



SAR COMPLIANCE EVALUATION REPORT

Applicant Name:

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

Date of Testing:

01/03/12 - 01/31/12

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

0Y1201030012-R1.A3L

FCC ID:

A3LSGHI577

APPLICANT:

SAMSUNG ELECTRONICS, CO. LTD.

EUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SGH-I577

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
LTE Band 17	706.50 - 713.50	22.80	0.12	0.08	0.10
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	32.81	0.25	0.50	0.50
WCDMA/HSPA 850	826.40 - 846.60 MHz	22.90	0.21	0.28	0.34
LTE Band 4 (AWS)	1712.50 - 1752.50 MHz	22.76	0.92	0.62	0.74
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	30.30	0.45	0.58	0.76
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz	23.02	0.71	0.67	0.87
2.4 GHz WLAN	2412 - 2462 MHz	15.41	0.08	0.27	0.27
Bluetooth	2402 - 2480 MHz	11.87	N/A		
Simultaneous SAR per KDB 690783 D01:			0.96	0.94	0.94

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

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

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. This revised Test Report (S/N: 0Y1201030012-R1.A3L) supersedes and replaces any previously issued test reports on the same subject EUT for the same type of testing as indicated. Please discard and destroy any previously issued test reports and dispose of them accordingly.


Randy Ortanez
President



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Tx Frequency
LTE Band 17	706.50 - 713.50
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz
WCDMA/HSPA 850	826.40 - 846.60 MHz
LTE Band 4 (AWS)	1712.50 - 1752.50 MHz
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz
2.4 GHz WLAN	2412 - 2462 MHz
Bluetooth	2402 - 2480 MHz
NFC	13.56 MHz

1.2 Near Field Communications (NFC)

This DUT has NFC operations. The NFC antenna is integrated into the standard battery and will be the only battery available from the manufacturer for this model. Therefore all SAR tests were performed with the standard battery which already integrates the NFC antenna. As described in Operational Description, the device restricts the battery used to battery model: ICP565154M.

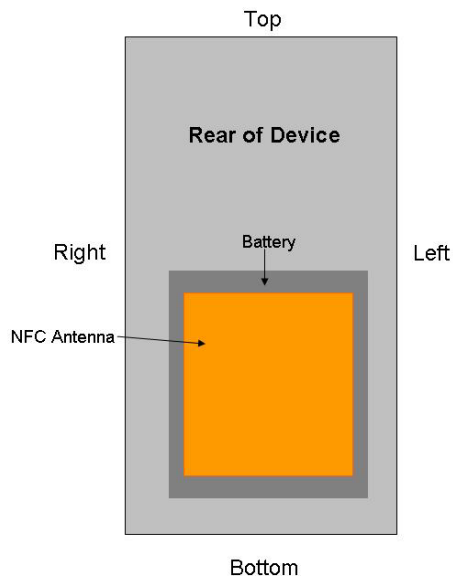


Figure 1-1
NFC Antenna Location on the Battery

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1.3 DUT Antenna Locations

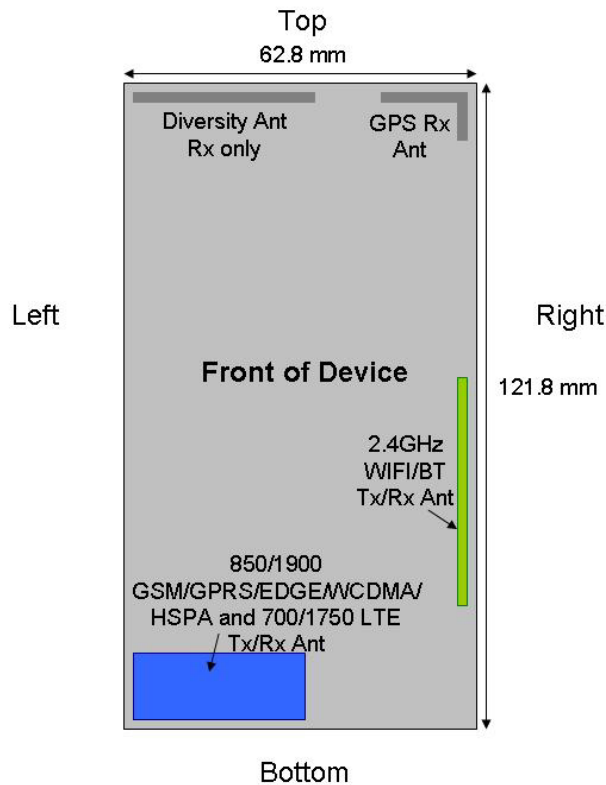


Figure 1-2
DUT Antenna Locations

1.4 Simultaneous Transmission Capabilities

According to KDB 648474, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in **Figure 1-3** and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.



Figure 1-3
Simultaneous Transmission Paths

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This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to KDB 447498 4) b) iii) procedures.

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

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

(*) = for VOIP 3rd party applications possibly installed and used by end-user

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

1.5 Device Restrictions Applicable for SAR Testing

(A) WIFI/BT Testing

Since Wireless Router operations are not allowed by the chipset firmware using 5 GHz WIFI, only 2.4 GHz WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations in KDB 941225 D06.

The separation distance between the licensed transmitter and the Bluetooth/WLAN antenna is 25mm.

- Maximum peak RF Conducted Power of Bluetooth Tx is 15.38 mW.
- Maximum peak RF Conducted Power of WLAN 802.11b mode is 67.14 mW.
- Maximum peak RF Conducted Power of WLAN 802.11g mode is 113.24 mW.
- Maximum peak RF Conducted Power of WLAN 802.11n mode is 97.50 mW.
- Maximum average RF Conducted Power of Bluetooth Tx is 13.65 mW.
- Maximum average RF Conducted Power of WLAN 802.11b mode is 34.75 mW.
- Maximum average RF Conducted Power of WLAN 802.11g mode is 18.92 mW.
- Maximum average RF Conducted Power of WLAN 802.11n mode is 14.89 mW.

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

1. The maximum average RF conducted power for Bluetooth (13.65 mW) is less than 60/f.
2. Bluetooth and 2.4 GHz WLAN share the same antenna path and cannot transmit simultaneously.
3. The maximum peak and average Bluetooth power is less than the respective peak and average output powers in all WLAN modes.
4. The measured WLAN SAR is < 0.4 W/kg for all applicable Bluetooth configurations (Body-Worn).
5. Simultaneous transmission SAR exclusion applies to all applicable configurations involving WLAN or Bluetooth since all simultaneous sums for WLAN are less than 1.6 W/kg.

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(B) GSM/WCDMA/LTE Testing

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

GSM/GPRS/EDGE DTM is not supported. Therefore GSM Voice cannot transmit simultaneously with GPRS/EDGE Data.

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

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

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

1.6 Power Reduction for SAR

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

1.7 FCC Guidance Applied

- FCC OET Supplement C
- IEEE 1528-2003
- April 2011 TCB Workshop Notes
- FCC KDB 941225
- FCC KDB 248227
- FCC KDB 648474

1.8 Samples Used for SAR Testing

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

Table 1-2
SAR Test Sample Serial Numbers

Mode/Band	Serial Number
GSM/GPRS 850	#59
GSM/GPRS/WCDMA 850/1900 and 2.4 GHz WLAN	FI-343-A
LTE Band 4 and Band 17	FI-343-C

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Table 2-1
LTE Checklist per KDB 941225 D05

KDB 941225 Section	FCC ID	A3LSGHI577		
	Form Factor	Smartphone		
1)	Frequency Range of each LTE transmission band	BAND4 : Tx (1712.50 ~ 1752.50 MHz) BAND17: Tx (706.50 ~ 713.50 MHz)		
2)	Channel Bandwidths	BAND4 : 5.0MHz, 10MHz BAND17 : 5.0MHz, 10MHz		
3)	Channel Numbers and Frequencies (MHz)	Low	Mid	High
	LTE Band 4 and BW 5MHz	1712.5MHz(19975)	1732.5MHz(20175)	1752.5MHz(20375)
	LTE Band 4 and BW 10MHz	1715MHz(20000)	1732.5MHz(20175)	1750MHz(20350)
	LTE Band 17 and BW 5MHz	706.5MHz(23755)	710MHz(23790)	713.5MHz(23825)
	LTE Band 17 and BW 10MHz	709MHz(23780)	710MHz(23790)	711MHz(23800)
4)(a)	UE Category	3		
(b)	Modulations Supported in UL	QPSK, 16QAM		
	LTE Transmitter and Antenna Implementation	GSM/GPRS/EDGE/WCDMA/HSPA/LTE share same transmission path		
5)	Description of LTE Tx and Ant. Implementation	1 Main TX/RX Ant and 1 Diversity RX Ant		
6)	LTE Voice available?	No		
	Hotspot with LTE+WIFI	Yes		
	Hotspot with LTE+WIFI active with 1XVoice sessions?	No		
7)	LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	Yes		
	A-MPR (Additional MPR) disabled for SAR Testing?	Yes		
8)	Conducted power Table provided for 1RB (low and high offset), 50% RB (centered), 100% RB	Yes		
9-10)	Non-LTE US Wireless Operating Modes/Band	RF Output Power	RF Exposure Configurations	
	850 MHz GSM	See page 1		
	1900MHz GSM			
	850 MHz WCDMA			
	1900 MHz WCDMA			
	2.4GHz Bluetooth			
	2.4GHz WI-FI			
11)	Simultaneous Tx Conditions (Voice and Data Configurations)	See Section 1.4		
12)	Power Reduction used for SAR Compliance?	No		
13)	Describe Power Reduction (LTE Modes)	N/A		
14)	SAR Test Plan	N/A		
15)	SAR test data, preliminary	N/A		

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The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [24]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

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

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

Figure 3-1
SAR Mathematical Equation

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

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

where:

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

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

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4 TEST SITE LOCATION

4.1 INTRODUCTION

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

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.

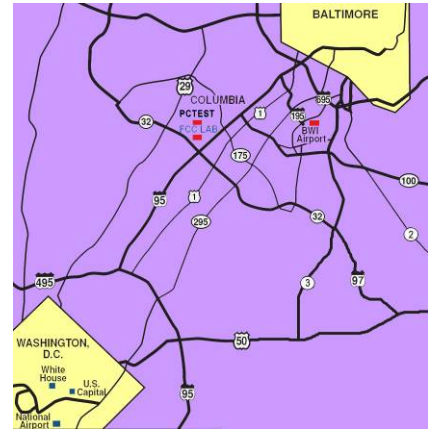
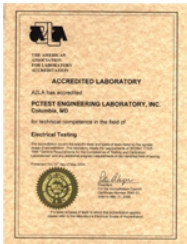


Figure 4-1
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

4.2 Test Facility / Accreditations:

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



- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing-Aid Compatibility (HAC), Battery Safety, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC-2451).
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and all Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS and CDMA, and EvDO mobile phones.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO Data, CDMA 1xRTT Data

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5 SAR MEASUREMENT SETUP

5.1 Robotic System

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

5.2 System Hardware

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

5.3 System Electronics

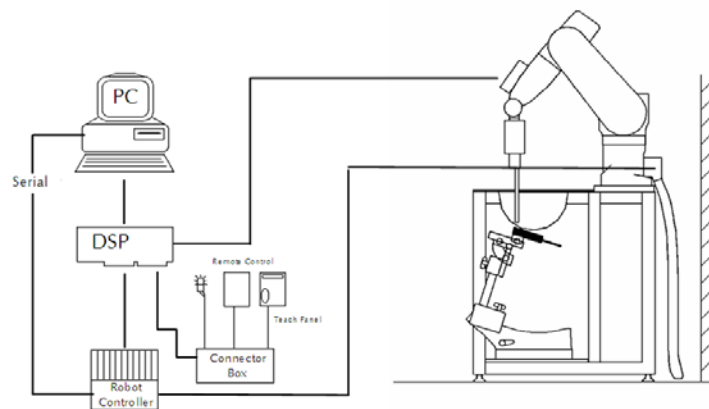


Figure 5-1
SAR Measurement System Setup

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

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5.4 Automated Test System Specifications

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

Data Acquisition Electronic System (DAE)

Data Converter

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

PC Interface Card

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

Phantom

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



Figure 5-2
SAR Measurement System

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6.1 Probe Measurement System



Figure 6-1
SAR System

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

6.2 Probe Specifications

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



Figure 6-2
Near-Field Probe



Figure 6-3
Triangular Probe Configuration

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7.1 SAM Phantoms



Figure 7-1
SAM Phantoms

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

The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

7.2 Tissue Simulating Mixture Characterization

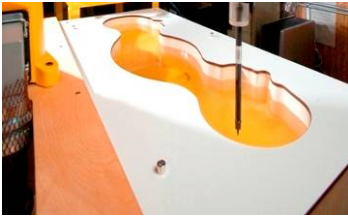


Figure 7-2
SAM Phantom with
Simulating Tissue

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

Table 7-1
Composition of the Tissue Equivalent Matter

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

See next page for 750 MHz Tissue Composition

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

2 Composition / Information on ingredients	
The Item is composed of the following ingredients:	
H ₂ O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 80%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-82-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1 – 0.7%
Relevant for safety; Refer to the respective Safety Data Sheet*.	

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

Measurement Certificate / Material Test

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

Measurement Method

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

Target Parameters

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

Test Condition

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

Additional information

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

Results

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

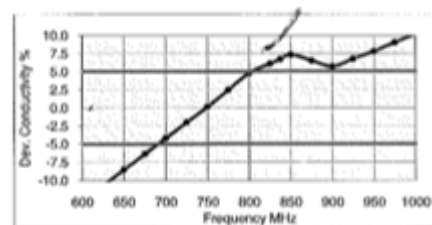
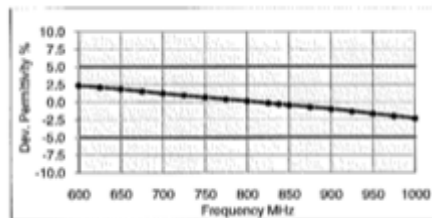


Figure 7-3
750MHz Body Tissue Equivalent Matter

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Measurement Certificate / Material Test

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

Measurement Method

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

Target Parameters

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

Test Condition

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

Additional Information

TSL Density 1.284 g/cm³
TSL Heat-capacity 2.701 kJ/(kg*K)

Results

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

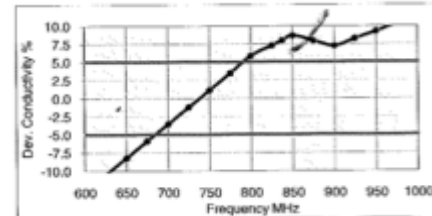
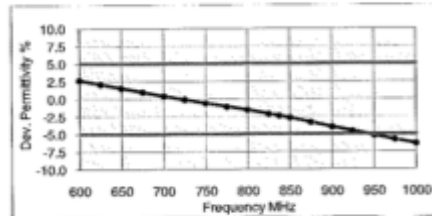


Figure 7-4
750MHz Head Tissue Equivalent Matter

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8 DOSIMETRIC ASSESSMENT

8.1 SAR Measurement Procedure

The evaluation was performed using the following procedure:

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

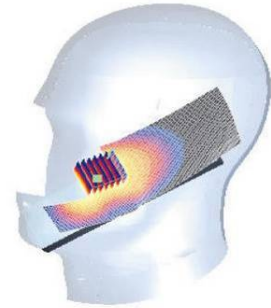


Figure 8-1
Sample SAR Area Scan

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9.1 EAR REFERENCE POINT

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

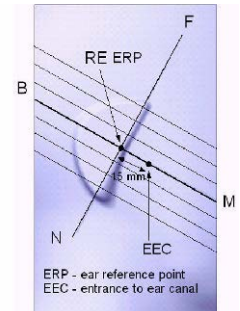


Figure 9-1
Close-Up Side view
of ERP

9.2 HANDSET REFERENCE POINTS

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



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

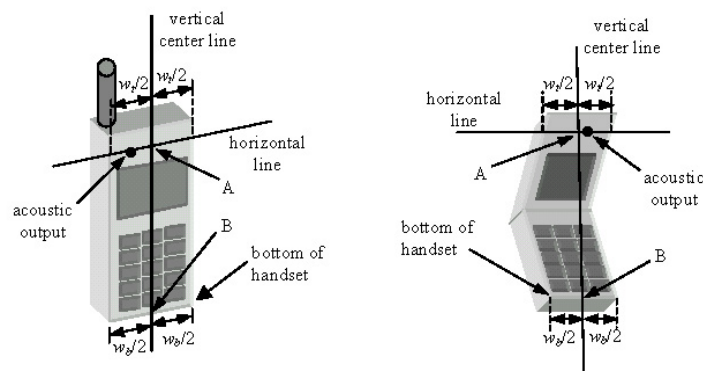


Figure 9-3
Handset Vertical Center & Horizontal Line Reference Points

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10 TEST CONFIGURATION POSITIONS

10.1 Device Holder

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

10.2 Positioning for Cheek/Touch

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

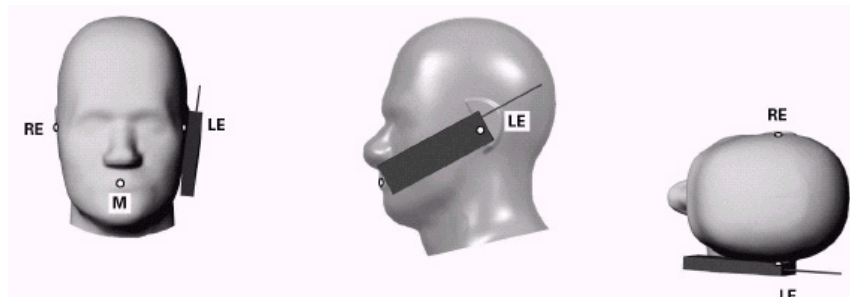


Figure 10-1 Front, Side and Top View of Cheek/Touch Position

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

10.3 Positioning for Ear / 15° Tilt

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

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

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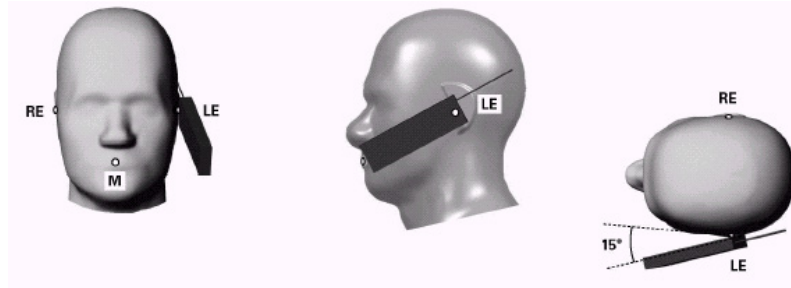


Figure 10-2 Front, Side and Top View of Ear/15° Tilt Position

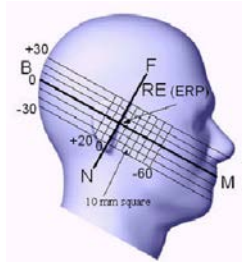


Figure 10-3
Side view w/ relevant markings



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

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

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

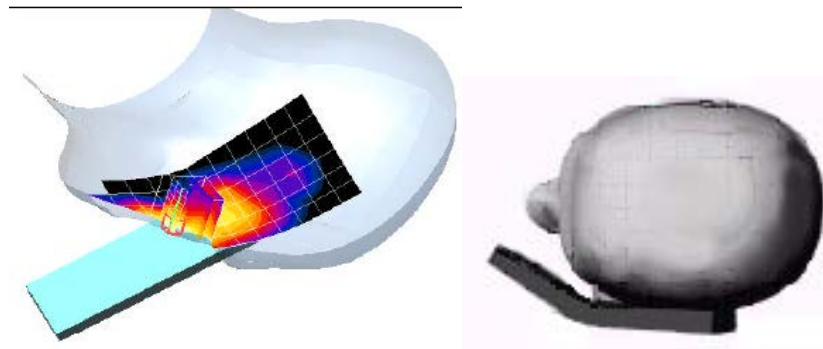


Figure 10-5
SAR Scans near the Jaw/Mouth

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

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

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

10.5 Body Holster /Belt Clip Configurations

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

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

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

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11 FCC RF EXPOSURE LIMITS

11.1 Uncontrolled Environment

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

11.2 Controlled Environment

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

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

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

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

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12 FCC MEASUREMENT PROCEDURES

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

12.1 Procedures Used to Establish RF Signal for SAR

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

The device was placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test were evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device was tested throughout the SAR test at maximum output power, the SAR measurement system measures a "point SAR" at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviated by more than 5%, the SAR test and drift measurements were repeated.

12.2 SAR Measurement Conditions for LTE

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

12.2.1 MPR

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

12.2.2 A-MPR

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

12.2.3 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05:

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

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- g. Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
- h. Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required for the highest bandwidth on the highest output power channel for the 1 RB allocation since the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM.
- i. Per Page 5, 4) B), I), when the SAR for 16QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
- j. Per Page 4, 4), A) I) and Page 5, 4), A)I, 100% RB Allocation is not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth.
- k. Per Page 5, 5) B) I), smaller bandwidths are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth and maximum conducted powers of the smaller bandwidths for all channels and configurations were not more than 0.5 dB higher than the larger bandwidth.

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

12.3.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s".

12.3.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all "1s". SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

12.3.3 Body SAR Measurements

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

12.3.4 SAR Measurements for Handsets with Rel 5 HSDPA

Body SAR for HSDPA is not required for handsets with HSDPA capabilities when the maximum average output power of each RF channel with HSDPA active is less than 0.25 dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is $\leq 75\%$ of the SAR limit. Otherwise, SAR is measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration measured in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that resulted in the highest SAR in 12.2 kbps RMC mode for that RF channel.

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

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parameters of $\Delta\text{ACK} = \Delta\text{NACK} = 5$ and $\Delta\text{CQI} = 2$ is used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

12.3.5 SAR Measurements for Handsets with Rel 6 HSUPA

Body SAR for HSUPA is not required when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 0.25 dB higher than as measured without HSUPA/HSDPA using 12.2 kbps RMC and maximum SAR for 12.2 kbps RMC is $\leq 75\%$ of the SAR limit. Otherwise SAR is measured on the maximum output channel for the body exposure configuration produced highest SAR in 12.2 kbps RMC for that RF channel, using the additional procedures under "Release 6 HSPA data devices"

Head SAR for VOIP operations under HSPA is not required when maximum average output of each RF channel with HSPA is less than 0.25 dB higher than as measured using 12.2 kbps RMC. Otherwise SAR is measured using same HSPA configuration as used for body SAR.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{15}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽⁴⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{d1}: 47/15$ $\beta_{d2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: ΔACK , ΔNACK and $\Delta\text{CQI} = 8 \Leftrightarrow A_{15} = \beta_{15}/\beta_c = 30/15 \Leftrightarrow \beta_{15} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{15}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

12.4 SAR Testing with 802.11 Transmitters

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

Normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 for more details.

12.4.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

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12.4.2 Frequency Channel Configurations [27]

802.11 b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g/n modes are tested on channels 1, 6 and 11. These are referred to as the "default test channels". For 2.4 GHz, 802.11g/n modes were evaluated only if the output power was 0.25 dB higher than the 802.11b mode. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.

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

Mode	GHz	Channel	Turbo Channel	"Default Test Channels"			
				§15.247		UNII	
				802.11b	802.11g		
802.11 b/g	2.412	1		✓	▽		
	2.437	6	6	✓	▽		
	2.462	11		✓	▽		

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13 RF CONDUCTED POWERS

13.1 LTE Conducted Powers

Table 13-1
Band 17 LTE RF Output Conducted Powers

Frequency [MHz]	Channel	Modulation	Bandwidth [MHz]	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
710.0	23790	QPSK	5	1	0	0	0	22.60
710.0	23790	QPSK	5	1	24	0	0	22.64
710.0	23790	QPSK	5	12	6	0-1	1	21.60
710.0	23790	QPSK	5	25	0	0-1	1	21.75
710.0	23790	16-QAM	5	1	0	0-1	1	21.62
710.0	23790	16-QAM	5	1	24	0-1	1	21.70
710.0	23790	16-QAM	5	12	6	0-2	2	20.70
710.0	23790	16-QAM	5	25	0	0-2	2	20.81
710.0	23790	QPSK	10	1	0	0	0	22.80
710.0	23790	QPSK	10	1	49	0	0	22.70
710.0	23790	QPSK	10	25	12	0-1	1	21.80
710.0	23790	QPSK	10	50	0	0-1	1	21.89
710.0	23790	16QAM	10	1	0	0-1	1	21.56
710.0	23790	16QAM	10	1	49	0-1	1	21.54
710.0	23790	16QAM	10	25	12	0-2	2	21.31
710.0	23790	16QAM	10	50	0	0-2	2	20.91

Notes:

1. Differences from expected MPR levels are a result of measurement uncertainty. Per the manufacturer, the measured powers are acceptable for use within the intended network infrastructure. Powers measured below the expected levels on the devices were extrapolated to ensure compliance for SAR.
2. Per KDB 447498 6)c), only 1 channel is required for LTE Band 17 SAR with 10 MHz Bandwidth.

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

Frequency [MHz]	Channel	Modulation	Bandwidth (MHz)	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1712.5	19975	QPSK	5	1	0	0	0	22.64
1712.5	19975	QPSK	5	1	24	0	0	22.62
1712.5	19975	QPSK	5	12	6	0-1	1	21.90
1712.5	19975	QPSK	5	25	0	0-1	1	21.81
1712.5	19975	16-QAM	5	1	0	0-1	1	21.92
1712.5	19975	16-QAM	5	1	24	0-1	1	21.80
1712.5	19975	16-QAM	5	12	6	0-2	2	20.89
1712.5	19975	16-QAM	5	25	0	0-2	2	21.19
1715	20000	QPSK	10	1	0	0	0	22.56
1715	20000	QPSK	10	1	49	0	0	22.63
1715	20000	QPSK	10	25	12	0-1	1	21.75
1715	20000	QPSK	10	50	0	0-1	1	21.72
1715	20000	16QAM	10	1	0	0-1	1	21.73
1715	20000	16QAM	10	1	49	0-1	1	21.52
1715	20000	16QAM	10	25	12	0-2	2	20.83
1715	20000	16QAM	10	50	0	0-2	2	20.63

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

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

Frequency [MHz]	Channel	Modulation	Bandwidth (MHz)	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1732.5	20175	QPSK	5	1	0	0	0	22.70
1732.5	20175	QPSK	5	1	24	0	0	22.85
1732.5	20175	QPSK	5	12	6	0-1	1	21.85
1732.5	20175	QPSK	5	25	0	0-1	1	21.85
1732.5	20175	16-QAM	5	1	0	0-1	1	21.92
1732.5	20175	16-QAM	5	1	24	0-1	1	21.89
1732.5	20175	16-QAM	5	12	6	0-2	2	20.78
1732.5	20175	16-QAM	5	25	0	0-2	2	20.98
1732.5	20175	QPSK	10	1	0	0	0	22.65
1732.5	20175	QPSK	10	1	49	0	0	22.71
1732.5	20175	QPSK	10	25	12	0-1	1	22.02
1732.5	20175	QPSK	10	50	0	0-1	1	21.86
1732.5	20175	16QAM	10	1	0	0-1	1	21.74
1732.5	20175	16QAM	10	1	49	0-1	1	21.58
1732.5	20175	16QAM	10	25	12	0-2	2	21.20
1732.5	20175	16QAM	10	50	0	0-2	2	21.02

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

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

Frequency [MHz]	Channel	Modulation	Bandwidth (MHz)	# of Resource Blocks	Resource Block Offset	MPR Allowed by 3GPP [dB]	Target MPR [dB]	Maximum Average Power [dBm]
1752.5	20375	QPSK	5	1	0	0	0	22.76
1752.5	20375	QPSK	5	1	24	0	0	22.69
1752.5	20375	QPSK	5	12	6	0-1	1	21.73
1752.5	20375	QPSK	5	25	0	0-1	1	21.74
1752.5	20375	16-QAM	5	1	0	0-1	1	21.84
1752.5	20375	16-QAM	5	1	24	0-1	1	21.76
1752.5	20375	16-QAM	5	12	6	0-2	2	20.64
1752.5	20375	16-QAM	5	25	0	0-2	2	20.58
1750	20350	QPSK	10	1	0	0	0	22.76
1750	20350	QPSK	10	1	49	0	0	22.72
1750	20350	QPSK	10	25	12	0-1	1	21.75
1750	20350	QPSK	10	50	0	0-1	1	21.74
1750	20350	16QAM	10	1	0	0-1	1	21.51
1750	20350	16QAM	10	1	49	0-1	1	21.55
1750	20350	16QAM	10	25	12	0-2	2	21.23
1750	20350	16QAM	10	50	0	0-2	2	20.85

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

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13.2 GSM Conducted Powers

		Maximum Burst-Averaged Output Power				
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
Cellular	128	32.75	32.64	32.37	27.37	27.13
	190	32.81	32.75	32.08	27.22	26.98
	251	32.78	32.76	32.10	27.24	27.02
PCS	512	30.08	30.11	29.75	25.70	25.47
	661	30.30	30.30	29.55	25.75	25.53
	810	30.20	30.20	29.90	26.00	25.75

		Calculated Maximum Frame-Averaged Output Power				
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
Cellular	128	23.72	23.61	26.35	18.34	21.11
	190	23.78	23.72	26.06	18.19	20.96
	251	23.75	23.73	26.08	18.21	21.00
PCS	512	21.05	21.08	23.73	16.67	19.45
	661	21.27	21.27	23.53	16.72	19.51
	810	21.17	21.17	23.88	16.97	19.73

Note: Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.

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

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

GSM Class: B

GPRS Multislot class: 10 (max 2 Tx Uplink slots)

EDGE Multislot class: 10 (max 2 Tx Uplink slots)

DTM Multislot Class: N/A

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13.2.1 HSPA Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			β_c	β_d	MPR
			4132	4183	4233	9262	9400	9538			
99	WCDMA	12.2 kbps RMC	23.10	22.90	22.97	22.80	23.02	23.01	-	-	-
99		12.2 kbps AMR	23.10	22.85	22.96	22.82	23.01	22.97	-	-	-
6	HSDPA	Subtest 1	21.52	21.33	21.50	21.30	21.46	21.60	2	15	0
6		Subtest 2	21.63	21.43	21.44	21.61	21.62	21.69	11	15	0
6		Subtest 3	21.22	20.93	21.09	20.90	21.17	21.06	15	8	0.5
6		Subtest 4	21.15	20.97	20.99	20.91	21.15	21.05	15	4	0.5
6	HSUPA	Subtest 1	21.68	21.25	21.27	21.35	21.41	21.55	10	15	0
6		Subtest 2	18.81	18.55	18.62	18.53	18.89	18.64	6	15	2
6		Subtest 3	20.73	20.40	20.66	20.45	20.55	20.52	15	9	1
6		Subtest 4	18.77	18.60	18.52	18.53	19.02	18.97	2	15	2
6		Subtest 5	21.59	21.25	21.19	21.33	21.25	21.23	14	15	0

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

It is expected by the manufacturer that MPR for some HSUPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model. Detailed information is included in the operational description explaining how the MPR is applied for this model.

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



Figure 13-1
Power Measurement Setup

13.3 WLAN Conducted Powers

Table 13-5
IEEE 802.11b Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power [dBm]
2412	1	1	15.36
		2	15.37
		5.5	15.35
		11	15.32
2437	6	1	15.41
		2	15.35
		5.5	15.39
		11	15.39
2462	11	1	15.37
		2	15.3
		5.5	15.35
		11	15.38

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Table 13-6
IEEE 802.11g Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	6	12.60
		9	12.61
		12	12.54
		18	12.61
		24	12.56
		36	12.60
		48	12.68
		54	12.59
2437	6	6	12.69
		9	12.62
		12	12.62
		18	12.58
		24	12.63
		36	12.61
		48	12.63
		54	12.62
2462	11	6	12.73
		9	12.71
		12	12.71
		18	12.71
		24	12.72
		36	12.69
		48	12.70
		54	12.77

Table 13-7
IEEE 802.11n Average RF Power

Freq [MHz]	Channel	Data Rate [Mbps]	Average Power (dBm)
2412	1	6.5/7.2	11.49
		13/14.40	11.62
		19.5/21.70	11.54
		26/28.90	11.57
		29/43.3	11.61
		52/57.80	11.66
		58.50/65	11.53
		65/72.2	11.65
2437	6	6.5/7.2	11.64
		13/14.40	11.63
		19.5/21.70	11.59
		26/28.90	11.57
		29/43.3	11.71
		52/57.80	11.61
		58.50/65	11.69
		65/72.2	11.67
2462	11	6.5/7.2	11.73
		13/14.40	11.71
		19.5/21.70	11.63
		26/28.90	11.64
		29/43.3	11.60
		52/57.80	11.61
		58.50/65	11.65
		65/72.2	11.58

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

- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.

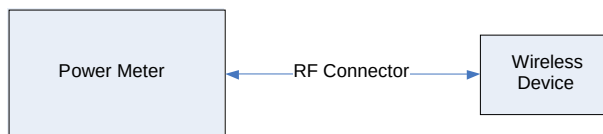


Figure 13-2
Power Measurement Setup

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13.4 Bluetooth Conducted Powers

Table 13-8
Bluetooth Average and Peak Conducted Powers

Frequency [MHz]	Channel No.	Data Rate [Mbps]	Average Power (dBm)	Peak Power (dBm)
2402	0	1	11.01	11.29
2441	39	1	11.35	11.62
2480	78	1	10.90	11.16
2402	0	2	8.88	11.24
2441	39	2	9.26	11.60
2480	78	2	8.77	11.14
2402	0	3	8.87	11.55
2441	39	3	9.27	11.87
2480	78	3	8.83	11.40

Bluetooth SAR was not required per April 2011 TCB Workshop Slides (see Section 1.5(A)).

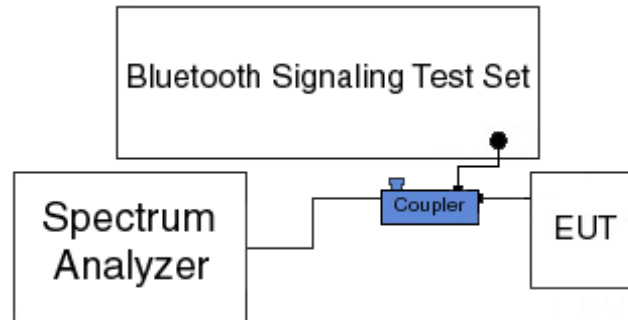


Figure 13-3
Power Measurement Setup

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14 FCC PERSONAL WIRELESS ROUTER CONFIGURATIONS

14.1 Personal Wireless Router Considerations

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

14.2 SAR Test Setup for Personal Wireless Router Features

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. Therefore, SAR must be evaluated for each frequency transmission and mode separately and summed with the WIFI transmitter according to KDB 648474 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

14.3 Power Reduction for Portable Hotspot Mode

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

14.4 SAR Test Configurations

Table 14-1
Mobile Hotspot Sides for SAR Testing

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

Note: Particular DUT edges were not required to be evaluated for Wireless Router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06 guidance, page 2. The antenna document shows the distances between the transmit antennas and the edges of the device.

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15 SYSTEM VERIFICATION

15.1 Tissue Verification

Table 15-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
01/12/2012	750H	23.8	680	0.841	44.01	0.885	42.273	-4.97%	4.11%
			695	0.861	43.74	0.886	42.193	-2.82%	3.67%
			710	0.877	43.61	0.887	42.113	-1.13%	3.55%
			725	0.898	44.07	0.888	42.033	1.13%	4.85%
			740	0.911	43.71	0.889	41.953	2.47%	4.19%
01/04/2012	835H	21.0	755	0.927	43.47	0.891	41.876	4.04%	3.81%
			820	0.875	41.22	0.898	41.571	-2.56%	-0.84%
			835	0.893	40.82	0.900	41.500	-0.78%	-1.64%
			850	0.906	40.79	0.916	41.500	-1.09%	-1.71%
			820	0.879	43.16	0.898	41.571	-2.12%	3.82%
01/31/2012	835H	22.3	835	0.890	43.06	0.900	41.500	-1.11%	3.76%
			850	0.895	42.76	0.916	41.500	-2.29%	3.04%
			1710	1.389	39.48	1.348	40.136	3.04%	-1.63%
01/11/2012	1750H	22.1	1750	1.432	39.31	1.370	40.100	4.53%	-1.97%
			1790	1.462	39.18	1.394	40.020	4.88%	-2.10%
			1850	1.339	41.57	1.400	40.000	-4.36%	3.93%
01/05/2012	1900H	22.8	1880	1.373	41.38	1.400	40.000	-1.93%	3.45%
			1910	1.403	41.36	1.400	40.000	0.21%	3.40%
			2401	1.822	37.78	1.758	39.298	3.64%	-3.86%
01/12/2012	2450H	21.9	2450	1.876	37.59	1.800	39.200	4.22%	-4.11%
			2499	1.943	37.45	1.852	39.135	4.91%	-4.31%
			680	0.926	58.71	0.956	56.069	-3.14%	4.71%
01/12/2012	750B	22.2	695	0.939	58.69	0.957	55.985	-1.88%	4.83%
			710	0.959	58.40	0.958	55.901	0.10%	4.47%
			725	0.944	55.83	0.960	55.817	-1.67%	0.02%
			740	0.959	55.65	0.961	55.733	-0.21%	-0.15%
			755	0.969	55.52	0.963	55.649	0.62%	-0.23%
01/05/2012	835B	20.5	820	0.968	54.45	0.969	55.284	-0.10%	-1.51%
			835	0.982	54.11	0.970	55.200	1.24%	-1.97%
			850	0.996	54.10	0.988	55.154	0.81%	-1.91%
01/31/2012	835B	22.3	820	0.978	54.12	0.969	55.284	0.93%	-2.11%
			835	0.990	54.00	0.970	55.200	2.06%	-2.17%
			850	0.993	53.58	0.988	55.154	0.51%	-2.85%
01/03/2012	1750B	24.3	1710	1.496	50.89	1.460	53.540	2.47%	-4.95%
			1750	1.539	50.79	1.490	53.430	3.29%	-4.94%
			1790	1.566	50.68	1.510	53.330	3.71%	-4.97%
01/05/2012	1900B	22.8	1850	1.454	53.11	1.520	53.300	-4.34%	-0.36%
			1880	1.486	52.83	1.520	53.300	-2.24%	-0.88%
			1910	1.522	52.82	1.520	53.300	0.13%	-0.90%
01/17/2012	2450B	22.7	2401	1.940	50.52	1.903	52.765	1.94%	-4.25%
			2450	2.018	50.39	1.950	52.700	3.49%	-4.38%
			2499	2.086	50.22	2.019	52.638	3.32%	-4.59%

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

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

15.2 Measurement Procedure for Tissue verification

- 1) The network analyzer and probe system was configured and calibrated.

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- 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):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

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 $j = \sqrt{-1}$.

15.3 Test System Verification

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

Table 15-2
System Verification Results

System Verification TARGET & MEASURED											
Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation (%)
750	Head	01/12/2012	23.8	22.8	0.100	1046	3561	0.852	8.400	8.520	1.43%
835	Head	01/04/2012	22.6	20.9	0.100	4d047	3258	1.01	9.530	10.100	5.98%
835	Head	01/31/2012	24.9	23.6	0.100	4d026	3258	0.959	9.460	9.590	1.37%
1750	Head	01/11/2012	23.4	21.5	0.100	1051	3209	3.8	37.000	38.000	2.70%
1900	Head	01/05/2012	24.3	22.4	0.100	502	3209	3.89	40.200	38.900	-3.23%
2450	Head	01/12/2012	24.9	23.2	0.040	719	3258	2.21	53.800	55.250	2.70%
750	Body	01/12/2012	23.2	22.1	0.100	1046	3561	0.865	8.800	8.650	-1.70%
835	Body	01/05/2012	22.7	21.6	0.100	4d047	3258	0.984	9.850	9.840	-0.10%
835	Body	01/31/2012	22.5	20.6	0.100	4d026	3258	1.02	9.660	10.200	5.59%
1750	Body	01/03/2012	23.1	22.5	0.040	1051	3561	1.48	37.000	37.000	0.00%
1900	Body	01/05/2012	24.3	23.1	0.100	502	3209	4.24	41.100	42.400	3.16%
2450	Body	01/17/2012	23.0	22.1	0.040	719	3561	2.12	51.300	53.000	3.31%

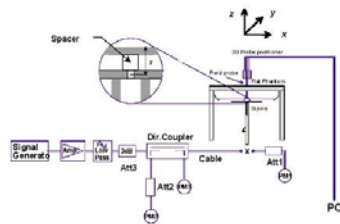


Figure 15-1
System Verification Setup Diagram



Figure 15-2
System Verification Setup Photo

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16 SAR DATA SUMMARY

16.1 Head SAR Data

Table 16-1
LTE Band 17 Head SAR Results

MEASUREMENT RESULTS													
FREQUENCY		Mode/Band	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Phone Serial Number	# of Resource Blocks	Resource Block Offset	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	QPSK	10	22.80	0.16	0	Right	Touch	FI-343-C	1	0	0.080
710.00	23790	LTE Band 17	QPSK	10	22.70	0.11	0	Right	Touch	FI-343-C	1	49	0.080
710.00	23790	LTE Band 17	QPSK	10	21.80	0.15	1	Right	Touch	FI-343-C	25	12	0.071
710.00	23790	LTE Band 17	16QAM	10	21.56	0.18	1	Right	Touch	FI-343-C	1	0	0.061
710.00	23790	LTE Band 17	16QAM	10	21.54	0.05	1	Right	Touch	FI-343-C	1	49	0.061
710.00	23790	LTE Band 17	16QAM	10	21.31	0.16	2	Right	Touch	FI-343-C	25	12	0.056
710.00	23790	LTE Band 17	QPSK	10	22.80	0.19	0	Right	Tilt	FI-343-C	1	0	0.041
710.00	23790	LTE Band 17	QPSK	10	22.70	0.18	0	Right	Tilt	FI-343-C	1	49	0.022
710.00	23790	LTE Band 17	QPSK	10	21.80	0.08	1	Right	Tilt	FI-343-C	25	12	0.029
710.00	23790	LTE Band 17	16QAM	10	21.56	0.10	1	Right	Tilt	FI-343-C	1	0	0.030
710.00	23790	LTE Band 17	16QAM	10	21.54	0.08	1	Right	Tilt	FI-343-C	1	49	0.019
710.00	23790	LTE Band 17	16QAM	10	21.31	0.17	2	Right	Tilt	FI-343-C	25	12	0.019
710.00	23790	LTE Band 17	QPSK	10	22.80	0.13	0	Left	Touch	FI-343-C	1	0	0.109
710.00	23790	LTE Band 17	QPSK	10	22.70	0.04	0	Left	Touch	FI-343-C	1	49	0.117
710.00	23790	LTE Band 17	QPSK	10	21.80	0.13	1	Left	Touch	FI-343-C	25	12	0.109
710.00	23790	LTE Band 17	16QAM	10	21.56	0.17	1	Left	Touch	FI-343-C	1	0	0.089
710.00	23790	LTE Band 17	16QAM	10	21.54	0.15	1	Left	Touch	FI-343-C	1	49	0.091
710.00	23790	LTE Band 17	16QAM	10	21.31	0.16	2	Left	Touch	FI-343-C	25	12	0.095
710.00	23790	LTE Band 17	QPSK	10	22.80	0.18	0	Left	Tilt	FI-343-C	1	0	0.040
710.00	23790	LTE Band 17	QPSK	10	22.70	0.07	0	Left	Tilt	FI-343-C	1	49	0.024
710.00	23790	LTE Band 17	QPSK	10	21.80	0.08	1	Left	Tilt	FI-343-C	25	12	0.028
710.00	23790	LTE Band 17	16QAM	10	21.56	0.20	1	Left	Tilt	FI-343-C	1	0	0.030
710.00	23790	LTE Band 17	16QAM	10	21.54	0.13	1	Left	Tilt	FI-343-C	1	49	0.018
710.00	23790	LTE Band 17	16QAM	10	21.31	0.17	2	Left	Tilt	FI-343-C	25	12	0.023
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram					

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Table 16-2
GSM 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	190	GSM 850	32.81	0.05	Right	Touch	#59	0.220
836.60	190	GSM 850	32.81	0.02	Right	Tilt	#59	0.157
836.60	190	GSM 850	32.81	-0.09	Left	Touch	#59	0.252
836.60	190	GSM 850	32.81	0.03	Left	Tilt	#59	0.171
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 16-3
WCDMA 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	4183	WCDMA 850	22.90	0.10	Right	Touch	FI-343-A	0.178
836.60	4183	WCDMA 850	22.90	0.06	Right	Tilt	FI-343-A	0.116
836.60	4183	WCDMA 850	22.90	0.01	Left	Touch	FI-343-A	0.205
836.60	4183	WCDMA 850	22.90	0.12	Left	Tilt	FI-343-A	0.114
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram			

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

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR (dB)	Side	Test Position	Phone Serial Number	# of Resource Blocks	Resource Block Offset	SAR (1g) (W/kg)
MHz	Ch.												
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	0.06	0	Right	Touch	FI-343-C	1	0	0.451
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.18	0	Right	Touch	FI-343-C	1	49	0.429
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	0.00	1	Right	Touch	FI-343-C	25	12	0.345
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	0.00	1	Right	Touch	FI-343-C	1	0	0.353
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.01	1	Right	Touch	FI-343-C	1	49	0.351
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	0.16	2	Right	Touch	FI-343-C	25	12	0.325
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	0.03	0	Right	Tilt	FI-343-C	1	0	0.338
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.03	0	Right	Tilt	FI-343-C	1	49	0.338
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	0.00	1	Right	Tilt	FI-343-C	25	12	0.268
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.10	1	Right	Tilt	FI-343-C	1	0	0.264
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.02	1	Right	Tilt	FI-343-C	1	49	0.265
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.01	2	Right	Tilt	FI-343-C	25	12	0.239
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	-0.15	0	Left	Touch	FI-343-C	1	0	0.921
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.15	0	Left	Touch	FI-343-C	1	49	0.923
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.16	1	Left	Touch	FI-343-C	25	12	0.696
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.18	1	Left	Touch	FI-343-C	1	0	0.718
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.17	1	Left	Touch	FI-343-C	1	49	0.732
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.12	2	Left	Touch	FI-343-C	25	12	0.676
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	0.12	0	Left	Tilt	FI-343-C	1	0	0.381
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.06	0	Left	Tilt	FI-343-C	1	49	0.351
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.12	1	Left	Tilt	FI-343-C	25	12	0.302
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	0.06	1	Left	Tilt	FI-343-C	1	0	0.287
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	0.04	1	Left	Tilt	FI-343-C	1	49	0.290
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	0.08	2	Left	Tilt	FI-343-C	25	12	0.267
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram				

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

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Table 16-5
GSM 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	661	GSM 1900	30.30	0.03	Right	Touch	FI-343-A	0.233
1880.00	661	GSM 1900	30.30	0.01	Right	Tilt	FI-343-A	0.156
1880.00	661	GSM 1900	30.30	0.00	Left	Touch	FI-343-A	0.454
1880.00	661	GSM 1900	30.30	-0.03	Left	Tilt	FI-343-A	0.138
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 16-6
WCDMA 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	9400	WCDMA 1900	23.02	0.06	Right	Touch	FI-343-A	0.329
1880.00	9400	WCDMA 1900	23.02	0.18	Right	Tilt	FI-343-A	0.250
1880.00	9400	WCDMA 1900	23.02	-0.08	Left	Touch	FI-343-A	0.712
1880.00	9400	WCDMA 1900	23.02	0.09	Left	Tilt	FI-343-A	0.203
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 16-7
2.4 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Phone Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	15.41	0.12	Right	Touch	FI-343-A	1	0.076
2437	6	IEEE 802.11b	DSSS	15.41	-0.19	Right	Tilt	FI-343-A	1	0.025
2437	6	IEEE 802.11b	DSSS	15.41	0.14	Left	Touch	FI-343-A	1	0.034
2437	6	IEEE 802.11b	DSSS	15.41	0.22	Left	Tilt	FI-343-A	1	0.029
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Head 1.6 W/kg (mW/g) averaged over 1 gram				

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16.2 Body-Worn SAR Data

Table 16-8
LTE Band 17 Body-Worn SAR Data

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR (dB)	Spacing	Phone Serial Number	# of Resource Blocks	Resource Block Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	QPSK	10	22.80	0.11	0	1.0 cm	FI-343-C	1	0	back	0.075
710.00	23790	LTE Band 17	QPSK	10	22.70	0.16	0	1.0 cm	FI-343-C	1	49	back	0.074
710.00	23790	LTE Band 17	QPSK	10	21.80	0.18	1	1.0 cm	FI-343-C	25	12	back	0.068
710.00	23790	LTE Band 17	16QAM	10	21.56	0.14	1	1.0 cm	FI-343-C	1	0	back	0.064
710.00	23790	LTE Band 17	16QAM	10	21.54	0.17	1	1.0 cm	FI-343-C	1	49	back	0.062
710.00	23790	LTE Band 17	16QAM	10	21.31	0.12	2	1.0 cm	FI-343-C	25	12	back	0.052
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram					

Table 16-9
GSM/GPRS and WCDMA Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	# of Time Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GSM	32.81	-0.09	1.0 cm	#59	1	back	0.273
836.60	190	GSM 850	GPRS	32.08	0.01	1.0 cm	#59	2	back	0.496
836.60	4183	WCDMA 850	RMC	22.90	0.01	1.0 cm	FI-343-A	N/A	back	0.276
1880.00	661	GSM 1900	GSM	30.30	-0.09	1.0 cm	FI-343-A	1	back	0.341
1880.00	661	GSM 1900	GPRS	29.55	-0.08	1.0 cm	FI-343-A	2	back	0.580
1880.00	9400	WCDMA 1900	RMC	23.02	-0.03	1.0 cm	FI-343-A	N/A	back	0.670
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram				

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

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR (dB)	Spacing	Phone Serial Number	# of Resource Blocks	Resource Block Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	0.02	0	1.0 cm	FI-343-C	1	0	back	0.609
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	0.05	0	1.0 cm	FI-343-C	1	49	back	0.620
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.14	1	1.0 cm	FI-343-C	25	12	back	0.495
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.05	1	1.0 cm	FI-343-C	1	0	back	0.480
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	0.05	1	1.0 cm	FI-343-C	1	49	back	0.473
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.01	2	1.0 cm	FI-343-C	25	12	back	0.438
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram					

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

Table 16-11
WLAN Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	15.41	0.16	1.0 cm	FI-343-A	1	back	0.269
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram				

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16.3 Hotspot SAR Data

Table 16-12
LTE Band 17 Hotspot SAR Data

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR (dB)	Spacing	Phone Serial Number	# of Resource Blocks	Resource Block Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
710.00	23790	LTE Band 17	QPSK	10	22.80	0.11	0	1.0 cm	FI-343-C	1	0	back	0.075
710.00	23790	LTE Band 17	QPSK	10	22.70	0.16	0	1.0 cm	FI-343-C	1	49	back	0.074
710.00	23790	LTE Band 17	QPSK	10	21.80	0.18	1	1.0 cm	FI-343-C	25	12	back	0.068
710.00	23790	LTE Band 17	16QAM	10	21.56	0.14	1	1.0 cm	FI-343-C	1	0	back	0.064
710.00	23790	LTE Band 17	16QAM	10	21.54	0.17	1	1.0 cm	FI-343-C	1	49	back	0.062
710.00	23790	LTE Band 17	16QAM	10	21.31	0.12	2	1.0 cm	FI-343-C	25	12	back	0.052
710.00	23790	LTE Band 17	QPSK	10	22.80	-0.08	0	1.0 cm	FI-343-C	1	0	front	0.104
710.00	23790	LTE Band 17	QPSK	10	22.70	-0.18	0	1.0 cm	FI-343-C	1	49	front	0.095
710.00	23790	LTE Band 17	QPSK	10	21.80	-0.17	1	1.0 cm	FI-343-C	25	12	front	0.095
710.00	23790	LTE Band 17	16QAM	10	21.56	-0.14	1	1.0 cm	FI-343-C	1	0	front	0.090
710.00	23790	LTE Band 17	16QAM	10	21.54	-0.11	1	1.0 cm	FI-343-C	1	49	front	0.081
710.00	23790	LTE Band 17	16QAM	10	21.31	-0.13	2	1.0 cm	FI-343-C	25	12	front	0.078
710.00	23790	LTE Band 17	QPSK	10	22.80	0.06	0	1.0 cm	FI-343-C	1	0	bottom	0.009
710.00	23790	LTE Band 17	QPSK	10	22.70	-0.03	0	1.0 cm	FI-343-C	1	49	bottom	0.024
710.00	23790	LTE Band 17	QPSK	10	21.80	0.09	1	1.0 cm	FI-343-C	25	12	bottom	0.019
710.00	23790	LTE Band 17	16QAM	10	21.56	0.10	1	1.0 cm	FI-343-C	1	0	bottom	0.014
710.00	23790	LTE Band 17	16QAM	10	21.54	0.14	1	1.0 cm	FI-343-C	1	49	bottom	0.019
710.00	23790	LTE Band 17	16QAM	10	21.31	-0.16	2	1.0 cm	FI-343-C	25	12	bottom	0.016
710.00	23790	LTE Band 17	QPSK	10	22.80	-0.04	0	1.0 cm	FI-343-C	1	0	left	0.072
710.00	23790	LTE Band 17	QPSK	10	22.70	-0.05	0	1.0 cm	FI-343-C	1	49	left	0.064
710.00	23790	LTE Band 17	QPSK	10	21.80	0.07	1	1.0 cm	FI-343-C	25	12	left	0.065
710.00	23790	LTE Band 17	16QAM	10	21.56	-0.09	1	1.0 cm	FI-343-C	1	0	left	0.056
710.00	23790	LTE Band 17	16QAM	10	21.54	0.07	1	1.0 cm	FI-343-C	1	49	left	0.048
710.00	23790	LTE Band 17	16QAM	10	21.31	-0.14	2	1.0 cm	FI-343-C	25	12	left	0.051
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body					
Spatial Peak								1.6 W/kg (mW/g)					
Uncontrolled Exposure/General Population								averaged over 1 gram					

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Table 16-13
GPRS and WCDMA Hotspot SAR Data

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	# of Time Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GPRS	32.08	0.01	1.0 cm	#59	2	back	0.496
836.60	190	GSM 850	GPRS	32.08	-0.04	1.0 cm	#59	2	front	0.373
836.60	190	GSM 850	GPRS	32.08	-0.02	1.0 cm	#59	2	bottom	0.214
836.60	190	GSM 850	GPRS	32.08	0.00	1.0 cm	#59	2	left	0.504
836.60	4183	WCDMA 850	RMC	22.90	0.01	1.0 cm	FI-343-A	N/A	back	0.276
836.60	4183	WCDMA 850	RMC	22.90	-0.06	1.0 cm	FI-343-A	N/A	front	0.338
836.60	4183	WCDMA 850	RMC	22.90	0.09	1.0 cm	FI-343-A	N/A	bottom	0.062
836.60	4183	WCDMA 850	RMC	22.90	0.02	1.0 cm	FI-343-A	N/A	left	0.336
1880.00	661	GSM 1900	GPRS	29.55	-0.08	1.0 cm	FI-343-A	2	back	0.580
1880.00	661	GSM 1900	GPRS	29.55	-0.06	1.0 cm	FI-343-A	2	front	0.550
1880.00	661	GSM 1900	GPRS	29.55	-0.03	1.0 cm	FI-343-A	2	bottom	0.756
1880.00	661	GSM 1900	GPRS	29.55	-0.12	1.0 cm	FI-343-A	2	left	0.445
1880.00	9400	WCDMA 1900	RMC	23.02	-0.03	1.0 cm	FI-343-A	N/A	back	0.670
1880.00	9400	WCDMA 1900	RMC	23.02	-0.10	1.0 cm	FI-343-A	N/A	front	0.692
1852.40	9262	WCDMA 1900	RMC	22.80	0.01	1.0 cm	FI-343-A	N/A	bottom	0.866
1880.00	9400	WCDMA 1900	RMC	23.02	0.05	1.0 cm	FI-343-A	N/A	bottom	0.810
1907.60	9538	WCDMA 1900	RMC	23.01	0.14	1.0 cm	FI-343-A	N/A	bottom	0.808
1880.00	9400	WCDMA 1900	RMC	23.02	0.03	1.0 cm	FI-343-A	N/A	left	0.366
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram				

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Table 16-14
LTE Band 4 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS													
FREQUENCY		Mode	Modulation	Bandwidth (MHz)	Conducted Power [dBm]	Power Drift [dB]	Target MPR (dB)	Spacing	Phone Serial Number	# of Resource Blocks	Resource Block Offset	Side	SAR (1g)
MHz	Ch.												(W/kg)
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	0.02	0	1.0 cm	FI-343-C	1	0	back	0.609
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	0.05	0	1.0 cm	FI-343-C	1	49	back	0.620
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.14	1	1.0 cm	FI-343-C	25	12	back	0.495
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.05	1	1.0 cm	FI-343-C	1	0	back	0.480
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	0.05	1	1.0 cm	FI-343-C	1	49	back	0.473
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.01	2	1.0 cm	FI-343-C	25	12	back	0.438
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	-0.05	0	1.0 cm	FI-343-C	1	0	front	0.676
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.14	0	1.0 cm	FI-343-C	1	49	front	0.683
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.07	1	1.0 cm	FI-343-C	25	12	front	0.519
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.10	1	1.0 cm	FI-343-C	1	0	front	0.484
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.04	1	1.0 cm	FI-343-C	1	49	front	0.470
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.12	2	1.0 cm	FI-343-C	25	12	front	0.463
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	-0.09	0	1.0 cm	FI-343-C	1	0	bottom	0.724
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	-0.12	0	1.0 cm	FI-343-C	1	49	bottom	0.736
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	-0.09	1	1.0 cm	FI-343-C	25	12	bottom	0.580
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.19	1	1.0 cm	FI-343-C	1	0	bottom	0.552
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.18	1	1.0 cm	FI-343-C	1	49	bottom	0.555
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.13	2	1.0 cm	FI-343-C	25	12	bottom	0.514
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.76	-0.08	0	1.0 cm	FI-343-C	1	0	left	0.288
1750.00	20350	LTE Band 4 (AWS)	QPSK	10	22.72	0.14	0	1.0 cm	FI-343-C	1	49	left	0.289
1732.50	20175	LTE Band 4 (AWS)	QPSK	10	22.02	0.19	1	1.0 cm	FI-343-C	25	12	left	0.224
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.74	-0.08	1	1.0 cm	FI-343-C	1	0	left	0.215
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.58	-0.12	1	1.0 cm	FI-343-C	1	49	left	0.212
1732.50	20175	LTE Band 4 (AWS)	16QAM	10	21.20	-0.09	2	1.0 cm	FI-343-C	25	12	left	0.198
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body					
Spatial Peak								1.6 W/kg (mW/g)					
Uncontrolled Exposure/General Population								averaged over 1 gram					

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

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Table 16-15
WLAN Hotspot SAR Data

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Phone Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2437	6	IEEE 802.11b	DSSS	15.41	0.16	1.0 cm	FI-343-A	1	back	0.269
2437	6	IEEE 802.11b	DSSS	15.41	-0.06	1.0 cm	FI-343-A	1	front	0.048
2437	6	IEEE 802.11b	DSSS	15.41	0.12	1.0 cm	FI-343-A	1	bottom	0.028
2437	6	IEEE 802.11b	DSSS	15.41	-0.16	1.0 cm	FI-343-A	1	right	0.245
ANSI / IEEE C95.1 1992 - SAFETY LIMIT						Body				
Spatial Peak						1.6 W/kg (mW/g)				
Uncontrolled Exposure/General Population						averaged over 1 gram				

16.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC/OET Bulletin 65, Supplement C [June 2001].
2. Batteries are fully charged for all readings. Standard battery was used.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Liquid tissue depth was at least 15.0 cm.
5. All samples tested were electrically identical per the applicant.
6. Band 4 LTE SAR was measured with a probe calibrated at 1750 MHz and is valid for measuring SAR from ± 50 MHz. The 1750 MHz specific liquid was verified with specific probe calibration factors as required per FCC KDB 450824 D01.
7. Device was tested using a fixed spacing for body-worn testing. A separation distance of 10 mm was tested because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
8. To confirm the proper SAR liquid depth, the z-axis plots from the system verifications were included since the system verifications were performed using the same liquid, probe and DAE as the SAR tests in the same time period.
9. The standard battery contains a near field communications (NFC) antenna, and is the only battery that comes with the device. Per KDB Inquiry 277820, all tests were performed using the standard NFC battery. The technical description contains detailed information about the near field communications antenna. As described in Operational Description, the device restricts the battery used, to battery model: ICP565154M.

GSM/GPRS Notes:

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

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Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

4. Justification for reduced test configurations per KDB Publication 941225 D03: The source-based time-averaged output power was evaluated for all multi-slot operations. In addition to the worst-case reported, all source-based time-averaged powers within 10% of the worst-case were additionally included in the evaluation for data modes.

WCDMA/HSPA Notes:

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

LTE Notes:

1. Considerations: LTE test configurations are determined according to SAR Test Considerations for LTE handsets and Data Modems KDB 941225 D05 Publication:
 - a. Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
 - b. Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel is tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation because the SAR is < 0.8 W/kg.
 - c. Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required for the highest bandwidth.
 - d. Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation since the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK.
 - e. Per Page 4, 3) B), I), when the SAR for QPSK 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
 - f. Per Page 4, 4) A), 16QAM with 50% RB is required for the highest bandwidth on the channel with the highest measured SAR for QPSK with 50% RB allocation.
 - g. Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
 - h. Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required for the highest bandwidth on the highest output power channel for the 1 RB allocation since the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM.
 - i. Per Page 5, 4) B), I), when the SAR for 16QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
 - j. Per Page 4, 4), A) I) and Page 5, 4), A) I), 100% RB Allocation is not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth.
 - k. Per Page 5, 5) B) I), smaller bandwidths are not required to be tested since SAR is not > 1.45 W/kg for the highest bandwidth and maximum conducted powers of the smaller bandwidths for all channels and configurations were not more than 0.5 dB higher than the larger bandwidth.
2. There is permanently applied MPR implemented by the manufacturer. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1. The differences

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noted are not cases of implemented MPR but rather associated with measurement uncertainty and allowable tolerances per 3GPP standard and the manufacturer.

3. A-MPR was disabled for all SAR tests.
4. LTE Head was evaluated to cover third-party VOIP applications that may result in LTE being used held to the ear.
5. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally tests body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. WLAN transmission was verified using a spectrum analyzer.
3. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
4. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

Hotspot Notes:

1. Top Edge and Right Edge for the GSM/WCDMA/LTE transmitter was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 14.4).
2. Top Edge and Left Edge for the WLAN transmitter was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 14.4).
3. During SAR Testing for the Wireless Router conditions per KDB 941225 D06, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 14.2).
4. For Hotspot SAR testing, transmission modes were evaluated separately for SAR. SAR evaluation requires a single frequency of measurement for valid measurements using the SAR probe and tissue which are calibrated for specific limited frequency ranges. Therefore, during SAR evaluation it was ensured that the WLAN transmission was disabled by the manufacturer to assess the standalone SAR. WLAN SAR was separately evaluated to account for the WLAN SAR for portable hotspot exposure conditions (see Section 14).

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17 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

17.1 Introduction

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

17.2 FCC Power Tables & Conditions

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW

Device output power should be rounded to the nearest mW to compare with values specified in this table.

Figure 17-1
Output Power Thresholds for Unlicensed Transmitters

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

Figure 17-2
SAR Evaluation Requirements for Multiple Transmitter Handsets

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17.3 Head SAR Simultaneous Transmission Analysis

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.220	0.076	0.296	Head SAR	Right Cheek	0.233	0.076	0.309
	Right Tilt	0.157	0.025	0.182		Right Tilt	0.156	0.025	0.181
	Left Cheek	0.252	0.034	0.286		Left Cheek	0.454	0.034	0.488
	Left Tilt	0.171	0.029	0.200		Left Tilt	0.138	0.029	0.167
Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.178	0.076	0.254	Head SAR	Right Cheek	0.329	0.076	0.405
	Right Tilt	0.116	0.025	0.141		Right Tilt	0.250	0.025	0.275
	Left Cheek	0.205	0.034	0.239		Left Cheek	0.712	0.034	0.746
	Left Tilt	0.114	0.029	0.143		Left Tilt	0.203	0.029	0.232

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

When the user utilizes multiple services in WCDMA 3G mode (multi-Radio Access Bearer or multi-RAB), the power control will be based on a physical control channel (dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the WCDMA+WLAN sum also represents the WCDMA Voice/Data + WLAN Hotspot scenario.

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

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.080	0.076	0.156	Head SAR	Right Cheek	0.451	0.076	0.527
	Right Tilt	0.041	0.025	0.066		Right Tilt	0.338	0.025	0.363
	Left Cheek	0.117	0.034	0.151		Left Cheek	0.923	0.034	0.957
	Left Tilt	0.040	0.029	0.069		Left Tilt	0.381	0.029	0.410

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

17.4 Body-Worn Simultaneous Transmission Analysis

Table 17-3
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.273	0.269	0.542
Back Side	WCDMA 850	0.276	0.269	0.545
Back Side	GSM 1900	0.341	0.269	0.610
Back Side	WCDMA 1900	0.670	0.269	0.939

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

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

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 17	0.075	0.269	0.344
Back Side	LTE Band 4 (AWS)	0.620	0.269	0.889

The above tables represent 2.4 GHz WLAN client data simultaneously transmitting in a body-worn accessory exposure condition during a LTE VoIP call with hotspot enabled.

17.5 Hotspot SAR Simultaneous Transmission Analysis

Table 17-5
Simultaneous Transmission Scenario (Hotspot at 1.0 cm)

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.075	0.269	0.344	Body SAR	Back	0.496	0.269	0.765
	Front	0.104	0.048	0.152		Front	0.373	0.048	0.421
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.024	0.028	0.052		Bottom	0.214	0.028	0.242
	Right	-	0.245	0.245		Right	-	0.245	0.245
	Left	0.072	-	0.072		Left	0.504	-	0.504
Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.276	0.269	0.545	Body SAR	Back	0.620	0.269	0.889
	Front	0.338	0.048	0.386		Front	0.683	0.048	0.731
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.062	0.028	0.090		Bottom	0.736	0.028	0.764
	Right	-	0.245	0.245		Right	-	0.245	0.245
	Left	0.336	-	0.336		Left	0.289	-	0.289
Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.580	0.269	0.849	Body SAR	Back	0.670	0.269	0.939
	Front	0.550	0.048	0.598		Front	0.692	0.048	0.740
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.756	0.028	0.784		Bottom	0.866	0.028	0.894
	Right	-	0.245	0.245		Right	-	0.245	0.245
	Left	0.445	-	0.445		Left	0.366	-	0.366

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

When the user utilizes multiple services in WCDMA 3G mode (multi-Radio Access Bearer or multi-RAB), the power control will be based on a physical control channel (dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the WCDMA+WLAN sum also represents the WCDMA Voice/Data + WLAN Hotspot scenario.

17.6 Simultaneous Transmission Conclusion

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

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18 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2011	Annual	10/10/2012	3613A00315
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/21/2011	Annual	4/21/2012	JP38020182
Agilent	E5515C	Wireless Communications Test Set	10/10/2011	Annual	10/10/2012	GB46110872
Agilent	E5515C	Wireless Communications Test Set	10/20/2011	Annual	10/20/2012	GB46310798
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/8/2011	Annual	4/8/2012	MY45470194
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
Index SAR	IXTL-010	Dielectric Measurement Kit	N/A		N/A	N/A
Index SAR	IXTL-030	30MM TEM line for 6 GHz	N/A		N/A	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT		N/A	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT		N/A	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	4/19/2011	Annual	4/19/2012	107826
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
SPEAG	D1900V2	1900 MHz SAR Dipole	2/17/2011	Annual	2/17/2012	502
SPEAG	D2450V2	2450 MHz SAR Dipole	8/19/2011	Annual	8/19/2012	719
SPEAG	DB35V2	835 MHz SAR Dipole	2/9/2011	Annual	2/9/2012	4047
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2011	Annual	4/20/2012	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/21/2011	Annual	2/21/2012	649
SPEAG	EX3DV4	SAR Probe	7/27/2011	Annual	7/27/2012	3561
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/19/2011	Annual	5/19/2012	859
SPEAG	ES3DV3	SAR Probe	4/18/2011	Annual	4/18/2012	3209
Rohde & Schwarz	SMIQ03B	Signal Generator	4/6/2011	Annual	4/6/2012	DE27259
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5318
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5442
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	1190013
Anritsu	ML2438A	Power Meter	2/7/2011	Annual	2/7/2012	98150041
Agilent	8648D	Signal Generator	4/5/2011	Annual	4/5/2012	3629U00687
Anritsu	ML2438A	Power Meter	10/13/2011	Annual	10/13/2012	1070030
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5821
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	8013
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	5605
Anritsu	MA2481A	Power Sensor	2/7/2011	Annual	2/7/2012	2400
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB43304447
Agilent	E5515C	Wireless Communications Tester	4/21/2011	Annual	4/21/2012	US41140256
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	N/A		N/A	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT		N/A	N/A
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331322
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331323
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331330
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331332
Control Company	61220-416	Long-Stem Thermometer	3/16/2011	Biennial	3/16/2013	111391601
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286445
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286460
VWR	36934-158	Wall-Mounted Thermometer	5/26/2010	Biennial	5/26/2012	101718589
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286454
VWR	36934-158	Wall-Mounted Thermometer	2/26/2010	Biennial	2/26/2012	101536273
SPEAG	ES3DV3	SAR Probe	4/8/2011	Annual	4/8/2012	3258
SPEAG	D1750V2	1750 MHz SAR Dipole	5/24/2011	Annual	5/24/2012	1051
MiniCircuits	SLP-2400+	Low Pass Filter	CBT		N/A	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT		N/A	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT		N/A	120
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT		N/A	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT		N/A	N/A
SPEAG	D750V3	750 MHz Dipole	10/27/2011	Annual	10/27/2012	1046
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		N/A	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		N/A	N/A

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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19 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

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

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

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20.1 Measurement Conclusion

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

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

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FCC ID: A3LSGHI577		SAR COMPLIANCE REPORT		Reviewed by: Quality Manager
Filename: 0Y1201030012-R1.A3L	Test Dates: 01/03/12 - 01/31/12	EUT Type: Portable Handset		Page 53 of 54

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FCC ID: A3LSGHI577		SAR COMPLIANCE REPORT		Reviewed by: Quality Manager
Filename: 0Y1201030012-R1.A3L	Test Dates: 01/03/12 - 01/31/12	EUT Type: Portable Handset		Page 54 of 54

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.877 \text{ mho/m}$; $\epsilon_r = 43.61$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-12-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Right Head, Touch, Mid.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

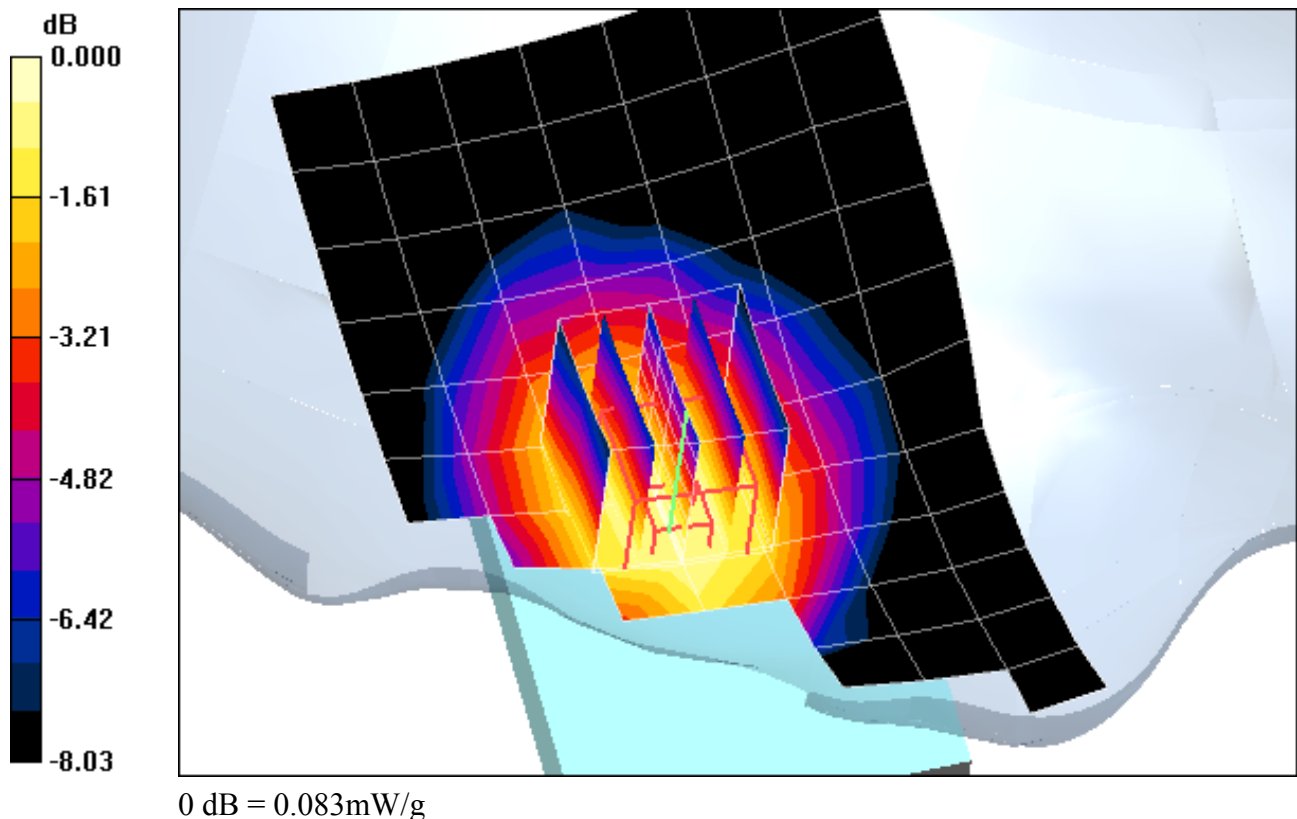
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.94 V/m; Power Drift = 0.110 dB

Peak SAR (extrapolated) = 0.103 W/kg

SAR(1 g) = 0.080 mW/g; SAR(10 g) = 0.062 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.877 \text{ mho/m}$; $\epsilon_r = 43.61$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-12-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Right Head, Tilt, Mid.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

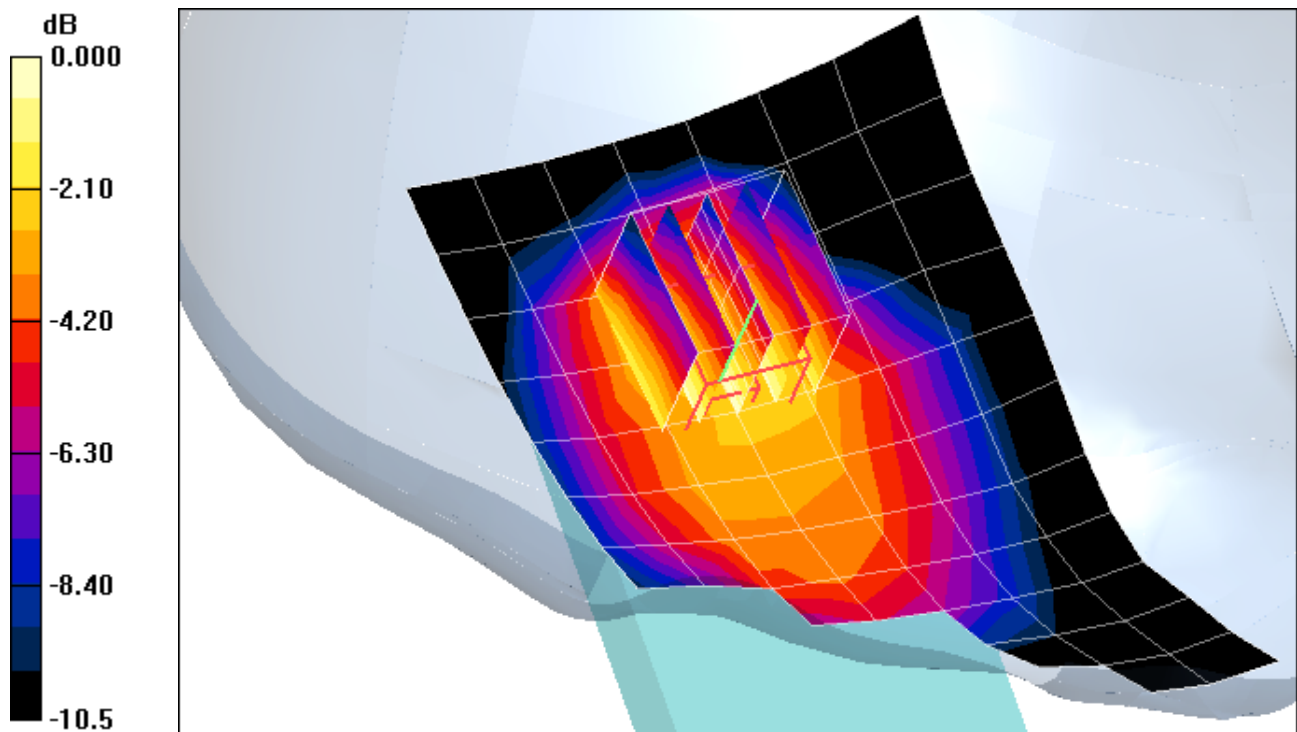
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.06 V/m; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 0.051 W/kg

SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.042mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.877 \text{ mho/m}$; $\epsilon_r = 43.61$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-12-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Left Head, Touch, Mid.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

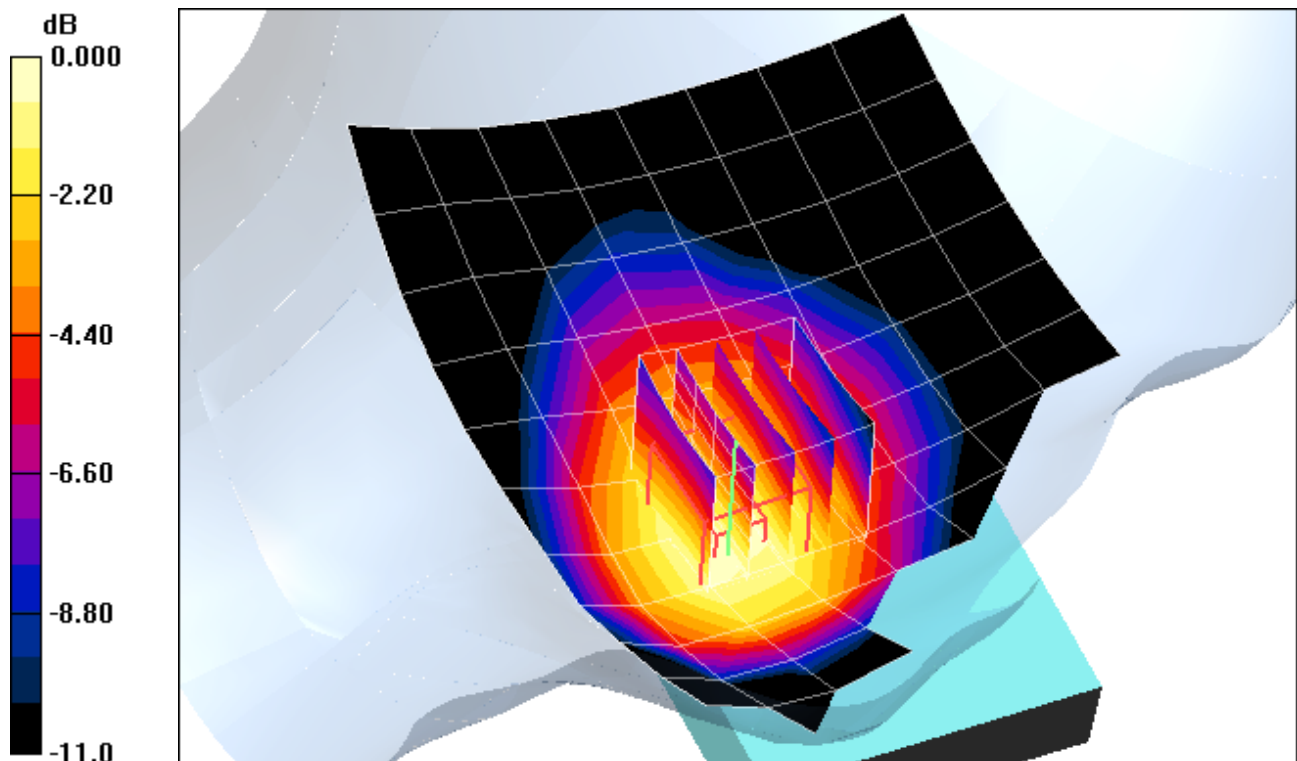
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.0 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.150 W/kg

SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.085 mW/g



0 dB = 0.121mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.877 \text{ mho/m}$; $\epsilon_r = 43.61$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-12-2012; Ambient Temp: 23.8°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Left Head, Tilt, Mid.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

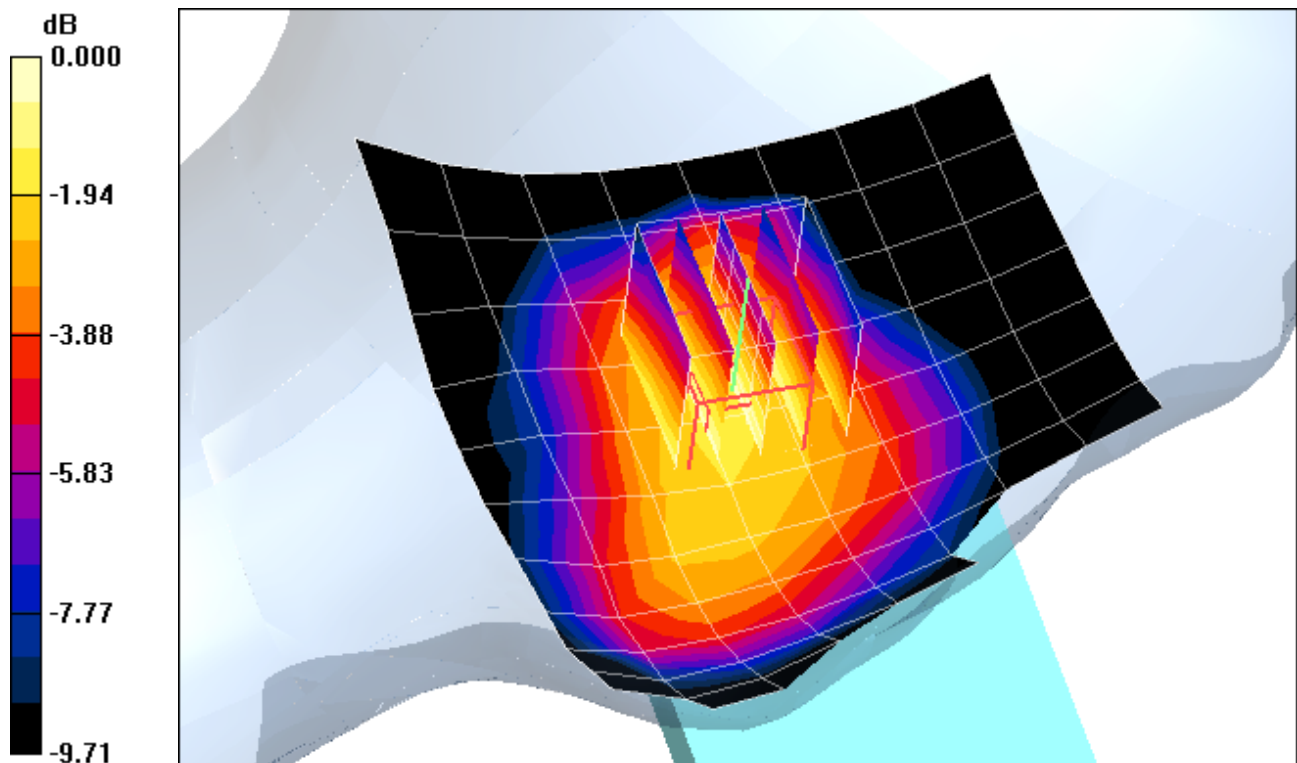
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.05 V/m; Power Drift = 0.181 dB

Peak SAR (extrapolated) = 0.051 W/kg

SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.042mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.891 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Right Head, Touch, Mid.ch

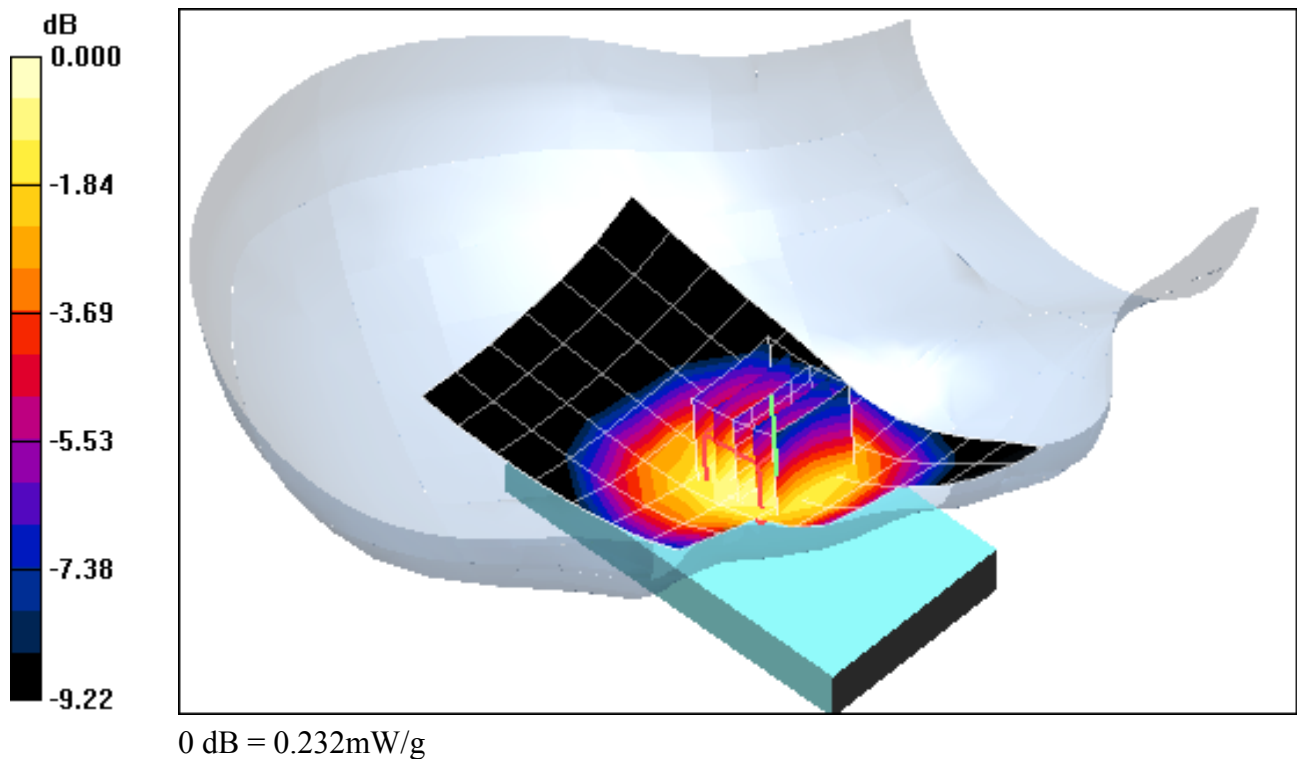
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.1 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 0.280 W/kg

SAR(1 g) = 0.220 mW/g; SAR(10 g) = 0.166 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.891 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Right Head, Tilt, Mid.ch

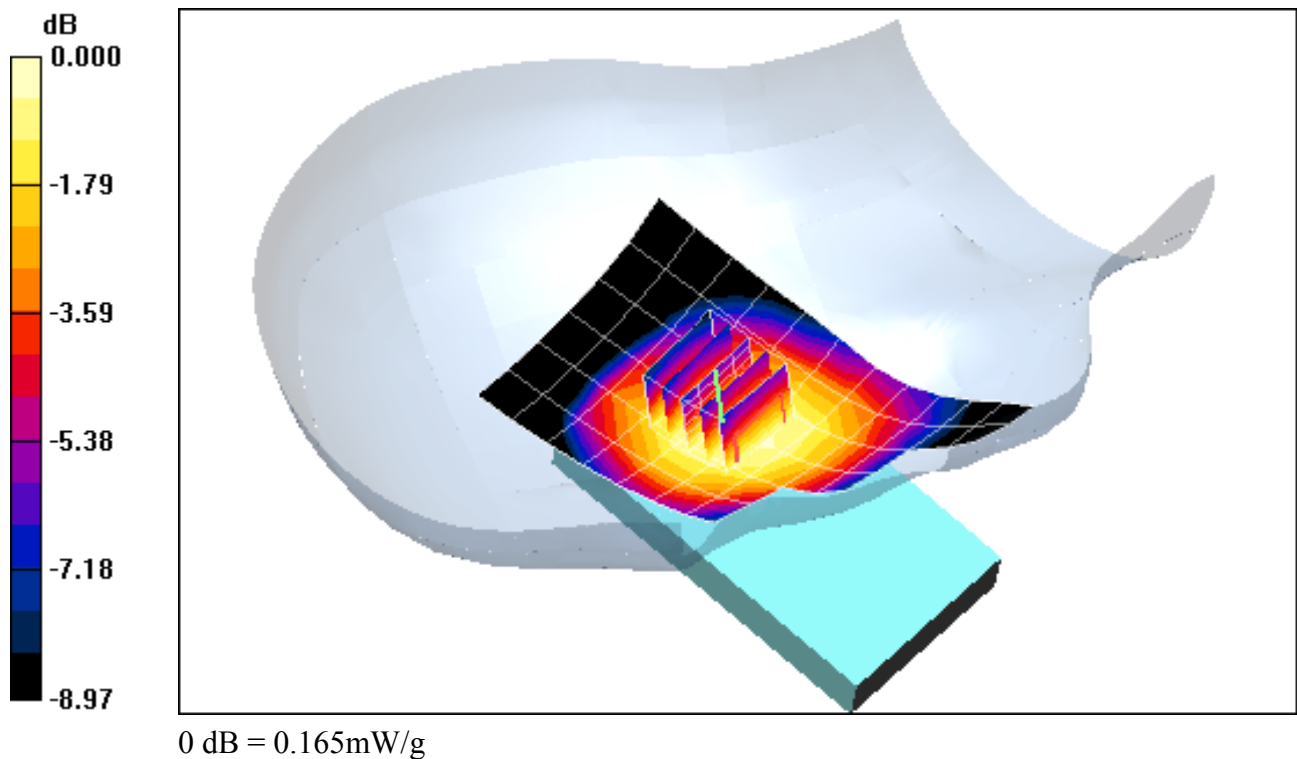
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.6 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.157 mW/g; SAR(10 g) = 0.121 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.891 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Left Head, Touch, Mid.ch

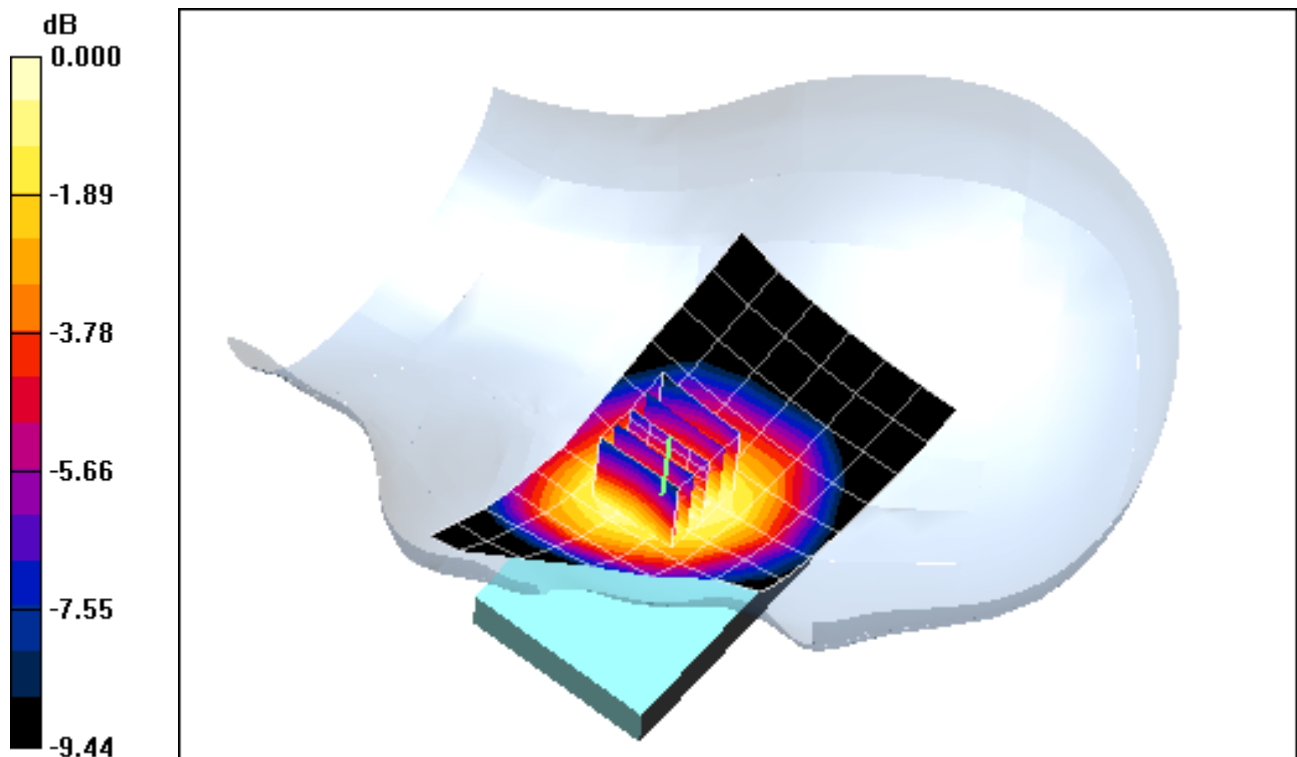
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.3 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.320 W/kg

SAR(1 g) = 0.252 mW/g; SAR(10 g) = 0.188 mW/g



0 dB = 0.265mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.891 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GSM 850, Left Head, Tilt, Mid.ch

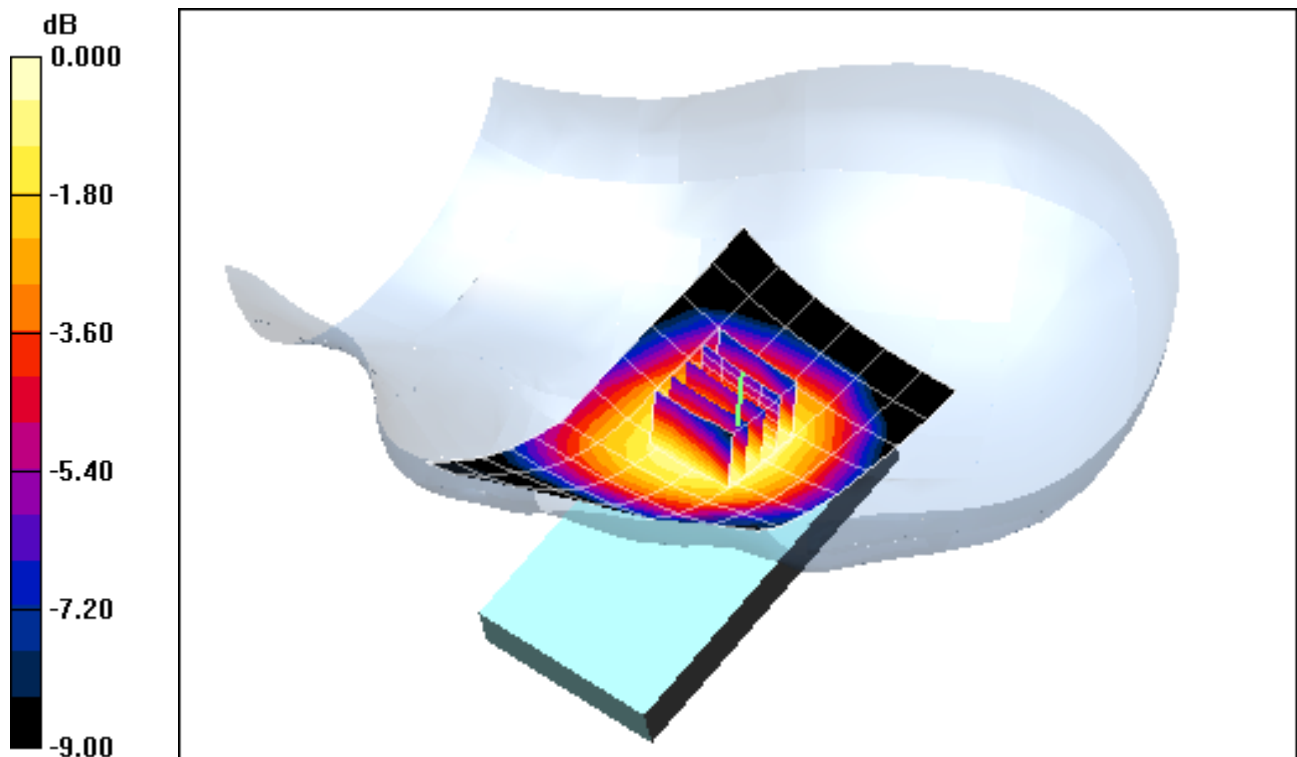
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.3 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 0.214 W/kg

SAR(1 g) = 0.171 mW/g; SAR(10 g) = 0.131 mW/g



0 dB = 0.179mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.894 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Right Head, Touch, Mid.ch

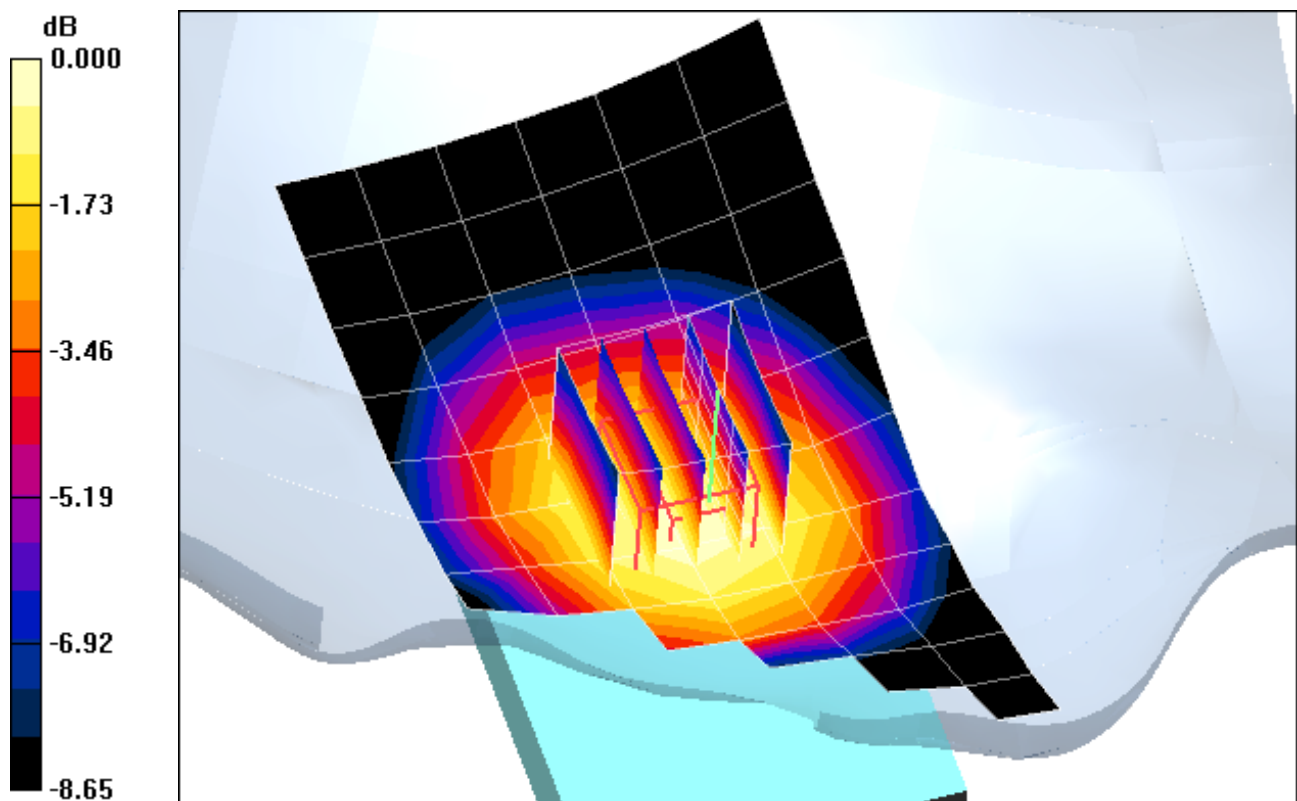
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.1 V/m; Power Drift = 0.101 dB

Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.178 mW/g; SAR(10 g) = 0.135 mW/g



0 dB = 0.186mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.894 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Right Head, Tilt, Mid.ch

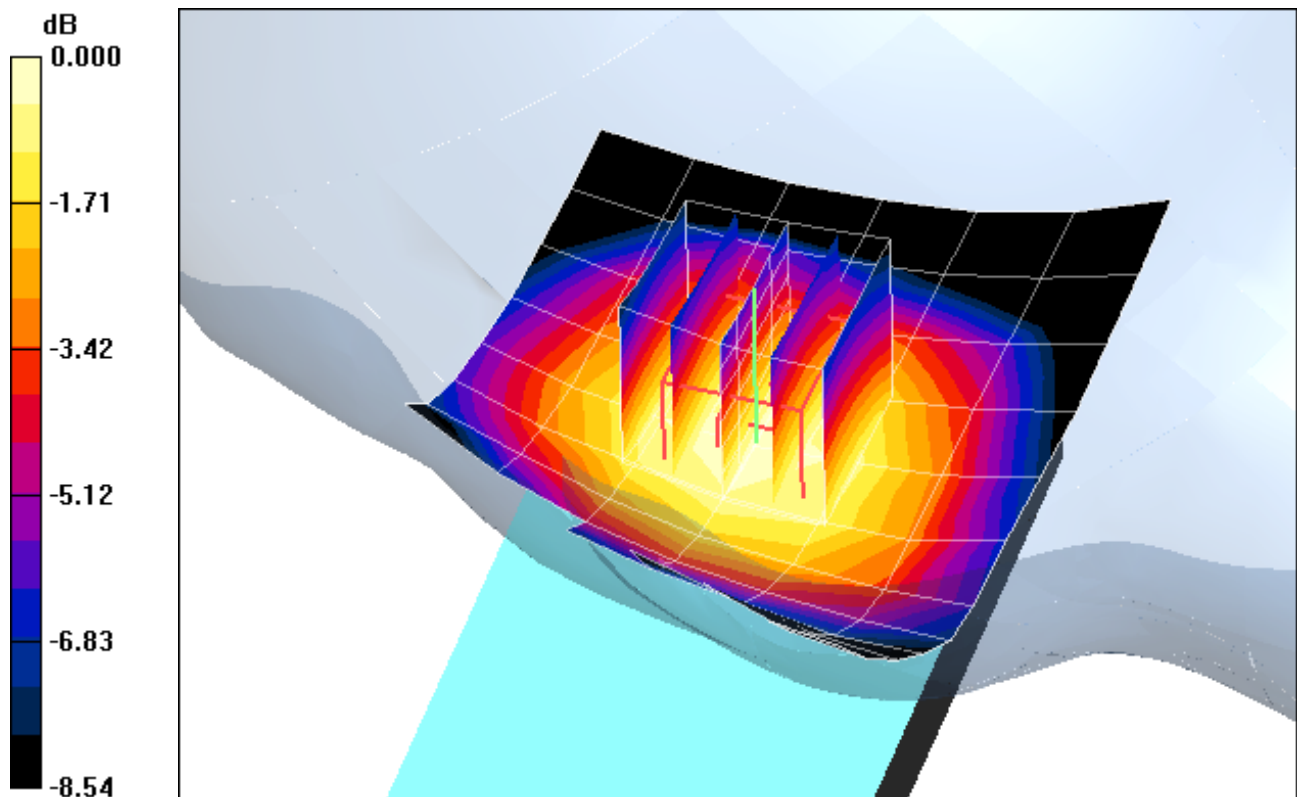
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.7 V/m; Power Drift = 0.063 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.088 mW/g



0 dB = 0.121mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.894 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Left Head, Touch, Mid.ch

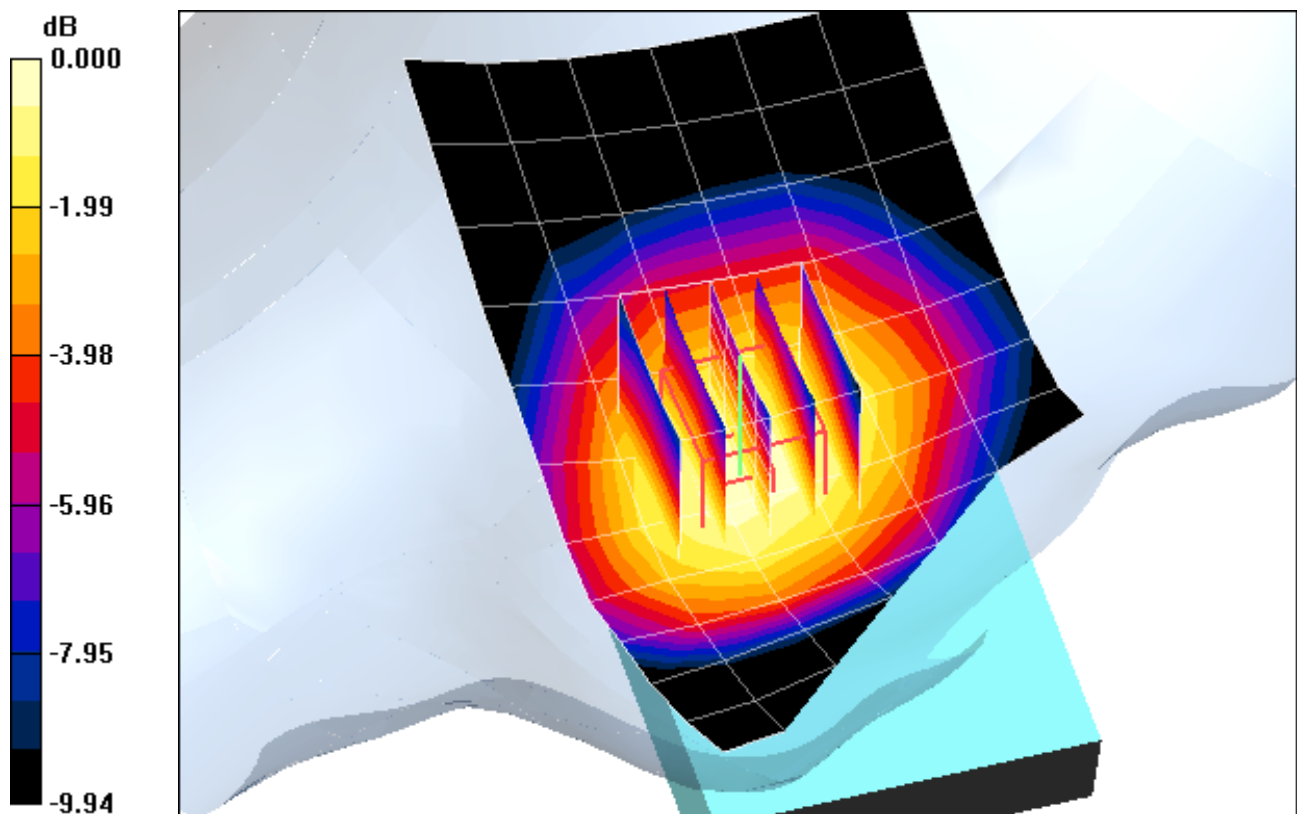
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.4 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.266 W/kg

SAR(1 g) = 0.205 mW/g; SAR(10 g) = 0.153 mW/g



0 dB = 0.216mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.894 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Left Head, Tilt, Mid.ch

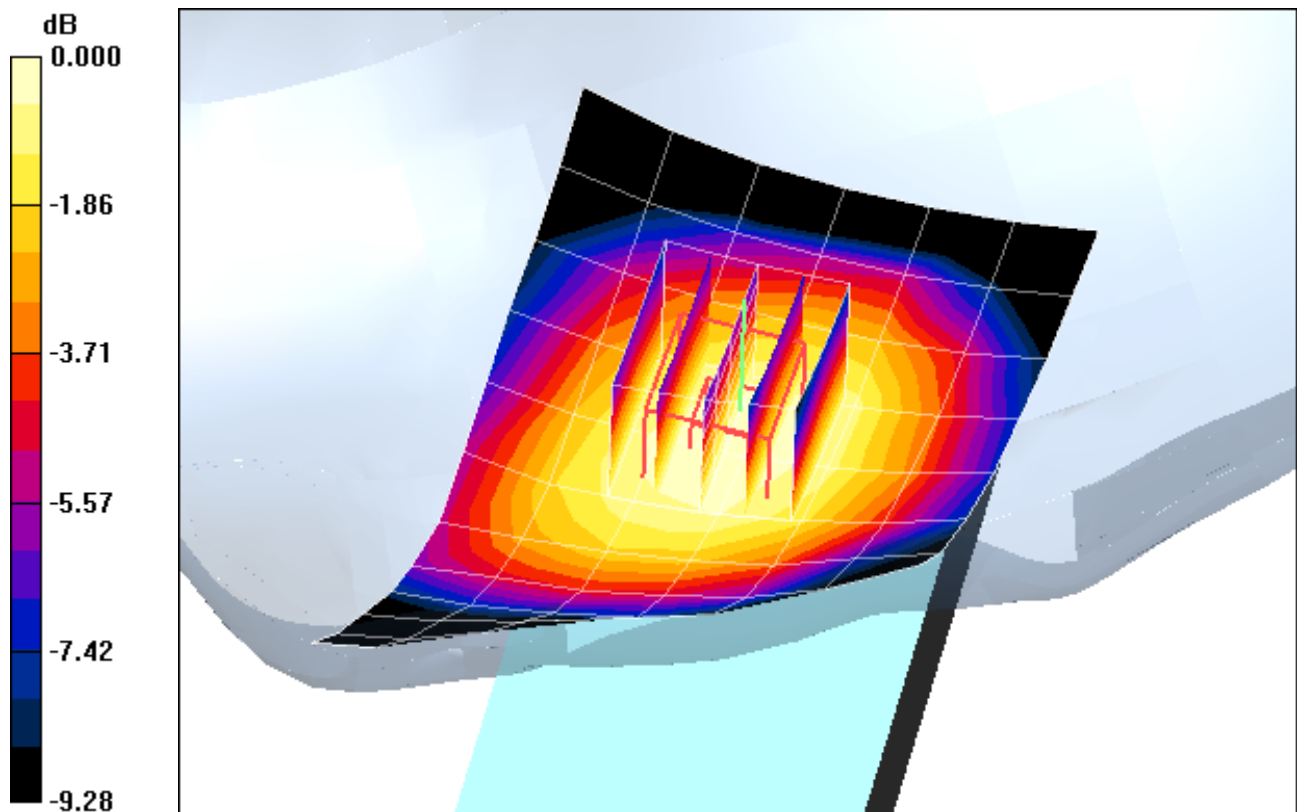
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.5 V/m; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.143 W/kg

SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.087 mW/g



0 dB = 0.118mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Right Head, Touch, High.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

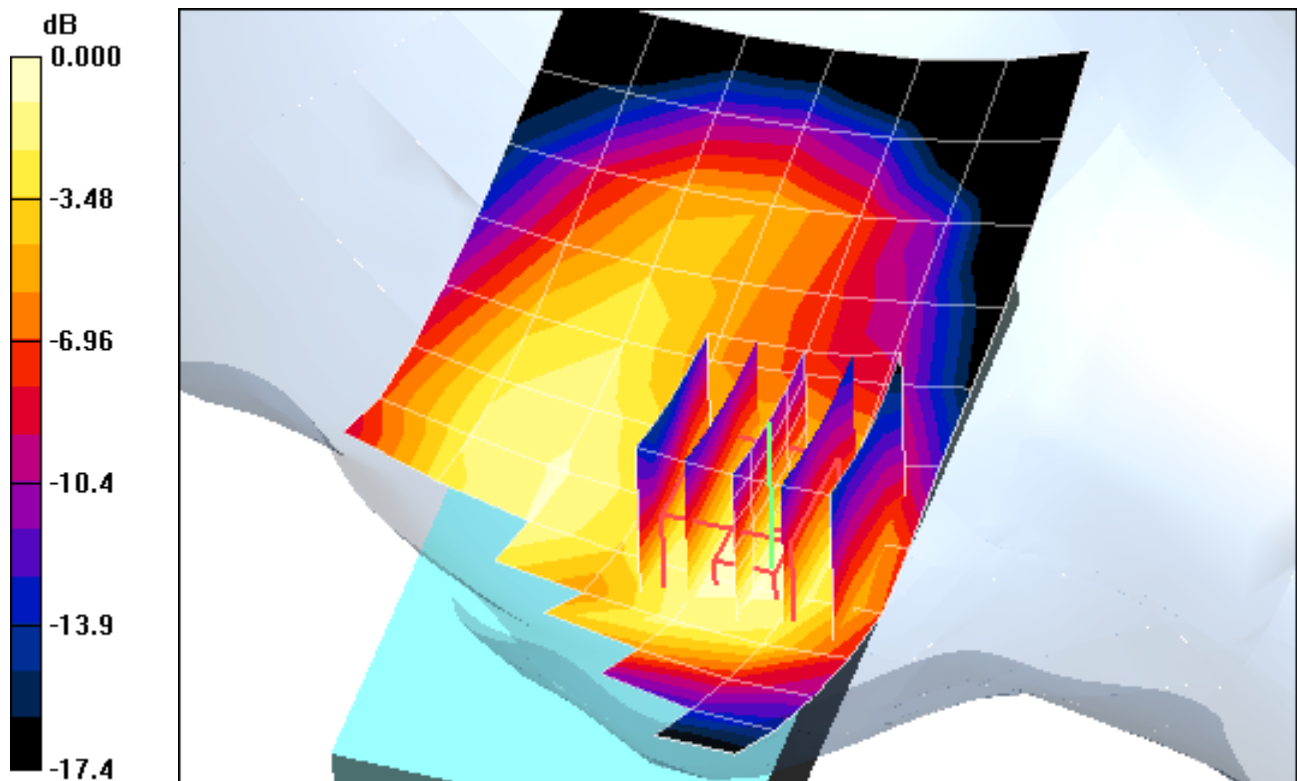
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.3 V/m; Power Drift = 0.061 dB

Peak SAR (extrapolated) = 0.684 W/kg

SAR(1 g) = 0.451 mW/g; SAR(10 g) = 0.274 mW/g



0 dB = 0.491mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Right Head, Tilt, High.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

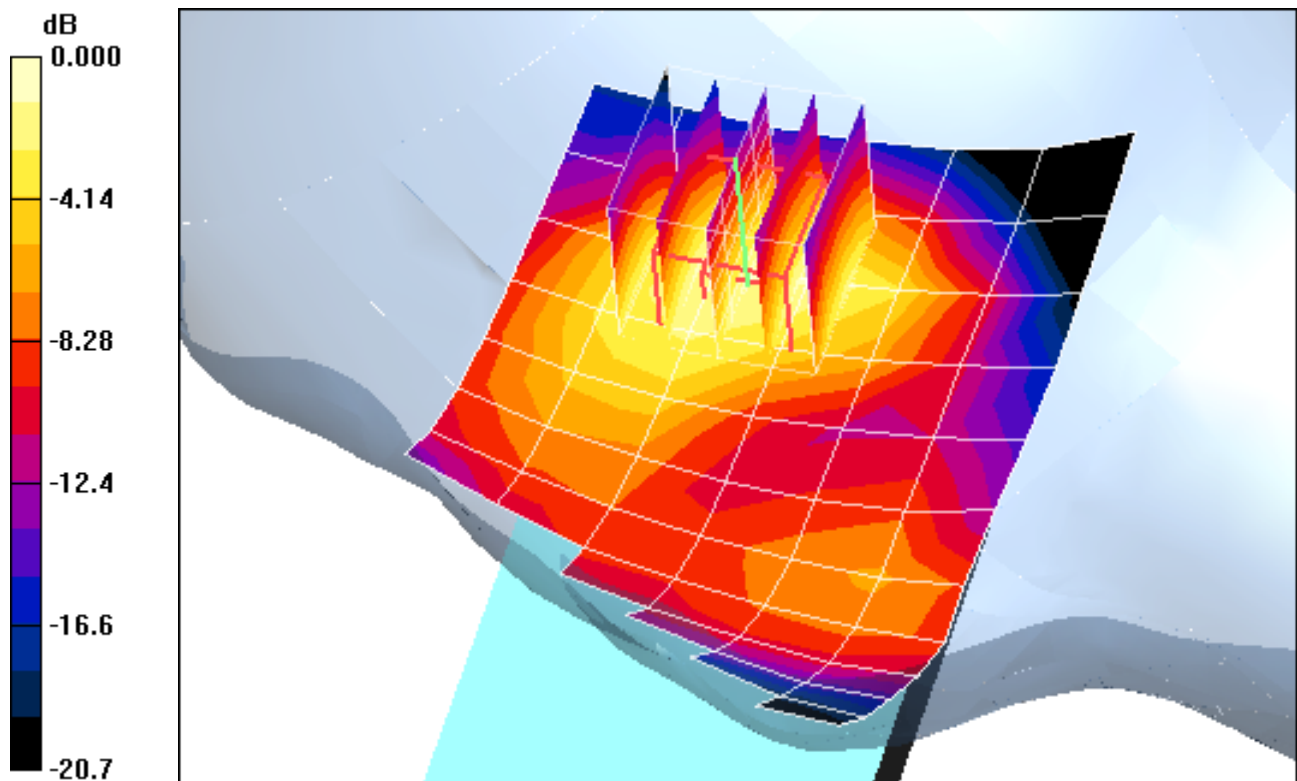
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.1 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.566 W/kg

SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.199 mW/g



0 dB = 0.366mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Left Head, Touch, High.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

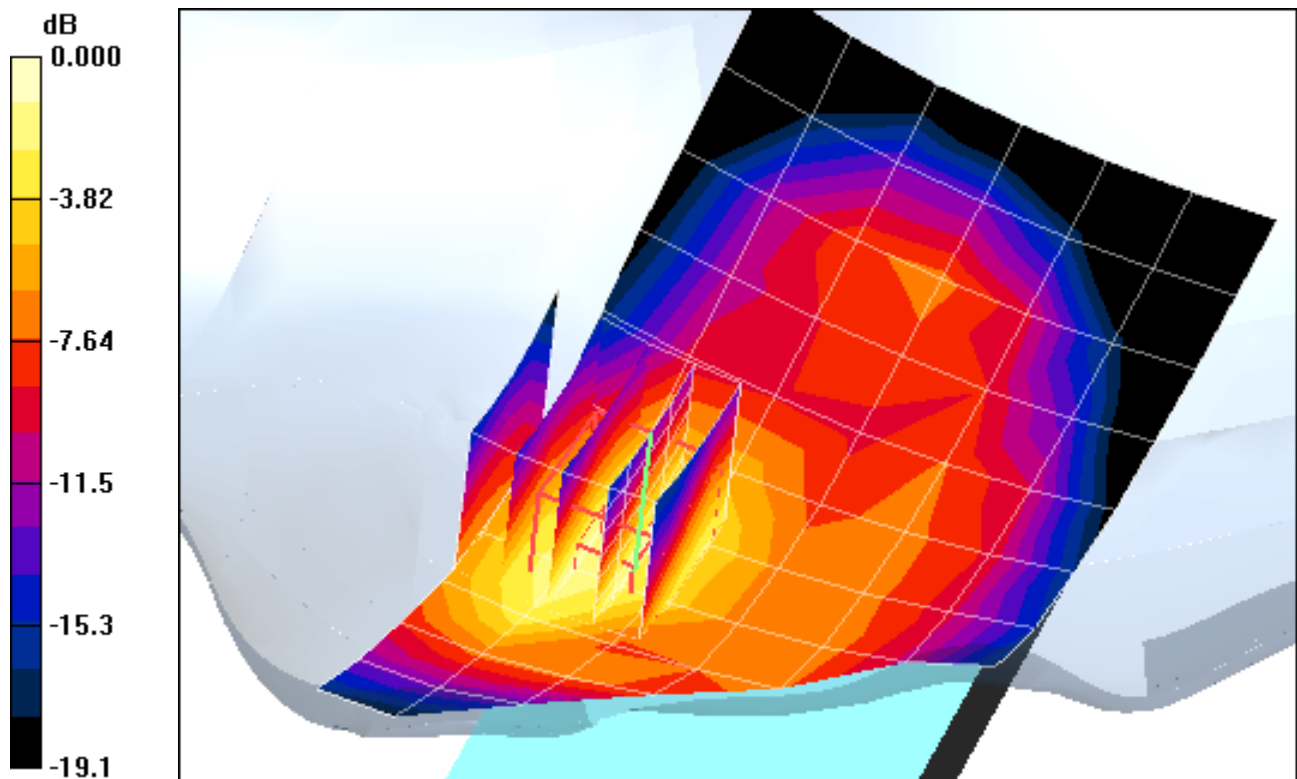
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.2 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.527 mW/g



0 dB = 0.955mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Left Head, Tilt, High.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

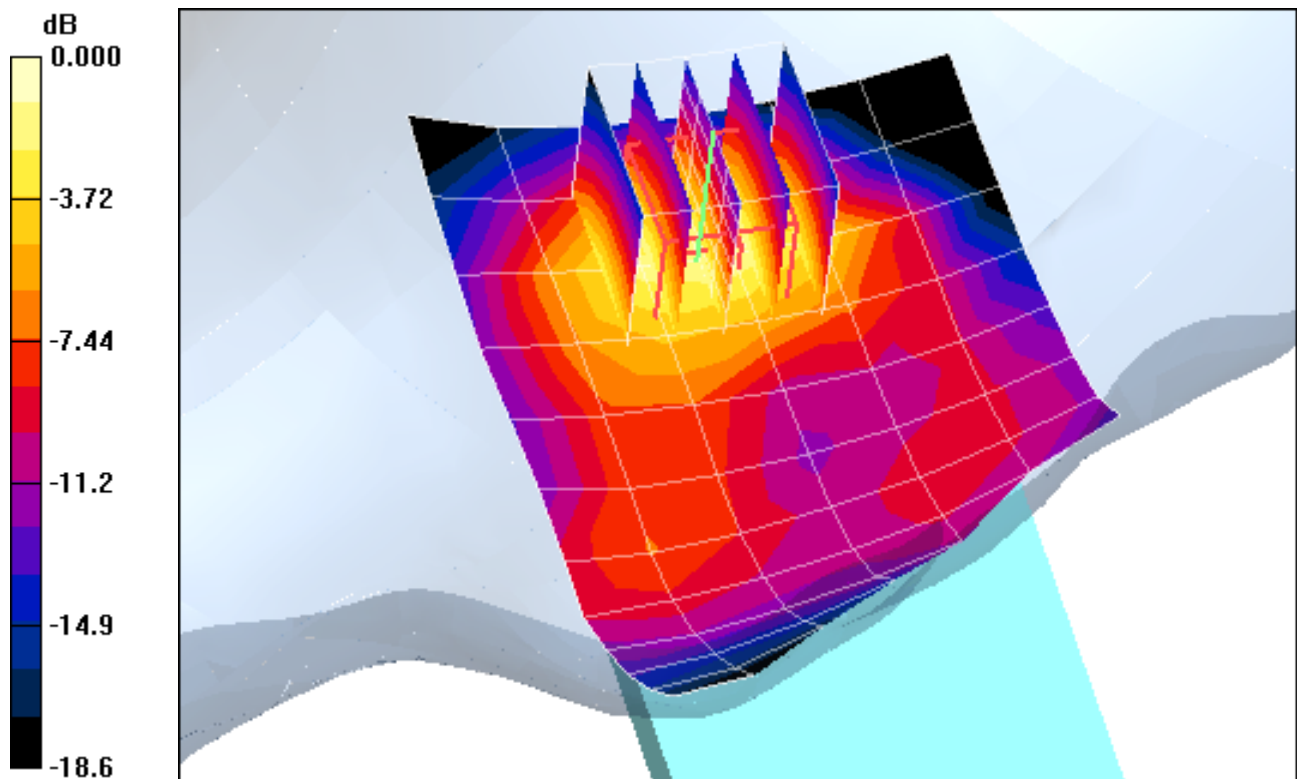
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.2 V/m; Power Drift = 0.124 dB

Peak SAR (extrapolated) = 0.644 W/kg

SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.213 mW/g



0 dB = 0.420mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

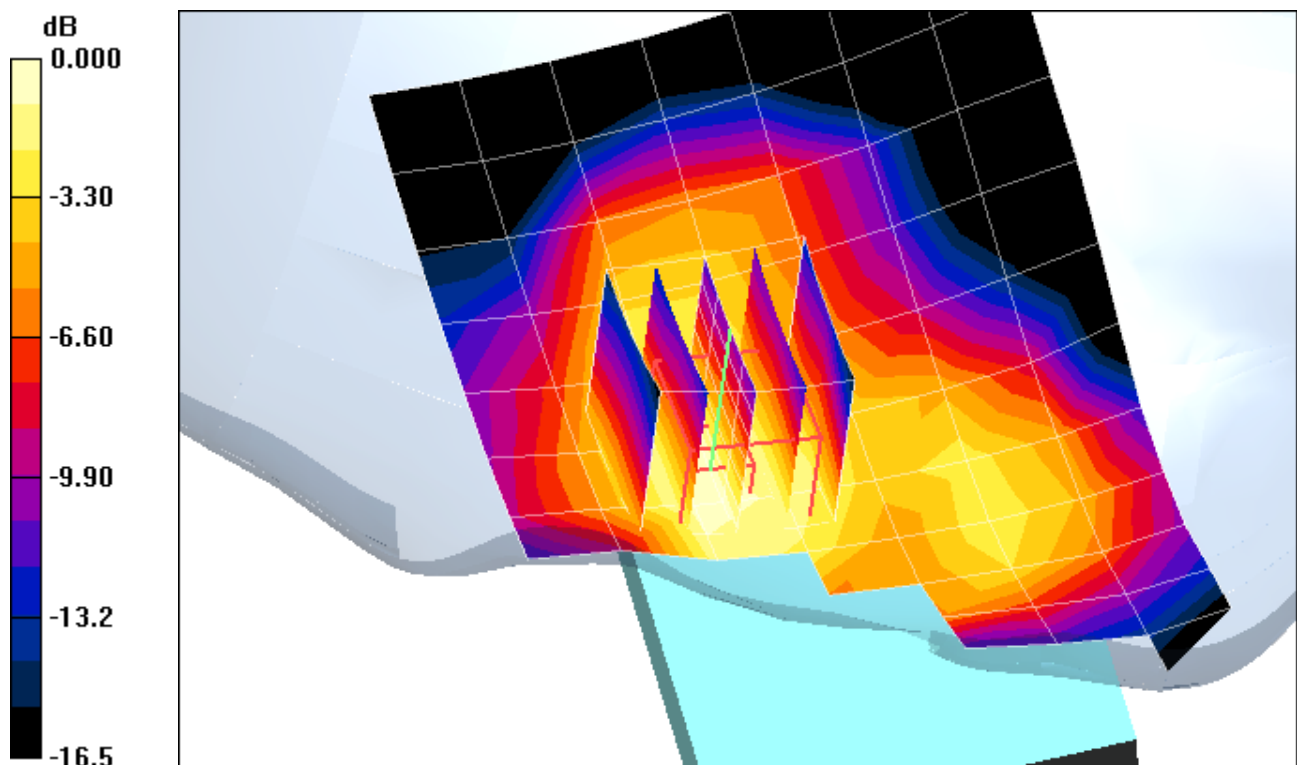
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.2 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.365 W/kg

SAR(1 g) = 0.233 mW/g; SAR(10 g) = 0.144 mW/g



0 dB = 0.255mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

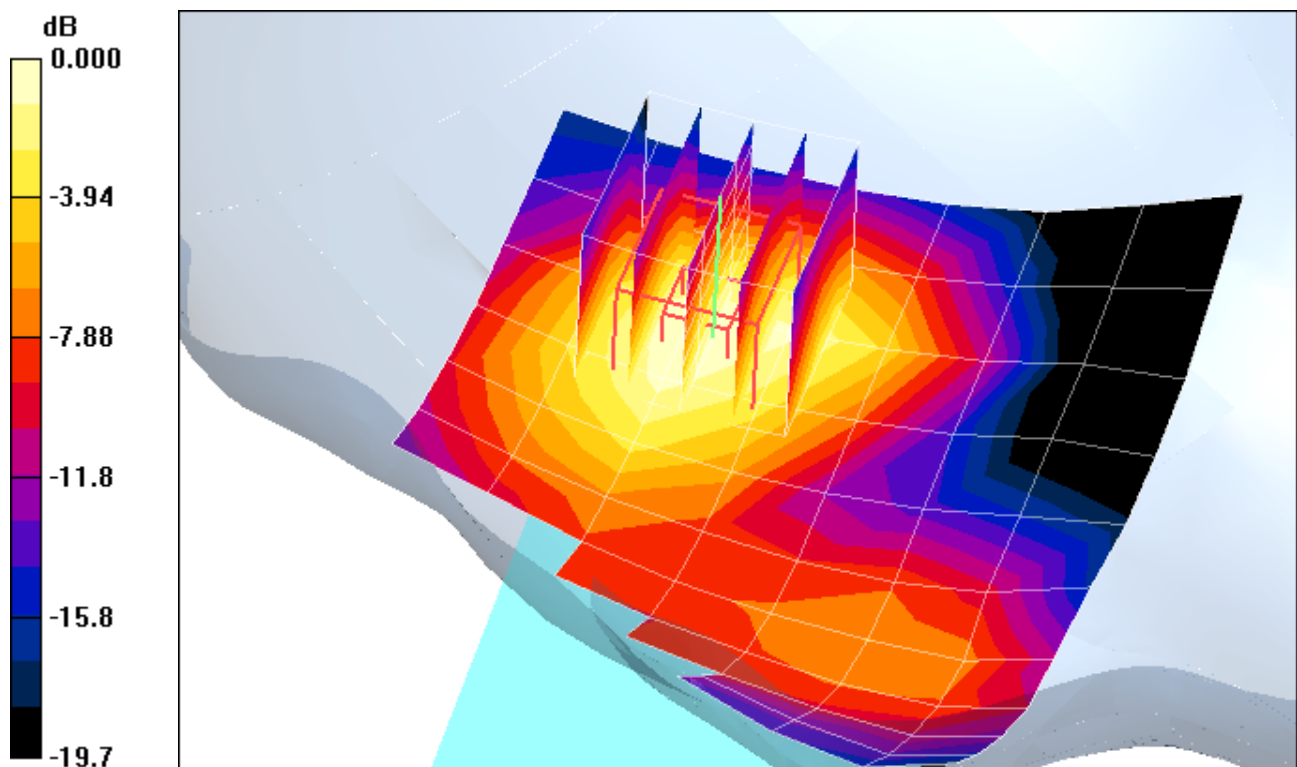
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.9 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.257 W/kg

SAR(1 g) = 0.156 mW/g; SAR(10 g) = 0.091 mW/g



0 dB = 0.165mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

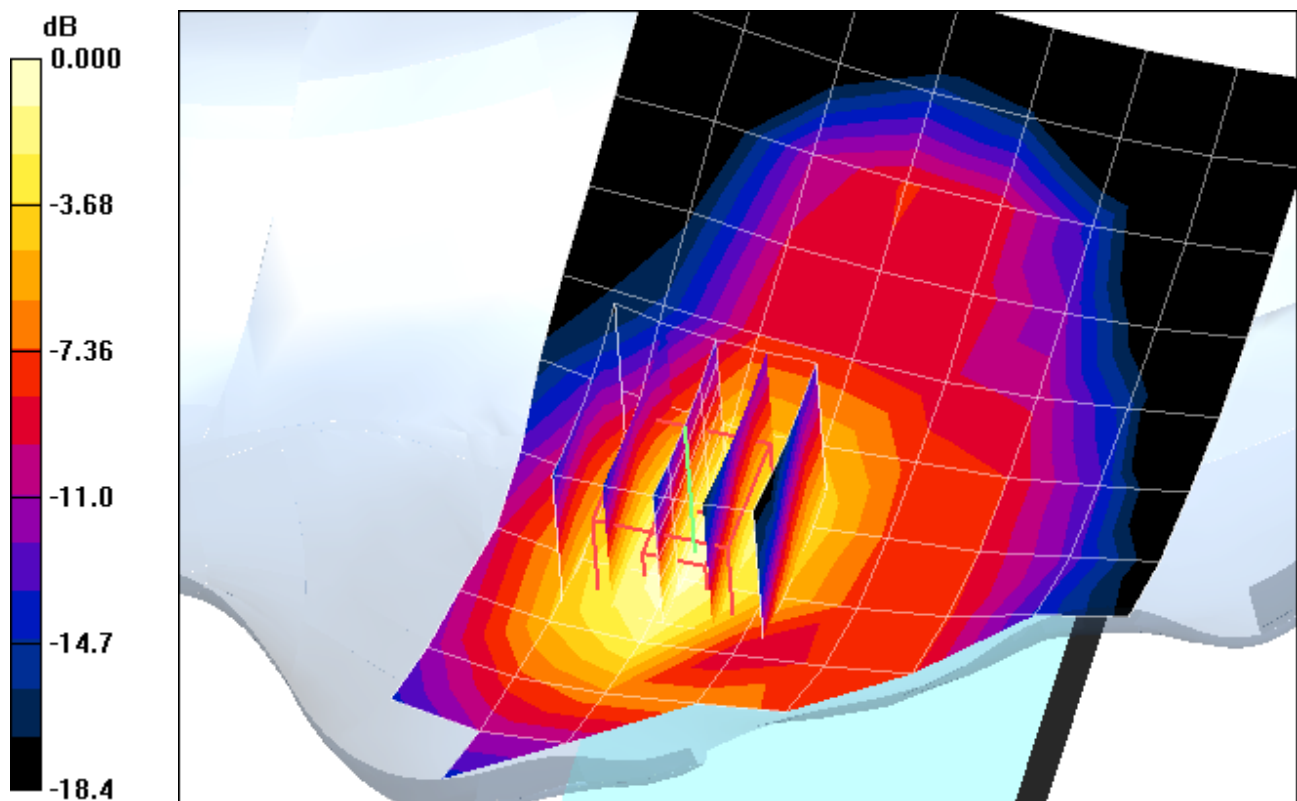
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.2 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.723 W/kg

SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.259 mW/g



0 dB = 0.501mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

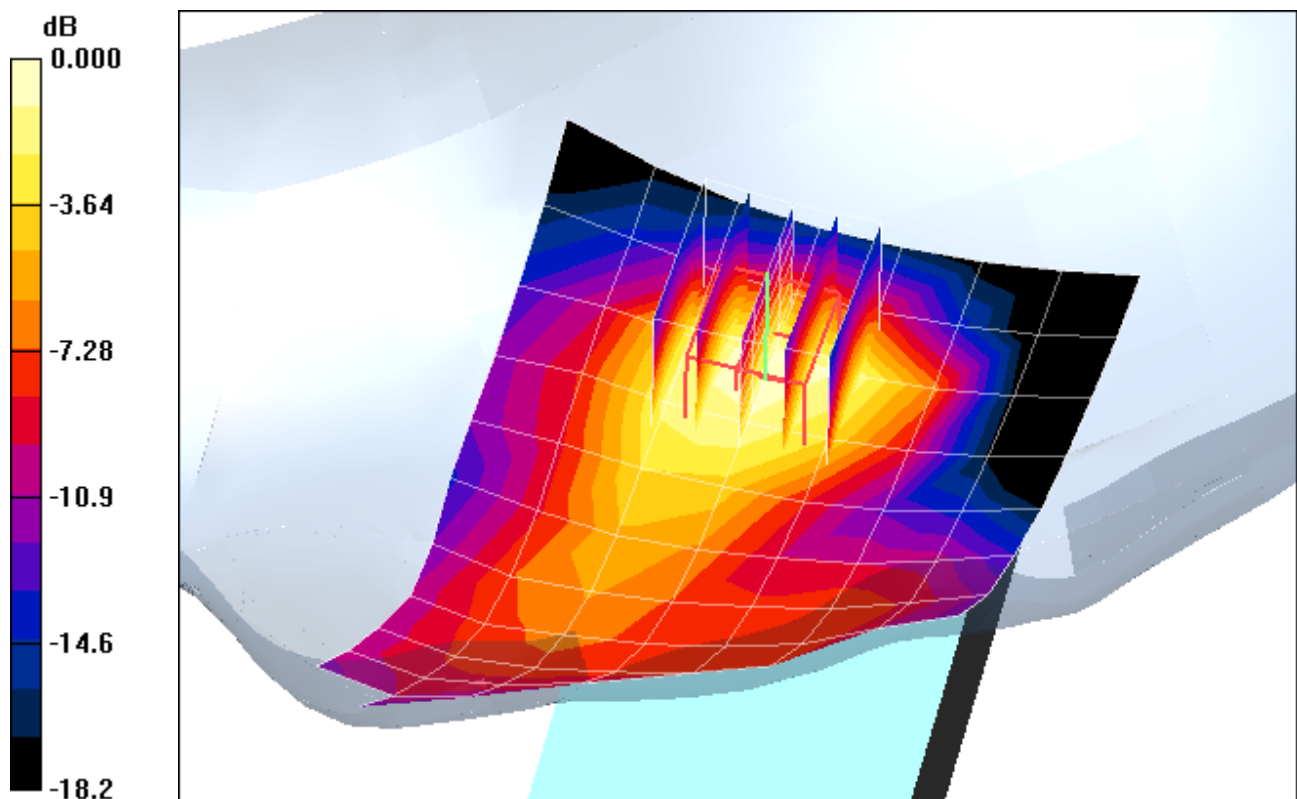
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.4 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.230 W/kg

SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.081 mW/g



0 dB = 0.149mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

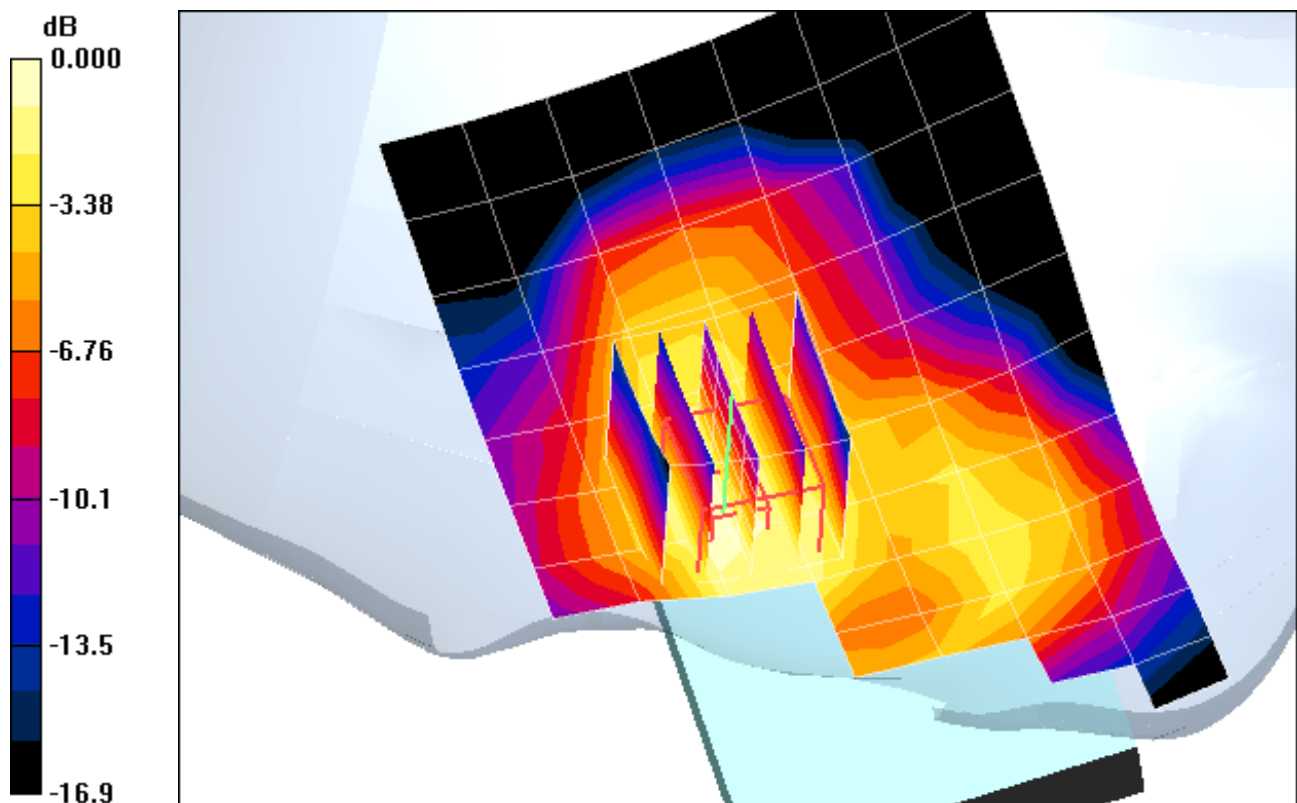
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.6 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.518 W/kg

SAR(1 g) = 0.329 mW/g; SAR(10 g) = 0.203 mW/g



0 dB = 0.361mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

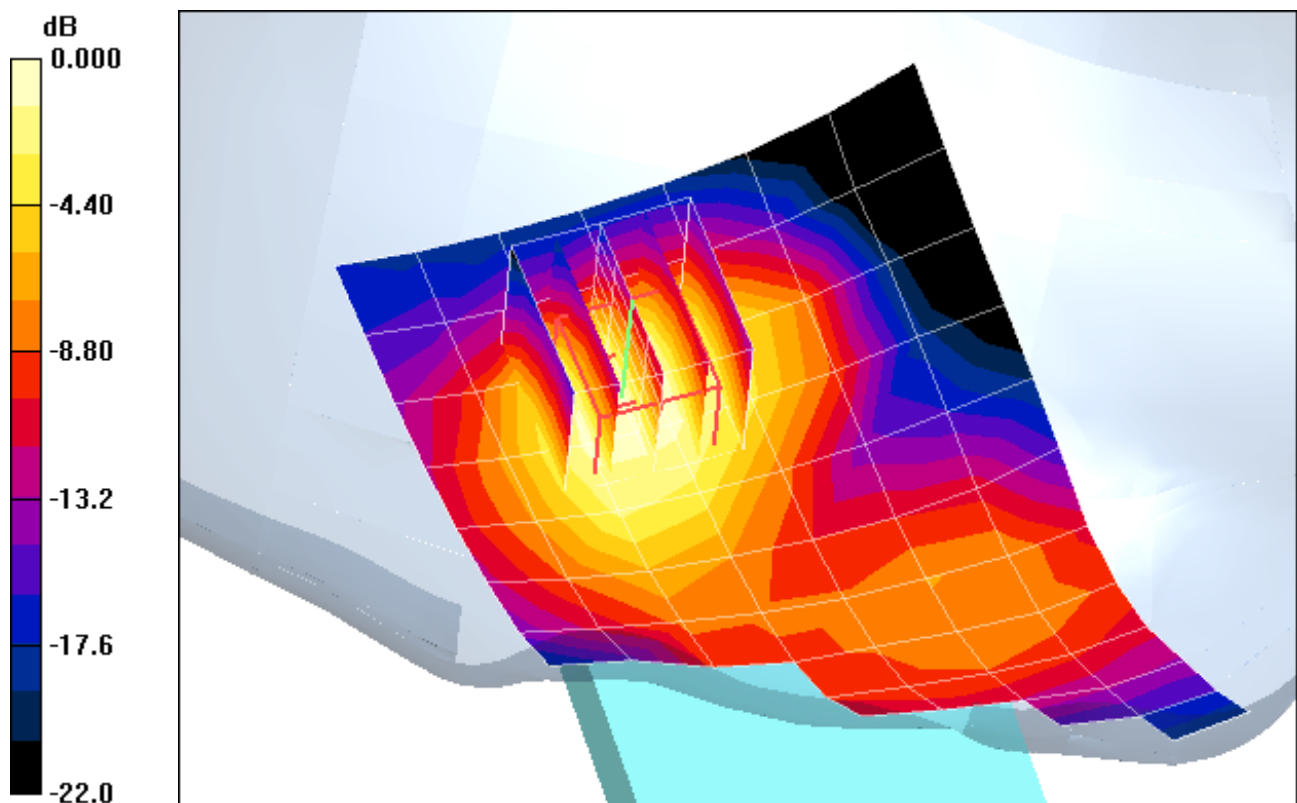
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.8 V/m; Power Drift = 0.175 dB

Peak SAR (extrapolated) = 0.419 W/kg

SAR(1 g) = 0.250 mW/g; SAR(10 g) = 0.147 mW/g



0 dB = 0.270mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

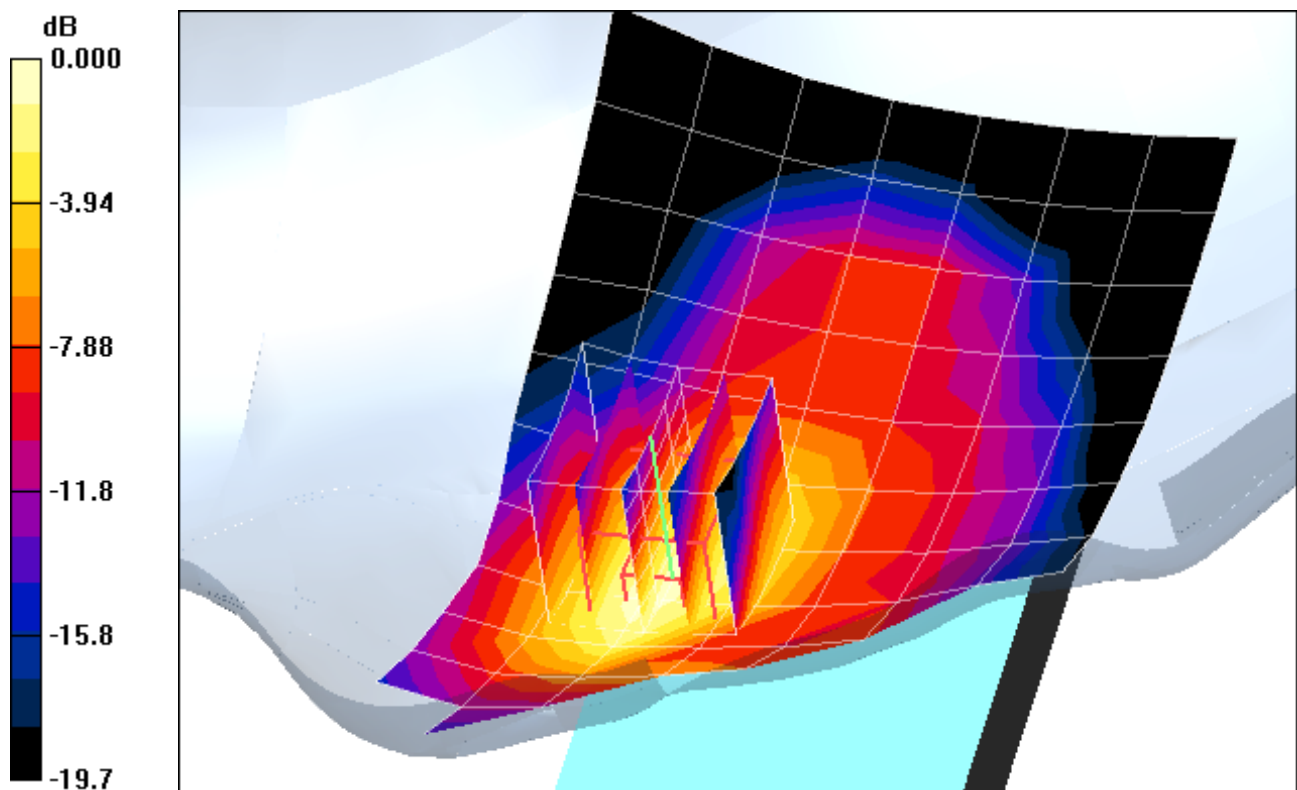
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.7 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.712 mW/g; SAR(10 g) = 0.404 mW/g



0 dB = 0.797mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

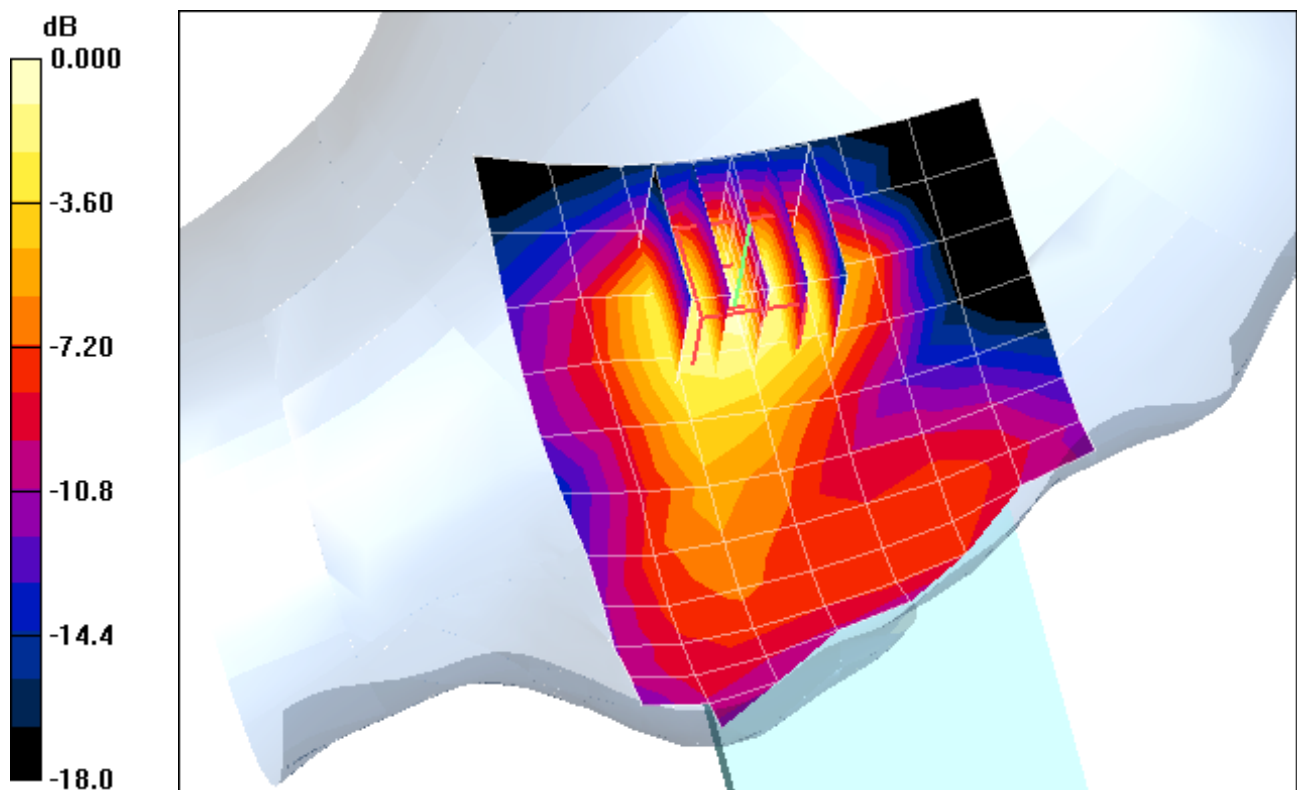
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.7 V/m; Power Drift = 0.093 dB

Peak SAR (extrapolated) = 0.332 W/kg

SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.119 mW/g



0 dB = 0.221mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Touch, Ch 06, 1 Mbps

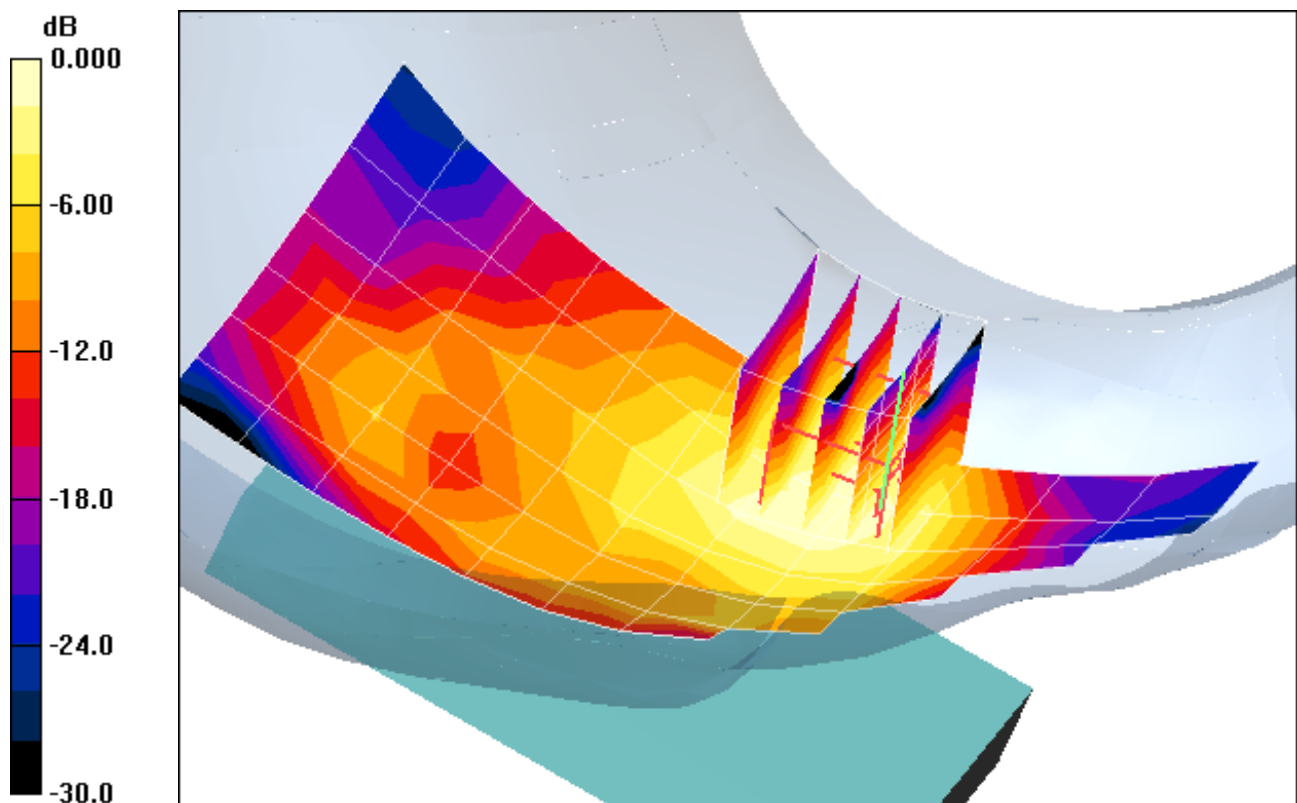
Area Scan(7x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.08 V/m; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.158 W/kg

SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.038 mW/g



0 dB = 0.099mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Tilt, Ch 06, 1 Mbps

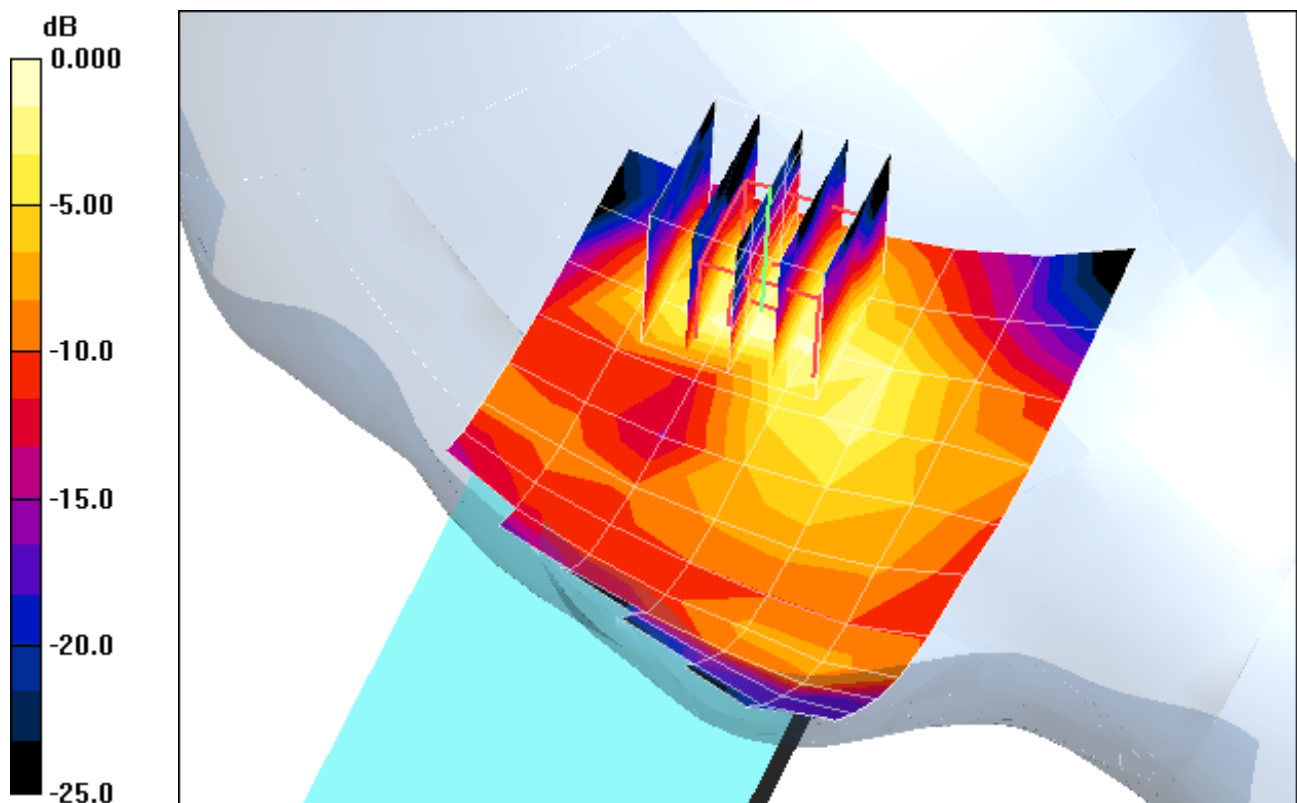
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.60 V/m; Power Drift = -0.193 dB

Peak SAR (extrapolated) = 0.049 W/kg

SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.012 mW/g



0 dB = 0.033mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Touch, Ch 06, 1 Mbps

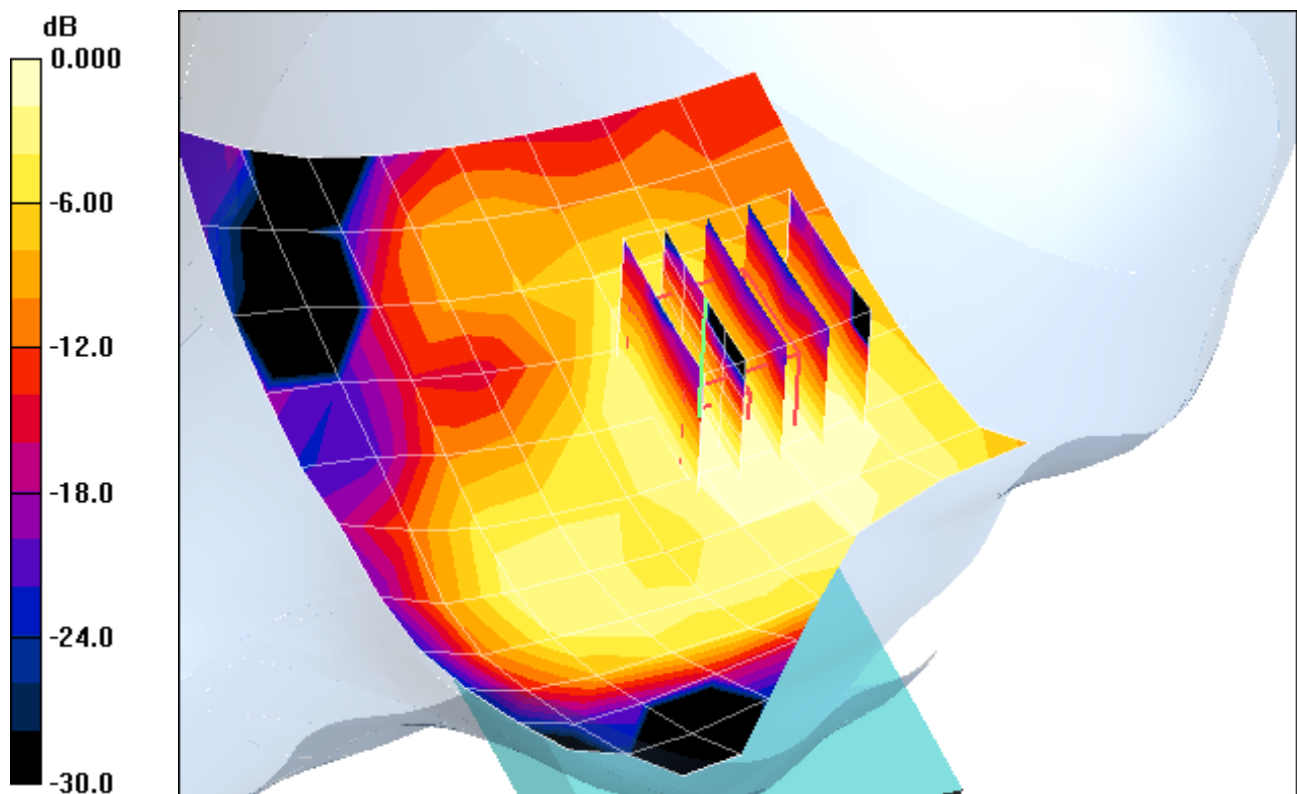
Area Scan (9x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.13 V/m; Power Drift = 0.139 dB

Peak SAR (extrapolated) = 0.061 W/kg

SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.018 mW/g



0 dB = 0.041mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Tilt, Ch 06, 1 Mbps

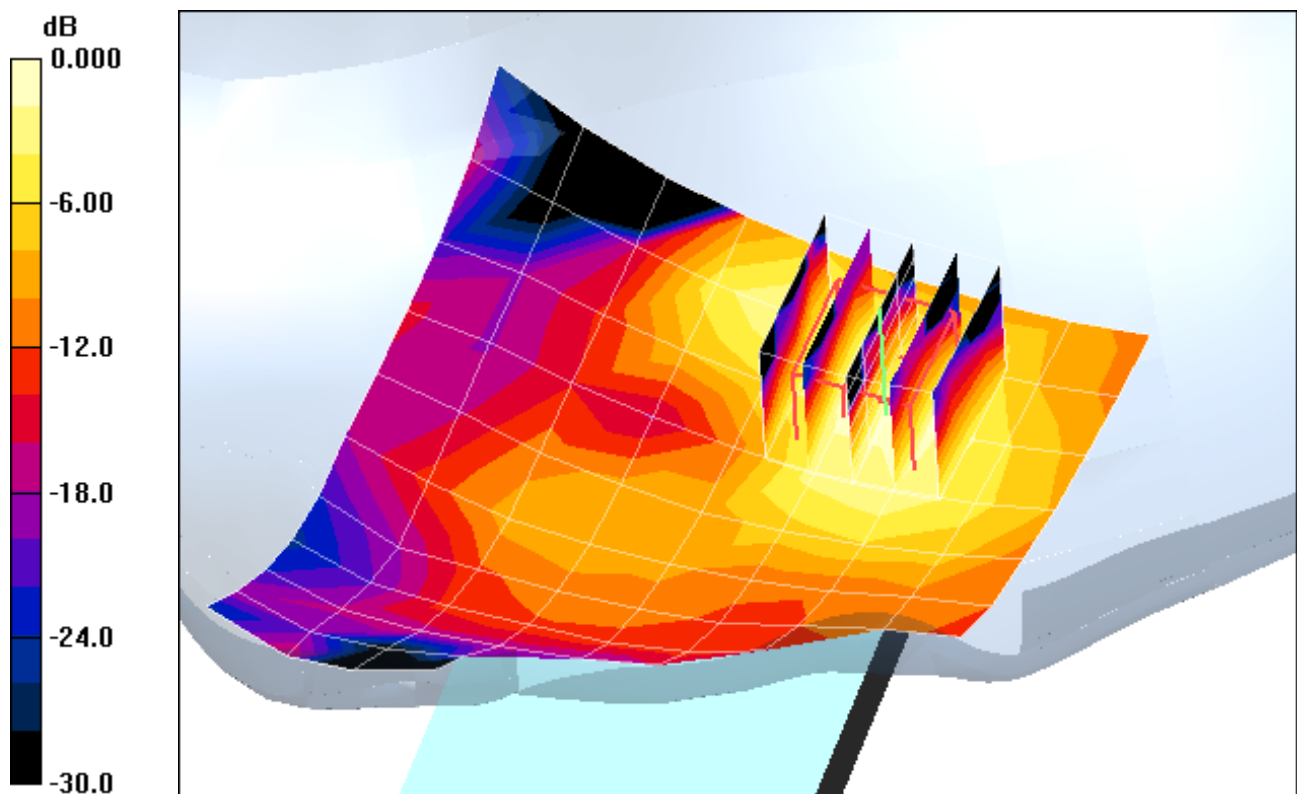
Area Scan (9x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.55 V/m; Power Drift = 0.218 dB

Peak SAR (extrapolated) = 0.053 W/kg

SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.015 mW/g



0 dB = 0.037mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 58.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Back side, Mid.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

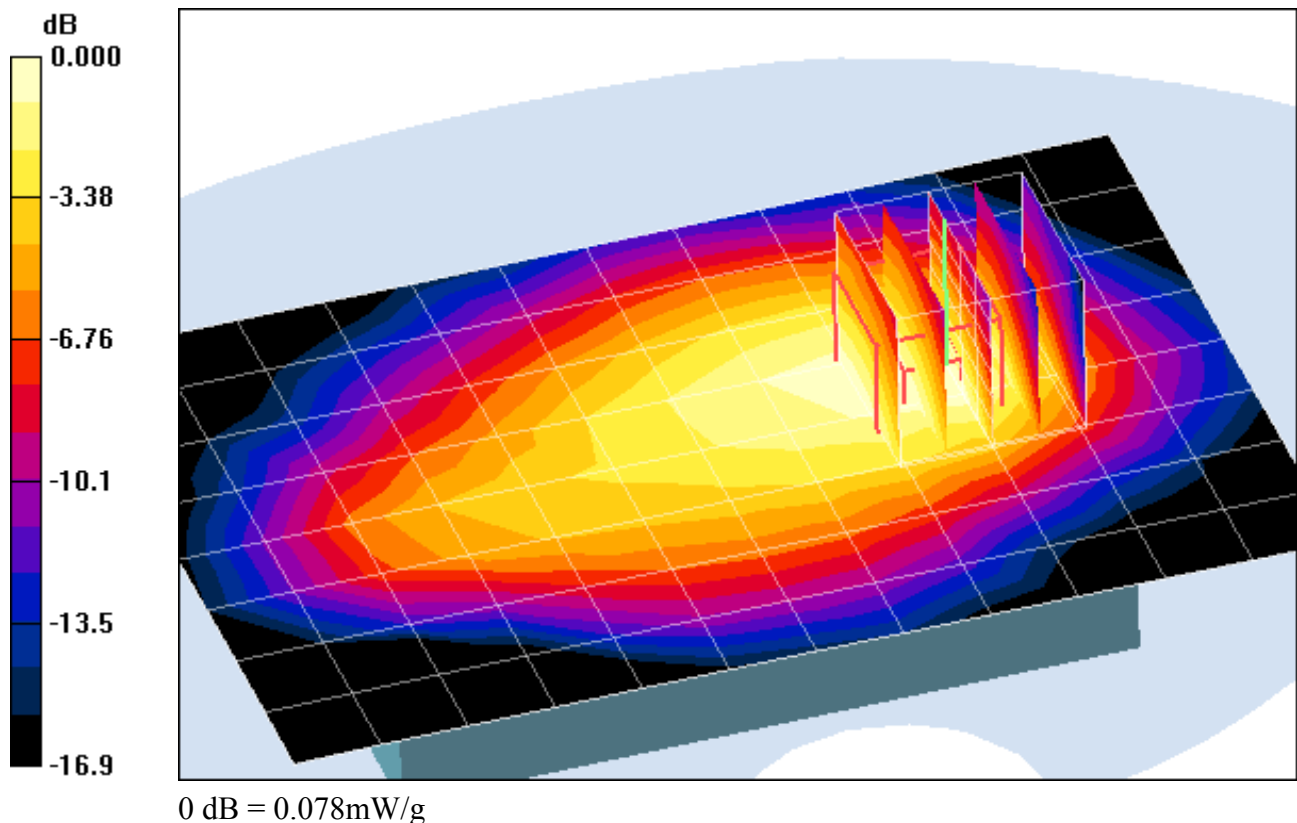
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.00 V/m; Power Drift = 0.106 dB

Peak SAR (extrapolated) = 0.108 W/kg

SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.052 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 58.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Front side, Mid.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

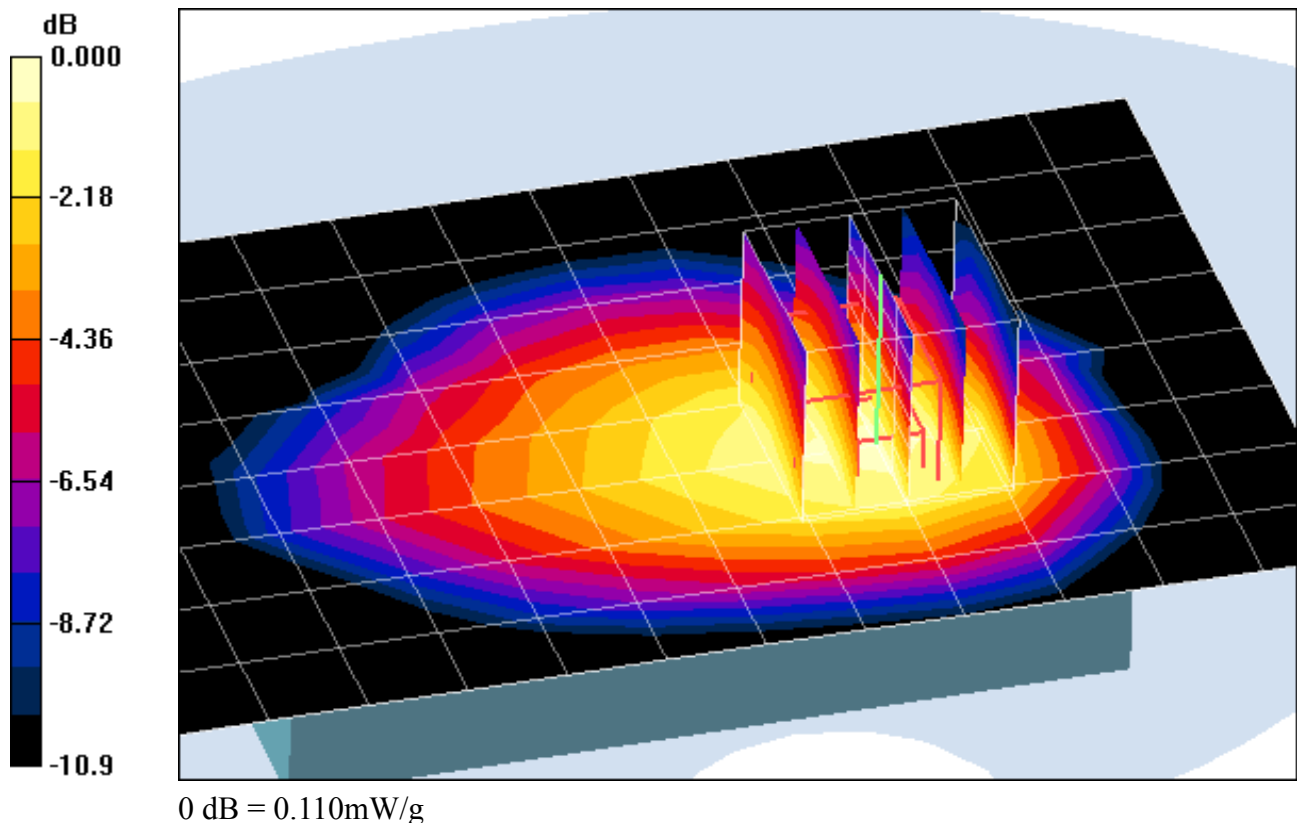
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.7 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 0.142 W/kg

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.074 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 58.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Bottom Edge, Mid.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

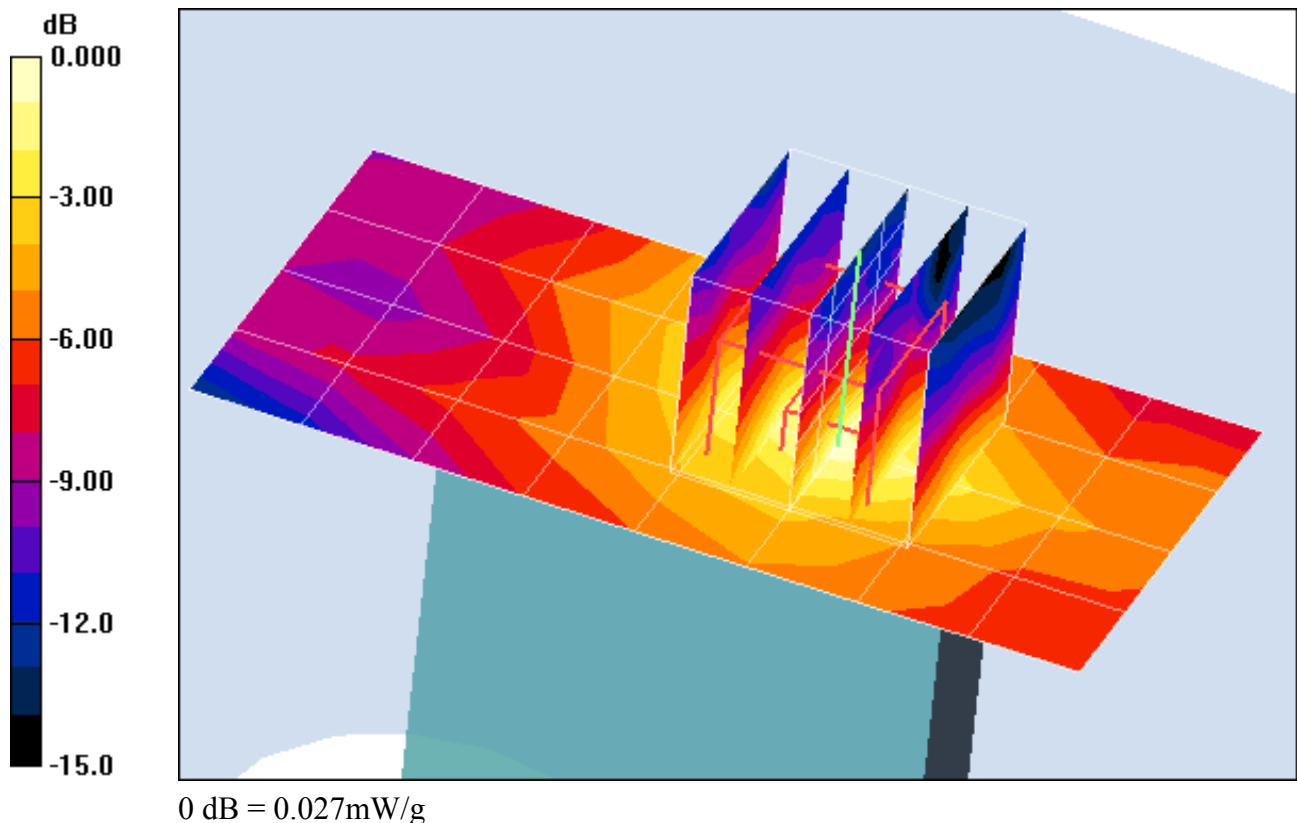
Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.23 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 0.047 W/kg

SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.013 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 700; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 58.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 17, Left Edge, Mid.ch, QPSK,
1 RB, 0 RB Offset, 10MHz Bandwidth**

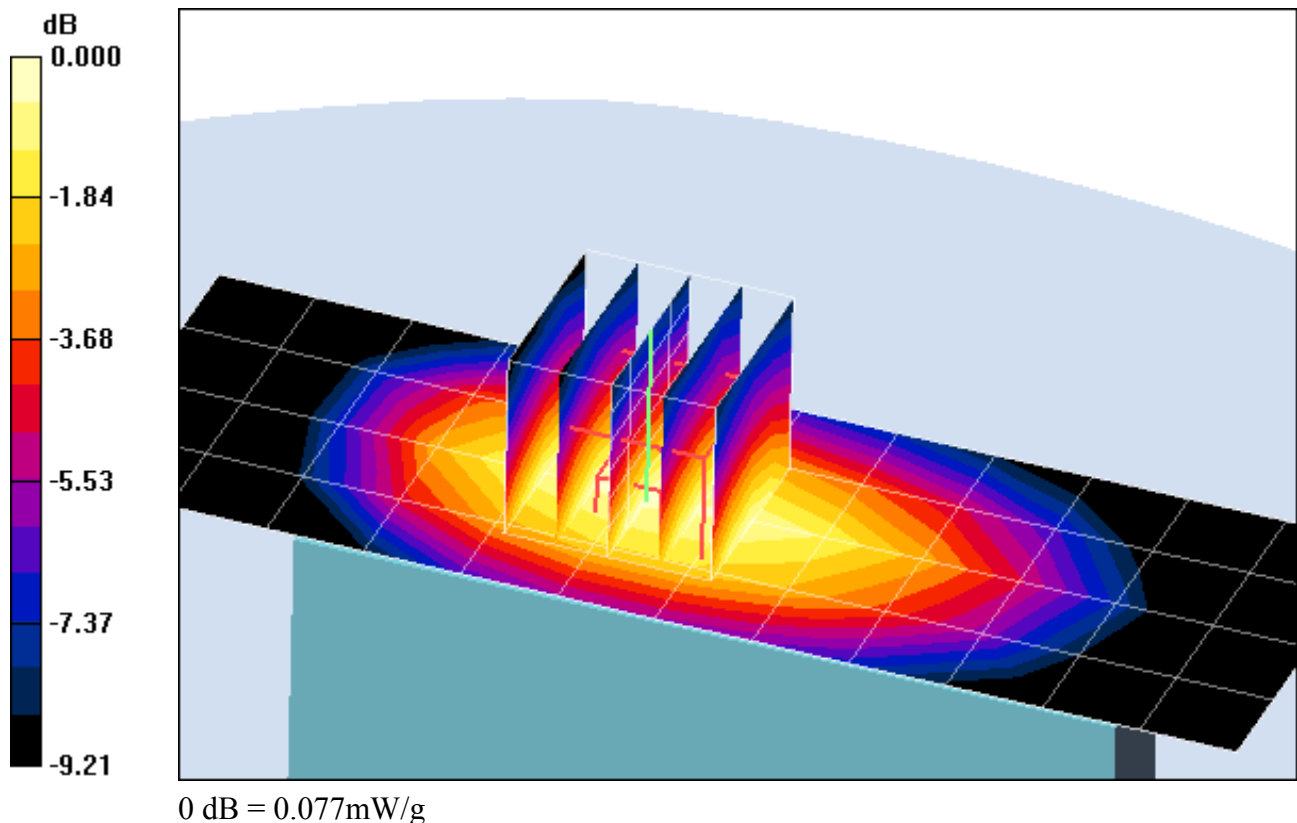
Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.00 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 0.104 W/kg

SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.050 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

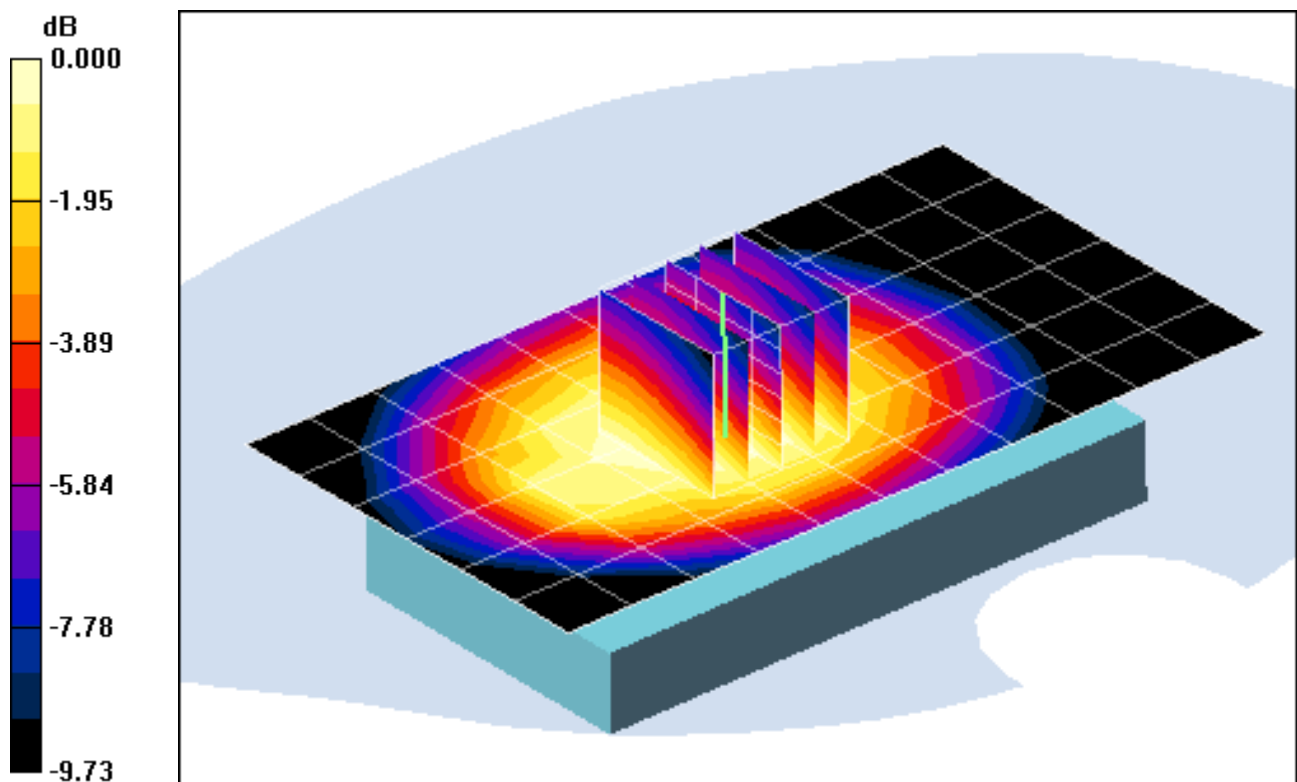
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.9 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.669 W/kg

SAR(1 g) = 0.496 mW/g; SAR(10 g) = 0.373 mW/g



0 dB = 0.522mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

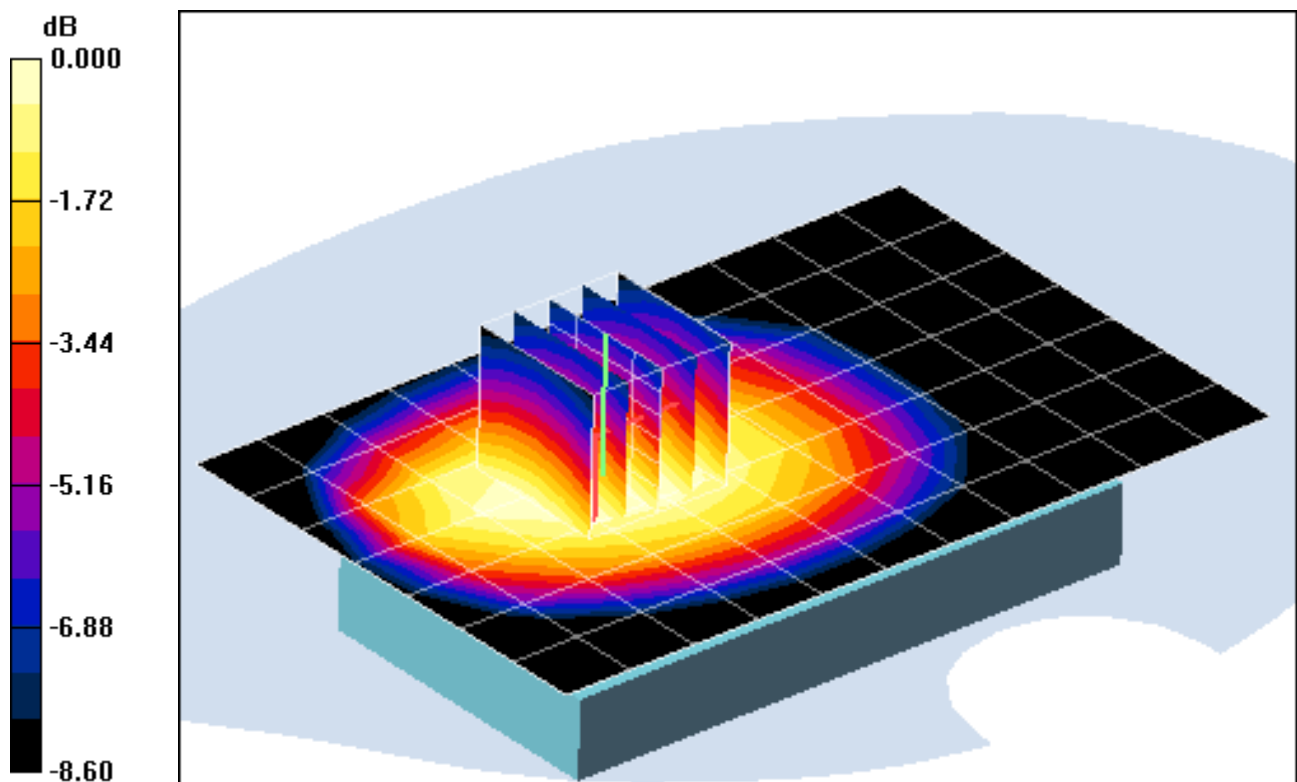
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.9 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.477 W/kg

SAR(1 g) = 0.373 mW/g; SAR(10 g) = 0.281 mW/g



0 dB = 0.391mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

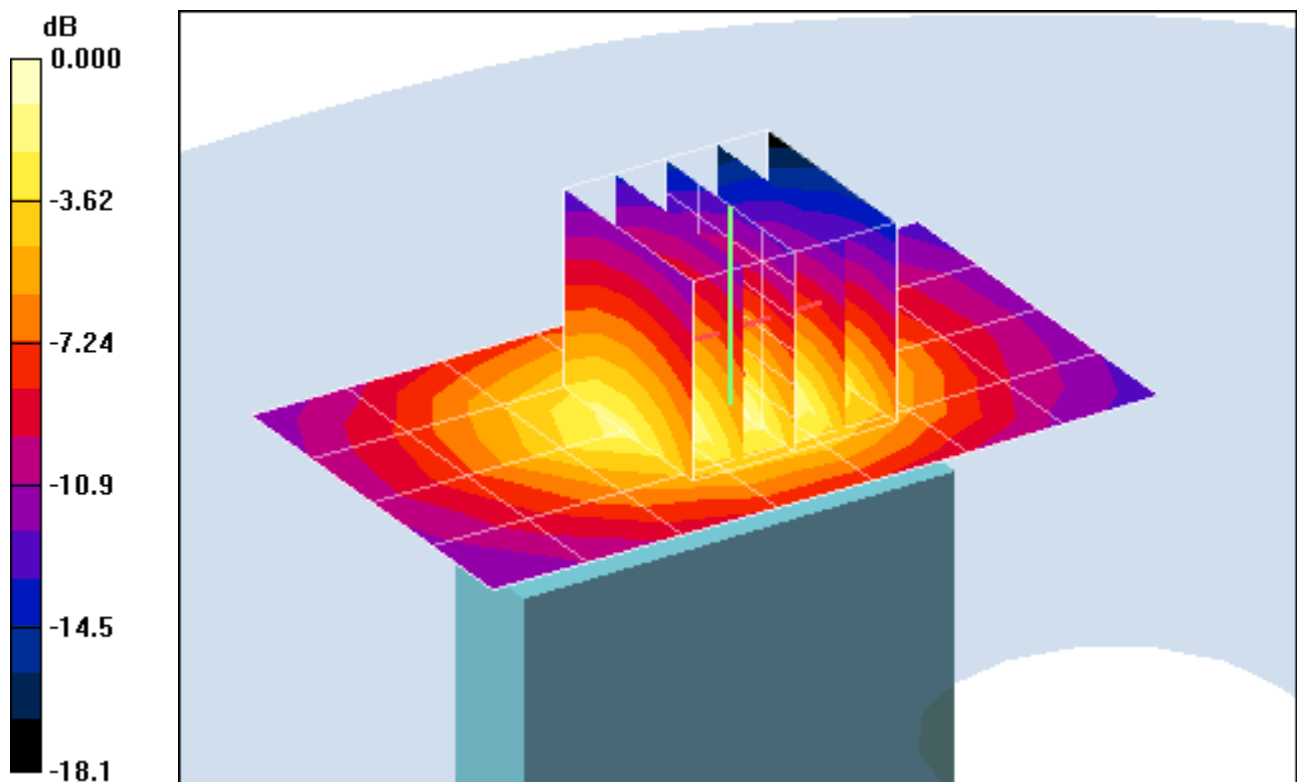
Area Scan (5x8x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.5 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 0.433 W/kg

SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.116 mW/g



0 dB = 0.230mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: 59

Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

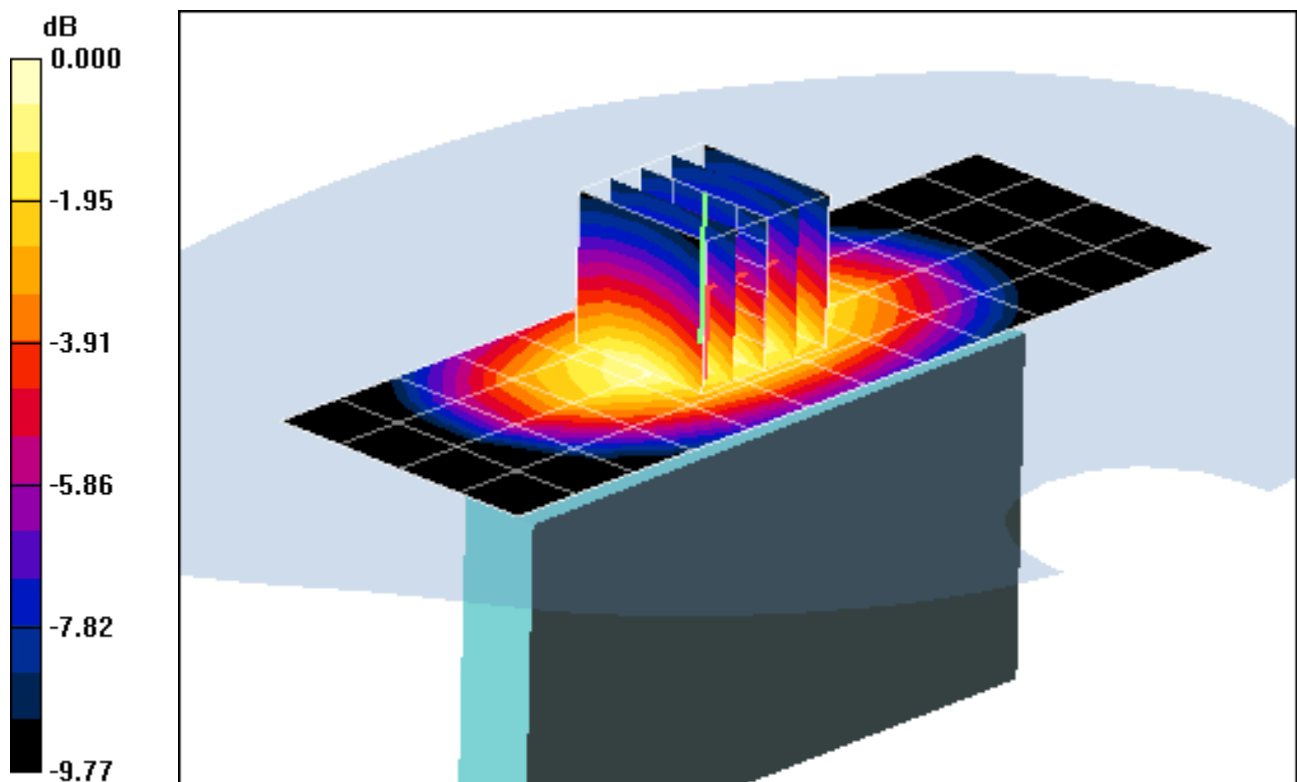
Area Scan (5x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.2 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.720 W/kg

SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.345 mW/g



0 dB = 0.538mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Back side, Mid.ch

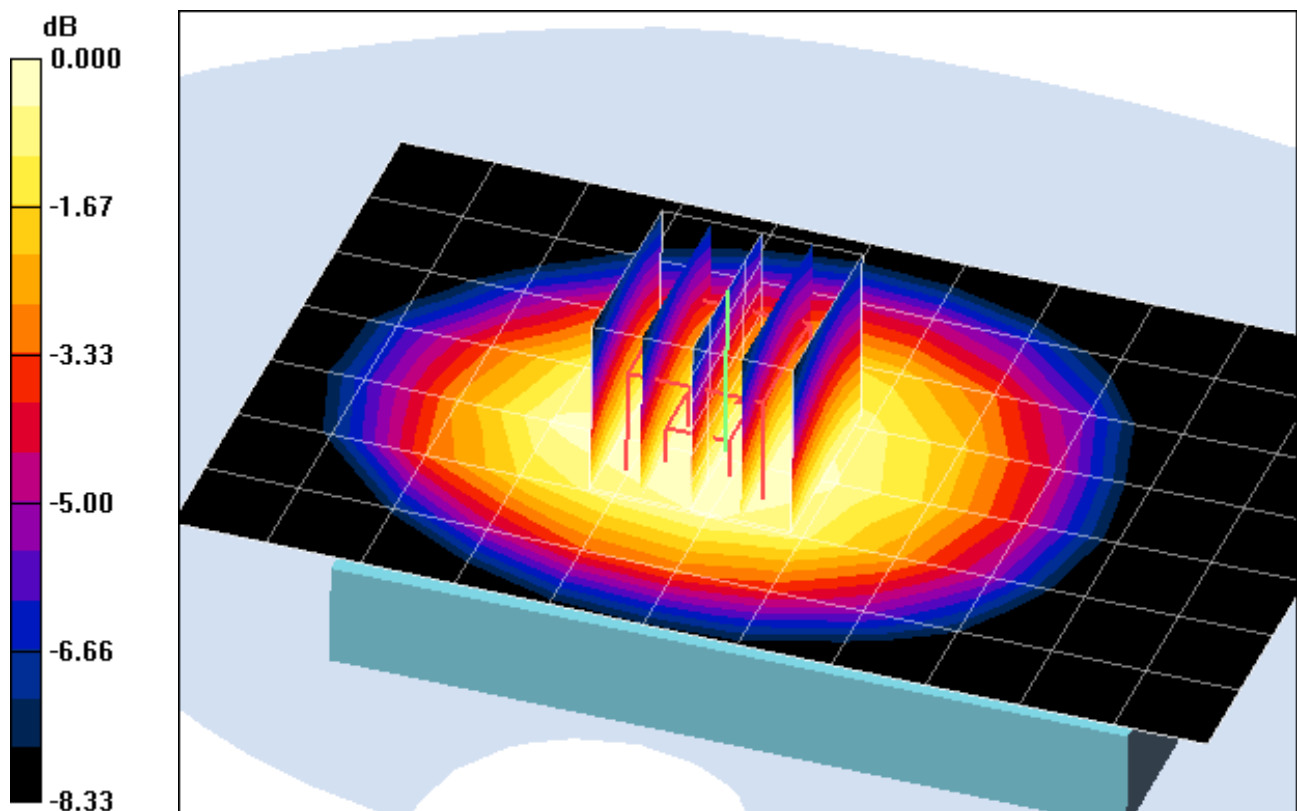
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.4 V/m; Power Drift = 0.012 dB

Peak SAR (extrapolated) = 0.357 W/kg

SAR(1 g) = 0.276 mW/g; SAR(10 g) = 0.212 mW/g



0 dB = 0.288mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Front side, Mid.ch

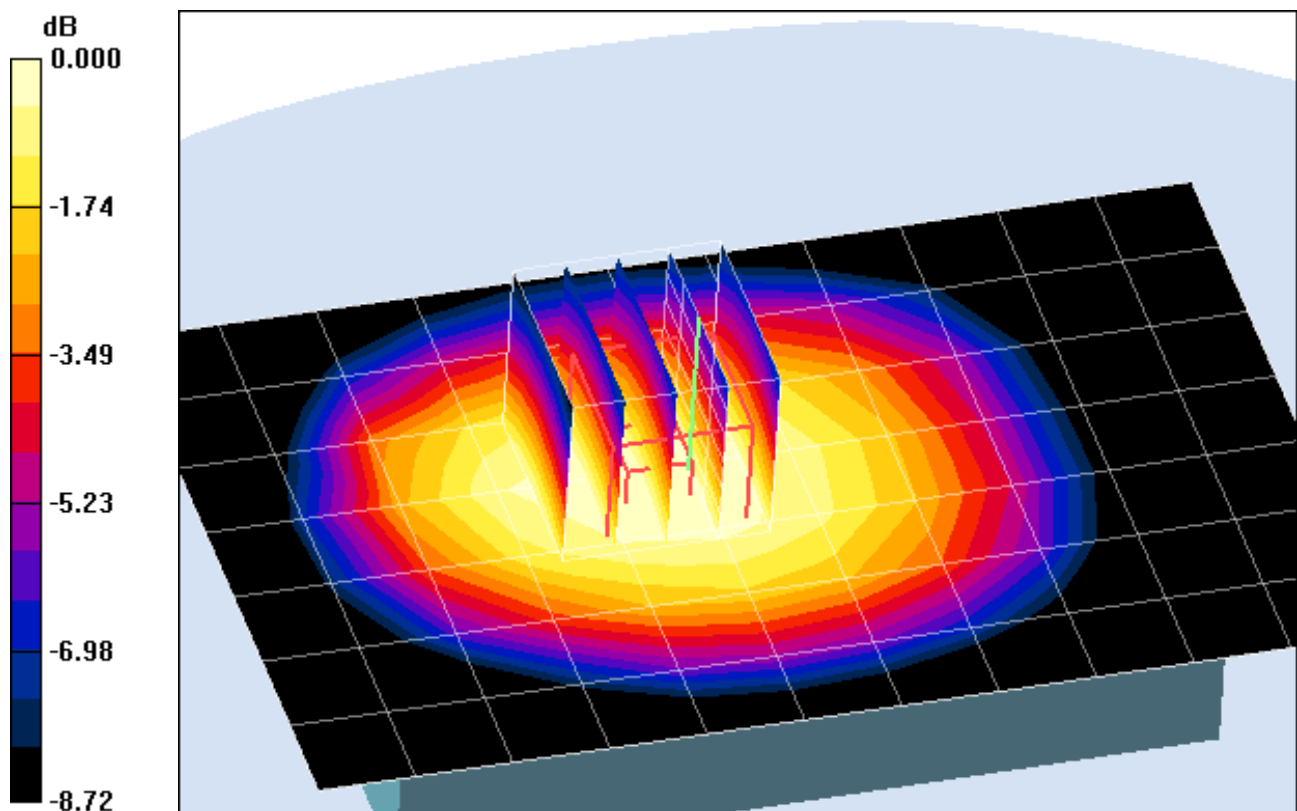
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.2 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.259 mW/g



0 dB = 0.353mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Bottom Edge, Mid.ch

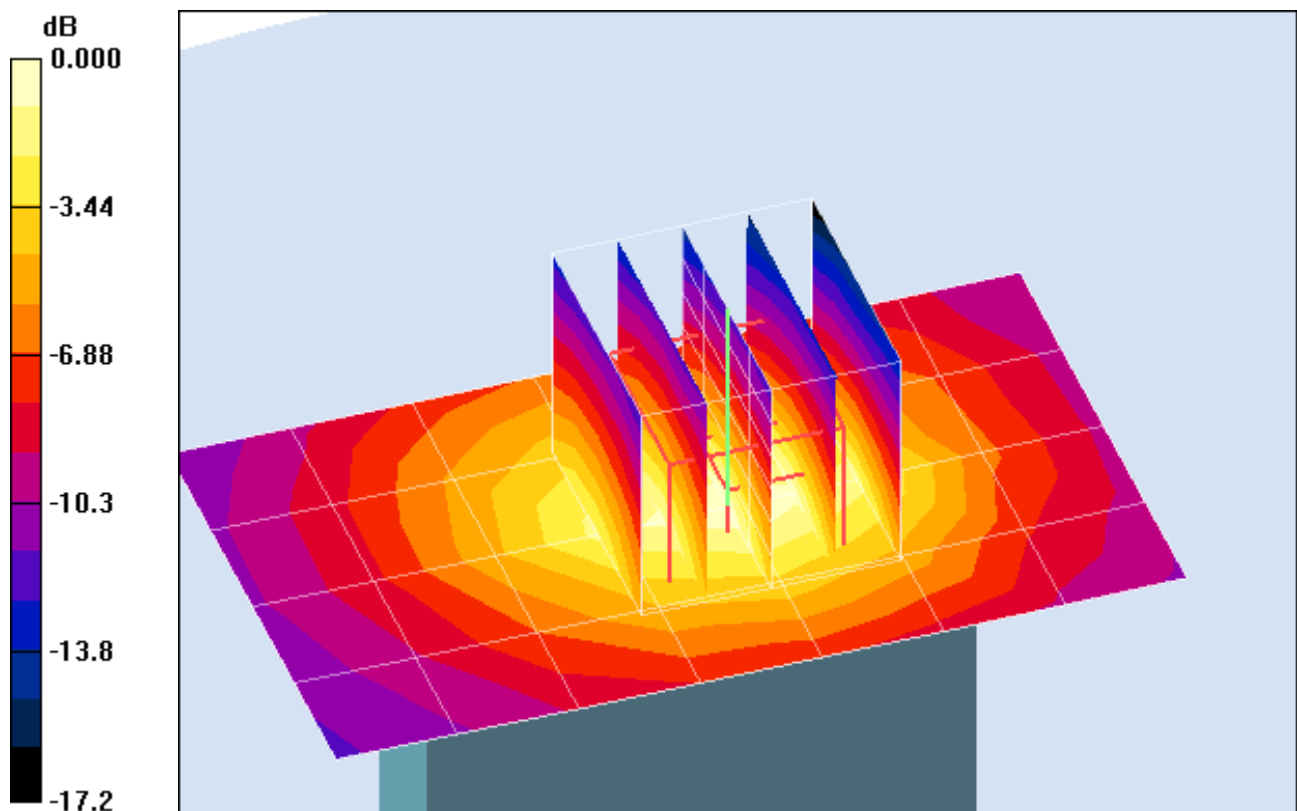
Area Scan (5x8x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.31 V/m; Power Drift = 0.085 dB

Peak SAR (extrapolated) = 0.119 W/kg

SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.034 mW/g



0 dB = 0.067mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Left Edge, Mid.ch

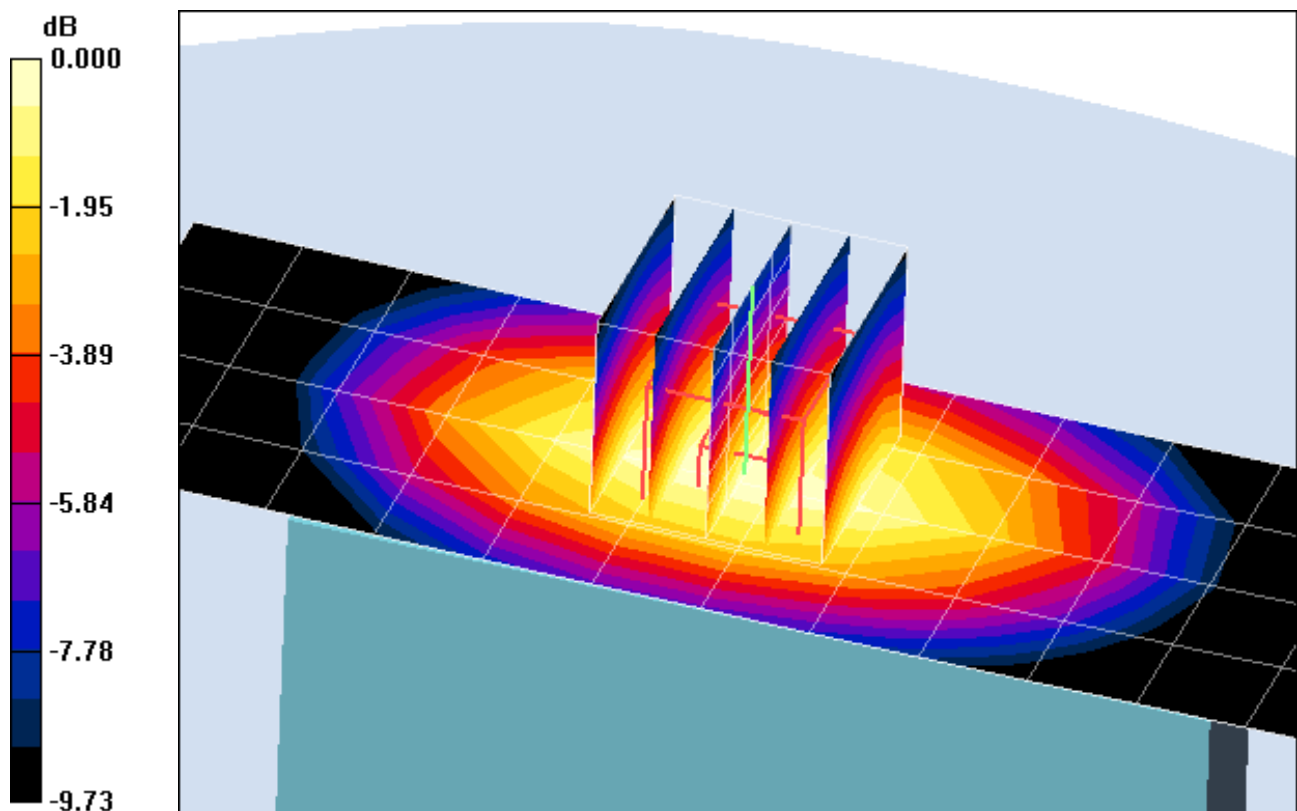
Area Scan (5x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.2 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 0.482 W/kg

SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.230 mW/g



0 dB = 0.359mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Back side, High.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

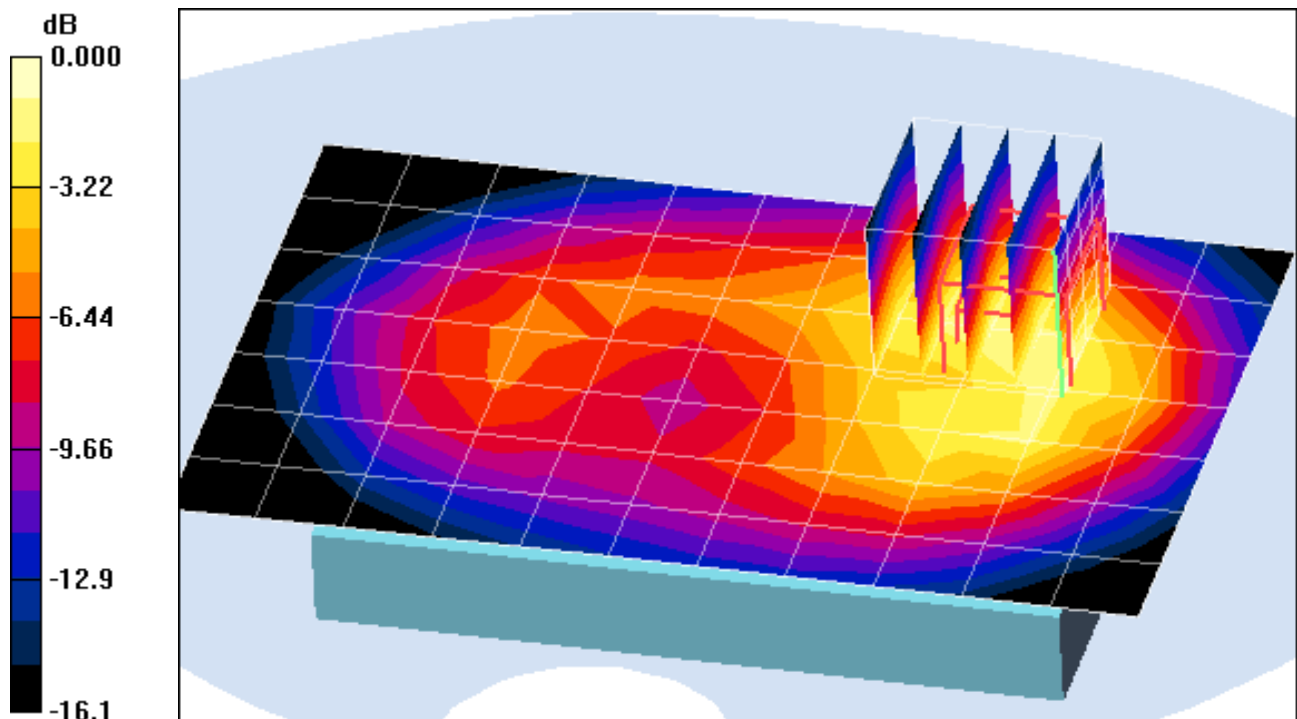
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.9 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.620 mW/g; SAR(10 g) = 0.359 mW/g



0 dB = 0.739mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Front side, High.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

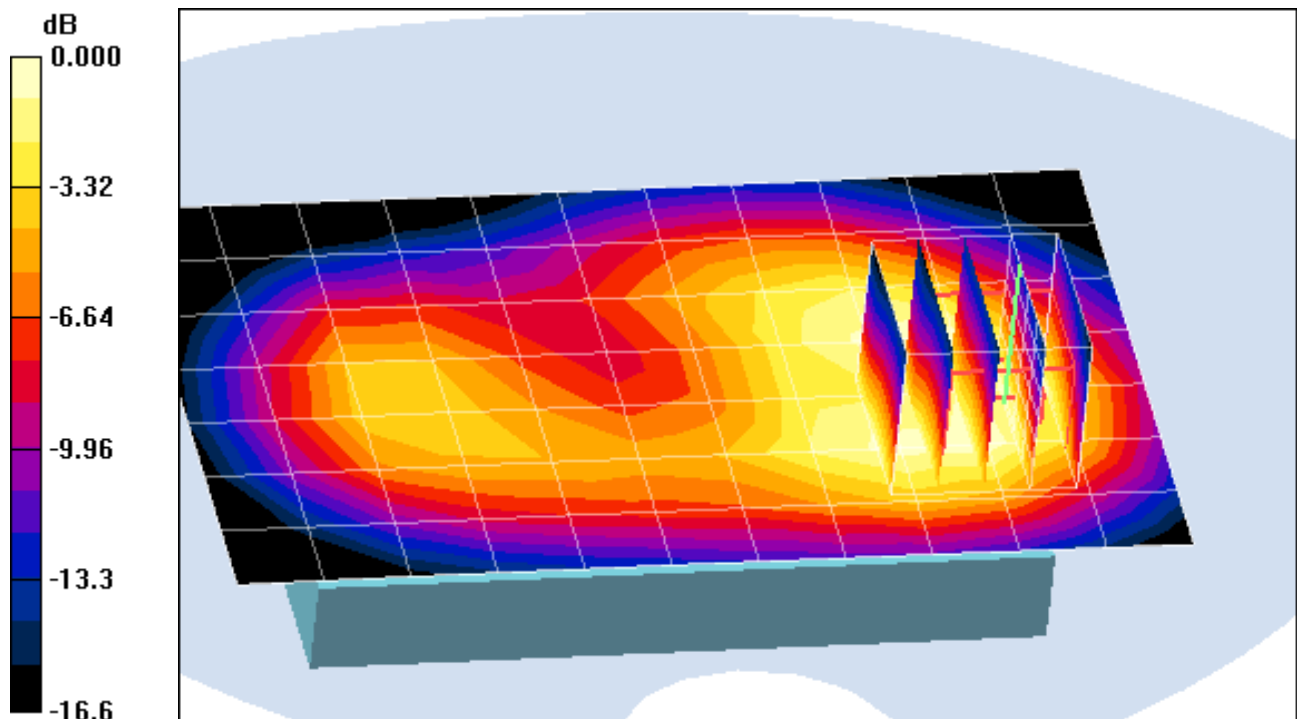
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.6 V/m; Power Drift = -0.139 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.390 mW/g



0 dB = 0.773mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Bottom Edge, High.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

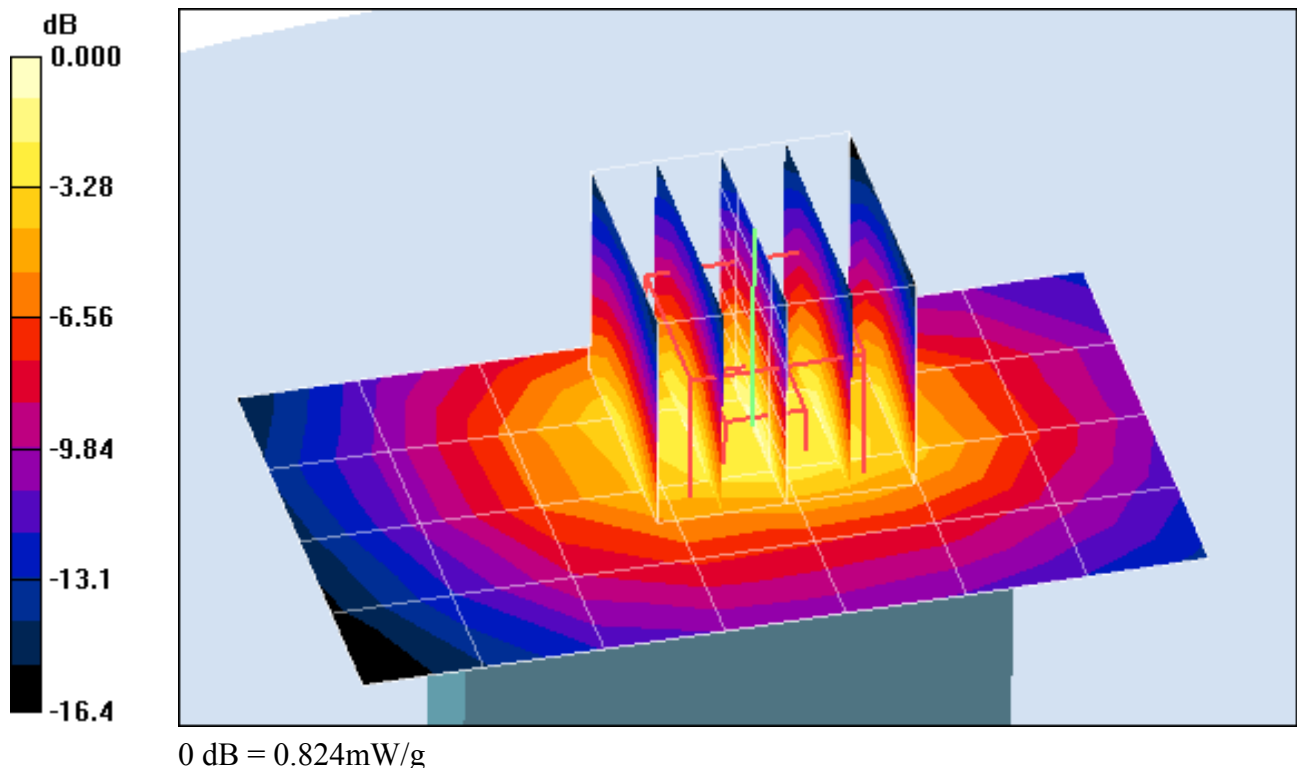
Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.119 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.407 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-C

Communication System: LTE 1750; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Mode: LTE Band 4 (AWS), Left Edge, High.ch, QPSK,
1 RB, 49 RB Offset, 10MHz Bandwidth**

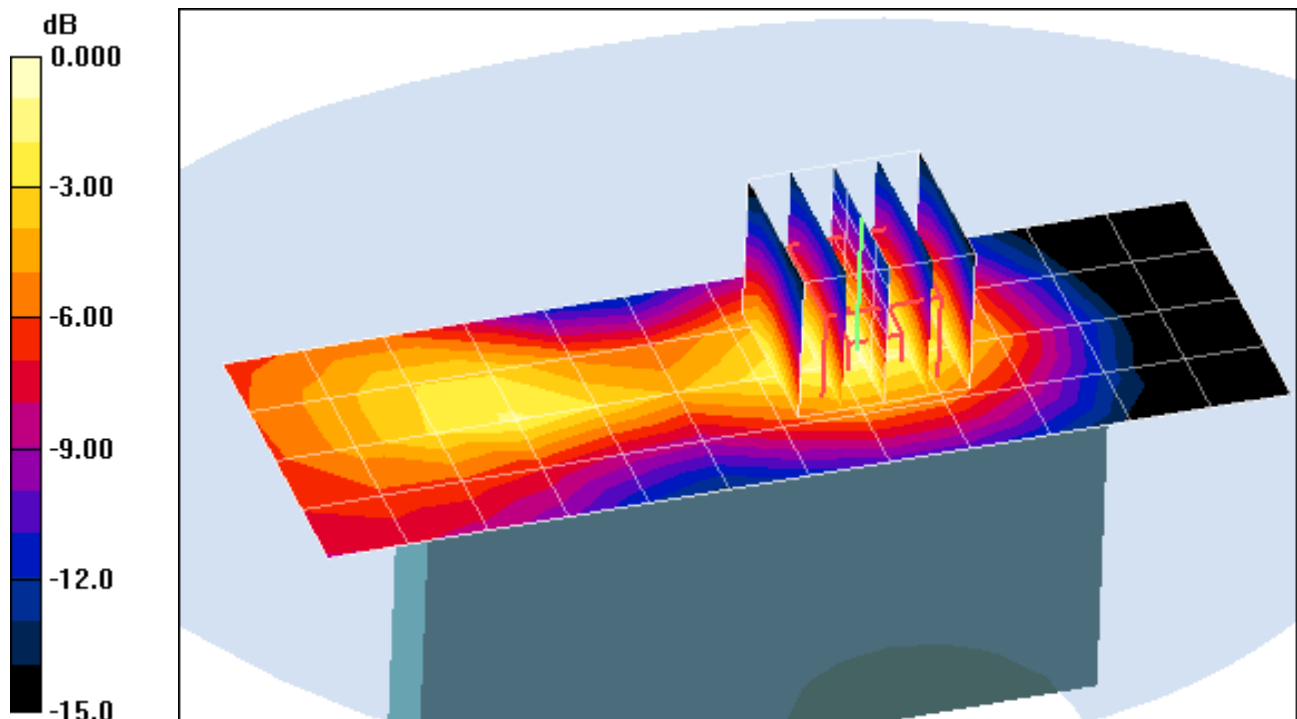
Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.9 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.470 W/kg

SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.170 mW/g



0 dB = 0.317mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Back side, Mid.ch, 2 Tx Slots

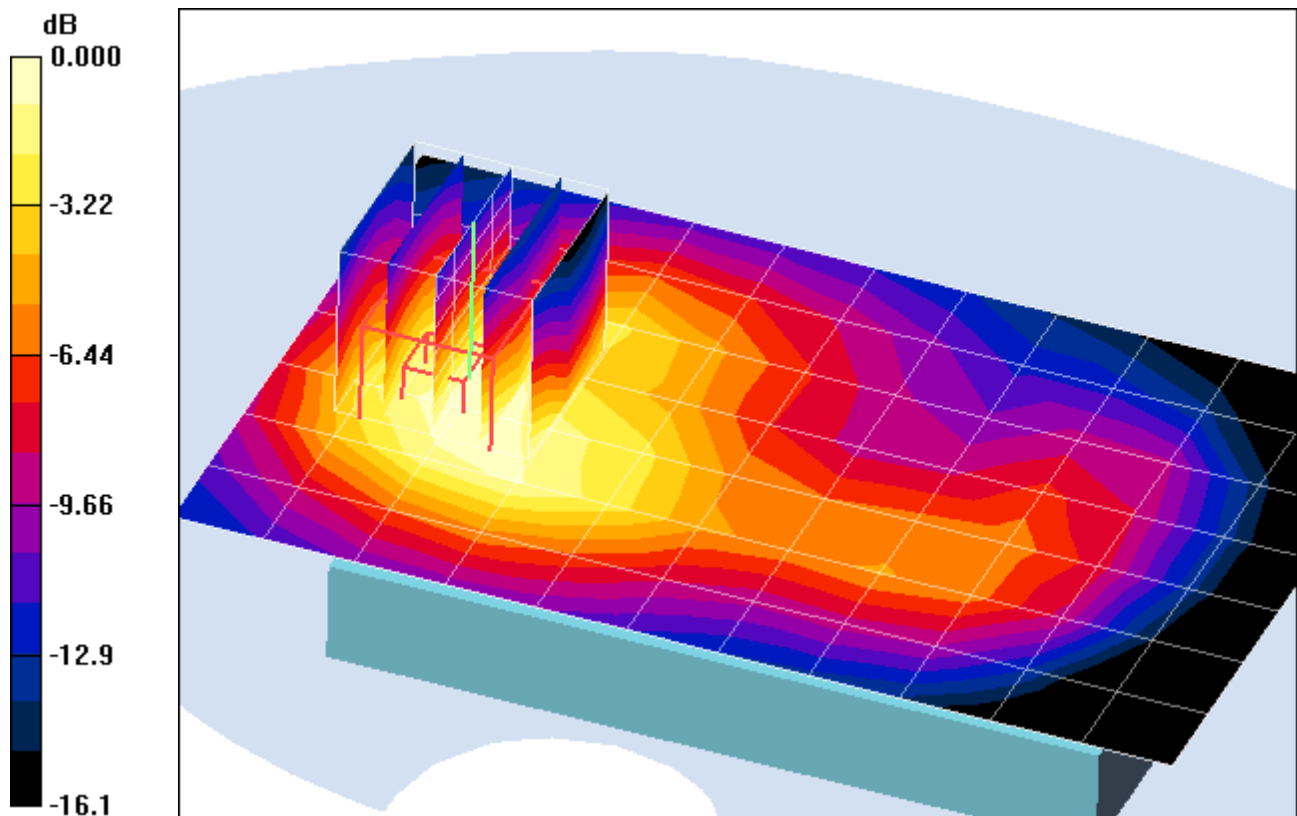
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.6 V/m; Power Drift = -0.082 dB

Peak SAR (extrapolated) = 0.921 W/kg

SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.340 mW/g



0 dB = 0.626mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Front side, Mid.ch, 2 Tx Slots

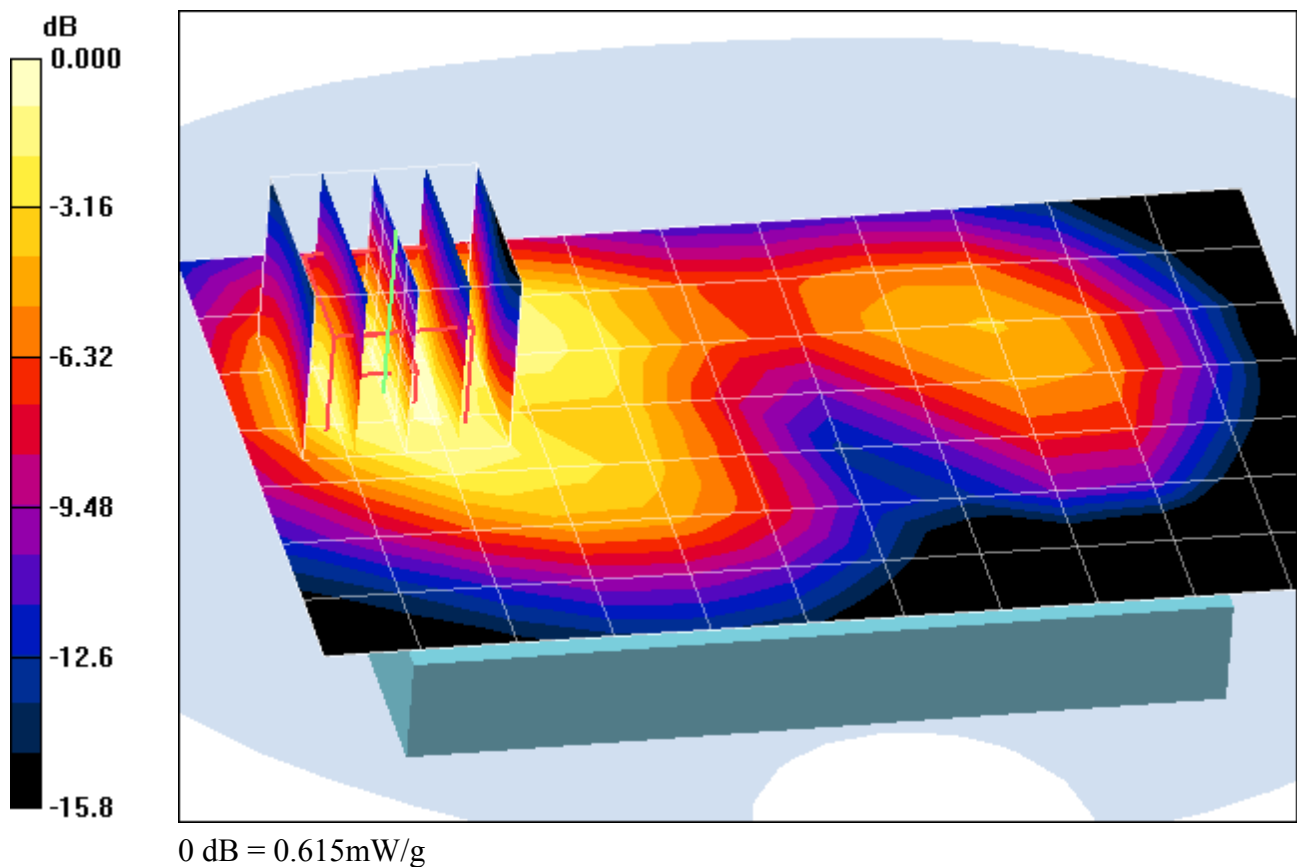
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.4 V/m; Power Drift = -0.056 dB

Peak SAR (extrapolated) = 0.891 W/kg

SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.320 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Bottom Edge, Mid.ch, 2 Tx Slots

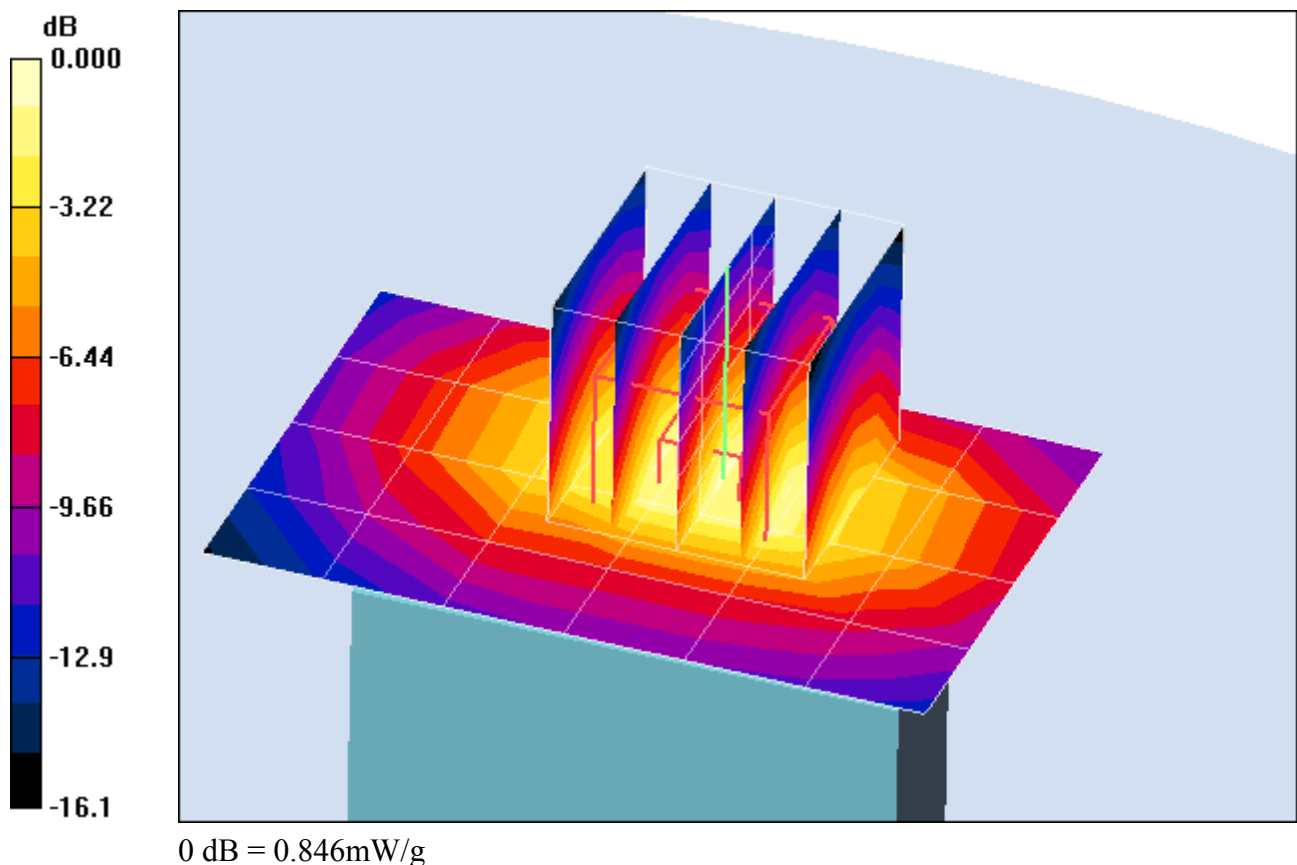
Area Scan (5x7x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.7 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.418 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Left Edge, Mid.ch, 2 Tx Slots

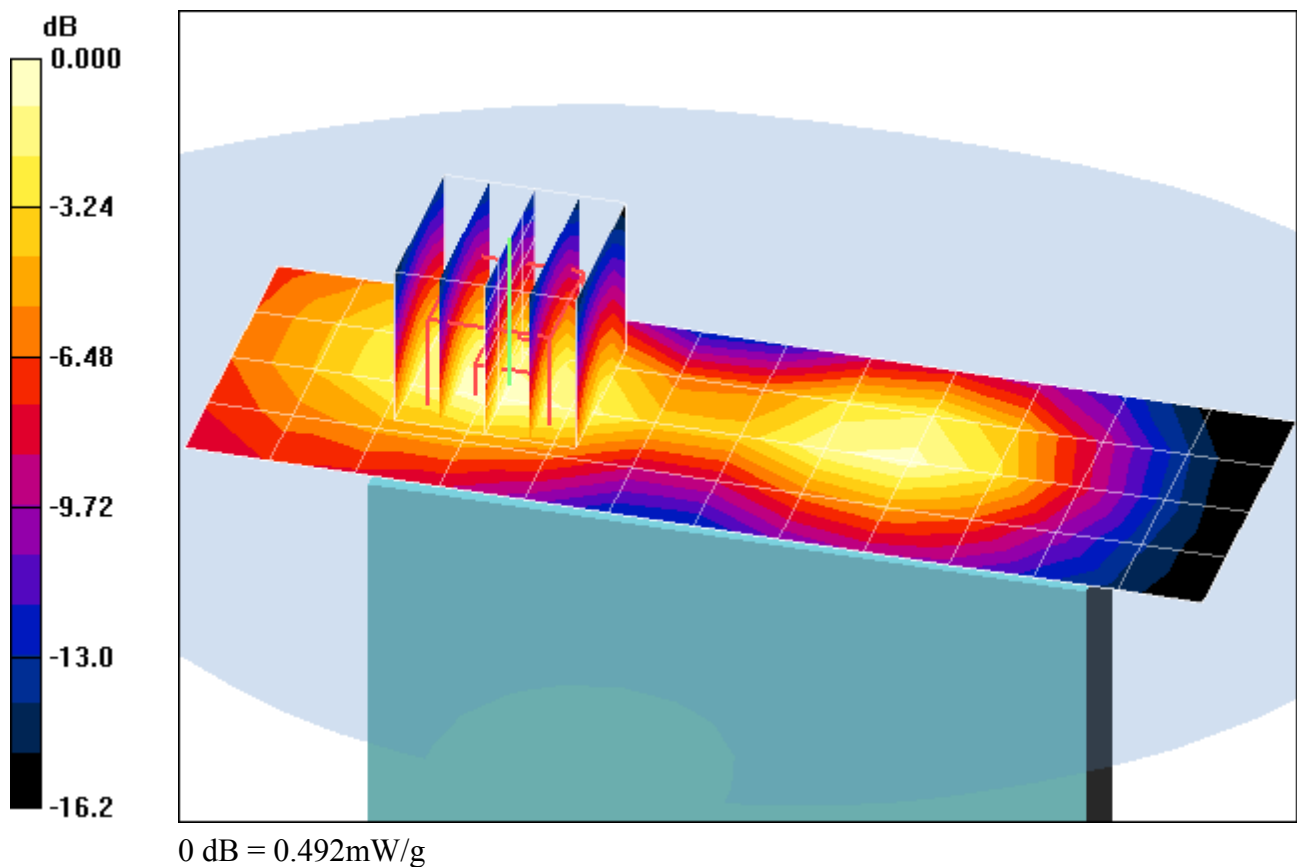
Area Scan (5x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.6 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 0.743 W/kg

SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.256 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Back side, Mid.ch

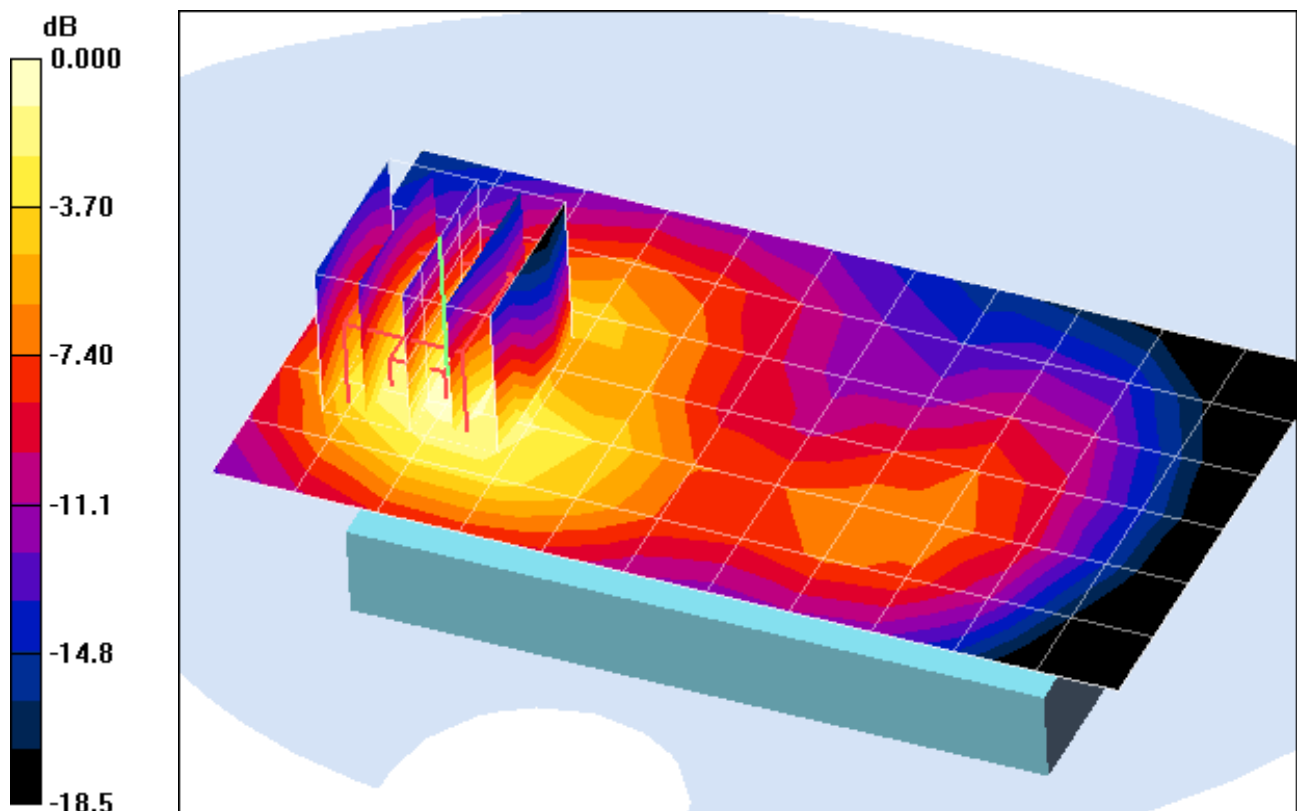
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.4 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.670 mW/g; SAR(10 g) = 0.368 mW/g



0 dB = 0.737mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Front side, Mid.ch

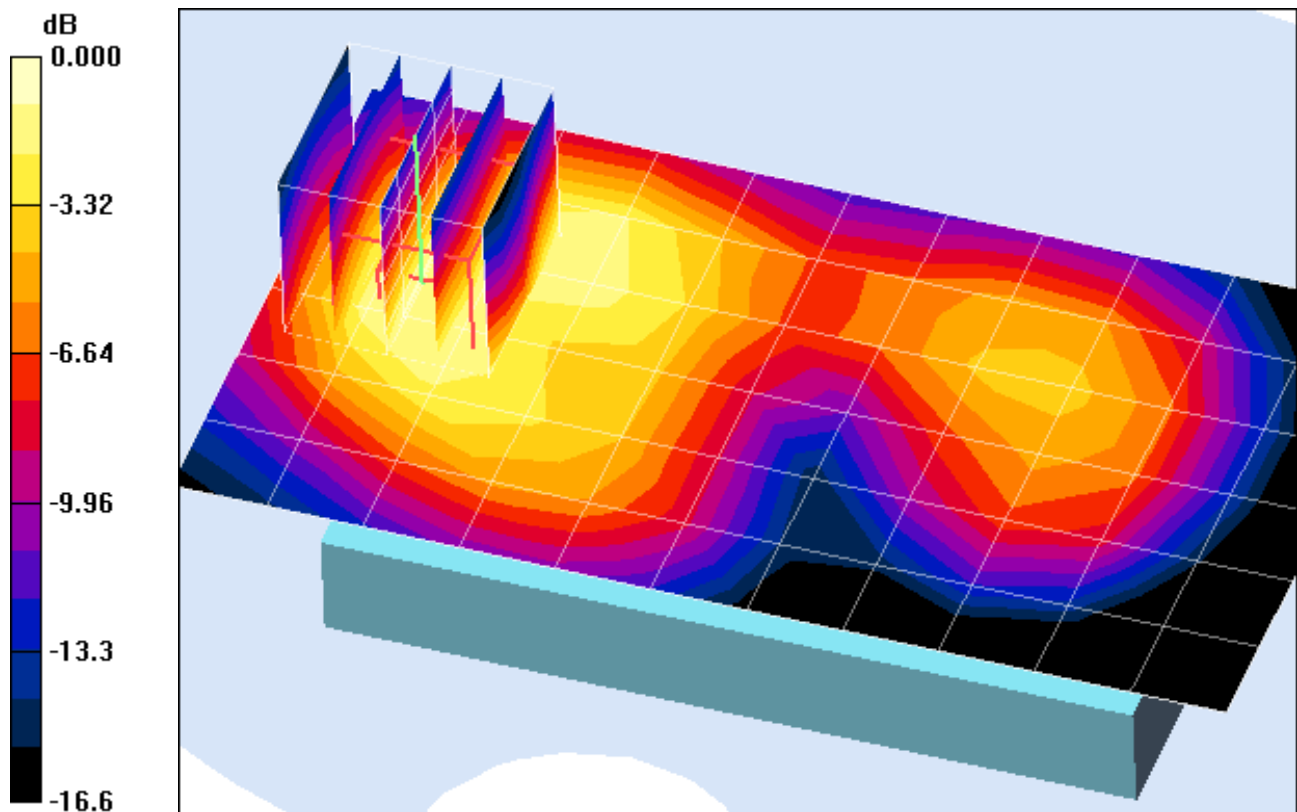
Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.8 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.692 mW/g; SAR(10 g) = 0.392 mW/g



0 dB = 0.782mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):

$f = 1852.4 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Bottom Edge, Low.ch

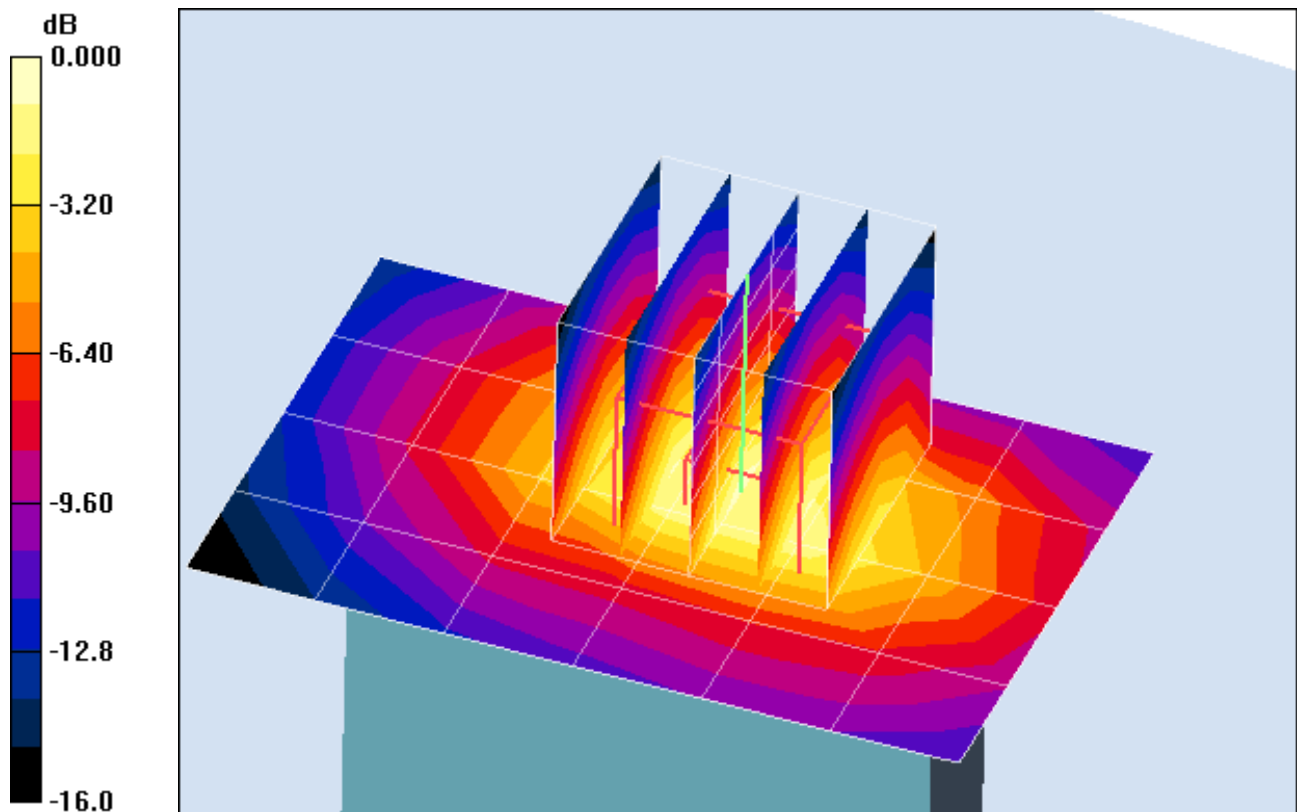
Area Scan (5x7x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 26.3 V/m; Power Drift = 0.012 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.866 mW/g; SAR(10 g) = 0.481 mW/g



0 dB = 0.982mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 1900, Left Edge, Mid.ch

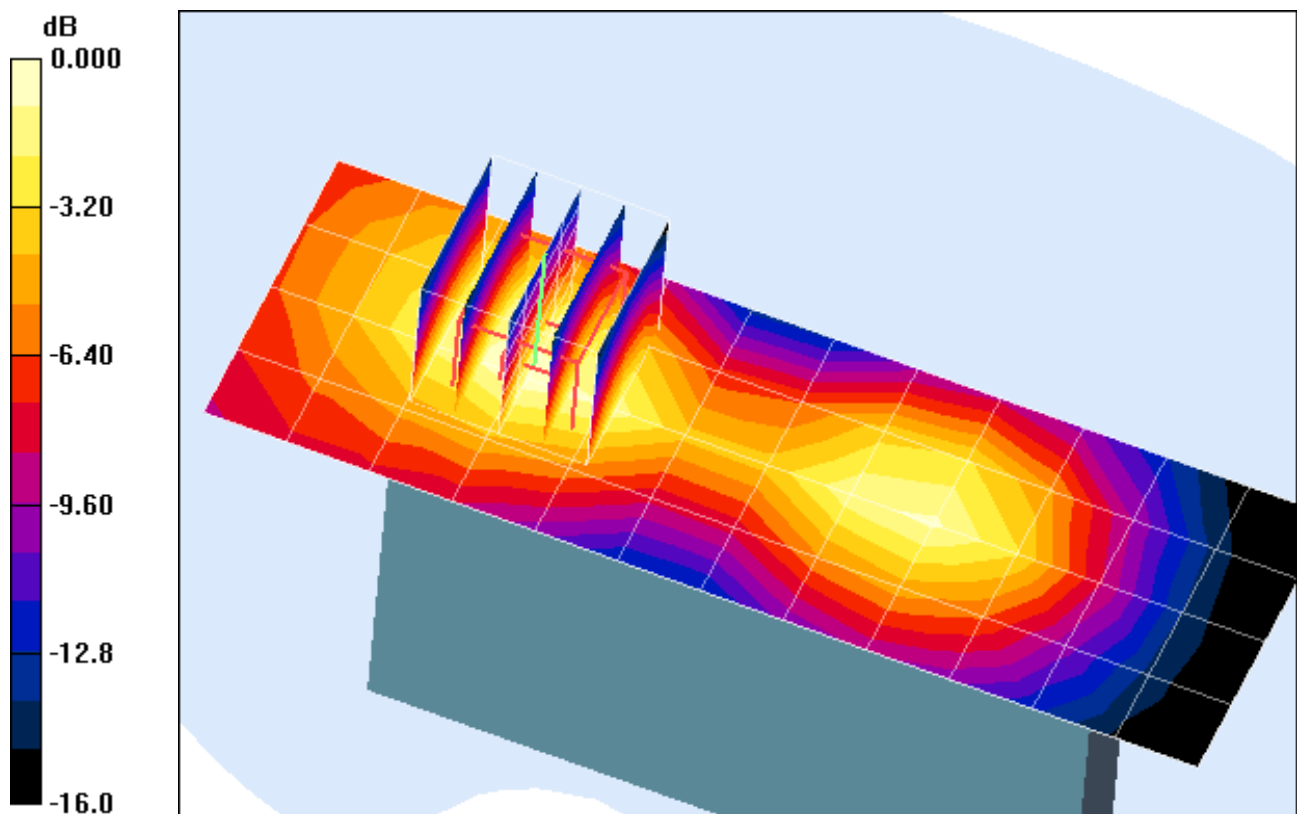
Area Scan (5x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.3 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 0.608 W/kg

SAR(1 g) = 0.366 mW/g; SAR(10 g) = 0.210 mW/g



0 dB = 0.403mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

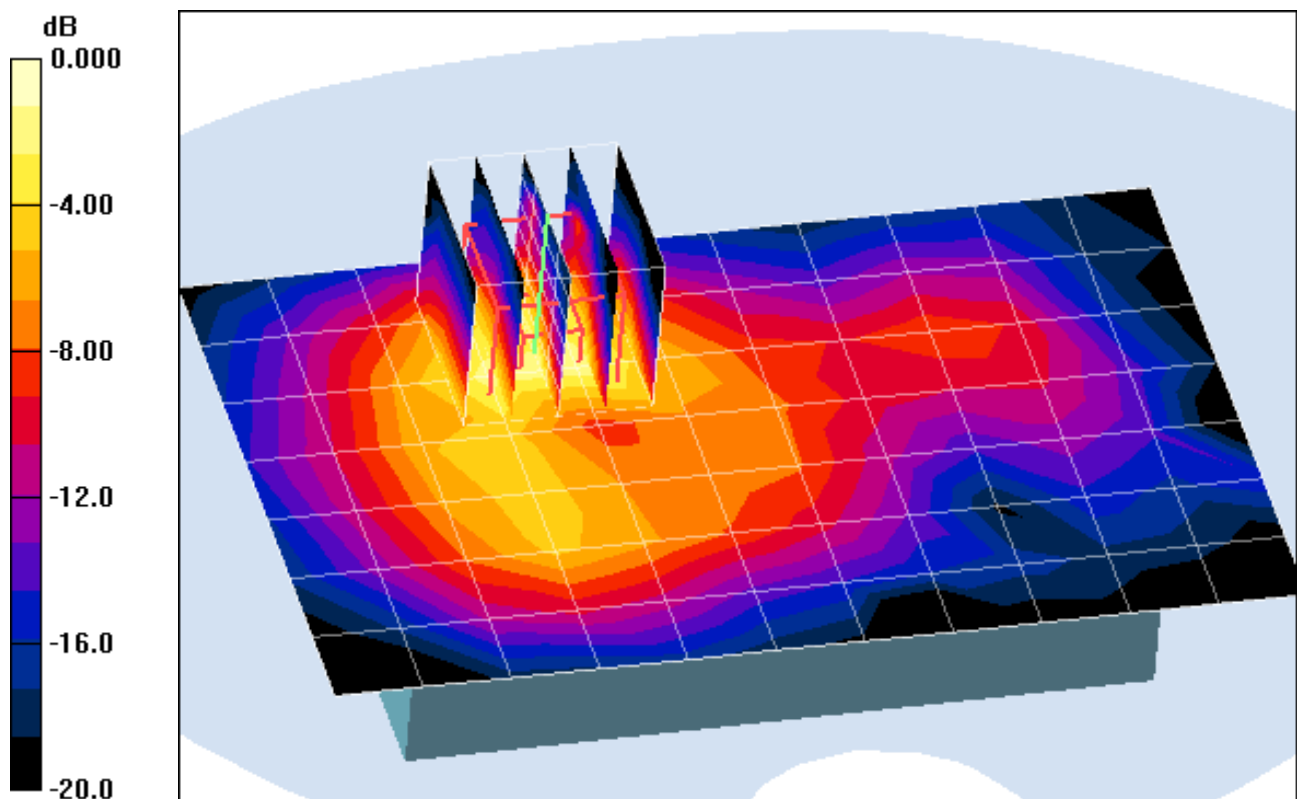
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.12 V/m; Power Drift = 0.155 dB

Peak SAR (extrapolated) = 0.526 W/kg

SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.116 mW/g



0 dB = 0.383mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

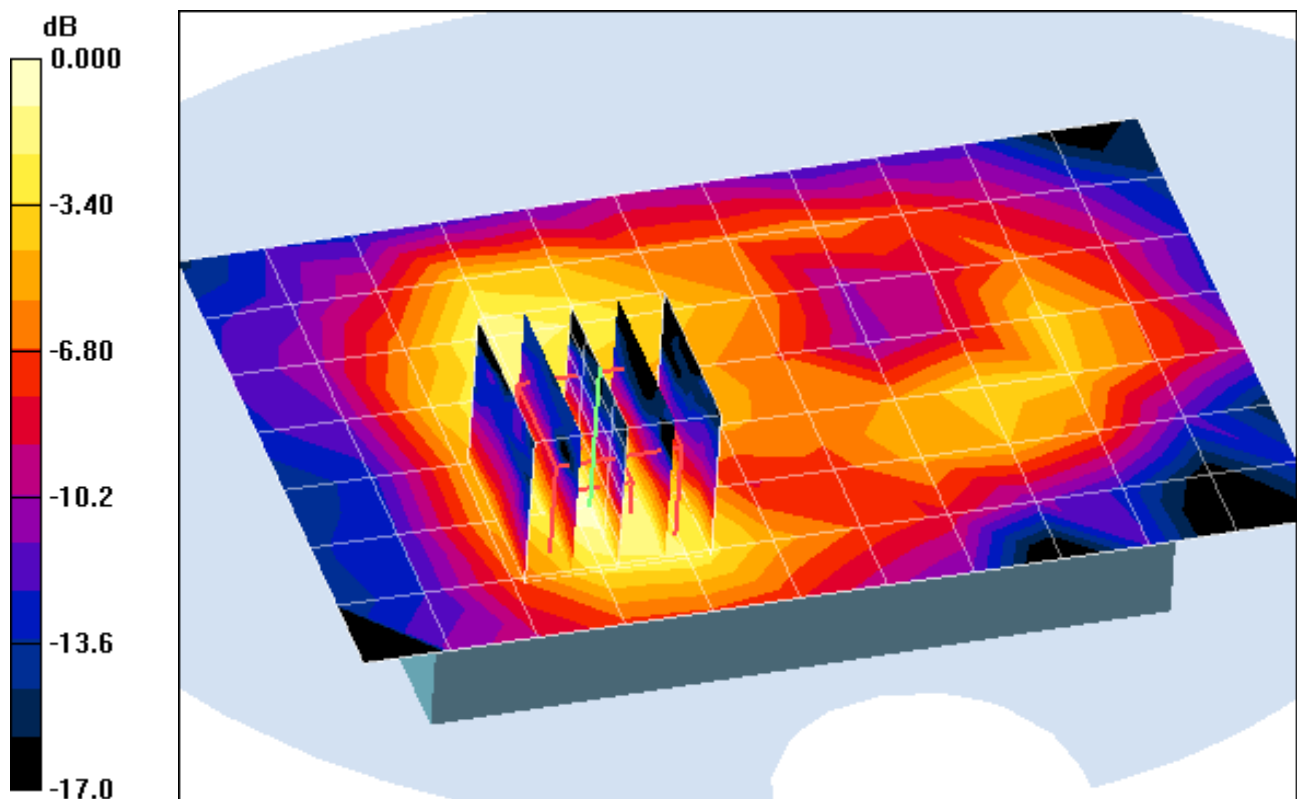
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.95 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 0.113 W/kg

SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.024 mW/g



0 dB = 0.062mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

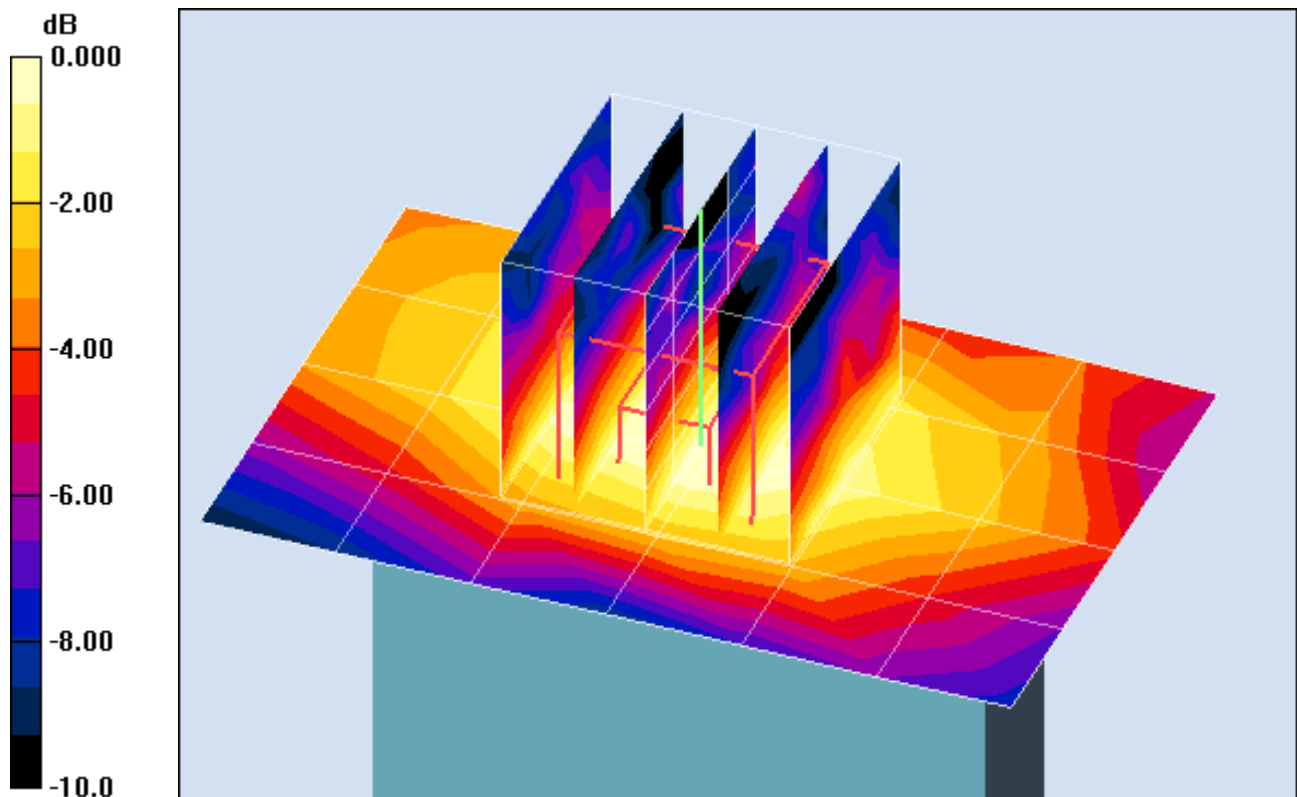
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.79 V/m; Power Drift = 0.124 dB

Peak SAR (extrapolated) = 0.052 W/kg

SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.016 mW/g



0 dB = 0.034mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI577; Type: Portable Handset; Serial: FI-343-A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

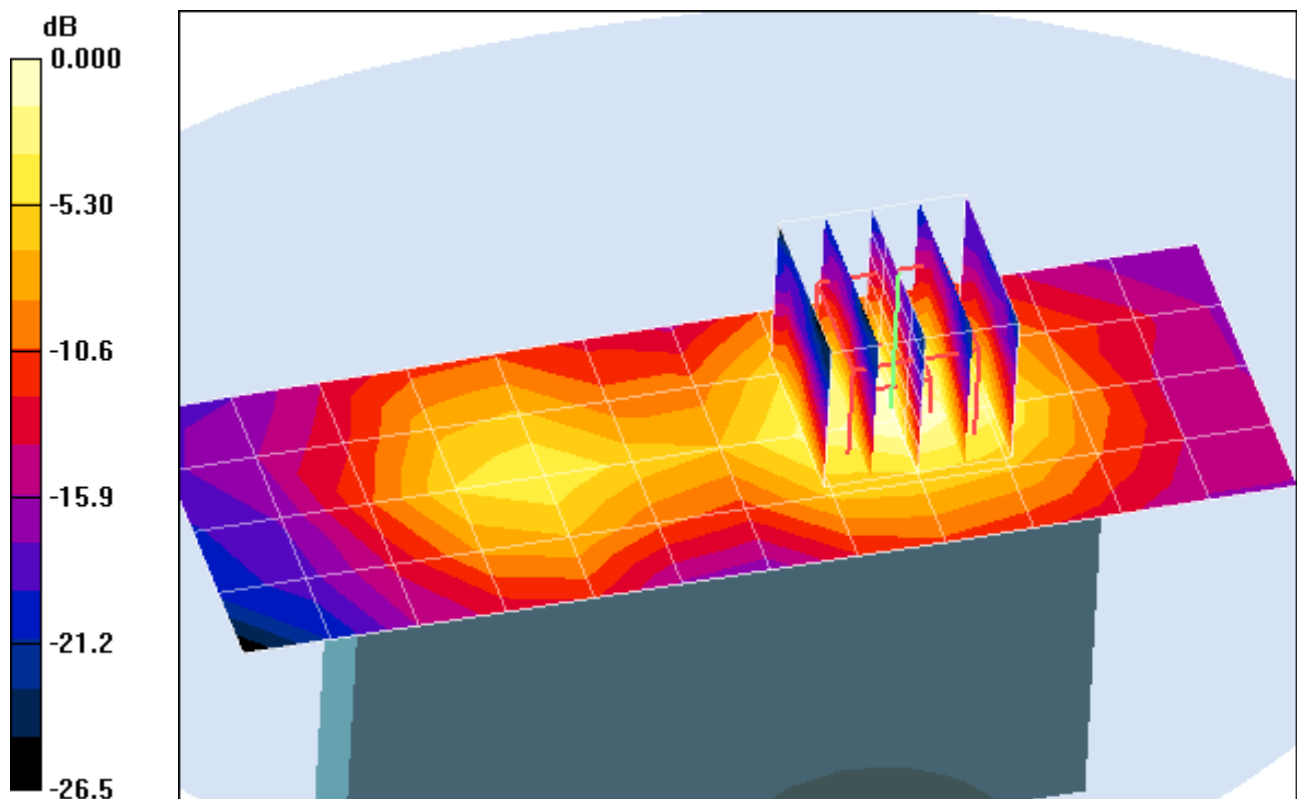
Area Scan (5x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.48 V/m; Power Drift = -0.161 dB

Peak SAR (extrapolated) = 0.481 W/kg

SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.110 mW/g



0 dB = 0.249mW/g

APPENDIX B: DIPOLE VALIDATION

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.922 \text{ mho/m}$; $\epsilon_r = 43.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space 1.5 cm

Test Date: 01-12-2012; Ambient Temp: 23.8 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

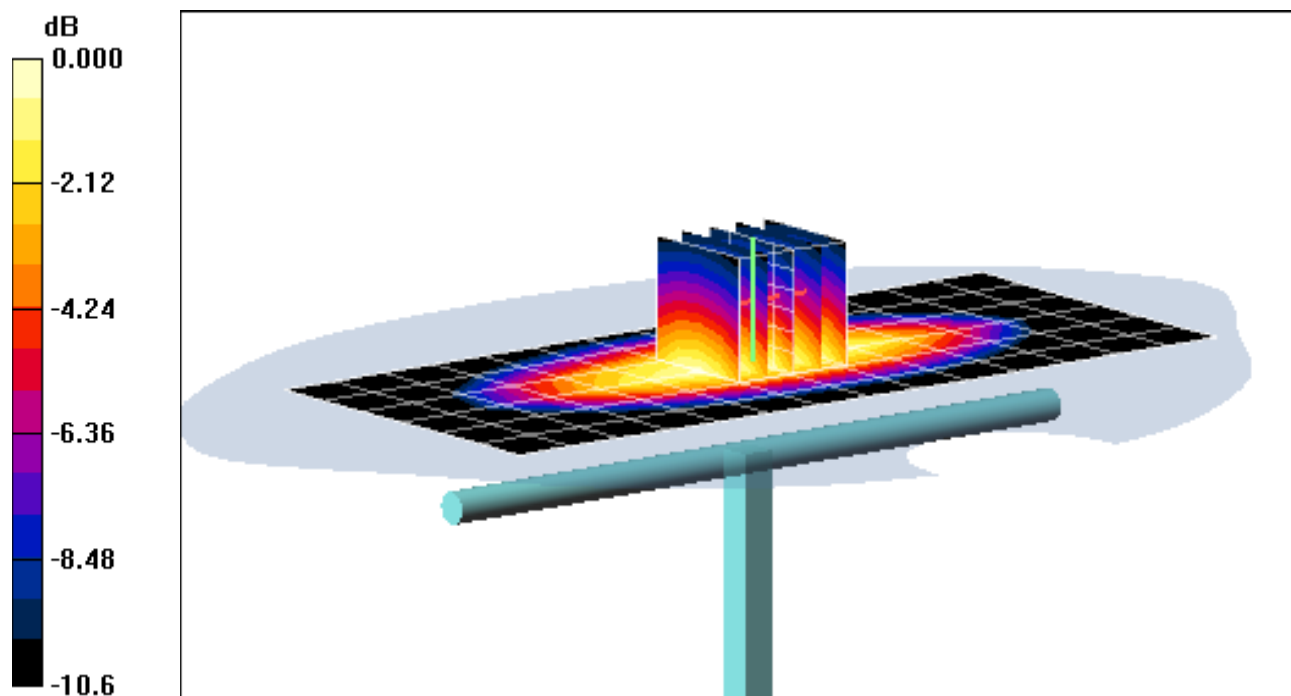
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.555 mW/g

Deviation = 1.43%



0 dB = 0.919mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.922 \text{ mho/m}$; $\epsilon_r = 43.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space 1.5 cm

Test Date: 01-12-2012; Ambient Temp: 23.8 °C; Tissue Temp: 22.8 °C

Probe: EX3DV4 - SN3561; ConvF(8.38, 8.38, 8.38); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

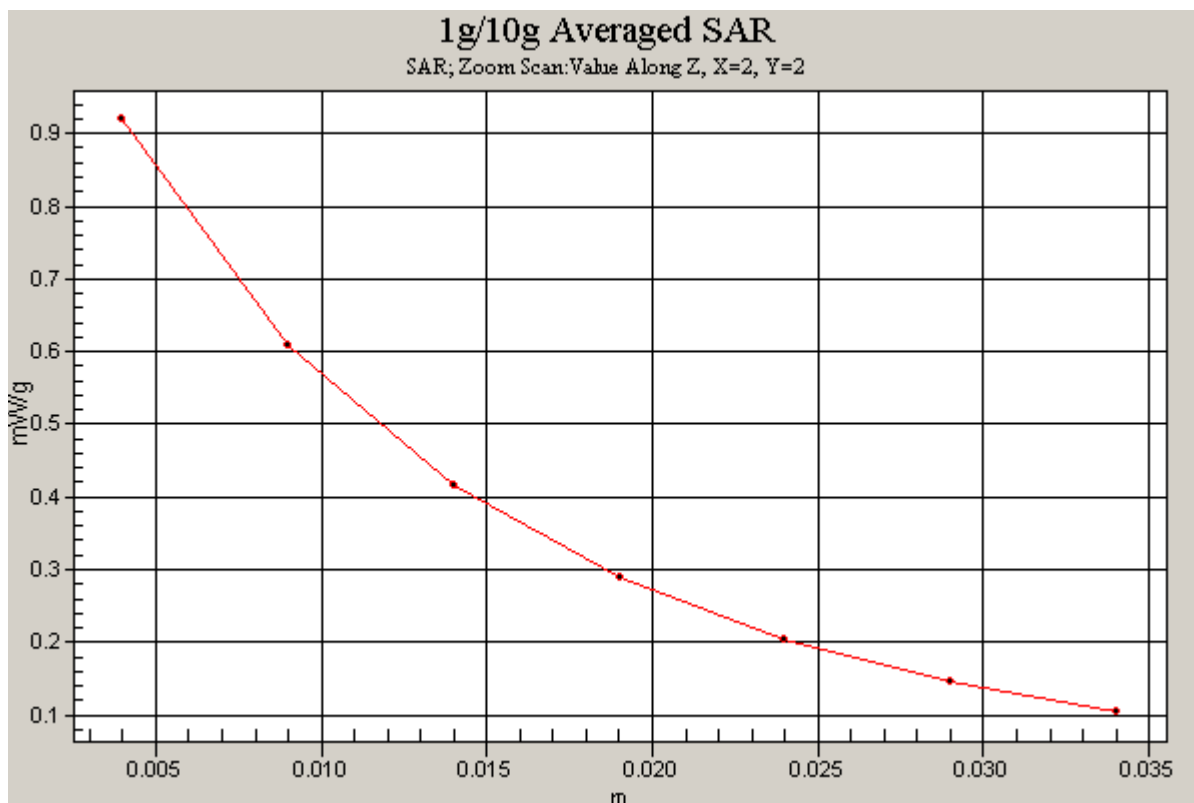
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.555 mW/g

Deviation = 1.43%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.893 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

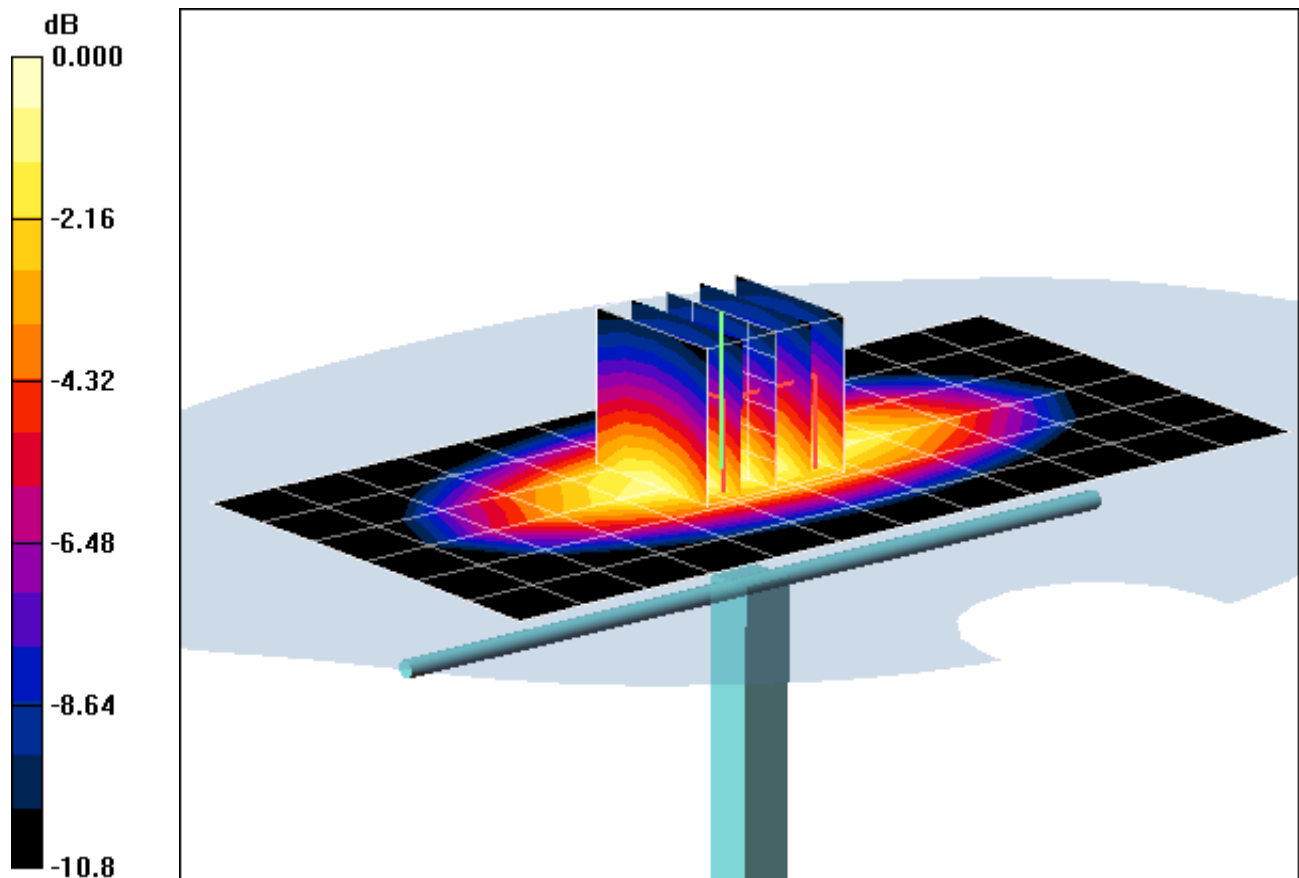
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.653 mW/g

Deviation = 5.98 %



0 dB = 1.09mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.893 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-04-2012; Ambient Temp: 22.6°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

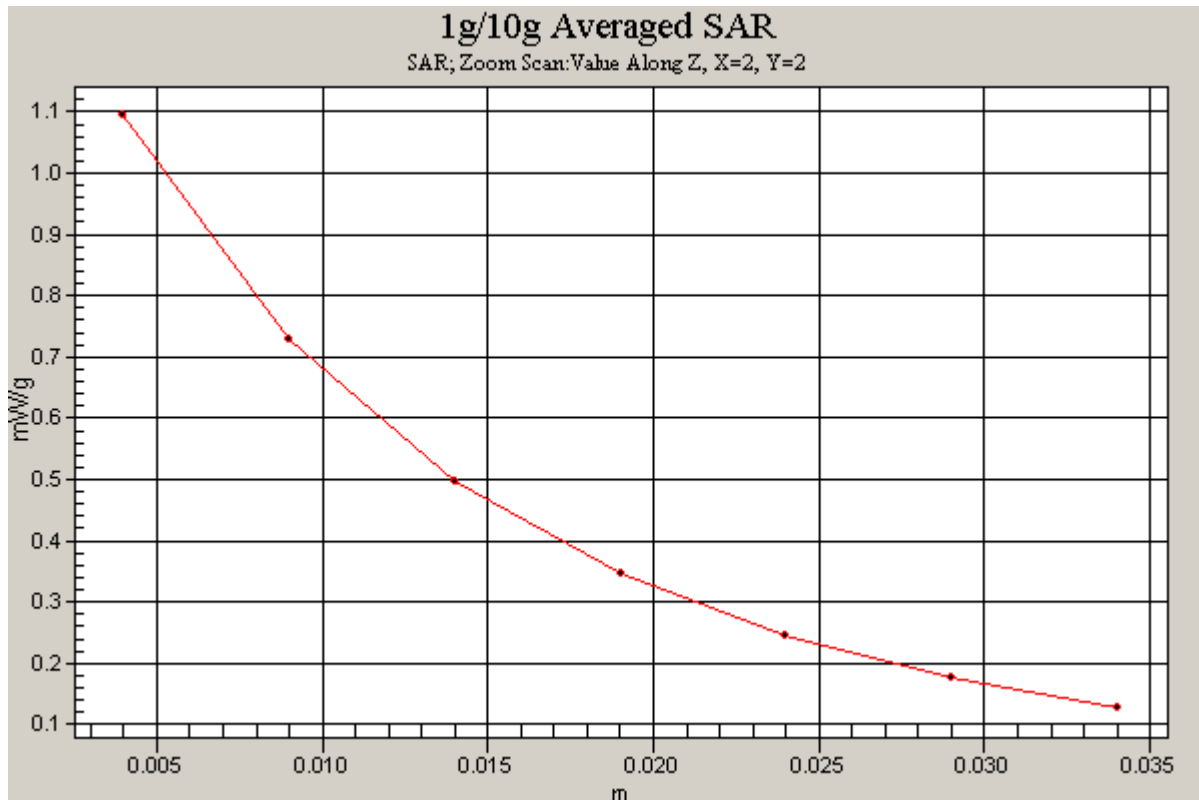
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.653 mW/g

Deviation = 5.98 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 43.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

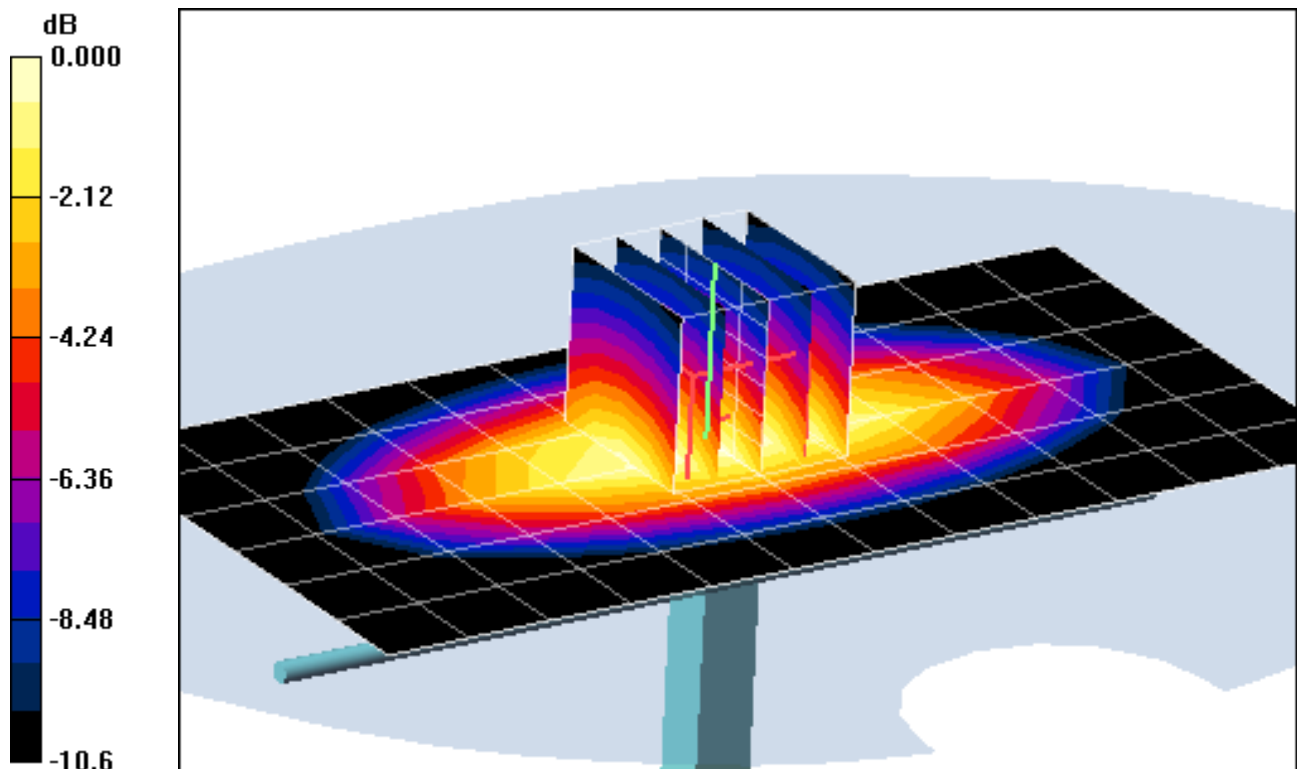
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 0.959 mW/g; SAR(10 g) = 0.625 mW/g

Deviation: 1.37%



0 dB = 1.03mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 43.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-31-2012; Ambient Temp: 24.9°C; Tissue Temp: 23.6°C

Probe: ES3DV3 - SN3258; ConvF(6.18, 6.18, 6.18); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

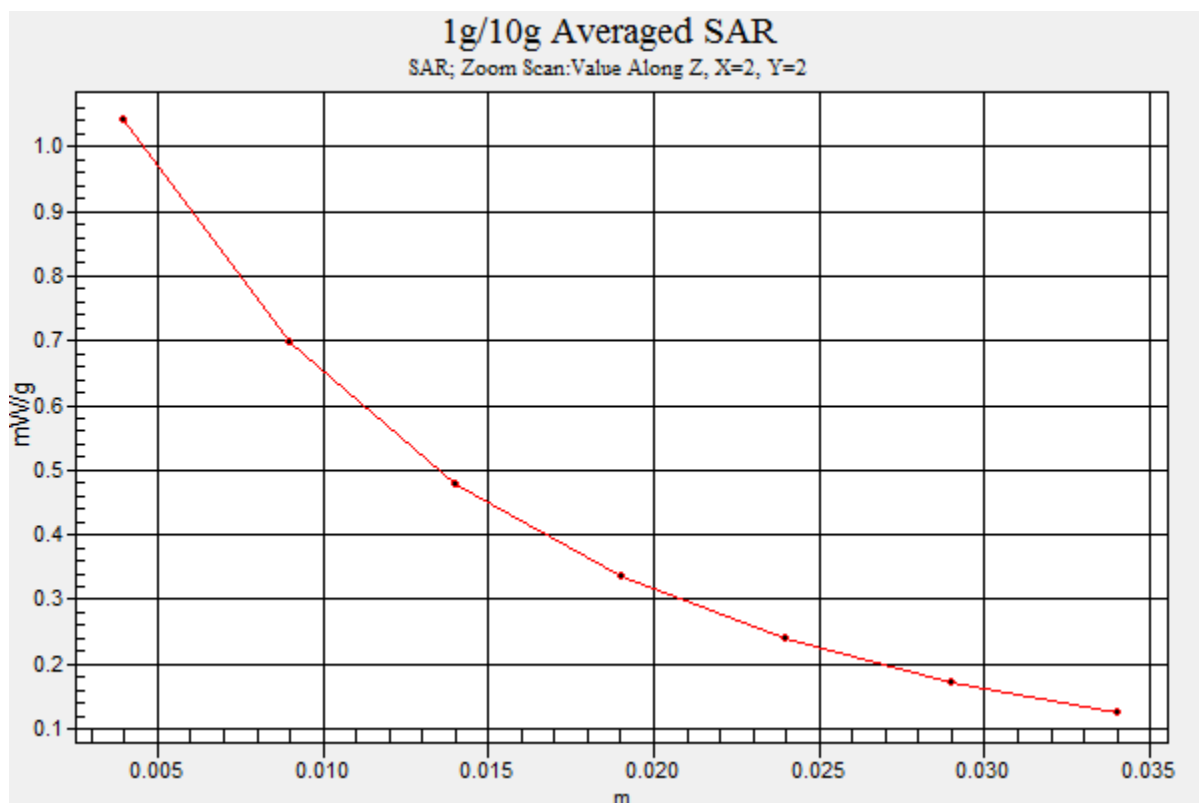
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 0.959 mW/g; SAR(10 g) = 0.625 mW/g

Deviation: 1.37%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 5.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

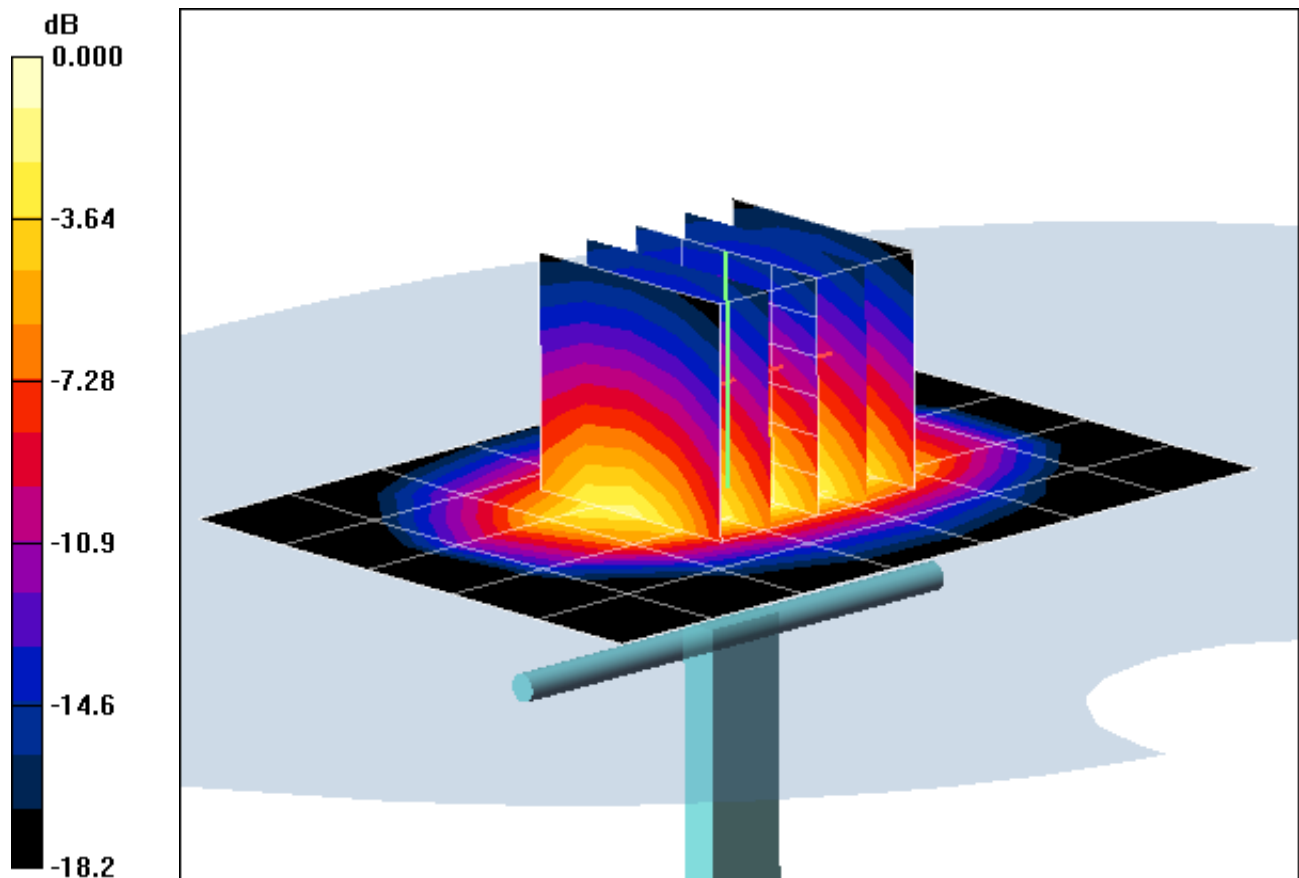
Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 3.8 mW/g; SAR(10 g) = 1.94 mW/g

Deviation = 2.70 %



0 dB = 4.24mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2012; Ambient Temp: 23.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.33, 5.33, 5.33); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 5.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

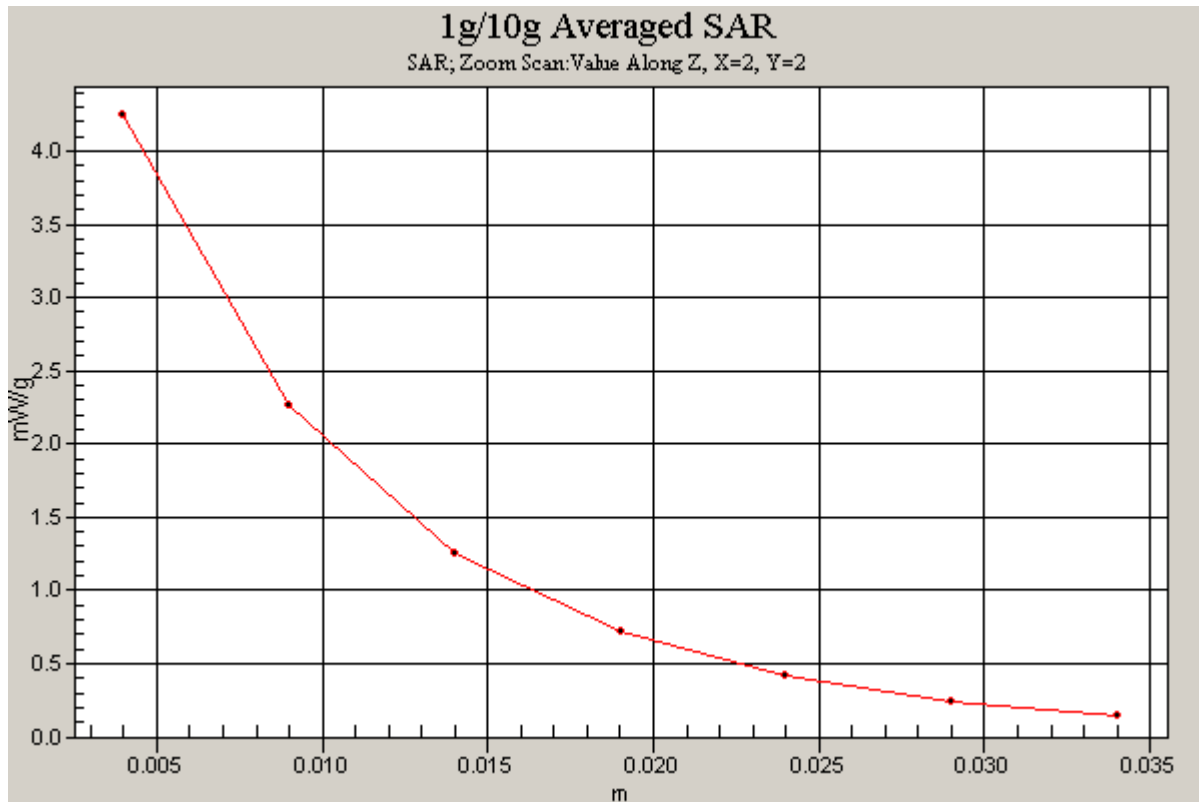
Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 3.8 mW/g; SAR(10 g) = 1.94 mW/g

Deviation = 2.70 %



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

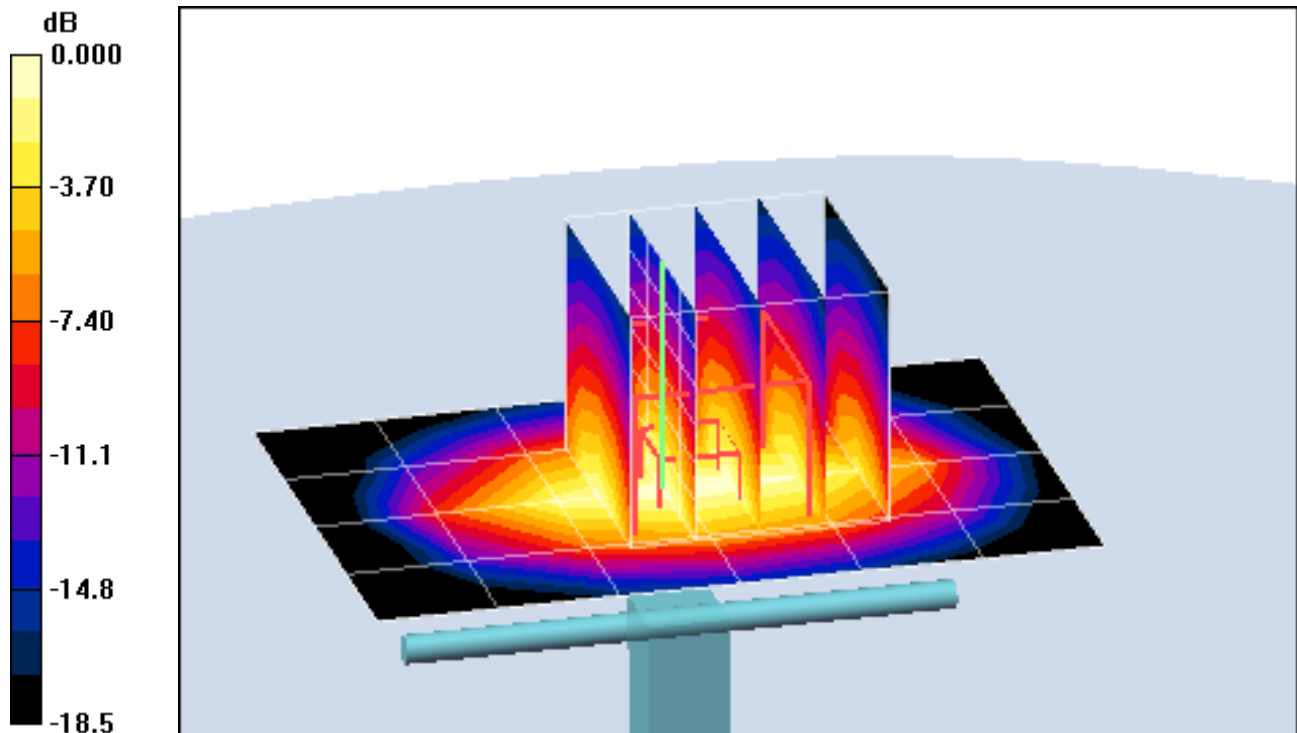
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.01 mW/g

Deviation: -3.23%



0 dB = 4.27mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(5.11, 5.11, 5.11); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

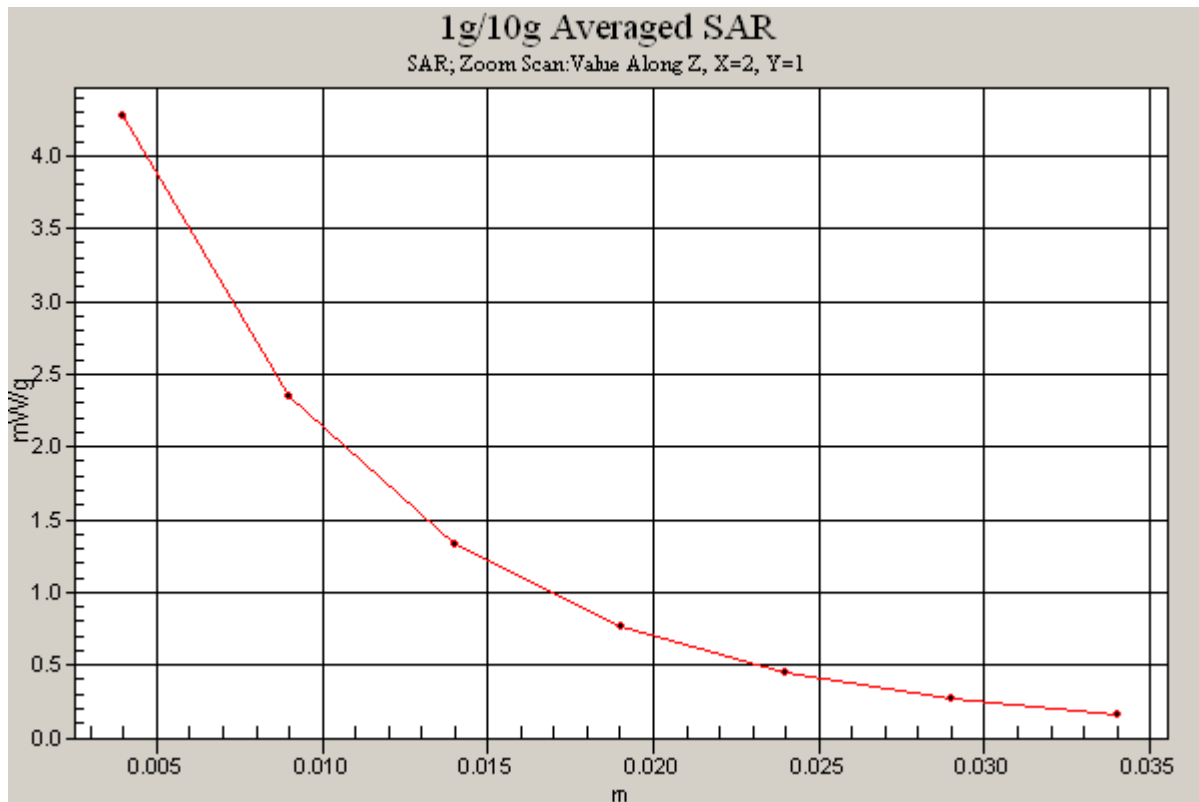
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.01 mW/g

Deviation: -3.23%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.88 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

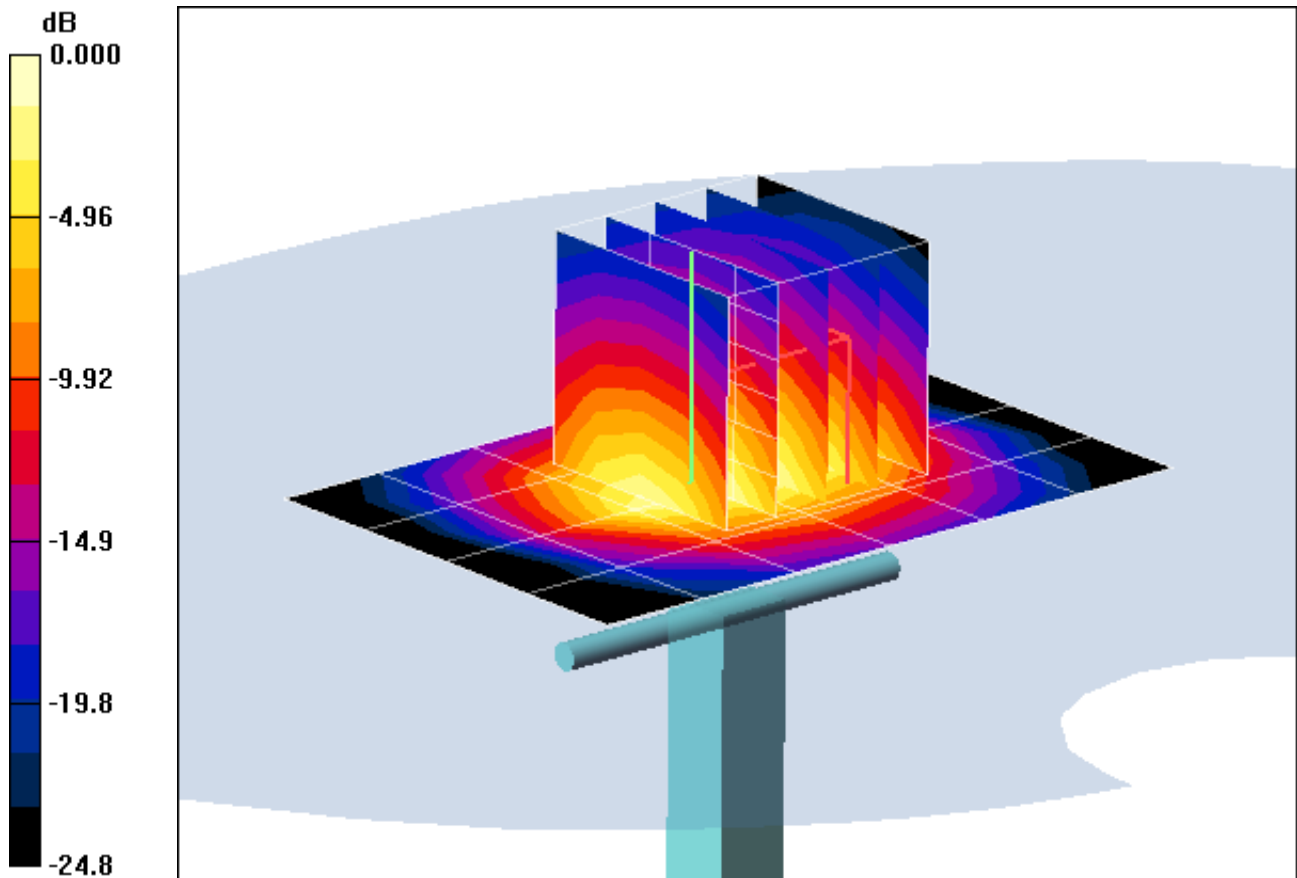
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 16.0 dBm (40 mW)

SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.02 mW/g

Deviation = 2.70 %



0 dB = 2.81mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.88 \text{ mho/m}$; $\epsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

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

Probe: ES3DV3 - SN3258; ConvF(4.5, 4.5, 4.5); Calibrated: 4/8/2011

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

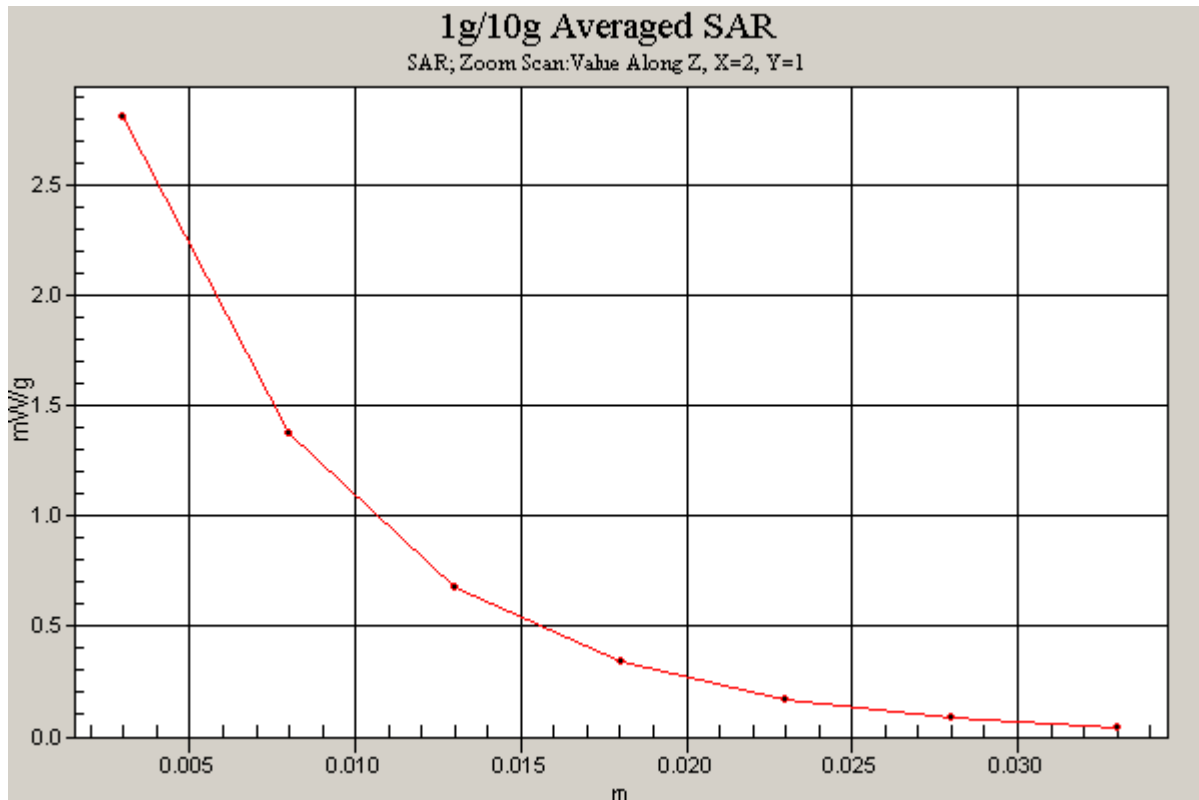
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 16.0 dBm (40 mW)

SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.02 mW/g

Deviation = 2.70 %



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.966 \text{ mho/m}$; $\epsilon_r = 55.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space 1.5 cm

Test Date: 01-12-2012; Ambient Temp: 23.2 °C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

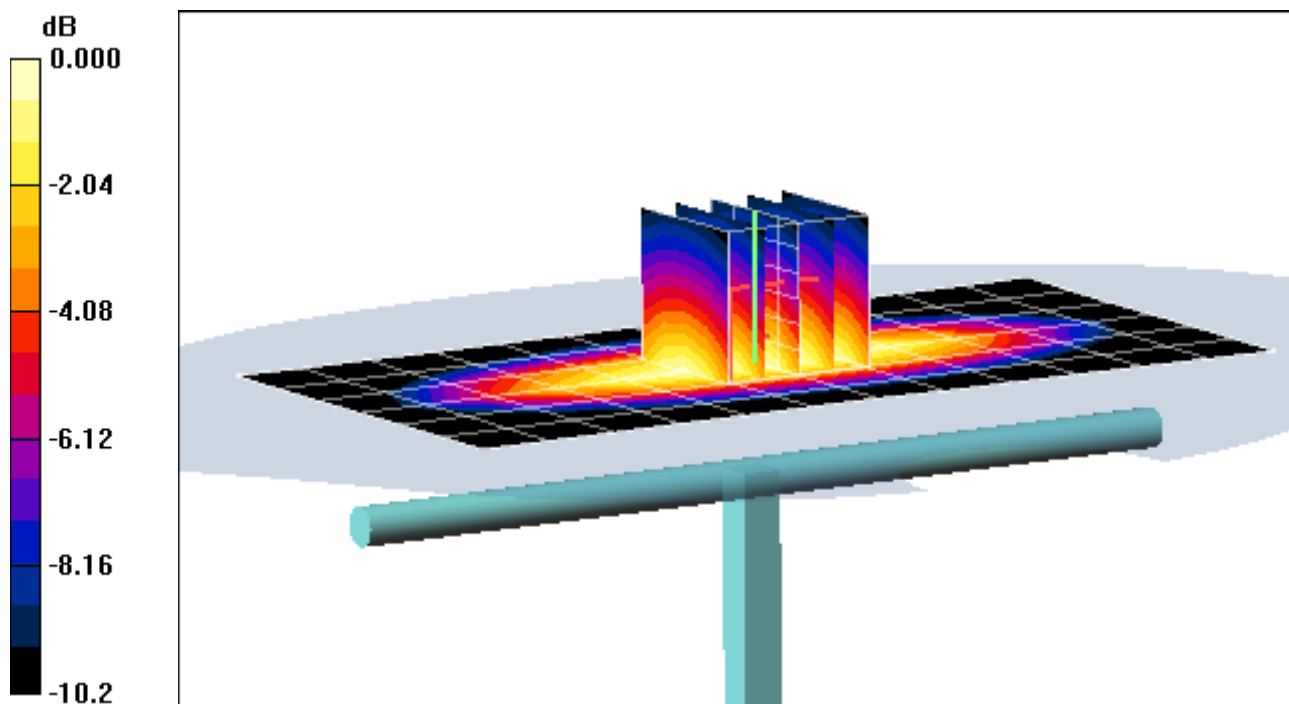
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 0.865 mW/g; SAR(10 g) = 0.570 mW/g

Deviation = -1.70 %



0 dB = 0.934mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.966 \text{ mho/m}$; $\epsilon_r = 55.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space 1.5 cm

Test Date: 01-12-2012; Ambient Temp: 23.2 °C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

750MHz System Verification

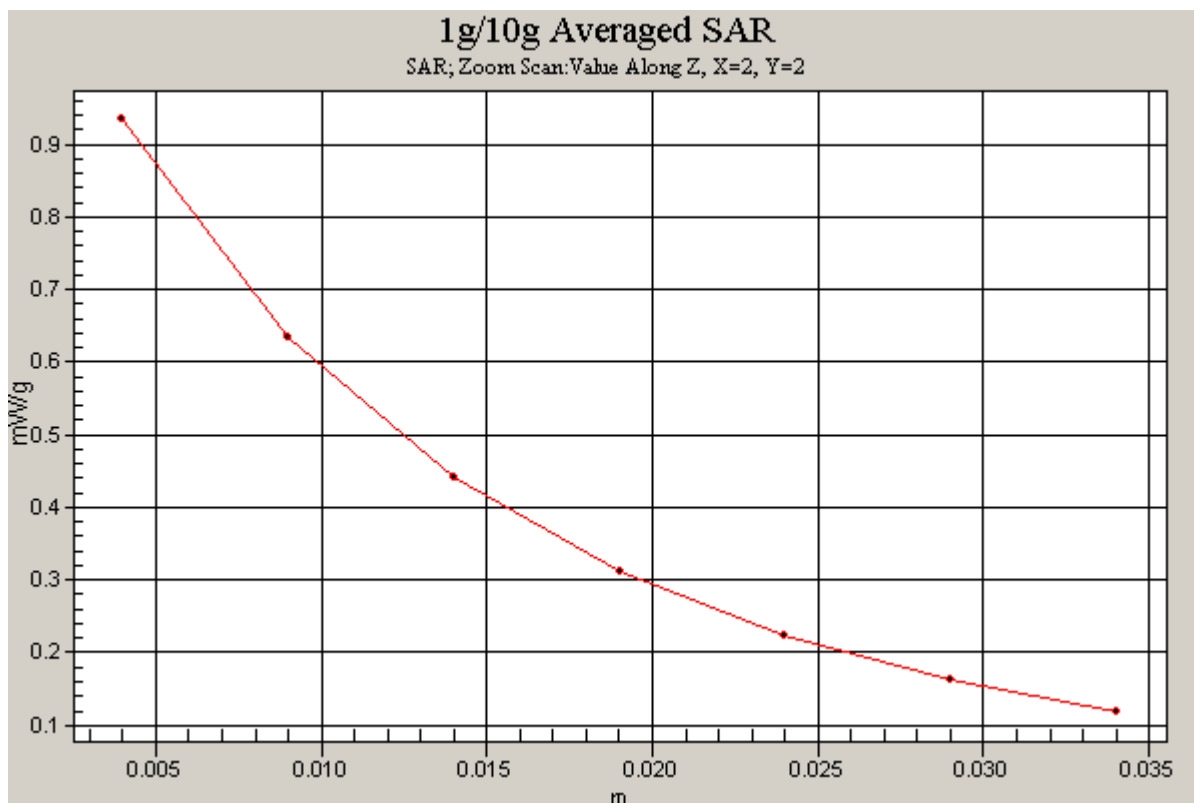
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 0.865 mW/g; SAR(10 g) = 0.570 mW/g

Deviation = -1.70 %



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.982 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

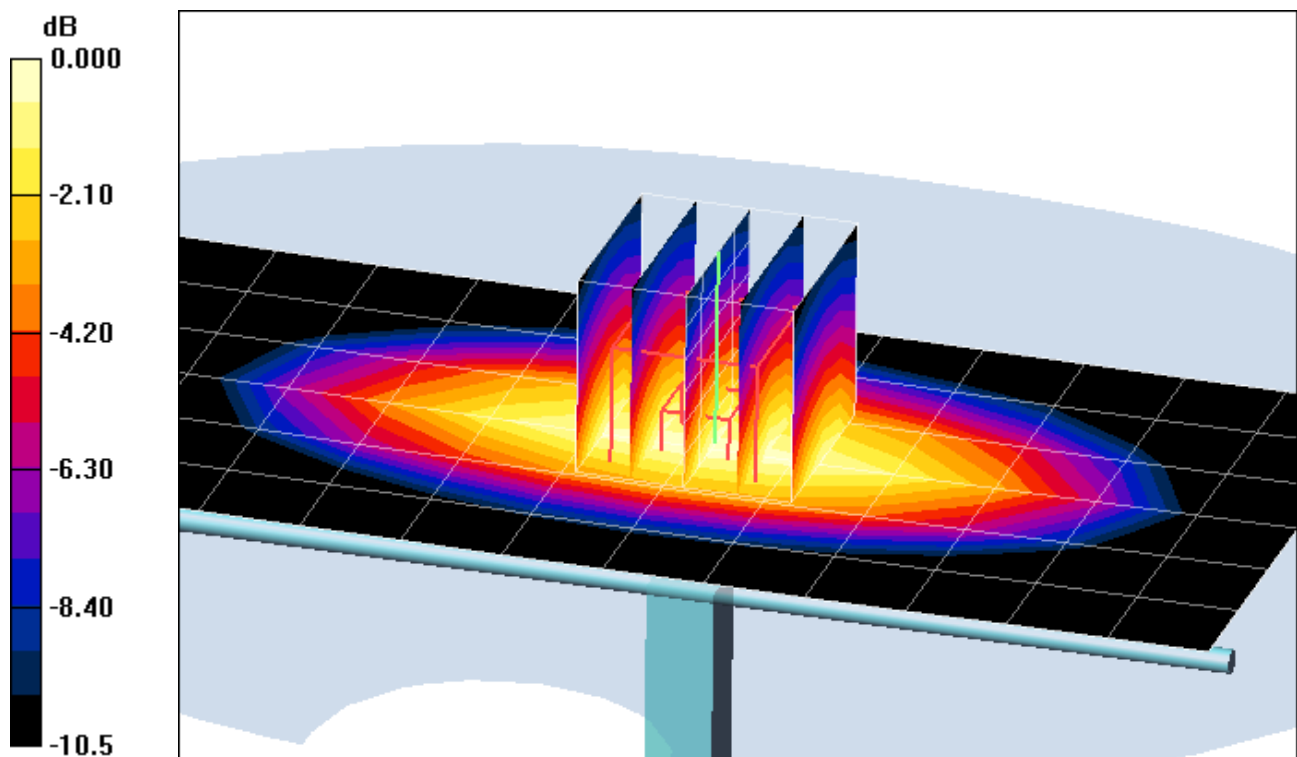
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.641 mW/g

Deviation: -0.10%



0 dB = 1.07mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.982 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2012; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

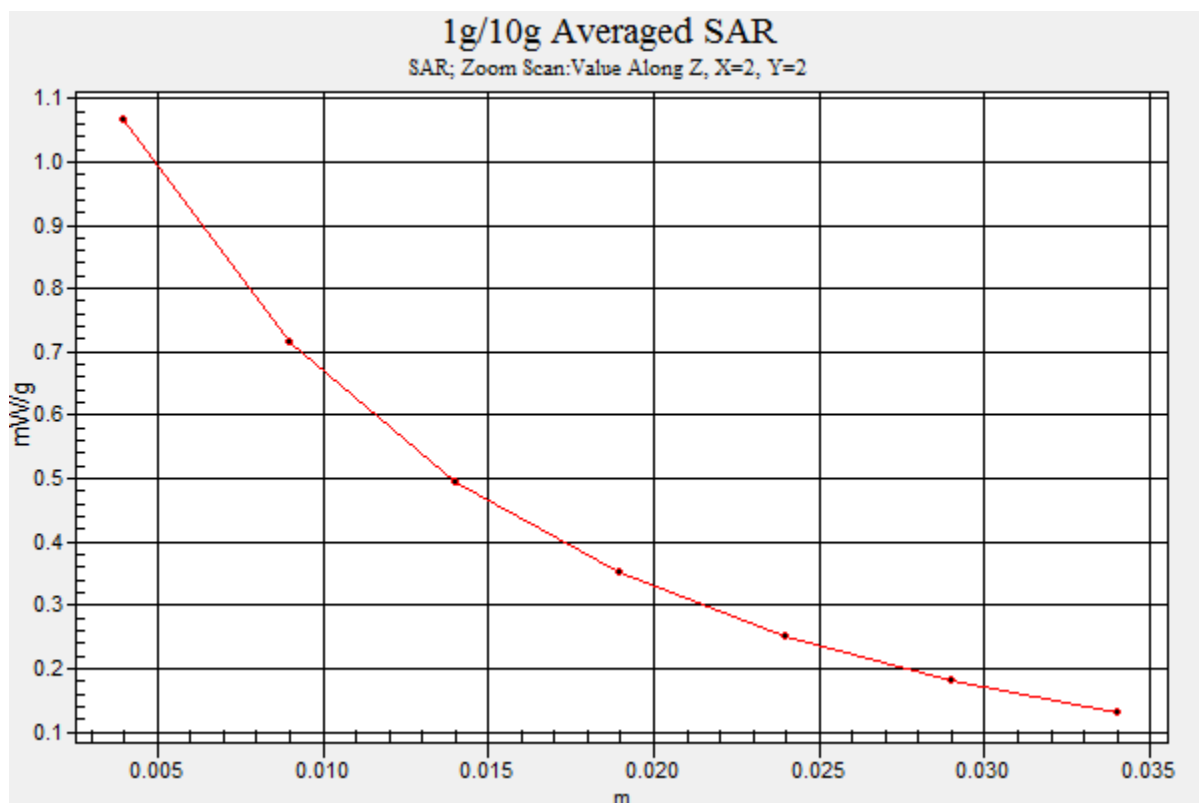
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.641 mW/g

Deviation: -0.10%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

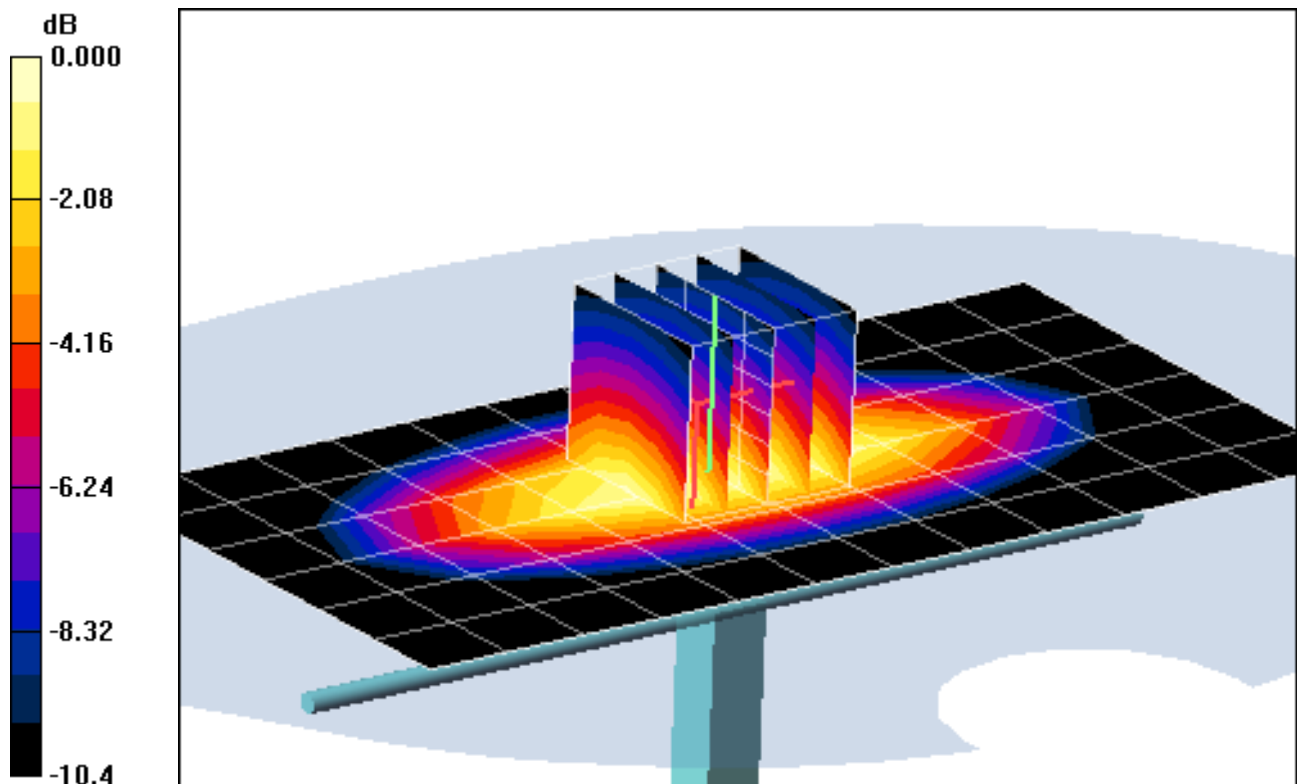
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.667 mW/g

Deviation: 5.59%



0 dB = 1.11mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-31-2012; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3258; ConvF(6.12, 6.12, 6.12); Calibrated: 4/8/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 2/21/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

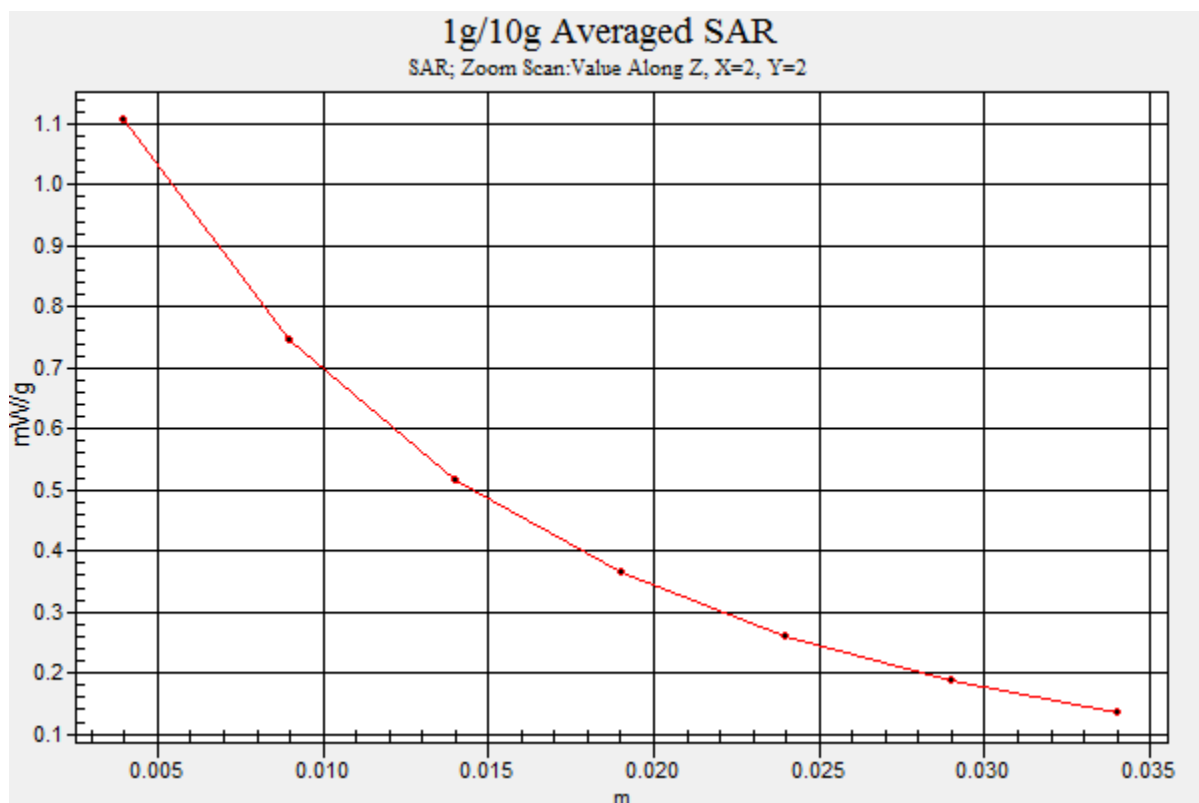
Area Scan (7x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.667 mW/g

Deviation: 5.59%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

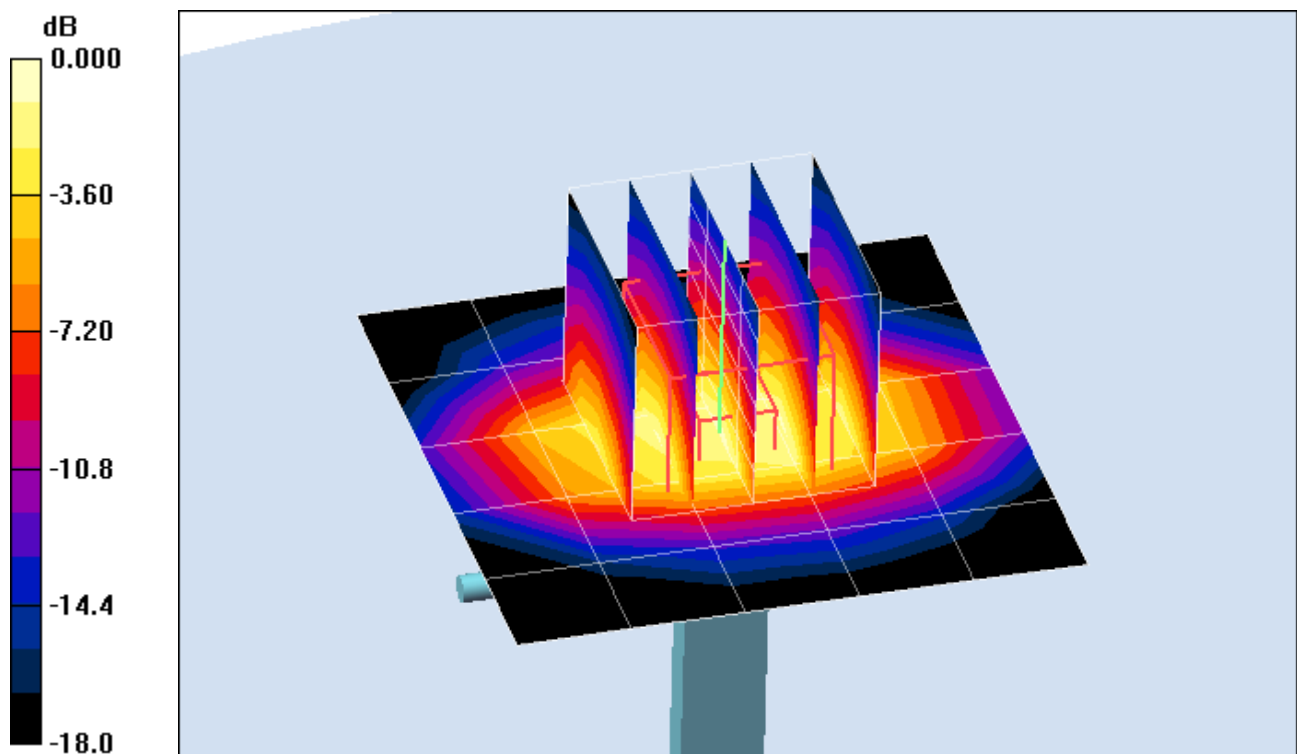
Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 16.0 dBm (40 mW)

SAR(1 g) = 1.48 mW/g; SAR(10 g) = 0.757 mW/g

Deviation: 0.00%



0 dB = 1.67mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 50.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(7.14, 7.14, 7.14); Calibrated: 7/27/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

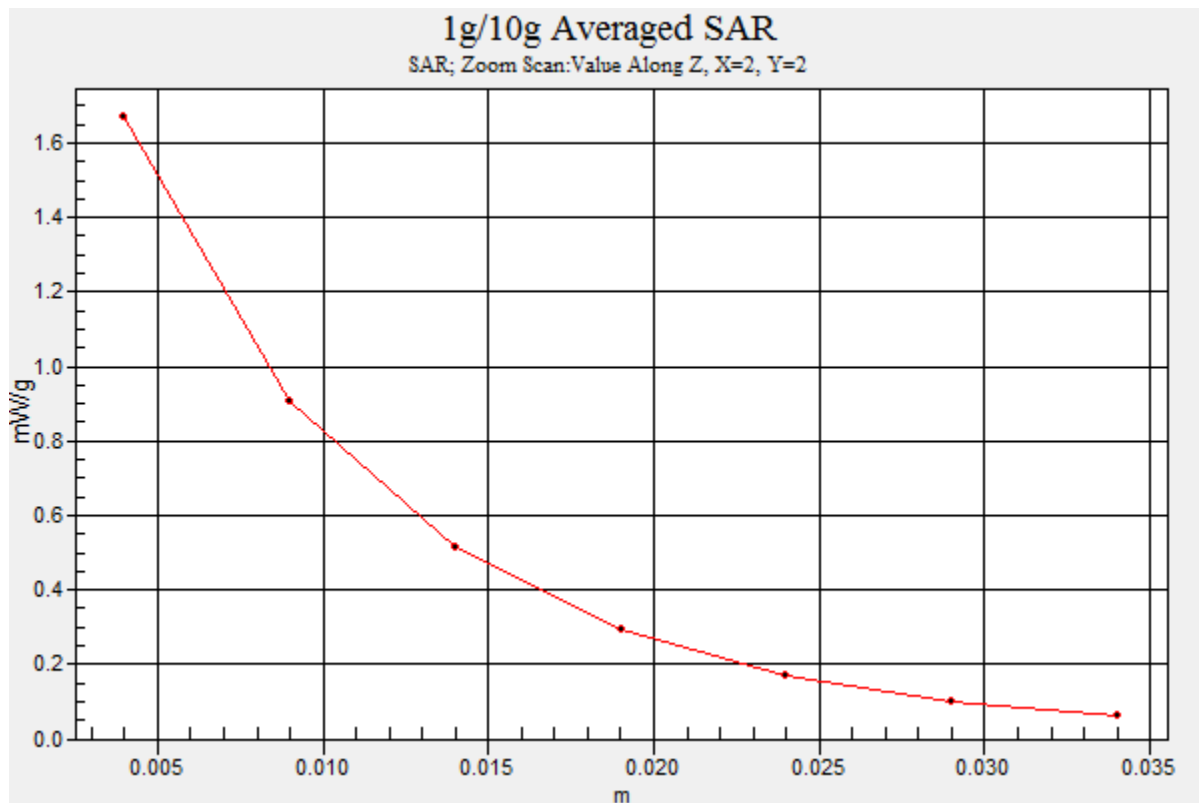
Area Scan (6x6x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 16.0 dBm (40 mW)

SAR(1 g) = 1.48 mW/g; SAR(10 g) = 0.757 mW/g

Deviation: 0.00%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.51 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

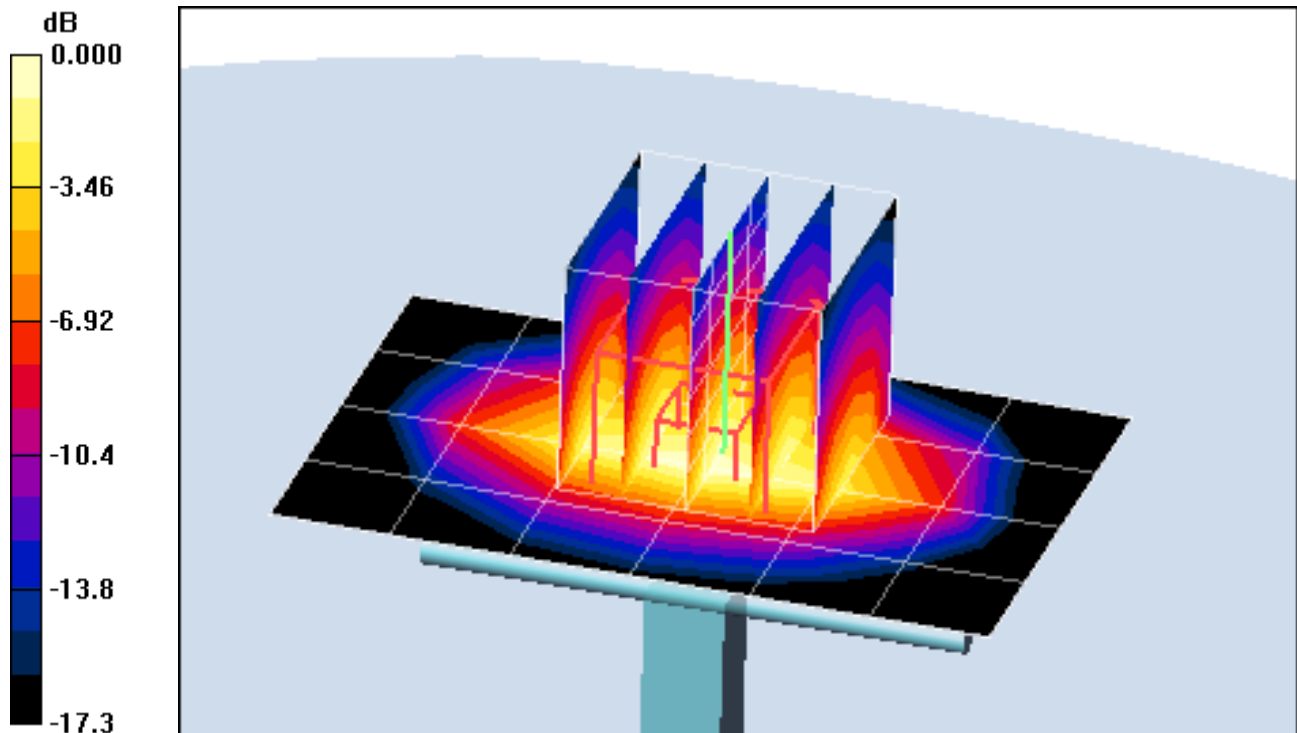
Area Scan (5x7x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 4.24 mW/g; SAR(10 g) = 2.24 mW/g

Deviation: 3.16%



0 dB = 4.69mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.51 \text{ mho/m}$; $\epsilon_r = 52.82$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2012; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3209; ConvF(4.48, 4.48, 4.48); Calibrated: 4/18/2011

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/19/2011

Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

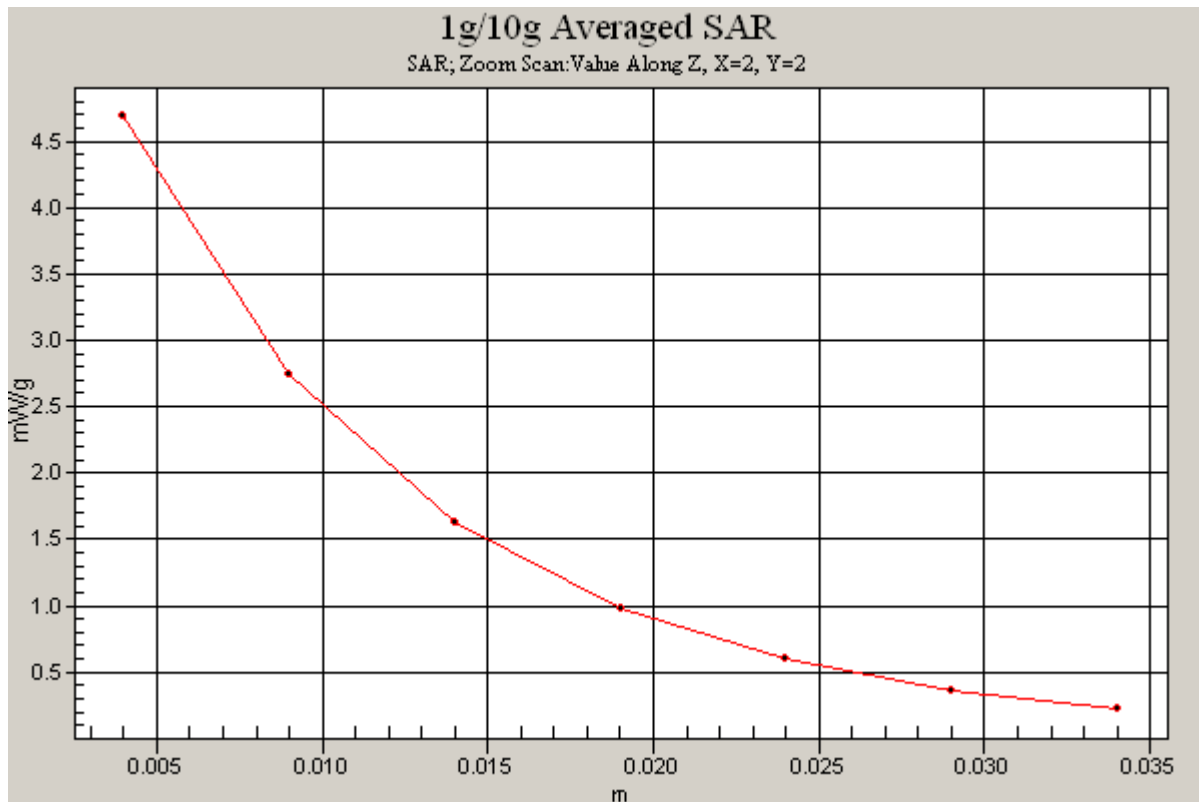
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

SAR(1 g) = 4.24 mW/g; SAR(10 g) = 2.24 mW/g

Deviation: 3.16%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.02 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

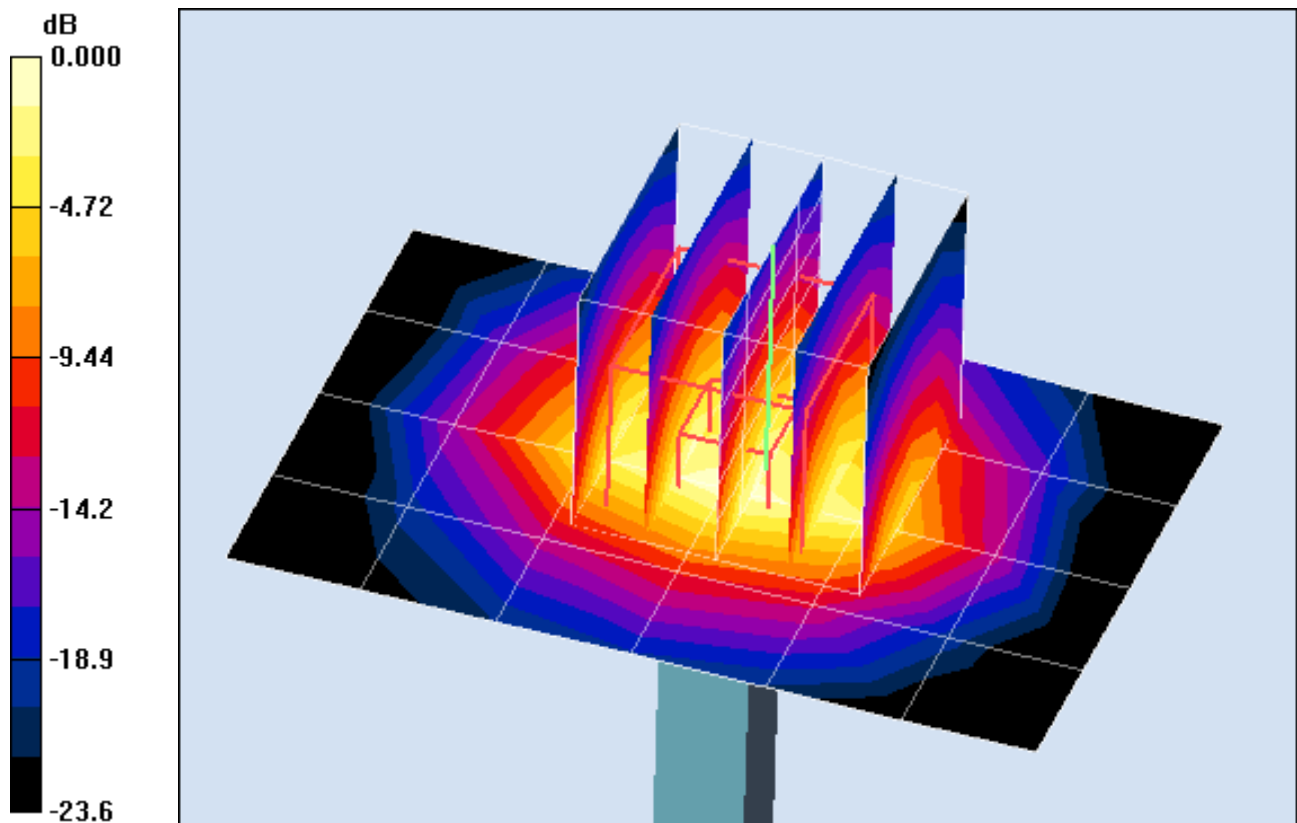
Area Scan (5x7x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 16.0 dBm (40 mW)

SAR(1 g) = 2.12 mW/g; SAR(10 g) = 0.952 mW/g

Deviation: 3.31%



0 dB = 2.78mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.02 \text{ mho/m}$; $\epsilon_r = 50.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-17-2012; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

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

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 4/20/2011

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2450MHz System Verification

Area Scan (5x7x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 16.0 dBm (40 mW)

SAR(1 g) = 2.12 mW/g; SAR(10 g) = 0.952 mW/g

Deviation: 3.31%

