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SAR COMPLIANCE EVALUATION REPORT

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

Date of Testing:
09/14/10 - 10/11/10
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0Y1009101521-R3.A3L

FCC ID: **A3LSWDSC01C**

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

EUT Type:	850/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093; FCC/OET Bulletin 65 Supplement C [June 2001]
FCC Classification Applicable for SAR:	PCS Licensed Transmitter (PCB) / Digital Transmission System (DTS) Unlicensed Transmitter National Infrastructure (UNII)
Model(s):	SC-01C
Tx Frequency:	824.20 - 848.80 MHz (GSM 850) / 1850.20 - 1909.80 MHz (GSM 1900) 1852.4 - 1907.6 MHz (UMTS II) / 2412 - 2462 MHz (WLAN) 5180 – 5320 MHz (WLAN) / 5500-5805 MHz (WLAN)
Conducted Power:	32.68 dBm GSM 850 / 29.47 dBm GSM 1900 22.93 dBm UMTS II / 16.47 dBm 2.4 GHz WLAN 12.61 dBm 5 GHz WLAN
Max. SAR Measurement:	1.02 W/kg GSM 850 Body SAR 0.63 W/kg GSM 1900 Body SAR 1.29 W/kg UMTS II Body SAR 0.29 W/kg 2.4 GHz WLAN Body SAR / 0.79 W/kg 5 GHz WLAN Body SAR
Test Device Serial No.:	Pre-Production [S/N: 26, 27, R9YZ969580]

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: 0Y1009101521-R3.A3L) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard or destroy the previously issued test report 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 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.

1.1 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 1-1
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]

2 TEST SITE LOCATION

2.1 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.

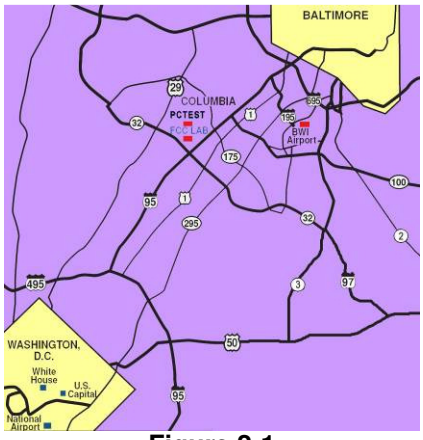

Figure 2-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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.

2.2 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), 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

3 SAR MEASUREMENT SETUP

3.1 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 3-1).

3.2 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.

3.3 System Electronics

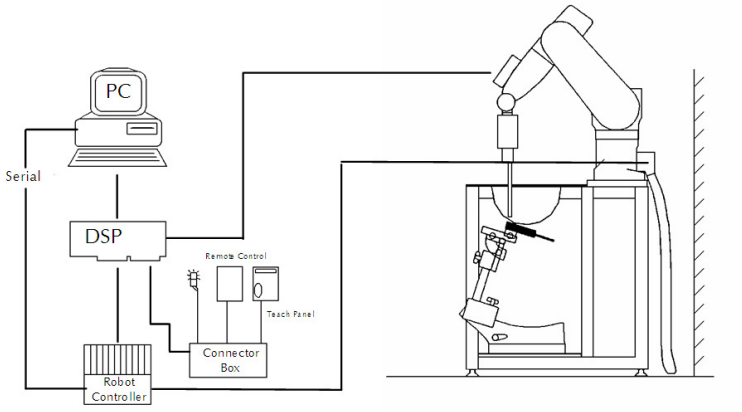

Figure 3-1
SAR Measurement System Setup

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.

3.4 Automated Test System Specifications

Test Software: SPEAG DASY4 version 4.7
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: DASY4, 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 3-2
DASY4 SAR Measurement System

4 DASY E-FIELD PROBE SYSTEM

4.1 Probe Measurement System

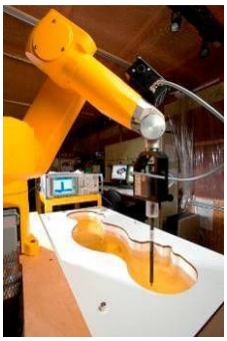

Figure 4-1
SAR System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration (see Figure 4-3) 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 5-1). The approach is stopped at reaching the maximum.

4.2 Probe Specifications

Model:	ES3DV3, EX3DV4
Frequency Range:	10 MHz – 6.0 GHz (EX3DV4) 10 MHz – 4 GHz (ES3DV3)
Calibration:	In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity:	± 0.2 dB (30 MHz to 6 GHz) for EX3DV4 ± 0.2 dB (30 MHz to 4 GHz) for 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 4-2
Near-Field Probe

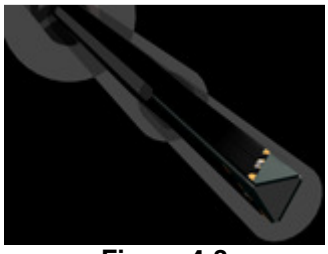

Figure 4-3
Triangular Probe
Configuration

5 PROBE CALIBRATION PROCESS

5.1 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.

5.2 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.

5.3 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.

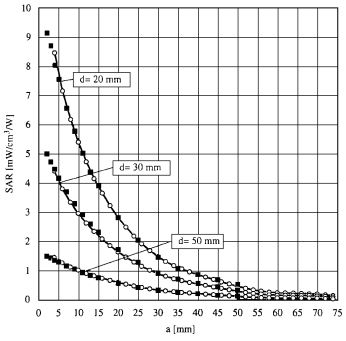

Figure 5-1 E-Field and Temperature measurements at 900MHz [9]

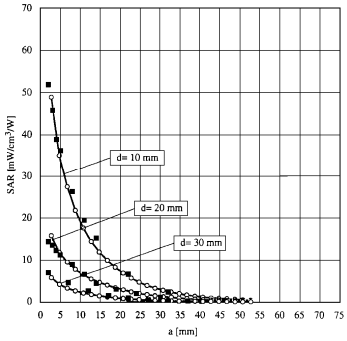

Figure 5-2 E-Field and temperature measurements at 1.9GHz [9]

6 PHANTOM AND EQUIVALENT TISSUES

6.1 SAM Phantoms

Figure 6-1
SAM Phantoms

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

6.2 Head & Body Simulating Mixture Characterization

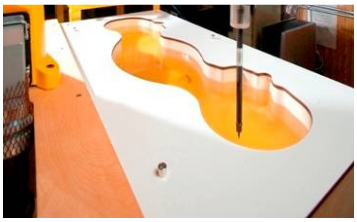

Figure 6-2
SAM Phantom with Simulating Tissue

The mixture is characterized to obtain proper dielectric constant (permittivity) and conductivity of the tissue of interest. The head 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 6-1
Composition of the Head & Body Tissue Equivalent Matter

Frequency (MHz)	835	1900	2450	5200-5800
Tissue	Body	Body	Body	Body
Ingredients (% by weight)				
Bactericide	0.1			
DGBE		29.44	26.7	
HEC	1			
NaCl	0.94	0.39	0.1	
Sucrose	44.9			
Triton X-100				10.67
Diethylenglycol monohexylether				10.67
Water	53.06	70.16	73.2	78.66

7 DOSIMETRIC ASSESSMENT & PHANTOM SPECS

7.1 Measurement Procedure

The evaluation was performed using the following procedure:

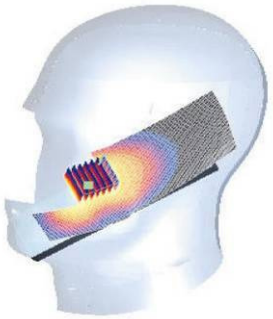

Figure 7-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head was measured at a distance of no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm x 15mm.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during testing the 1 gram cube. This fixed point was measured and used as a reference value.
3. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation. Around this point, a volume of 32mm x 32mm x 30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual for more details):
   a. The data was extrapolated to the surface of the outer-shell of the phantom. The combined distance extrapolated was the combined distance from the center of the dipoles 2.7mm away from the tip of the probe housing plus the 1.2 mm distance between the surface and the lowest measuring point. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete. If the value deviated by more than 5%, the evaluation was repeated.
5. For 5 GHz testing finer resolution zoom scans were preformed as specified by FCC SAR Measurement Requirements for 3 – 6 GHz, KDB pub 865664. The 5 GHz zoom scan requires a minimum volume of 24mm x 24mm x 20mm and 7 x 7 x 11 points.

7.2 Specific Anthropomorphic Mannequin (SAM) Specifications

The phantom for SAR assessment testing is a low-loss dielectric shell, with shape and dimensions derived from the anthropometric data of the 90th percentile adult male head dimensions as tabulated by the US Army. The SAM Twin Phantom shell is bisected along the mid-sagittal plane into right and left halves (see Figure 7-2). 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 7-2
SAM Twin Phantom Shell

8 RF EXPOSURE LIMITS

8.1 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.

8.2 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 8-1
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.

9 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	5.5	N	1	1.0	1.0	5.5	5.5	∞
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				11.8	11.5	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				23.7	23.0	

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

Applicable for 5200 – 5800 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	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)			RSS				12.4	12.0	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.7	24.0	

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

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
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
10/11/2010	835B	820	0.970	55.09	0.969	55.284	0.10%	-0.35%
		835	0.980	54.96	0.970	55.200	1.03%	-0.43%
		850	0.990	54.80	0.988	55.154	0.20%	-0.64%
10/18/2010	1900B	1850	1.490	52.96	1.520	53.300	-1.97%	-0.64%
		1880	1.520	52.82	1.520	53.300	0.00%	-0.90%
		1910	1.560	52.72	1.520	53.300	2.63%	-1.09%
09/14/2010	2450B	2401	1.907	52.03	1.903	52.765	0.21%	-1.39%
		2450	1.975	51.88	1.950	52.700	1.28%	-1.56%
		2499	2.051	51.69	2.019	52.638	1.58%	-1.80%
10/08/2010	2450B	2401	1.974	50.51	1.903	52.765	3.73%	-4.27%
		2450	1.990	50.20	1.950	52.700	2.05%	-4.74%
		2499	2.100	50.17	2.019	52.638	4.01%	-4.69%
09/16/2010	5200B-5800B	5170	5.210	47.17	5.264	49.055	-1.03%	-3.84%
		5210	5.268	47.10	5.311	49.001	-0.81%	-3.88%
		5250	5.326	47.00	5.358	48.946	-0.60%	-3.98%
		5270	5.346	46.95	5.381	48.919	-0.65%	-4.03%
		5310	5.401	46.89	5.428	48.865	-0.50%	-4.04%
		5350	5.457	46.80	5.470	48.811	-0.24%	-4.12%
		5470	5.616	46.56	5.615	48.648	0.02%	-4.29%
		5510	5.675	46.50	5.661	48.594	0.25%	-4.31%
		5550	5.738	46.42	5.708	48.539	0.53%	-4.37%
		5570	5.759	46.40	5.731	48.512	0.49%	-4.35%
		5610	5.813	46.28	5.778	48.458	0.61%	-4.49%
		5650	5.873	46.23	5.825	48.404	0.82%	-4.49%
		5670	5.897	46.19	5.848	48.376	0.84%	-4.52%
		5710	5.945	46.08	5.895	48.322	0.85%	-4.64%
		5750	6.015	46.00	5.942	48.268	1.23%	-4.70%
		5770	6.049	45.98	5.965	48.241	1.41%	-4.69%
		5810	6.075	45.90	6.012	48.186	1.05%	-4.74%
		5850	6.156	45.78	6.058	48.132	1.62%	-4.89%
10/06/2010 to 10/07/2010	5200B-5800B	5170	5.340	48.90	5.264	49.055	1.44%	-0.32%
		5210	5.370	48.84	5.311	49.001	1.11%	-0.33%
		5250	5.460	48.61	5.358	48.946	1.90%	-0.69%
		5270	5.460	48.76	5.381	48.919	1.47%	-0.33%
		5310	5.520	48.57	5.428	48.865	1.69%	-0.60%
		5350	5.610	48.57	5.470	48.811	2.56%	-0.49%
		5470	5.720	48.29	5.615	48.648	1.87%	-0.74%
		5510	5.850	48.19	5.661	48.594	3.34%	-0.83%
		5550	5.890	48.04	5.708	48.539	3.19%	-1.03%
		5570	5.930	47.84	5.731	48.512	3.47%	-1.39%
		5610	5.980	47.93	5.778	48.458	3.50%	-1.09%
		5650	6.020	47.65	5.825	48.404	3.35%	-1.56%
		5670	6.000	47.71	5.848	48.376	2.60%	-1.38%
		5710	6.110	47.63	5.895	48.322	3.65%	-1.43%
		5750	6.170	47.55	5.942	48.268	3.84%	-1.49%
		5770	6.180	47.39	5.965	48.241	3.60%	-1.76%
		5810	6.230	47.12	6.012	48.186	3.63%	-2.21%
		5850	6.280	47.26	6.058	48.132	3.66%	-1.81%

Note: KDB 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.

10.2 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 $j = \sqrt{-1}$.

10.3 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 450824:

Table 10-2
Extended Dipole Calibration Data

D835V2 SN: 4d047				
Date of Measurement	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**
1/19/2009	-28.4		50.9	
8/19/2010	-25.6	-10%	48.9	-2

D1900V2 SN:5d080				
Date of Measurement	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**
8/18/2009	-24.3		50	
8/19/2010	-22.4	**-7.8%**	51	**1.0**

D2450V2 SN: 797				
Date of Measurement	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**
1/8/2009	-25	**3.3%**	55.1	**1.8**
8/19/2010	-22.4	**-10.4%**	52.3	**-2.8**

D5GHzV2 SN: 1057 5500MHz				
Date of Measurement	Return Loss (dB)	**Δ %**	Impedance (Ω)	**ΔΩ**
1/15/2009	-30.2		51.5	
8/19/2010	-29.4	**-2.6%**	48.9	-2.6

10.4 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 10-3
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 (%)**
10/11/2010	23.4	21.7	0.063	835	4d047	Body	0.635	9.820	10.079	2.64%
10/11/2010	23.9	22.4	0.100	1900	5d080	Body	4.070	40.500	40.700	0.49%
09/14/2010	23.9	22.2	0.013	2450	797	Body	0.628	53.000	49.841	-5.96%
10/08/2010	24.0	22.1	0.025	2450	797	Body	1.350	53.000	54.000	1.89%
09/16/2010	23.7	22.5	0.025	5200	1057	Body	1.850	79.100	74.000	-6.45%
09/16/2010	23.5	22.3	0.025	5500	1057	Body	2.030	81.600	81.200	-0.49%
09/16/2010	23.9	22.8	0.025	5800	1057	Body	1.890	71.600	75.600	5.59%
10/06/2010	21.7	20.6	0.100	5200	1057	Body	8.000	79.100	80.000	1.14%
10/07/2010	22.1	20.9	0.100	5500	1057	Body	7.920	81.600	79.200	-2.94%
10/07/2010	21.4	20.8	0.100	5800	1057	Body	7.870	71.600	78.700	9.92%

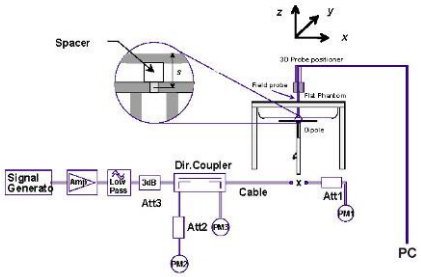

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

Note: Measured SAR was confirmed to be within IEEE 1528 Section 8.3.6 ranges for System Check.

11 ANTENNA LOCATIONS AND KEY FEATURES

11.1 Antenna & Key Feature Information for SC-01C

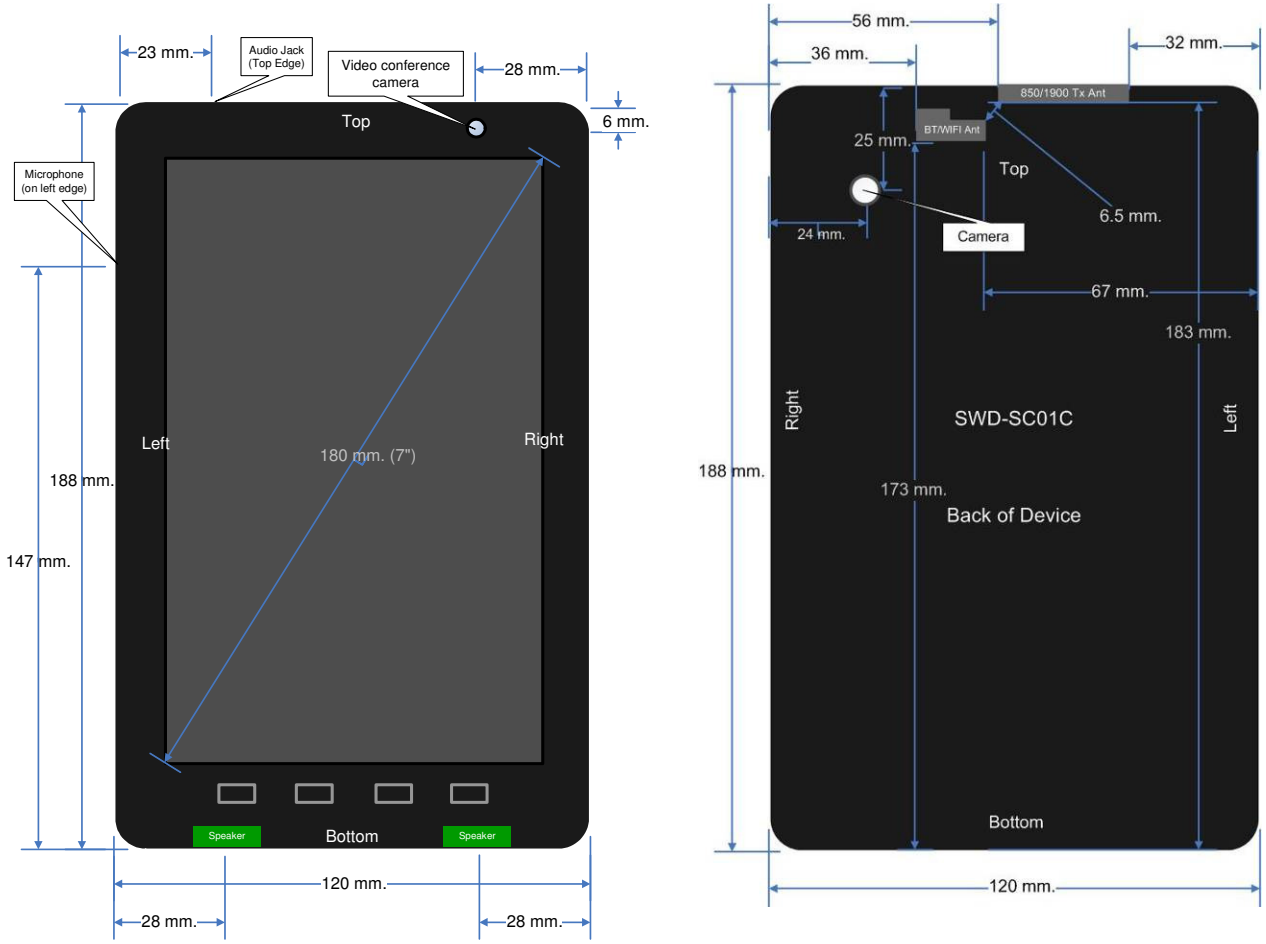

Figure 11-1
Antenna & Key Feature Diagram

Note: The sensor pad is located near the upper half of the device (below both antennas) at the back, with sufficient size to cover exposure conditions to the main antenna. See technical description for sensor size and location.

11.2 Display Orientations Capabilities

Table 11-1 Display Orientation Capabilities

Transmission Modes	Right Side Up Portrait	Up-Side Down Portrait	Left Side down Landscape	Right Side Down Landscape	Back Flat
	Bottom	Top	Left	Right	Back
Voice	Yes	Yes	Yes	Yes	Yes
Video-Call	Yes	N/A	Yes	Yes	Yes
Data Transmit Modes	Yes	Yes	Yes	Yes	Yes

12 SIMULTANEOUS TRANSMISSION ANALYSIS

12.1 Simultaneous Transmission Information

This device contains multiple transmitters that may operate simultaneously and therefore, require a simultaneous transmission analysis (See Section 12.2).

Bluetooth and WIFI cannot transmit simultaneously since they share the same circuit path and are switched by the radio.

The 5GHz WIFI cannot transmit simultaneously with the 2G/3G antenna.

12.2 Simultaneous Transmission Analysis

Table 12-1 SAR Sum Summary

Simult Tx	Configuration	2G/3G SAR (W/kg)	WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.290	0.292	**1.582**
	Top	0.953	0.089	**1.042**
	Left	0.301	0.000	**0.301**
	Right	0.127	0.016	**0.143**
	Bottom	0.022	0.000	**0.022**

Note: "-" SAR results shown in the table are zero for summation purposes. SAR was not required to be measured due to exclusions mentioned in Section 15.3.

12.3 Simultaneous Transmission Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit.

Therefore, no volumetric SAR summation is required since the numerical sums are below the limit.

13 RF CONDUCTED POWERS

13.1 Power Reduction Design Specification

Mode	Power Reduction
850 GSM	3 dB
1900 GSM	4 dB
1900 UMTS	4 dB
WIFI	0 dB

13.2 GSM Conducted Powers

		RF Conducted Power Table - Without Power Back Off								
		Voice	*GPRS Data*				*EDGE Data*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
Cellular	128	32.58	32.62	29.68	28.07	26.79	27.24	23.94	22.07	20.94
	190	32.66	32.68	29.70	28.13	26.73	27.22	23.93	22.06	20.89
	251	32.60	32.61	29.64	28.08	26.70	27.19	23.91	22.08	20.85
PCS	512	29.08	29.11	26.62	25.00	23.65	25.93	22.94	21.51	20.72
	661	29.25	29.27	26.82	25.11	23.98	26.18	23.13	21.58	20.74
	810	29.47	29.45	26.90	25.39	24.07	26.45	23.18	21.88	20.82

		RF Conducted Power Table - With Power Back Off								
		Voice	*GPRS Data*				*EDGE Data*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
Cellular	128	29.50	29.50	26.61	25.01	23.67	24.27	20.91	18.94	17.75
	190	29.51	29.52	26.57	25.00	23.63	24.24	21.03	19.14	17.73
	251	29.50	29.48	26.54	24.98	23.60	24.22	21.00	19.12	17.71
PCS	512	24.93	24.97	22.43	20.94	19.70	21.77	18.75	17.32	16.68
	661	25.11	25.08	22.78	21.20	19.88	22.10	19.06	17.53	16.77
	810	25.42	25.40	22.92	21.26	20.19	22.28	19.17	17.83	16.93

GSM Device Class: C (only voice or only data connection possible)
GPRS Multislot Class: 12 (4 Tx max slots uplink)
EDGE Multislot Class: 12 (4 Tx max slots uplink)
DTM Multislot Class: N/A

13.3 WCDMA 1900 Conducted Powers (no back-off)

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]		
			9262	9400	9538
99	WCDMA	12.2 kbps RMC	**22.93**	22.83	22.85
99		12.2 kbps AMR	22.84	22.71	22.68

13.4 WCDMA 1900 Conducted Powers (with Back-off)

3GPP Release	Mode	3GPP 34.121 Subtest	PCS Band [dBm]		
			9262	9400	9538
99	WCDMA	12.2 kbps RMC	19.03	18.81	18.83
99		12.2 kbps AMR	18.87	18.82	18.80

Note: This device does not support HSDPA Release 5 or HSUPA Release 6 operations for WCDMA 1900 MHz Band.

Figure 13-1
Power Measurement Setup

14 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.

14.1.1 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.

14.1.2 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. 802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; channels 104, 116, 124 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz §15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. 4.9 GHz is tested on channels 1, 10 and 5 or 6, whichever has the higher output power, for 5 MHz channels; channels 11, 15 and 19 for 10 MHz channels; and channels 21 and 25 for 20 MHz channels. 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 14-1
802.11 Test Channels per FCC Requirements

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

14.2 Procedures Used to Establish RF Signal for SAR

The device was placed into a simulated connection using the manufacturer provided test software. SAR measurements were taken with a fully charged battery. Power was manually set. WIFI has no power back-off features.

Table 14-2
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	16.47	16.32	16.62	16.25
802.11b	2437	6	16.17	16.04	16.01	15.68
802.11b	2462	11	16.18	15.77	15.71	15.39

Table 14-3
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	13.41	12.85	12.55	12.48	12.09	11.62	11.40	11.07
802.11g	2437	6	12.81	12.61	12.67	11.98	12.11	11.53	11.22	11.39
802.11g	2462	11	12.87	12.22	12.16	11.98	12.10	11.60	11.18	10.91

Table 14-4
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	2412	1	13.89	13.73	13.36	13.09	12.76	12.51	12.19	12.11
802.11n	2437	6	13.52	13.23	13.07	12.80	12.35	12.06	12.07	12.01
802.11n	2462	11	13.53	13.34	12.91	12.80	12.28	12.11	11.80	11.64

Table 14-5
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36	9.75	9.67	9.54	9.28	9.25	8.57	8.24	8.30
802.11a	5200	40	9.34	9.19	8.94	8.72	8.64	8.28	7.72	7.58
802.11a	5220	44	8.93	8.61	8.68	8.47	8.31	8.05	7.34	7.31
802.11a	5240	48	8.71	8.53	8.39	8.08	7.88	7.61	7.26	7.13
802.11a	5260	52	8.24	8.23	8.12	7.88	7.74	7.44	7.07	6.93
802.11a	5280	56	8.16	8.12	7.84	7.67	7.31	6.73	6.52	6.45
802.11a	5300	60	8.13	7.71	7.52	7.44	7.23	6.98	6.61	6.58
802.11a	5320	64	7.82	7.56	7.41	7.33	6.99	6.53	6.23	6.21
802.11a	5500	100	8.91	8.85	8.77	8.36	7.80	7.61	7.42	7.31
802.11a	5520	104	8.79	8.72	8.71	8.45	8.16	7.98	7.43	7.32
802.11a	5540	108	9.12	8.82	8.63	8.61	8.34	8.10	7.77	7.78
802.11a	5560	112	9.58	9.28	9.08	8.74	8.58	8.08	7.84	7.59
802.11a	5580	116	9.53	9.27	9.15	8.96	8.81	8.41	7.96	7.81
802.11a	5600	120	9.68	9.58	9.60	9.16	8.99	8.59	8.37	8.24
802.11a	5620	124	10.09	9.93	9.75	9.55	9.37	9.08	8.48	8.66
802.11a	5640	128	10.35	10.32	10.06	9.77	9.57	9.20	8.97	8.92
802.11a	5660	132	10.86	10.68	10.68	10.46	10.00	9.53	9.54	9.15
802.11a	5680	136	11.17	11.00	10.85	10.66	10.46	10.06	9.80	9.74
802.11a	5700	140	11.62	11.25	11.23	11.03	10.81	10.46	10.21	10.06
802.11a	5745	149	11.63	11.47	11.28	10.94	10.62	10.26	9.87	9.86
802.11a	5765	153	11.76	11.87	11.48	11.27	11.03	10.69	10.45	10.28
802.11a	5785	157	12.41	12.19	12.05	11.70	11.55	10.96	10.68	10.55
802.11a	5805	161	12.61	12.38	12.28	11.85	11.68	11.48	11.10	11.02
802.11a	5825	165	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 14-6
IEEE 802.11n Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		13.5	27	40	54	81	108	122	135
802.11n	**5180**	**36**	9.84	9.53	9.26	9.13	8.80	8.20	8.20	8.08
802.11n	5200	40	9.18	8.79	8.63	8.55	8.30	7.96	7.88	7.76
802.11n	5220	44	8.87	8.69	8.39	8.20	7.91	7.25	7.19	7.07
802.11n	**5240**	**48**	8.49	8.36	7.92	7.64	7.43	7.16	7.17	6.93
802.11n	**5260**	**52**	8.22	7.77	7.58	7.35	7.28	6.88	6.88	6.73
802.11n	5280	56	7.90	7.76	7.32	7.30	7.02	6.69	6.61	6.54
802.11n	5300	60	8.11	7.78	7.51	7.30	6.58	6.36	6.27	6.11
802.11n	**5320**	**64**	7.48	7.28	7.02	6.94	6.45	6.02	5.97	5.90
802.11n	5500	100	8.69	8.43	8.10	7.94	7.74	7.53	7.35	7.29
802.11n	**5520**	**104**	8.74	8.48	8.35	8.00	7.68	7.44	7.31	7.24
802.11n	5540	108	9.20	8.94	8.69	8.50	7.83	7.57	7.50	7.32
802.11n	5560	112	9.18	8.84	8.57	8.35	8.11	7.75	7.70	7.57
802.11n	**5580**	**116**	9.35	9.17	8.91	8.54	8.26	8.00	7.90	7.70
802.11n	5600	120	9.70	9.45	9.20	9.00	8.61	8.18	8.15	8.00
802.11n	**5620**	**124**	10.03	9.73	9.56	9.36	8.83	8.59	8.39	8.28
802.11n	5640	128	10.37	9.94	9.77	9.63	9.30	9.04	9.00	8.82
802.11n	5660	132	10.57	10.24	10.01	9.89	9.60	9.35	9.24	9.10
802.11n	**5680**	**136**	11.10	10.86	10.62	10.43	10.15	9.84	9.40	9.30
802.11n	5700	140	11.52	11.05	10.88	10.72	10.40	10.10	10.01	9.99
802.11n	**5745**	**149**	11.20	10.95	10.72	10.60	10.32	10.01	9.90	9.81
802.11n	5765	153	11.81	11.50	11.26	11.08	10.71	10.16	10.09	9.84
802.11n	5785	157	12.15	11.90	11.69	11.39	10.92	10.64	10.54	10.47
802.11n	**5805**	**161**	12.28	12.03	11.87	11.70	11.35	10.81	10.71	10.69
802.11n	5825	165	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Figure 14-1
Power Measurement Setup

Notes:

1. The maximum RF output powers for all channels across all data rates were measured.
2. Per KDB 248227 Publication, since the SAR < 0.8 W/kg, the highest default channel per 5 GHz band across the lowest data rates were evaluated for SAR.
3. WIFI has no power back-off capability in this device.

15 SAR TESTING CONSIDERATIONS & FCC KDB INQUIRIES

15.1 "UMPC Mini-Tablet" testing for SAR

A general composite test separation distance of 5 mm was considered for the transmitting modes of the device according to Lab KDB Inquiry 502978.

15.2 Edge SAR Testing Distance

A test separation distance of 5 mm was applied for all transmission modes for the top, left, right, bottom and back of the device. The back of the device has a camera that is not used for video conference calls. The test considerations were based on the form factor, size, operational configurations, exposure conditions, video conference camera location, and display orientations pertinent for the device per KDB Inquiry 502978.

15.3 WIFI Exclusion for SAR Testing

From the discussions with FCC lab pertinent to KDB Inquiry 502978, SAR was evaluated at 5 mm from the back, right and top edges. Since the antenna is closest to the back, right and top edges of the device, these edges were tested for SAR. Left and bottom edges were excluded from additional SAR testing.

15.4 Additional SAR Testing for the Back of the Device

Based on the discussions with applicant and FCC lab on 8/19/2010 for lab KDB Inquiry 607156, it was determined that the sensor type and implementation required (1) secondary SAR evaluation at a conservative distance from the device where power back-off de-activated and (2) reliability sensor activation data is provided (See Table 15-1). Details about sensing mechanism and sensor pad locations are included in the technical description.

There is only one sensor on the back of the device (no sensors for the edges). Please see below for sensor activation/de-activation information:

Table 15-1
Body Sensor Distance from Back of Mini-Tablet

distance in mm	9	10	11	12	13	14
Condition of Sensor in the back of the device	on	on	on	off	off	off

Please see Figure 15-1 for RF power vs. back-off distance when back off is activated.

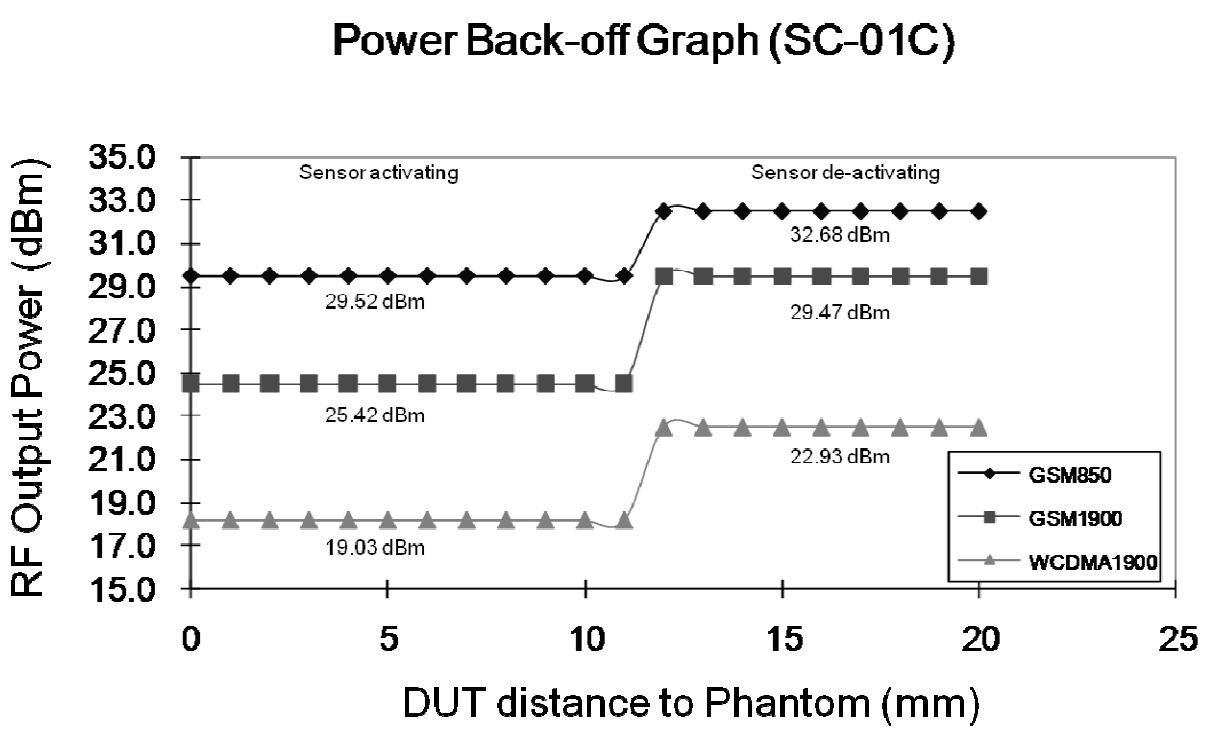

Figure 15-1
Back Off Sensor Power Reduction Graph

The RF output power was measured at the RF conducted port.

15.5 Method of SAR Measurement with Power Reduction

Based on the power-reduction activation vs. distance results and discussions with the applicant and FCC pertaining to KDB Inquiry 607156, the device was tested at 5 mm with the sensor activated and additionally at a conservative 10 mm distance with the sensor de-activated (max power, no back-off).

To test SAR with power back-off ON at 5 mm, the device was placed in maximum power transmit mode with a base station simulator. The device was then positioned under the tissue equivalent liquid-filled flat phantom at a distance of 5 mm.

To test SAR with power back-off OFF at 10 mm, the device sensor detection mechanism would normally be active and therefore had to be disabled via manufacturer test software. The device was placed in maximum power transmit mode with a base station simulator. The device was then positioned under the tissue equivalent liquid-filled flat phantom at a distance of 10 mm with the sensor deactivated (via manufacturer test software) and tested at maximum power.

16 SAR DATA SUMMARY

Table 16-1
GSM 850 Body SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode/Band	Service	C_Power[dBm]		Spacing	Slots	Side	SAR (1g)
MHz	Ch.			Start	End				(W/kg)
836.60	190	GSM 850	GSM	29.51	29.50	0.5 cm	1	*Back	0.599
836.60	190	GSM 850	GPRS	29.52	29.48	0.5 cm	1	*Back	0.522
836.60	190	GSM 850	GPRS	26.57	26.59	0.5 cm	2	*Back	0.590
836.60	190	GSM 850	GPRS	25.00	25.01	0.5 cm	3	*Back	0.729
824.20	128	GSM 850	GPRS	23.67	23.63	0.5 cm	4	*Back	0.790
836.60	190	GSM 850	GPRS	23.63	23.62	0.5 cm	4	*Back	0.881
848.80	251	GSM 850	GPRS	23.60	23.61	0.5 cm	4	*Back	**1.020**
836.60	190	GSM 850	GSM	32.66	32.67	1.0 cm	1	Back	0.561
836.60	190	GSM 850	GPRS	32.68	32.65	1.0 cm	1	Back	0.436
836.60	190	GSM 850	GPRS	29.70	29.71	1.0 cm	2	Back	0.543
836.60	190	GSM 850	GPRS	28.13	28.13	1.0 cm	3	Back	0.576
836.60	190	GSM 850	GPRS	26.73	26.69	1.0 cm	4	Back	0.578
836.60	190	GSM 850	GPRS	26.73	26.73	0.5 cm	4	Top	**0.774**
836.60	190	GSM 850	GPRS	26.73	26.67	0.5 cm	4	Bottom	**0.054**
836.60	190	GSM 850	GPRS	26.73	26.69	0.5 cm	4	Left	**0.049**
836.60	190	GSM 850	GPRS	26.73	26.71	0.5 cm	4	Right	**0.127**
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.
2. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings.
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 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. Justification for reduced test configurations per KDB 941225: The source-based time-averaged output power was evaluated for all multi-slot operations. In addition to the worst-case reported, all source-based time-averaged powers within 10% of the worst-case were additionally included in the evaluation.
8. Asterisk (*) denotes power back off activated.
9. Justification for 5 mm edge test configurations based on discussions with FCC lab pertinent to KDB Inquiry 502978. See Section 15.2 for more details.
   Per discussions with applicant and FCC lab on 8/19/2010 based on KDB Inquiry 607156, a conservative secondary test distance of 10 mm from the back was chosen to test SAR at maximum power, with the sensor de-activated. See Section 15.5 for more details.

Table 16-2
GSM 1900 Body SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode/Band	Service	C_Power[dBm]		Spacing	Slots	Side	SAR (1g)
MHz	Ch.			Start	End				(W/kg)
1880.00	661	GSM 1900	GSM	25.11	25.07	0.5 cm	1	*Back	0.509
1880.00	661	GSM 1900	GPRS	22.78	22.78	0.5 cm	2	*Back	0.546
1880.00	661	GSM 1900	GPRS	21.20	21.16	0.5 cm	3	*Back	0.431
1880.00	661	GSM 1900	GPRS	19.88	19.83	0.5 cm	4	*Back	0.598
1880.00	661	GSM 1900	GSM	29.25	29.24	1.0 cm	1	Back	**0.630**
1880.00	661	GSM 1900	GPRS	26.82	26.84	1.0 cm	2	Back	0.536
1880.00	661	GSM 1900	GPRS	25.11	25.12	1.0 cm	3	Back	0.576
1880.00	661	GSM 1900	GPRS	23.98	24.01	1.0 cm	4	Back	0.577
1880.00	661	GSM 1900	GSM	29.25	29.25	0.5 cm	1	Top	0.489
1880.00	661	GSM 1900	GSM	29.25	29.44	0.5 cm	1	Bottom	0.022
1880.00	661	GSM 1900	GSM	29.25	29.16	0.5 cm	1	Left	0.172
1880.00	661	GSM 1900	GSM	29.25	29.15	0.5 cm	1	Right	0.027
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.
2. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings.
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 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. Justification for reduced test configurations per KDB 941225: The source-based time-averaged output power was evaluated for all multi-slot operations. In addition to the worst-case reported, all source-based time-averaged powers within 10% of the worst-case were additionally included in the evaluation.
8. Asterisk (*) denotes power back off activated.
9. Justification for 5 mm edge test configurations based on discussions with FCC lab pertinent to KDB Inquiry 502978. See Section 15.2 for more details.
10. Per discussions with applicant and FCC lab on 8/19/2010 based on KDB Inquiry 607156, a conservative test distance of 10 mm from the back was chosen to test SAR at maximum power, with the sensor de-activated. See Section 15.4 for more details.

Table 16-3
UMTS II Body SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Service	C_Power[dBm]		Spacing	Side	SAR (1g)
MHz	Ch.			Start	End			(W/kg)
1880.00	9400	UMTS II	RMC	18.81	18.79	0.5 cm	*Back	0.726
1852.40	9262	UMTS II	RMC	22.93	23.01	1.0 cm	Back	1.000
1880.00	9400	UMTS II	RMC	22.83	22.84	1.0 cm	Back	**1.290**
1907.60	9538	UMTS II	RMC	22.85	22.89	1.0 cm	Back	**1.050**
1852.40	9262	UMTS II	RMC	22.93	22.95	0.5 cm	Top	0.839
1880.00	9400	UMTS II	RMC	22.83	22.82	0.5 cm	Top	0.953
1907.60	9538	UMTS II	RMC	22.85	22.86	0.5 cm	Top	0.846
1880.00	9400	UMTS II	RMC	22.83	22.98	0.5 cm	Bottom	0.013
1880.00	9400	UMTS II	RMC	22.83	22.86	0.5 cm	Left	0.301
1880.00	9400	UMTS II	RMC	22.83	23.02	0.5 cm	Right	0.038
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.
2. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings.
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 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. WCDMA mode was tested under RMC 12.2 kbps.
8. Asterisk (*) denotes power back off activated.
9. Justification for 5 mm edge test configurations based on discussions with FCC lab pertinent to KDB Inquiry 502978. See Section 15.2 for more details.
10. Per discussions with applicant and FCC lab on 8/19/2010 based on KDB Inquiry 607156, a conservative test distance of 10 mm from the back was chosen to test SAR at maximum power, with the sensor de-activated. See Section 15.4 for more details.

Table 16-4
2.4 GHz Body SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode	C_Power[dBm]		Service	Spacing	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.		Start	End					(W/kg)
2412	1	IEEE 802.11b	16.62	16.60	DSSS	0.5 cm	1	Back	**0.292**
2412	1	IEEE 802.11b	16.62	16.57	DSSS	0.5 cm	1	Top	0.089
2412	1	IEEE 802.11b	16.62	16.83	DSSS	0.5 cm	1	Right	0.016
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
2. All modes of operation were investigated, and worst-case results are reported.
3. Batteries are fully charged for all readings.
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 248227 pub and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate was 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 highest output power channel in the lowest data rate IEEE 802.11b mode per channel.
7. WLAN transmission was verified using a spectrum analyzer.
8. There is no power back-off for WIFI.

Table 16-5
5 GHz WLAN Body SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode	C_Power[dBm]		Side	Spacing	Data Rate (Mbps)	SAR (1g)
MHz	Ch.		Start	End				(W/kg)
5180	36	5.2 GHz WLAN	9.75	9.78	Back	0.5 cm	6	0.224
5260	52	5.3 GHz WLAN	8.24	8.29	Back	0.5 cm	6	**0.203**
5700	100	5.5 - 5.7 GHz WLAN	8.91	8.90	Back	0.5 cm	6	**0.785**
5805	161	5.8 GHz WLAN	12.61	12.53	Back	0.5 cm	6	0.506
5180	36	5.2 GHz WLAN	9.75	9.58	Top	0.5 cm	6	0.148
5260	52	5.3 GHz WLAN	8.24	8.25	Top	0.5 cm	6	0.079
5700	100	5.5 - 5.7 GHz WLAN	8.91	9.06	Top	0.5 cm	6	0.167
5805	161	5.8 GHz WLAN	12.61	12.60	Top	0.5 cm	6	0.202
5180	36	5.2 GHz WLAN	9.75	9.62	Right	0.5 cm	6	0.028
5260	52	5.3 GHz WLAN	8.24	8.36	Right	0.5 cm	6	0.020
5700	100	5.5 - 5.7 GHz WLAN	8.91	8.74	Right	0.5 cm	6	0.024
5805	161	5.8 GHz WLAN	12.61	12.71	Right	0.5 cm	6	0.010
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.
2. All modes of operation were investigated, and worst-case results are reported.
3. Batteries were fully charged for all readings.
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 248227 publication and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation. Other IEEE 802.11n modes were not investigated since the average output powers were not greater than 0.25 dB than the corresponding channel in IEEE 802.11a mode
7. Per KDB 248227 pub, the highest channel power across all “default” channels at the lowest data rate was tested, since SAR was less than 0.8 W/kg.
8. WLAN transmission was verified with a spectrum analyzer.
9. There is no power back-off for WiFi.

17 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	9/19/2009	Biennial	9/19/2011	3613A00315
Agilent	8753E	(30kHz-6GHz) Network Analyzer	3/31/2010	Annual	3/31/2011	JP38020182
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/30/2010	Annual	3/30/2011	MY45470194
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
Rohde & Schwarz	CMU200	Base Station Simulator	11/11/2009	Annual	11/11/2010	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/21/2010	Annual	6/21/2011	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	11/4/2009	Annual	11/4/2010	109892
Rohde & Schwarz	NRV-Z32	Peak Power Sensor (100uW-2W)	12/5/2008	Biennial	12/5/2010	100155
Rohde & Schwarz	NRV-Z33	Peak Power Sensor (1mW-20W)	12/5/2008	Biennial	12/5/2010	100004
SPEAG	D1450V2	1450 MHz SAR Dipole	5/20/2009	Biennial	5/20/2011	1025
SPEAG	D1765V2	1765 MHz SAR Dipole	5/19/2009	Biennial	5/19/2011	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	1/20/2009	Biennial	1/20/2011	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	1/8/2009	Biennial	1/8/2011	797
SPEAG	D2600V2	2600 MHz SAR Dipole	8/12/2009	Biennial	8/12/2011	1004
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/19/2009	Biennial	8/19/2011	1007
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/15/2009	Biennial	1/15/2011	1057
SPEAG	D835V2	835 MHz SAR Dipole	1/19/2009	Biennial	1/19/2011	4d047
SPEAG	D835V2	835 MHz SAR Dipole	8/24/2009	Biennial	8/24/2011	4d026
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/22/2010	Annual	3/22/2011	704
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/21/2010	Annual	4/21/2011	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2010	Annual	1/22/2011	649
SPEAG	EX3DV4	SAR Probe	1/26/2010	Annual	1/26/2011	3550
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/8/2010	Annual	7/8/2011	859
SPEAG	D750V3	750 MHz Dipole	8/19/2010	Biennial	8/19/2012	1003
SPEAG	ES3DV3	SAR Probe	3/16/2010	Annual	3/16/2011	3213
SPEAG	ES3DV3	SAR Probe	4/20/2010	Annual	4/20/2011	3209
Rohde & Schwarz	SMIQ03B	Signal Generator	4/1/2010	Annual	4/1/2011	DE27259
SPEAG	D1640V2	1640 MHz Dipole	8/17/2010	Biennial	8/17/2012	321
Rohde & Schwarz	CMW500	LTE Base Station Simulator	8/30/2010	Annual	8/30/2011	100976
Anritsu	MA2481A	Power Sensor	12/2/2009	Annual	12/2/2010	5318
Anritsu	MA2481A	Power Sensor	12/3/2009	Annual	12/3/2010	5442
Anritsu	ML2438A	Power Meter	12/3/2009	Annual	12/3/2010	1190013
Anritsu	ML2438A	Power Meter	12/3/2009	Annual	12/3/2010	98150041
Agilent	8648D	Signal Generator	4/1/2010	Annual	4/1/2011	3629U00687
Anritsu	ML2438A	Power Meter	12/3/2009	Annual	12/3/2010	1070030
Anritsu	MA2481A	Power Sensor	12/2/2009	Annual	12/2/2010	5821
Anritsu	MA2481A	Power Sensor	12/3/2009	Annual	12/3/2010	8013
Anritsu	MA2481A	Power Sensor	12/3/2009	Annual	12/3/2010	2400
Aprel	ALS-PR-DIEL	Dielectric Probe Kit	N/A		N/A	260-00959
Agilent	E5515C	Wireless Communications Tester	4/14/2010	Annual	4/14/2011	US41140256
SPEAG	ES3DV3	SAR Probe	2/10/2010	Annual	2/10/2011	3173

Justification for 2-year calibration cycle for SAR dipoles is found in Section 10.3.

18 CONCLUSION

18.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

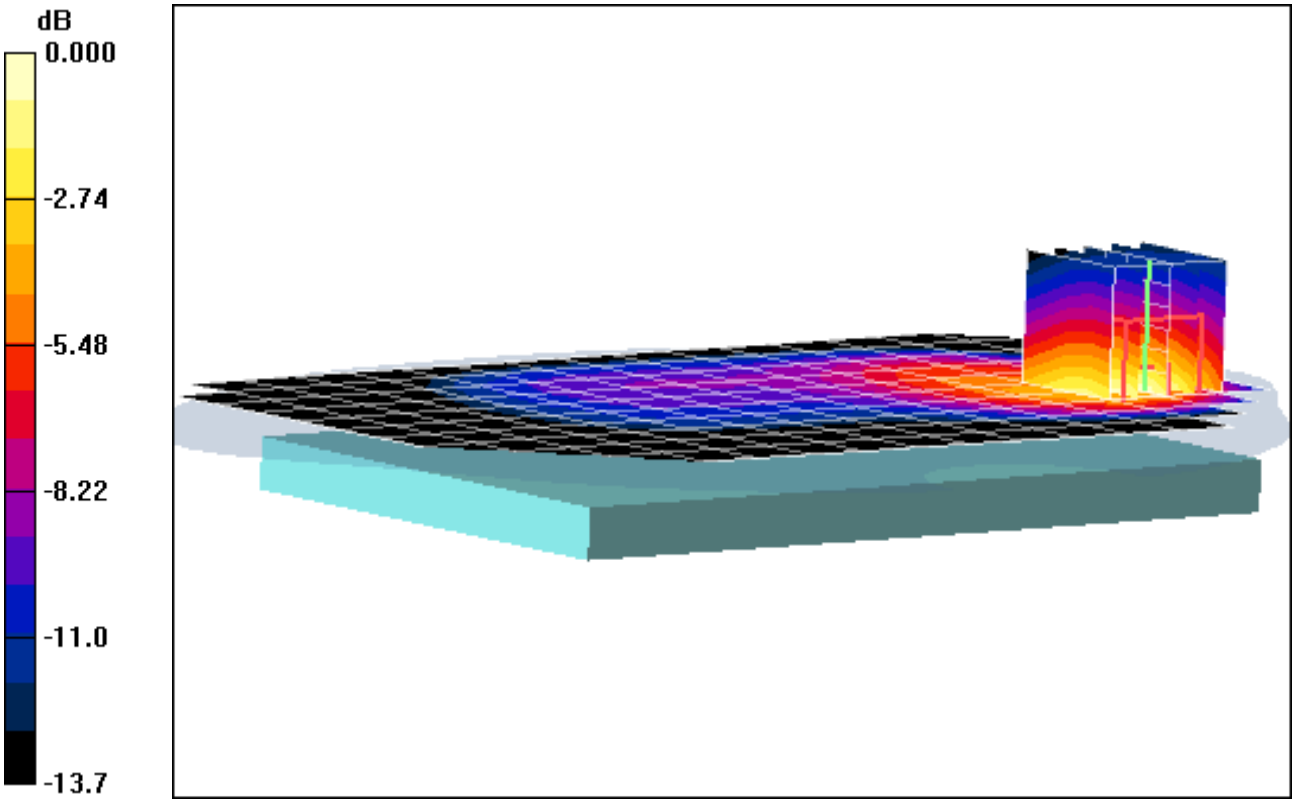
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 848.8 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
f = 848.8 MHz; σ = 0.989 mho/m; ε_r = 54.81; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Back side, High.ch, 4 Tx Slots

Area Scan (11x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.7 V/m
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.597 mW/g



0 dB = 1.11mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

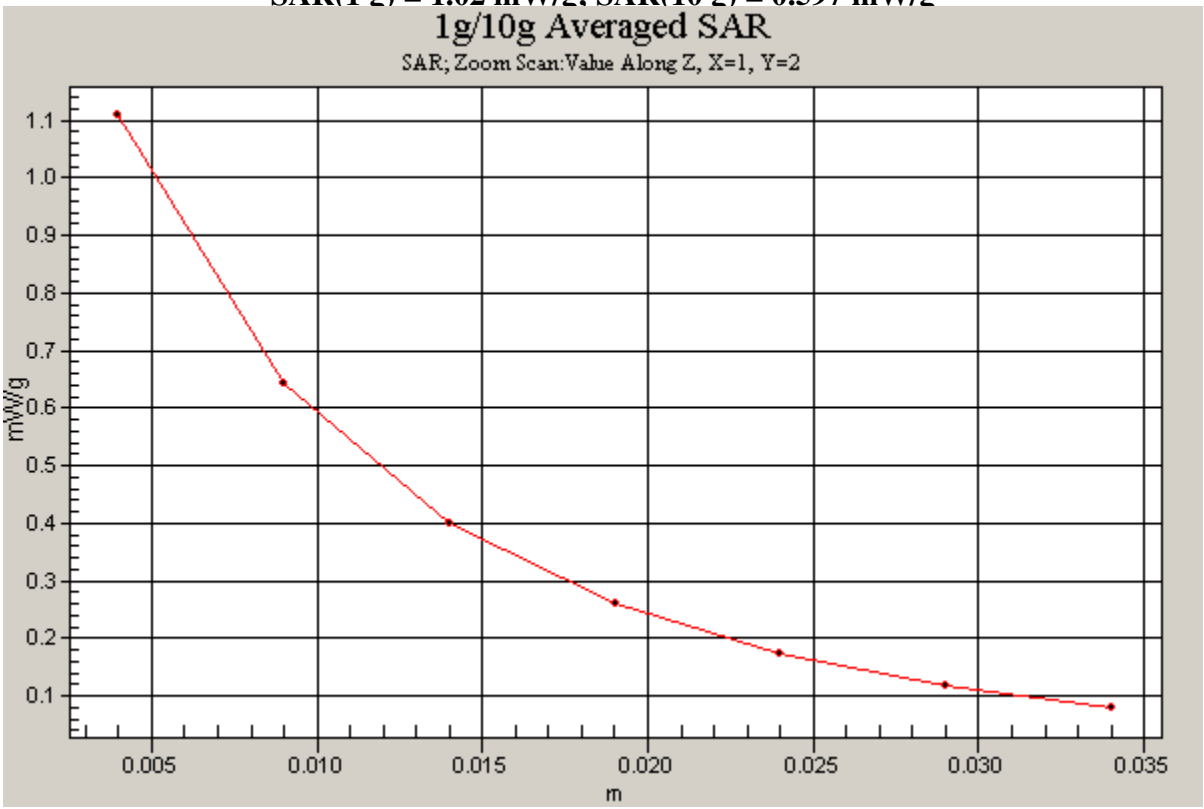
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 848.8 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
$f = 848.8$ MHz; $\sigma = 0.989$ mho/m; $\varepsilon_r = 54.81$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Back side, High.ch, 4 Tx Slots

Area Scan (11x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.7 V/m
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.597 mW/g



DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

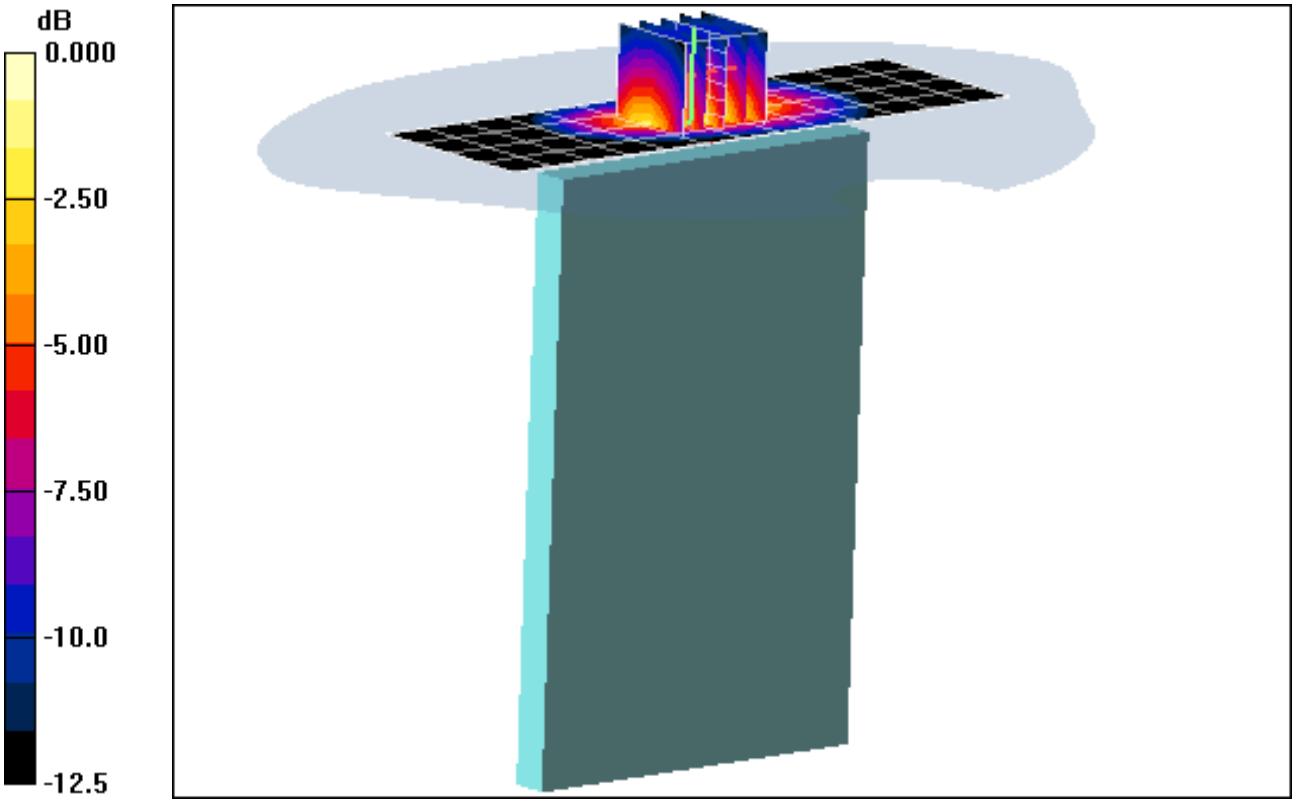
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.981 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Top, Mid.ch, 4 Tx Slots

Area Scan (5x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.8 V/m
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.774 mW/g; SAR(10 g) = 0.453 mW/g



0 dB = 0.955mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

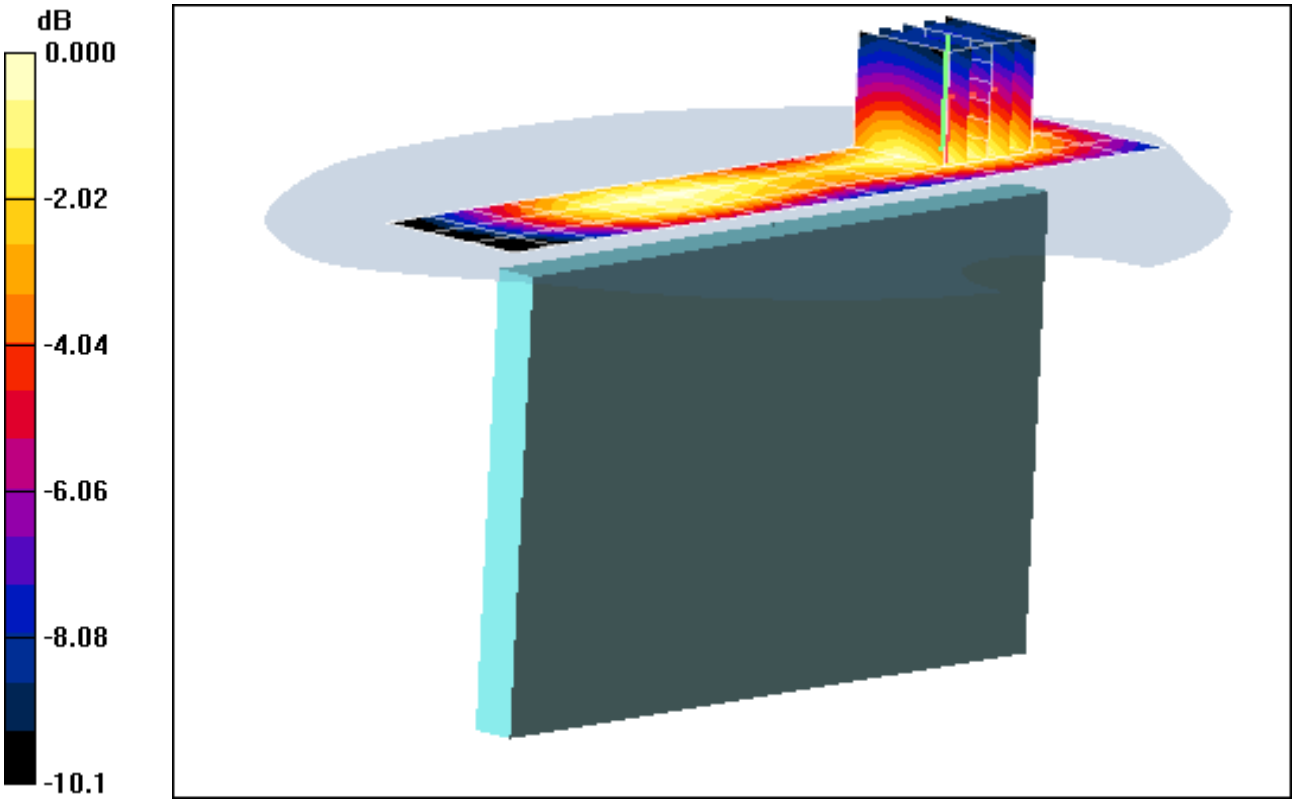
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.981 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4° C; Tissue Temp: 21.7° C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Left side, Mid.ch, 4 Tx Slots

Area Scan (4x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.49 V/m
Peak SAR (extrapolated) = 0.070 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.033 mW/g



0 dB = 0.049mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

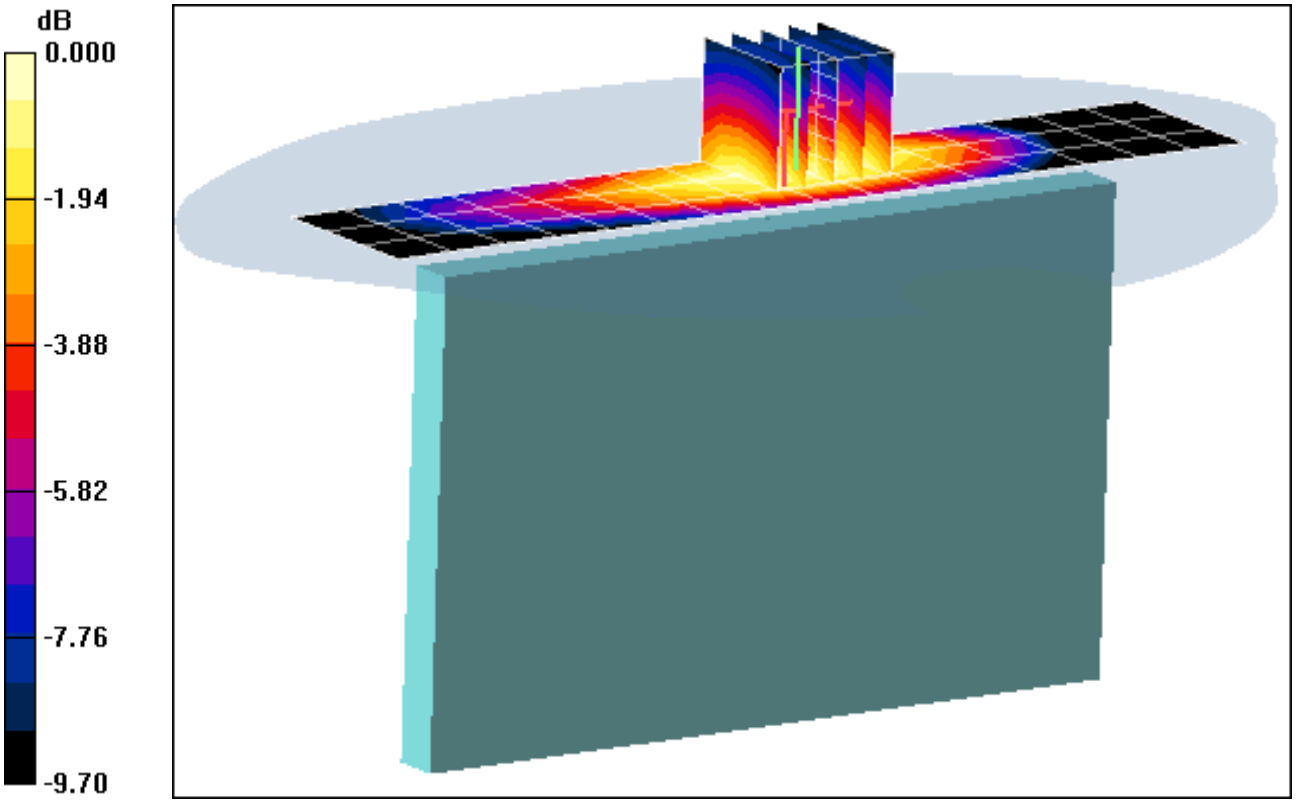
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.981 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Right side, Mid.ch, 4 Tx Slots

Area Scan (4x17x1): 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) = 0.182 W/kg
SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.086 mW/g



0 dB = 0.136mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

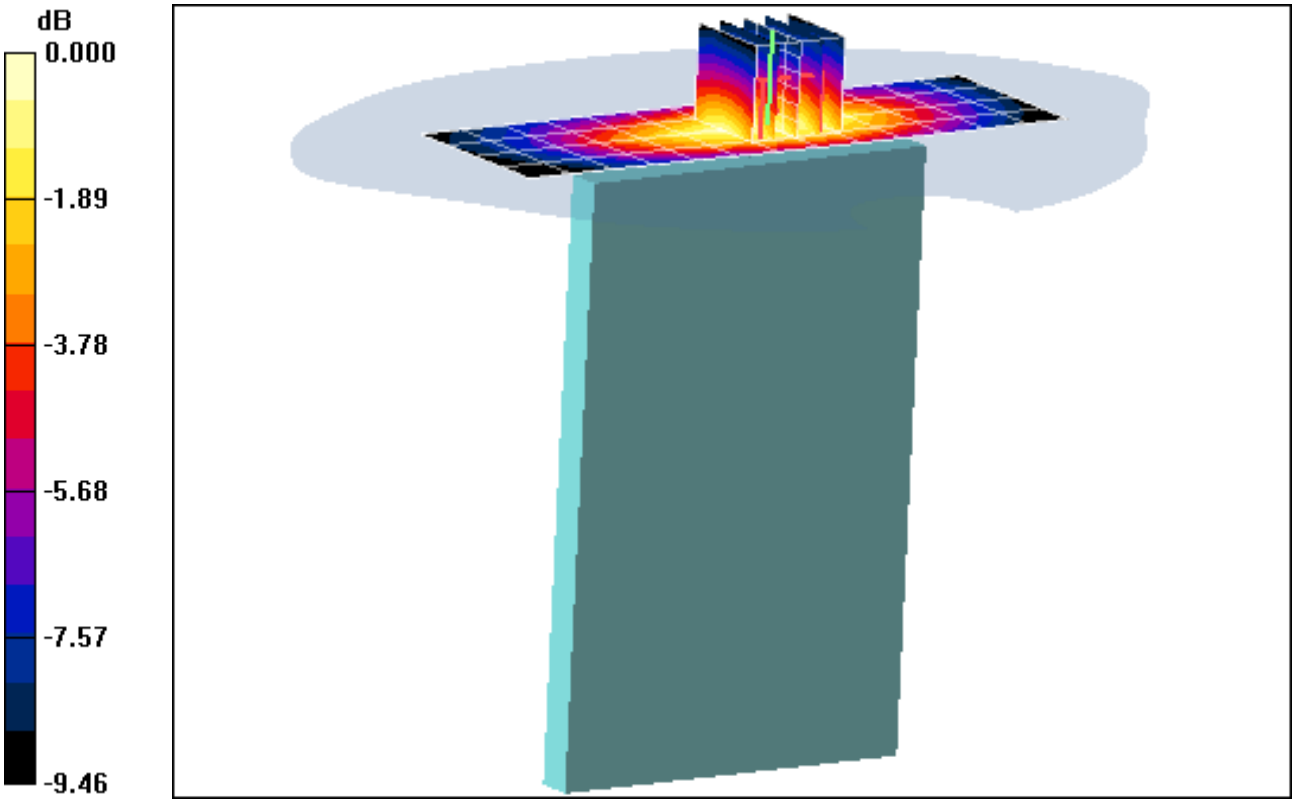
Communication System: GSM850 GPRS; 4 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:2.076
Medium: 835 Muscle Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.981 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °CC

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 850, Body SAR, Bottom side, Mid.ch, 4 Tx Slots

Area Scan (5x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.83 V/m
Peak SAR (extrapolated) = 0.079 W/kg
SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.036 mW/g



0 dB = 0.058mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

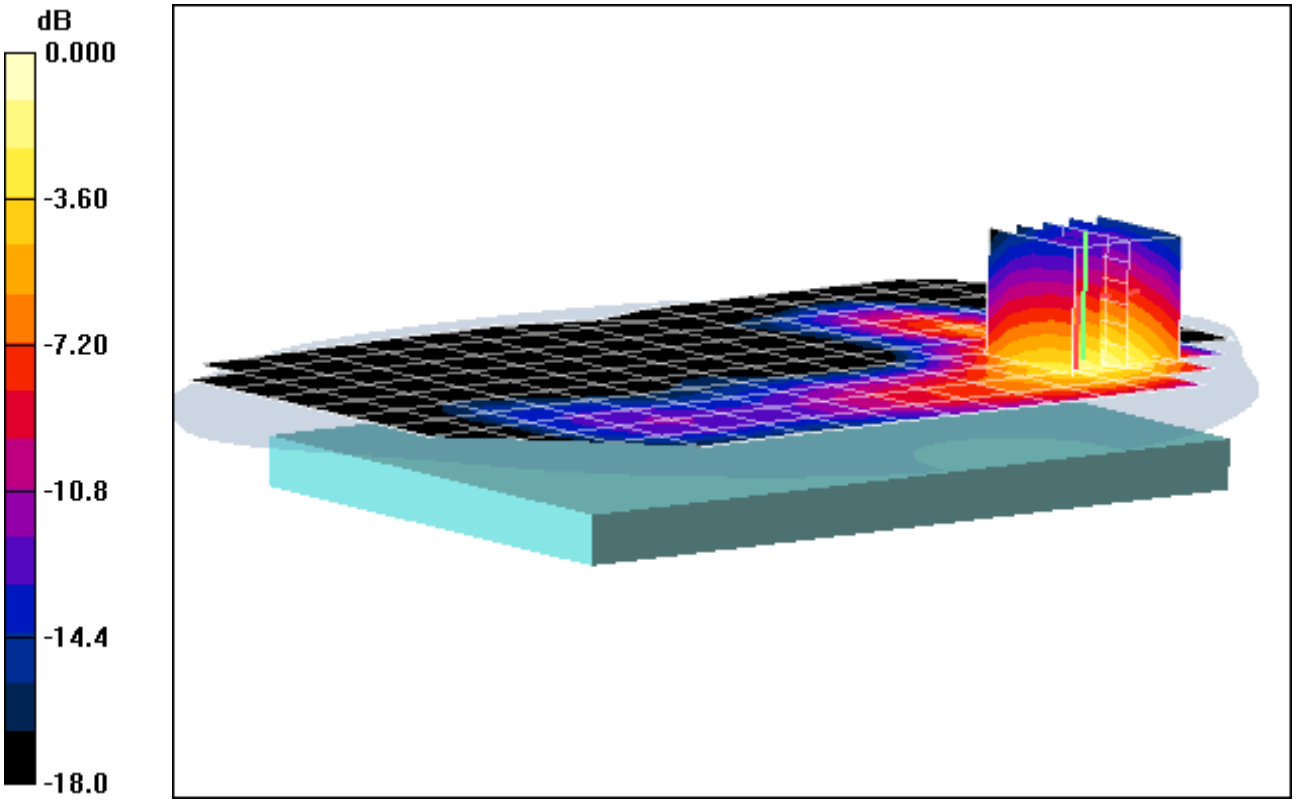
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (11x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.2 V/m
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.630 mW/g; SAR(10 g) = 0.335 mW/g



0 dB = 0.594mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

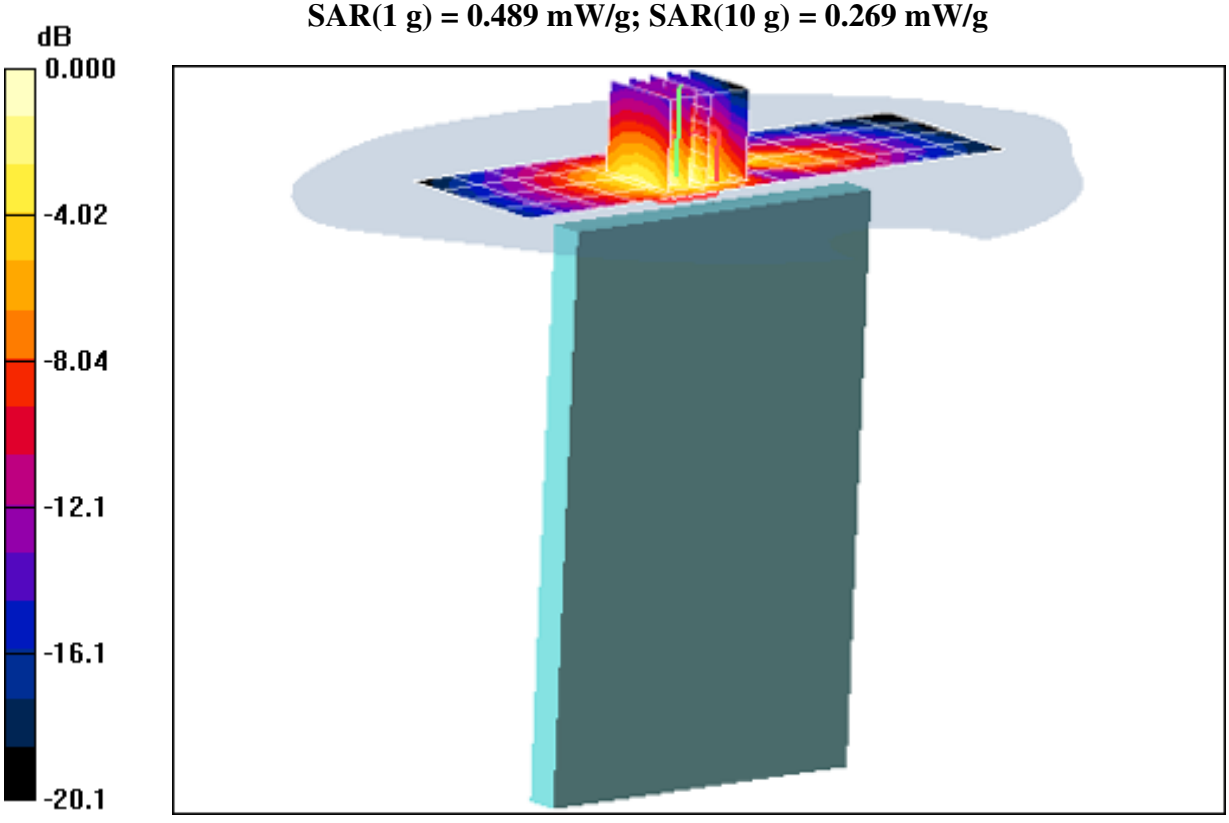
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 1900, Body SAR, Top, 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 = 17.5 V/m
Peak SAR (extrapolated) = 0.835 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.269 mW/g



0 dB = 0.488mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

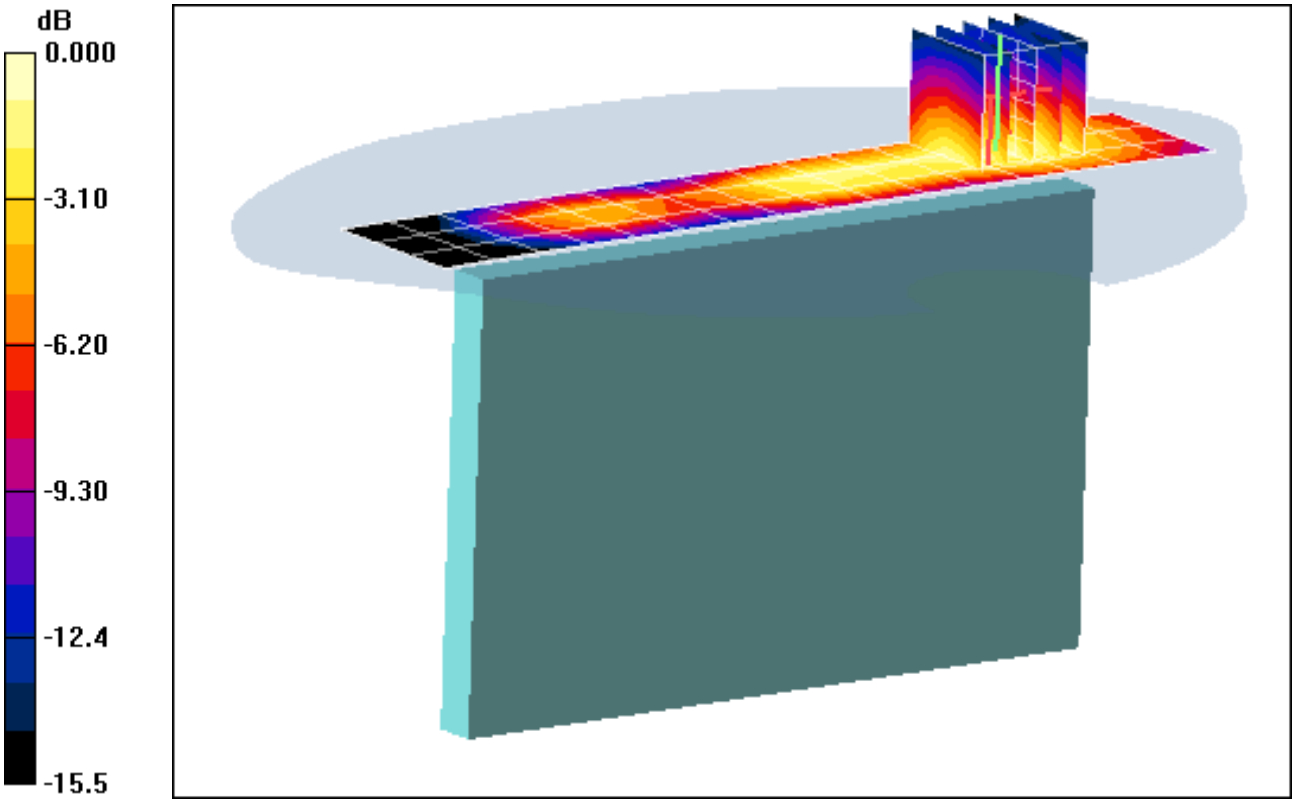
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM1900, Body SAR, Left Side, Mid.ch

Area Scan (4x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m
Peak SAR (extrapolated) = 0.282 W/kg
SAR(1 g) = 0.172 mW/g; SAR(10 g) = 0.101 mW/g



0 dB = 0.190mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

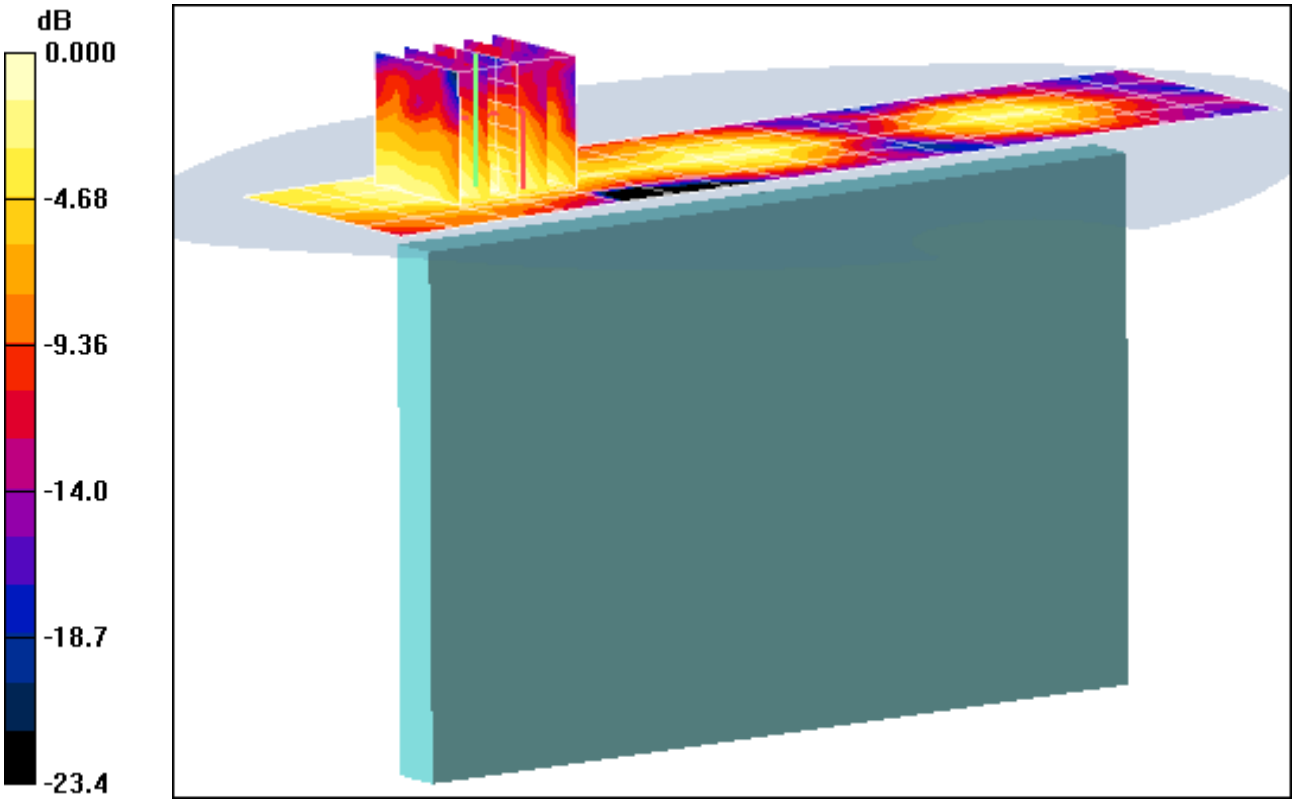
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM1900, Body SAR, Right Side, Mid.ch

Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.14 V/m
Peak SAR (extrapolated) = 0.038 W/kg
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.016 mW/g



0 dB = 0.030mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

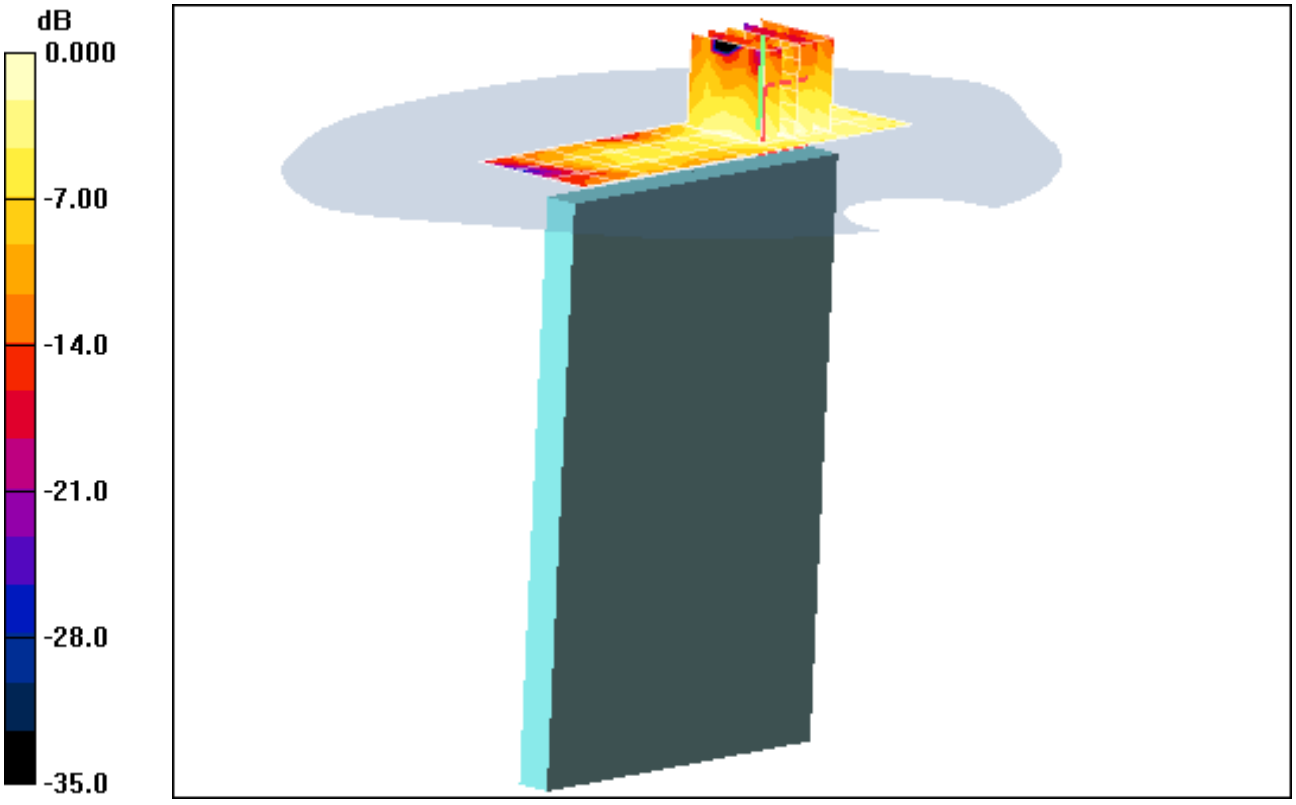
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM1900, Body SAR, Bottom, Mid.ch

Area Scan (4x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.48 V/m
Peak SAR (extrapolated) = 0.035 W/kg
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.013 mW/g



0 dB = 0.025mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

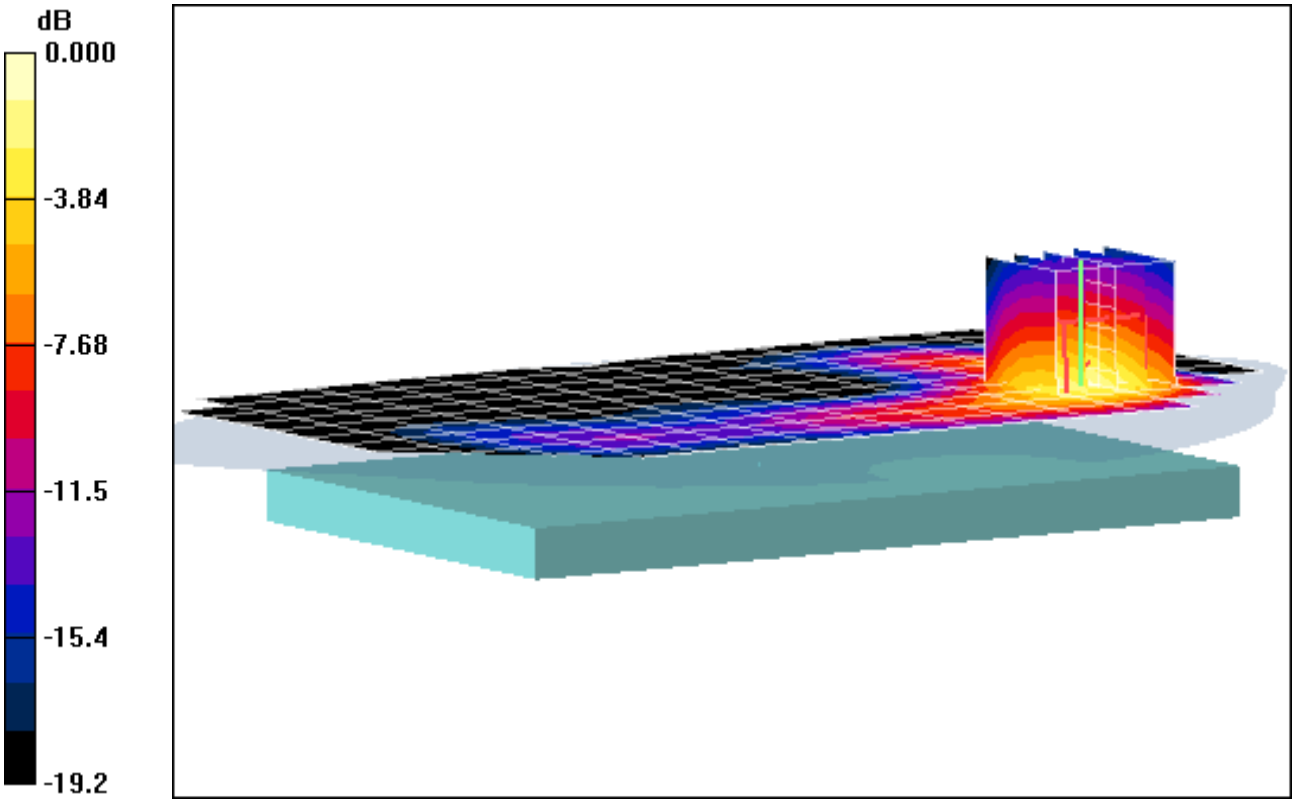
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (11x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.4 V/m
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.701 mW/g



0 dB = 1.43mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

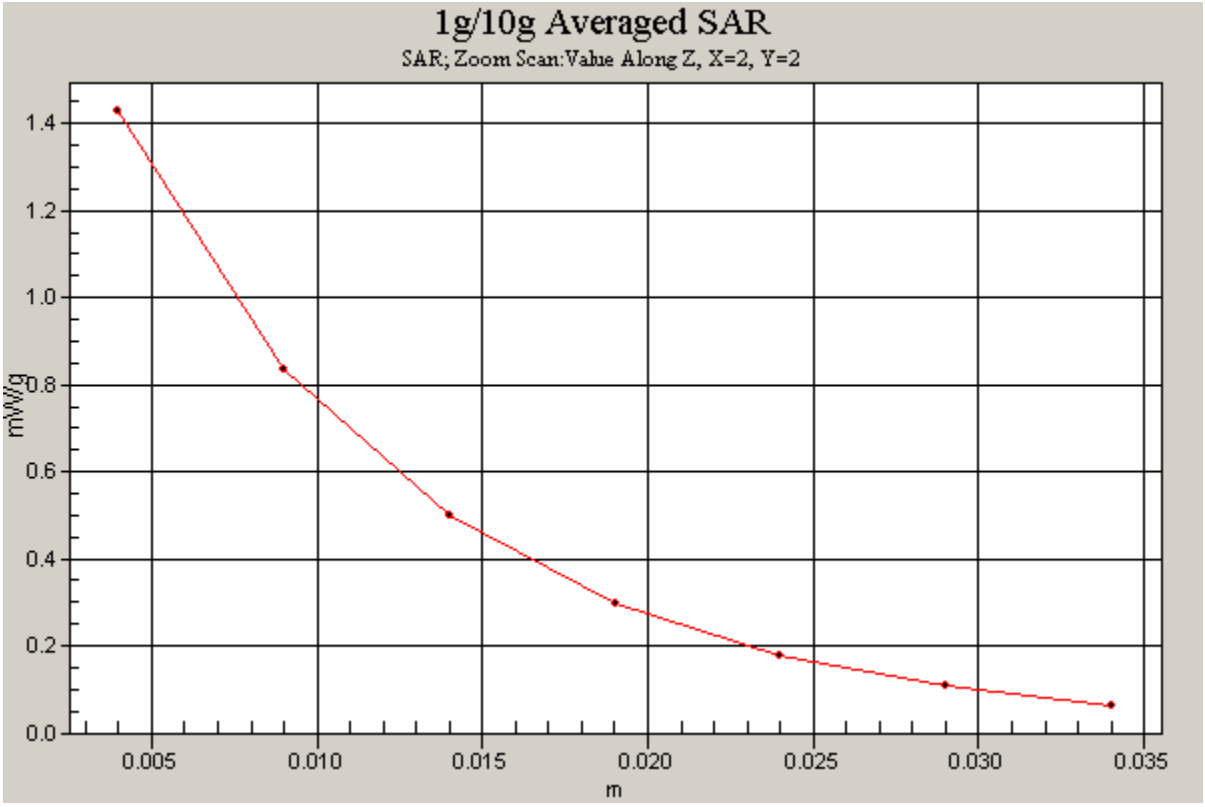
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (11x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.4 V/m
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.701 mW/g



DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 26

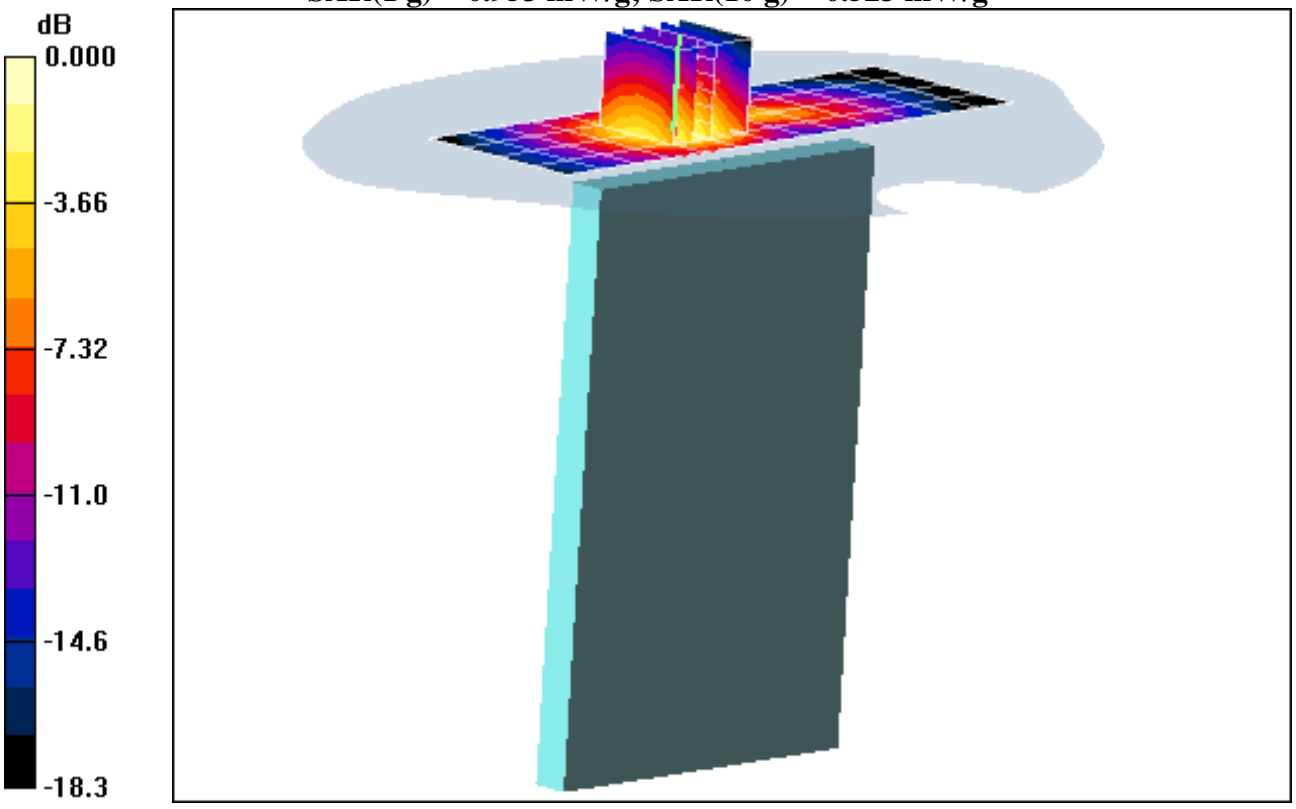
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Top, 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 = 26.8 V/m
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 0.953 mW/g; SAR(10 g) = 0.523 mW/g



0 dB = 0.952mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

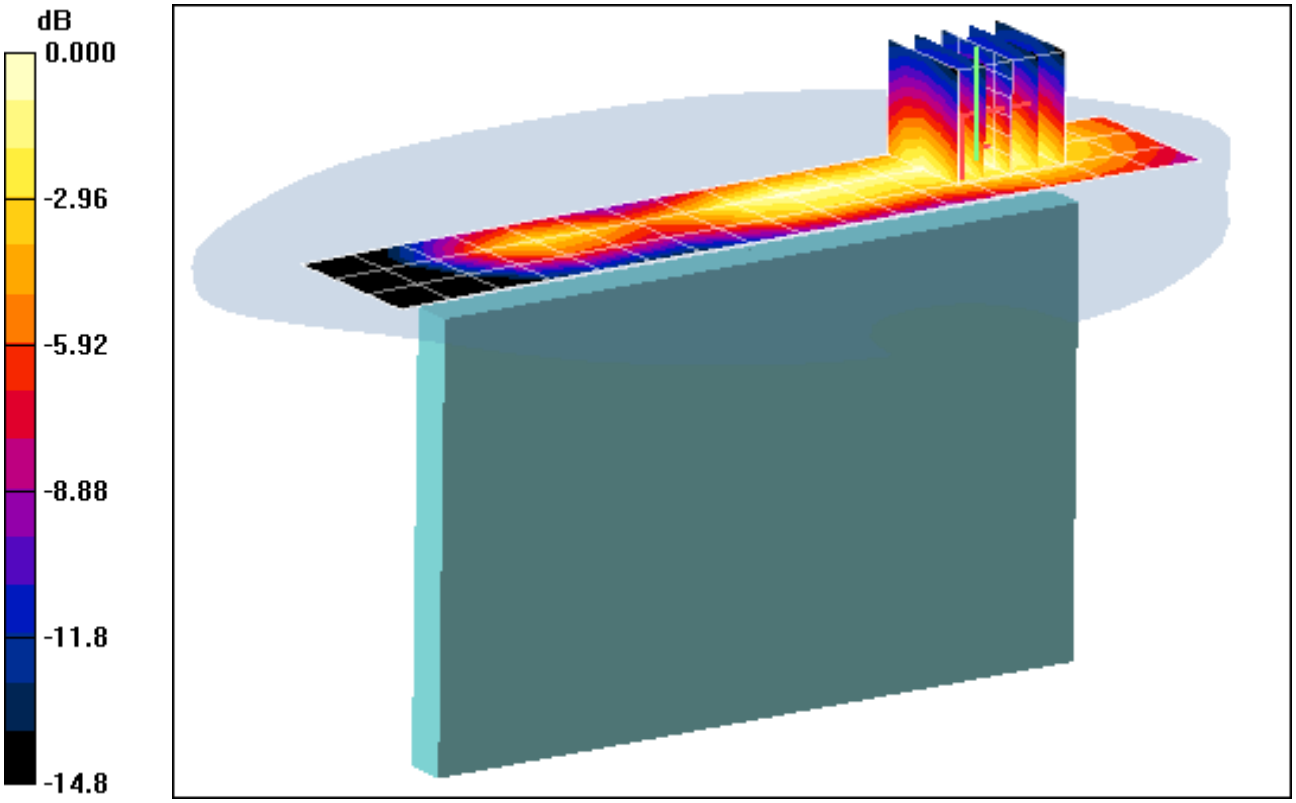
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Left Side, Mid.ch

Area Scan (4x17x1): 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) = 0.481 W/kg
SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.179 mW/g



0 dB = 0.302mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: R9YZ969580

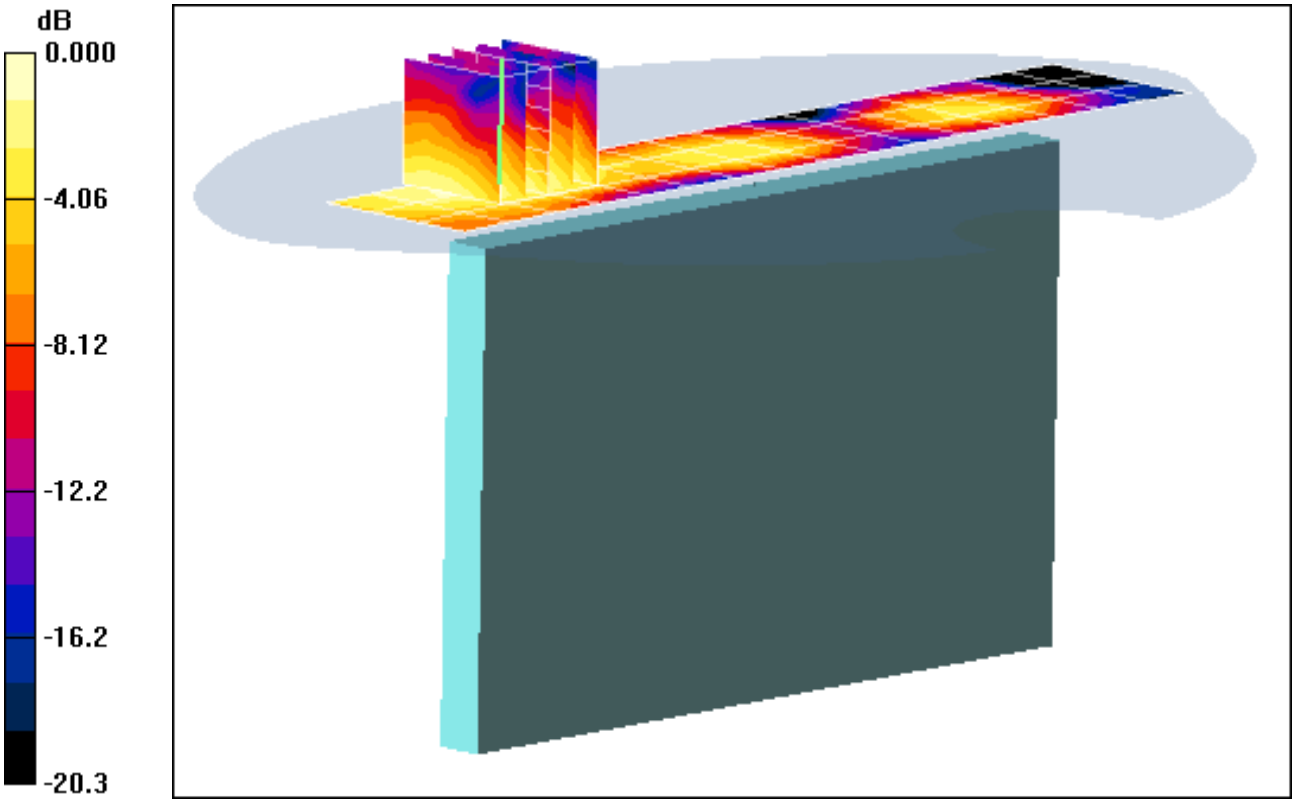
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Right, Mid.ch

Area Scan (4x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.21 V/m
Peak SAR (extrapolated) = 0.060 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.023 mW/g



0 dB = 0.040mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 26

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used:
f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.82; ρ = 1000 kg/m^3

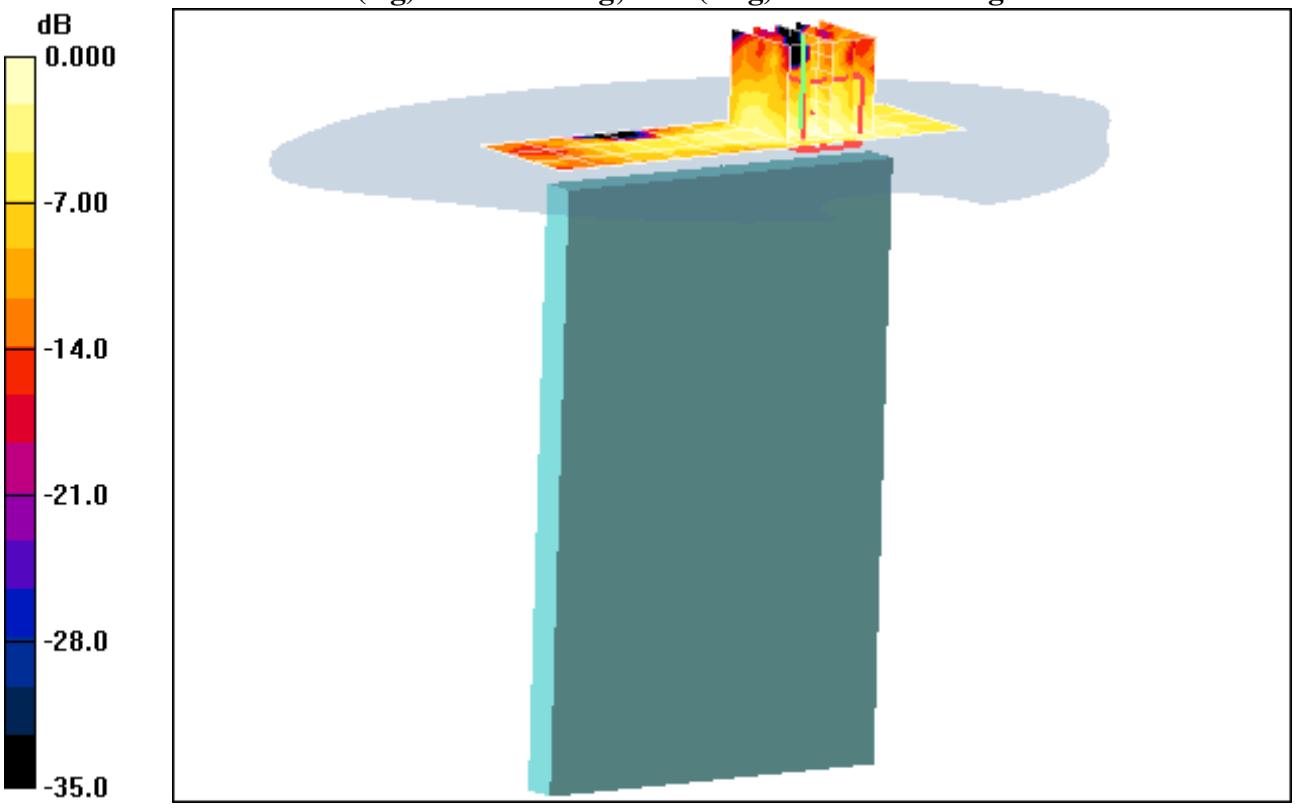
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-18-2010; Ambient Temp: 24.2° C; Tissue Temp: 22.4 ° C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Body SAR, Bottom, Mid.ch

Area Scan (4x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.72 V/m
Peak SAR (extrapolated) = 0.024 W/kg
SAR(1 g) = 0.013 mW/g; SAR(10 g) = 0.00705 mW/g



0 dB = 0.014mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

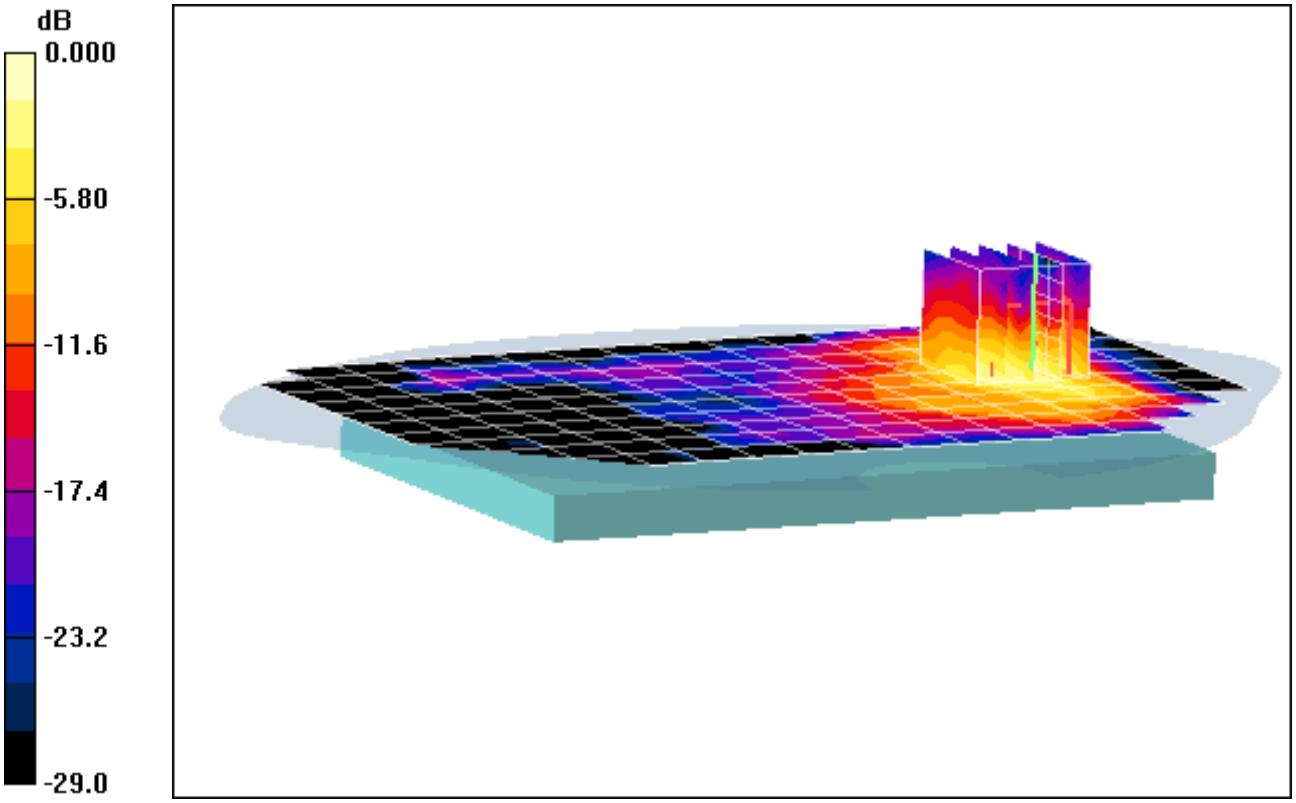
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.92 mho/m; ε_r= 52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-14-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3561; ConvF(6.44, 6.44, 6.44); Calibrated: 8/19/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
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 01, 1 Mbps, Back Side

Area Scan (11x17x1): 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) = 0.668 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.130 mW/g



0 dB = 0.439mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

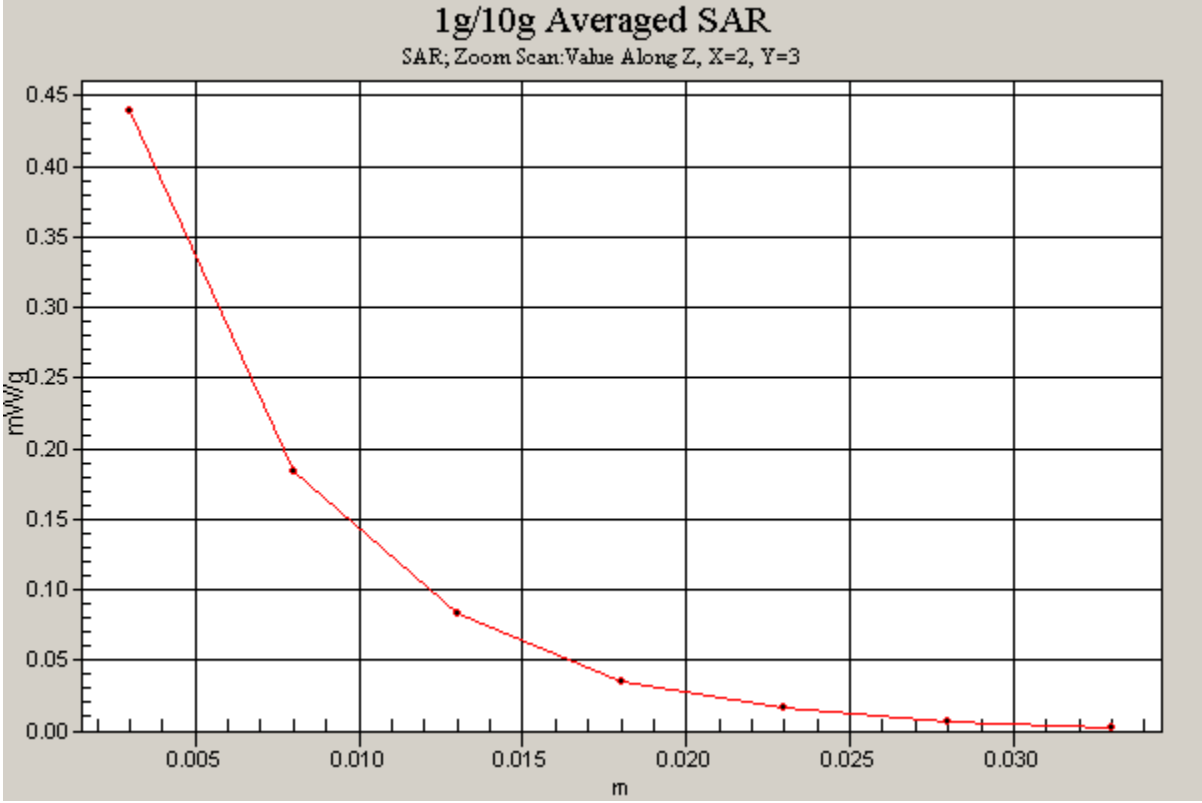
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.92 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-14-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3561; ConvF(6.44, 6.44, 6.44); Calibrated: 8/19/2010
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
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 01, 1 Mbps, Back Side

Area Scan (11x17x1): 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) = 0.668 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.130 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

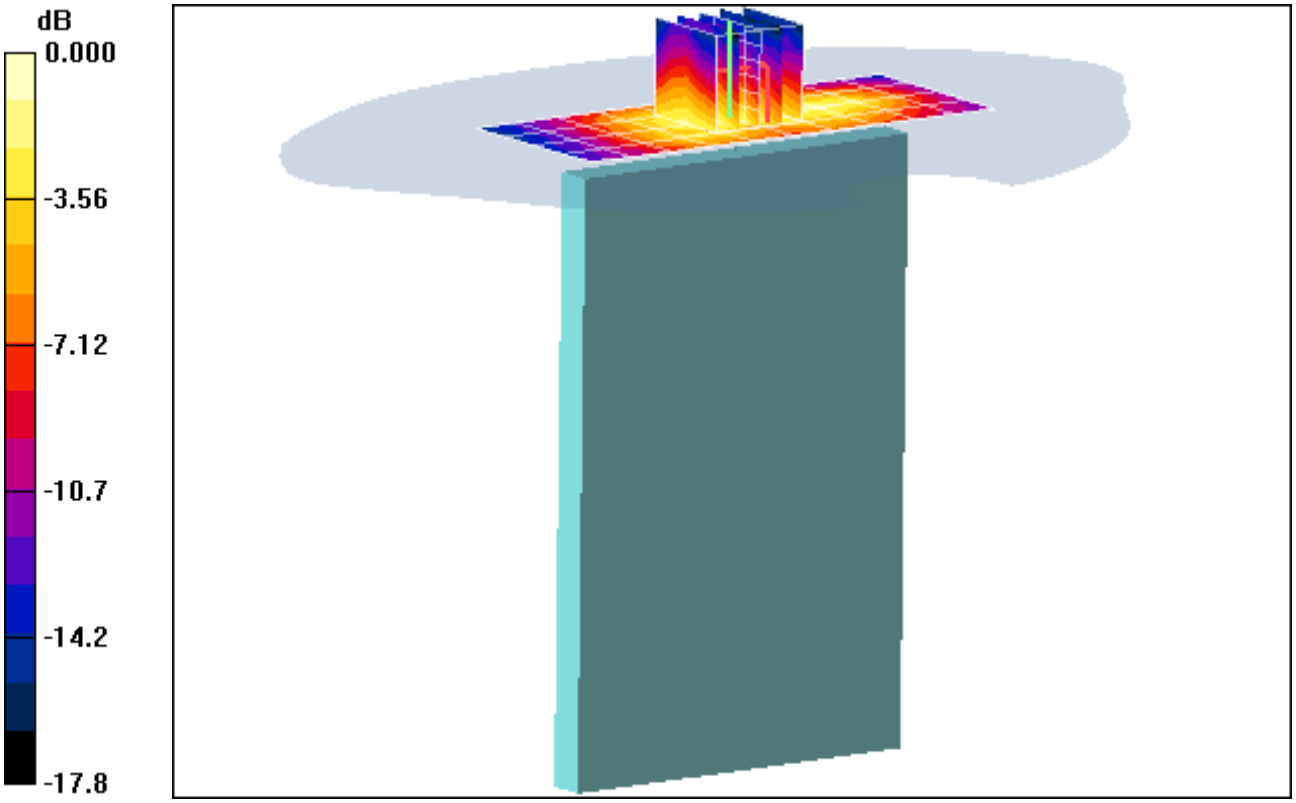
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.91 mho/m; ε_r = 50.47; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-08-2010; Ambient Temp: 24.0 °C; Tissue Temp: 22.1 °C

Probe: ES3DV3 - SN3213; ConvF(4.27, 4.27, 4.27); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 01, 1 Mbps, Top

Area Scan (5x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.04 V/m
Peak SAR (extrapolated) = 0.164 W/kg
SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.047 mW/g



0 dB = 0.100mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

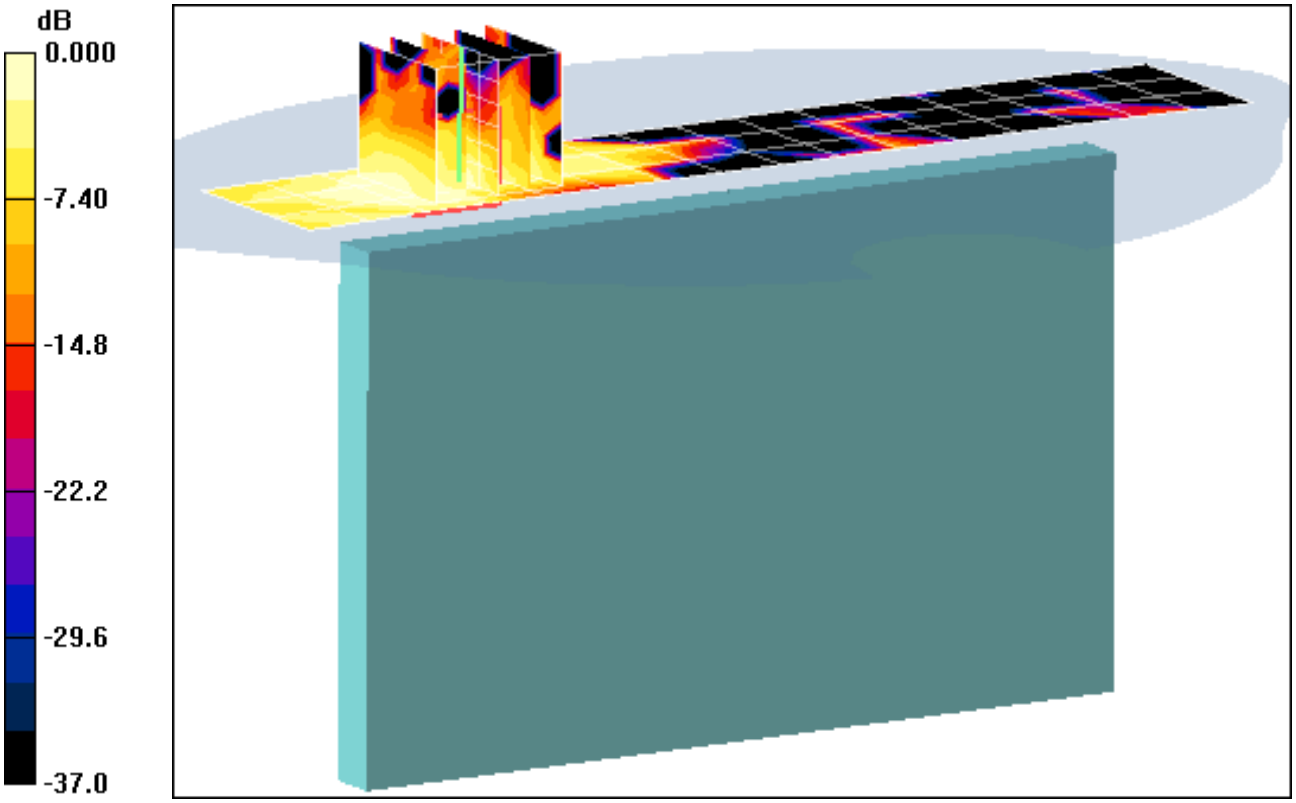
Communication System: IEEE 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.92 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-14-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3561; ConvF(6.44, 6.44, 6.44); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
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 01, 1 Mbps, Right Side

Area Scan (4x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.48 V/m
Peak SAR (extrapolated) = 0.040 W/kg
SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00879 mW/g



0 dB = 0.016mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

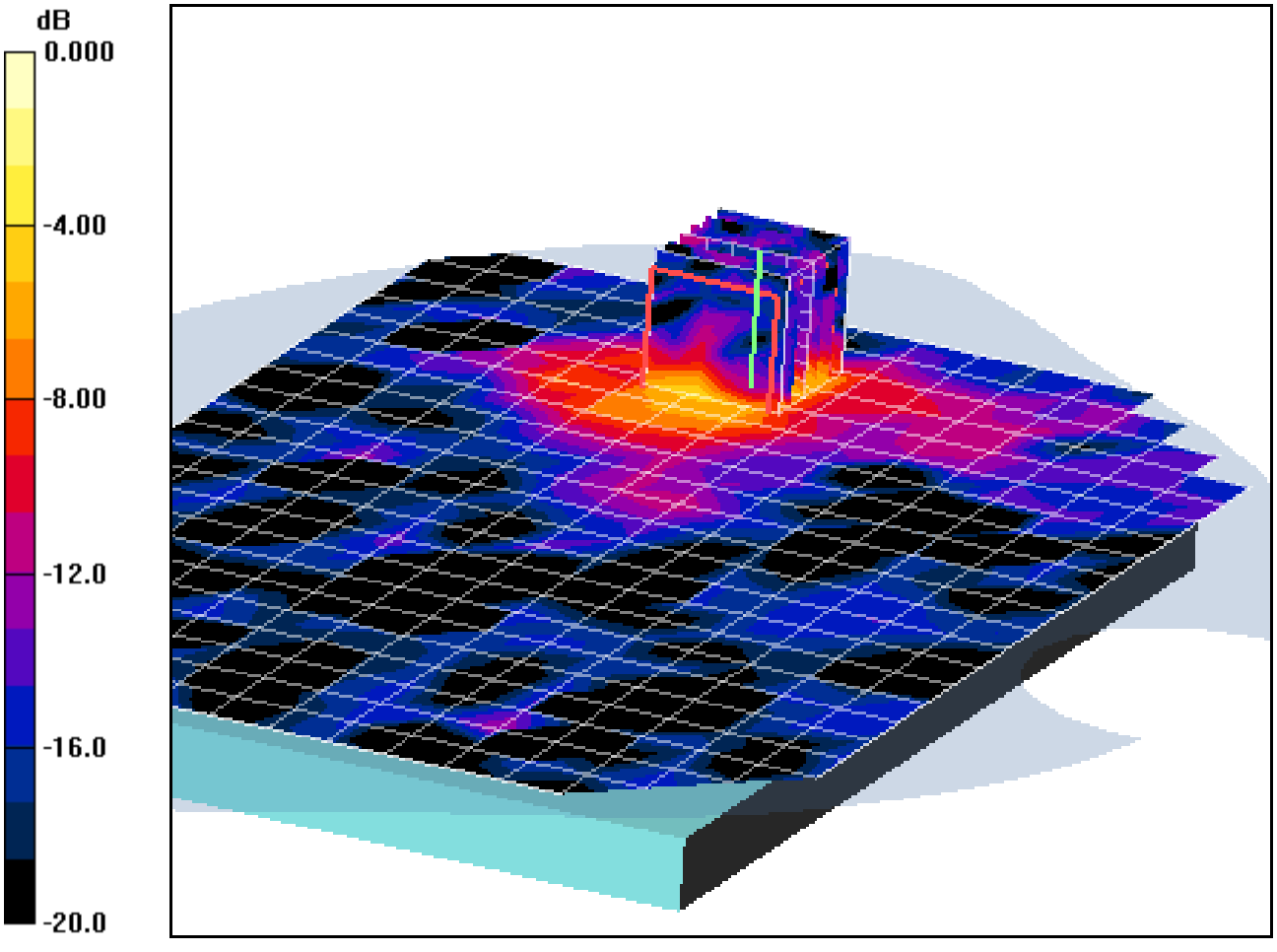
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
$f = 5180$ MHz; $\sigma = 5.224$ mho/m; $\varepsilon_r = 47.15$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(3.67, 3.67, 3.67); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.2 GHz, Body Back, Ch 36, 6 Mbps

Area Scan (16x23x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.29 V/m
Peak SAR (extrapolated) = 0.876 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.070 mW/g



0 dB = 0.437mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

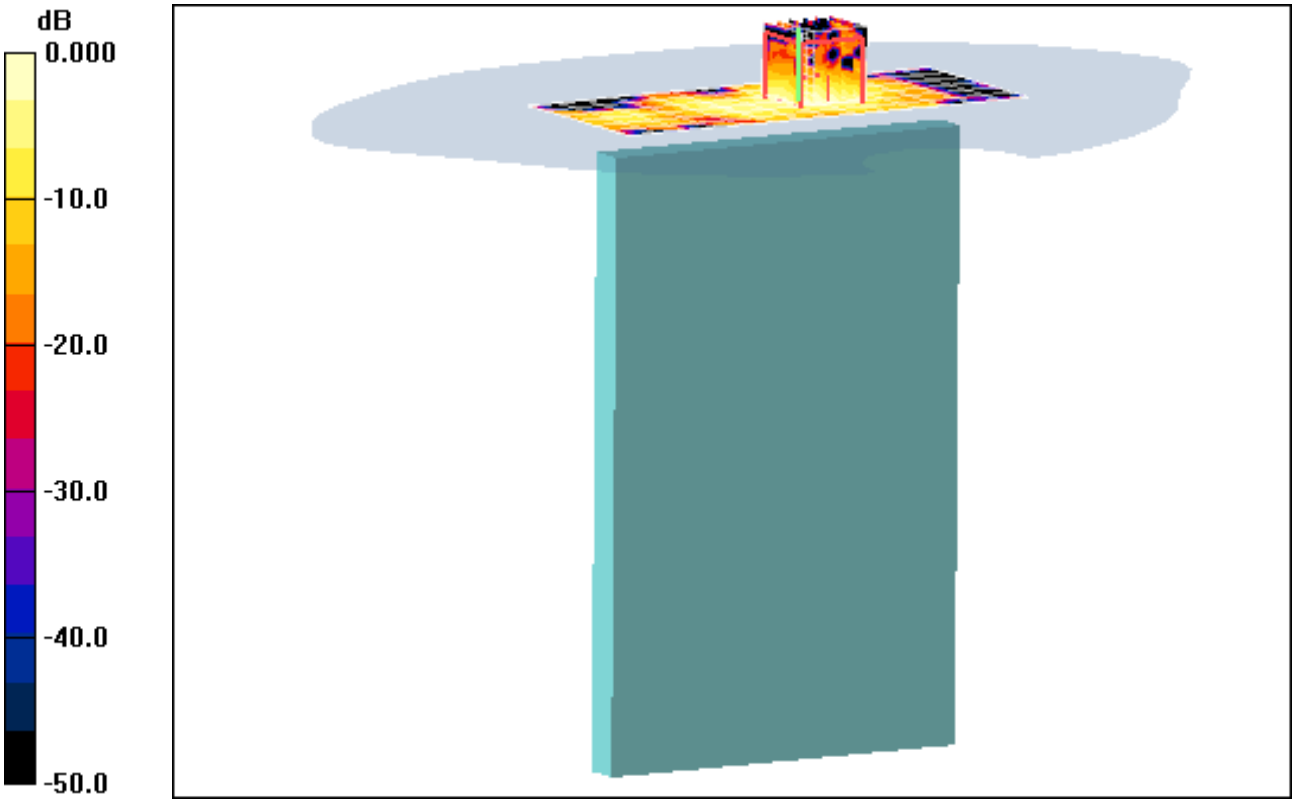
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5180 MHz; σ = 5.35 mho/m; ε_r = 48.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-06-2010; Ambient Temp: 21.7 °C; Tissue Temp: 20.6 °C

Probe: EX3DV4 - SN3561; ConvF(3.67, 3.67, 3.67); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.2 GHz, Top, Ch 36, 6 Mbps

Area Scan (7x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.07 V/m
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.148 mW/g; SAR(10 g) = 0.040 mW/g



0 dB = 0.209mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

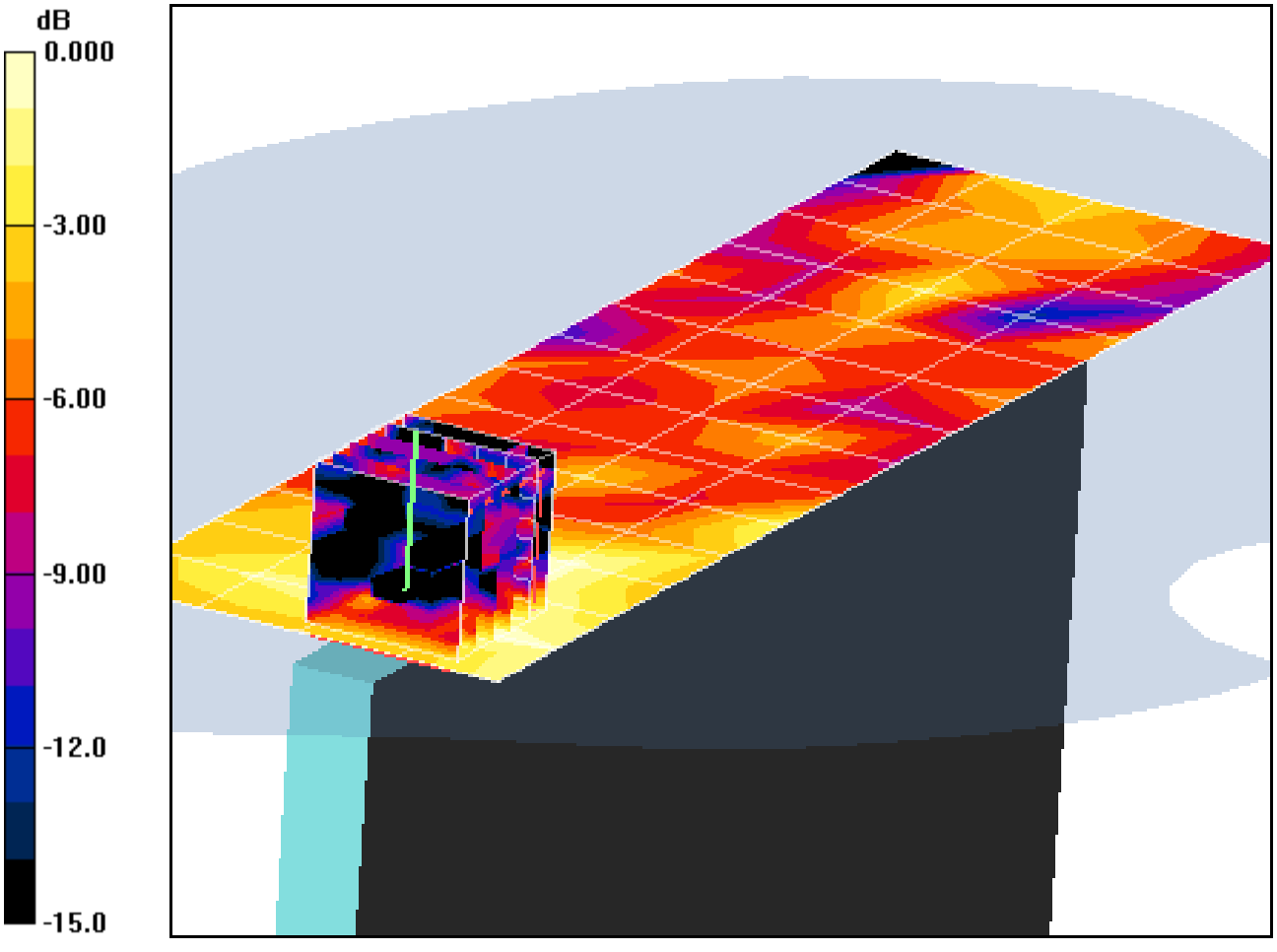
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
$f = 5180$ MHz; $\sigma = 5.224$ mho/m; $\varepsilon_r = 47.15$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.7 °C; Tissue Temp: 22.5 °C

Probe: EX3DV4 - SN3561; ConvF(3.67, 3.67, 3.67); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.2 GHz, Right, Ch 36, 6 Mbps

Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.80 V/m
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.011 mW/g



0 dB = 0.051mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

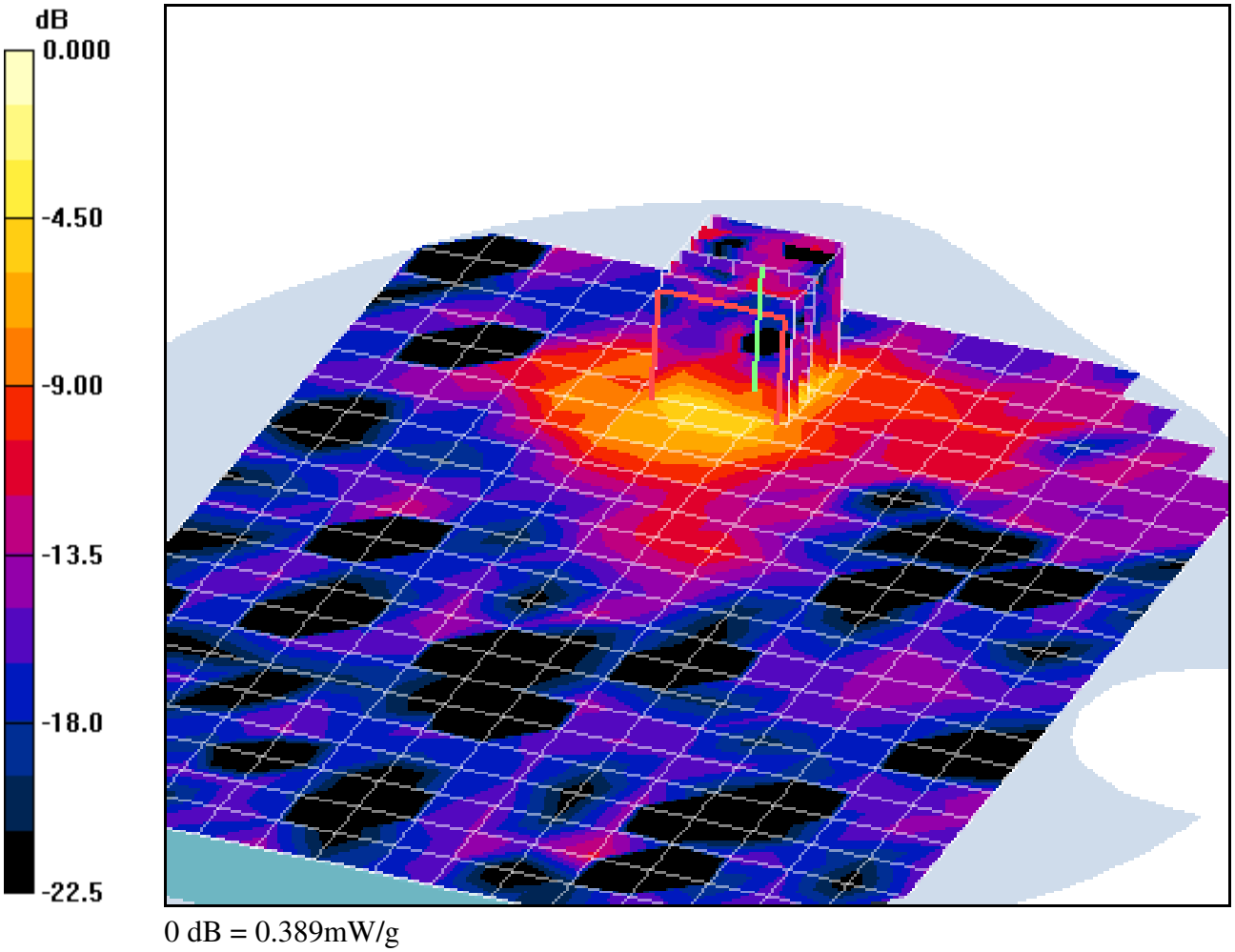
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5260 MHz; σ = 5.34 mho/m; ε_r = 46.98; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.7 °C; Tissue Temp: 22.5 °C

Probe: EX3DV4 - SN3561; ConvF(3.42, 3.42, 3.42); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.3 GHz, Body Back, Ch 52, 6 Mbps

Area Scan (16x23x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.89 V/m
Peak SAR (extrapolated) = 0.760 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.063 mW/g



0 dB = 0.389mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

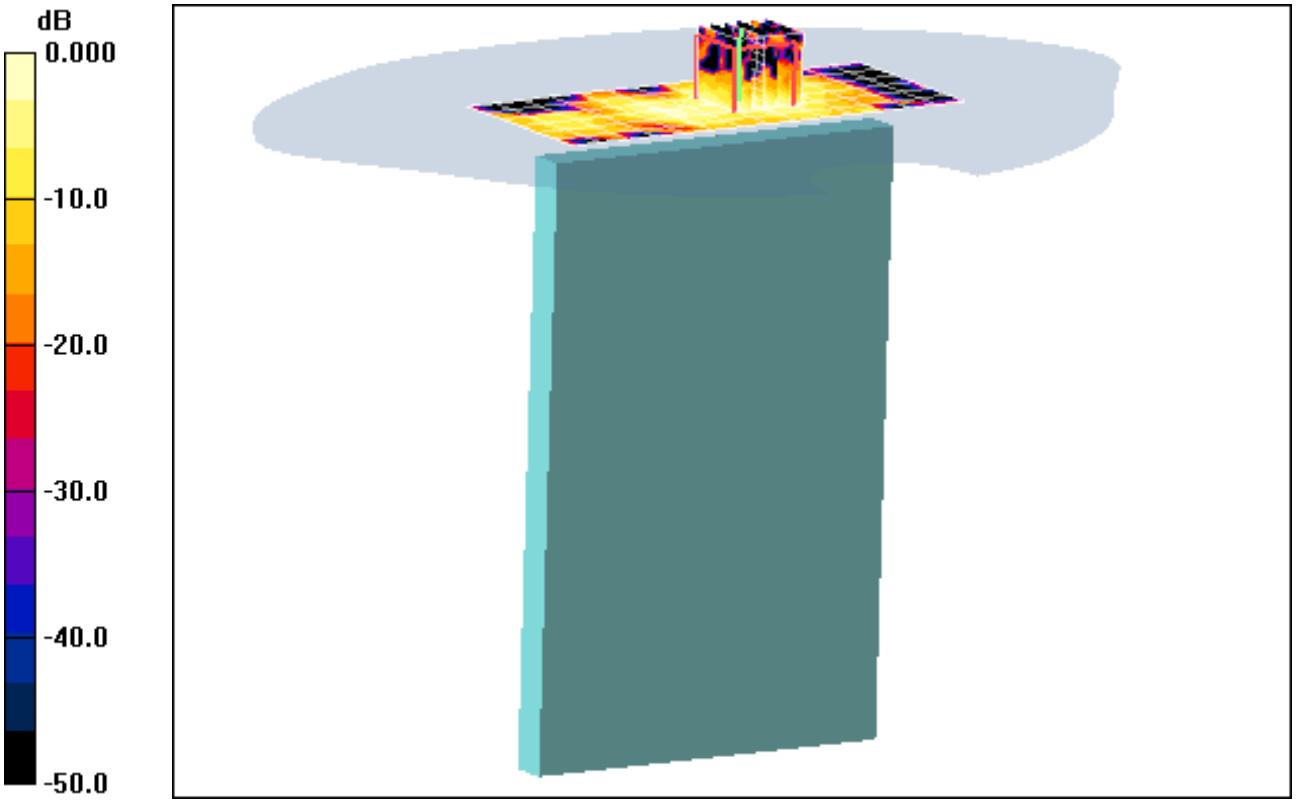
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5260 MHz; σ = 5.46 mho/m; ε_r = 48.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-06-2010; Ambient Temp: 21.7 °C; Tissue Temp: 20.6 °C

Probe: EX3DV4 - SN3561; ConvF(3.42, 3.42, 3.42); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.3 GHz, Top, Ch 52, 6 Mbps

Area Scan (7x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.24 V/m
Peak SAR (extrapolated) = 0.245 W/kg
SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.026 mW/g



0 dB = 0.158mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

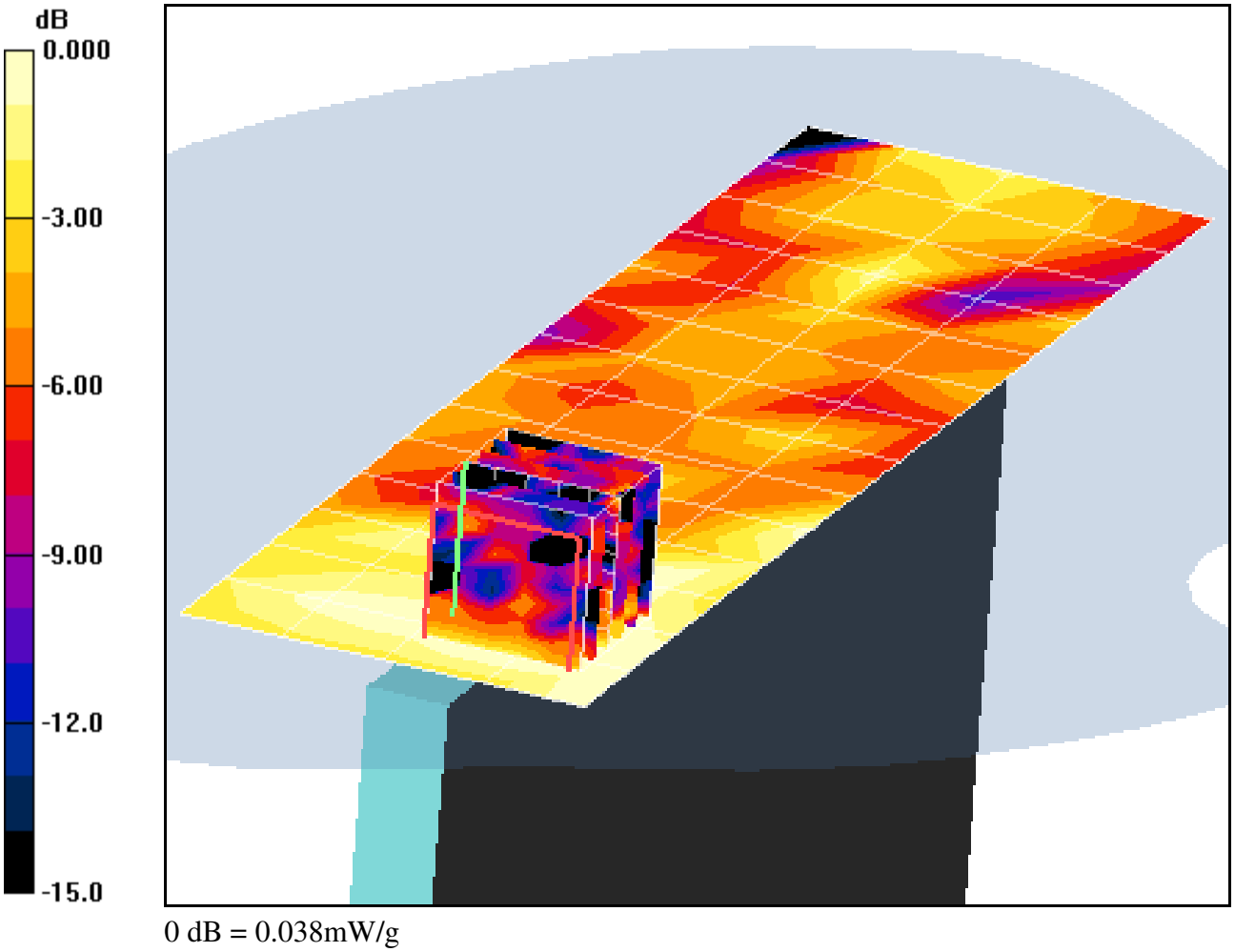
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5260 MHz; σ = 5.34 mho/m; ε_r = 46.98; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.7 °C; Tissue Temp: 22.5 °C

Probe: EX3DV4 - SN3561; ConvF(3.42, 3.42, 3.42); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.3 GHz, Right, Ch 52, 6 Mbps

Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.92 V/m
Peak SAR (extrapolated) = 0.163 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.00603 mW/g



0 dB = 0.038mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

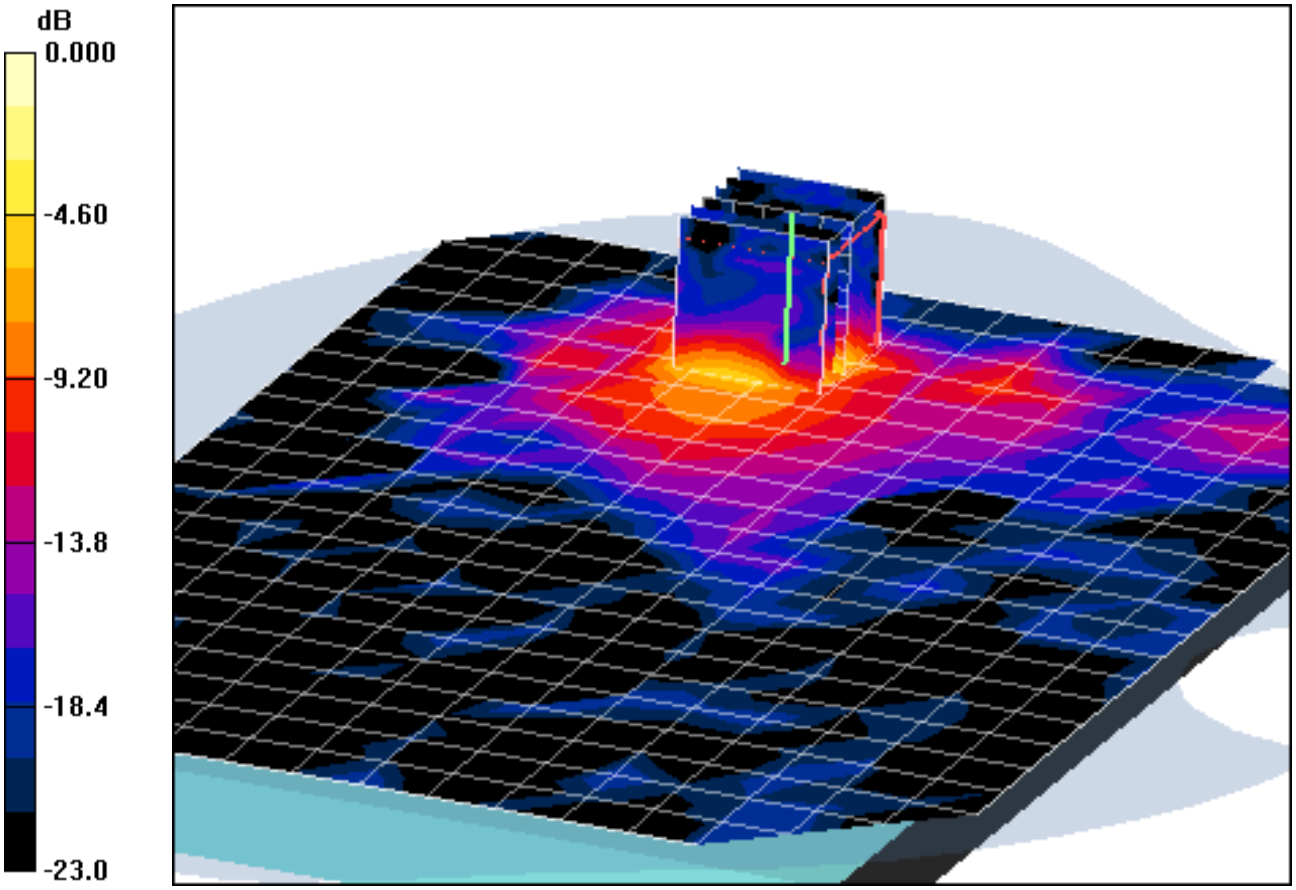
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
$f = 5700$ MHz; $\sigma = 5.933$ mho/m; $\varepsilon_r = 46.11$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.5 °C; Tissue Temp: 22.3 °C

Probe: EX3DV4 - SN3561; ConvF(3.12, 3.12, 3.12); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.5 GHz, Body Back, Ch 140, 6 Mbps

Area Scan (16x23x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 15.5 V/m
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 0.785 mW/g; SAR(10 g) = 0.221 mW/g



0 dB = 1.55mW/g

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

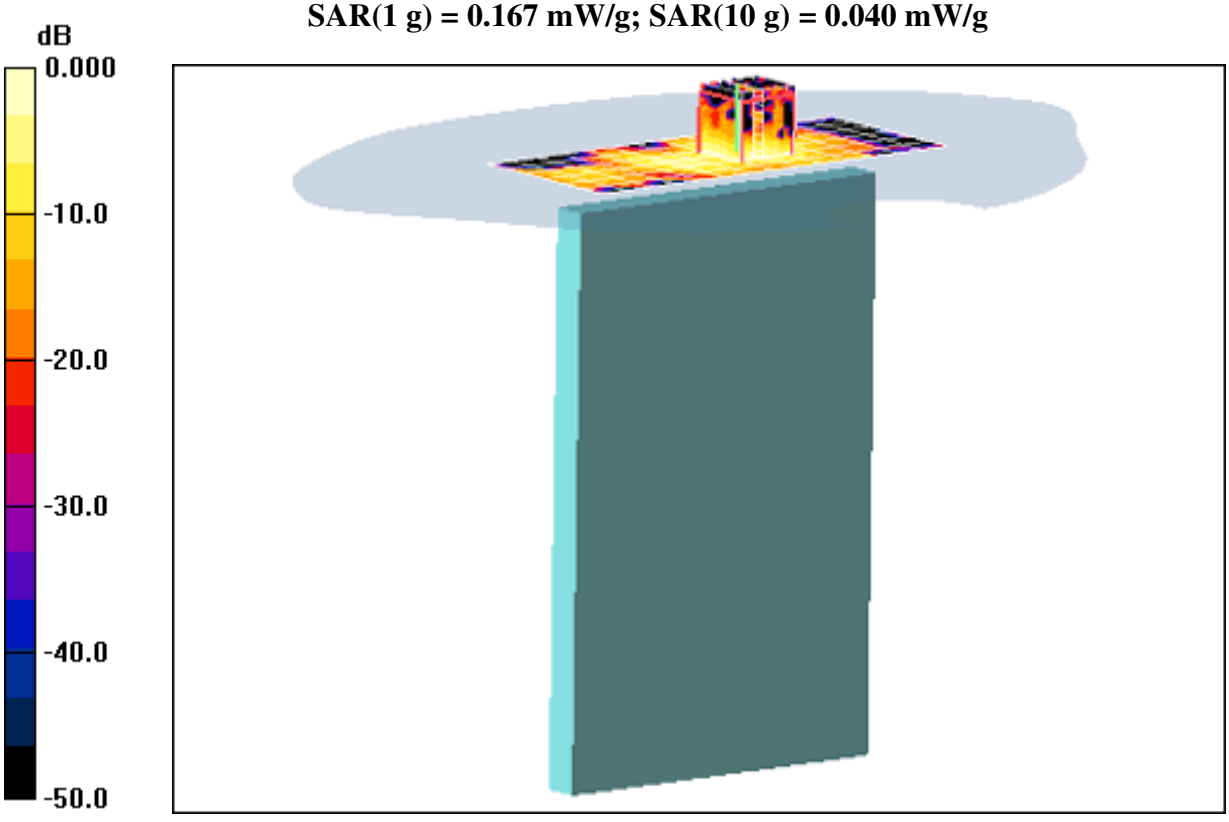
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5700 MHz; σ = 6.082 mho/m; ε_r = 47.65; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-07-2010; Ambient Temp: 22.1 °C; Tissue Temp: 20.9 °C

Probe: EX3DV4 - SN3561; ConvF(3.12, 3.12, 3.12); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.5 GHz, Top, Ch 140, 6 Mbps

Area Scan (7x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.12 V/m
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.167 mW/g; SAR(10 g) = 0.040 mW/g



0 dB = 0.273mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

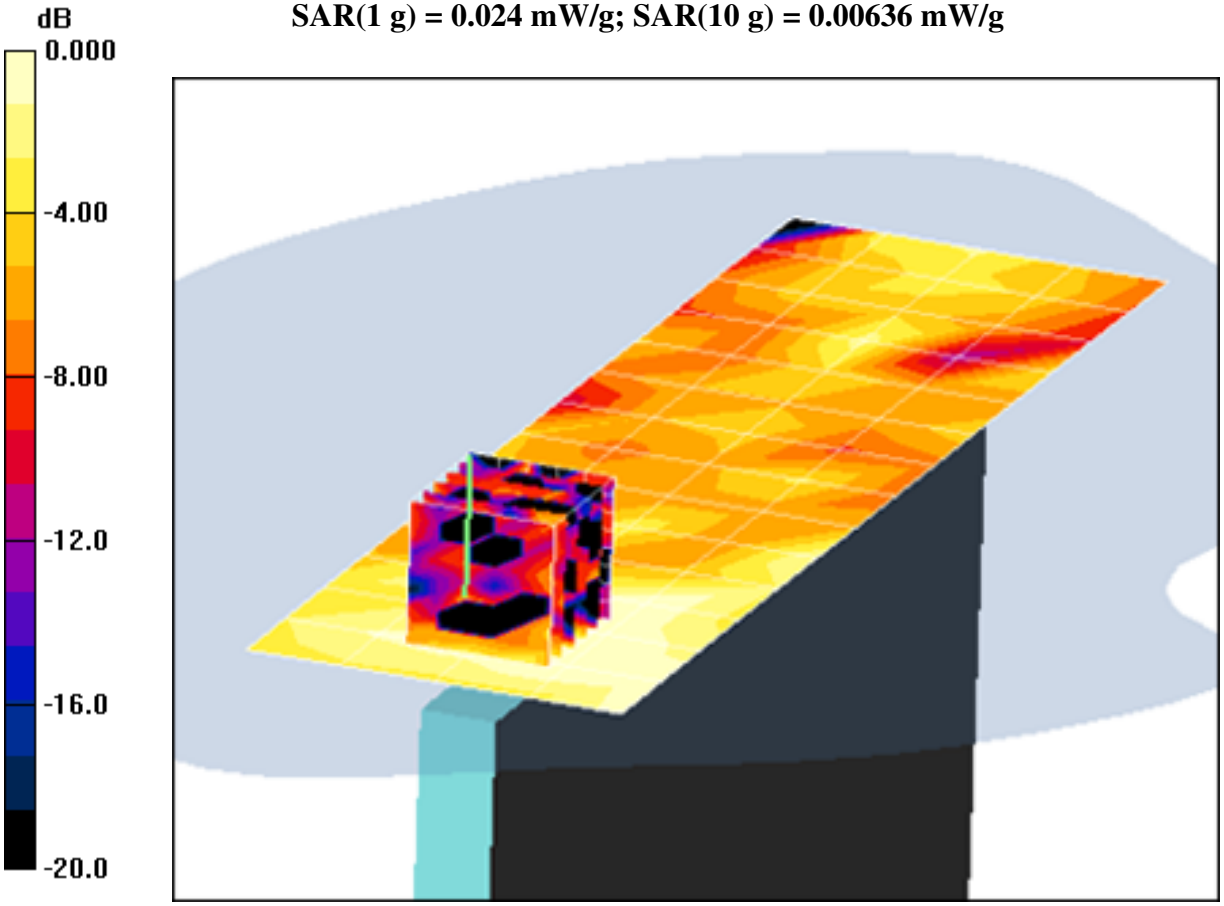
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5700 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5700 MHz; σ = 5.933 mho/m; ε_r = 46.11; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.5° C; Tissue Temp: 22.3° C

Probe: EX3DV4 - SN3561; ConvF(3.12, 3.12, 3.12); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.5 GHz, Right, Ch 140, 6 Mbps

Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan(7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.03 V/m
Peak SAR (extrapolated) = 0.222 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.00636 mW/g



0 dB = 0.044mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

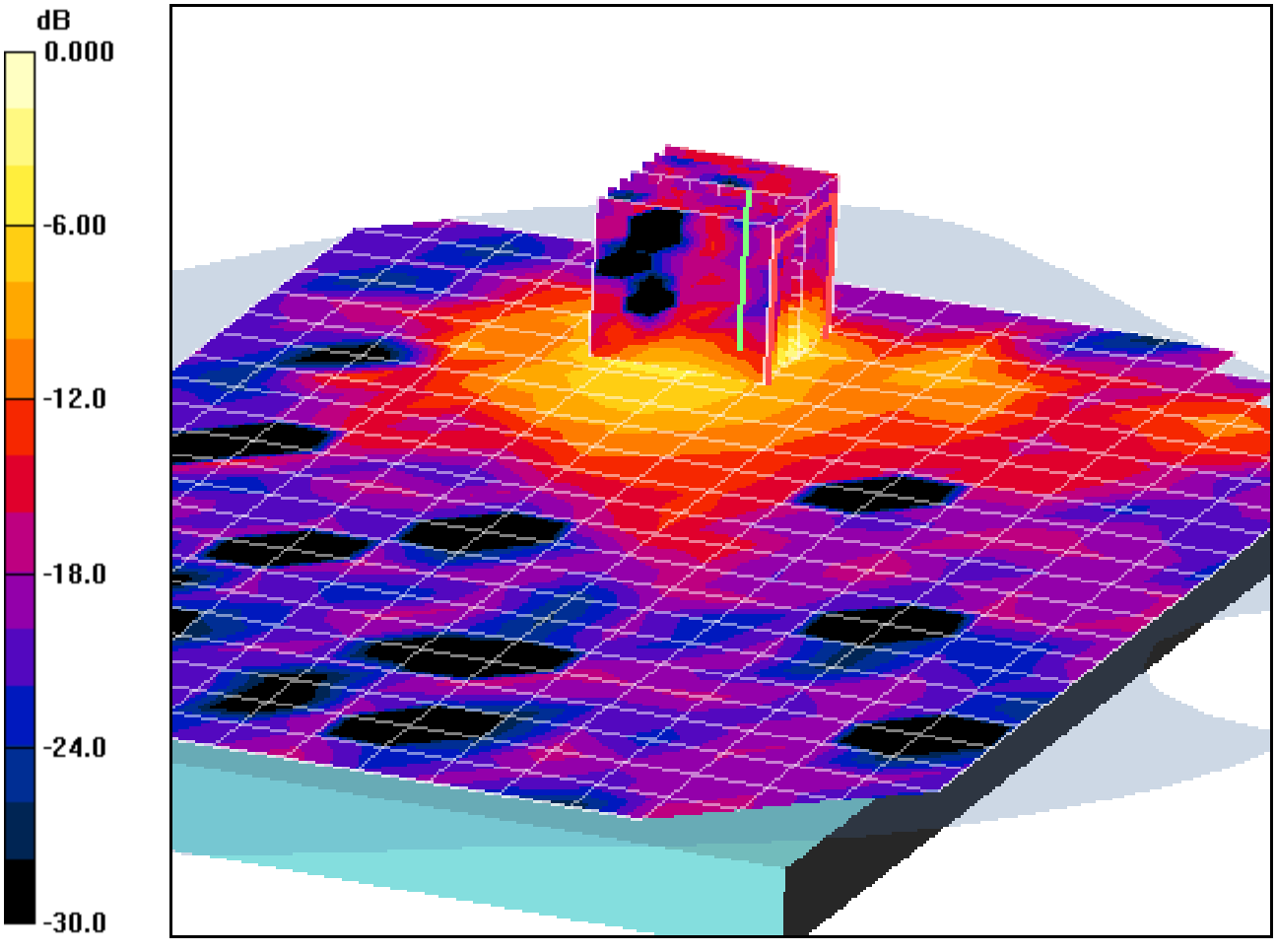
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5805 MHz; σ = 6.07 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.8 GHz, Body Back, Ch 161, 6 Mbps

Area Scan (16x23x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 10.2 V/m
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.146 mW/g



0 dB = 1.10mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

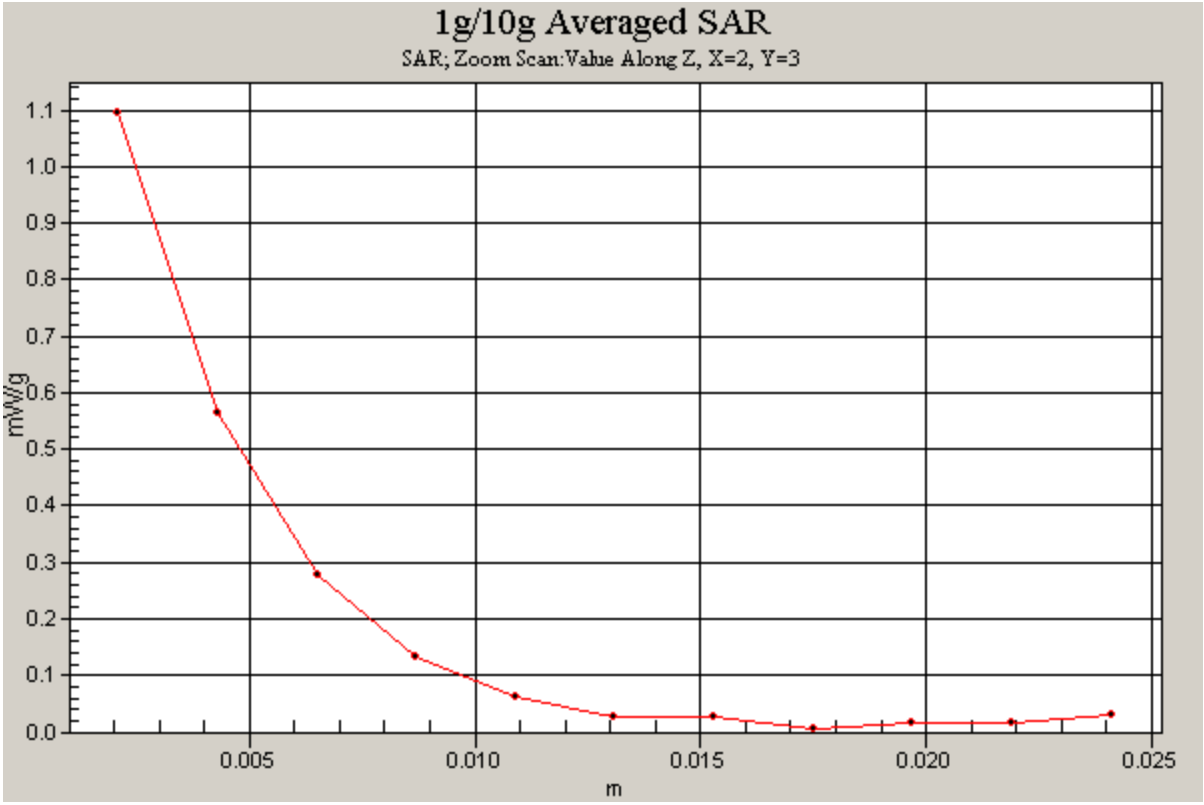
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5805 MHz; σ = 6.07 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.8 GHz, Body Back, Ch 161, 6 Mbps

Area Scan (16x23x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 10.2 V/m
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.146 mW/g



DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

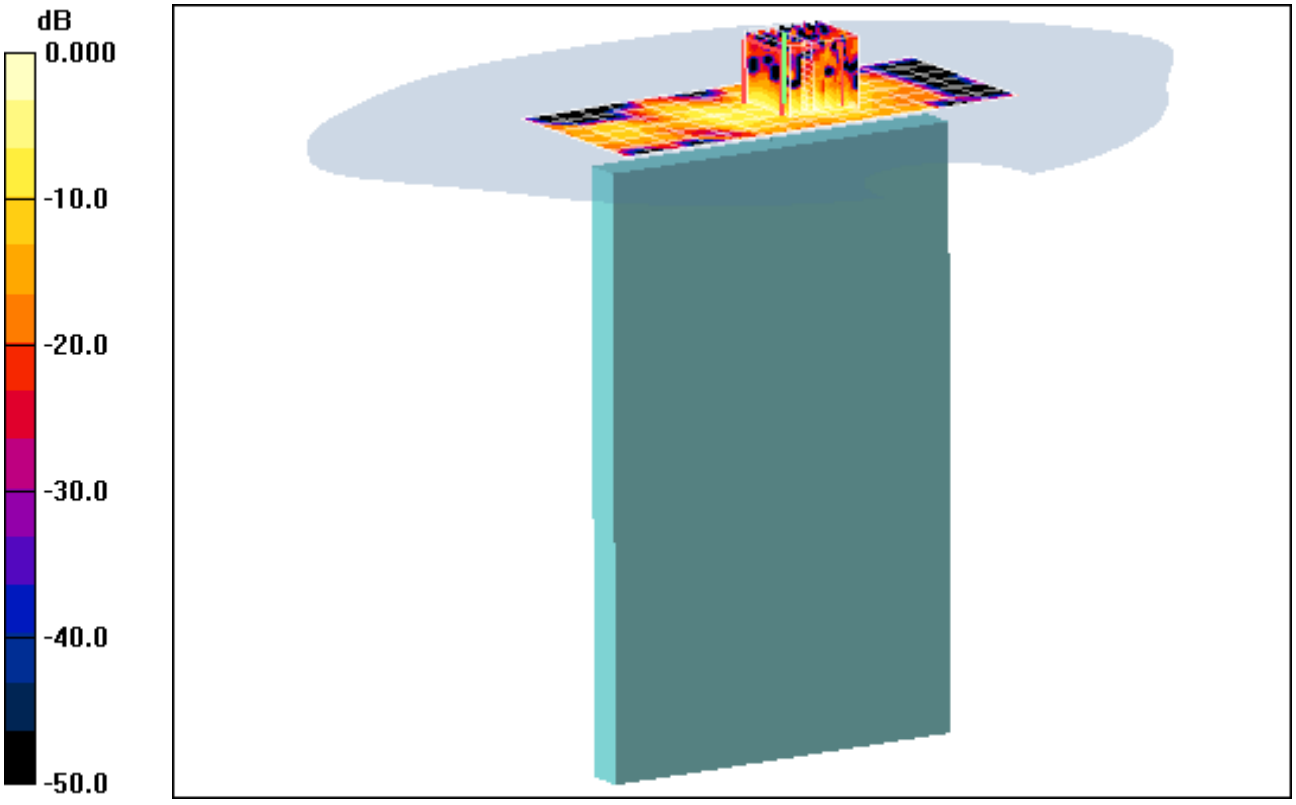
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5805 MHz; σ = 6.22 mho/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 10-07-2010; Ambient Temp: 21.4 °C; Tissue Temp: 20.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.8 GHz, Top, Ch 161, 6 Mbps

Area Scan (7x15x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.55 V/m
Peak SAR (extrapolated) = 0.747 W/kg
SAR(1 g) = 0.202 mW/g; SAR(10 g) = 0.060 mW/g



0 dB = 0.417mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSWDSC01C; Type: 835/1900 GSM/GPRS/EDGE and 1900 WCDMA Mini-Tablet with Bluetooth and WLAN; Serial: 27

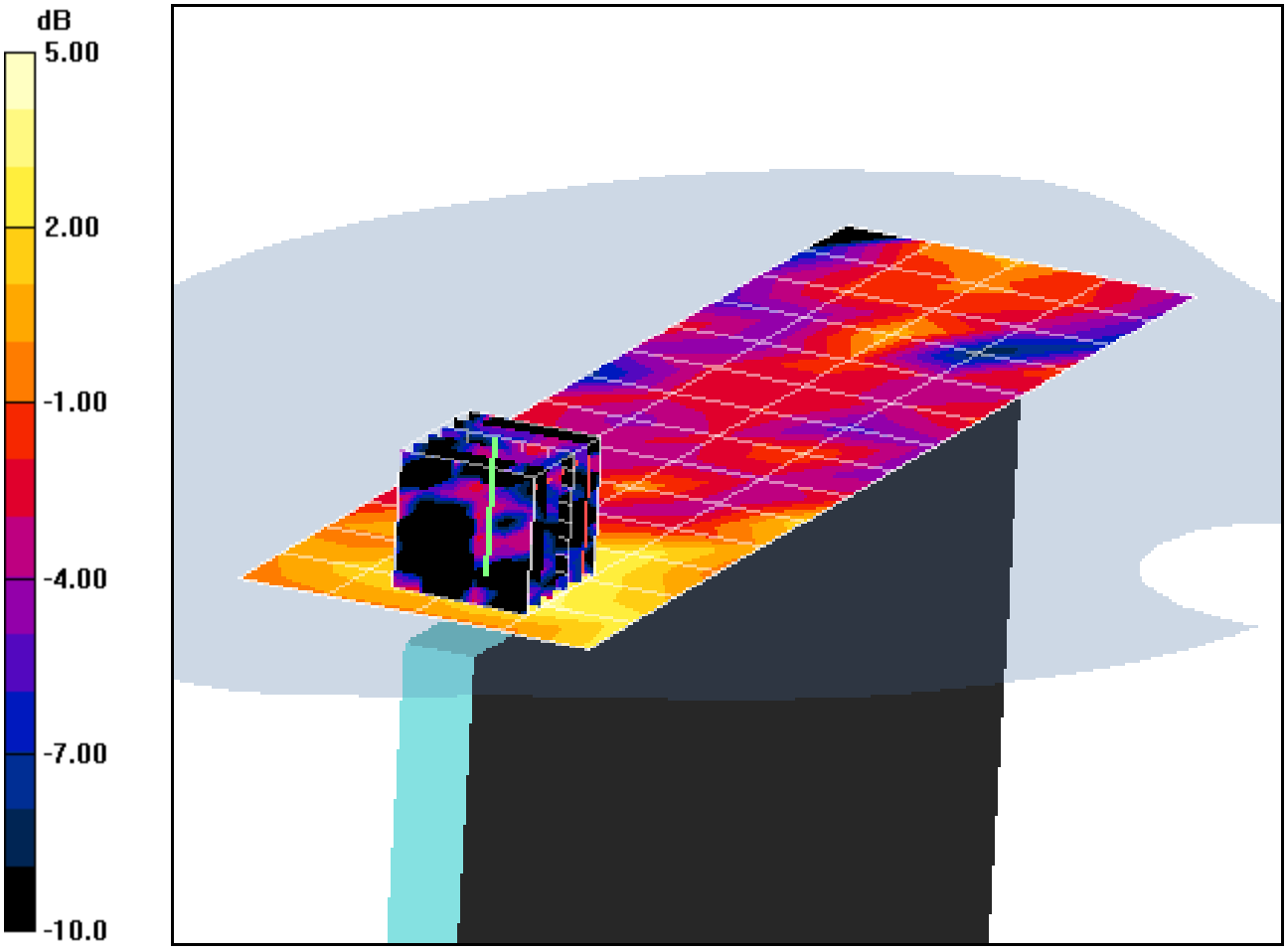
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5805 MHz; σ = 6.07 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.5 cm

Test Date: 09-16-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2.04mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WLAN 802.11a 5.8 GHz, Right, Ch 161, 6 Mbps

Area Scan (5x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.56 V/m
Peak SAR (extrapolated) = 0.087 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00179 mW/g



0 dB = 0.023mW/g

APPENDIX B: DIPOLE VALIDATION

PCTEST ENGINEERING LABORATORY, INC.

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

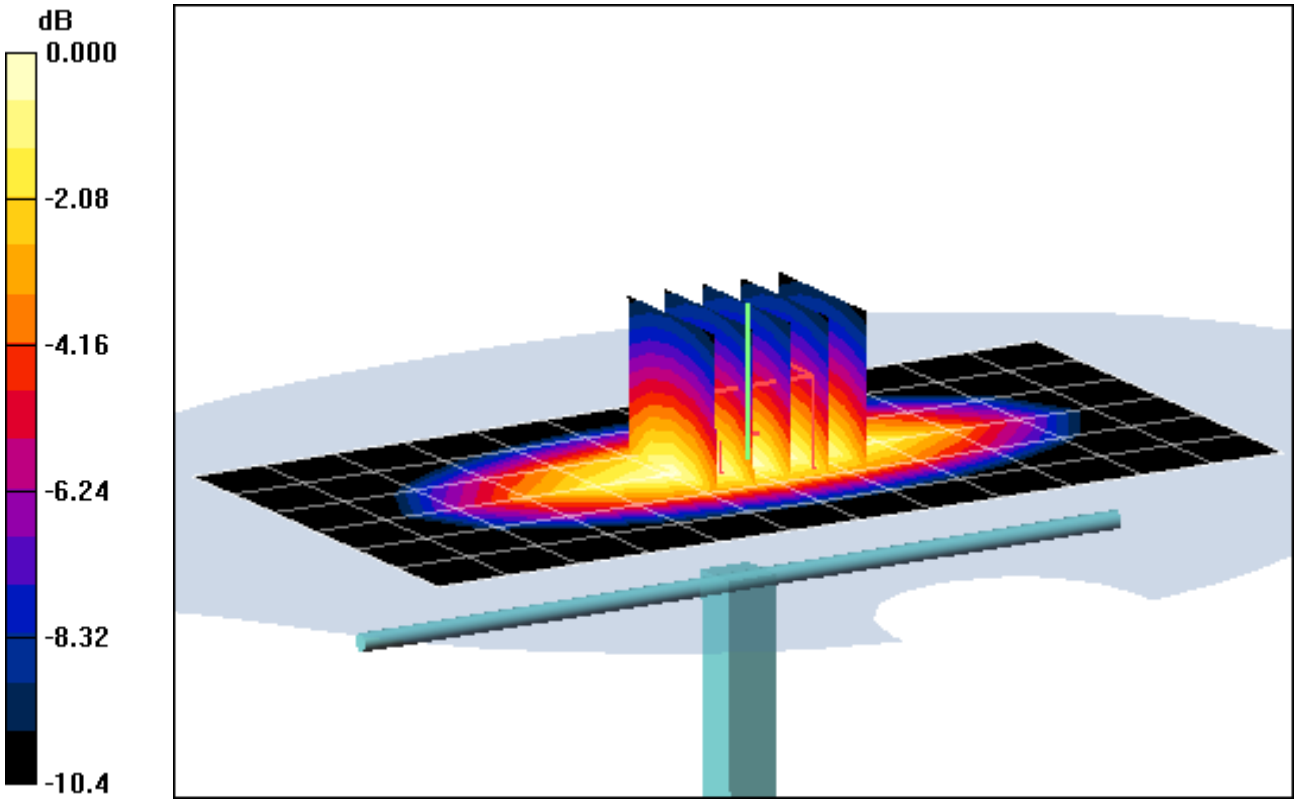
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Muscle Medium parameters used:
f = 835 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 10-11-2010; Ambient Temp: 23.4 °C; Tissue Temp: 21.7 °C

Probe: ES3DV3 - SN3213; ConvF(5.91, 5.91, 5.91); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 18.0 dBm (63 mW)
SAR(1 g) = 0.635 mW/g; SAR(10 g) = 0.418 mW/g
Deviation = 2.64 %



0 dB = 0.686mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

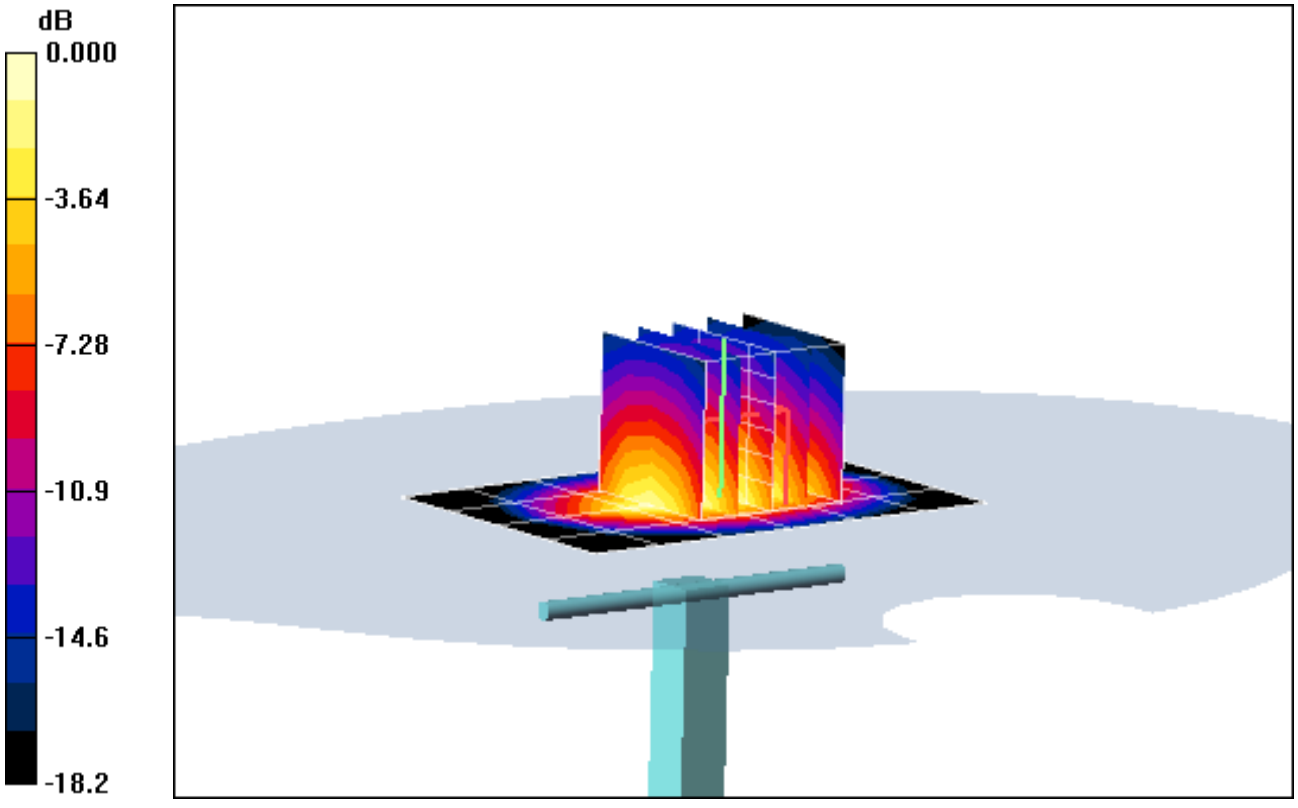
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Muscle Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.55 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-18-2010; Ambient Temp: 24.2 °C; Tissue Temp: 22.4 °C

Probe: EX3DV4 - SN3561; ConvF(6.59, 6.59, 6.59); Calibrated: 8/19/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 4.22 mW/g; SAR(10 g) = 2.18 mW/g
Deviation = 4.20 %



0 dB = 4.67mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

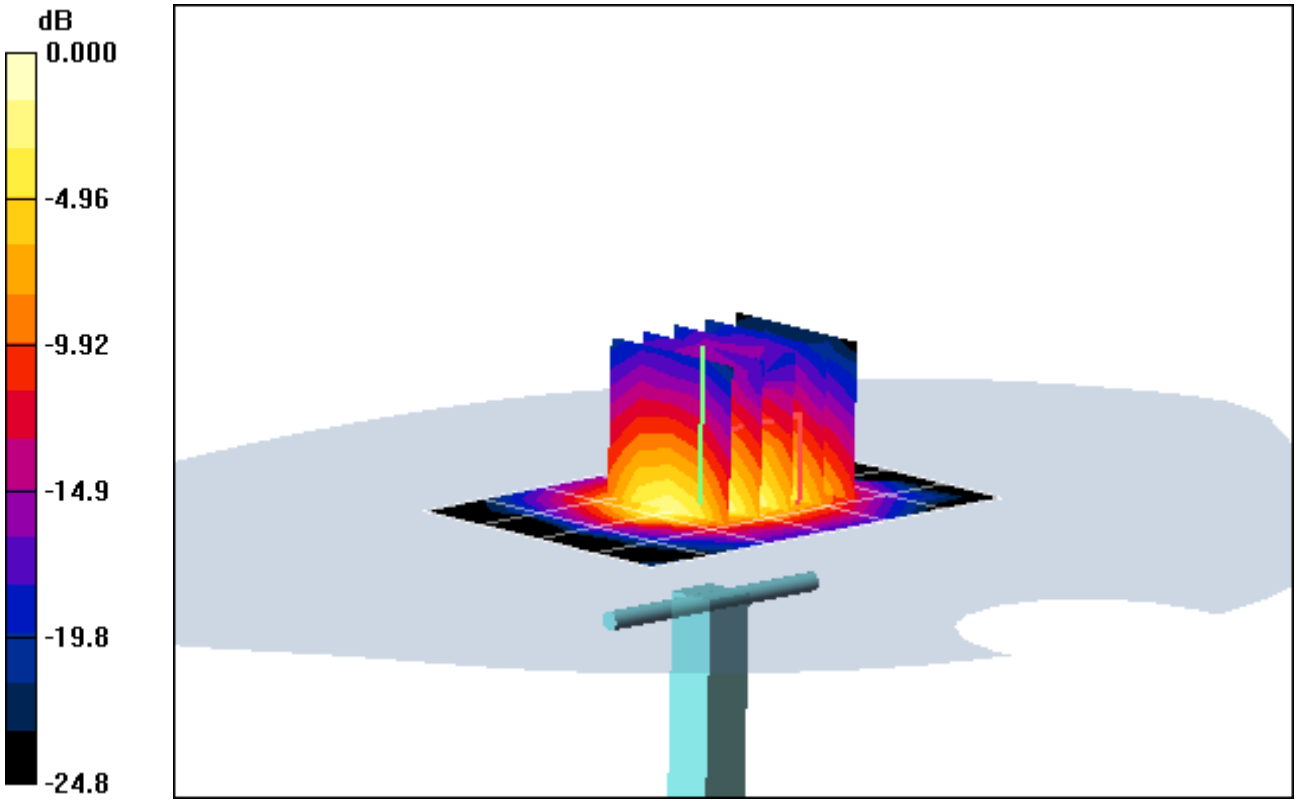
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used:
f = 2450 MHz; σ = 1.98 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-14-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.2 °C

Probe: EX3DV4 - SN3561; ConvF(6.44, 6.44, 6.44); Calibrated: 8/19/2010
Sensor-Surface: 5mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 11.0 dBm (12.6 mW)
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.288 mW/g
Deviation = -5.96 %



0 dB = 0.604mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

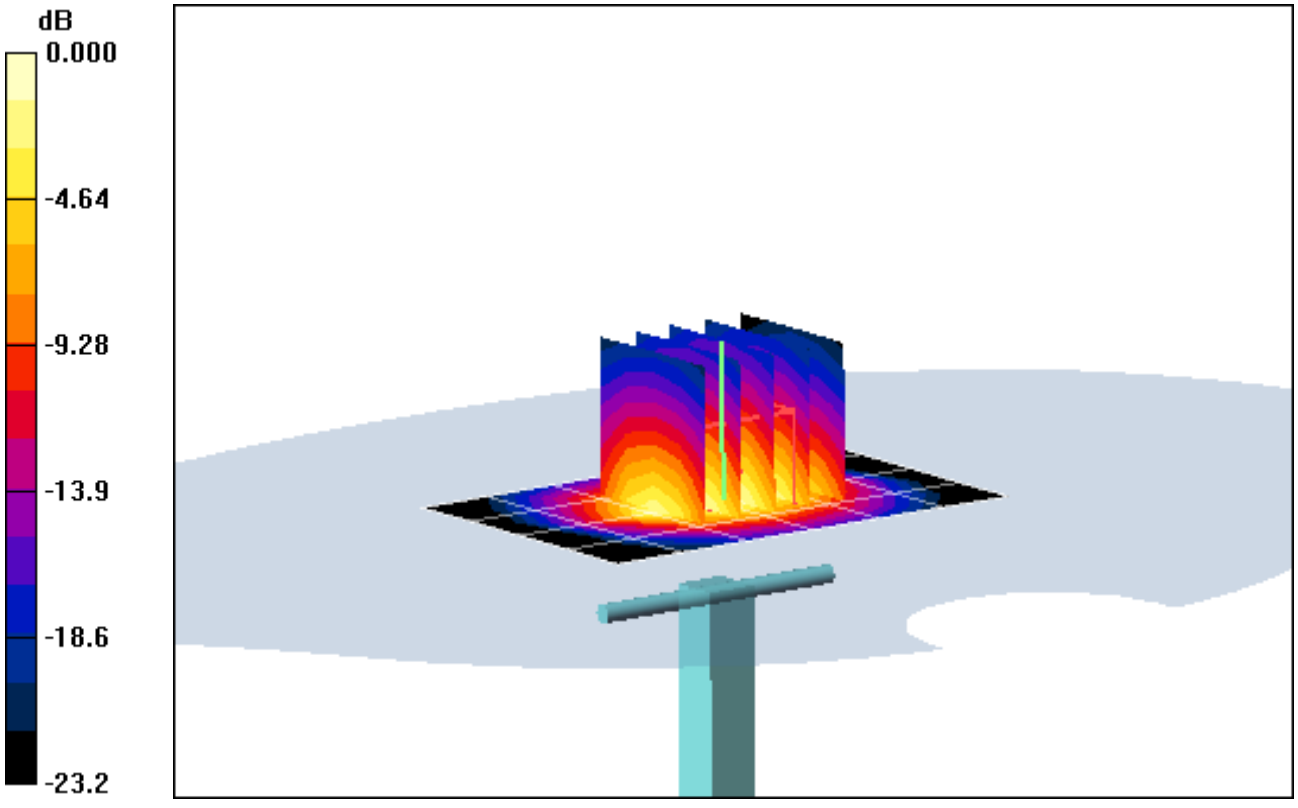
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Muscle Medium parameters used:
f = 2450 MHz; σ = 2.025 mho/m; ε_r = 50.19; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-08-2010; Ambient Temp: 24.0 °C; Tissue Temp: 22.1 °C

Probe: ES3DV3 - SN3213; ConvF(4.27, 4.27, 4.27); Calibrated: 3/16/2010
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn704; Calibrated: 3/22/2010
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 14.0 dBm (25 mW)
SAR(1 g) = 1.35 mW/g; SAR(10 g) = 0.626 mW/g
Deviation = 1.89 %



0 dB = 1.52mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

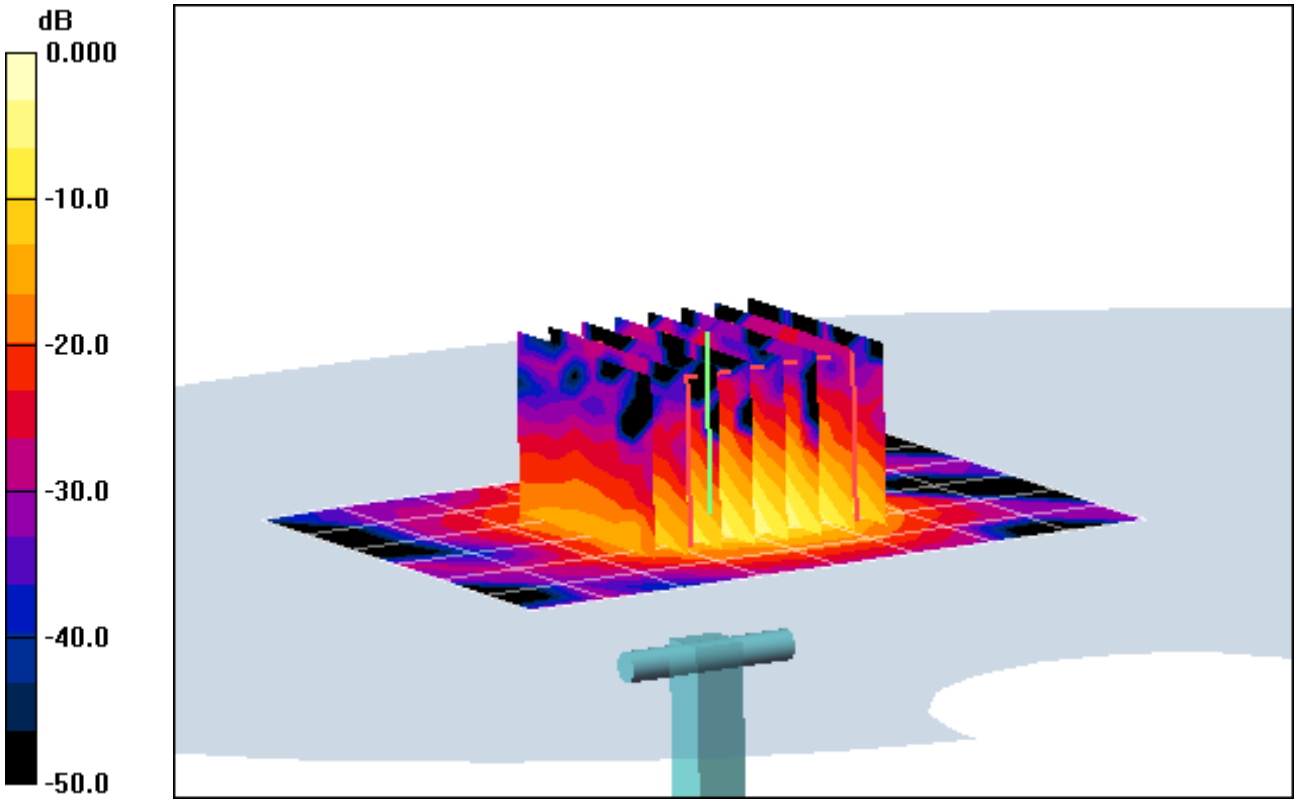
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5200 MHz; σ = 5.25 mho/m; ε_r = 47.1; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-16-2010; Ambient Temp: 23.7 °C; Tissue Temp: 22.5 °C

Probe: EX3DV4 - SN3561; ConvF(3.67, 3.67, 3.67); Calibrated: 8/19/2010
Sensor-Surface: 2.32mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14.0 dBm (25 mW)
SAR(1 g) = 1.85 mW/g; SAR(10 g) = 0.523 mW/g
Deviation = -6.45 %



0 dB = 3.31mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

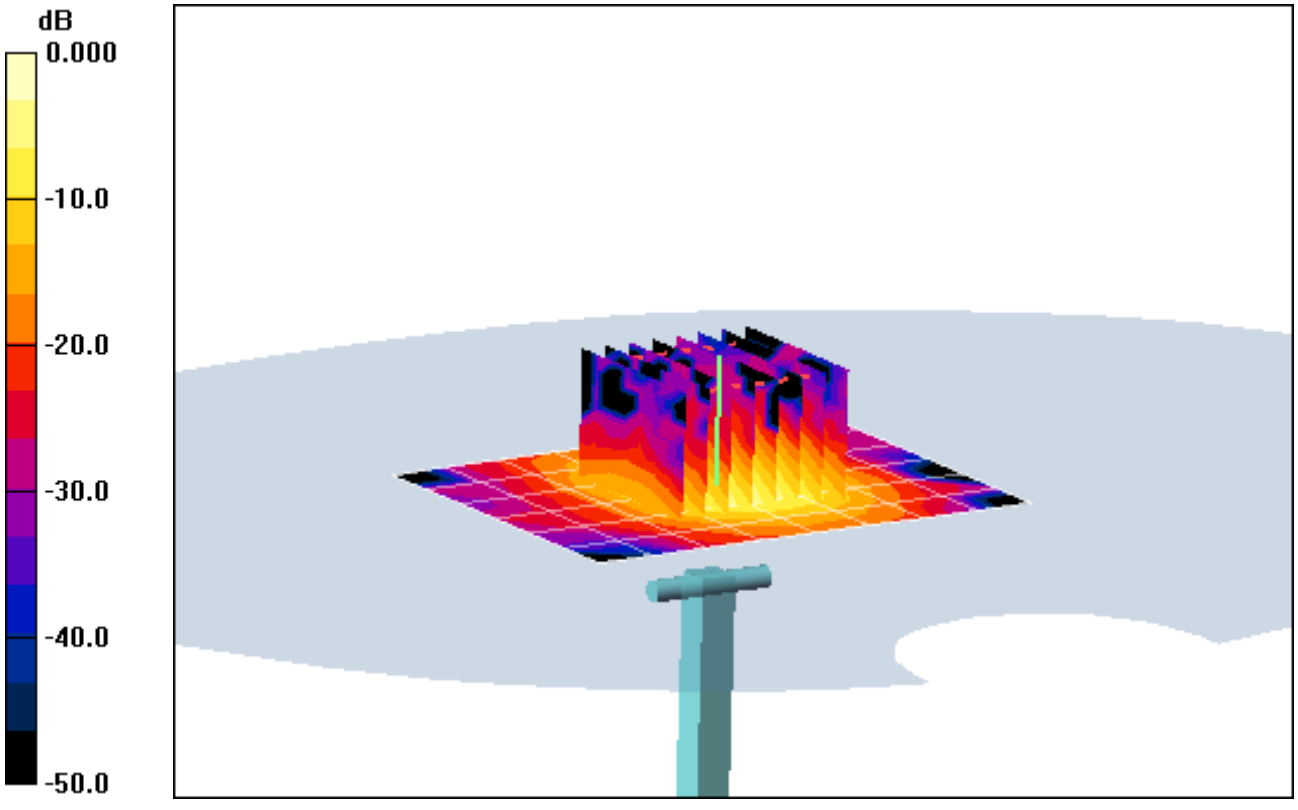
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5500 MHz; σ = 5.66 mho/m; ε_r = 46.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-16-2010; Ambient Temp: 23.5 °C; Tissue Temp: 22.3 °C

Probe: EX3DV4 - SN3561; ConvF(3.31, 3.31, 3.31); Calibrated: 8/19/2010
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14.0 dBm (25 mW)
SAR(1 g) = 2.03 mW/g; SAR(10 g) = 0.568 mW/g
Deviation = -0.49 %



0 dB = 4.10mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5.2-5.8 GHz Muscle Medium parameters used (interpolated):
f = 5800 MHz; σ = 6.07 mho/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

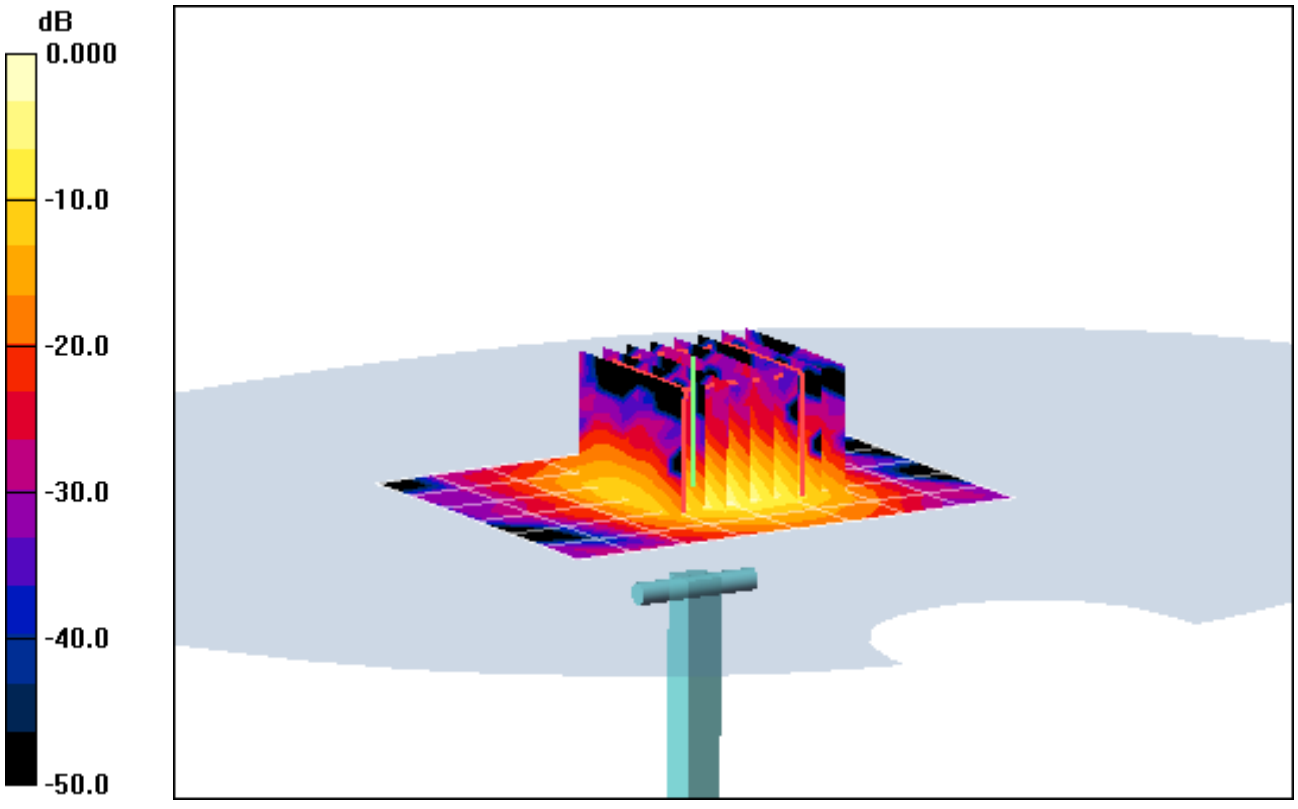
Test Date: 09-16-2010; Ambient Temp: 23.9 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 14.0 dBm (25 mW)
SAR(1 g) = 1.89 mW/g; SAR(10 g) = 0.527 mW/g
Deviation = 5.59 %



0 dB = 3.73mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

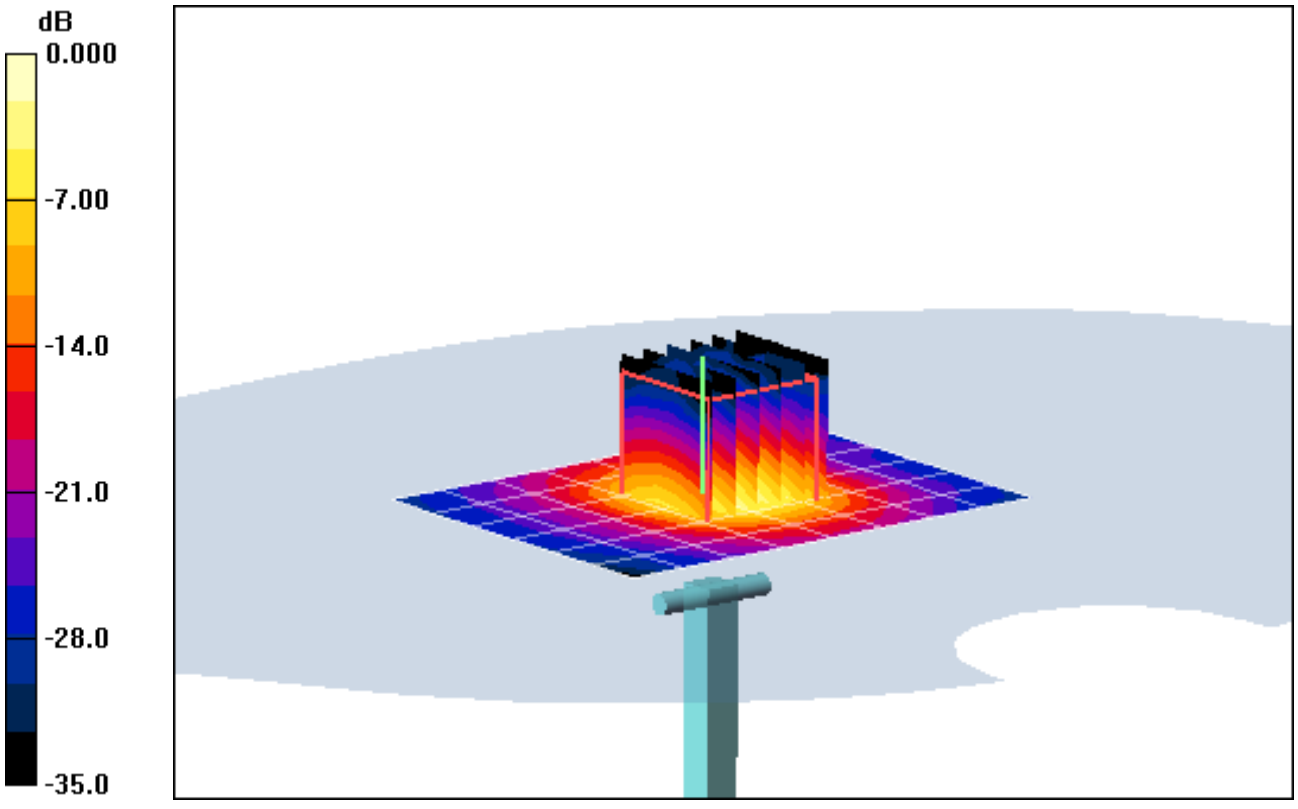
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5200 MHz; σ = 5.36 mho/m; ε_r = 48.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-06-2010; Ambient Temp: 21.7 °C; Tissue Temp: 20.6 °C

Probe: EX3DV4 - SN3561; ConvF(3.67, 3.67, 3.67); Calibrated: 8/19/2010
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 10.0 dBm (100 mW)
SAR(1 g) = 8 mW/g; SAR(10 g) = 2.18 mW/g
Deviation = 1.14 %



0 dB = 15.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

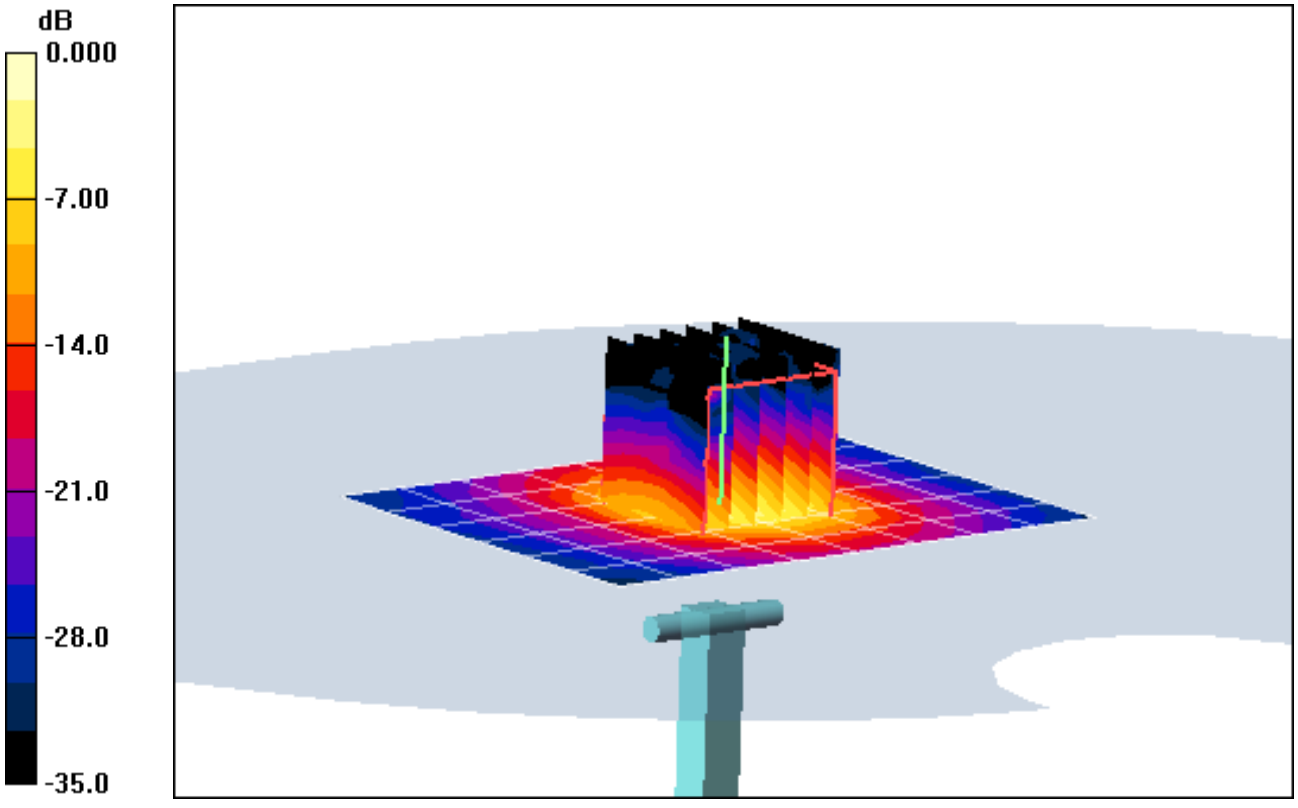
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5500 MHz; σ = 5.82 mho/m; ε_r = 48.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-07-2010; Ambient Temp: 22.1 °C; Tissue Temp: 20.9 °C

Probe: EX3DV4 - SN3561; ConvF(3.31, 3.31, 3.31); Calibrated: 8/19/2010
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 10.0 dBm (100 mW)
SAR(1 g) = 7.92 mW/g; SAR(10 g) = 2.11 mW/g
Deviation = -2.94 %



0 dB = 17.2mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

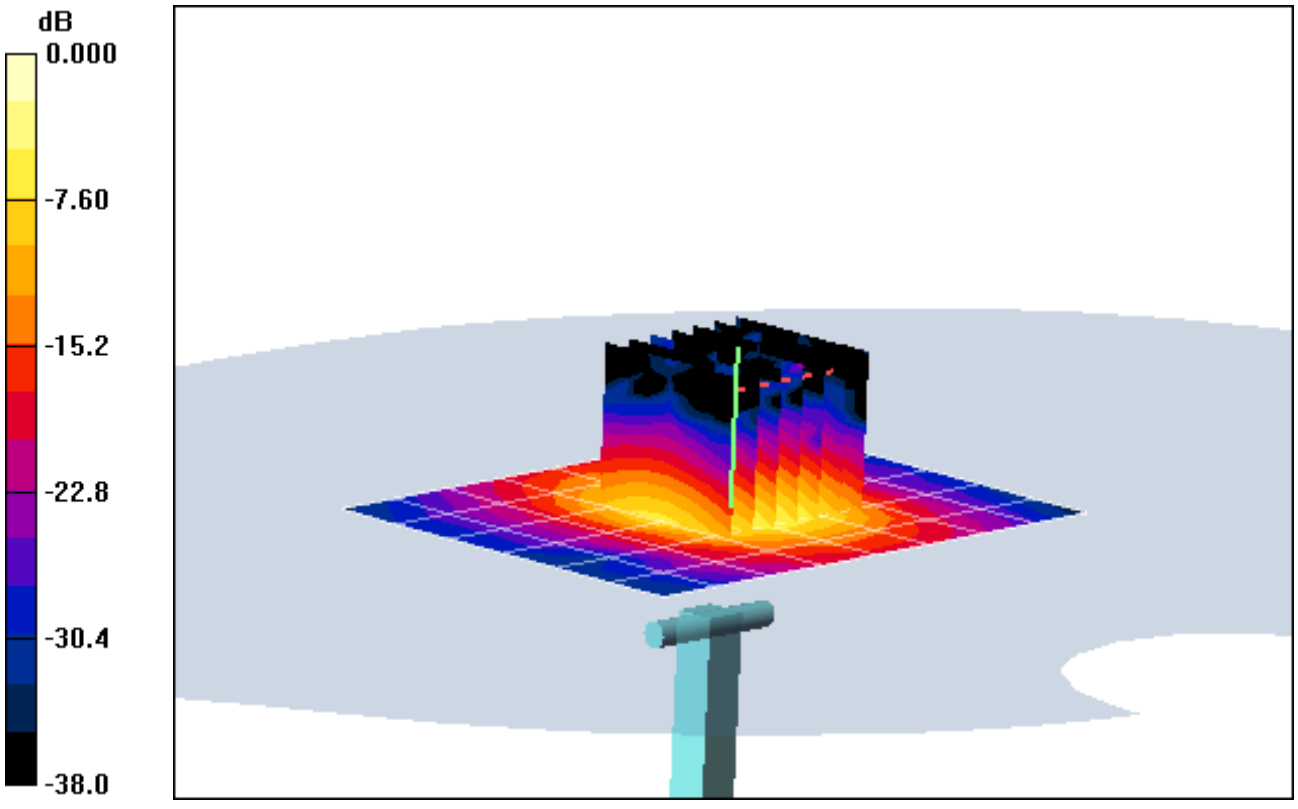
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5GHz Medium parameters used (interpolated):
f = 5800 MHz; σ = 6.22 mho/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10-07-2010; Ambient Temp: 21.4 °C; Tissue Temp: 20.8 °C

Probe: EX3DV4 - SN3561; ConvF(3.25, 3.25, 3.25); Calibrated: 8/19/2010
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/21/2010
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 10.0 dBm (100 mW)
SAR(1 g) = 7.87 mW/g; SAR(10 g) = 2.18 mW/g
Deviation = 9.92 %



0 dB = 16.5mW/g

APPENDIX C: PROBE CALIBRATION

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client PC Test

Certificate No: ES3-3213_Mar10

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3213

Calibration procedure(s): QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes

Calibration date: March 16, 2010

VOIC
3/29/10

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 19, 2010

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Servizio svizzero di taratura
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Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3213

Manufactured:	October 14, 2008
Last calibrated:	April 15, 2009
Recalibrated:	March 16, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV3 SN:3213

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.24	1.40	1.36	± 10.1%
DCP (mV)[B]	93.8	93.1	91.6	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY - Parameters of Probe: ES3DV3 SN:3213

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	6.30	6.30	6.30	0.99	1.04 ± 13.3%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.98	5.98	5.98	0.96	1.07 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.11	5.11	5.11	0.50	1.38 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.92	4.92	4.92	0.53	1.39 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.36	4.36	4.36	0.46	1.62 ± 11.0%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY - Parameters of Probe: ES3DV3 SN:3213

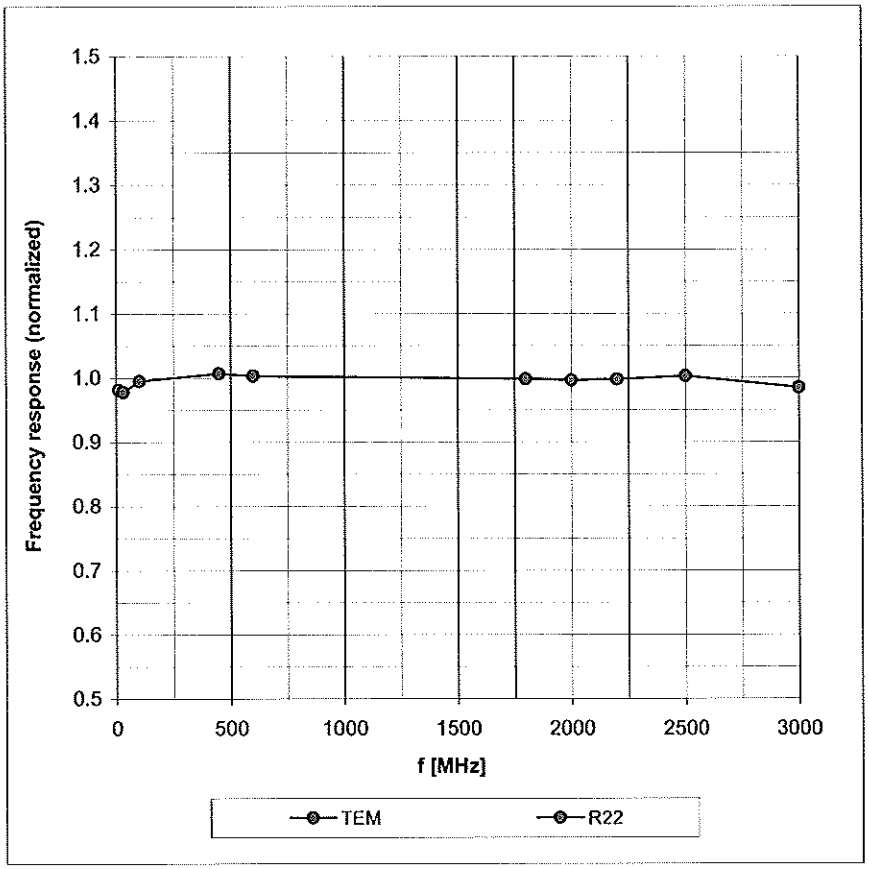
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	5.97	5.97	5.97	0.77	1.16	± 13.3%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.91	5.91	5.91	0.85	1.17	± 11.0%
1640	± 50 / ± 100	53.8 ± 5%	1.40 ± 5%	5.04	5.04	5.04	0.35	1.97	± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.80	4.80	4.80	0.42	1.82	± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.61	4.61	4.61	0.41	1.97	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.27	4.27	4.27	0.70	1.36	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.16	4.16	4.16	0.92	1.17	± 11.0%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

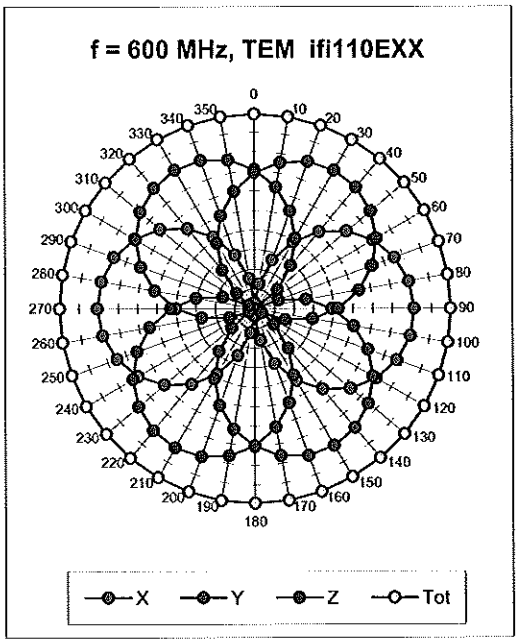
Frequency Response of E-Field

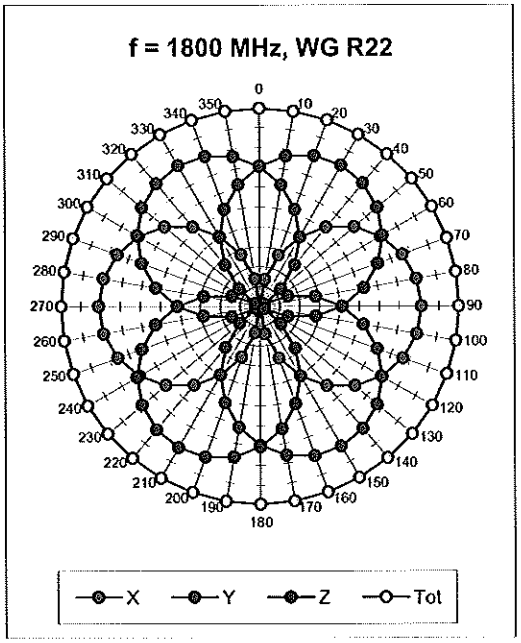
(TEM-Cell:ifi110 EXX, Waveguide: R22)

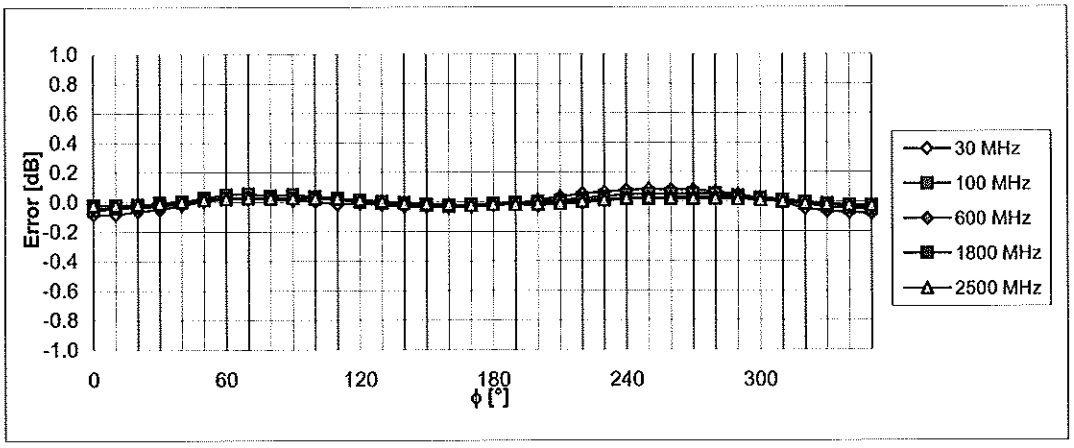


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



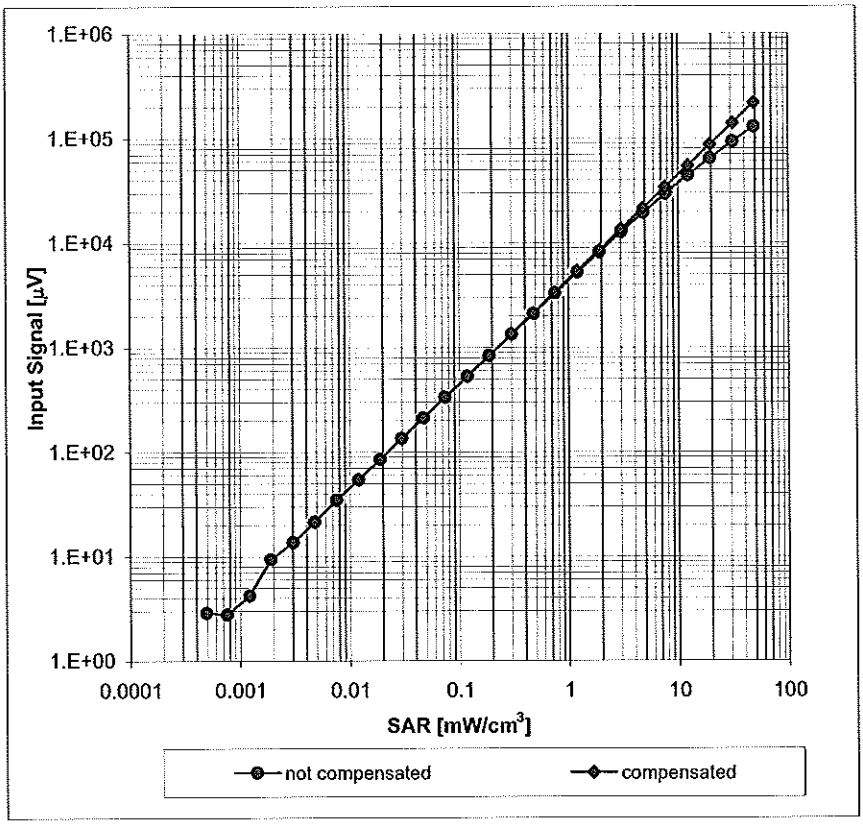


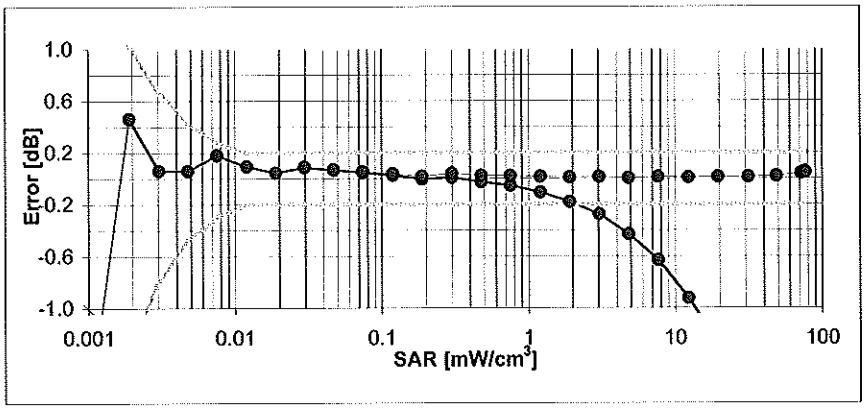


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

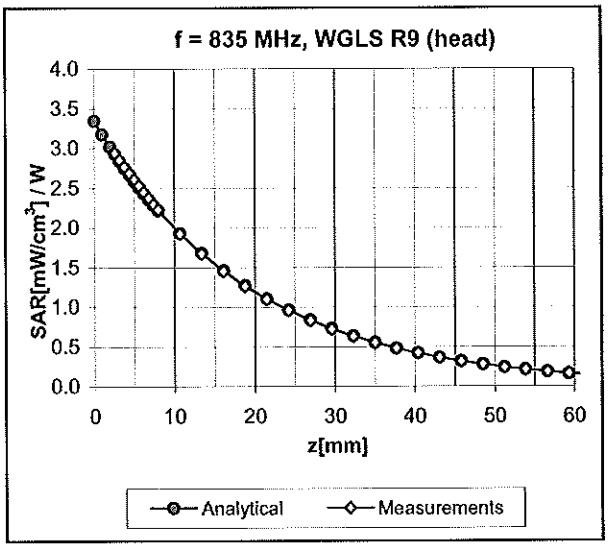
(Waveguide R22, f = 1800 MHz)

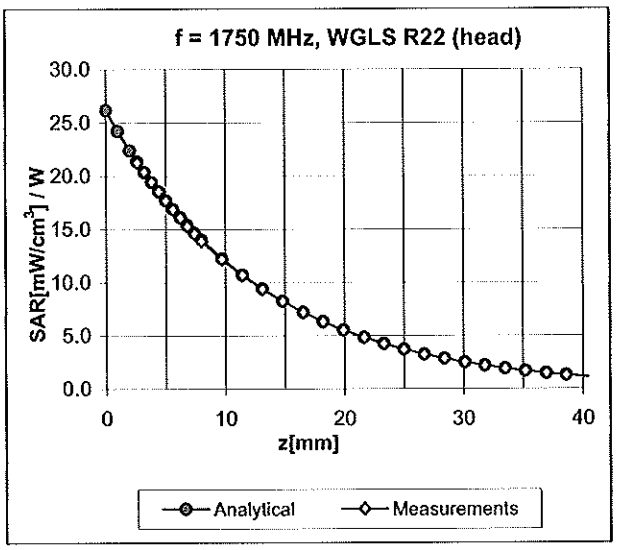




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

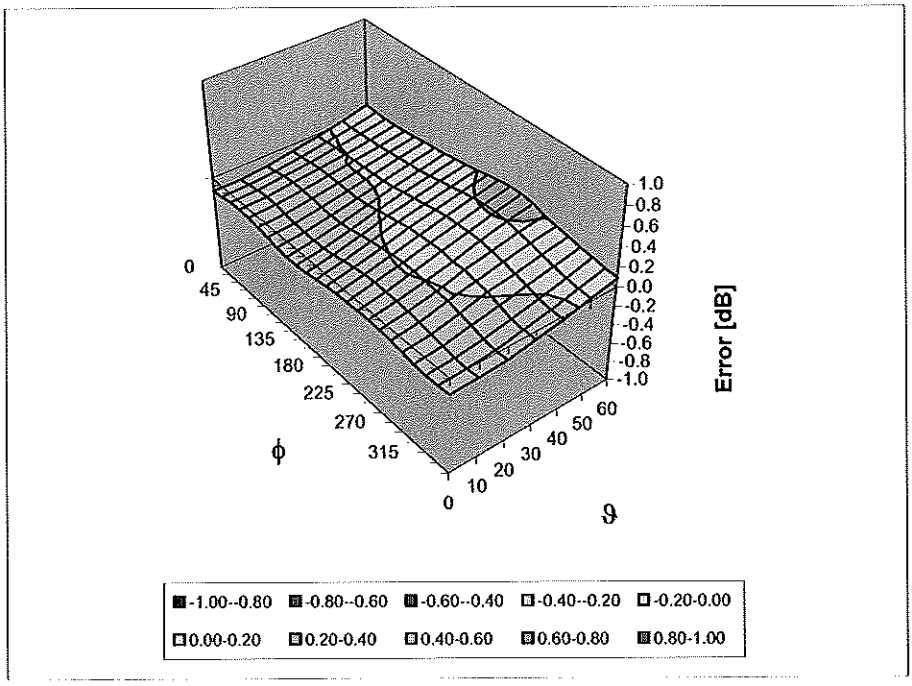
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

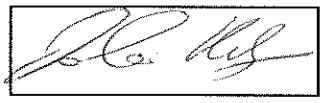
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3213**
Place of Assessment:	**Zurich**
Date of Assessment:	**April 13, 2010**
Probe Calibration Date:	**March 16, 2010**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. The evaluation is coupled with measured conversion factors (probe calibration date indicated above). The uncertainty of the numerical assessment is based on the extrapolation from measured value at 835 MHz or at 1750 MHz.

Assessed by:



Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV3 SN:3213

Conversion factor (± standard deviation)

1640 ± 50 MHz	*ConvF*	**5.27 ± 7%**	ε_r = 40.2 ± 5% σ = 1.31 ± 5% mho/m (head tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY4 Manual.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client PC Test

Certificate No: EX3-3561_Aug10

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3561

Calibration procedure(s): QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes

Calibration date: August 19, 2010

KOK 8/30/10

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
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Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: August 20, 2010

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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3561

Manufactured:	February 14, 2005
Last calibrated:	August 26, 2008
Recalibrated:	August 19, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3561

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.45	0.48	0.43	± 10.1%
DCP (mV)[B]	87.4	89.6	88.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300	± 1.5%
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value

DASY/EASY - Parameters of Probe: EX3DV4 SN:3561

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][c]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	8.36	8.36	8.36	0.76	0.64 ± 11.0%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	7.96	7.96	7.96	0.75	0.64 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	6.92	6.92	6.92	0.90	0.57 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	6.69	6.69	6.69	0.76	0.63 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	6.11	6.11	6.11	0.42	0.83 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.09	6.09	6.09	0.36	0.93 ± 11.0%

[c] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3561

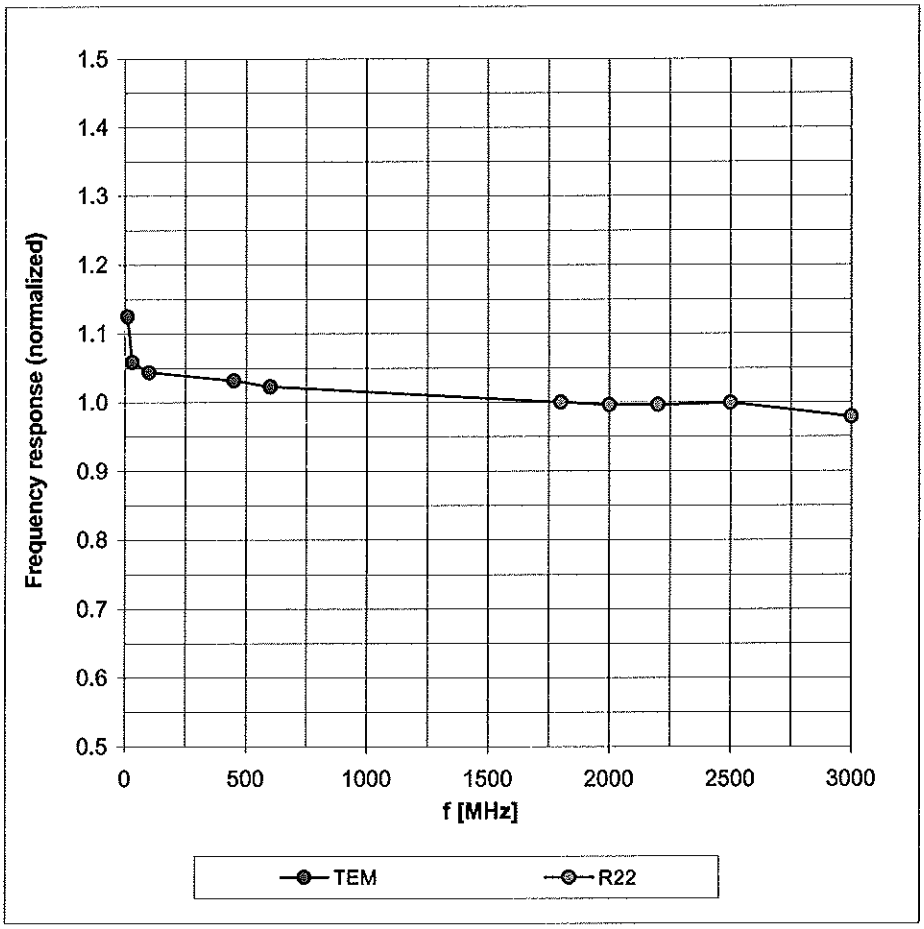
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	8.09	8.09	8.09	0.74	0.65 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	6.84	6.84	6.84	0.43	0.82 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	6.59	6.59	6.59	0.56	0.71 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	6.44	6.44	6.44	0.37	0.87 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.45	6.45	6.45	0.37	0.95 ± 11.0%
4950	± 50 / ± 100	49.4 ± 5%	5.01 ± 5%	3.80	3.80	3.80	0.53	1.90 ± 13.1%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	3.67	3.67	3.67	0.60	1.95 ± 13.1%
5300	± 50 / ± 100	48.5 ± 5%	5.42 ± 5%	3.42	3.42	3.42	0.63	1.95 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.31	3.31	3.31	0.63	1.95 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.12	3.12	3.12	0.65	1.95 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.25	3.25	3.25	0.65	1.95 ± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

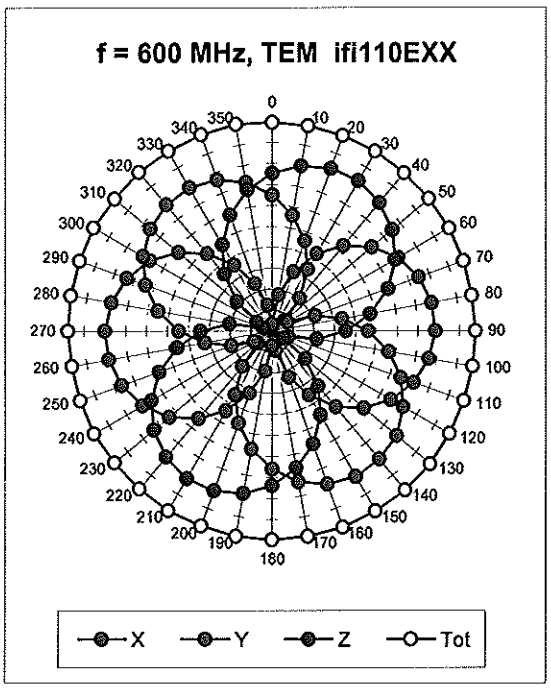
Frequency Response of E-Field

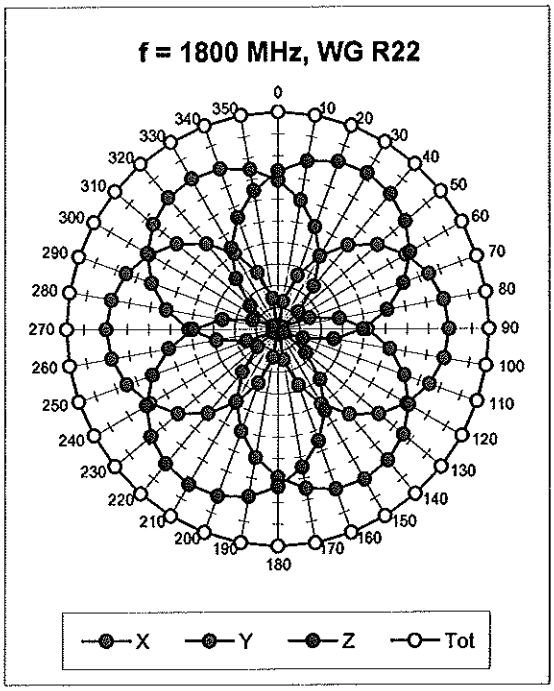
(TEM-Cell:ifi110 EXX, Waveguide: R22)

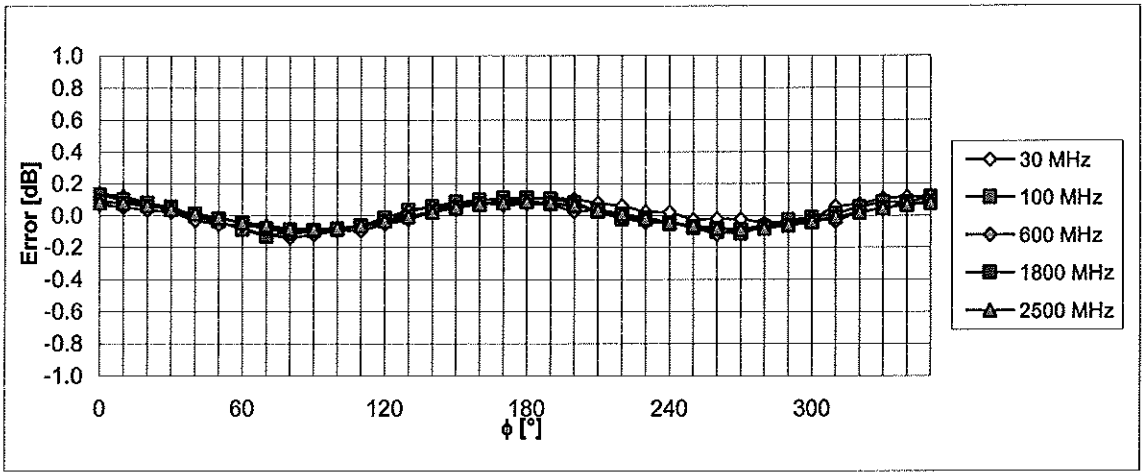


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



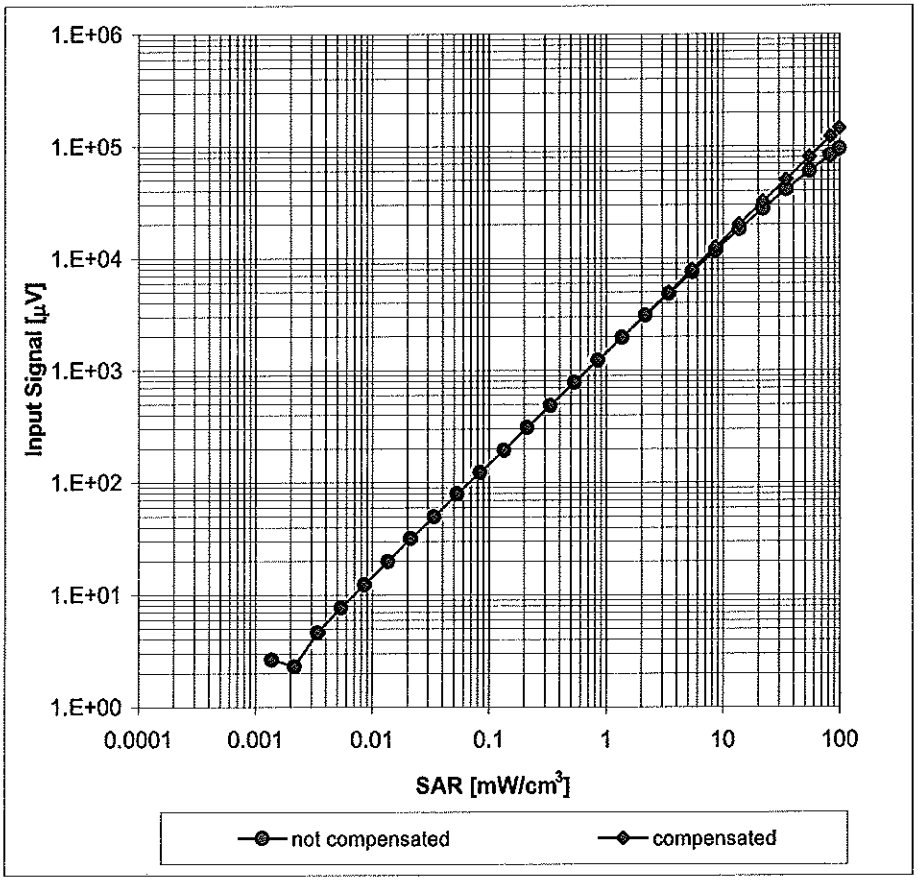


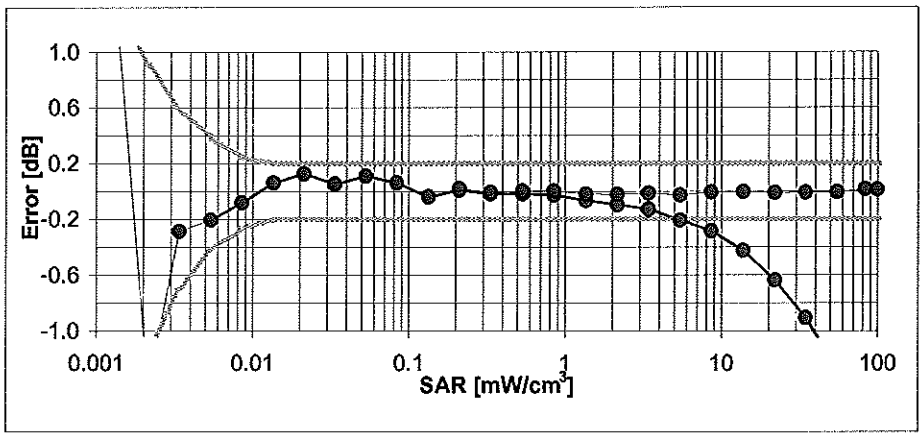


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

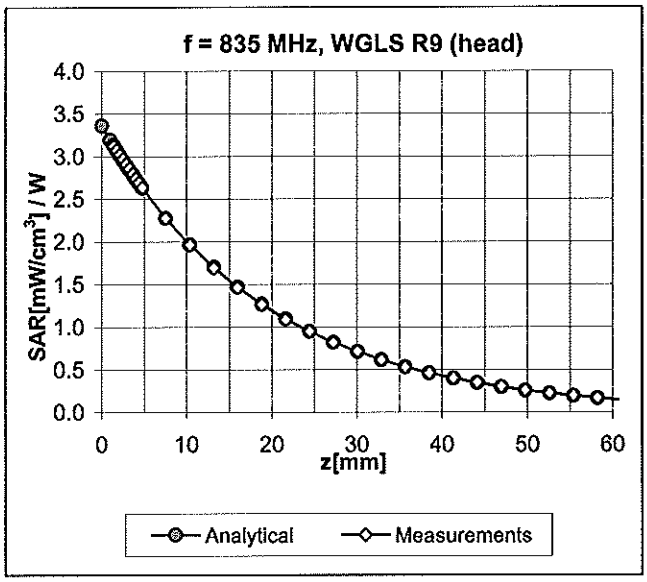
(Waveguide R22, f = 1800 MHz)

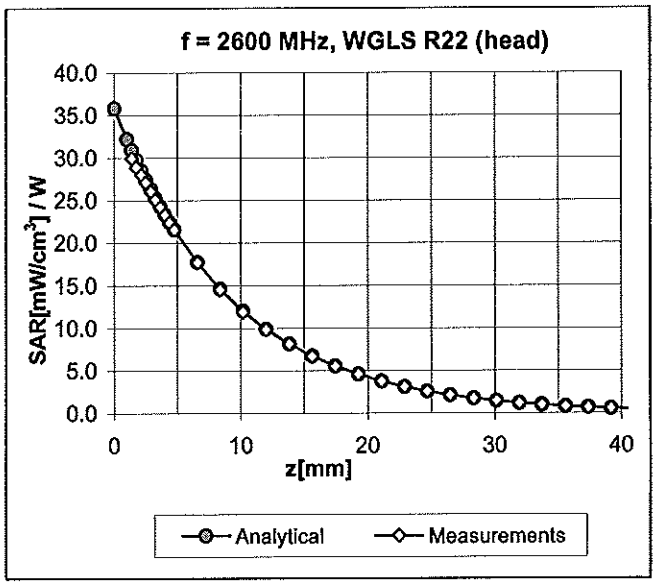




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

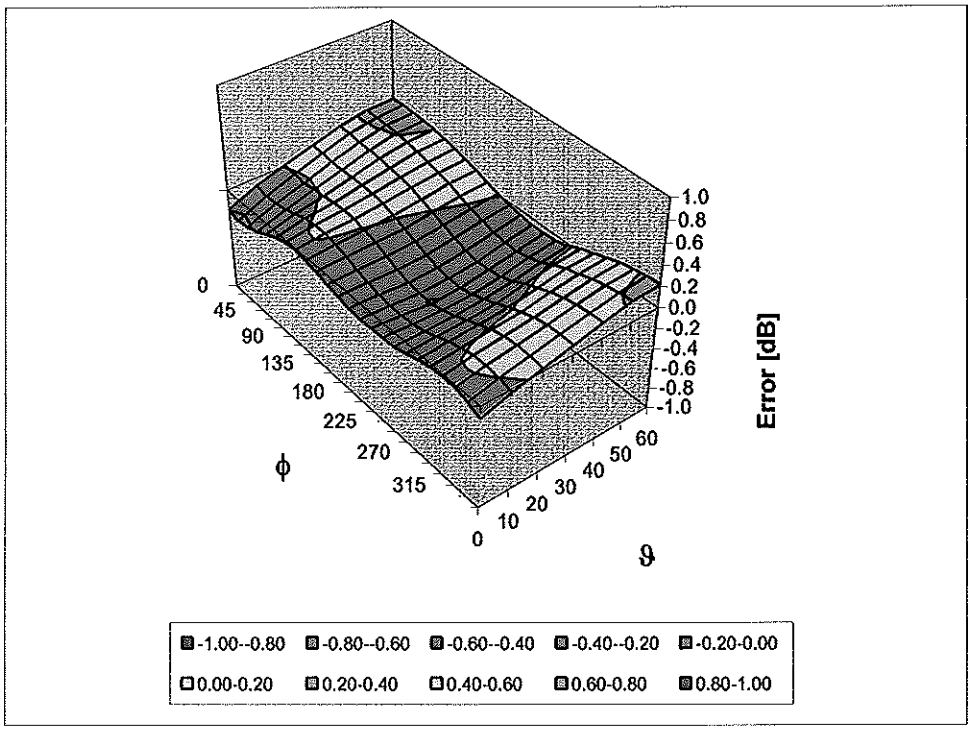
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm