069 SJUG6093AA	1	**0.255**
2437	6	IEEE 802.11b	DSSS	13.97	0.02	Left	Tilt	LSNW230069 SJUG6093AA	1	**0.028**
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 (SNN5890A) 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 802.11b mode.
7. WLAN transmission was verified using a spectrum analyzer.
8. All samples tested were electrically identical per the applicant.

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Table 17-4
WIMAX Tx Antenna 1 Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY	Mode/Band	Zone Type	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Modulation	Bandwidth [MHz]	Serial Number	WIMAX Tx Antenna	Measured SAR (1g)	Scaling Factor	Scaled SAR (1g)
MHz											(W/kg)		(W/kg)
2600	WIMAX	PUSC	23.94	0.10	Right	Touch	QPSK	5	LSNW270089SJUG6093AA	1	0.353	1.074	0.379
2600	WIMAX	PUSC	23.22	-0.03	Right	Touch	QPSK	10	LSNW270089SJUG6093AA	1	0.312	0.978	0.305
2600	WIMAX	BAMC	23.57	0.02	Right	Touch	QPSK	5	LSNW270089SJUG6093AA	1	0.364	1.169	**0.426**
2600	WIMAX	BAMC	22.93	-0.01	Right	Touch	QPSK	10	LSNW270089SJUG6093AA	1	0.299	1.045	0.313
2600	WIMAX	PUSC	23.94	0.05	Right	Tilt	QPSK	5	LSNW270089SJUG6093AA	1	0.0485	1.074	**0.052**
2600	WIMAX	PUSC	23.22	-0.02	Right	Tilt	QPSK	10	LSNW270089SJUG6093AA	1	0.0451	0.978	0.044
2600	WIMAX	PUSC	23.94	-0.02	Left	Touch	QPSK	5	LSNW270089SJUG6093AA	1	0.227	1.074	**0.244**
2600	WIMAX	PUSC	23.22	-0.02	Left	Touch	QPSK	10	LSNW270089SJUG6093AA	1	0.218	0.978	0.213
2600	WIMAX	PUSC	23.94	0.06	Left	Tilt	QPSK	5	LSNW270089SJUG6093AA	1	0.0672	1.074	**0.072**
2600	WIMAX	PUSC	23.22	0.10	Left	Tilt	QPSK	10	LSNW270089SJUG6093AA	1	0.0709	0.978	0.069
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 (SNN5890A) 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. All samples tested were electrically identical per the applicant.
8. SAR Test configurations 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 BAMC and PUSC Zone types.
    d. The average output power of BAMC zone type is lower than PUSC zone type for all configurations measured. Therefore, WIMAX SAR for BAMC Zone type was tested in the highest SAR configuration determined in each PUSC configuration.
    e. 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.
    f. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    g. The scaled SAR was used to determine test reduction scenarios.

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Table 17-5
WIMAX Tx Antenna 2 Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY MHz	Mode	Zone Type	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Modulation	Bandwidth [MHz]	Serial Number	WIMAX Tx Antenna	Measured SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)
2600	WIMAX	PUSC	23.86	0.03	Right	Touch	QPSK	5	LSNW270089SJUG6093AA	2	0.133	1.094	0.145
2600	WIMAX	PUSC	22.96	0.00	Right	Touch	QPSK	10	LSNW270089SJUG6093AA	2	0.117	1.038	**0.121**
2600	WIMAX	PUSC	23.86	0.04	Right	Tilt	QPSK	5	LSNW270089SJUG6093AA	2	0.125	1.094	0.137
2600	WIMAX	PUSC	22.96	0.02	Right	Tilt	QPSK	10	LSNW270089SJUG6093AA	2	0.119	1.038	**0.124**
2600	WIMAX	PUSC	23.86	0.00	Left	Touch	QPSK	5	LSNW270089SJUG6093AA	2	0.288	1.094	0.315
2600	WIMAX	PUSC	22.96	0.03	Left	Touch	QPSK	10	LSNW270089SJUG6093AA	2	0.238	1.038	0.247
2600	WIMAX	BAMC	23.51	-0.02	Left	Touch	QPSK	5	LSNW270089SJUG6093AA	2	0.261	1.185	**0.309**
2600	WIMAX	BAMC	22.61	0.03	Left	Touch	QPSK	10	LSNW270089SJUG6093AA	2	0.215	1.125	0.242
2600	WIMAX	PUSC	23.86	0.07	Left	Tilt	QPSK	5	LSNW270089SJUG6093AA	2	0.15	1.094	0.164
2600	WIMAX	PUSC	22.96	0.04	Left	Tilt	QPSK	10	LSNW270089SJUG6093AA	2	0.141	1.038	**0.146**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

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 (SNN5890A) 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. All samples tested were electrically identical per the applicant.
8. SAR Test configurations 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 BAMC and PUSC Zone types.
    d. The average output power of BAMC zone type is lower than PUSC zone type for all configurations measured. Therefore, WIMAX SAR for BAMC Zone type was tested in the highest SAR configuration determined in each PUSC configuration.
    e. WIMAX SAR was scaled according to FCC WIMAX requirements (See 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.
    f. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    g. The scaled SAR was used to determine test reduction scenarios.

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Table 17-6
Body-Worn SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Side	SAR (1g)
MHz	Ch.								(W/kg)
836.52	384	Cell. CDMA	TDSO32	25.16	0.01	2.5 cm	LSNW230069 SJUG6093AA	back	**0.702**
1851.25	25	PCS CDMA	TDSO32	25.29	-0.04	2.5 cm	LSNW230069 SJUG6093AA	back	0.659
1880.00	600	PCS CDMA	TDSO32	25.33	-0.01	2.5 cm	LSNW230069 SJUG6093AA	back	**0.912**
1908.75	1175	PCS CDMA	TDSO32	25.25	-0.08	2.5 cm	LSNW230069 SJUG6093AA	back	0.678
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	Mode	Zone Type	Conducted Power [dBm]	Power Drift [dB]	Spacing	Modulation	Bandwidth [MHz]	Serial Number	WIMAX Tx Antenna	Side	Measured SAR (1g)	Scaling Factor	Scaled SAR (1g)
MHz											(W/kg)		(W/kg)
2600	WIMAX	PUSC	23.94	-0.03	2.5 cm	QPSK	5	LSNW270089SJUG6093AA	1	back	0.0417	1.074	0.045
2600	WIMAX	PUSC	23.22	0.01	2.5 cm	QPSK	10	LSNW270089SJUG6093AA	1	back	0.0432	0.978	0.042
2600	WIMAX	PUSC	23.86	0.00	2.5 cm	QPSK	5	LSNW270089SJUG6093AA	2	back	0.0794	1.094	0.087
2600	WIMAX	PUSC	22.96	-0.02	2.5 cm	QPSK	10	LSNW270089SJUG6093AA	2	back	0.102	1.038	**0.106**
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 (SNN5890A) was used.
5. Liquid tissue depth was at least 15.0 cm.
6. A separation distance of 25 mm is chosen because Motorola has determined that it supports the types of body-worn accessories available in the marketplace to users for this handset.
7. CDMA 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 FCC KDB Publication 941225.
8. 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).
9. All samples tested were electrically identical per the applicant.
10. 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 BAMC and PUSC Zone types.
    d. The average output power of BAMC zone type is lower than PUSC zone type for all configurations measured. Therefore, WIMAX SAR for BAMC Zone type was tested in the highest SAR configuration determined in each PUSC configuration.
    e. 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.
    f. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    g. The scaled SAR was used to determine test reduction scenarios.
11. Body-Worn SAR was tested with headphones (model: SJYN0234B).

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Table 17-7
CDMA Hotspot Body SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Hotspot Power Reduction [dB]	Spacing	Serial Number	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.52	384	Cell. CDMA	TDSO32	17.07	0.03	8.0	1.0 cm	LSNW260017 SJUG6093AA	back	0.210
836.52	384	Cell. CDMA	TDSO32	17.07	0.01	8.0	1.0 cm	LSNW260017 SJUG6093AA	front	0.161
836.52	384	Cell. CDMA	TDSO32	17.07	0.03	8.0	1.0 cm	LSNW260017 SJUG6093AA	bottom	0.015
836.52	384	Cell. CDMA	TDSO32	17.07	-0.02	8.0	1.0 cm	LSNW260017 SJUG6093AA	right	0.158
836.52	384	Cell. CDMA	TDSO32	17.07	0.00	8.0	1.0 cm	LSNW260017 SJUG6093AA	left	0.166
836.52	384	Cell. CDMA	EVDO	17.27	0.01	8.0	1.0 cm	LSNW260017 SJUG6093AA	back	0.218
836.52	384	Cell. CDMA	EVDO	17.27	0.00	8.0	1.0 cm	LSNW260017 SJUG6093AA	front	0.165
836.52	384	Cell. CDMA	EVDO	17.27	0.01	8.0	1.0 cm	LSNW260017 SJUG6093AA	bottom	0.013
836.52	384	Cell. CDMA	EVDO	17.27	0.00	8.0	1.0 cm	LSNW260017 SJUG6093AA	right	0.157
836.52	384	Cell. CDMA	EVDO	17.27	0.00	8.0	1.0 cm	LSNW260017 SJUG6093AA	left	0.161
1851.25	25	PCS CDMA	TDSO32	19.37	-0.01	5.5	1.0 cm	TA035000ZH	back	0.656
1880.00	600	PCS CDMA	TDSO32	19.21	0.02	5.5	1.0 cm	TA035000ZH	back	0.918
1908.75	1175	PCS CDMA	TDSO32	19.14	-0.01	5.5	1.0 cm	TA035000ZH	back	0.862
1880.00	600	PCS CDMA	TDSO32	19.21	0.01	5.5	1.0 cm	TA035000ZH	front	0.540
1851.25	25	PCS CDMA	TDSO32	19.37	0.06	5.5	1.0 cm	TA035000ZH	bottom	0.951
1880.00	600	PCS CDMA	TDSO32	19.21	-0.03	5.5	1.0 cm	TA035000ZH	bottom	1.350
1908.75	1175	PCS CDMA	TDSO32	19.14	0.06	5.5	1.0 cm	TA035000ZH	bottom	1.380
1880.00	600	PCS CDMA	TDSO32	19.21	0.07	5.5	1.0 cm	TA035000ZH	right	0.149
1880.00	600	PCS CDMA	TDSO32	19.21	-0.01	5.5	1.0 cm	TA035000ZH	left	0.091
1851.25	25	PCS CDMA	EVDO	19.52	0.00	5.5	1.0 cm	TA035000ZH	back	0.633
1880.00	600	PCS CDMA	EVDO	19.32	0.02	5.5	1.0 cm	TA035000ZH	back	0.912
1908.75	1175	PCS CDMA	EVDO	19.27	0.01	5.5	1.0 cm	TA035000ZH	back	1.070
1880.00	600	PCS CDMA	EVDO	19.32	0.01	5.5	1.0 cm	TA035000ZH	front	0.473
1851.25	25	PCS CDMA	EVDO	19.52	-0.06	5.5	1.0 cm	TA035000ZH	bottom	0.959
1880.00	600	PCS CDMA	EVDO	19.32	0.02	5.5	1.0 cm	TA035000ZH	bottom	1.130
1908.75	1175	PCS CDMA	EVDO	19.27	-0.02	5.5	1.0 cm	TA035000ZH	bottom	1.210
1880.00	600	PCS CDMA	EVDO	19.32	0.04	5.5	1.0 cm	TA035000ZH	right	0.047
1880.00	600	PCS CDMA	EVDO	19.32	0.01	5.5	1.0 cm	TA035000ZH	left	0.100
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 (SNN5890A) was used.
5. Liquid tissue depth was at least 15.0 cm.
6. Device was tested using a fixed spacing.
7. CDMA Hotspot Body SAR was tested under EVDO Rev. 0 per FCC 3G Guidance (See Section 12.2.5) per FCC KDB Publication 941225 D01.
8. 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).
9. All samples tested were electrically identical per the applicant.
10. Top Edge was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 15).
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). This methodology is distinct from past Motorola methodologies to obtain reduced power measurements.
12. Power Reduction is enabled for CDMA when the phone is in a hotspot condition on the body. See Section 15.3.
13. TDSO32 was tested in addition to EVDO for summation purposes to account for the 1x Voice Call + WIMAX Hotspot user condition. RC3/SO32 was tested with FCH only since FCH+SCH modes are not greater than 0.25 dB of the FCH only mode per FCC KDB Publication 941225 D01.
14. TDSO32 was tested with headphones (model: SJYN0234B) to cover the body-worn usage.

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Table 17-8
Hotspot 2.4 GHz Body SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Serial Number	Data Rate (Mbps)	Side	SAR
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	13.97	0.01	1.0 cm	LSNW230069 SJUG6093AA	1	back	**0.182**
2437	6	IEEE 802.11b	DSSS	13.97	-0.02	1.0 cm	LSNW230069 SJUG6093AA	1	front	**0.105**
2437	6	IEEE 802.11b	DSSS	13.97	-0.01	1.0 cm	LSNW230069 SJUG6093AA	1	left	**0.306**
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 (SNN5890A) 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 using 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 802.11n) 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 802.11b mode.
8. WLAN transmission was verified using a spectrum analyzer.
9. All samples tested were electrically identical per the applicant.
10. Top, 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 guidance (see Section 15).

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Table 17-9
WIMAX Hotspot Body SAR Results

MEASUREMENT RESULTS													
FREQUENCY	Mode	Zone Type	Conducted Power [dBm]	Power Drift [dB]	Spacing	Modulation	Bandwidth [MHz]	Serial Number	WIMAX Tx Antenna	Side	Measured SAR (1g)	Scaling Factor	SAR (1g)
MHz											(W/kg)		(W/kg)
2600	WIMAX	PUSC	23.94	-0.03	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	1	back	0.211	1.074	**0.227**
2600	WIMAX	PUSC	23.22	0.01	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	1	back	0.212	0.978	0.207
2600	WIMAX	PUSC	23.94	-0.02	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	1	front	0.119	1.074	**0.128**
2600	WIMAX	PUSC	23.22	0.00	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	1	front	0.0112	0.978	0.011
2600	WIMAX	PUSC	23.94	0.00	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	1	right	0.237	1.074	0.254
2600	WIMAX	PUSC	23.22	0.00	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	1	right	0.233	0.978	0.228
2600	WIMAX	BAMC	23.57	0.00	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	1	right	0.273	1.169	0.319
2600	WIMAX	BAMC	22.93	0.01	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	1	right	0.231	1.045	**0.241**
2600	WIMAX	PUSC	23.86	-0.02	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	2	back	0.507	1.094	0.554
2600	WIMAX	PUSC	22.96	0.00	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	2	back	0.39	1.038	0.405
2600	WIMAX	BAMC	23.51	0.00	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	2	back	0.47	1.185	**0.557**
2600	WIMAX	BAMC	22.61	-0.01	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	2	back	0.386	1.125	0.434
2600	WIMAX	PUSC	23.86	-0.01	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	2	front	0.0958	1.094	**0.105**
2600	WIMAX	PUSC	22.96	-0.02	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	2	front	0.0613	1.038	0.064
2600	WIMAX	PUSC	23.86	0.02	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	2	top	0.0714	1.094	**0.078**
2600	WIMAX	PUSC	23.86	0.02	1.0 cm	QPSK	5	LSNW270089SJUG6093AA	2	right	0.351	1.094	**0.384**
2600	WIMAX	PUSC	22.96	0.00	1.0 cm	QPSK	10	LSNW270089SJUG6093AA	2	right	0.27	1.038	0.280
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 (SNN5890A) 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: 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. Top, Bottom and Left Edges for WIMAX Tx 1 and Bottom and Left Edges for WIMAX Tx 2 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).
10. 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).
11. SAR Test configurations 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 BAMC and PUSC Zone types.
    d. The average output power of BAMC zone type is lower than PUSC zone type for all configurations measured. Therefore, WIMAX SAR for BAMC Zone type was tested in the highest SAR configuration determined in each PUSC configuration.
    e. 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.
    f. Crest Factor used for the SAR system for the WIMAX signal for 5 MHz and 10 MHz BW was 1/(15/48) = 3.2.
    g. The scaled SAR was used to determine test reduction scenarios.

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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

Peak RF Conducted Power of Bluetooth Tx is 16.943 mW. RF Conducted Power of WLAN is 24.95 mW.

18.4 Simultaneous Transmission Analysis

Per April 2011 FCC/TCB Workshop Guidance, p.20, Bluetooth SAR was not required since a) Bluetooth and 2.4GHz Wi-Fi are implemented in the same chipset, using the same antenna and RF components, b) Bluetooth time-averaged power is < 60/2.4 mW (or 25 mW), c) the maximum peak and average Bluetooth power is less than the output power in all Wi-Fi modes, d) the measured Wi-Fi SAR is < 0.4 W/kg for all configurations, and e) simultaneous transmission SAR exclusion applies to all applicable configurations involving Wi-Fi or Bluetooth.

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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

Bluetooth cannot transmit with WIFI (same RF path) but can additionally transmit with CDMA/EVDO and WIMAX for Body SAR conditions only. 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 voice can transmit simultaneously with WIMAX and WLAN acting as a hotspot. WIMAX Tx Ant 1 and WIMAX Tx Ant 2 cannot transmit simultaneously. CDMA and EVDO cannot transmit simultaneously (same RF path).

CDMA supports voice and data modes. WIFI and WIMAX support data communication only.

Table 19-1
Possible Simultaneous Transmission Scenarios

No.	Capable Tx Configurations	Head SAR	Body SAR	Hotspot SAR	Note
1	CDMA	√	√	-	Standalone 1X-RTT CDMA
2	EVDO	x	√	-	Standalone EVDO
3	WIMAX	x	√	-	Standalone WIMAX
4	WIFI	x	√	-	Standalone WIFI
5	CDMA+WIMAX	√	√	-	1X Voice + WIMAX Data
6	CDMA+WIFI	√	√	-	1X Voice + WIFI Data
7	WIMAX+WIFI	x	x	√	WIMAX+WIFI Hotspot
8	EVDO+WIFI	x	x	√	EVDO+WIFI Hotspot
9	CDMA + WIMAX + WIFI	√	√	√	1x Voice + WIMAX Hotspot

19.2 Head SAR Simultaneous Transmission Analysis

Table 19-2
Cellular CDMA + WIMAX + WIFI Simultaneous Tx (Held to Ear)

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	WIMAX SAR (W/kg) (Scaled)		WIFI SAR (W/kg)	Σ SAR (W/kg)					SPLS Ratios per KDB 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	Transmitter	1	Tx 1 2a	Tx 2 2b	3	1+2a	1+2b	1+3	1+2a+3	1+2b+3		
Head SAR	Right Cheek	0.922	0.426	0.145	0.102	**1.348**	**1.067**	**1.024**	**1.450**	**1.169**	N/A	N/A
	Right Tilt	0.516	0.052	0.137	0.038	**0.568**	**0.653**	**0.554**	**0.606**	**0.690**	N/A	N/A
	Left Cheek	0.930	0.244	0.315	0.255	**1.174**	**1.245**	**1.185**	**1.429**	**1.500**	N/A	N/A
	Left Tilt	0.550	0.072	0.164	0.028	**0.622**	**0.714**	**0.578**	**0.650**	**0.742**	N/A	N/A

*SPLS: SAR Sum to peak location separation
Note:

1. Voice is only supported with CDMA transmission. WIMAX and WIFI were additionally measured in the head to support simultaneous transmission scenarios. WIMAX + WIFI is not a possible simultaneous transmission scenario in a held to ear position because there is no voice transmission supported with this specific combination.
2. Since the numerical sums were below 1.6 W/kg for, no SAR ratio analysis or aggregate volumetric SAR evaluations for the transmitters was required.
3. WIMAX Tx Ant. 1 and WIMAX Tx Ant. 2 cannot transmit simultaneously.

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Table 19-3
PCS CDMA + WIMAX + WIFI Simultaneous Tx (Held to Ear)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	WIMAX SAR (W/kg) (Scaled)		WIFI SAR (W/kg)	Σ SAR (W/kg)					SPLS Ratios per KDB 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	Transmitter	1	Tx 1 2a	Tx 2 2b	3	1+2a	1+2b	1+3	1+2a+3	1+2b+3		
Head SAR	Right Cheek	0.424	0.426	0.145	0.102	**0.850**	**0.569**	**0.526**	**0.952**	**0.671**	N/A	N/A
	Right Tilt	0.362	0.052	0.137	0.038	**0.414**	**0.499**	**0.400**	**0.452**	**0.536**	N/A	N/A
	Left Cheek	0.870	0.244	0.315	0.255	**1.114**	**1.185**	**1.125**	**1.369**	**1.440**	N/A	N/A
	Left Tilt	0.301	0.072	0.164	0.028	**0.373**	**0.465**	**0.329**	**0.401**	**0.493**	N/A	N/A

*SPLS: SAR Sum to peak location separation

Note:

1. Voice is only supported with CDMA transmission. WIMAX and WIFI were additionally measured in the head to support simultaneous transmission scenarios. WIMAX + WIFI is not a possible simultaneous transmission scenario in a held to ear position because there is no voice transmission supported with this specific combination.
2. Since the numerical sums were below 1.6 W/kg for, no SAR ratio analysis or aggregate volumetric SAR evaluations for the transmitters was required.
3. WIMAX Tx Ant. 1 and WIMAX Tx Ant. 2 cannot transmit simultaneously.

19.3 Body-Worn SAR Simultaneous Transmission Analysis

Table 19-4
Body-Worn Simultaneous Tx Analysis at 2.5 cm

Simult Tx	Configuration	CDMA SAR (W/kg)	WIMAX SAR (W/kg) (Scaled)		WIFI SAR (W/kg)	Σ SAR (W/kg)					SPLS Ratios per KDB 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	Transmitter	TDSO 1	Tx 1 2a	Tx 2 2b	3	1x Voice + WIMAX Data		1x Voice + WIFI Data	1x Voice + WIMAX + WIFI			
	Power Level	25	24	24	14	1+2a	1+2b	1+3	1+2a+3	1+2b+3		
Body SAR	Cell CDMA	0.702	0.045	0.106	< 0.182	**0.747**	**0.775**	**<0.884**	**<0.747**	**<0.808**	N/A	N/A
Body SAR	PCS CDMA	0.912	0.045	0.106	< 0.182	**0.957**	**0.270**	**<1.094**	**<0.957**	**<1.018**	N/A	N/A

*SPLS: SAR Sum to peak location separation

Notes:

1. Bluetooth can transmit simultaneously with CDMA/EVDO and WIMAX (but not WIFI). Bluetooth SAR was not required and is 0 W/kg for summation analysis purposes.
2. Since the numerical sums were below 1.6 W/kg for, no SAR ratio analysis or aggregate volumetric SAR evaluations for the transmitters was required.
3. WIMAX Tx Ant. 1 and WIMAX Tx Ant. 2 cannot transmit simultaneously.
4. For SAR calculations at 2.5 cm, WLAN SAR values for 1.0 cm were used since the 1.0 cm test distance. 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.

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19.4 Hotspot SAR Simultaneous Transmission Analysis

Table 19-5
Cellular CDMA, WIMAX, WIFI Simultaneous Tx Analysis for Hotspot Modes

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)		WIMAX SAR (W/kg) (Scaled)		WIFI SAR (W/kg)	Σ SAR (W/kg)					SPLS Ratios per KDB 648474	Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	Transmitter	1x Voice 1a	EVDO 1b	Tx 1 2a	Tx 2 2b	3	CDMA EVDO + WIFI	WIMAX+WIFI		1x Voice + WIMAX + WIFI			
	Power Level	17	17	24	24	14	1b+3	2a+3	2b+3	1a+2a+3	1a+2b+3		
Body SAR	Back	0.210	0.218	0.227	0.557	0.182	**0.400**	**0.409**	**0.739**	**0.619**	**0.949**	N/A	N/A
	Front	0.161	0.165	0.128	0.105	0.105	**0.270**	**0.233**	**0.210**	**0.394**	**0.371**	N/A	N/A
	Top				0.078		**0.000**	**0.000**	**0.078**	**0.000**	**0.078**	N/A	N/A
	Bottom	0.015	0.013				**0.013**	**0.000**	**0.000**	**0.015**	**0.015**	N/A	N/A
	Right	0.158	0.157	0.319	0.384		**0.157**	**0.319**	**0.384**	**0.477**	**0.542**	N/A	N/A
	Left	0.166	0.161			0.306	**0.467**	**0.306**	**0.306**	**0.472**	**0.472**	N/A	N/A

*SPLS: SAR Sum to peak location separation

Notes:

1. Per FCC KDB Publication 941225 D06, when the antenna distance from the edge was greater than 2.5 cm, SAR is not required and is 0 W/kg for summation analysis.
2. Since the numerical sums were below 1.6 W/kg for, no SAR ratio analysis or aggregate volumetric SAR evaluations for the transmitters was required.
3. WIMAX Tx Ant. 1 and WIMAX Tx Ant. 2 cannot transmit simultaneously.

Table 19-6
PCS CDMA, WIMAX, WIFI Simultaneous Tx Analysis for Hotspot Modes

Simult Tx	Configuration	PCS CDMA SAR (W/kg)		WIMAX SAR (W/kg) (Scaled)		WIFI SAR (W/kg)	Σ SAR (W/kg)					SPLS Ratios per KDB 648474			Simultaneous Transmission (with Volume Scan) SAR (W/kg)
	Transmitter	1x Voice 1a	EVDO 1b	Tx 1 2a	Tx 2 2b	3	CDMA EVDO + WIFI	WIMAX+WIFI		1x Voice + WIMAX + WIFI					
	Power Level	17	17	24	24	14	1b+3	2a+3	2b+3	1a+2a+3	1a+2b+3	1a+2b	1a+3	2b+3	
Body SAR	Back	0.918	1.070	0.227	0.557	0.182	**1.252**	**0.409**	**0.739**	**1.327**	**See Note 5**	**0.14**	**0.25**	**0.08**	N/A
	Front	0.540	0.473	0.128	0.105	0.105	**0.578**	**0.233**	**0.210**	**0.773**	**0.750**	N/A	N/A	N/A	N/A
	Top				0.078		**0.000**	**0.000**	**0.078**	**0.000**	**0.078**	N/A	N/A	N/A	N/A
	Bottom	1.380	1.210				**1.210**	**0.000**	**0.000**	**1.380**	**1.380**	N/A	N/A	N/A	N/A
	Right	0.149	0.047	0.319	0.384		**0.047**	**0.319**	**0.384**	**0.468**	**0.533**	N/A	N/A	N/A	N/A
	Left	0.0905	0.100			0.306	**0.406**	**0.306**	**0.306**	**0.397**	**0.397**	N/A	N/A	N/A	N/A

*SPLS: SAR Sum to peak location separation

Notes:

1. Per FCC KDB Publication 941225 D06, when the antenna distance from the edge was greater than 2.5 cm, SAR is not required and is 0 W/kg for summation analysis.
2. WIMAX Tx Ant. 1 and WIMAX Tx Ant. 2 cannot transmit simultaneously.
3. For numerical sums below 1.6 W/kg, no SAR ratio analysis or aggregate volumetric SAR evaluations for the transmitters were required.
4. See Section 19.5 for SPLS ratio analysis for the 1x Voice + WIMAX Hotspot in the back configuration with WIMAX Antenna 2.
5. No evaluation was performed to determine the aggregate 1-g SAR in this configuration as the SPLS ratio of all antenna pairs was below 0.3 per FCC KDB Publication 648474 D01.

19.5 SAR Sum to Peak Location Separation (SPLS) Ratio Analysis

Per FCC KDB Publication 648474 D01, when the sum of the standalone transmitters is more than 1.6 W/kg, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. Based on the on the 1-g SAR limit and a separation distance of 5 cm, when the SAR peak to location ratio for each pair of antennas is < 0.3, simultaneous SAR evaluation is not required.

The sum of the standalone SAR values was above 1.6 W/kg for the 1x Voice + WIMAX Hotspot with WIMAX Antenna 2.

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Table 19-7
Zoom Scan Peak SAR Locations

Mode/Band	x (cm)	y (cm)	z (cm)
PCS CDMA	-2.01	-6.30	-20.25
WLAN	1.35	-3.35	-20.39
WIMAX Antenna 2	-4.50	4.00	-20.39

$\text{Distance}_{\text{PCS CDMA-WLAN}} = \sqrt{(-2.01-1.35)^2+(-6.30+3.35)^2+(-20.25+20.39)^2} = 4.47cm$

$\text{Distance}_{\text{PCS CDMA-WiMAX 2}} = \sqrt{(-2.01+4.50)^2+(-6.30+4.00)^2+(-20.25+20.39)^2} = 10.59cm$

$\text{Distance}_{\text{WLAN-WiMAX 2}} = \sqrt{(-1.35+4.50)^2+(-3.35-4.00)^2+(-20.39+20.39)^2} = 9.39cm$

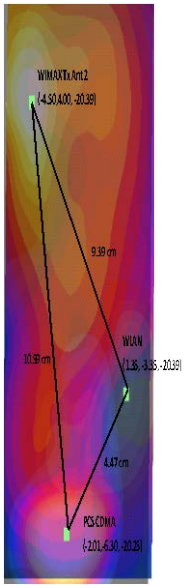

Figure 19-1
Simultaneous Transmission of PCS CDMA, WIMAX Tx Ant 2 and WLAN.

Table 19-8
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (cm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	Da-b	(a+b) / (Da-b)
PCS CDMA	WLAN	0.92	0.18	1.1	4.47	0.25
PCS CDMA	WIMAX 2	0.92	0.56	1.48	10.59	0.14
WLAN	WIMAX 2	0.18	0.56	0.74	9.39	0.08

Since the SPLS Ratio for each antenna pair was less than 0.3, no volumetric simultaneous transmission scenario is required per FCC KDB 648474 Publication D01.

19.6 Simultaneous Transmission Conclusion

Per FCC KDB Publication 648474 D01, no aggregate volumetric simultaneous transmission is required for the device, since the sum of the standalone SAR values or the SAR Sum to peak separation ratios are < 0.3 for each antenna pair.

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20 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85070B	Dielectric Probe Kit	8/22/2010	Annual	8/22/2011	US33020316
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/13/2010	Annual	10/13/2011	3613A00315
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	E5515C	Wireless Communications Test Set	8/13/2010	Annual	8/13/2011	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/5/2011	Annual	4/5/2012	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
Index SAR	IXTL-010	Dielectric Measurement Kit	N/A		N/A	N/A
Index SAR	IXTL-030	30MM TEM line for 6 GHz	N/A		N/A	N/A
Pasternack	PE2208-6	Bidirectional Coupler	N/A		N/A	N/A
Pasternack	PE2209-10	Bidirectional Coupler	N/A		N/A	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	11/11/2010	Annual	11/11/2011	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/21/2010	Annual	6/21/2011	833855/0010
SPEAG	D1900V2	1900 MHz SAR Dipole	2/17/2011	Annual	2/17/2012	502
SPEAG	D1900V2	1900 MHz SAR Dipole	8/18/2009	Biennial	8/18/2011	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	8/27/2009	Biennial	8/27/2011	719
SPEAG	D2450V2	2450 MHz SAR Dipole	2/8/2011	Annual	2/8/2012	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/15/2011	Biennial	4/15/2013	1004
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/19/2009	Biennial	8/19/2011	1007
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/11/2011	Annual	2/11/2012	1057
SPEAG	D835V2	835 MHz SAR Dipole	2/9/2011	Annual	2/9/2012	4d047
SPEAG	D835V2	835 MHz SAR Dipole	8/24/2009	Biennial	8/24/2011	4d026
SPEAG	DAE3	Dasy Data Acquisition Electronics	11/18/2010	Annual	11/18/2011	455
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	8/19/2010	Annual	8/19/2011	3561
SPEAG	EX3DV4	SAR Probe	2/14/2011	Annual	2/14/2012	3550
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/8/2010	Annual	7/8/2011	859
SPEAG	D750V3	750 MHz Dipole	2/14/2011	Annual	2/14/2012	1003
SPEAG	ES3DV3	SAR Probe	3/24/2011	Annual	3/24/2012	3213
SPEAG	ES3DV3	SAR Probe	4/18/2011	Annual	4/18/2012	3209
SPEAG	D1640V2	1640 MHz Dipole	8/17/2010	Biennial	8/17/2012	321
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/30/2010	Annual	8/30/2011	100976
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5318
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5442
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	1190013
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	98150041
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	2400
Agilent	E5515C	Wireless Communications Test Set	8/13/2010	Annual	8/13/2011	GB43304447
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	N/A			17042
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	D2600V2	2600 MHz SAR Dipole	6/17/2010	Annual	6/17/2011	1027

Note: For every test, all equipment used was within recommended calibration dates.

Justification for 2-year calibration cycle for SAR dipoles is found in Section 16.3.

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21 MEASUREMENT UNCERTAINTIES

Applicable for 800 – 3000 MHz.

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

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

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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]

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[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 D06 Hot Spot SAR v01, KDB Publication 941225.

[38] FCC 802.16e/WIMAX SAR Guidance v01, KDB Publication 615223.

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

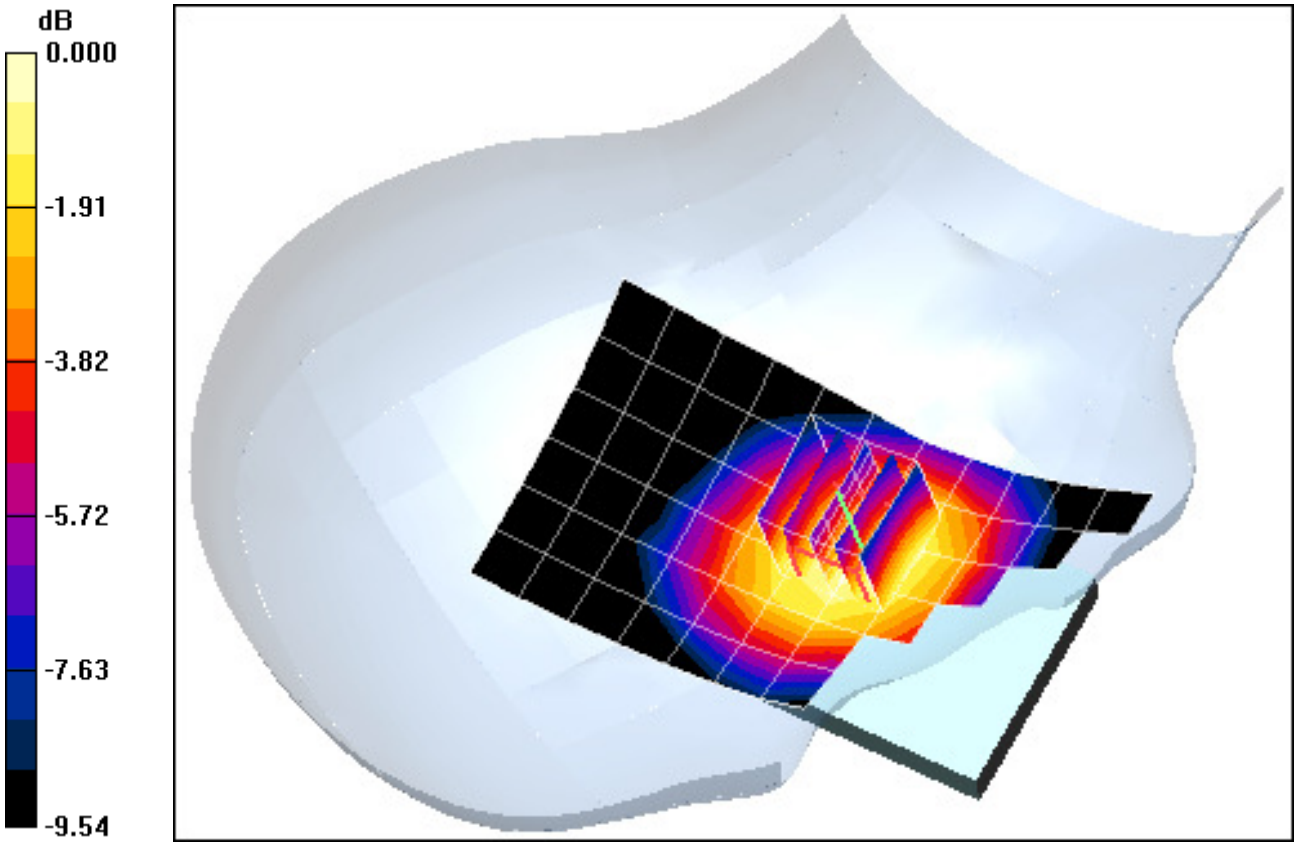
Communication System: Cellular CDMA; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 824.7 MHz; σ = 0.872 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-20-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); 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: Cellular CDMA, Right Head, Touch, Low.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 = 34.7 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.922 mW/g; SAR(10 g) = 0.694 mW/g



0 dB = 0.966mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

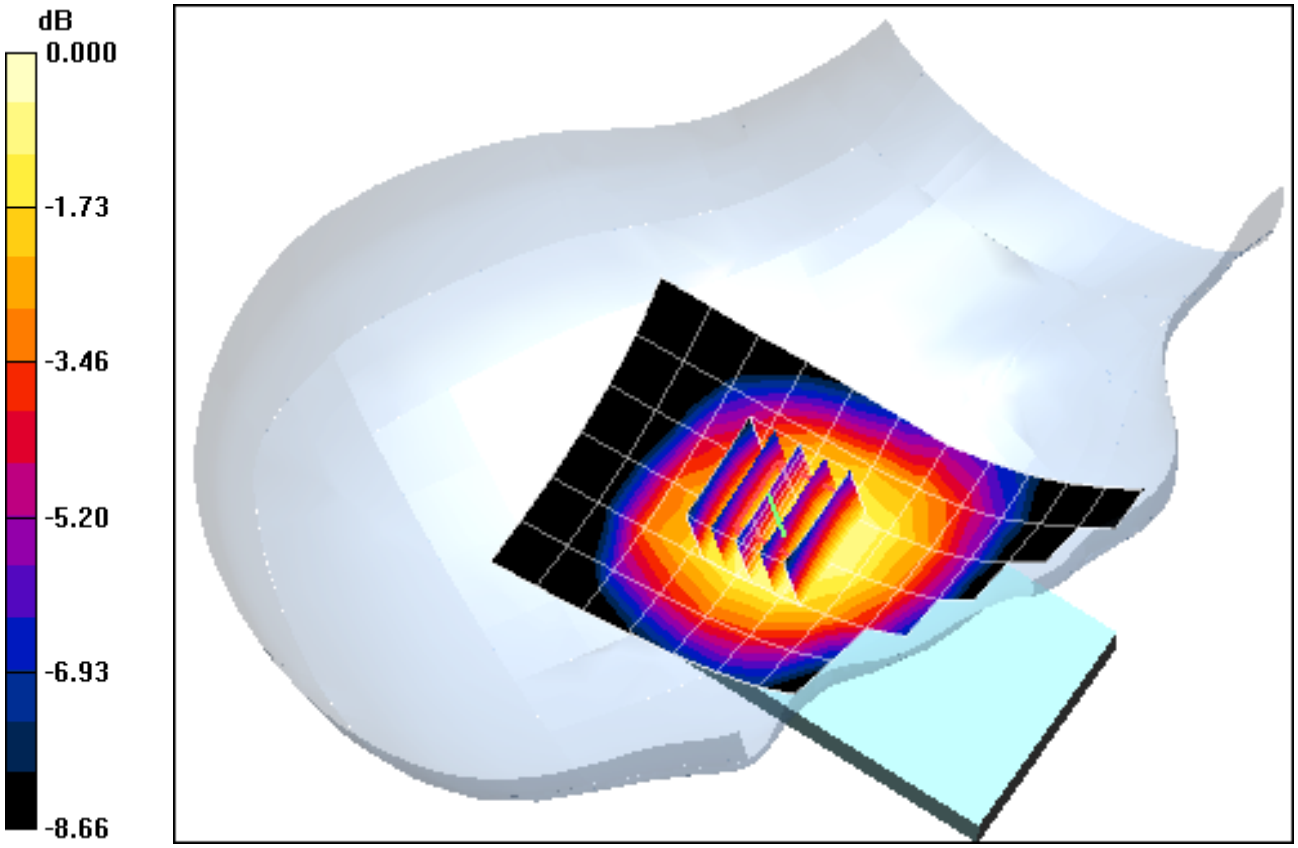
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium; parameters used (interpolated):
f = 836.52 MHz; σ = 0.883 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-20-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); 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: Cellular 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 = 25.4 V/m
Peak SAR (extrapolated) = 0.646 W/kg
SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.391 mW/g



0 dB = 0.536mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

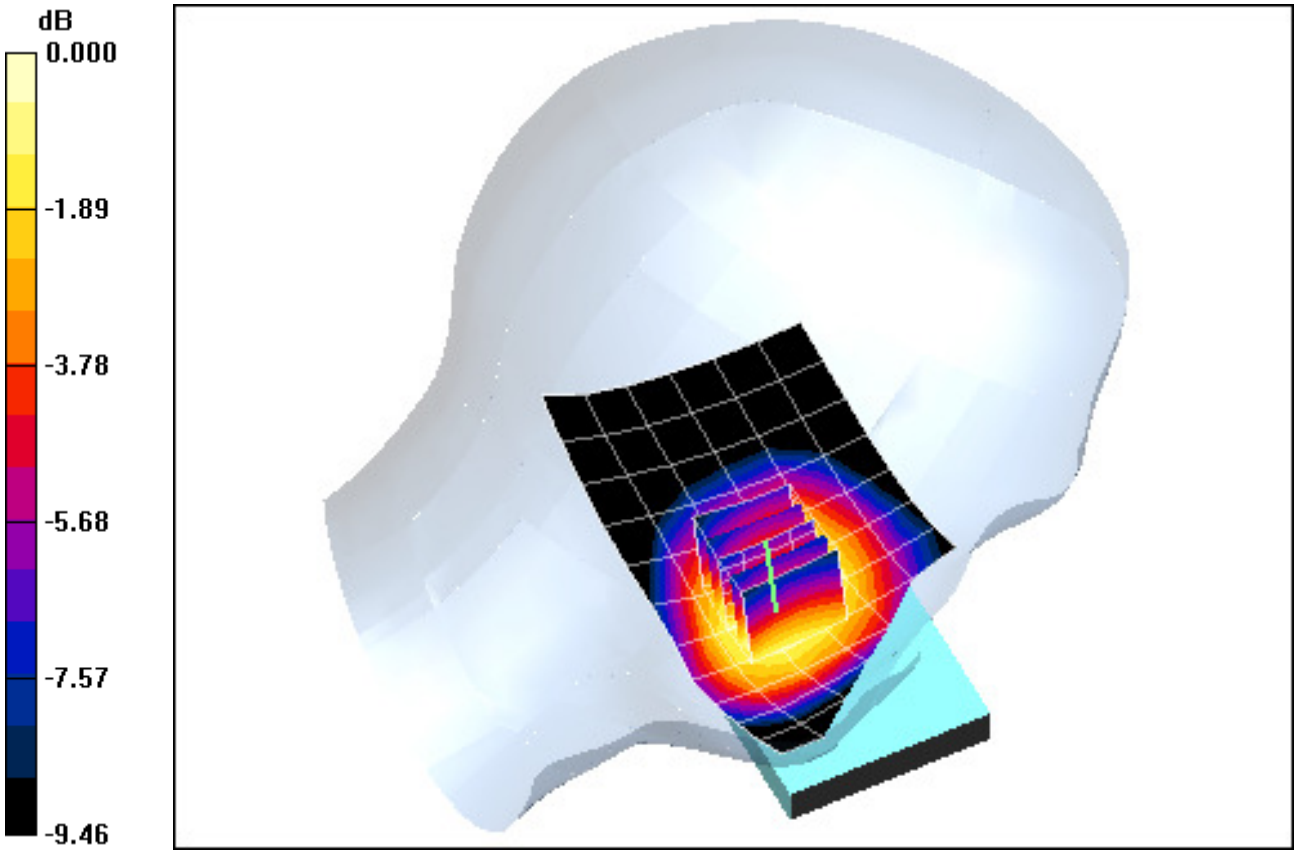
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.883 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-20-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); 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: Cellular 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 = 34.3 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.696 mW/g



0 dB = 0.980mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

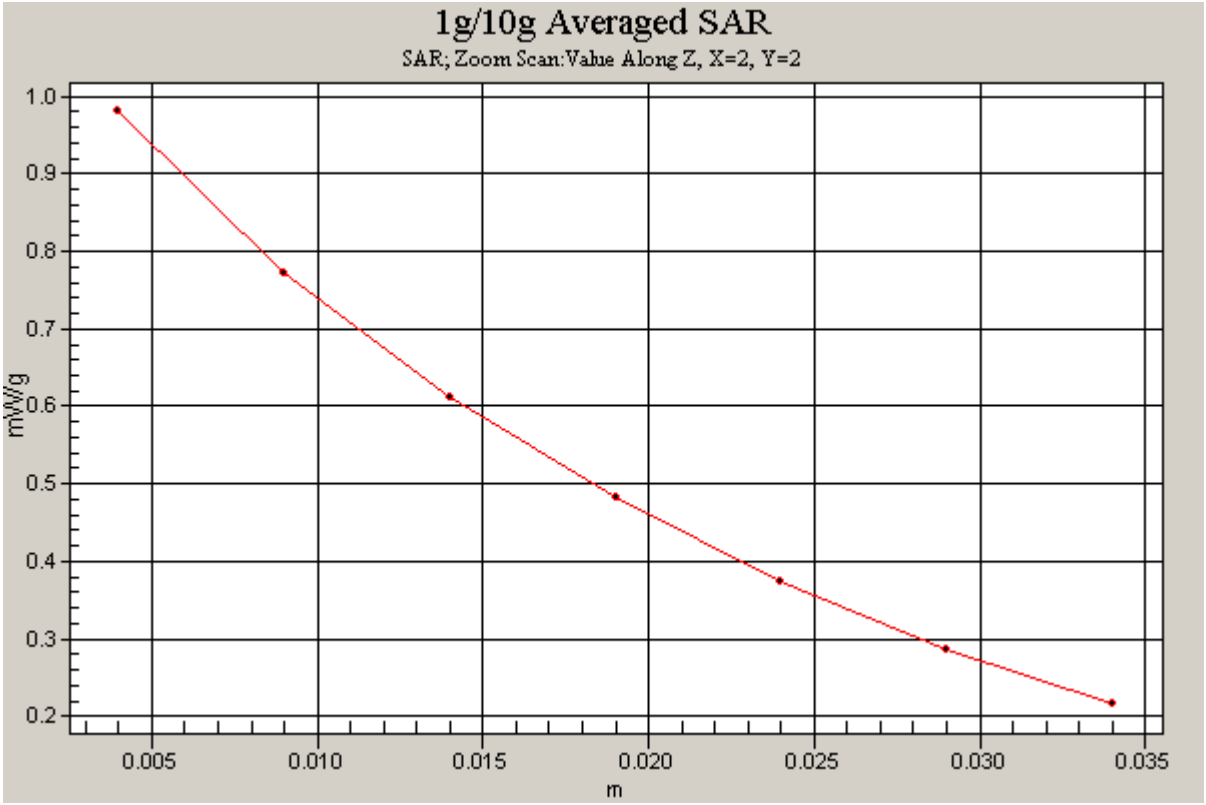
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.883 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-20-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); 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: Cellular 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 = 34.3 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.696 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

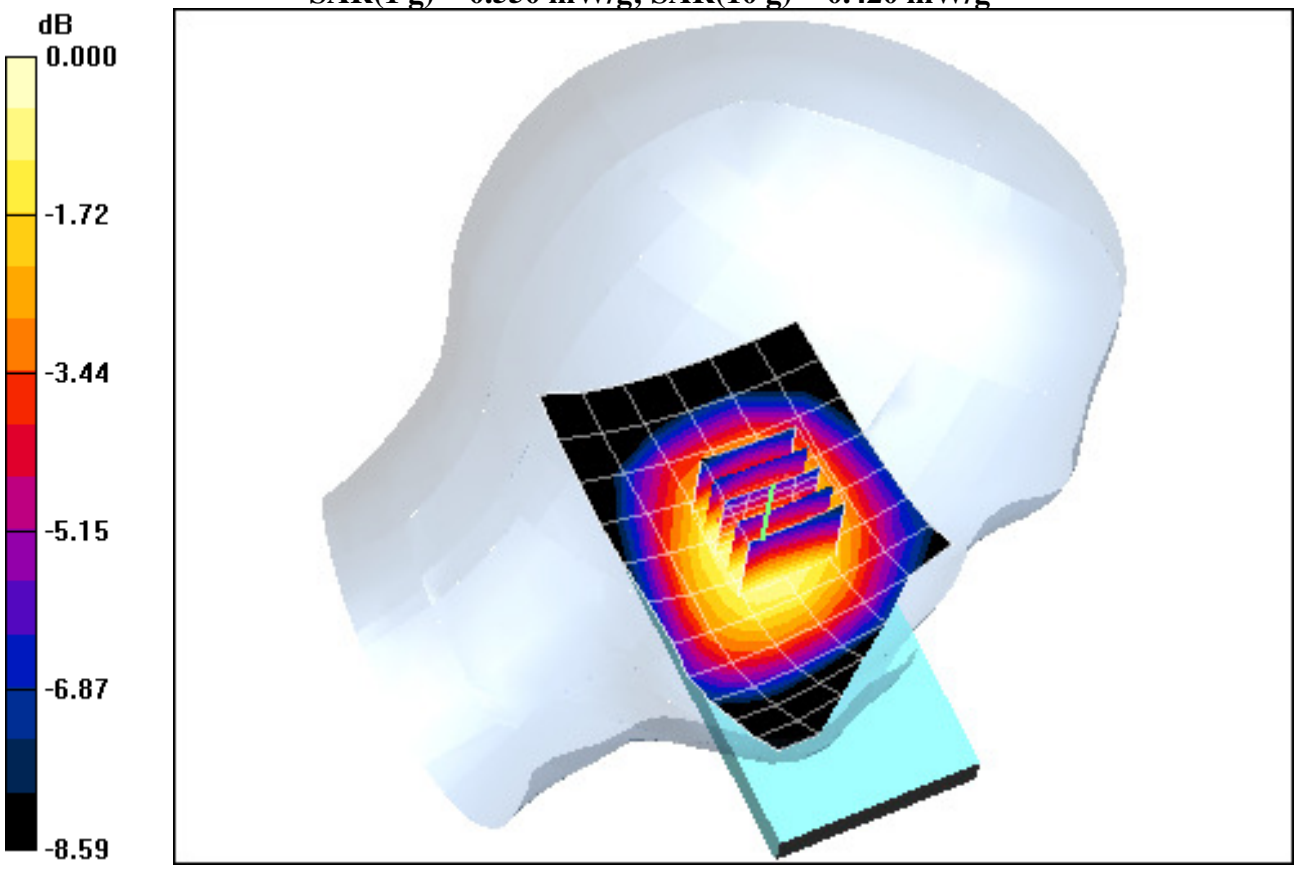
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.883 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-20-2011; Ambient Temp: 24.5 °C; Tissue Temp: 22.9 °C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); 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: Cellular 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 = 26.7 V/m
Peak SAR (extrapolated) = 0.680 W/kg
SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.420 mW/g



0 dB = 0.577mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

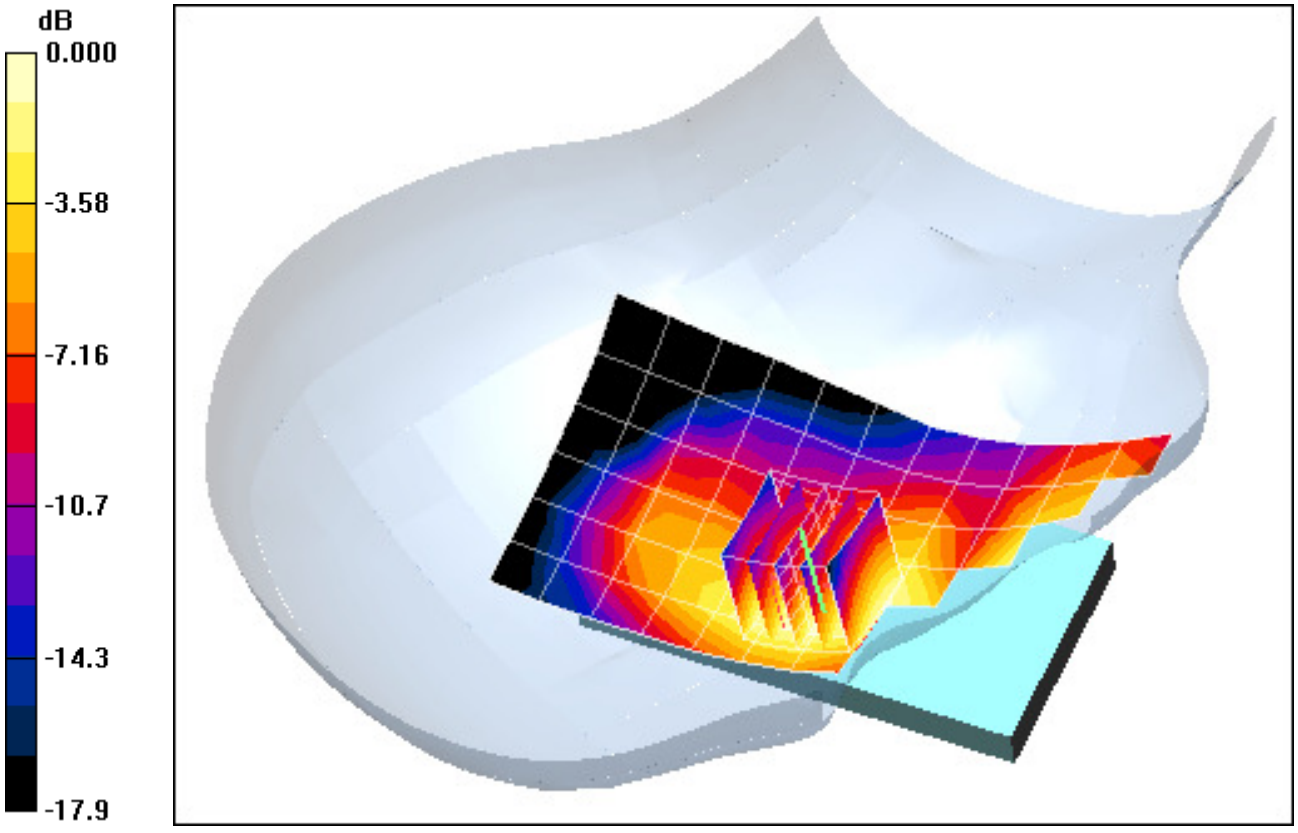
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-21-2011; Ambient Temp: 22.9 °C; Tissue Temp: 21.4 °C

Probe: EX3DV4 - SN3550; ConvF(7.01, 7.01, 7.01); Calibrated: 2/14/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 7/8/2010
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 = 18.1 V/m
Peak SAR (extrapolated) = 0.633 W/kg
SAR(1 g) = 0.424 mW/g; SAR(10 g) = 0.268 mW/g



0 dB = 0.460mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

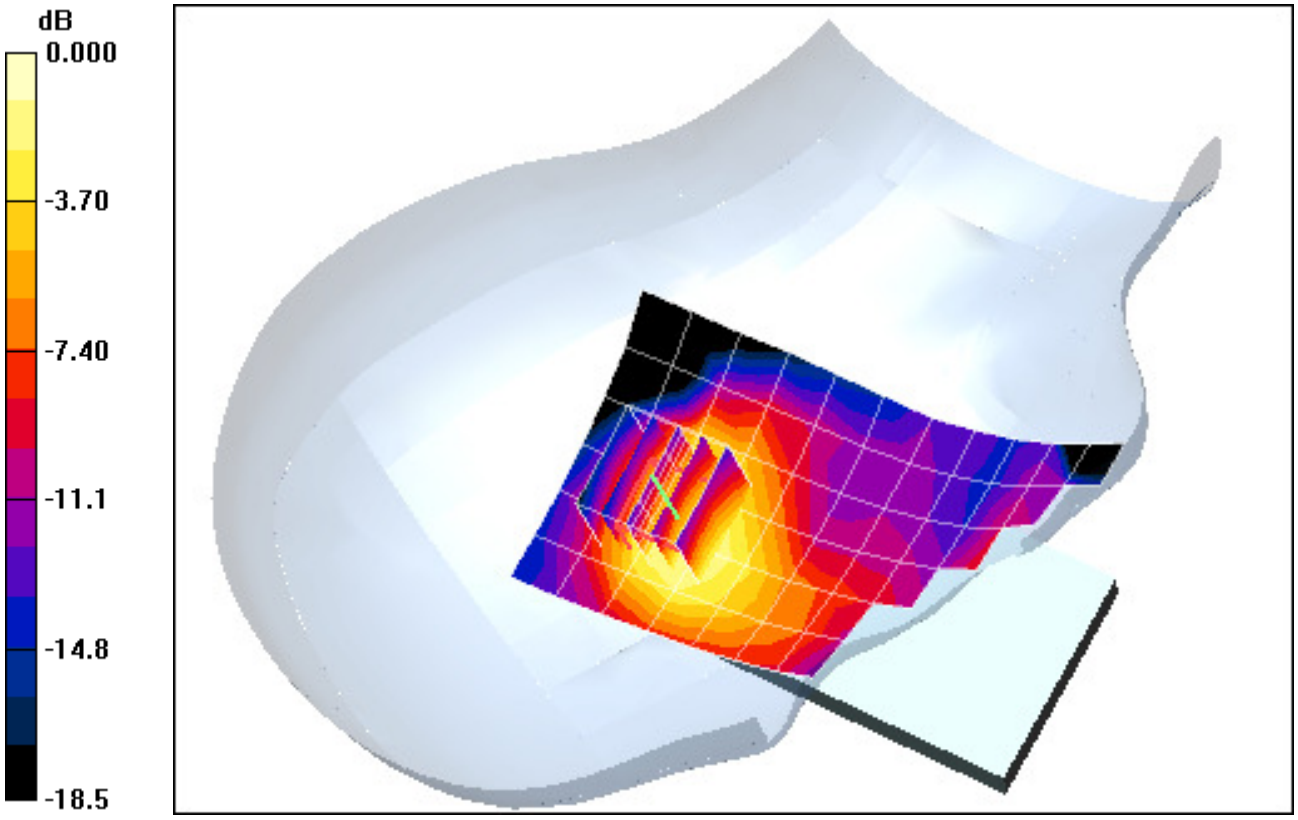
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-21-2011; Ambient Temp: 22.9 °C; Tissue Temp: 21.4 °C

Probe: EX3DV4 - SN3550; ConvF(7.01, 7.01, 7.01); Calibrated: 2/14/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 7/8/2010
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 = 16.7 V/m
Peak SAR (extrapolated) = 0.569 W/kg
SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.216 mW/g



0 dB = 0.385mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

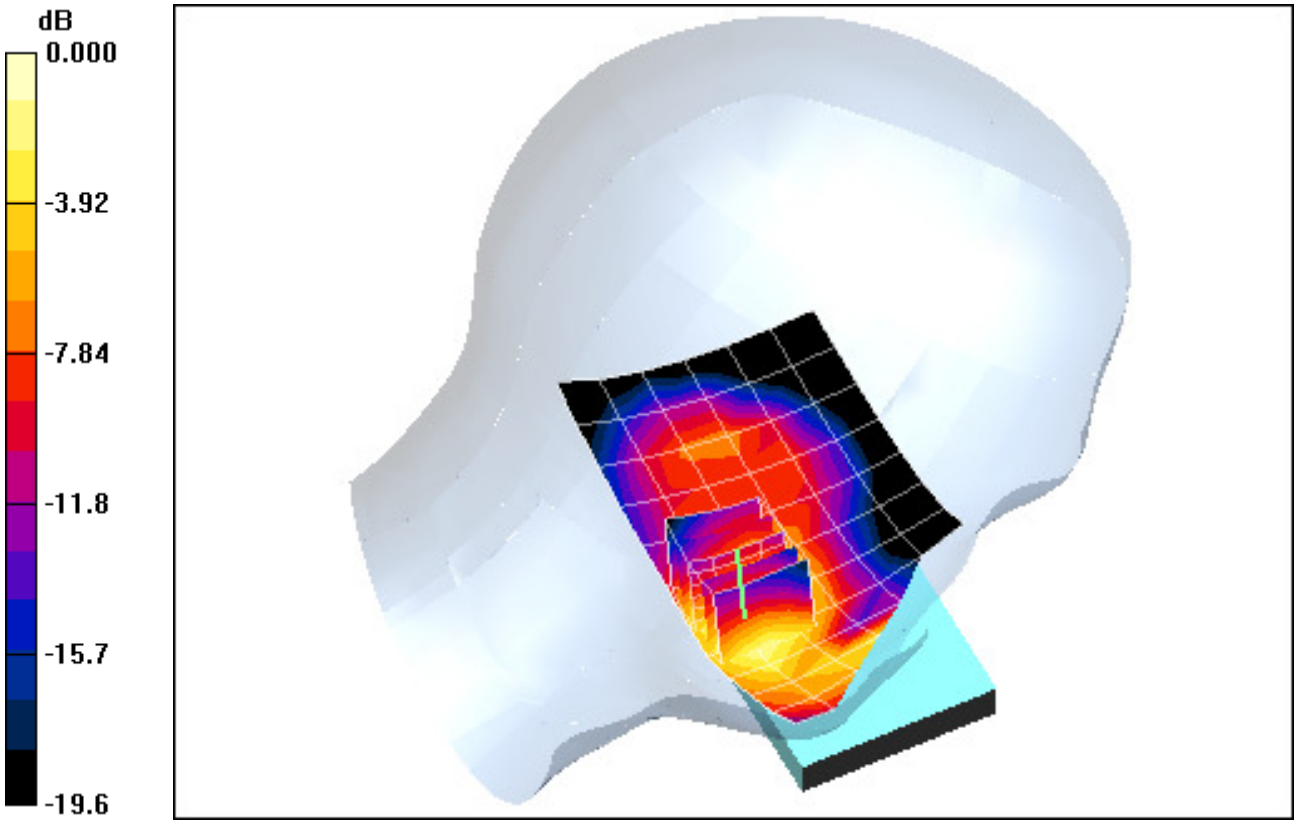
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-21-2011; Ambient Temp: 22.9 °C; Tissue Temp: 21.4 °C

Probe: EX3DV4 - SN3550; ConvF(7.01, 7.01, 7.01); Calibrated: 2/14/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 7/8/2010
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 = 26.4 V/m
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.533 mW/g



0 dB = 0.947mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

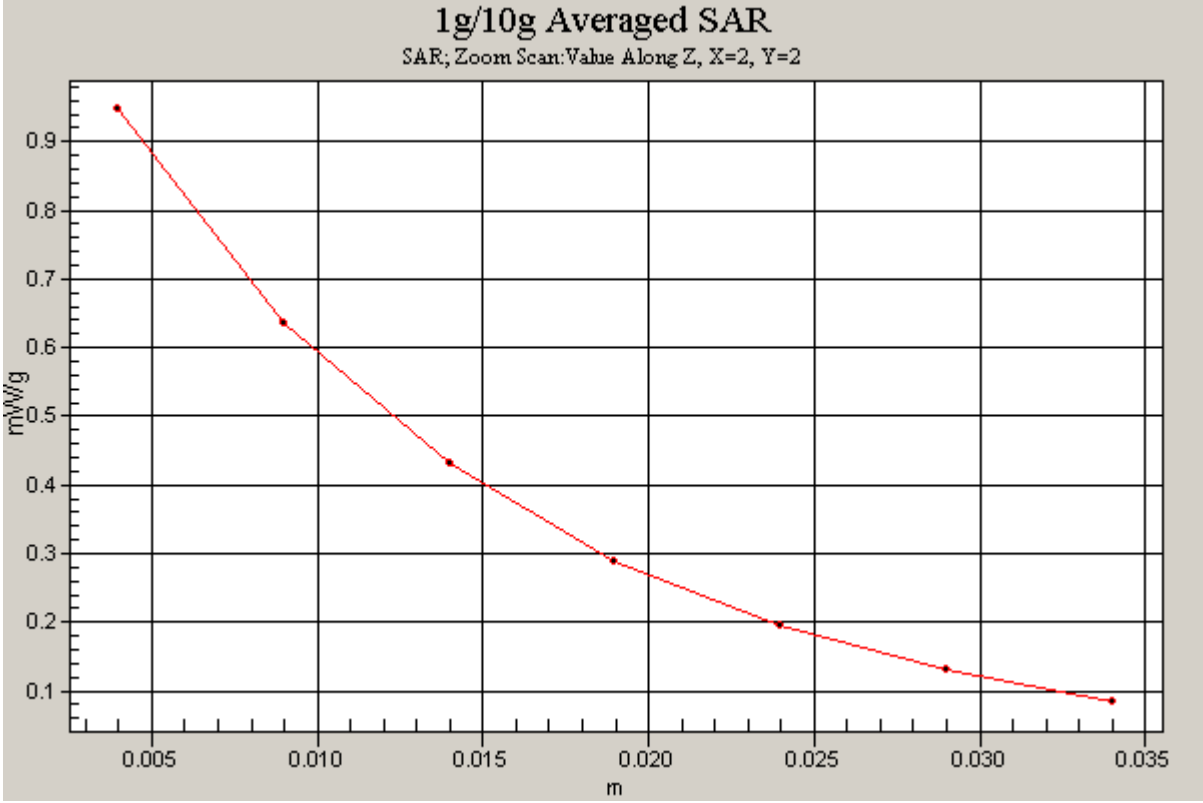
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-21-2011; Ambient Temp: 22.9 °C; Tissue Temp: 21.4 °C

Probe: EX3DV4 - SN3550; ConvF(7.01, 7.01, 7.01); Calibrated: 2/14/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 7/8/2010
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 = 26.4 V/m
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.533 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

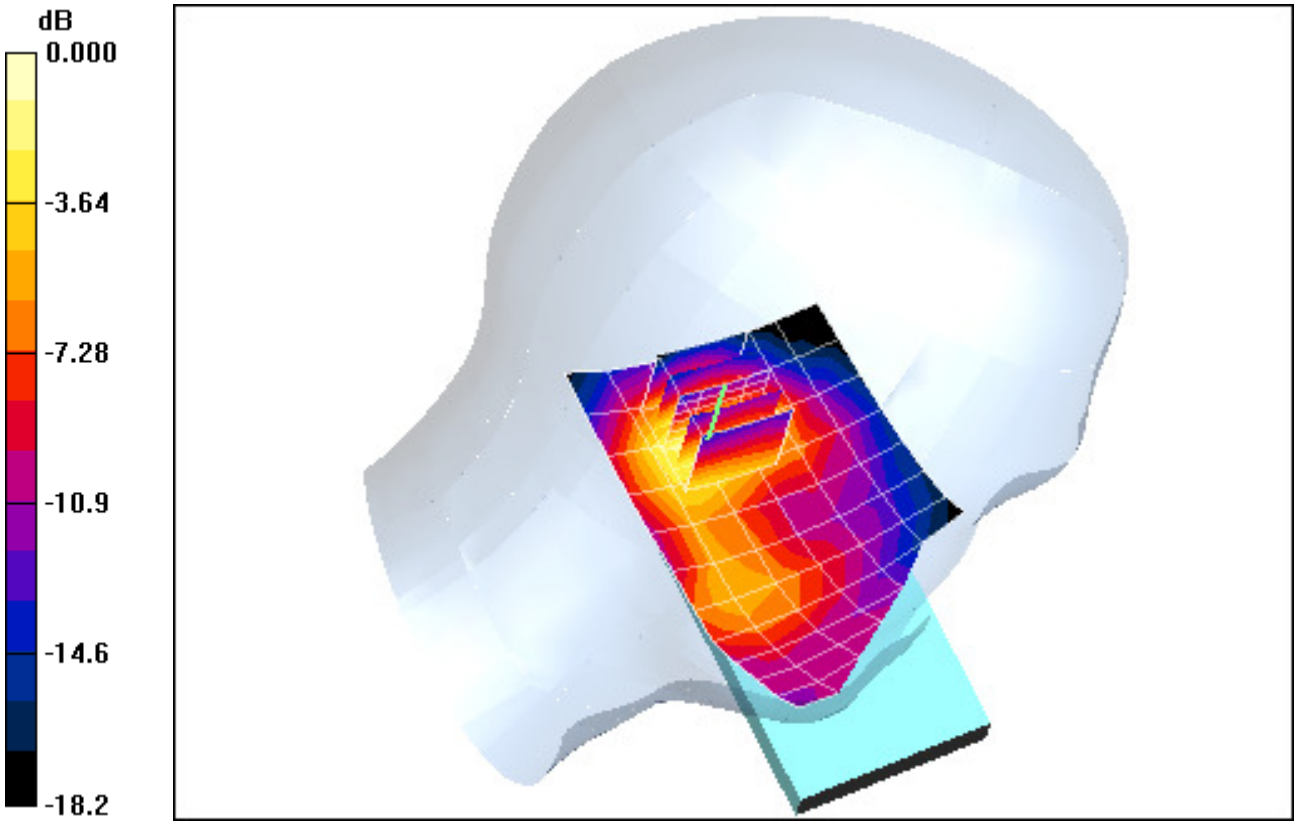
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-21-2011; Ambient Temp: 22.9 °C; Tissue Temp: 21.4 °C

Probe: EX3DV4 - SN3550; ConvF(7.01, 7.01, 7.01); Calibrated: 2/14/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 7/8/2010
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 = 15.4 V/m
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.174 mW/g



0 dB = 0.330mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX; Serial: LSNW230069 SJUG6093AA

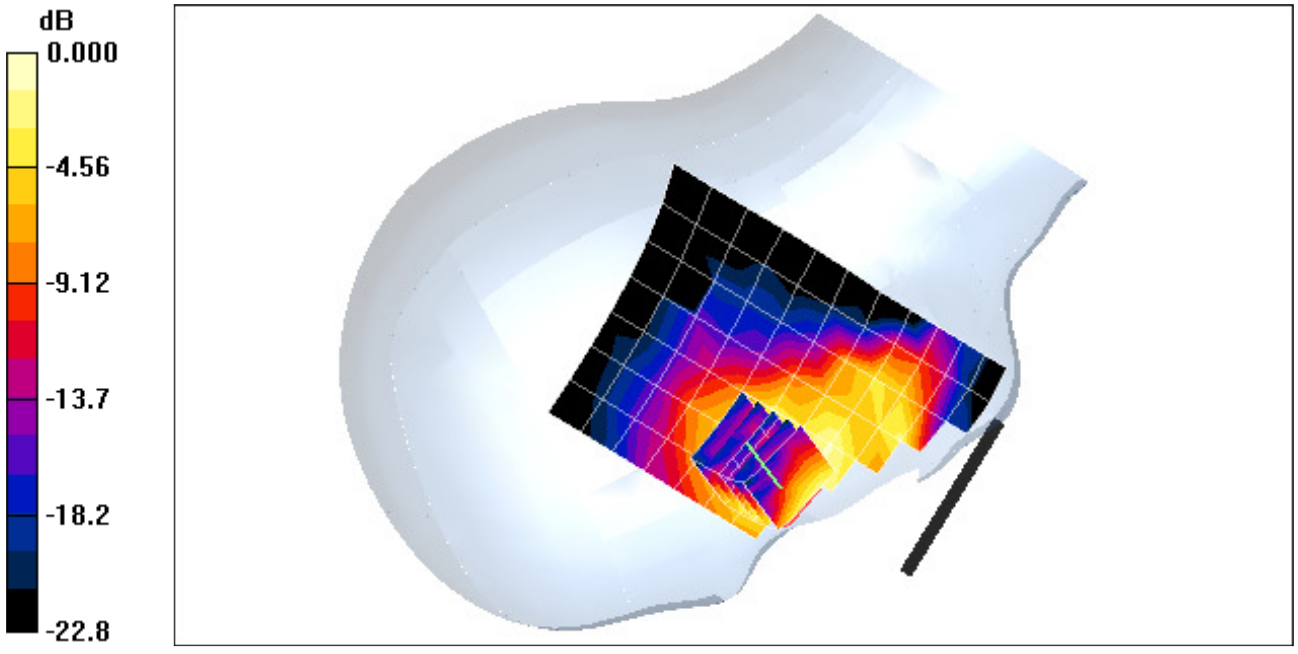
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.81 mho/m; ε_r = 38.75; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-19-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(4.21, 4.21, 4.21); 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: IEEE 802.11b, Right Head, Touch, Ch 06, 1 Mbps

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.47 V/m
Peak SAR (extrapolated) = 0.191 W/kg
SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.053 mW/g



0 dB = 0.131mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; EUT Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

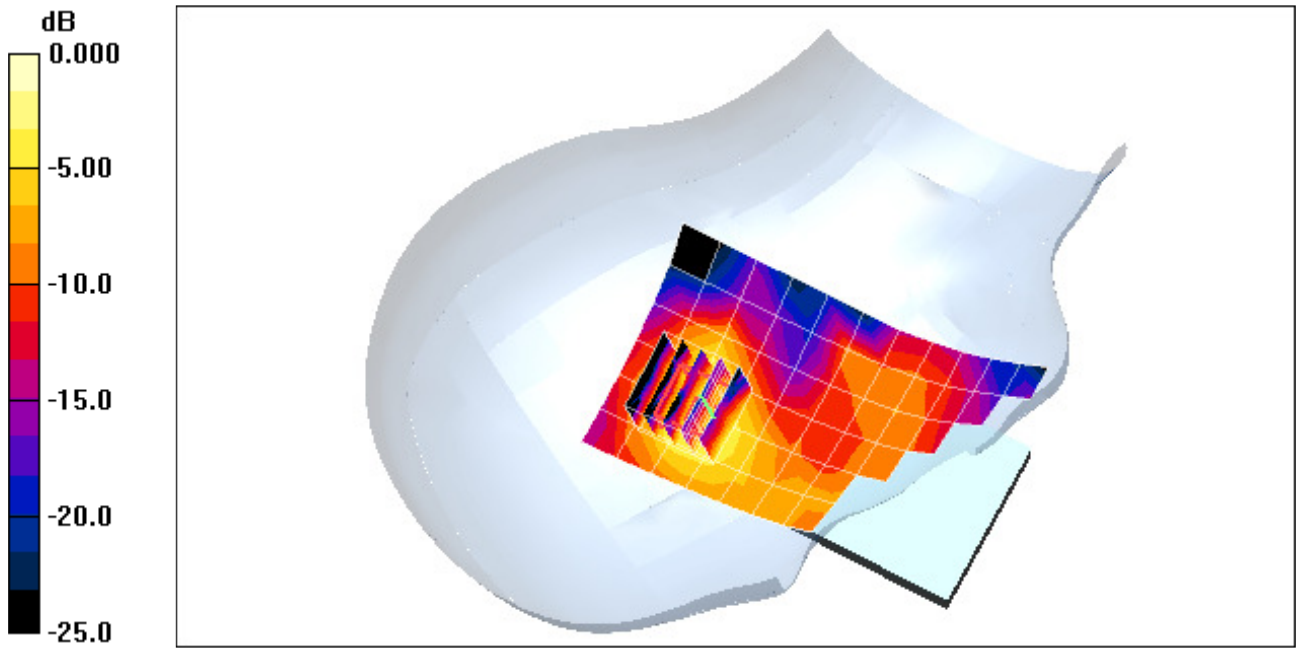
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.81 mho/m; ε_r = 38.75; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-19-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(4.21, 4.21, 4.21); 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: 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 = 4.51 V/m
Peak SAR (extrapolated) = 0.092 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.018 mW/g



0 dB = 0.061mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

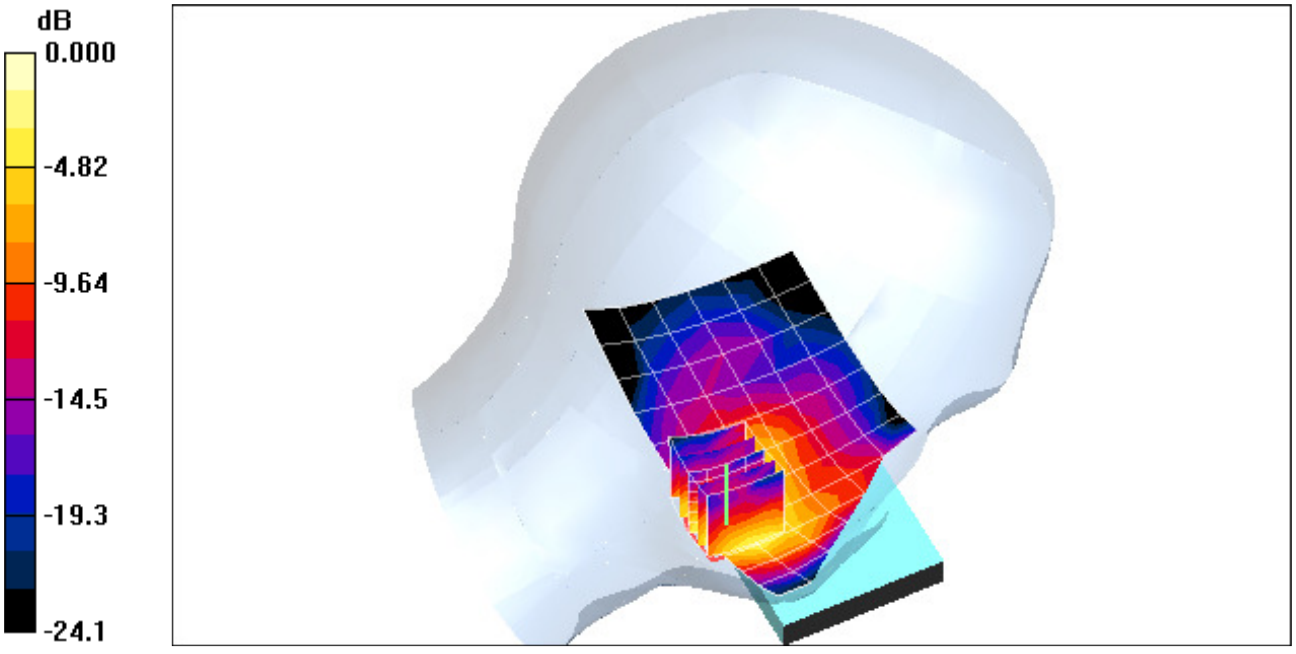
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.81 mho/m; ε_r = 38.75; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-19-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(4.21, 4.21, 4.21); 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: IEEE 802.11b, Left Head, Touch, Ch 06, 1 Mbps

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) = 0.483 W/kg
SAR(1 g) = 0.255 mW/g; SAR(10 g) = 0.129 mW/g



0 dB = 0.318mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

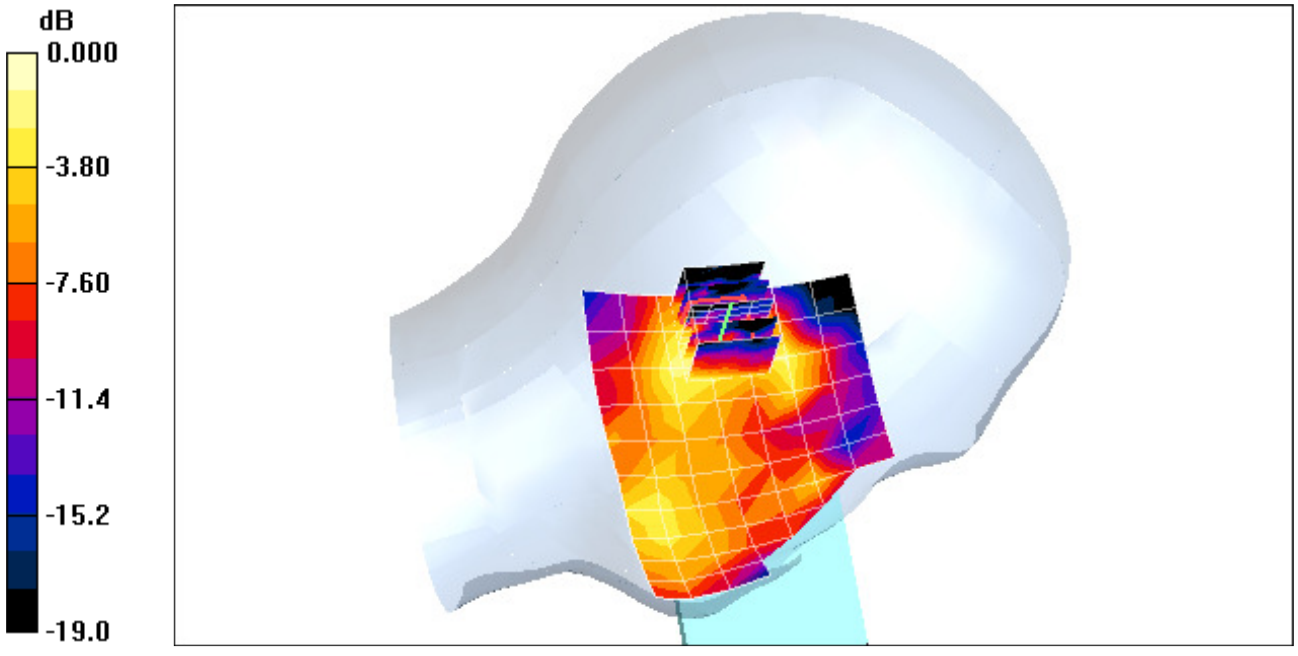
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.81 mho/m; ε_r = 38.75; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-19-2011; Ambient Temp: 24.1 °C; Tissue Temp: 23.5 °C

Probe: ES3DV2 - SN3022; ConvF(4.21, 4.21, 4.21); 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: IEEE 802.11b, Left Head, Tilt, Ch 06, 1 Mbps

Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.55 V/m
Peak SAR (extrapolated) = 0.061 W/kg
SAR(1 g) = 0.0275 mW/g; SAR(10 g) = 0.014 mW/g



0 dB = 0.037mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

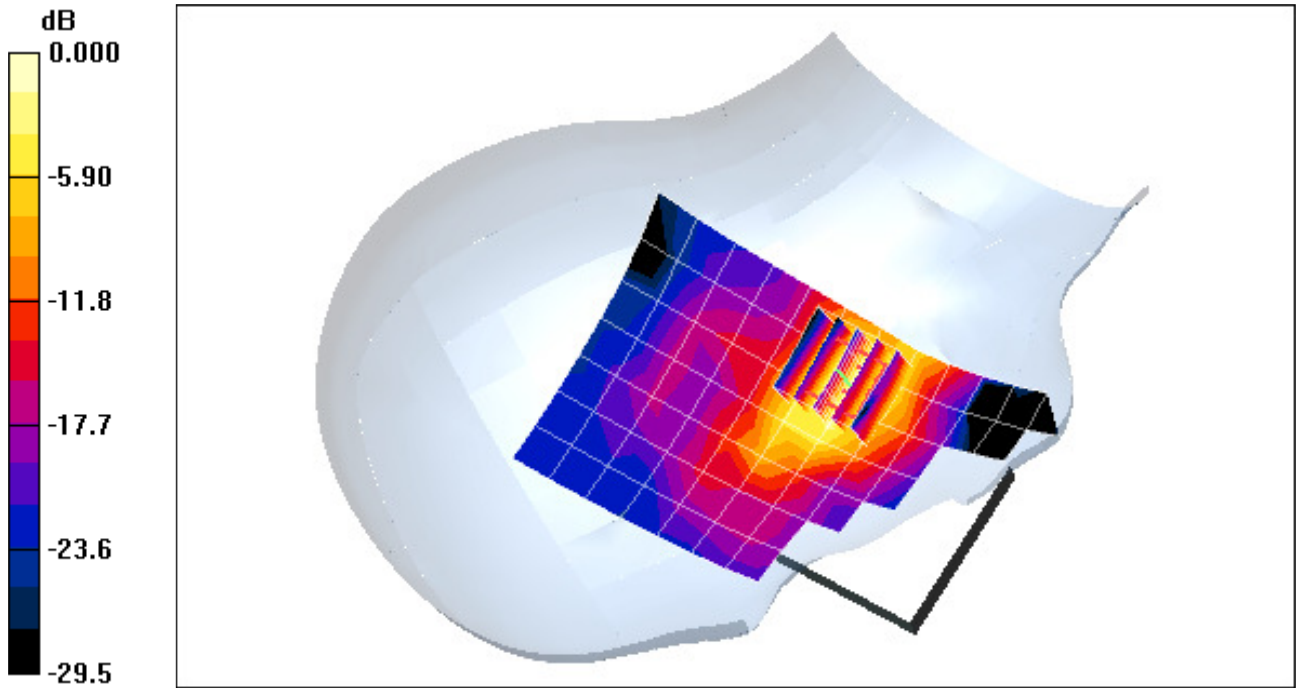
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, BAMC, QPSK, 5 Mhz BW, Tx Ant 1

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m
Peak SAR (extrapolated) = 0.815 W/kg
SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.162 mW/g



0 dB = 0.485mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

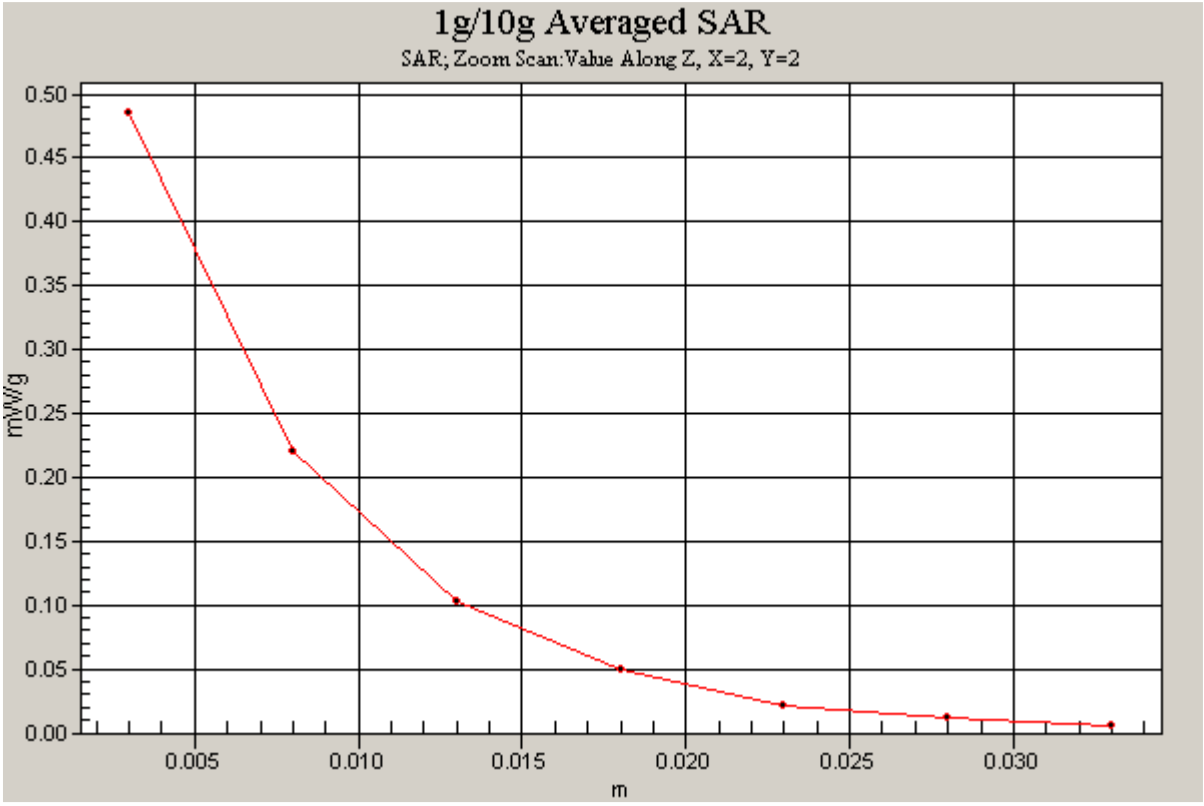
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, BAMC, QPSK, 5 Mhz BW, Tx Ant 1

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m
Peak SAR (extrapolated) = 0.815 W/kg
SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.162 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

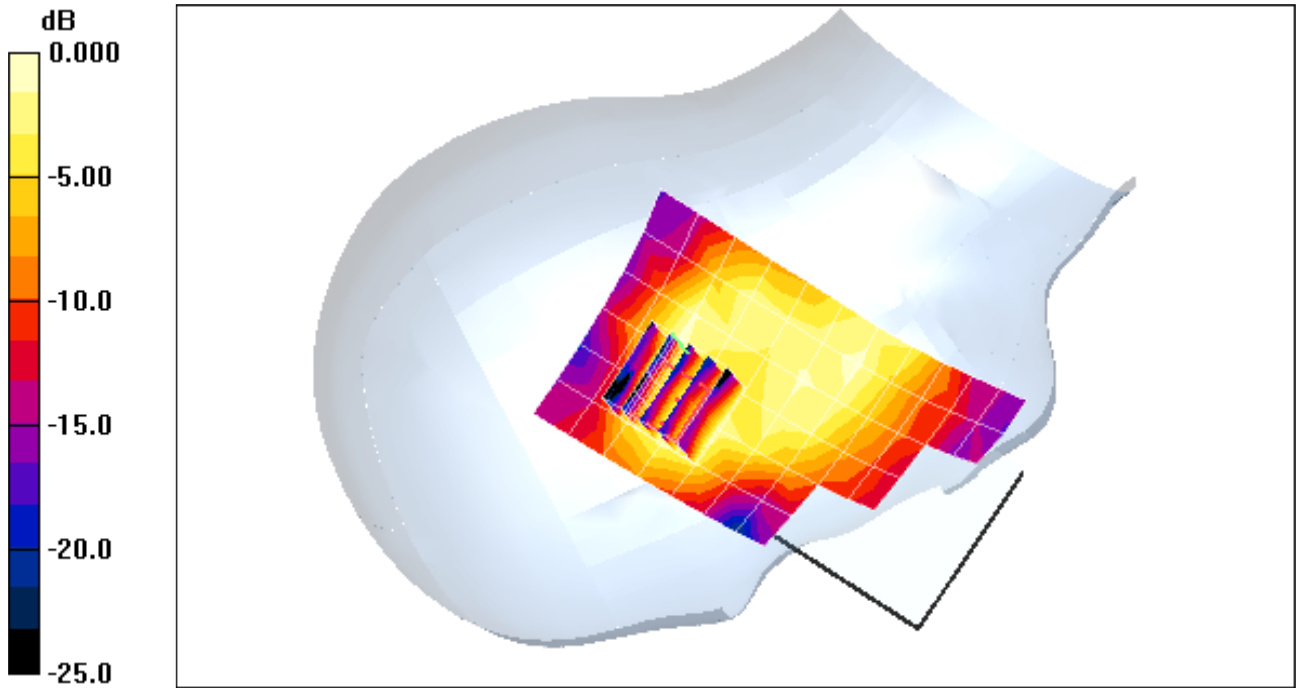
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, Tx Ant 1

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.04 V/m
Peak SAR (extrapolated) = 0.092 W/kg
SAR(1 g) = 0.0485 mW/g; SAR(10 g) = 0.025 mW/g



0 dB = 0.061mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

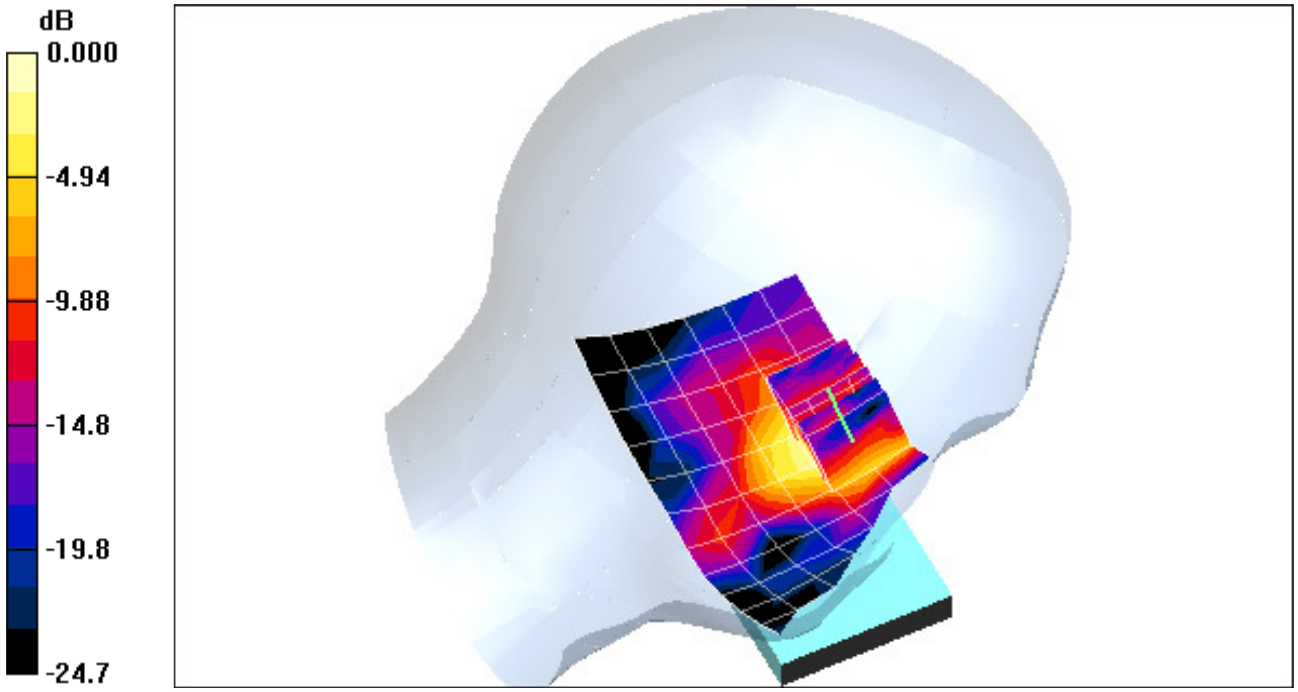
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, Tx Ant 1

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m
Peak SAR (extrapolated) = 0.471 W/kg
SAR(1 g) = 0.227 mW/g; SAR(10 g) = 0.115 mW/g



0 dB = 0.290mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

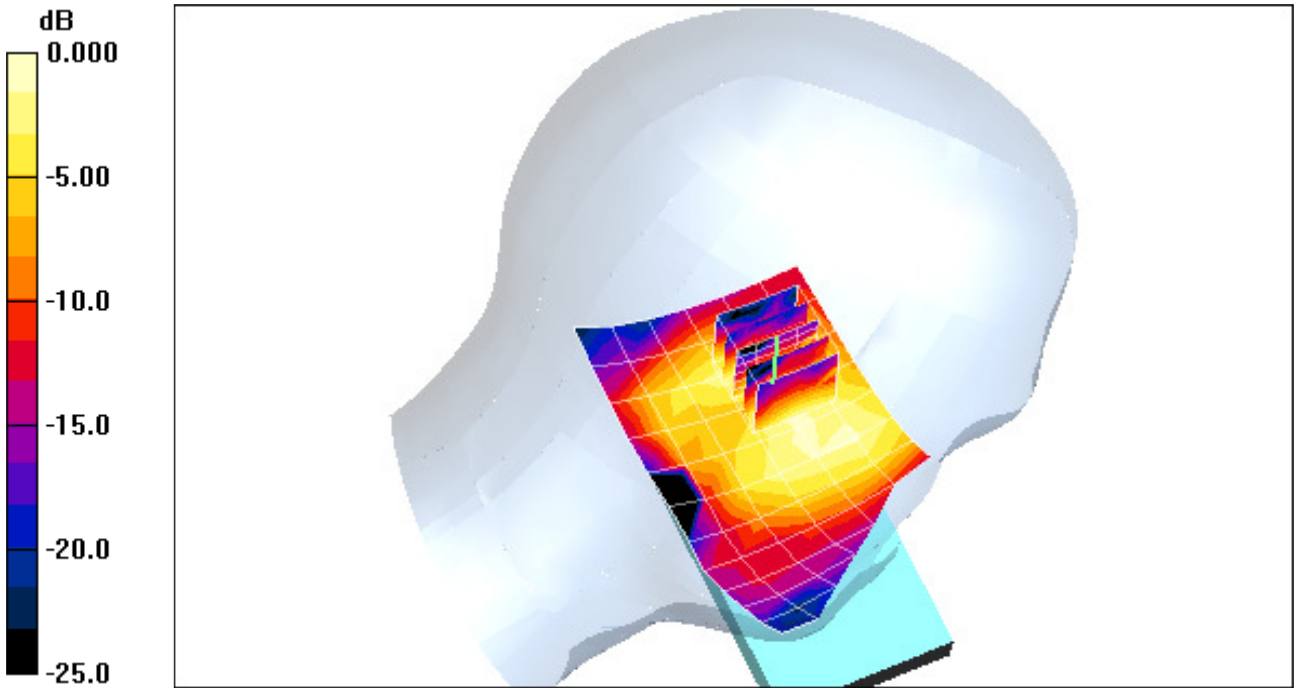
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, 10 MHz BW, Tx Ant 1

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.03 V/m
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.034 mW/g



0 dB = 0.087mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type:Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

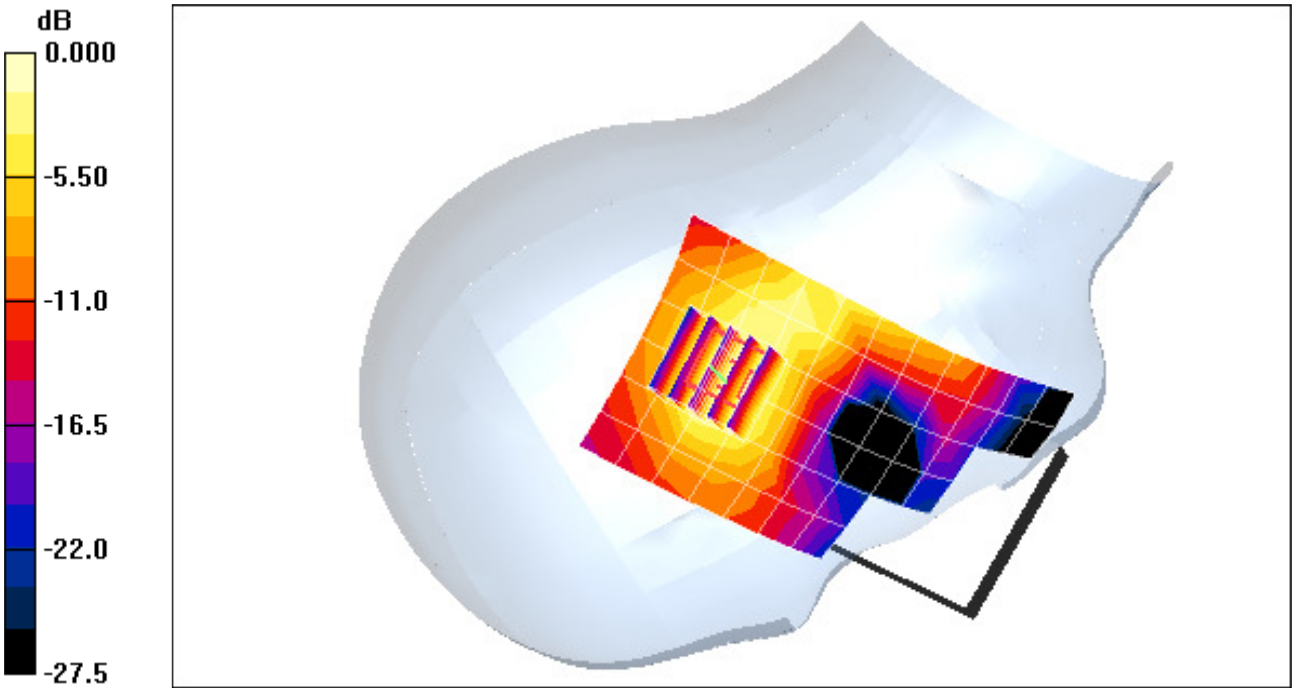
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, 5 MHz BW, Tx Ant 2

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.94 V/m
Peak SAR (extrapolated) = 0.255 W/kg
SAR(1 g) = 0.133 mW/g; SAR(10 g) = 0.070 mW/g



0 dB = 0.162mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

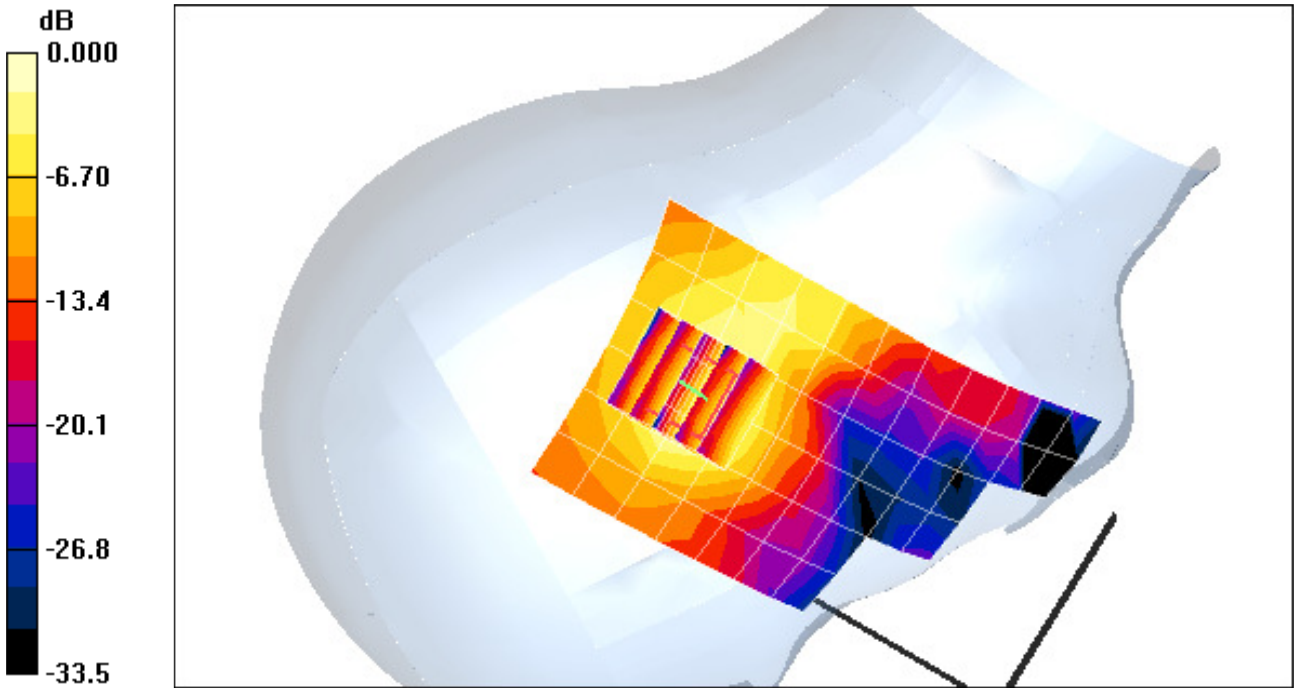
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, Tx Ant 2

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.14 V/m
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.063 mW/g



0 dB = 0.157mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

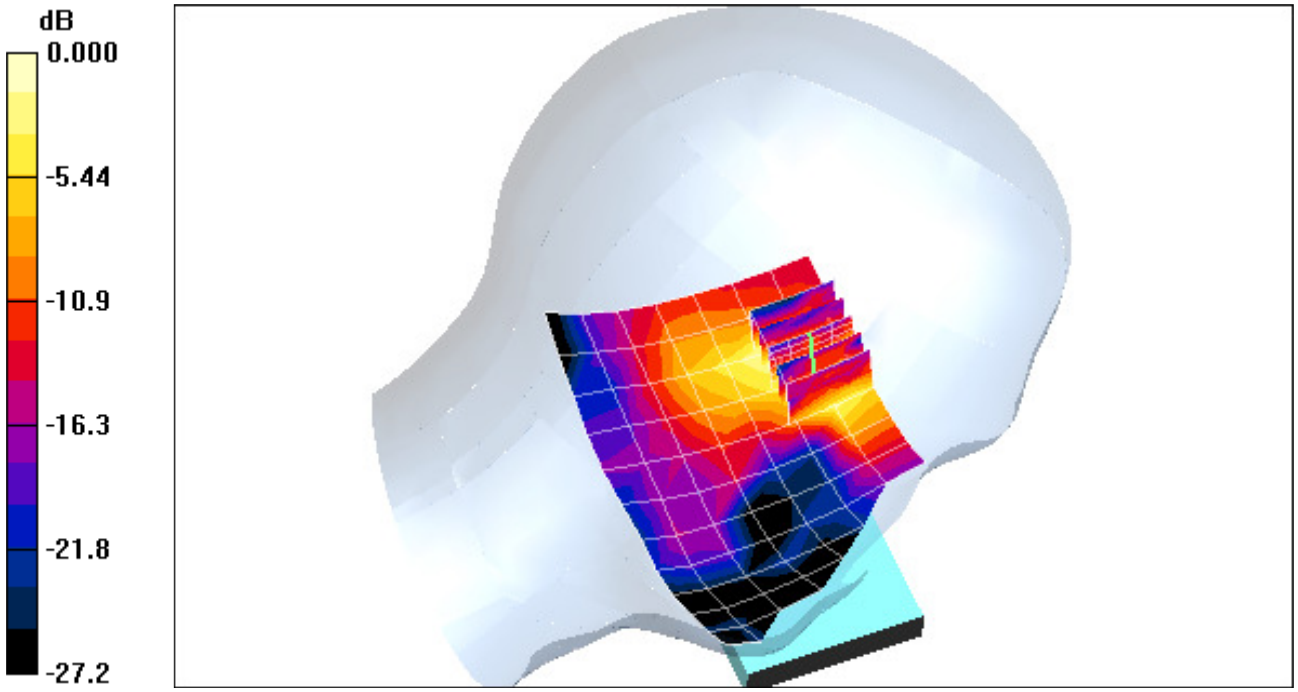
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, BAMC, QPSK, 5 MHz BW, Tx Ant 2

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m
Peak SAR (extrapolated) = 0.616 W/kg
SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.120 mW/g



0 dB = 0.351mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

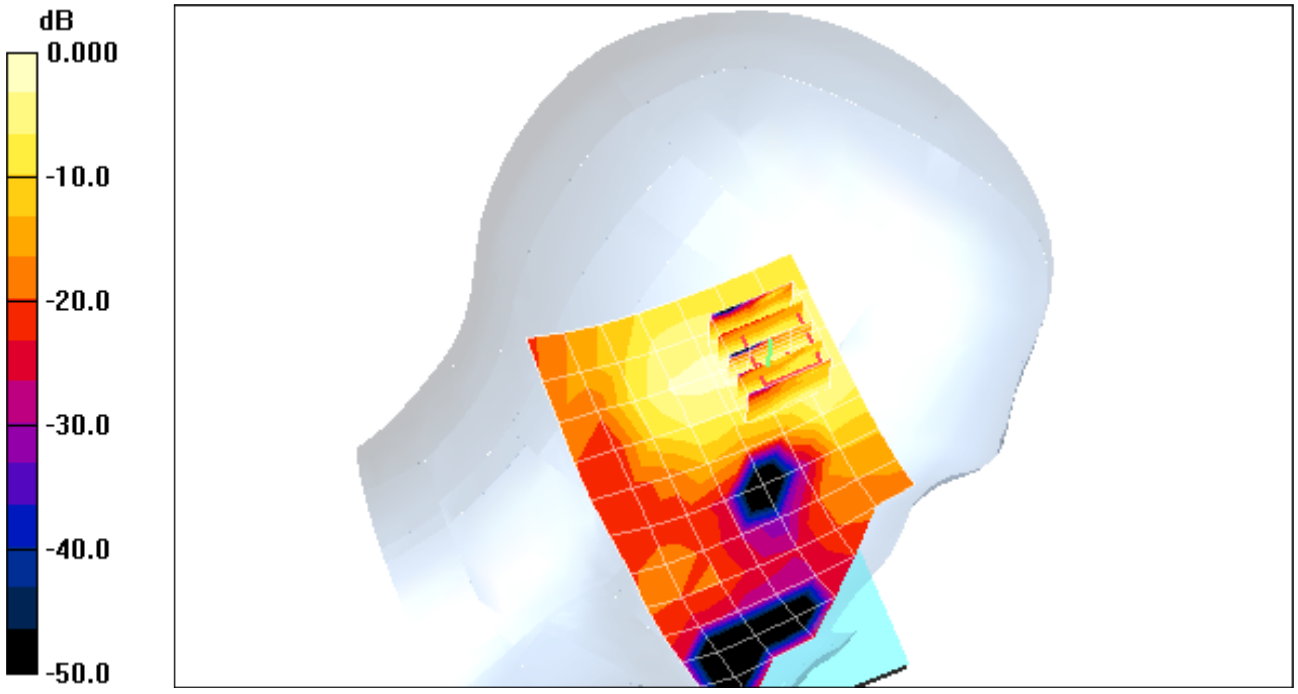
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Head Medium parameters used:
f = 2600 MHz; σ = 1.98 mho/m; ε_r = 37.25; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 04-27-2011; Ambient Temp: 24.1 °C; Tissue Temp: 22.8 °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, Tx Ant 2

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.36 V/m
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.076 mW/g



0 dB = 0.194mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

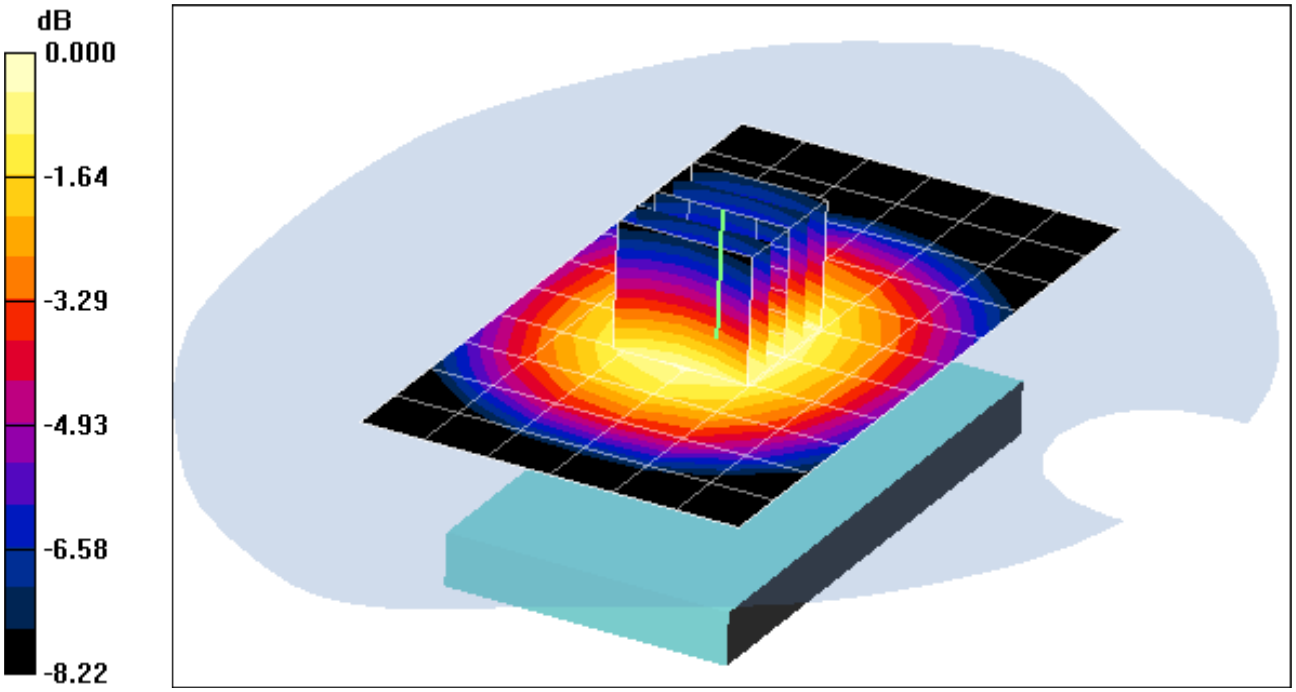
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.936 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 2.5 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Body Worn SAR, Back side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.0 V/m
Peak SAR (extrapolated) = 0.919 W/kg
SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.521 mW/g



0 dB = 0.743mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

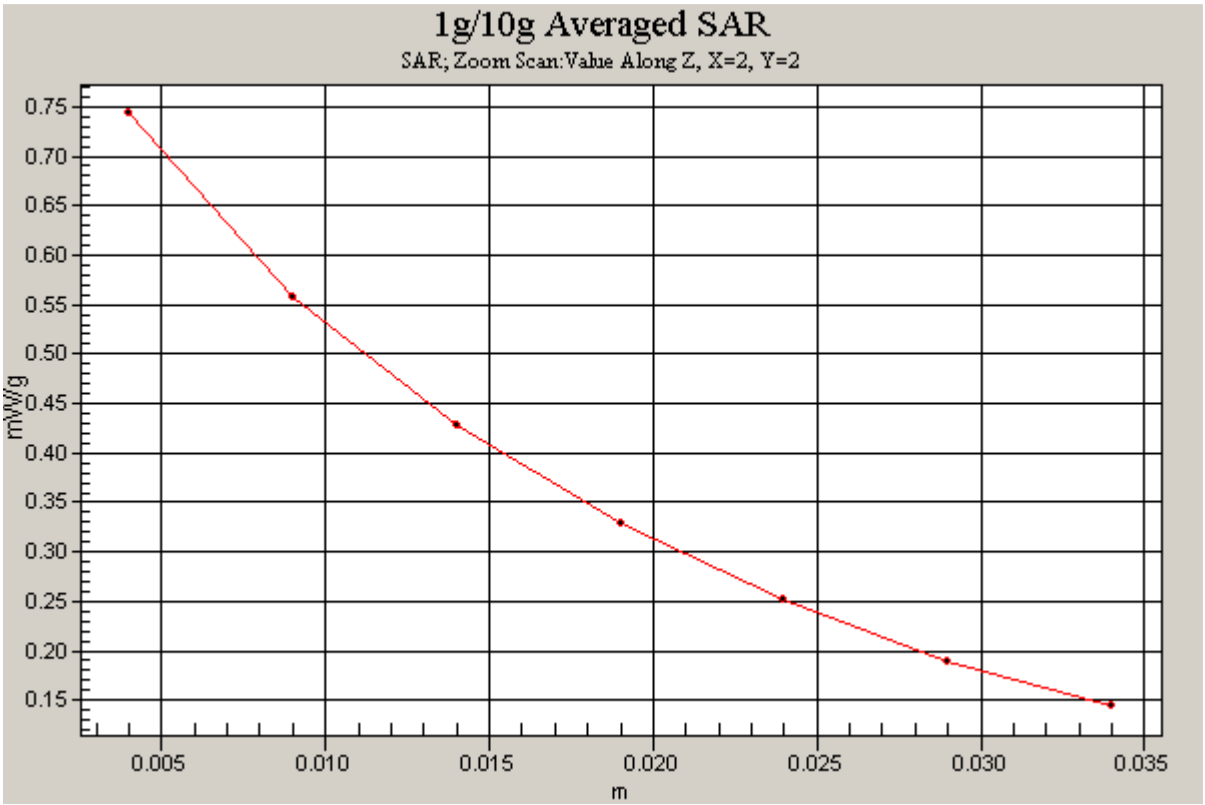
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.936 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 2.5 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Body Worn SAR, Back side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.0 V/m
Peak SAR (extrapolated) = 0.919 W/kg
SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.521 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

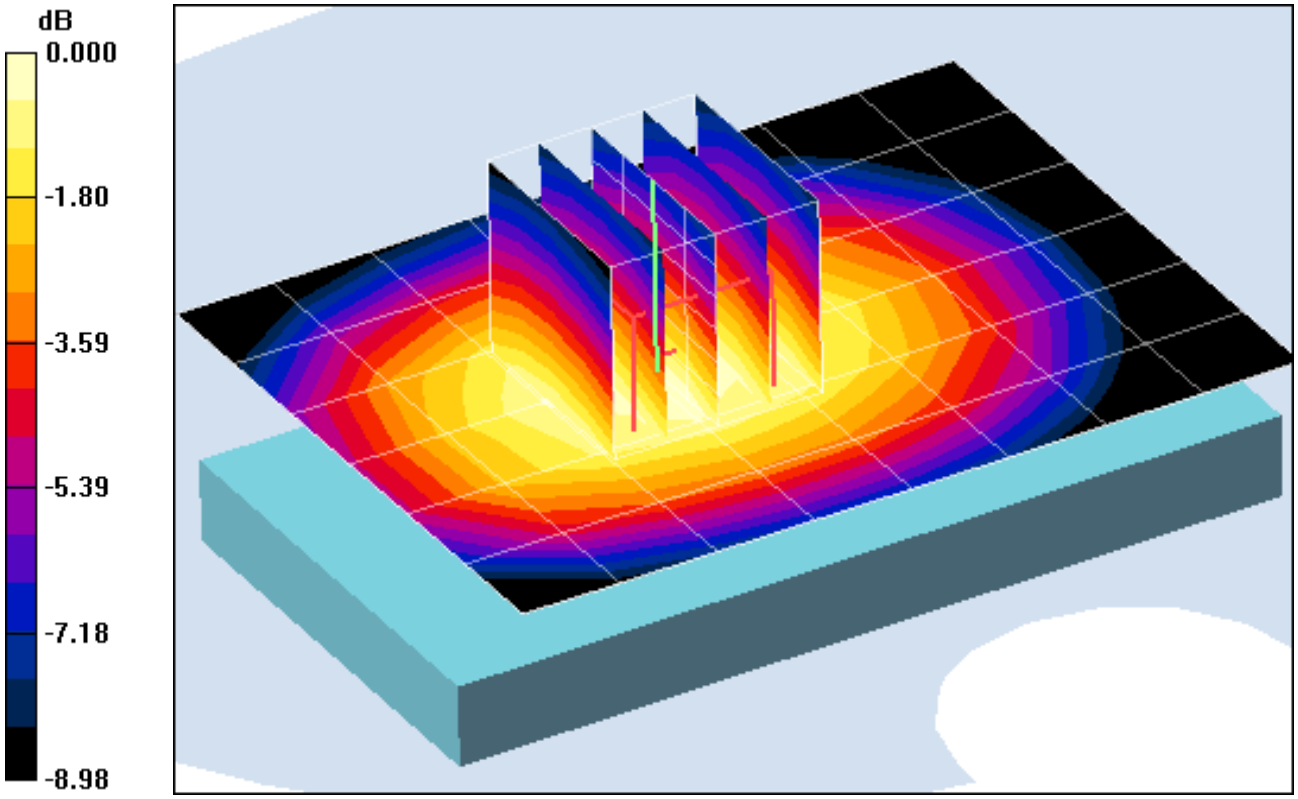
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.959 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Hotspot On, TDSO32, Body SAR, Back side, Mid.ch

Area Scan (7x9x1): 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) = 0.269 W/kg
SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.155 mW/g



0 dB = 0.221mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

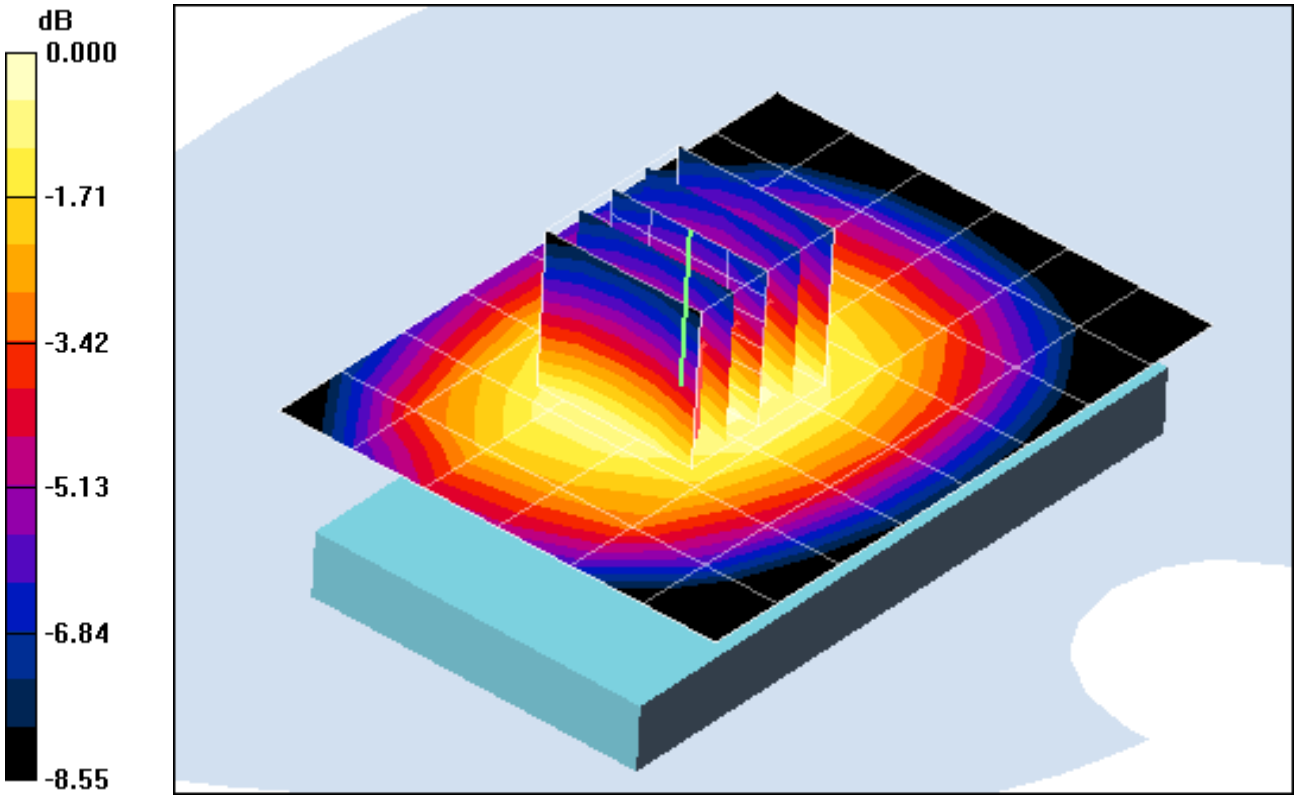
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.959 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Hotspot On, TDSO32, Body SAR, Front side, Mid.ch

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.4 V/m
Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.123 mW/g



0 dB = 0.169mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

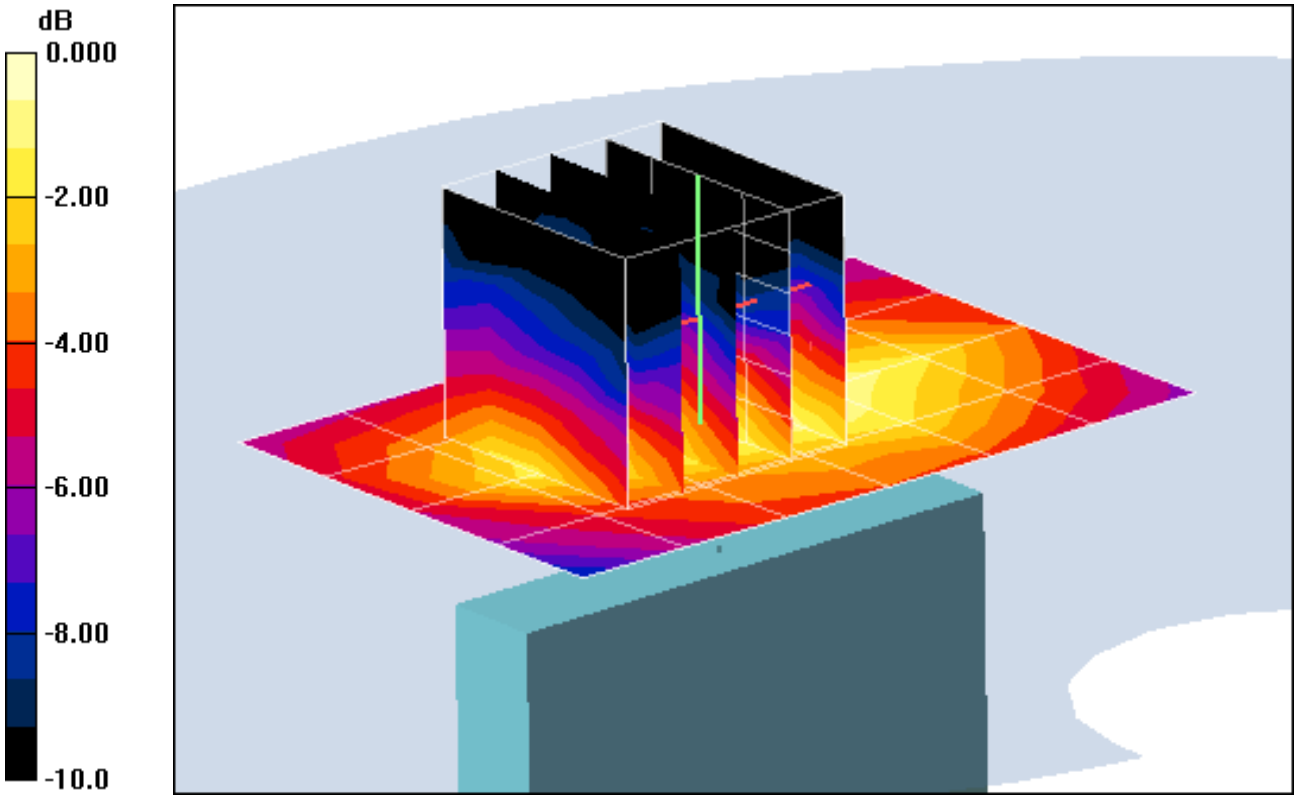
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.959 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Hotspot On, TDSO32, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.30 V/m
Peak SAR (extrapolated) = 0.026 W/kg
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00836 mW/g



0 dB = 0.016mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

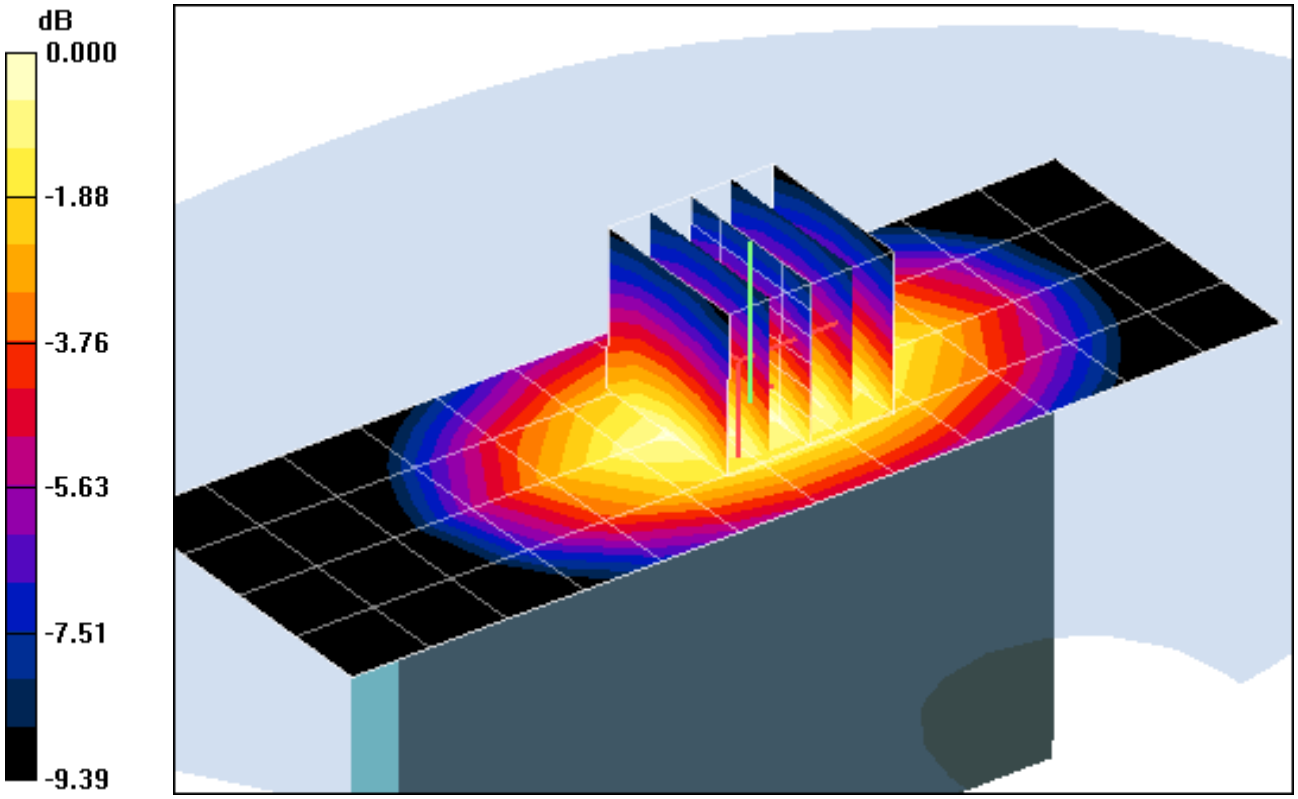
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.959 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Hotspot On, TDSO32, Body SAR, Right Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.7 V/m
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.158 mW/g; SAR(10 g) = 0.110 mW/g



0 dB = 0.167mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

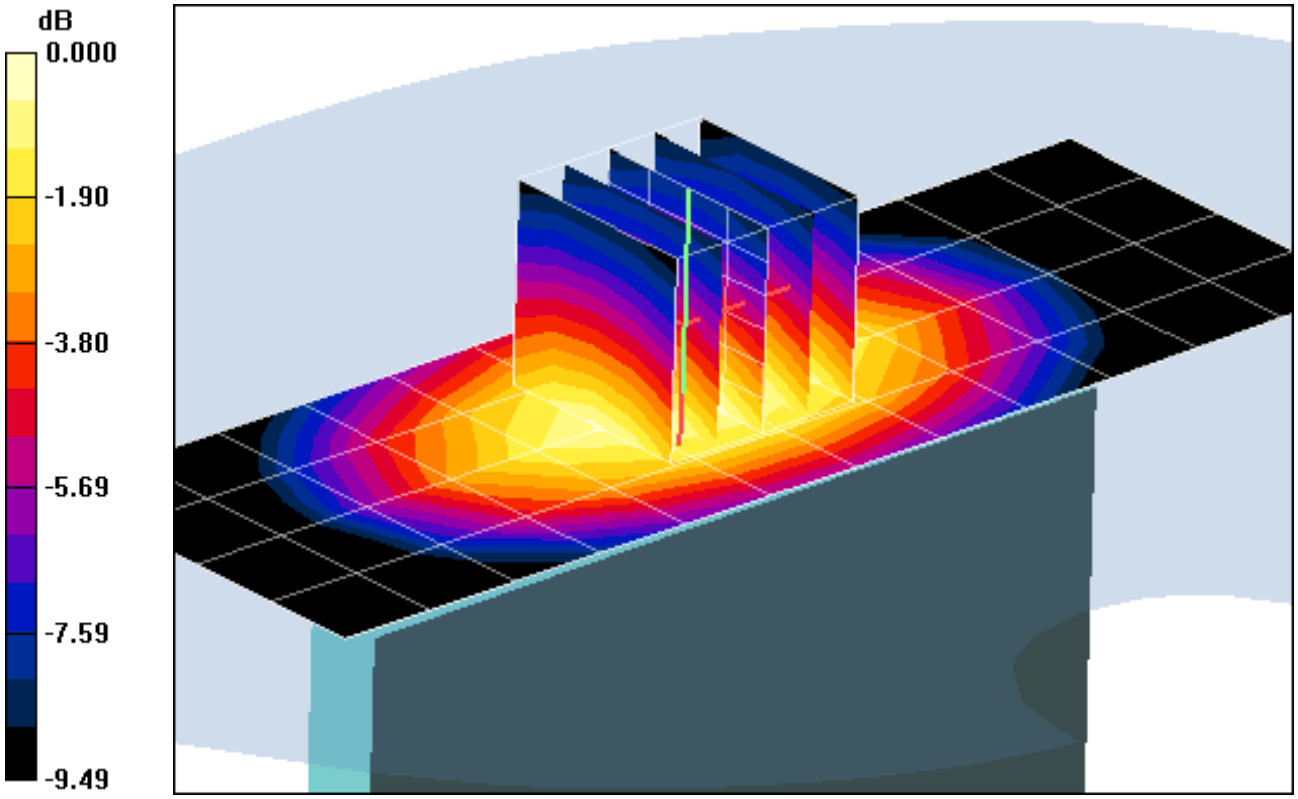
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.959 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2011; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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, Hotspot On, TDSO32, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.1 V/m
Peak SAR (extrapolated) = 0.232 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.115 mW/g



0 dB = 0.177mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

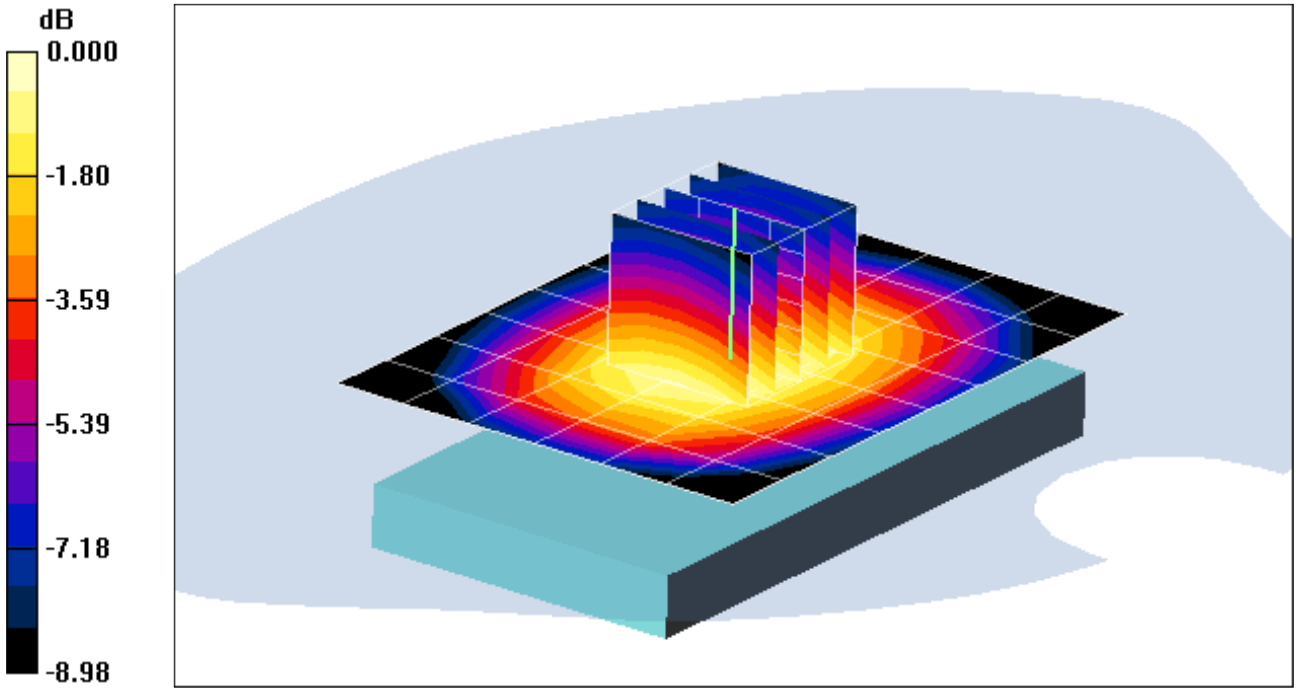
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.936 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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 EVDO, Hotspot On, Body SAR, Back side, Mid.ch

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m
Peak SAR (extrapolated) = 0.282 W/kg
SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.160 mW/g



0 dB = 0.230mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

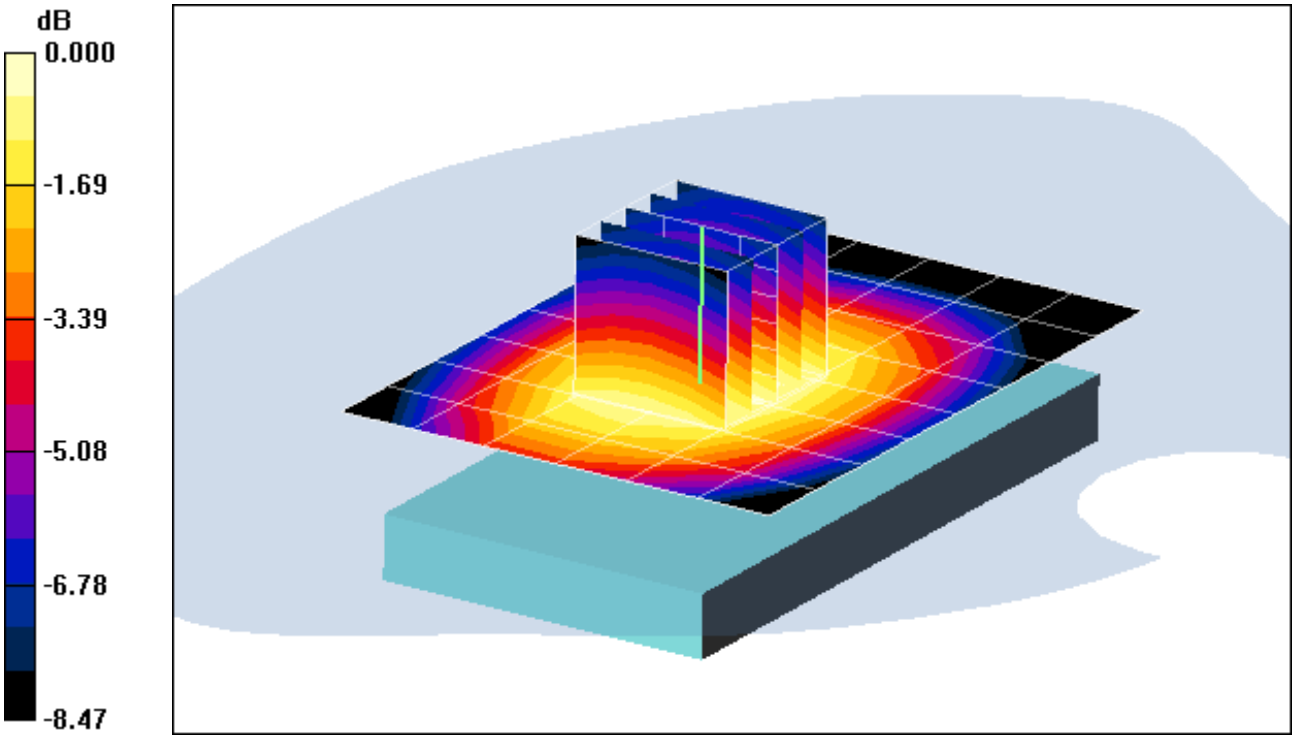
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.936$ mho/m; $\varepsilon_r = 52.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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 EVDO, Hotspot On, Body SAR, Front side, Mid.ch

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m
Peak SAR (extrapolated) = 0.207 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.125 mW/g



0 dB = 0.172mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

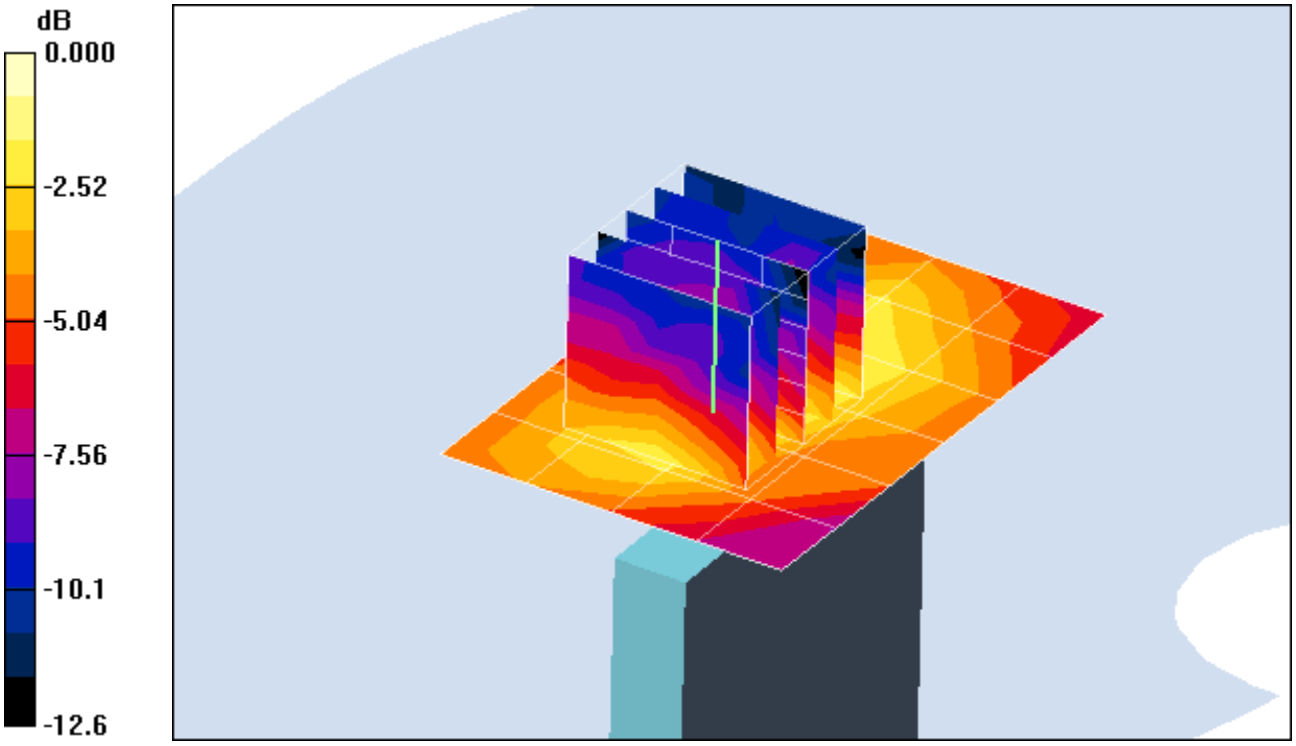
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.936$ mho/m; $\varepsilon_r = 52.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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 EVDO, Hotspot On, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.89 V/m
Peak SAR (extrapolated) = 0.025 W/kg
SAR(1 g) = 0.013 mW/g; SAR(10 g) = 0.00755 mW/g



0 dB = 0.015mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

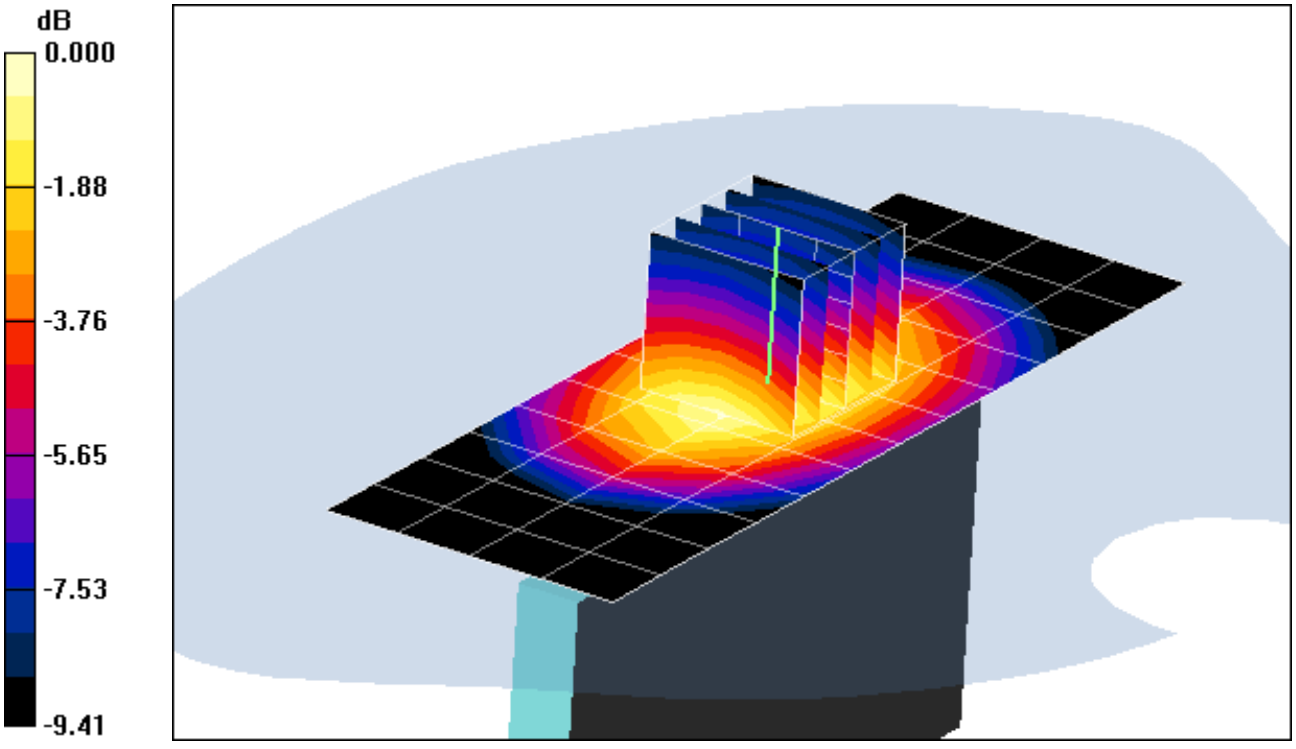
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.936$ mho/m; $\varepsilon_r = 52.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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 EVDO, Hotspot On, Body SAR, Right Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m
Peak SAR (extrapolated) = 0.218 W/kg
SAR(1 g) = 0.157 mW/g; SAR(10 g) = 0.109 mW/g



0 dB = 0.167mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW260017 SJUG6093AA

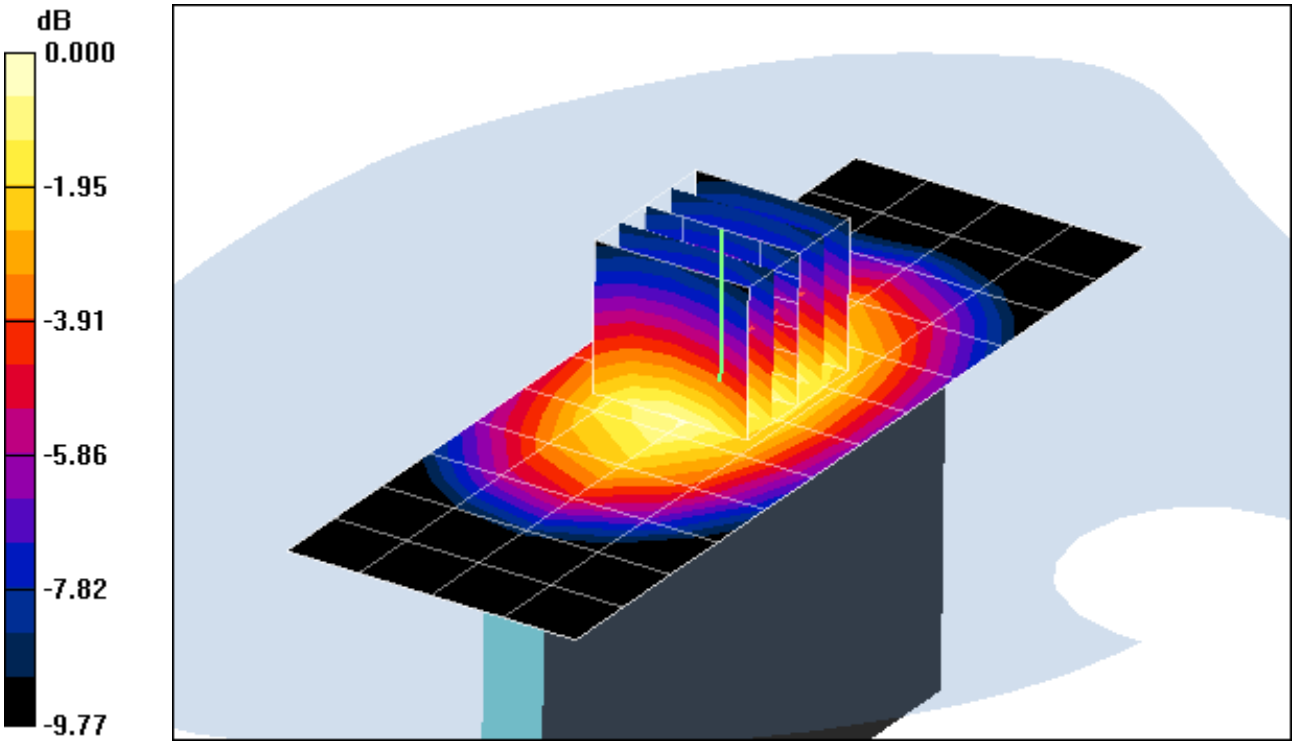
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.936$ mho/m; $\varepsilon_r = 52.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-25-2011; Ambient Temp: 23.8 °C; Tissue Temp: 22.6 °C

Probe: EX3DV4 - SN3561; ConvF(8.09, 8.09, 8.09); Calibrated: 8/19/2010
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 EVDO, Hotspot On, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.112 mW/g



0 dB = 0.173mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

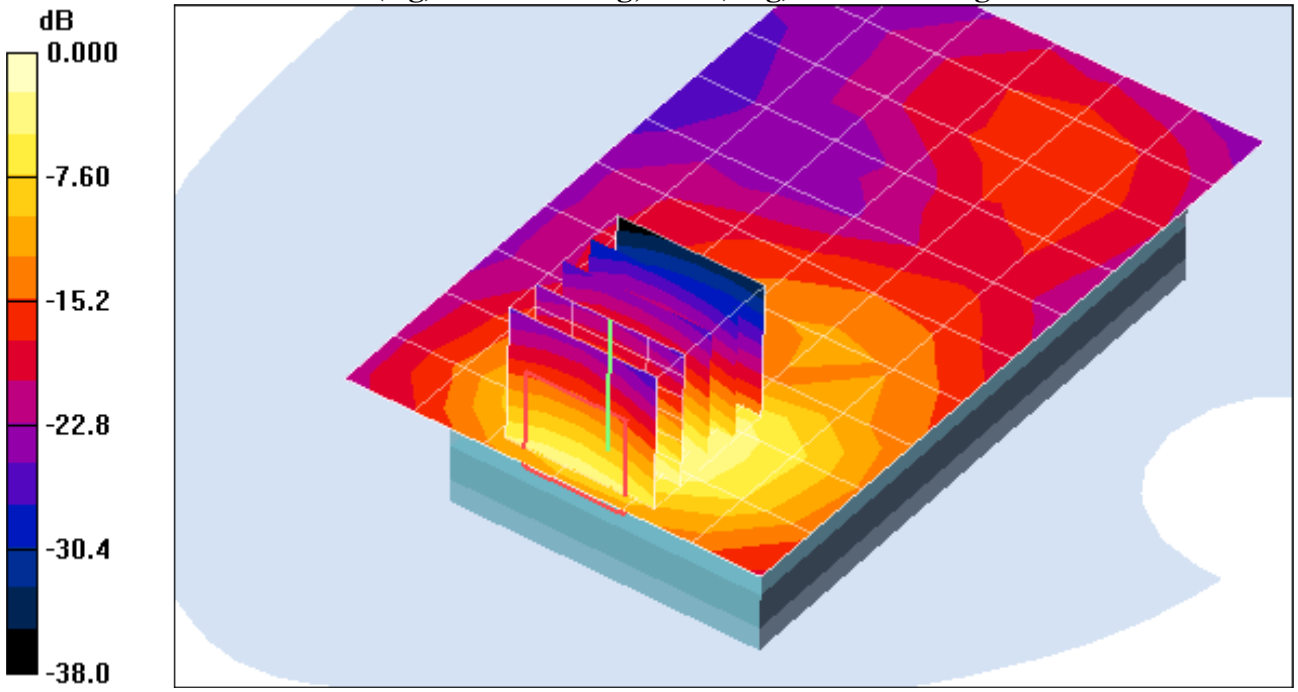
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 2.5 cm

Test Date: 04-25-2011; Ambient Temp: 23.7 °C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
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 CDMA, Body Worn SAR, Back side, Mid.ch

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.1 V/m
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.912 mW/g; SAR(10 g) = 0.551 mW/g



0 dB = 0.965mW/g

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

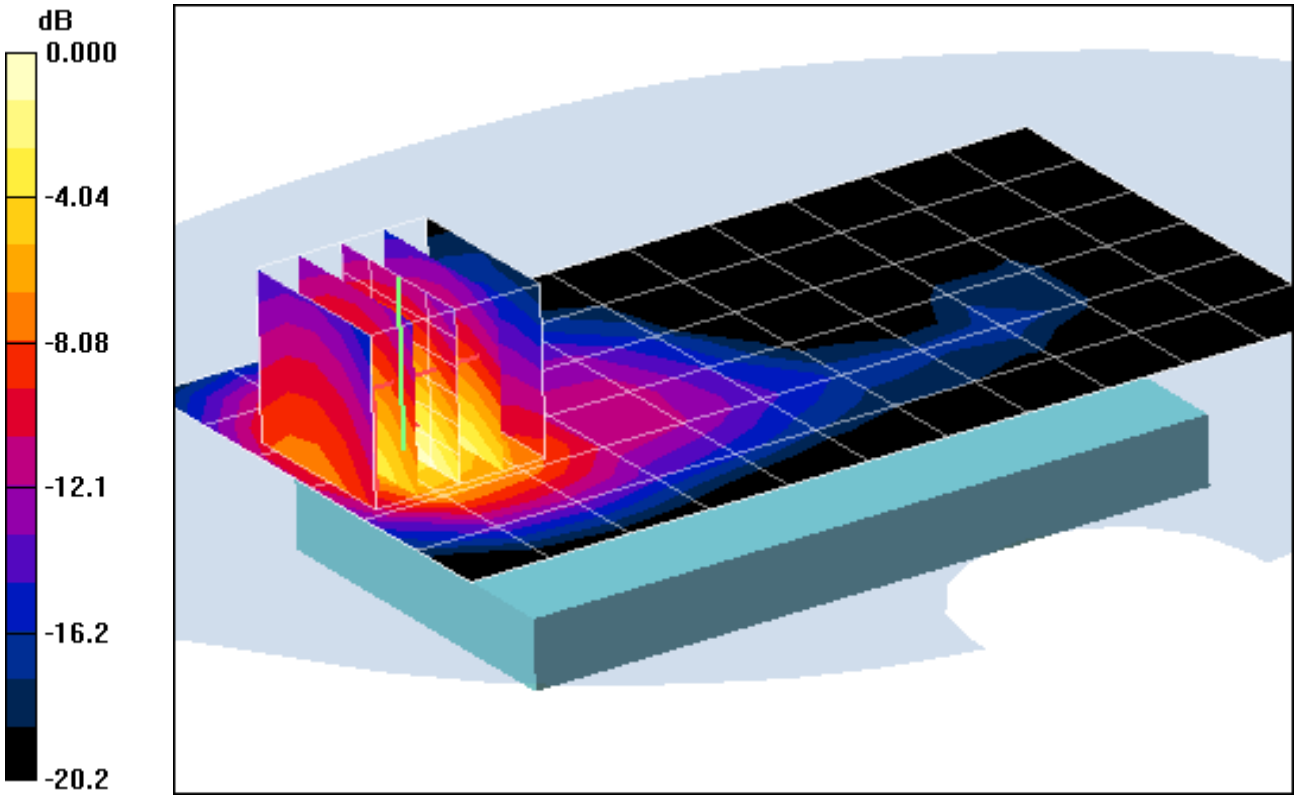
Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Back side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.91 V/m
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.918 mW/g; SAR(10 g) = 0.477 mW/g



0 dB = 1.01mW/g

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

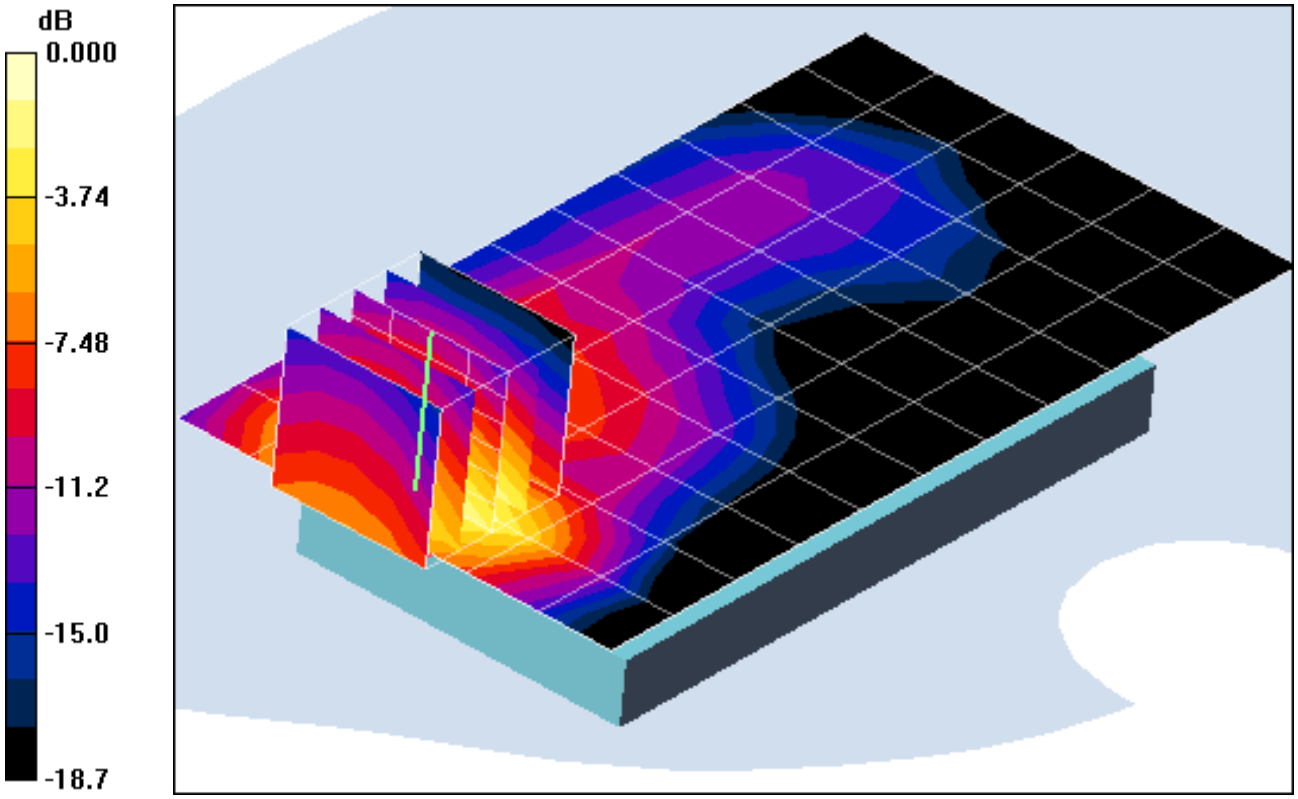
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Front side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m
Peak SAR (extrapolated) = 0.850 W/kg
SAR(1 g) = 0.540 mW/g; SAR(10 g) = 0.292 mW/g



0 dB = 0.579mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

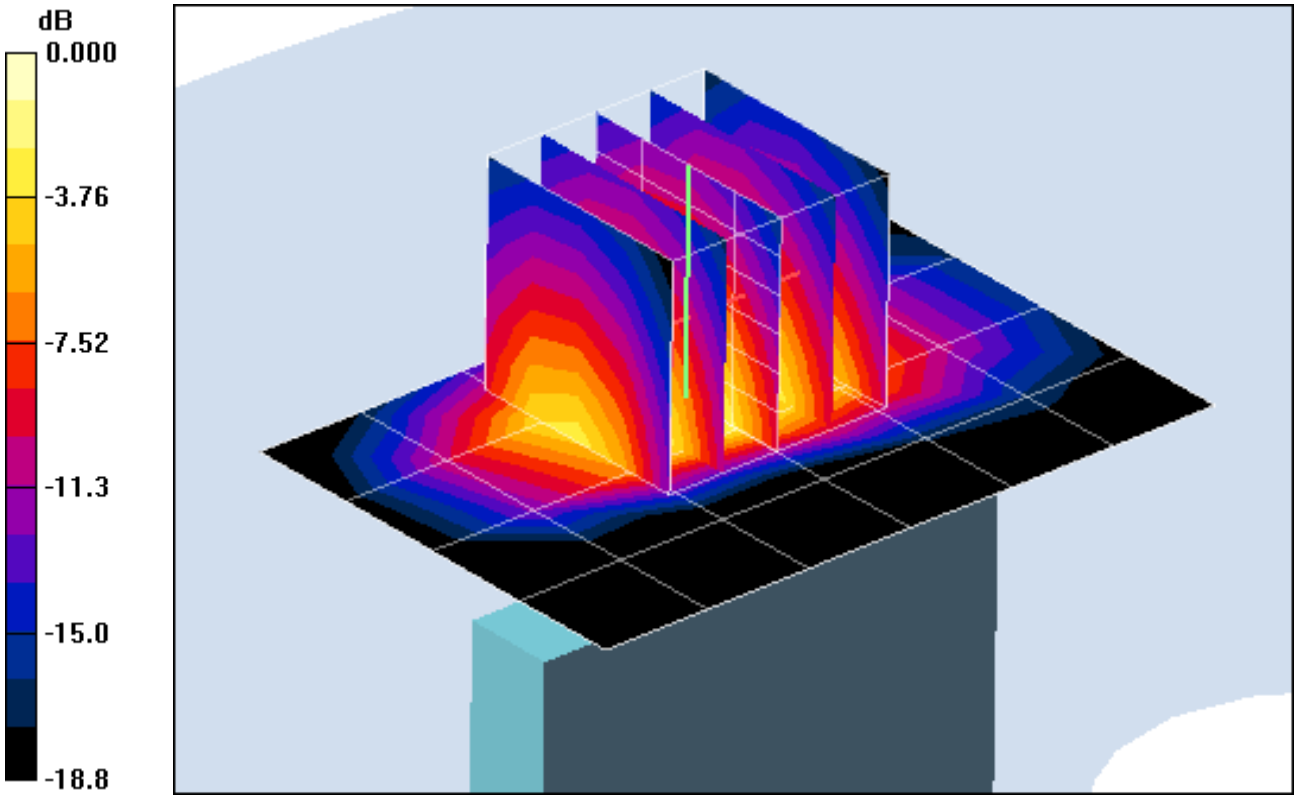
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.52 mho/m; ε_r = 53.26; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Bottom Edge, High.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 = 22.3 V/m
Peak SAR (extrapolated) = 2.26 W/kg
SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.701 mW/g



0 dB = 1.57mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

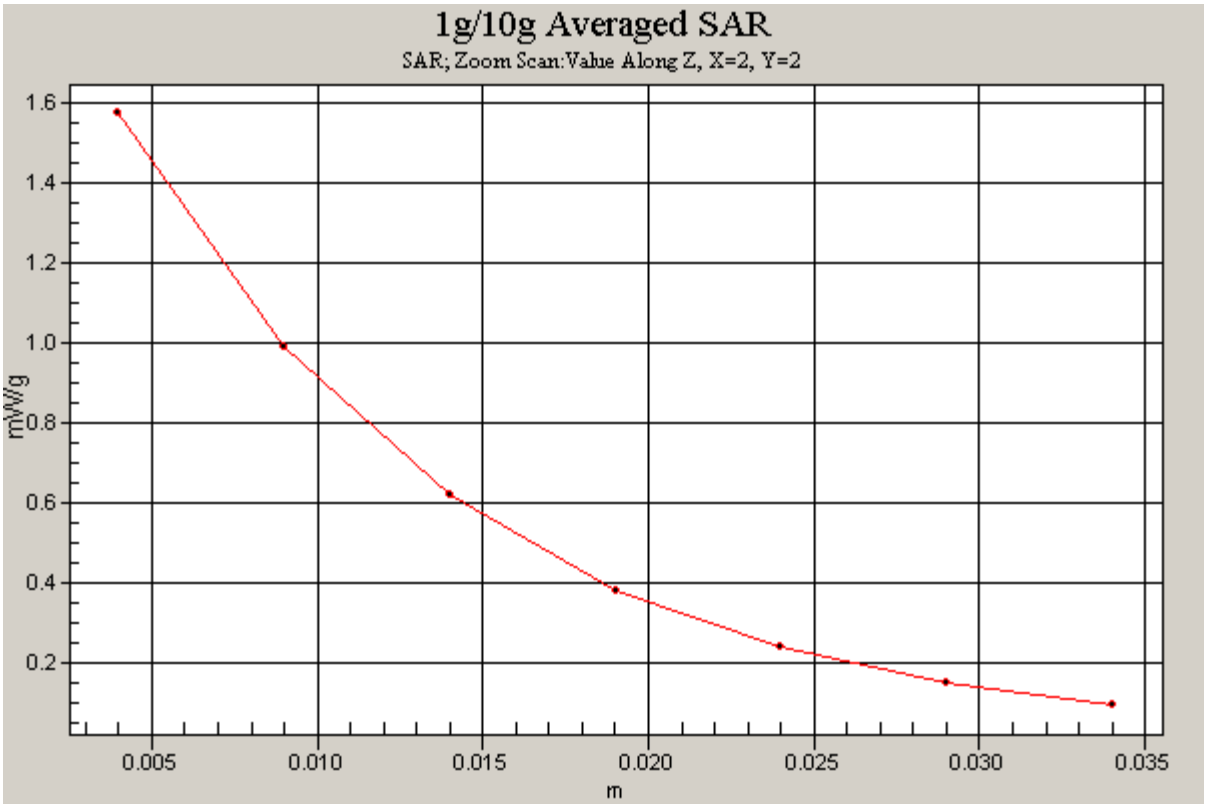
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.52 mho/m; ε_r = 53.26; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Bottom Edge, High.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 = 22.3 V/m
Peak SAR (extrapolated) = 2.26 W/kg
SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.701 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

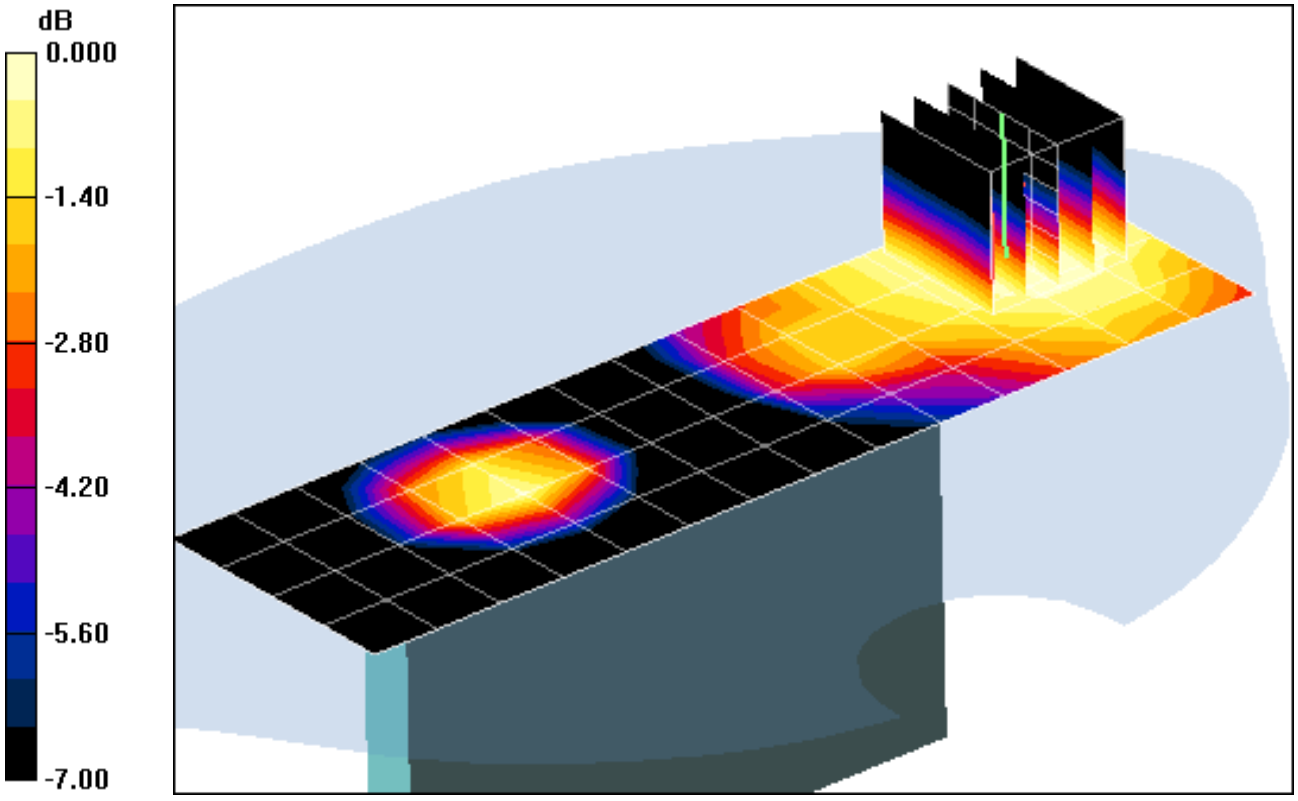
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Right Edge, Mid.ch

Area Scan (5x15x1): 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) = 0.200 W/kg
SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.105 mW/g



0 dB = 0.157mW/g

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

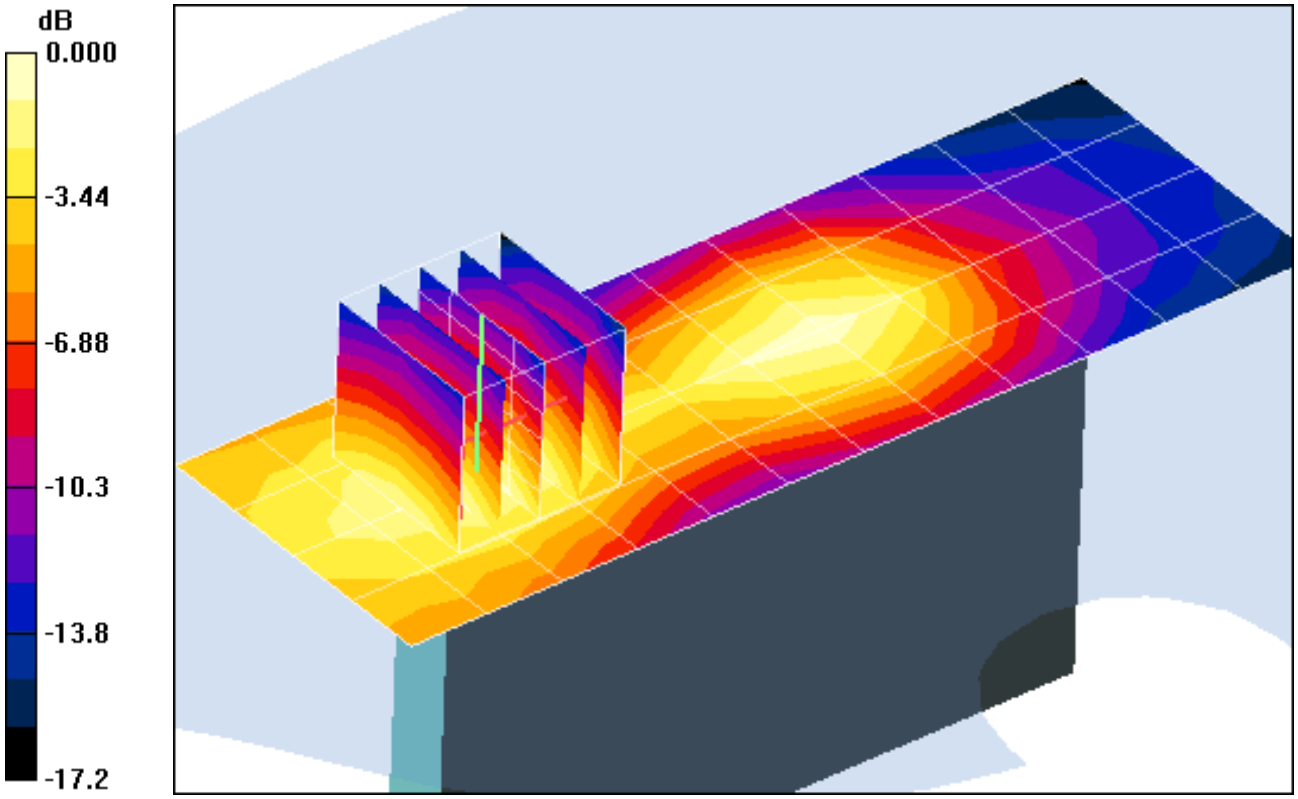
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.5 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2011; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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 Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: PCS TDSO32, Hotspot On, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.85 V/m
Peak SAR (extrapolated) = 0.132 W/kg
SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.055 mW/g



0 dB = 0.100mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX; Serial: TA035000ZH

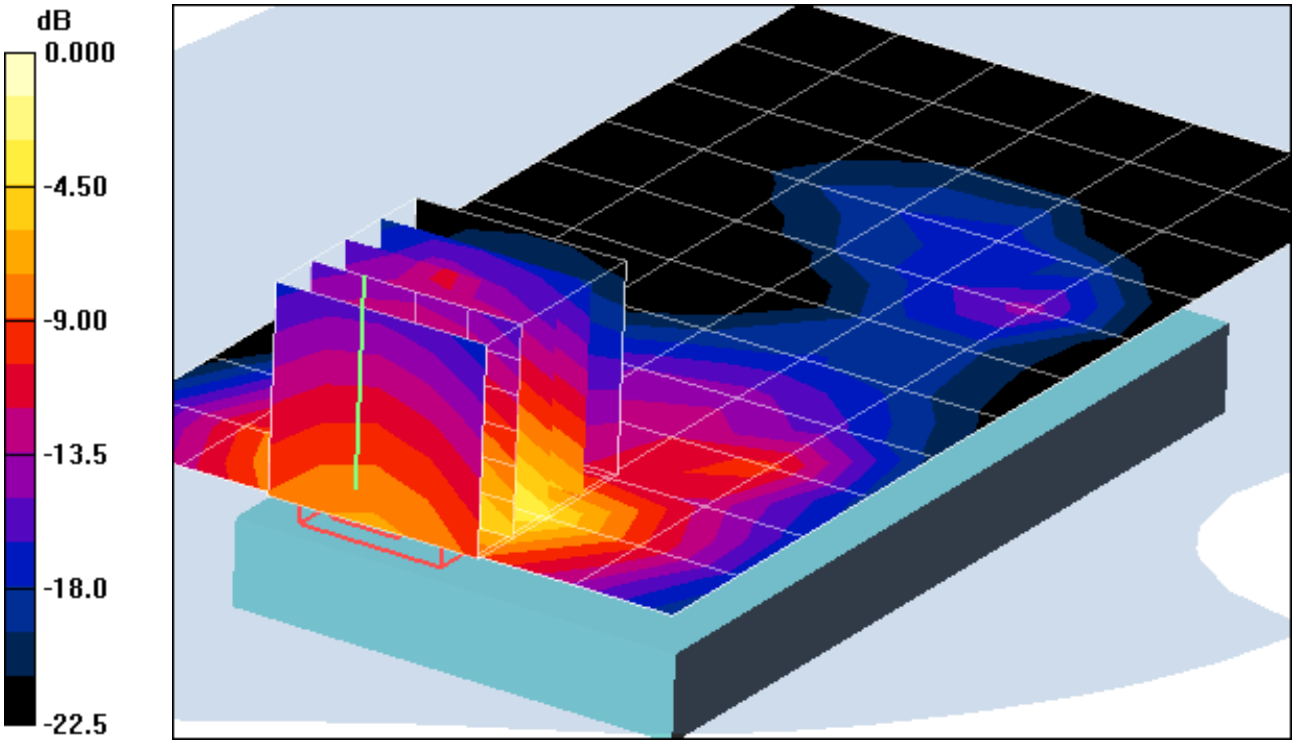
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.518 mho/m; ε_r = 52.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8°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 EVDO, Hotspot On, Body SAR, Back side, High ch.

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.8 V/m
Peak SAR (extrapolated) = 3.08 W/kg
SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.500 mW/g



0 dB = 1.43mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

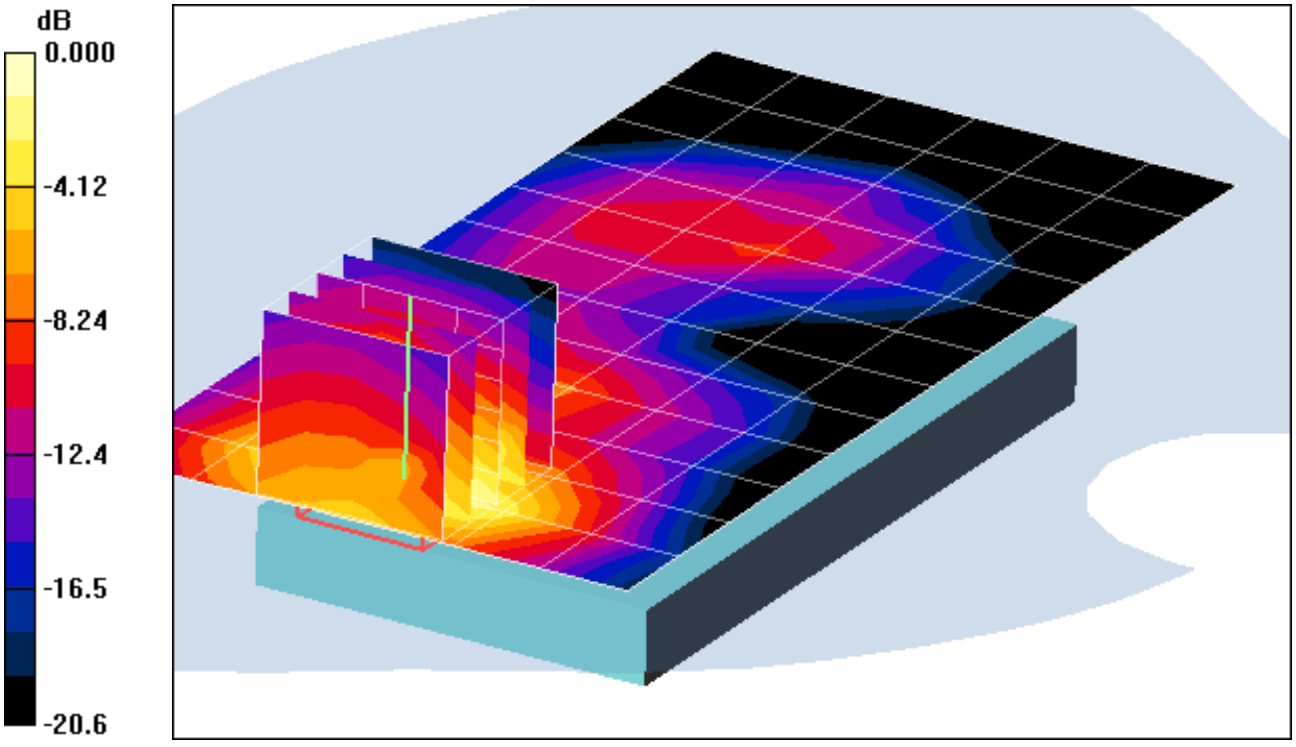
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8°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 EVDO, Hotspot On, Body SAR, Front 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 = 18.6 V/m
Peak SAR (extrapolated) = 0.700 W/kg
SAR(1 g) = 0.473 mW/g; SAR(10 g) = 0.262 mW/g



0 dB = 0.531mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

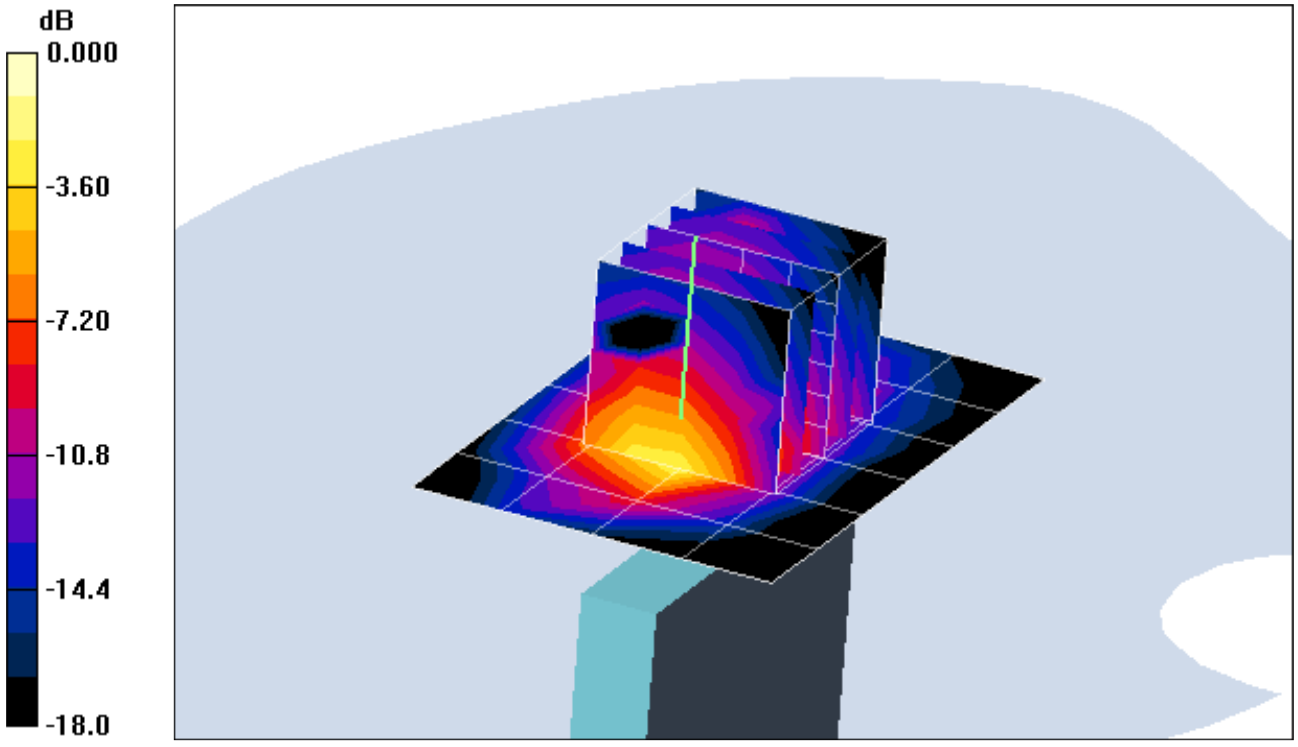
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.518 mho/m; ε_r = 52.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8°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 EVDO, Hotspot On, Body SAR, Bottom Edge, High 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 = 31.8 V/m
Peak SAR (extrapolated) = 1.98 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.616 mW/g



0 dB = 1.23mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

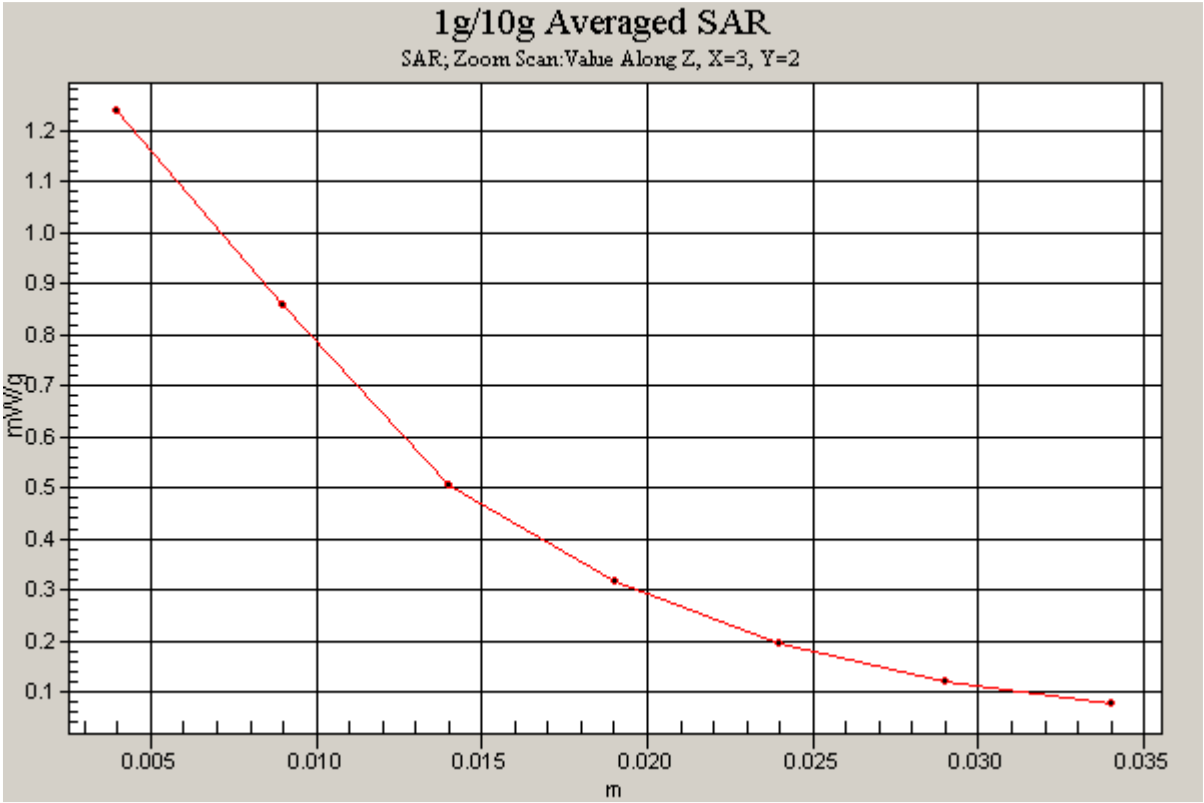
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.518 mho/m; ε_r = 52.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8°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 EVDO, Hotspot On, Body SAR, Bottom Edge, High 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 = 31.8 V/m
Peak SAR (extrapolated) = 1.98 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.616 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

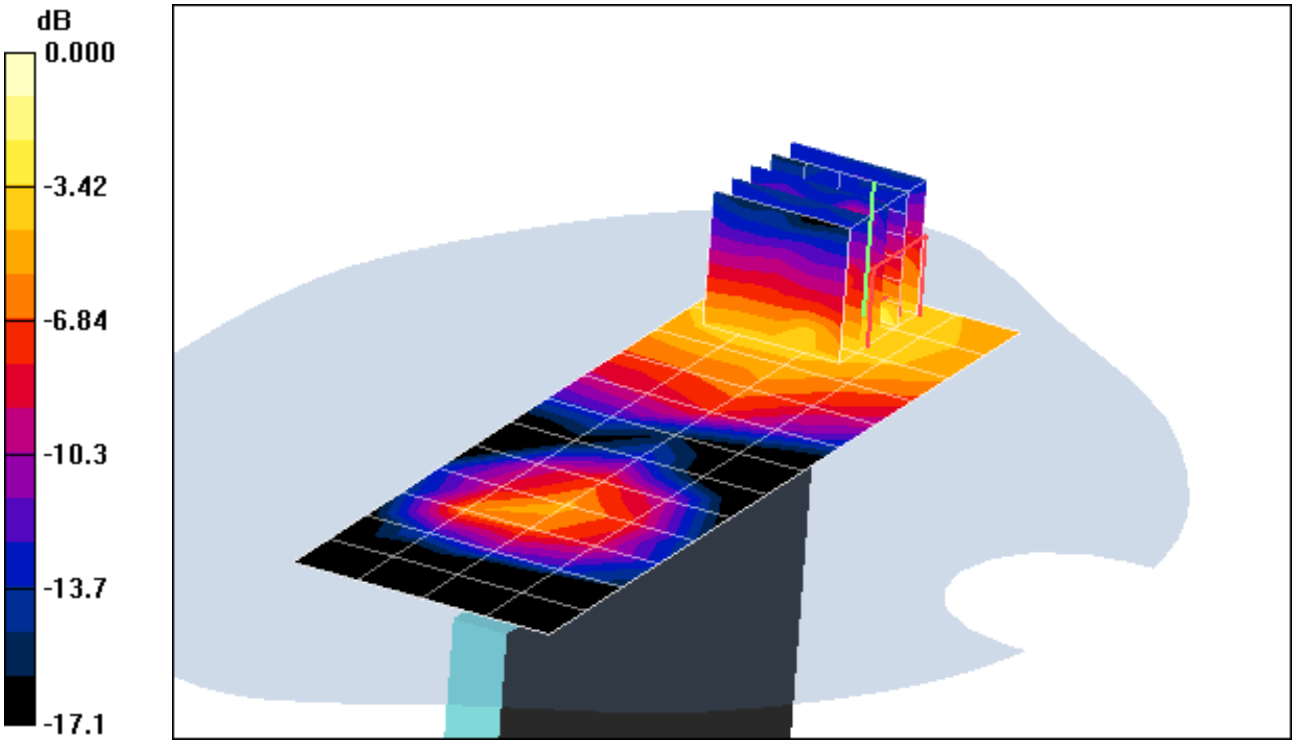
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8°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 EVDO, Hotspot On, Body SAR, Right Edge, Mid.ch

Area Scan (5x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.08 V/m
Peak SAR (extrapolated) = 0.137 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.024 mW/g



0 dB = 0.071mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: TA035000ZH

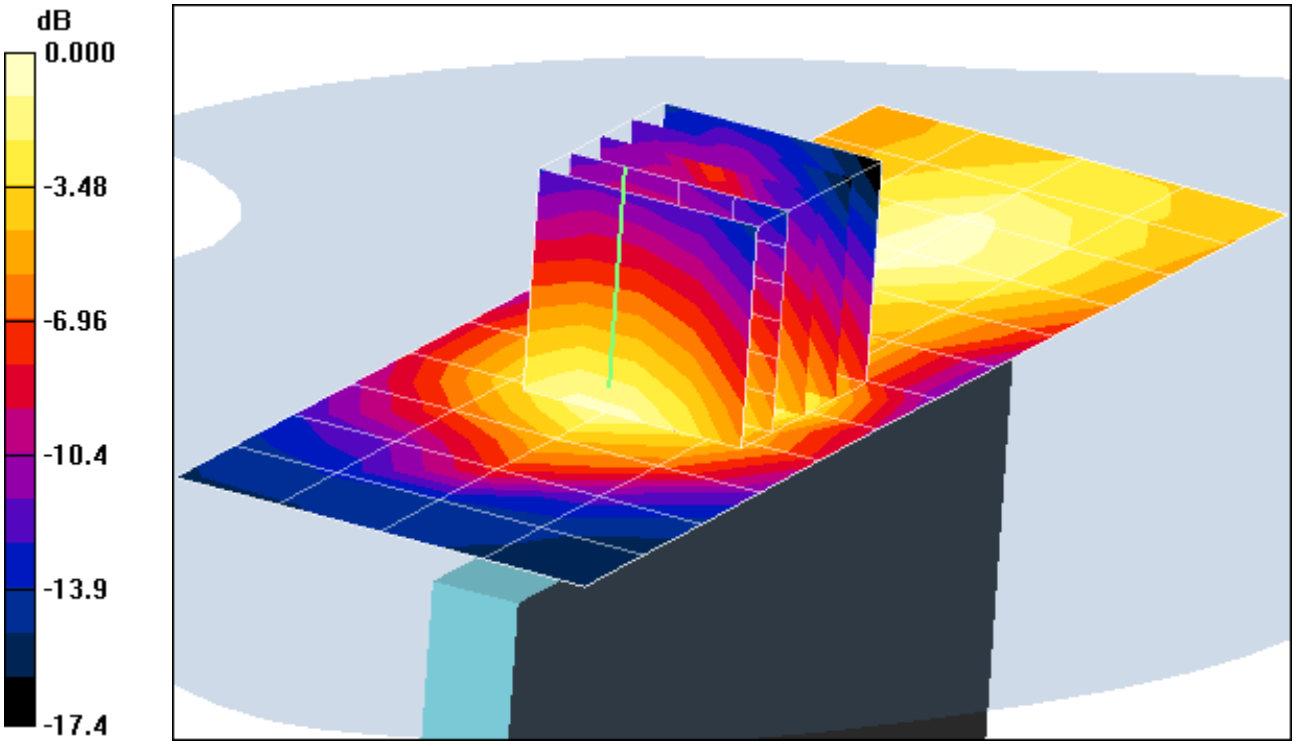
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2011; Ambient Temp: 24.1°C; Tissue Temp: 22.8 °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 EVDO, Hotspot On, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.36 V/m
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.061 mW/g



0 dB = 0.105mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069SJUG6093AA

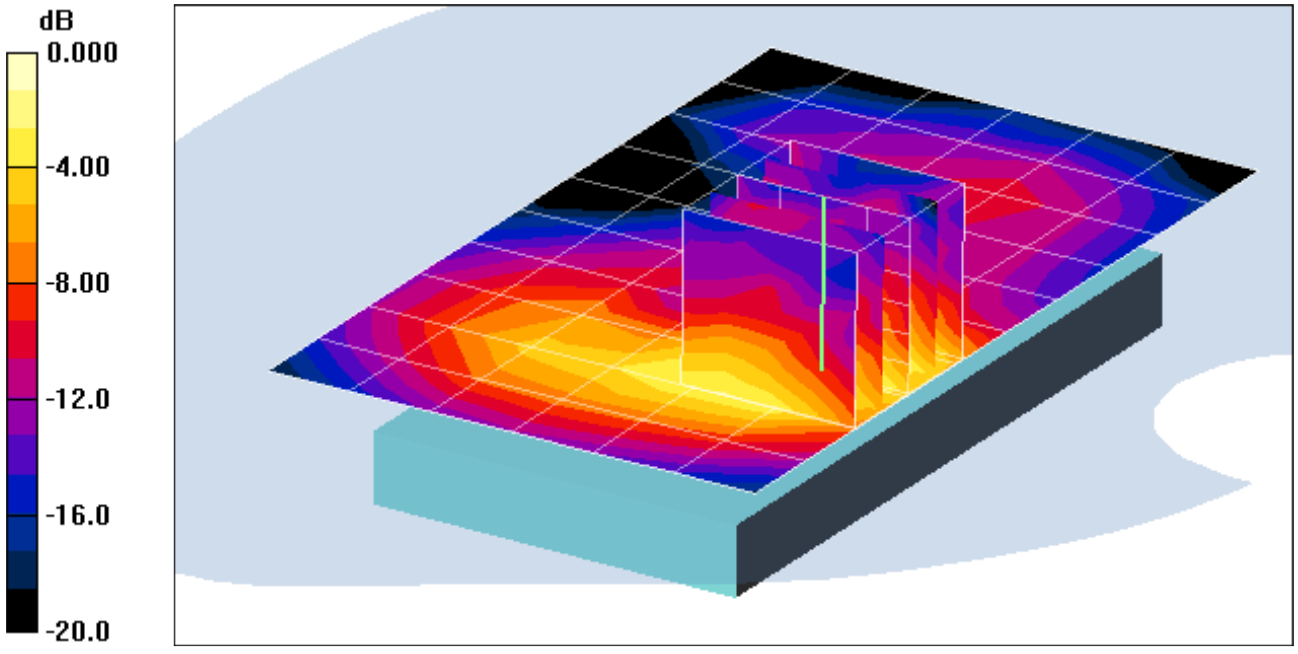
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.99 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-18-2011; Ambient Temp: 24.1 ° C; Tissue Temp: 23.0 °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: IEEE 802.11b, Body SAR, Ch.06, 1 Mbps, 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 = 9.69 V/m
Peak SAR (extrapolated) = 0.375 W/kg
SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.222mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

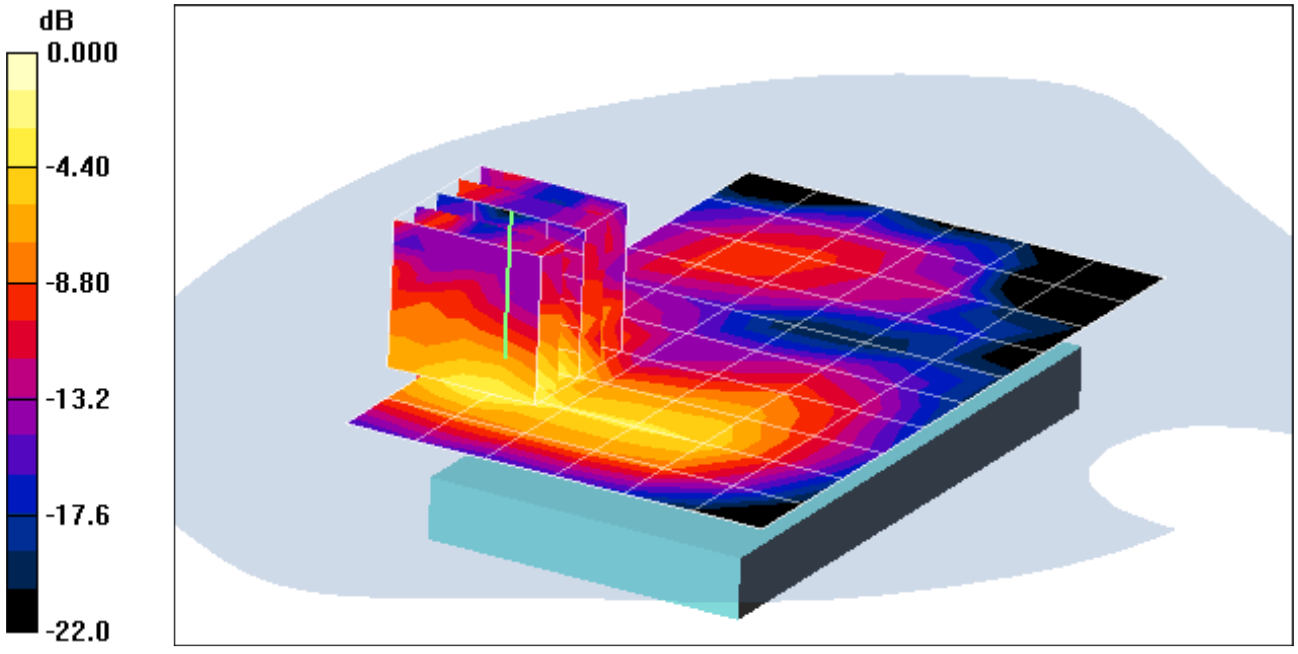
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.99 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-18-2011; Ambient Temp: 24.1 ° C; Tissue Temp: 23.0 °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: IEEE 802.11b, Body SAR, Ch. 06, 1 Mbps, Front 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 = 7.02 V/m
Peak SAR (extrapolated) = 0.198 W/kg
SAR(1 g) = 0.105 mW/g; SAR(10 g) = 0.053 mW/g



0 dB = 0.133mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW230069 SJUG6093AA

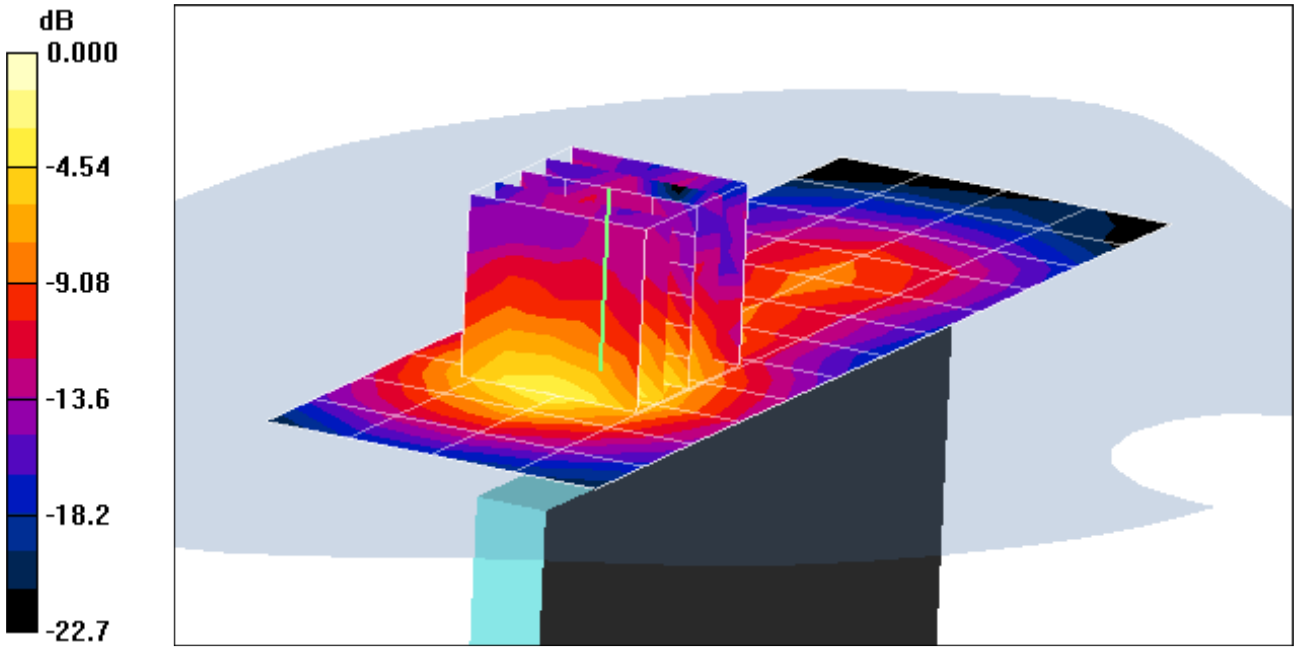
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.99 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-18-2011; Ambient Temp: 24.1 ° C; Tissue Temp: 23.0 °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: IEEE 802.11b, Body SAR, 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 = 12.5 V/m
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.306 mW/g; SAR(10 g) = 0.150 mW/g



0 dB = 0.394mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

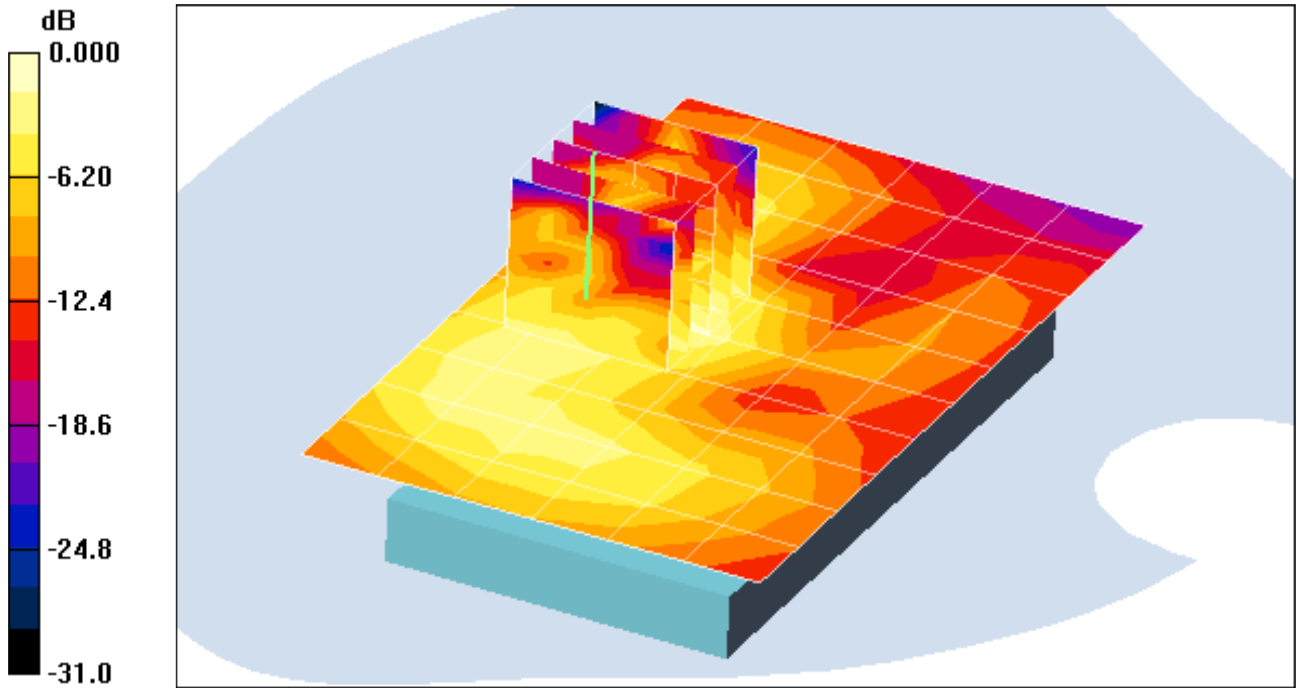
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 10MHz BW, Back Side, Tx Ant 1

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.60 V/m
Peak SAR (extrapolated) = 0.442 W/kg
SAR(1 g) = 0.212 mW/g; SAR(10 g) = 0.117 mW/g



0 dB = 0.263mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

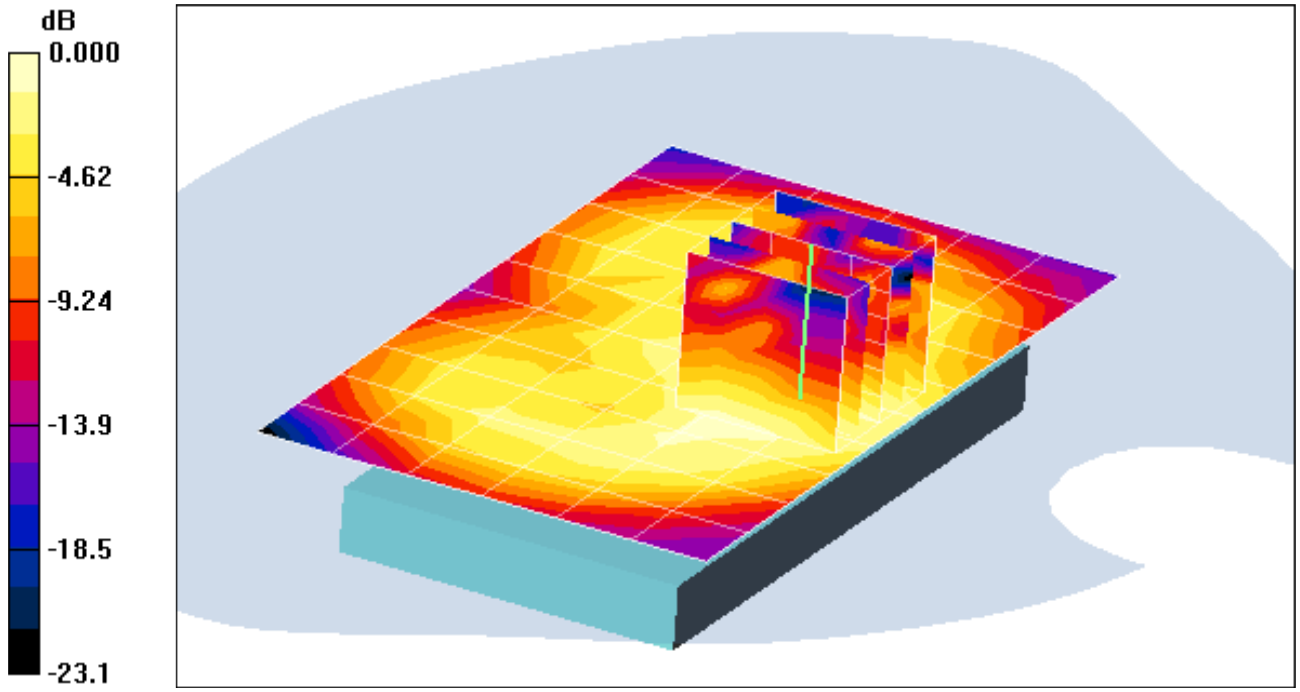
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5 MHz BW, Front Side, Tx Ant 1

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.50 V/m
Peak SAR (extrapolated) = 0.234 W/kg
SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.069 mW/g



0 dB = 0.147mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

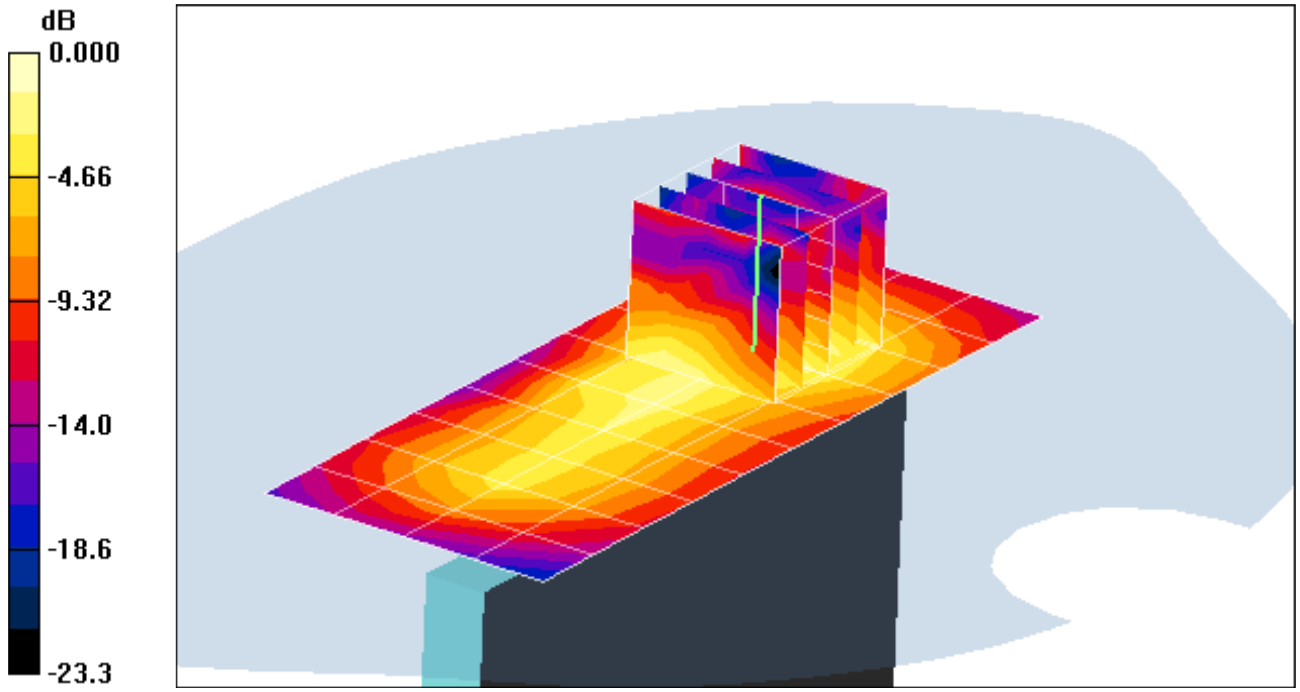
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., BAMC, QPSK, 5 MHz BW, Right Side, Tx Ant 1

Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m
Peak SAR (extrapolated) = 0.539 W/kg
SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.143 mW/g



0 dB = 0.338mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial:LSNW270089 SJUG6093AA

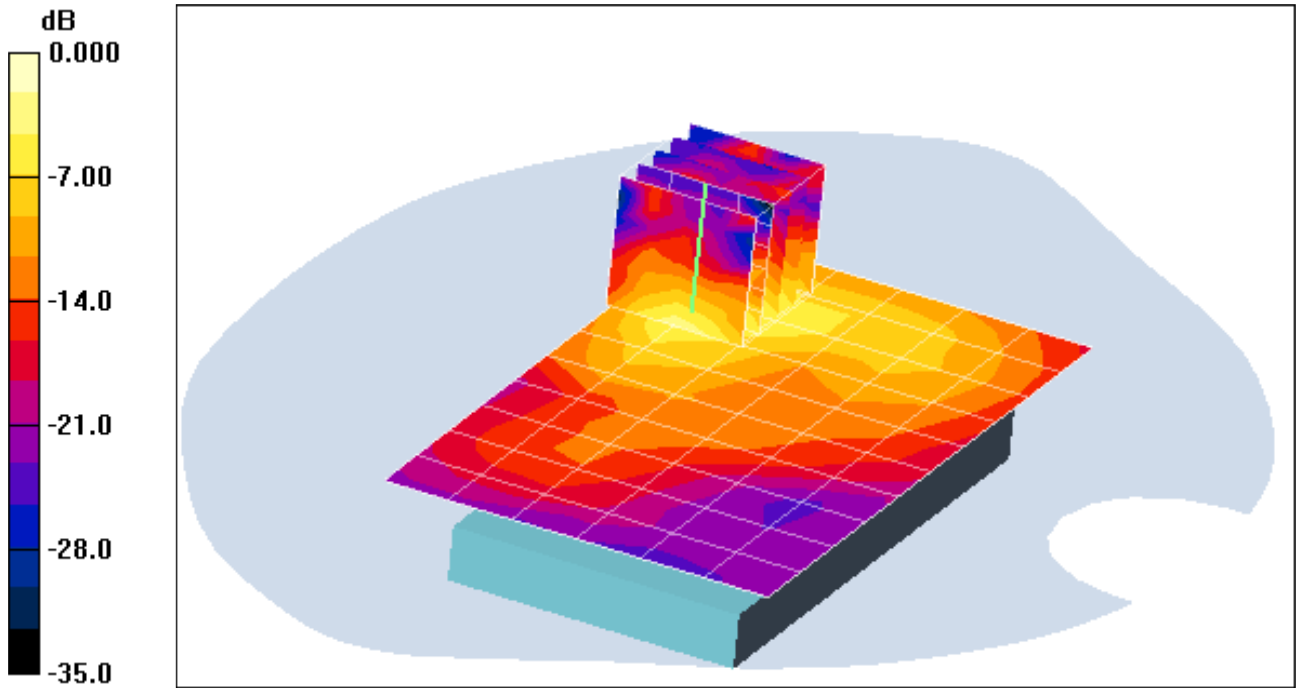
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5MHz BW, Back Side, Tx Ant 2

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.235 mW/g



0 dB = 0.639mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial:LSNW270089 SJUG6093AA

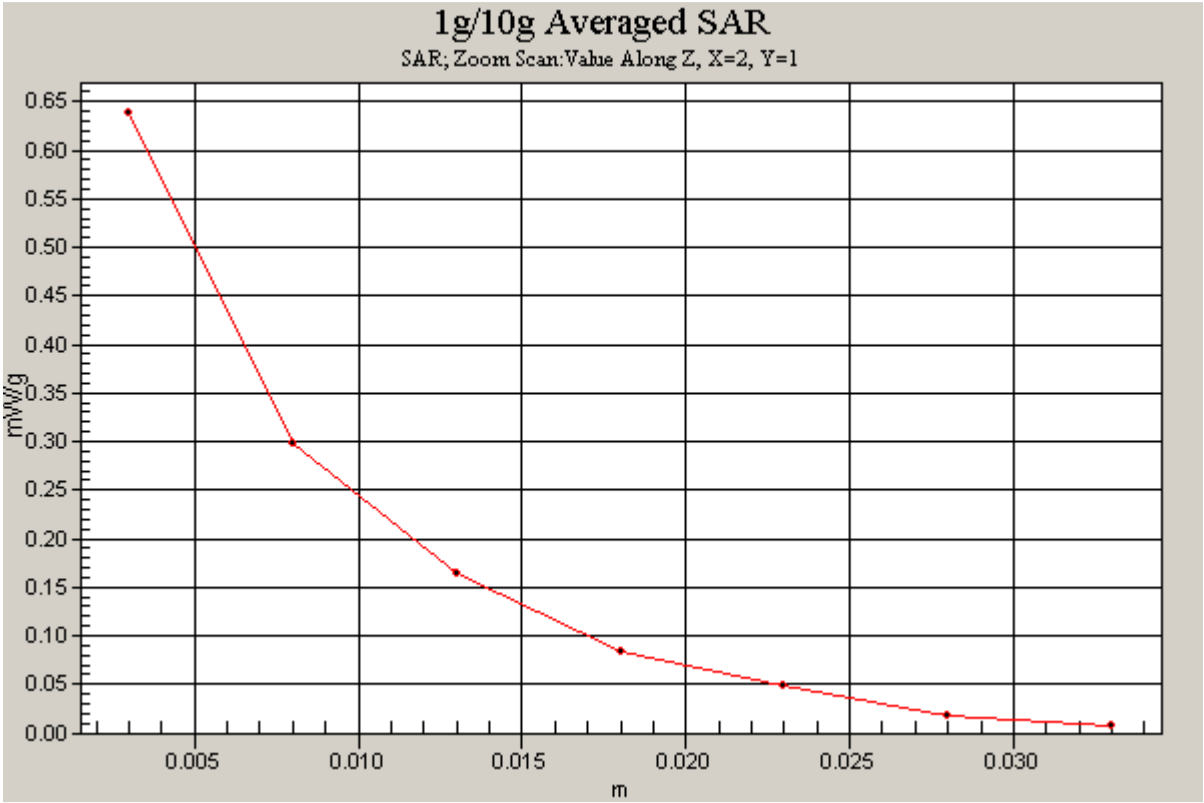
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5MHz BW, Back Side, Tx Ant 2

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.235 mW/g



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DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

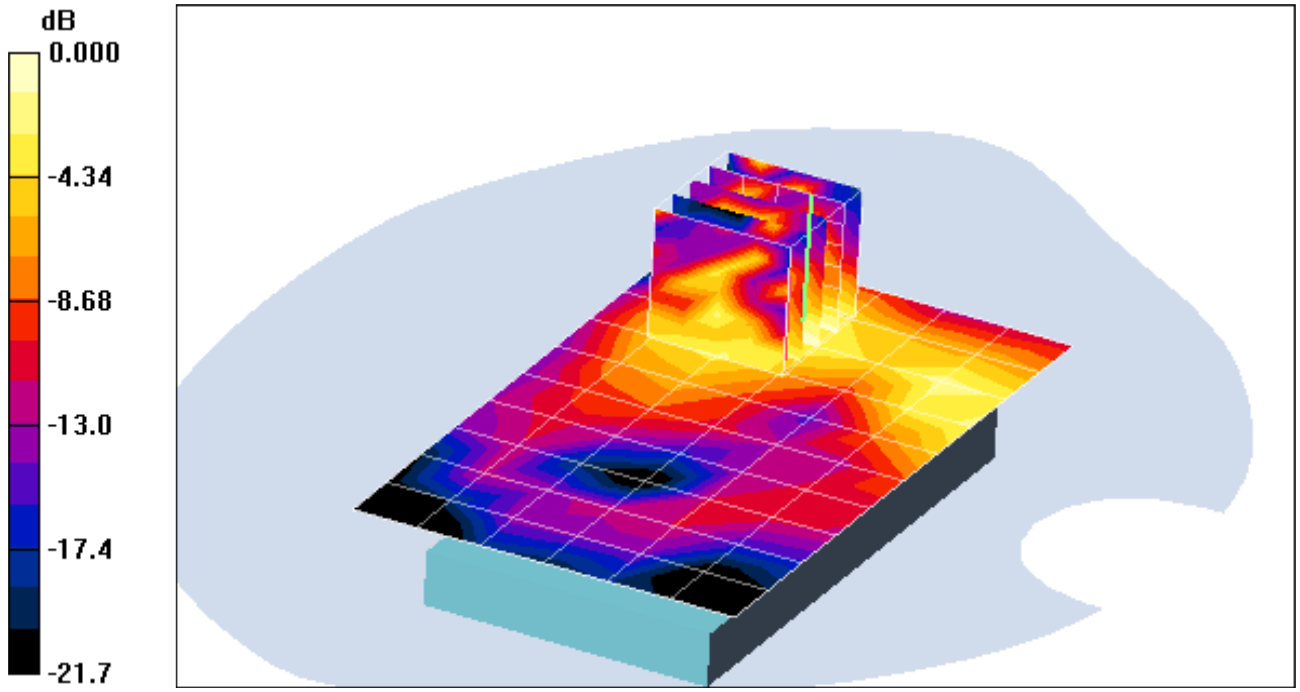
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section: Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5 MHz BW, Front Side, Tx Ant 2

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.54 V/m
Peak SAR (extrapolated) = 0.157 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.054 mW/g



0 dB = 0.108mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial:LSNW270089 SJUG6093AA

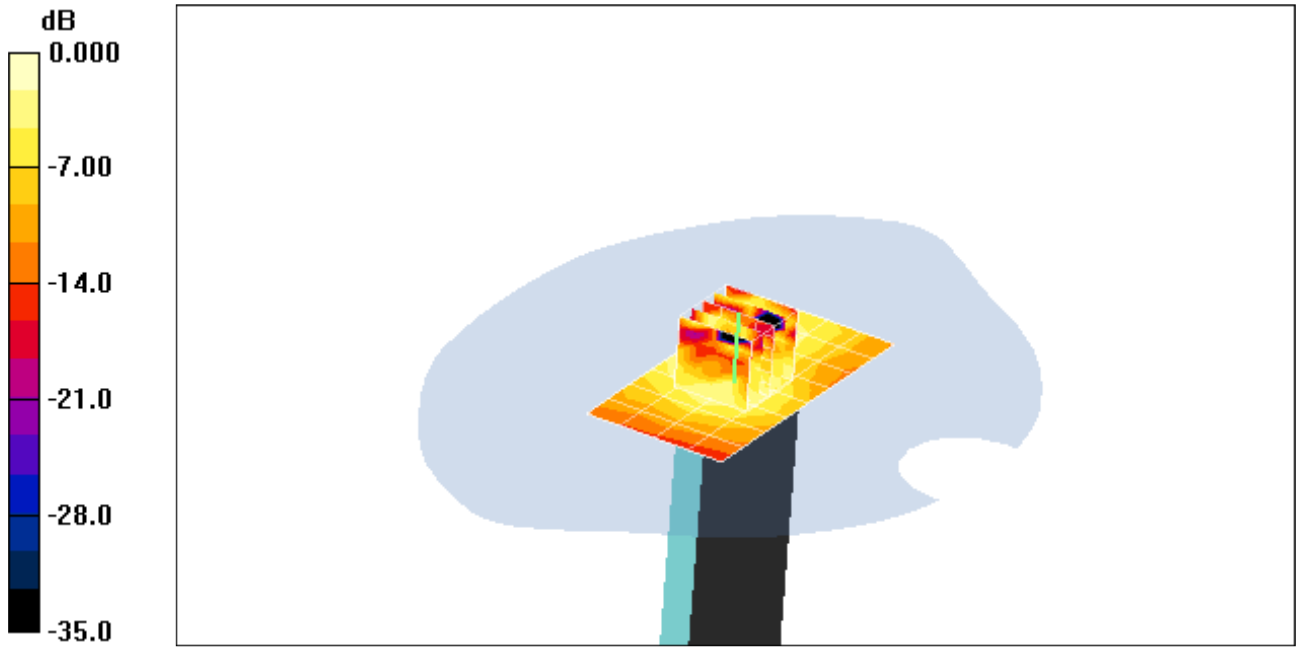
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5 MHz BW, Top Edge, Tx Ant 2

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.88 V/m
Peak SAR (extrapolated) = 0.106 W/kg
SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.038 mW/g



0 dB = 0.093mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: IHDP56MD1; Type: Cellular/PCS CDMA/EVDO Phone with Bluetooth, WLAN and WIMAX
Serial: LSNW270089 SJUG6093AA

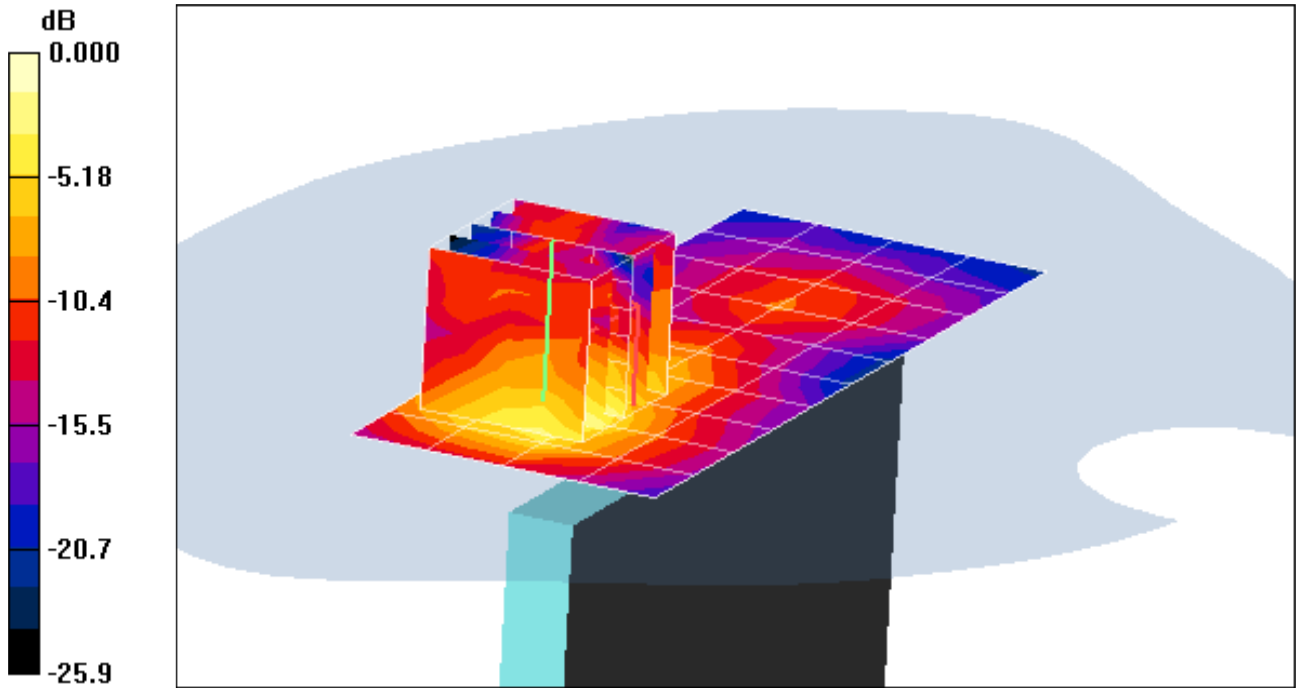
Communication System: WiMAX RF; Frequency: 2600 MHz;Duty Cycle: 1:3.2
Medium: 2500 Body Medium parameters used:
f = 2600 MHz; σ = 2.227 mho/m; ε_r = 49.92; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-26-2011; Ambient Temp: 24.9 °C; Tissue Temp: 23.1 °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, Body SAR, Mid Ch., PUSC, QPSK, 5 MHz BW, Right Side, Tx Ant 2

Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m
Peak SAR (extrapolated) = 0.775 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.167 mW/g



0 dB = 0.428mW/g