SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics, Co. Ltd.

416, Maetan 3-dong, Yeongtong-gu, Suwon-Si
Gyeonggi-do, 443-742
Republic of Korea

Date of Testing:
02/21/12 - 02/27/12

Test Site/Location:
PCTEST Lab, Columbia, MD, USA

Document Serial No.:
0Y1202220245-R1.A3L

FCC ID: **A3LSGHI747**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SGH-I747

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	32.23	0.22	0.57	0.57
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	28.66	0.53	0.51	0.61
WCDMA/HSPA 850	826.40 - 846.60 MHz	22.87	0.18	0.39	0.39
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz	22.27	0.62	0.50	0.56
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	22.74	0.59	0.73	0.74
LTE Band 17	706.5 - 713.5 MHz	22.78	0.13	0.41	0.41
2.4 GHz WLAN	2412 - 2462 MHz	16.28	0.03	0.09	0.09
5.8 GHz WLAN	5745 - 5825 MHz	13.67	0.06	0.16	
5.2 GHz WLAN	5180 - 5240 MHz	13.22	0.01	0.04	
5.3 GHz WLAN	5260 - 5320 MHz	13.34	0.03	0.09	
5.5 GHz WLAN	5500 - 5700 MHz	13.54	0.13	0.27	
Bluetooth	2402 - 2480 MHz	10.22	N/A		
Simultaneous SAR per KDB 690783 D01:			0.74	0.82	0.82

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

Note: This revised test report (S/N 0Y12022290245-R1.A3L) supersedes and replaces the previously issued test report on the same subject DUT for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of accordingly.

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

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

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

Randy Ortanez
President

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Tx Frequency
GSM/GPRS/EDGE 850	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz
WCDMA/HSPA 850	826.40 - 846.60 MHz
WCDMA/HSPA 1900	1852.4 - 1907.6 MHz
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz
LTE Band 17	706.5 - 713.5 MHz
2.4 GHz WLAN	2412 - 2462 MHz
5.8 GHz WLAN	5745 - 5825 MHz
5.2 GHz WLAN	5180 - 5240 MHz
5.3 GHz WLAN	5260 - 5320 MHz
5.5 GHz WLAN	5500 - 5700 MHz
Bluetooth	2402 - 2480 MHz
NFC	13.56 MHz

1.2 Near Field Communications (NFC)

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. The device restricts the battery used to battery model: EB-L1G6LLA.

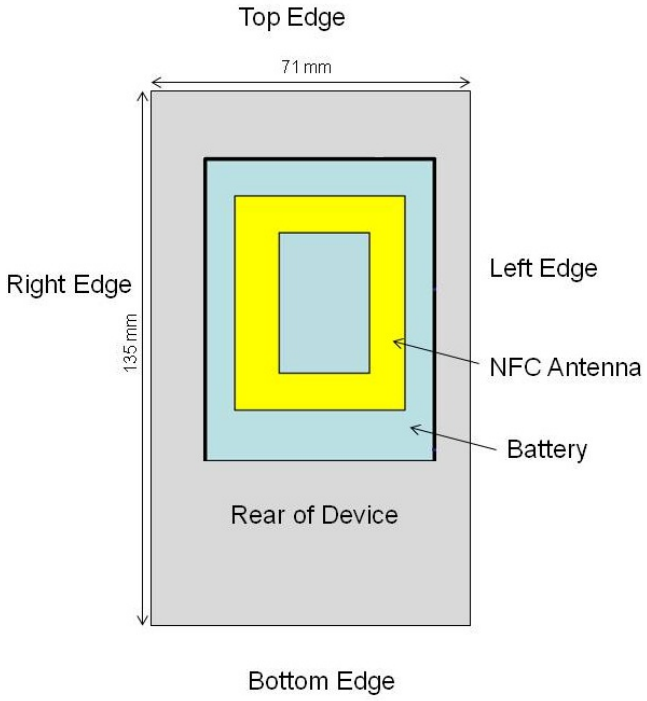


Figure 1-1
NFC Antenna Location on the Battery

1.3 DUT Antenna Locations

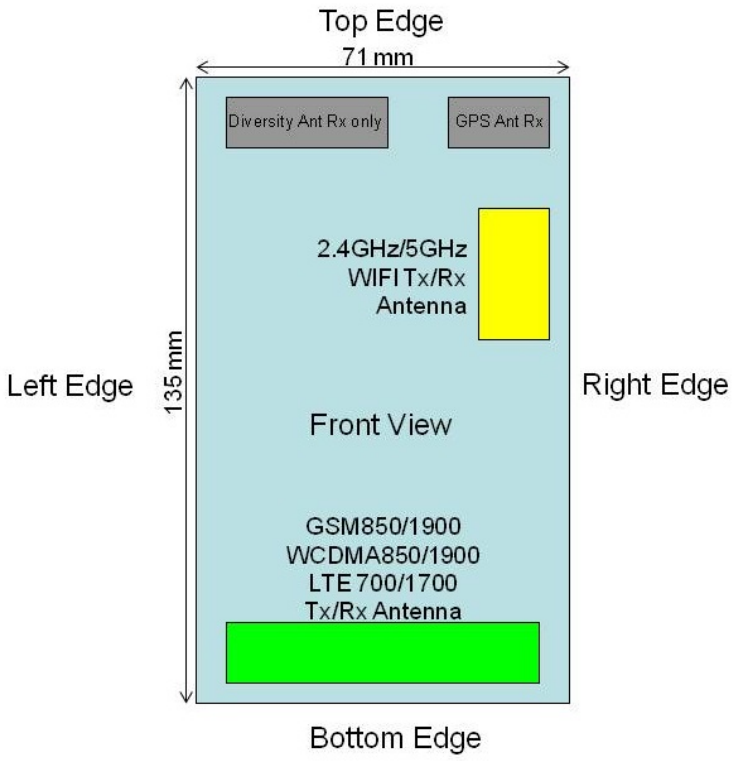


Figure 1-2
DUT Antenna Locations

Table 1-1
Mobile Hotspot Sides for SAR Testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
WCDMA 850	Yes	Yes	No	Yes	Yes	Yes
WCDMA 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 17	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	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. When the wireless router mode is enabled, all 5 GHz bands are disabled. Therefore 5 GHz WIFI is not considered in this section.

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.

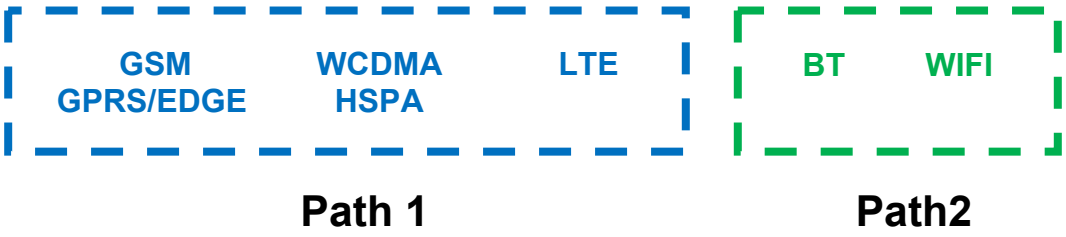


Figure 1-3
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to KDB 447498 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

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 Band 17/4 LTE Data + WIFI 2.4 GHz	Yes*	10mm*	Yes	4G Hotspot*	Yes
6	GSM 850/1900 MHz Voice + WiFi 5GHz	Yes	10mm	N/A	5 GHz Client Only	Yes
7	850/1900 MHz WCDMA Voice + WIFI 5 GHz	Yes	10mm	N/A	5 GHz Client Only	Yes
8	850/1900 MHz GPRS/EDGE Data + WiFi 5GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
9	850/1900 MHz WCDMA/HSPA Data + WIFI 5 GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
10	700/1750 MHz Band17/4 LTE Data + WIFI 5 GHz	N/A	N/A	N/A	Blocked by Chipset F/W	No
11	GSM/WCDMA Voice + LTE	N/A	N/A	N/A	Not Supported by H/W	No
12	GSM/WCDMA Voice + WIFI + LTE	N/A	N/A	N/A	Not Supported by H/W	No
13	850/1900MHz GPRS/EDGE Data + LTE	N/A	N/A	N/A	Not Supported by H/W	No
14	850/1900MHz WCDMA/HSPA Data + LTE	N/A	N/A	N/A	Not Supported by H/W	No

1. GSM/WCDMA/LTE share one path. The signals cannot be transmitted simultaneously
2. This model cannot act as a master device in 5 GHz WiFi, so this model is not capable of 5 GHz hotspot. This cannot be changed by any S/W modification by any party after it is manufactured.
3. (*) = for VOIP 3rd party applications possibly installed and used by end-user.
4. (**) = 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 SAR Test Exclusions Applied

(A) WIFI/BT

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 between the main antenna and the Bluetooth and WLAN antennas is 84 mm.
RF Conducted Power of Bluetooth Tx is 10.52 mW. RF Conducted Power of WLAN is 42.462 mW.

Per KDB Publication 648474, **Bluetooth SAR was not required** based on the maximum conducted power, the Bluetooth/WLAN to main antenna separation distance and Body-SAR of the main antenna.

This device supports 20MHz and 40MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only. IEEE 802.11n (20 MHz and 40 MHz Bandwidths) was not evaluated for SAR since the average output power for each bandwidth was not > 0.25 dB higher than IEEE 802.11a modes per KDB 248227.

(B) Licensed Transmitter(s)

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.

Simultaneous Voice 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 was not tested 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 Bulletin 65 Supplement C [June 2001]
- IEEE 1528-2003
- FCC KDB 941225 (2G/3G/4G and Hotspot)
- FCC KDB 248227 (802.11)
- FCC KDB 648474 (Simultaneous)
- FCC KDB 865664 (5 GHz)

1.8 Samples Used for SAR Testing

The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units

Serial Number	SAR #3	SAR #4	SAR #7
Mode/Band	WCDMA 850/1900 LTE Band 4	GSM/GPRS/EDGE 850/1900 LTE Band 17	2.4 GHz/5GHz WIFI

2 LTE CHECKLIST PER KDB 941225 D05

KDB 941225 Section	FCC ID	A3LSGHI747		
	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, 15MHz, 20MHz 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 4 and BW 15MHz	1717.5MHz(20025)	1732.5MHz(20175)	1747.5MHz(20325)
	LTE Band 4 and BW 20MHz	1720MHz(20050)	1732.5MHz(20175)	1745MHz(20300)
	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	Yes		
	A-MPR (Additional MPR) disabled for SAR Testing?	Yes		
8)	Conducted power Table provided for 1RB (low and high offset), 50% 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 WI-FI			
	2.4GHz Bluetooth			
	5GHz 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		

3 INTRODUCTION

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

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

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

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

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]

4 SAR MEASUREMENT SETUP

4.1 Automated SAR Measurement System

Measurements are performed using the DASY automated dosimetric SAR assessment system. The DASY 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 www.speag.com for more information about the specification of the SAR assessment system.

Figure 4-1
SAR Measurement System

Figure 4-2
Near-Field Probe

Table 4-1
Composition of the Tissue Equivalent Matter

Frequency (MHz)	835	835	1750	1750	1900	1900	2450	2450	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)										
Bactericide	0.1	0.1								
DGBE			47	31	44.92	29.44	7.99	26.7		
HEC	1	1								
NaCl	1.45	0.94	0.4	0.2	0.18	0.39	0.16	0.1		
Sucrose	57	44.9								
Triton X-100							19.97		17.24	
Diethylenglycol monohexylether									17.24	
Polysorbate (Tween) 80										20
Water	40.45	53.06	52.6	68.8	54.9	70.17	71.88	73.2	65.52	80

See next page for 750 MHz Tissue Composition

Table 4-2
Composition of 750 MHz Head and Body Tissue Equivalent Matter

2 Composition / Information on ingredients	
The Item is composed of the following ingredients:	
H_2O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7%
	Relevant for safety; Refer to the respective Safety Data Sheet*.

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

Measurement Certificate / Material Test

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

Measurement Method

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

Target Parameters

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

Test Condition

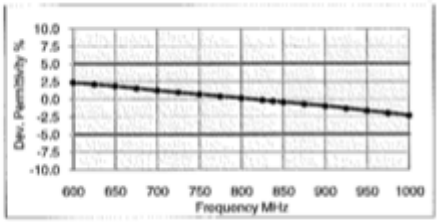
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

Additional Information

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

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e"	sigma	eps	sigma	Δ-eps	Δ-sigma
600	57.4	24.88	0.83	56.1	0.95	2.4	-12.7
625	57.2	24.53	0.85	56.0	0.95	2.1	-10.6
650	57.0	24.18	0.87	55.9	0.96	1.8	-8.5
675	56.7	23.90	0.90	55.8	0.96	1.5	-6.3
700	56.4	23.61	0.92	55.7	0.96	1.2	-4.2
725	56.2	23.37	0.94	55.6	0.96	0.9	-2.0
750	55.9	23.12	0.96	55.5	0.96	0.7	0.1
775	55.7	22.95	0.99	55.4	0.97	0.4	2.5
800	55.4	22.78	1.01	55.3	0.97	0.1	4.6
825	55.2	22.61	1.04	55.2	0.98	-0.2	6.1
838	55.0	22.52	1.05	55.2	0.98	-0.3	6.7
850	54.9	22.44	1.06	55.2	0.99	-0.4	7.3
875	54.7	22.30	1.09	55.1	1.02	-0.7	6.5
900	54.5	22.17	1.11	55.0	1.05	-1.0	5.7
925	54.2	22.05	1.13	55.0	1.06	-1.3	6.8
950	54.0	21.94	1.16	54.9	1.08	-1.7	7.8
975	53.8	21.85	1.18	54.9	1.09	-2.0	9.0
1000	53.6	21.75	1.21	54.8	1.10	-2.3	10.2



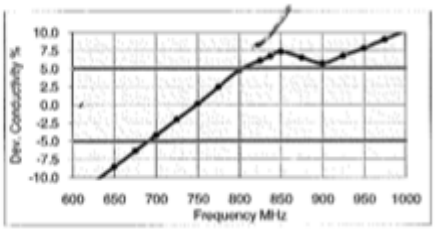


Figure 4-3
750MHz Body Tissue Equivalent Matter

Measurement Certificate / Material Test

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

Measurement Method

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

Target Parameters

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

Test Condition

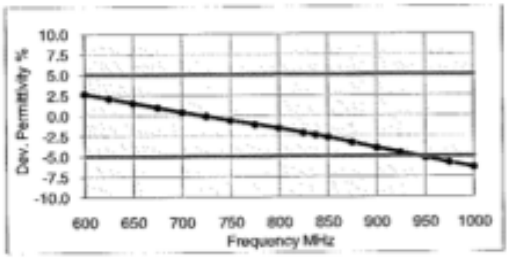
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

Additional Information

TSL Density	1.284 g/cm^3
TSL Heat-capacity	2.701 kJ/(kg*K)

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e"	sigma	eps	sigma	Δ-eps	Δ-sigma
600	43.9	23.01	0.77	42.7	0.88	2.7	-12.9
625	43.5	22.75	0.79	42.6	0.88	2.1	-10.5
650	43.1	22.49	0.81	42.5	0.89	1.5	-8.2
675	42.7	22.26	0.84	42.3	0.89	1.0	-5.9
700	42.4	22.03	0.86	42.2	0.89	0.4	-3.5
725	42.0	21.84	0.88	42.1	0.89	-0.1	-1.2
750	**41.7**	**21.65**	**0.90**	**41.9**	**0.89**	**-0.6**	**1.1**
775	41.4	21.50	0.93	41.8	0.90	-1.1	3.5
800	41.0	21.34	0.95	41.7	0.90	-1.6	5.9
825	40.7	21.19	0.97	41.6	0.91	-2.1	7.3
838	40.5	21.12	0.98	41.5	0.91	-2.4	8.0
850	40.4	21.05	1.00	41.5	0.92	-2.7	8.6
875	40.1	20.91	1.02	41.5	0.94	-3.3	7.9
900	39.8	20.77	1.04	41.5	0.97	-4.0	7.2
925	39.6	20.66	1.06	41.5	0.98	-4.6	8.2
950	39.3	20.55	1.09	41.4	0.99	-5.2	9.2
975	39.0	20.44	1.11	41.4	1.00	-5.8	10.3
1000	38.7	20.32	1.13	41.3	1.01	-6.4	11.4



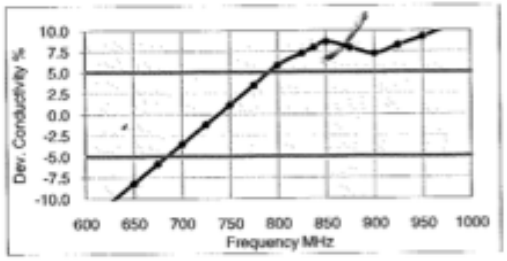


Figure 4-4
750MHz Head Tissue Equivalent Matter

5 DOSIMETRIC ASSESSMENT

5.1 Measurement Procedure

The evaluation was performed using the following procedure:

1. The SAR distribution at the exposed side of the head or body 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 device-head interface and the horizontal grid resolution was 15mm and 15mm for frequencies < 3 GHz in the x and y directions respectively. When applicable, for frequencies above 3 GHz, a 10 mm by 10 mm resolution was used.
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 the 1 gram cube evaluation. SAR at this fixed point was measured and used as a reference value.

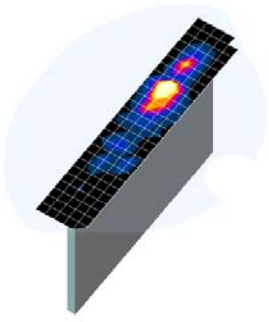


Figure 5-1
Sample SAR Area Scan

3. Based on the area scan data, the peak 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 at least 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 online 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.
5. For testing 5 GHz devices, finer resolution zoom scans were performed as specified by FCC SAR Measurement Requirements for 3 – 6 GHz, KDB 865664 publication. The 5 GHz zoom scan requires a minimum volume of 24mm x 24mm x 20mm and 7 x 7 x 11 points.

6 DEFINITION OF REFERENCE POINTS

6.1 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 6-2). 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].

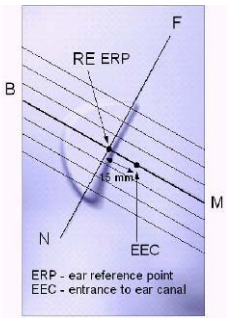


Figure 6-1
Close-Up Side view of ERP

6.2 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 6-3). The "test device reference point" was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at it's top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

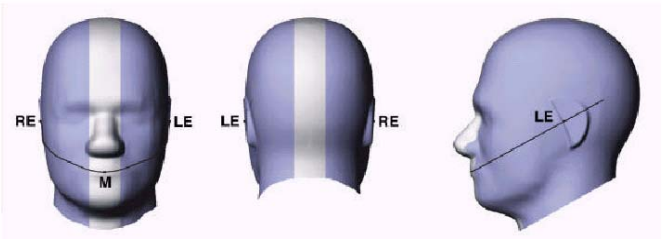


Figure 6-2
Front, back and side view of SAM Twin Phantom

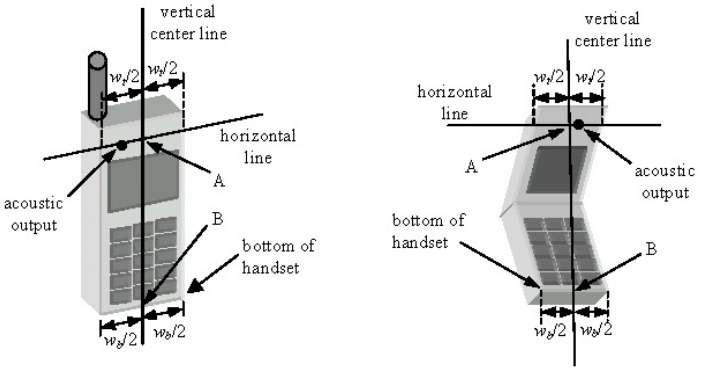


Figure 6-3
Handset Vertical Center & Horizontal Line Reference Points

7 TEST CONFIGURATION POSITIONS FOR HANDSETS

7.1 Device Holder

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

7.2 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 7-1), 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.

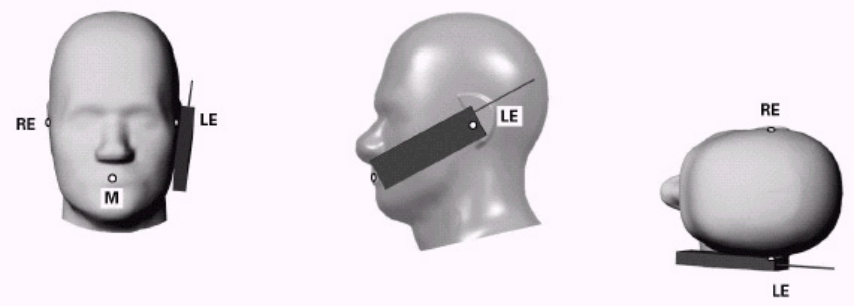


Figure 7-1 Front, Side and Top View of Cheek/Touch Position

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 was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 7-2).

7.3 Positioning for Ear / 15º Tilt

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

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 7-2).

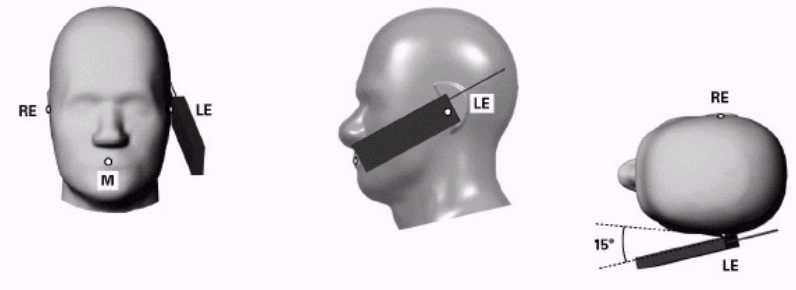


Figure 7-2 Front, Side and Top View of Ear/15º Tilt Position

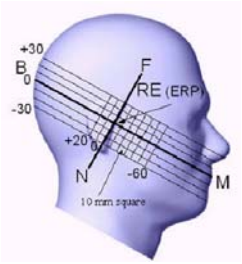


Figure 7-3
Side view w/ relevant markings

Figure 7-4 Body SAR Sample Photo
(Not Actual EUT)

7.4 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.

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 latest IEEE 1528 committee developments propose the usage of a tilted phantom when the antenna of the phone is mounted at the bottom or in all cases the peak absorption is in the chin region. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed individually from the table for emptying and cleaning.

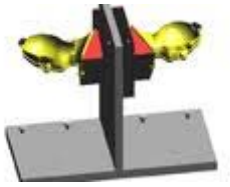


Figure 7-5 Twin SAM Chin20

7.5 Body-Worn Accessory 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 7-4). 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.

7.6 Wireless Router Configurations

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 x W ≥ 9 cm x 5 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.

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.

8 FCC RF EXPOSURE LIMITS

8.1 Uncontrolled Environment

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

8.2 Controlled Environment

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

Table 8-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

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

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

9 FCC MEASUREMENT PROCEDURES

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

9.1 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.

9.2 SAR Measurement Conditions for WCDMA

9.2.1 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".

9.2.2 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.

9.2.3 Body SAR Measurements

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

9.2.4 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 βc=9 and βd=15, and power offset parameters of ΔACK= ΔNACK =5 and ΔCQI=2 is used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

9.2.5 SAR Measurements for Handsets with Rel 6 HSUPA

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

9.3 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.

9.3.1 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1. The differences noted are not cases of implemented MPR but rather associated with measurement uncertainty and allowable tolerances per 3GPP standard and the manufacturer. See Section 10.3 for MPR targets.

9.3.2 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01.

9.3.3 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05:

a. Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
b. Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel is tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation when 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 when the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.
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 when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Otherwise, SAR tests are performed on the channel that produced the highest SAR for 16 QAM with 50% RB.
i. Per Page 5, 4) B), I), when the SAR for 16 QAM 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 when the 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 when SAR is not > 1.45 W/kg for the highest bandwidth and the maximum average output power of the smaller bandwidths across all channels and configurations is not more than 0.5 dB higher than the higher bandwidths.

9.4 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. 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.

9.4.1 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.

9.4.2 Frequency Channel Configurations [27]

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

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. When the adjacent channels are higher in power then the default channels, these “required channels” were considered instead of the default channels for SAR testing. 802.11n modes and higher data rates for 802.11a/n were evaluated only if the respective mode was 0.25 dB or higher than the 802.11a mode.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg or if the 1g averaged SAR was less than 0.8 W/kg, SAR testing was not required for the other test channels in the band.

10 RF CONDUCTED POWERS

10.1 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	32.40	32.50	**31.28**	26.64	26.55
	190	32.23	32.41	**30.93**	26.55	26.42
	251	32.28	32.37	**30.89**	26.46	26.33
PCS	512	28.79	28.76	**27.52**	25.34	25.26
	661	28.66	28.65	**27.60**	25.58	25.40
	810	28.90	28.92	**27.85**	25.61	25.39
		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	23.37	23.47	**25.26**	17.61	20.53
	190	23.20	23.38	**24.91**	17.52	20.40
	251	23.25	23.34	**24.87**	17.43	20.31
PCS	512	19.76	19.73	**21.50**	16.31	19.24
	661	19.63	19.62	**21.58**	16.55	19.38
	810	19.87	19.89	**21.83**	16.58	19.37

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.

CS1 coding scheme was used in GPRS output power measurements and SAR Testing, as a condition where GMSK modulation was ensured. Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels in the GPRS modes.

MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation and that MCS levels that produce 8-PSK modulation do not have any impact on the output power levels.

GSM Class: B
GPRS Multislot class: 10 (max 2 Tx Uplink slots)
EDGE Multislot class: 10 (max 2Tx Uplink slots)
DTM Multislot Class: N/A

Figure 10-1
Power Measurement Setup

10.2 HSPA Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.96	22.87	22.86	22.39	22.27	22.19	-
99		12.2 kbps AMR	22.84	22.71	22.73	22.33	22.23	22.10	-
6	HSDPA	Subtest 1	22.01	21.77	21.78	21.35	21.22	21.13	0
6		Subtest 2	22.25	21.91	21.95	21.33	21.30	21.66	0
6		Subtest 3	21.82	21.42	21.49	20.80	20.76	20.98	0.5
6		Subtest 4	21.59	21.39	21.46	20.89	20.75	20.62	0.5
6	HSUPA	Subtest 1	21.56	21.31	21.17	21.21	21.35	21.33	0
6		Subtest 2	19.19	18.92	18.90	18.52	18.59	18.34	2
6		Subtest 3	20.35	20.13	20.00	19.46	19.57	19.64	1
6		Subtest 4	21.28	21.34	21.42	20.85	20.90	20.72	2
6		Subtest 5	21.31	21.57	21.21	20.66	20.76	20.48	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 HSPA 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.

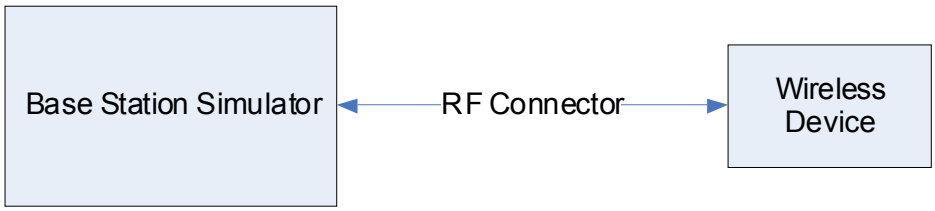


Figure 10-2
Power Measurement Setup

10.3 LTE Conducted Powers

10.3.1 LTE Band 4 (AWS)

Table 10-1
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1712.5	19975	5	QPSK	1	0	22.50	0	0
	1712.5	19975	5	QPSK	1	24	22.55	0	0
	1712.5	19975	5	QPSK	12	6	21.70	1	0-1
	1712.5	19975	5	QPSK	25	0	21.77	1	0-1
	1712.5	19975	5	16-QAM	1	0	21.95	1	0-1
	1712.5	19975	5	16-QAM	1	24	21.74	1	0-1
	1712.5	19975	5	16-QAM	12	6	20.52	2	0-2
	1712.5	19975	5	16-QAM	25	0	20.79	2	0-2
Mid	1732.5	20175	5	QPSK	1	0	22.73	0	0
	1732.5	20175	5	QPSK	1	24	22.81	0	0
	1732.5	20175	5	QPSK	12	6	21.79	1	0-1
	1732.5	20175	5	QPSK	25	0	21.99	1	0-1
	1732.5	20175	5	16-QAM	1	0	22.22	1	0-1
	1732.5	20175	5	16-QAM	1	24	22.28	1	0-1
	1732.5	20175	5	16-QAM	12	6	20.49	2	0-2
	1732.5	20175	5	16-QAM	25	0	21.03	2	0-2
High	1752.5	20375	5	QPSK	1	0	22.61	0	0
	1752.5	20375	5	QPSK	1	24	22.51	0	0
	1752.5	20375	5	QPSK	12	6	21.84	1	0-1
	1752.5	20375	5	QPSK	25	0	21.76	1	0-1
	1752.5	20375	5	16-QAM	1	0	21.66	1	0-1
	1752.5	20375	5	16-QAM	1	24	21.75	1	0-1
	1752.5	20375	5	16-QAM	12	6	20.68	2	0-2
	1752.5	20375	5	16-QAM	25	0	20.88	2	0-2

Table 10-2
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1715	20000	10	QPSK	1	0	22.56	0	0
	1715	20000	10	QPSK	1	49	22.61	0	0
	1715	20000	10	QPSK	25	12	21.77	1	0-1
	1715	20000	10	QPSK	50	0	21.63	1	0-1
	1715	20000	10	16QAM	1	0	21.33	1	0-1
	1715	20000	10	16QAM	1	49	21.56	1	0-1
	1715	20000	10	16QAM	25	12	20.73	2	0-2
	1715	20000	10	16QAM	50	0	20.70	2	0-2
Mid	1732.5	20175	10	QPSK	1	0	22.63	0	0
	1732.5	20175	10	QPSK	1	49	22.67	0	0
	1732.5	20175	10	QPSK	25	12	22.10	1	0-1
	1732.5	20175	10	QPSK	50	0	22.11	1	0-1
	1732.5	20175	10	16QAM	1	0	22.15	1	0-1
	1732.5	20175	10	16QAM	1	49	21.57	1	0-1
	1732.5	20175	10	16QAM	25	12	21.26	2	0-2
	1732.5	20175	10	16QAM	50	0	21.12	2	0-2
High	1750	20350	10	QPSK	1	0	22.56	0	0
	1750	20350	10	QPSK	1	49	22.63	0	0
	1750	20350	10	QPSK	25	12	21.66	1	0-1
	1750	20350	10	QPSK	50	0	21.51	1	0-1
	1750	20350	10	16QAM	1	0	22.11	1	0-1
	1750	20350	10	16QAM	1	49	21.56	1	0-1
	1750	20350	10	16QAM	25	12	21.07	2	0-2
	1750	20350	10	16QAM	50	0	21.15	2	0-2

Table 10-3
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1717.5	20025	15	QPSK	1	0	22.91	0	0
	1717.5	20025	15	QPSK	1	74	22.69	0	0
	1717.5	20025	15	QPSK	36	19	21.80	1	0-1
	1717.5	20025	15	QPSK	75	0	21.84	1	0-1
	1717.5	20025	15	16QAM	1	0	21.85	1	0-1
	1717.5	20025	15	16QAM	1	74	21.76	1	0-1
	1717.5	20025	15	16QAM	36	19	21.12	2	0-2
	1717.5	20025	15	16QAM	75	0	20.78	2	0-2
Mid	1732.5	20175	15	QPSK	1	0	22.60	0	0
	1732.5	20175	15	QPSK	1	74	22.73	0	0
	1732.5	20175	15	QPSK	36	19	21.88	1	0-1
	1732.5	20175	15	QPSK	75	0	22.10	1	0-1
	1732.5	20175	15	16QAM	1	0	21.96	1	0-1
	1732.5	20175	15	16QAM	1	74	21.69	1	0-1
	1732.5	20175	15	16QAM	36	19	21.26	2	0-2
	1732.5	20175	15	16QAM	75	0	21.18	2	0-2
High	1747.5	20325	15	QPSK	1	0	22.81	0	0
	1747.5	20325	15	QPSK	1	74	22.76	0	0
	1747.5	20325	15	QPSK	36	19	22.09	1	0-1
	1747.5	20325	15	QPSK	75	0	22.00	1	0-1
	1747.5	20325	15	16QAM	1	0	21.79	1	0-1
	1747.5	20325	15	16QAM	1	74	21.96	1	0-1
	1747.5	20325	15	16QAM	36	19	20.90	2	0-2
	1747.5	20325	15	16QAM	75	0	20.89	2	0-2

Table 10-4
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1720	20050	20	QPSK	1	0	22.60	0	0
	1720	20050	20	QPSK	1	99	22.66	0	0
	1720	20050	20	QPSK	50	25	21.89	1	0-1
	1720	20050	20	QPSK	100	0	21.97	1	0-1
	1720	20050	20	16QAM	1	0	**22.24**	1	0-1
	1720	20050	20	16QAM	1	99	**22.26**	1	0-1
	1720	20050	20	16QAM	50	25	20.88	2	0-2
	1720	20050	20	16QAM	100	0	20.81	2	0-2
Mid	1732.5	20175	20	QPSK	1	0	**22.74**	0	0
	1732.5	20175	20	QPSK	1	99	**22.70**	0	0
	1732.5	20175	20	QPSK	50	25	**22.11**	1	0-1
	1732.5	20175	20	QPSK	100	0	22.04	1	0-1
	1732.5	20175	20	16QAM	1	0	22.19	1	0-1
	1732.5	20175	20	16QAM	1	99	22.15	1	0-1
	1732.5	20175	20	16QAM	50	25	**21.18**	2	0-2
	1732.5	20175	20	16QAM	100	0	21.05	2	0-2
High	1745	20300	20	QPSK	1	0	22.68	0	0
	1745	20300	20	QPSK	1	99	22.58	0	0
	1745	20300	20	QPSK	50	25	22.04	1	0-1
	1745	20300	20	QPSK	100	0	22.03	1	0-1
	1745	20300	20	16QAM	1	0	21.81	1	0-1
	1745	20300	20	16QAM	1	99	21.59	1	0-1
	1745	20300	20	16QAM	50	25	20.66	2	0-2
	1745	20300	20	16QAM	100	0	21.20	2	0-2

10.3.2 LTE Band 17

Table 10-5
LTE Band 17 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	706.5	23755	5	QPSK	1	0	22.53	0	0
	706.5	23755	5	QPSK	1	24	22.43	0	0
	706.5	23755	5	QPSK	12	6	21.55	1	0-1
	706.5	23755	5	QPSK	25	0	21.66	1	0-1
	706.5	23755	5	16-QAM	1	0	21.49	1	0-1
	706.5	23755	5	16-QAM	1	24	21.31	1	0-1
	706.5	23755	5	16-QAM	12	6	20.43	2	0-2
	706.5	23755	5	16-QAM	25	0	20.85	2	0-2
Mid	710.0	23790	5	QPSK	1	0	22.63	0	0
	710.0	23790	5	QPSK	1	24	22.60	0	0
	710.0	23790	5	QPSK	12	6	21.80	1	0-1
	710.0	23790	5	QPSK	25	0	22.11	1	0-1
	710.0	23790	5	16-QAM	1	0	21.57	1	0-1
	710.0	23790	5	16-QAM	1	24	21.54	1	0-1
	710.0	23790	5	16-QAM	12	6	20.73	2	0-2
	710.0	23790	5	16-QAM	25	0	21.11	2	0-2
High	713.5	23825	5	QPSK	1	0	22.37	0	0
	713.5	23825	5	QPSK	1	24	22.58	0	0
	713.5	23825	5	QPSK	12	6	21.58	1	0-1
	713.5	23825	5	QPSK	25	0	21.82	1	0-1
	713.5	23825	5	16-QAM	1	0	21.31	1	0-1
	713.5	23825	5	16-QAM	1	24	21.48	1	0-1
	713.5	23825	5	16-QAM	12	6	20.42	2	0-2
	713.5	23825	5	16-QAM	25	0	21.08	2	0-2

Table 10-6
LTE Band 17 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	709	23780	10	QPSK	1	0	22.53	0	0
	709	23780	10	QPSK	1	49	22.66	0	0
	709	23780	10	QPSK	25	12	21.63	1	0-1
	709	23780	10	QPSK	50	0	22.04	1	0-1
	709	23780	10	16QAM	1	0	21.55	1	0-1
	709	23780	10	16QAM	1	49	21.48	1	0-1
	709	23780	10	16QAM	25	12	20.94	2	0-2
	709	23780	10	16QAM	50	0	21.01	2	0-2
Mid	710.0	23790	10	QPSK	1	0	**22.70**	0	0
	710.0	23790	10	QPSK	1	49	**22.78**	0	0
	710.0	23790	10	QPSK	25	12	**22.04**	1	0-1
	710.0	23790	10	QPSK	50	0	22.19	1	0-1
	710.0	23790	10	16QAM	1	0	**21.42**	1	0-1
	710.0	23790	10	16QAM	1	49	**21.55**	1	0-1
	710.0	23790	10	16QAM	25	12	**20.95**	2	0-2
	710.0	23790	10	16QAM	50	0	21.24	2	0-2
High	711	23800	10	QPSK	1	0	22.50	0	0
	711	23800	10	QPSK	1	49	22.54	0	0
	711	23800	10	QPSK	25	12	21.77	1	0-1
	711	23800	10	QPSK	50	0	21.98	1	0-1
	711	23800	10	16QAM	1	0	21.33	1	0-1
	711	23800	10	16QAM	1	49	21.33	1	0-1
	711	23800	10	16QAM	25	12	20.88	2	0-2
	711	23800	10	16QAM	50	0	21.16	2	0-2

10.3.3 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05:

1) Per Page 4, 3) A), QPSK with 50% RB is required for the highest bandwidth.
2) 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 when the SAR is < 0.8 W/kg.
3) Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required for the highest bandwidth.
4) Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation when the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB.
5) 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.
6) 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.
7) 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.
8) 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 when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Otherwise, SAR tests are performed on the channel that produced the highest SAR for 16 QAM with 50% RB.
9) Per Page 5, 4) B), I), when the SAR for 16 QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
10) Per Page 4, 4), A) I) and Page 5, 4), A),I), 100% RB Allocation is not required to be tested when the SAR is not > 1.45 W/kg for the highest bandwidth.
11) Per Page 5, 5) B) I), smaller bandwidths are not required to be tested when SAR is not > 1.45 W/kg for the highest bandwidth and the maximum average output power of the smaller bandwidths across all channels and configurations is not more than 0.5 dB higher than the higher bandwidths.
12) The bolded values in the tables above were evaluated for SAR testing.

10.4 WLAN Conducted Powers

Table 10-7
IEEE 802.11b Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]			
			Data Rate [Mbps]			
	[MHz]		1	2	5.5	11
802.11b	2412	1	15.66	15.44	15.76	15.66
802.11b	2437	6	15.67	15.74	15.86	15.83
802.11b	2462	11	**16.28**	16.22	15.79	16.15

Table 10-8
IEEE 802.11g Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11g	2412	1	13.79	14.01	14.10	13.79	13.85	13.72	13.93	13.84
802.11g	2437	6	14.19	14.29	13.99	13.71	13.86	13.71	14.33	14.31
802.11g	2462	11	14.35	14.55	14.72	14.47	14.68	14.36	14.53	14.49

Table 10-9
IEEE 802.11n Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	2412	1	12.41	12.56	12.46	12.46	12.59	12.34	12.34	12.61
802.11n	2437	6	12.71	12.79	13.00	13.02	13.18	12.91	13.13	13.09
802.11n	2462	11	13.18	13.27	13.27	13.30	13.43	13.23	13.37	13.32

Table 10-10
IEEE 802.11a Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11a	5180	36*	13.01	13.24	13.37	13.12	13.25	13.15	13.27	13.11
802.11a	5200	40	13.11	13.34	13.35	13.18	13.37	13.10	13.26	13.24
802.11a	5220	44	13.11	13.40	13.36	13.27	13.33	13.11	13.31	13.23
802.11a	5240	48*	**13.22**	13.41	13.46	13.17	13.37	13.08	13.34	13.40
802.11a	5260	52*	13.22	13.44	13.56	13.24	13.40	13.23	13.40	13.44
802.11a	5280	56	13.30	13.40	13.47	13.31	13.51	13.32	13.40	13.51
802.11a	5300	60	13.31	13.42	13.50	13.30	13.41	13.33	13.46	13.52
802.11a	5320	64*	**13.34**	13.52	13.55	13.31	13.50	13.34	13.51	13.45
802.11a	5500	100	13.13	13.45	13.51	13.31	13.21	13.37	13.29	13.26
802.11a	5520	104*	13.29	13.43	13.46	13.25	13.52	13.27	13.37	13.41
802.11a	5540	108	13.14	13.34	13.52	13.33	13.36	13.40	13.33	13.39
802.11a	5560	112	13.41	13.51	13.55	13.32	13.37	13.49	13.41	13.33
802.11a	5580	116*	13.42	13.58	13.63	13.35	13.49	13.54	13.47	13.54
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	**13.54**	13.62	13.58	13.11	13.04	13.09	13.11	13.12
802.11a	5680	136*	12.94	13.25	13.21	13.02	13.20	13.22	13.31	13.31
802.11a	5700	140	13.23	13.24	13.40	12.94	13.26	13.20	13.33	13.14
802.11a	5745	149*	13.50	13.60	13.77	13.57	13.84	13.51	13.74	13.67
802.11a	5765	153	**13.67**	13.75	13.72	13.59	13.64	13.52	13.80	13.78
802.11a	5785	157*	13.49	13.71	13.58	13.45	13.58	13.50	13.53	13.60
802.11a	5805	161*	13.27	13.69	13.64	13.36	13.52	13.37	13.43	13.43
802.11a	5825	165	13.38	13.40	13.74	13.14	13.44	13.33	13.40	13.41

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band. (*) – indicates default channels per KDB Publication 248227. When the adjacent channels are higher in power then the default channels, these “required channels” are considered instead of the default channels for SAR testing.

Table 10-11
IEEE 802.11n (20 MHz) Average RF Power

Mode	Freq	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	5180	36*	12.95	12.92	12.83	12.86	13.05	12.82	13.15	13.00
802.11n	5200	40	12.82	12.94	12.79	12.91	13.00	12.75	12.91	12.94
802.11n	5220	44	12.87	12.83	12.77	12.81	13.01	12.82	13.00	12.97
802.11n	5240	48*	12.92	13.17	13.01	13.04	13.41	13.17	13.33	13.32
802.11n	5260	52*	13.22	13.20	13.04	13.27	13.34	13.22	13.41	13.33
802.11n	5280	56	13.30	13.29	13.27	13.24	13.42	13.22	13.40	13.38
802.11n	5300	60	13.21	13.31	13.29	13.34	13.35	13.11	13.36	13.44
802.11n	5320	64*	13.25	13.44	13.34	13.34	13.52	13.30	13.44	13.51
802.11n	5500	100	13.04	13.10	13.12	13.14	13.29	13.14	13.24	13.24
802.11n	5520	104*	13.01	13.12	13.06	13.11	13.37	13.01	13.14	13.22
802.11n	5540	108	13.18	13.14	13.18	13.17	13.44	13.21	13.34	13.36
802.11n	5560	112	13.21	13.24	13.22	13.14	13.37	13.20	13.31	13.31
802.11n	5580	116*	13.21	13.24	13.41	13.34	13.43	13.41	13.40	13.41
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	13.37	13.42	13.40	13.35	13.45	13.27	13.47	13.45
802.11n	5680	136*	13.42	13.34	13.32	13.41	13.46	13.38	13.44	13.41
802.11n	5700	140	13.41	13.32	13.37	13.44	13.55	13.42	13.44	13.41
802.11n	5745	149*	13.51	13.59	13.51	13.44	13.71	13.52	13.73	13.69
802.11n	5765	153	13.15	13.05	13.20	13.26	13.37	13.21	13.17	13.00
802.11n	5785	157*	13.42	13.35	13.31	13.36	13.55	13.25	13.45	13.40
802.11n	5805	161*	13.02	13.34	13.33	13.34	13.50	13.32	13.42	13.19
802.11n	5825	165	13.25	13.28	13.31	13.25	13.28	13.26	13.40	13.30

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands. (*) – indicates default channels per KDB Publication 248227. When the adjacent channels are higher in power then the default channels, these “required channels” are considered instead of the default channels for SAR testing.

Table 10-12
IEEE 802.11n (40 MHz) Average RF Power

Mode	Freq [MHz]	Channel	802.11n (5GHz) Conducted Power [dBm] Data Rate [Mbps]							
			6.5/7.2	13/14.4	19.5/21.7	26/28.9	39/43.4	52/57.8	58.5/65	65/72.2
802.11n	5190	38*	12.66	12.38	12.61	12.66	12.67	12.77	12.56	12.82
802.11n	5230	46	12.52	12.88	12.47	12.49	12.67	12.79	12.43	12.56
802.11n	5270	54	12.63	12.84	12.42	12.46	12.72	12.72	12.44	12.53
802.11n	5310	62*	12.51	12.59	12.80	12.33	12.50	12.71	12.73	12.80
802.11n	5510	102*	12.48	12.28	12.31	12.50	12.39	12.54	12.53	12.40
802.11n	5550	110	12.30	12.56	12.48	12.45	12.43	12.65	12.44	12.74
802.11n	5590	118	12.54	12.51	12.64	12.39	12.79	12.76	12.80	12.73
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	12.69	12.75	12.77	12.89	12.85	12.92	12.89	12.93
802.11n	5755	151*	12.79	12.75	12.92	12.82	13.02	13.01	12.99	13.05
802.11n	5795	159	12.80	12.79	12.89	12.83	13.05	12.93	12.92	12.92

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands. (*) – indicates default channels per KDB Publication 248227. When the adjacent channels are higher in power then the default channels, these “required channels” are considered instead of the default channels for SAR testing.

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.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n 20 MHz Bandwidth and 802.11n 40 MHz Bandwidth) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
- 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 underlined data rate and channel above were tested for SAR.

Figure 10-3
Power Measurement Setup

11 SYSTEM VERIFICATION

11.1 Tissue Verification

Table 11-1
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
02/23/2012	740H	23.4	710	0.875	41.12	0.887	42.113	-1.35%	-2.36%
			725	0.889	40.91	0.888	42.033	0.11%	-2.67%
			740	0.903	40.73	0.889	41.953	1.57%	-2.92%
			755	0.916	40.52	0.891	41.876	2.81%	-3.24%
02/23/2012	835H	21.7	820	0.911	42.84	0.898	41.571	1.45%	3.05%
			835	0.921	42.69	0.900	41.500	2.33%	2.87%
			850	0.933	42.54	0.916	41.500	1.86%	2.51%
02/21/2012	1750H	22.3	1710	1.370	40.94	1.348	40.136	1.63%	2.00%
			1750	1.405	40.75	1.370	40.100	2.55%	1.62%
			1790	1.448	40.54	1.394	40.020	3.87%	1.30%
02/22/2012	1900H	23.6	1850	1.362	38.46	1.400	40.000	-2.71%	-3.85%
			1880	1.395	38.33	1.400	40.000	-0.36%	-4.18%
			1910	1.427	38.23	1.400	40.000	1.93%	-4.43%
02/24/2012	2450H	22.3	2401	1.773	39.89	1.758	39.298	0.85%	1.51%
			2450	1.832	39.69	1.800	39.200	1.78%	1.25%
			2499	1.894	39.48	1.852	39.135	2.27%	0.88%
02/27/2012	5200H-5800H	22.3	5200	4.553	35.71	4.660	36.000	-2.30%	-0.81%
			5240	4.598	35.70	4.700	35.960	-2.17%	-0.72%
			5320	4.671	35.60	4.780	35.880	-2.28%	-0.78%
			5500	4.847	35.27	4.965	35.650	-2.38%	-1.07%
			5660	5.014	35.16	5.130	35.440	-2.26%	-0.79%
			5765	5.129	34.96	5.235	35.335	-2.02%	-1.06%
			5800	5.159	34.94	5.270	35.300	-2.11%	-1.02%
02/23/2012	740B	24.9	710	0.994	56.28	0.958	55.901	3.76%	0.68%
			725	0.986	54.89	0.960	55.817	2.71%	-1.66%
			740	0.998	54.78	0.961	55.733	3.85%	-1.71%
			755	1.010	54.69	0.963	55.649	4.88%	-1.72%
02/23/2012	835B	22.3	820	0.965	53.65	0.969	55.284	-0.41%	-2.96%
			835	0.972	53.60	0.970	55.200	0.21%	-2.90%
			850	0.984	53.32	0.988	55.154	-0.40%	-3.33%
02/21/2012	1750B	22.4	1710	1.469	52.36	1.460	53.540	0.62%	-2.20%
			1750	1.514	52.20	1.490	53.430	1.61%	-2.30%
			1790	1.556	52.02	1.510	53.330	3.05%	-2.46%
02/22/2012	1900B	21.6	1850	1.528	52.65	1.520	53.300	0.53%	-1.22%
			1880	1.571	52.57	1.520	53.300	3.36%	-1.37%
			1910	1.588	52.45	1.520	53.300	4.47%	-1.59%
02/24/2012	2450B	24.3	2401	1.891	50.84	1.903	52.765	-0.63%	-3.65%
			2450	1.965	50.69	1.950	52.700	0.77%	-3.81%
			2499	2.000	50.66	2.019	52.638	-0.94%	-3.76%
02/27/2012	5200B-5800B	22.3	5200	5.210	47.52	5.299	49.014	-1.68%	-3.05%
			5240	5.285	47.49	5.346	48.933	-1.14%	-2.95%
			5320	5.394	47.31	5.439	48.607	-0.83%	-2.67%
			5500	5.656	46.78	5.650	48.580	0.11%	-3.71%
			5660	5.903	46.51	5.837	48.363	1.13%	-3.83%
			5765	6.069	46.15	5.959	48.220	1.85%	-4.29%
			5800	6.116	46.12	6.000	48.200	1.93%	-4.32%

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.

Probe calibration used within ±100 MHz of the test frequency in either 5.725 - 5.85 or 5.47-5.725 GHz is acceptable per KDB Publication 865664 since the design of the SAR probe supports the extended frequency, provided the DASY software version recommended is used for the tests, and the expanded calibration uncertainty (k=2) is less than or equal to 15% (See SAR probe calibration certificate for this information). The dielectric and conductivities measured are within 10% and 5% respectively of the target parameters specified in Supplement C 01-01.

Measurement Procedure for Tissue verification

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the sample which was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
3) The complex admittance with respect to the probe aperture was measured
4) The complex relative permittivity , for example from the below equation (Pournaropoulos and Misra):

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

where *Y* is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

11.2 Test System Verification

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

Table 11-2
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	02/23/2012	24.4	23.1	0.100	1046	3213	0.856	8.400	8.560	1.90%
835	Head	02/23/2012	23.1	22.2	0.100	4d026	3022	1	9.460	10.000	5.71%
1750	Body	02/21/2012	24.7	22.5	0.100	1051	3213	3.62	37.000	36.200	-2.16%
1900	Head	02/22/2012	22.0	21.8	0.040	5d141	3022	1.51	39.500	37.750	-4.43%
2450	Head	02/24/2012	23.1	22.3	0.040	719	3022	2.04	53.800	51.000	-5.20%
5200	Head	02/27/2012	23.8	22.7	0.100	1007	3589	7.27	79.800	72.700	-8.90%
5500	Head	02/27/2012	24.1	22.8	0.100	1007	3589	7.9	86.300	79.000	-8.46%
5800	Head	02/27/2012	24.0	22.9	0.100	1007	3589	7.58	79.400	75.800	-4.53%
750	Body	02/23/2012	23.2	23.1	0.100	1046	3213	0.917	8.800	9.170	4.20%
835	Body	02/23/2012	23.2	22.4	0.100	4d026	3022	0.965	9.660	9.650	-0.10%
1750	Body	02/21/2012	24.3	22.1	0.100	1051	3213	3.98	37.000	39.800	7.57%
1900	Body	02/22/2012	22.5	22.1	0.040	5d141	3022	1.64	41.400	41.000	-0.97%
2450	Body	02/24/2012	23.3	22.4	0.040	719	3022	2.09	51.300	52.250	1.85%
5200	Body	02/27/2012	23.8	22.6	0.100	1007	3589	7.79	75.500	77.900	3.18%
5500	Body	02/27/2012	24.1	22.6	0.100	1007	3589	8.74	81.300	87.400	7.50%
5800	Body	02/27/2012	24.0	22.8	0.100	1007	3589	7.96	75.300	79.600	5.71%

Note: Per KDB Publication 865664, when a reference dipole is not defined within ±100MHz of the test frequency, the system verification may be conducted within ± 200 MHz of the center frequency of the measurement frequencies if the SAR probe calibration is valid and the same tissue-equivalent matter is used for verification and test measurements.

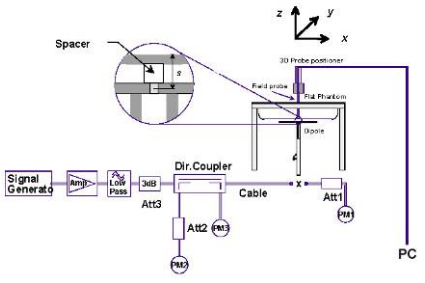


Figure 11-1
System Verification Setup Diagram

Figure 11-2
System Verification Setup Photo

12 SAR DATA SUMMARY

12.1 Standalone Head SAR Data

Table 12-1
GSM 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	190	GSM 850	32.23	0.16	Right	Touch	SAR #4	0.224
836.60	190	GSM 850	32.23	-0.08	Right	Tilt	SAR #4	0.112
836.60	190	GSM 850	32.23	0.13	Left	Touch	SAR #4	0.175
836.60	190	GSM 850	32.23	0.07	Left	Tilt	SAR #4	0.103
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 12-2
GSM 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	661	GSM 1900	28.66	-0.02	Right	Touch	SAR #4	0.271
1880.00	661	GSM 1900	28.66	-0.08	Right	Tilt	SAR #4	0.239
1880.00	661	GSM 1900	28.66	-0.10	Left	Touch	SAR #4	0.531
1880.00	661	GSM 1900	28.66	0.01	Left	Tilt	SAR #4	0.225
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 12-3
WCDMA 850 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode/Band	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
836.60	4183	WCDMA 850	22.87	0.02	Right	Touch	SAR #3	0.180
836.60	4183	WCDMA 850	22.87	0.06	Right	Tilt	SAR #3	0.094
836.60	4183	WCDMA 850	22.87	0.00	Left	Touch	SAR #3	0.143
836.60	4183	WCDMA 850	22.87	0.15	Left	Tilt	SAR #3	0.099
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 12-4
WCDMA 1900 Head SAR Results

MEASUREMENT RESULTS								
FREQUENCY		Mode	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.							(W/kg)
1880.00	9400	WCDMA 1900	22.27	0.15	Right	Touch	SAR #3	0.289
1880.00	9400	WCDMA 1900	22.27	0.18	Right	Tilt	SAR #3	0.223
1880.00	9400	WCDMA 1900	22.27	-0.01	Left	Touch	SAR #3	0.617
1880.00	9400	WCDMA 1900	22.27	0.03	Left	Tilt	SAR #3	0.237
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 12-5
LTE Band 4 (AWS) Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.													(W/kg)
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	0.11	1	Right	Touch	QPSK	50	25	SAR #3	0.177
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	0.09	0	Right	Touch	QPSK	1	0	SAR #3	**0.258**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.02	0	Right	Touch	QPSK	1	99	SAR #3	0.199
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	-0.10	2	Right	Touch	16 QAM	50	25	SAR #3	0.142
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.12	1	Right	Touch	16 QAM	1	0	SAR #3	0.100
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	0.04	1	Right	Touch	16 QAM	1	99	SAR #3	0.046
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.06	1	Right	Tilt	QPSK	50	25	SAR #3	0.203
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	0.02	0	Right	Tilt	QPSK	1	0	SAR #3	**0.285**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	-0.07	0	Right	Tilt	QPSK	1	99	SAR #3	0.217
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	-0.19	2	Right	Tilt	16 QAM	50	25	SAR #3	0.152
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	-0.17	1	Right	Tilt	16 QAM	1	0	SAR #3	0.089
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.06	1	Right	Tilt	16 QAM	1	99	SAR #3	0.044
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.01	1	Left	Touch	QPSK	50	25	SAR #3	0.377
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	-0.16	0	Left	Touch	QPSK	1	0	SAR #3	**0.585**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.01	0	Left	Touch	QPSK	1	99	SAR #3	0.417
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	0.20	2	Left	Touch	16 QAM	50	25	SAR #3	0.292
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.19	1	Left	Touch	16 QAM	1	0	SAR #3	0.366
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	0.19	1	Left	Touch	16 QAM	1	99	SAR #3	0.442
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	0.03	1	Left	Tilt	QPSK	50	25	SAR #3	0.191
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	0.00	0	Left	Tilt	QPSK	1	0	SAR #3	**0.277**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.02	0	Left	Tilt	QPSK	1	99	SAR #3	0.200
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	-0.11	2	Left	Tilt	16 QAM	50	25	SAR #3	0.147
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.03	1	Left	Tilt	16 QAM	1	0	SAR #3	0.192
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.04	1	Left	Tilt	16 QAM	1	99	SAR #3	0.098
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 FCC KDB 941225 D05 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 when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Therefore, low channel was tested for LTE Band 4 (AWS) 16 QAM 1 RB cases.

Table 12-6
LTE Band 17 Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.													(W/kg)
710.00	23790	Mid	LTE Band 17	10	22.04	0.08	1	Right	Touch	QPSK	25	12	SAR #4	0.113
710.00	23790	Mid	LTE Band 17	10	22.70	0.07	0	Right	Touch	QPSK	1	0	SAR #4	0.100
710.00	23790	Mid	LTE Band 17	10	22.78	0.14	0	Right	Touch	QPSK	1	49	SAR #4	**0.126**
710.00	23790	Mid	LTE Band 17	10	20.95	0.09	2	Right	Touch	16 QAM	25	12	SAR #4	0.097
710.00	23790	Mid	LTE Band 17	10	21.42	0.14	1	Right	Touch	16 QAM	1	0	SAR #4	0.076
710.00	23790	Mid	LTE Band 17	10	21.55	-0.09	1	Right	Touch	16 QAM	1	49	SAR #4	0.095
710.00	23790	Mid	LTE Band 17	10	22.04	0.04	1	Right	Tilt	QPSK	25	12	SAR #4	0.066
710.00	23790	Mid	LTE Band 17	10	22.70	0.14	0	Right	Tilt	QPSK	1	0	SAR #4	0.062
710.00	23790	Mid	LTE Band 17	10	22.78	0.14	0	Right	Tilt	QPSK	1	49	SAR #4	**0.078**
710.00	23790	Mid	LTE Band 17	10	20.95	0.16	2	Right	Tilt	16 QAM	25	12	SAR #4	0.057
710.00	23790	Mid	LTE Band 17	10	21.42	0.12	1	Right	Tilt	16 QAM	1	0	SAR #4	0.047
710.00	23790	Mid	LTE Band 17	10	21.55	0.15	1	Right	Tilt	16 QAM	1	49	SAR #4	0.062
710.00	23790	Mid	LTE Band 17	10	22.04	0.16	1	Left	Touch	QPSK	25	12	SAR #4	0.111
710.00	23790	Mid	LTE Band 17	10	22.70	-0.15	0	Left	Touch	QPSK	1	0	SAR #4	0.106
710.00	23790	Mid	LTE Band 17	10	22.78	0.01	0	Left	Touch	QPSK	1	49	SAR #4	**0.119**
710.00	23790	Mid	LTE Band 17	10	20.95	0.16	2	Left	Touch	16 QAM	25	12	SAR #4	0.102
710.00	23790	Mid	LTE Band 17	10	21.42	0.18	1	Left	Touch	16 QAM	1	0	SAR #4	0.078
710.00	23790	Mid	LTE Band 17	10	21.55	0.11	1	Left	Touch	16 QAM	1	49	SAR #4	0.090
710.00	23790	Mid	LTE Band 17	10	22.04	0.05	1	Left	Tilt	QPSK	25	12	SAR #4	0.066
710.00	23790	Mid	LTE Band 17	10	22.70	0.05	0	Left	Tilt	QPSK	1	0	SAR #4	0.062
710.00	23790	Mid	LTE Band 17	10	22.78	-0.14	0	Left	Tilt	QPSK	1	49	SAR #4	**0.073**
710.00	23790	Mid	LTE Band 17	10	20.95	0.12	2	Left	Tilt	16 QAM	25	12	SAR #4	0.061
710.00	23790	Mid	LTE Band 17	10	21.42	-0.04	1	Left	Tilt	16 QAM	1	0	SAR #4	0.048
710.00	23790	Mid	LTE Band 17	10	21.55	-0.02	1	Left	Tilt	16 QAM	1	49	SAR #4	0.055
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 12-7
2.4 GHz WLAN Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Battery Type	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	DSSS	16.28	0.02	Right	Touch	Standard	SAR #7	1	0.018
2462	11	IEEE 802.11b	DSSS	16.28	0.09	Right	Tilt	Standard	SAR #7	1	0.010
2462	11	IEEE 802.11b	DSSS	16.28	0.10	Left	Touch	Standard	SAR #7	1	0.028
2462	11	IEEE 802.11b	DSSS	16.28	0.01	Left	Tilt	Standard	SAR #7	1	0.015
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 12-8
5.8 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5765	153	IEEE 802.11a	OFDM	13.67	0.19	Right	Touch	SAR #7	6	0.048
5765	153	IEEE 802.11a	OFDM	13.67	0.05	Right	Tilt	SAR #7	6	0.057
5765	153	IEEE 802.11a	OFDM	13.67	-0.05	Left	Touch	SAR #7	6	0.059
5765	153	IEEE 802.11a	OFDM	13.67	0.03	Left	Tilt	SAR #7	6	0.055
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 12-9
5.2 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5240	48	IEEE 802.11a	OFDM	13.22	-0.07	Right	Touch	SAR #7	6	0.001
5240	48	IEEE 802.11a	OFDM	13.22	0.03	Right	Tilt	SAR #7	6	0.003
5240	48	IEEE 802.11a	OFDM	13.22	0.02	Left	Touch	SAR #7	6	0.010
5240	48	IEEE 802.11a	OFDM	13.22	-0.02	Left	Tilt	SAR #7	6	0.003
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Head 1.6 W/kg (mW/g) averaged over 1 gram				

Table 12-10
5.3 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5320	64	IEEE 802.11a	OFDM	13.34	-0.06	Right	Touch	SAR #7	6	0.001
5320	64	IEEE 802.11a	OFDM	13.34	-0.06	Right	Tilt	SAR #7	6	0.022
5320	64	IEEE 802.11a	OFDM	13.34	-0.02	Left	Touch	SAR #7	6	0.025
5320	64	IEEE 802.11a	OFDM	13.34	0.07	Left	Tilt	SAR #7	6	0.011
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 12-11
5.5 - 5.7 GHz WLAN Head SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.									(W/kg)
5660	132	IEEE 802.11a	OFDM	13.54	0.02	Right	Touch	SAR #7	6	0.091
5660	132	IEEE 802.11a	OFDM	13.54	-0.08	Right	Tilt	SAR #7	6	0.095
5660	132	IEEE 802.11a	OFDM	13.54	0.21	Left	Touch	SAR #7	6	0.126
5660	132	IEEE 802.11a	OFDM	13.54	0.10	Left	Tilt	SAR #7	6	0.125
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Head 1.6 W/kg (mW/g) averaged over 1 gram				

12.2 Standalone Body-Worn SAR Data

Table 12-12
GSM/WCDMA Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GSM	32.23	-0.01	1.0 cm	SAR #4	1	back	0.420
836.60	190	GSM 850	GPRS	30.93	-0.09	1.0 cm	SAR #4	2	back	0.567
1880.00	661	GSM 1900	GSM	28.66	-0.03	1.0 cm	SAR #4	1	back	0.342
1880.00	661	GSM 1900	GPRS	27.60	-0.02	1.0 cm	SAR #4	2	back	0.513
836.60	4183	WCDMA 850	RMC	22.87	0.01	1.0 cm	SAR #3	N/A	back	0.389
1880.00	9400	WCDMA 1900	RMC	22.27	0.06	1.0 cm	SAR #3	N/A	back	0.495
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: For GPRS and WCDMA Modes, Hotspot SAR Data was considered to determine body-worn SAR compliance per FCC KDB Publication 941225 D06

Table 12-13
LTE Body-Worn SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.08	1	SAR #3	QPSK	50	25	1.0 cm	back	0.502
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	-0.20	0	SAR #3	QPSK	1	0	1.0 cm	back	**0.734**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.13	0	SAR #3	QPSK	1	99	1.0 cm	back	0.588
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	0.20	2	SAR #3	16 QAM	50	25	1.0 cm	back	0.403
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.04	1	SAR #3	16 QAM	1	0	1.0 cm	back	0.371
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.02	1	SAR #3	16 QAM	1	99	1.0 cm	back	0.184
710.00	23790	Mid	LTE Band 17	10	22.04	-0.01	1	SAR #4	QPSK	25	12	1.0 cm	back	0.361
710.00	23790	Mid	LTE Band 17	10	22.70	0.05	0	SAR #4	QPSK	1	0	1.0 cm	back	0.349
710.00	23790	Mid	LTE Band 17	10	22.78	-0.01	0	SAR #4	QPSK	1	49	1.0 cm	back	**0.405**
710.00	23790	Mid	LTE Band 17	10	20.95	0.04	2	SAR #4	16 QAM	25	12	1.0 cm	back	0.320
710.00	23790	Mid	LTE Band 17	10	21.42	0.04	1	SAR #4	16 QAM	1	0	1.0 cm	back	0.265
710.00	23790	Mid	LTE Band 17	10	21.55	0.03	1	SAR #4	16 QAM	1	49	1.0 cm	back	0.307
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 FCC KDB 941225 D05 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 when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Therefore, low channel was tested for LTE Band 4 (AWS) 16 QAM 1 RB cases.

Note: For LTE Mode, Hotspot SAR Data was considered to determine body-worn SAR compliance per FCC KDB Publication 941225 D06

Table 12-14
WLAN Body-Worn SAR Results

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2462	11	IEEE 802.11b	DSSS	16.28	0.09	1.0 cm	SAR #7	1	back	0.087
5765	153	IEEE 802.11a	OFDM	13.67	-0.15	1.0 cm	SAR #7	6	back	0.158
5240	48	IEEE 802.11a	OFDM	13.22	0.16	1.0 cm	SAR #7	6	back	0.043
5320	64	IEEE 802.11a	OFDM	13.34	-0.09	1.0 cm	SAR #7	6	back	0.086
5660	132	IEEE 802.11a	OFDM	13.54	-0.10	1.0 cm	SAR #7	6	back	0.272
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: For IEEE 802.11b, Hotspot SAR Data was considered to determine body-worn SAR compliance per FCC KDB Publication 941225 D06

12.3 Standalone Wireless Router SAR Data

Table 12-15
GSM/WCDMA Hotspot SAR Data

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Side	SAR (1g)
MHz	Ch.									(W/kg)
836.60	190	GSM 850	GPRS	30.93	-0.09	1.0 cm	SAR #4	2	back	**0.567**
836.60	190	GSM 850	GPRS	30.93	-0.04	1.0 cm	SAR #4	2	front	0.396
836.60	190	GSM 850	GPRS	30.93	-0.05	1.0 cm	SAR #4	2	bottom	0.077
836.60	190	GSM 850	GPRS	30.93	0.00	1.0 cm	SAR #4	2	right	0.472
836.60	190	GSM 850	GPRS	30.93	-0.16	1.0 cm	SAR #4	2	left	0.440
1880.00	661	GSM 1900	GPRS	27.60	-0.02	1.0 cm	SAR #4	2	back	0.513
1880.00	661	GSM 1900	GPRS	27.60	0.08	1.0 cm	SAR #4	2	front	**0.609**
1880.00	661	GSM 1900	GPRS	27.60	-0.10	1.0 cm	SAR #4	2	bottom	0.328
1880.00	661	GSM 1900	GPRS	27.60	-0.12	1.0 cm	SAR #4	2	right	0.158
1880.00	661	GSM 1900	GPRS	27.60	0.05	1.0 cm	SAR #4	2	left	0.439
836.60	4183	WCDMA 850	RMC	22.87	0.01	1.0 cm	SAR #3	N/A	back	**0.389**
836.60	4183	WCDMA 850	RMC	22.87	0.01	1.0 cm	SAR #3	N/A	front	0.240
836.60	4183	WCDMA 850	RMC	22.87	0.12	1.0 cm	SAR #3	N/A	bottom	0.064
836.60	4183	WCDMA 850	RMC	22.87	0.01	1.0 cm	SAR #3	N/A	right	0.269
836.60	4183	WCDMA 850	RMC	22.87	0.11	1.0 cm	SAR #3	N/A	left	0.238
1880.00	9400	WCDMA 1900	RMC	22.27	0.06	1.0 cm	SAR #3	N/A	back	0.495
1880.00	9400	WCDMA 1900	RMC	22.27	0.02	1.0 cm	SAR #3	N/A	front	**0.561**
1880.00	9400	WCDMA 1900	RMC	22.27	0.06	1.0 cm	SAR #3	N/A	bottom	0.309
1880.00	9400	WCDMA 1900	RMC	22.27	-0.14	1.0 cm	SAR #3	N/A	right	0.142
1880.00	9400	WCDMA 1900	RMC	22.27	0.07	1.0 cm	SAR #3	N/A	left	0.410
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 12-16
LTE Band 4 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.	High												(W/kg)
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.08	1	SAR #3	QPSK	50	25	1.0 cm	back	0.502
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	-0.20	0	SAR #3	QPSK	1	0	1.0 cm	back	**0.734**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.13	0	SAR #3	QPSK	1	99	1.0 cm	back	0.588
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	0.20	2	SAR #3	16 QAM	50	25	1.0 cm	back	0.403
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.04	1	SAR #3	16 QAM	1	0	1.0 cm	back	0.371
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.02	1	SAR #3	16 QAM	1	99	1.0 cm	back	0.184
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	0.18	1	SAR #3	QPSK	50	25	1.0 cm	front	0.550
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	-0.11	0	SAR #3	QPSK	1	0	1.0 cm	front	**0.741**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	-0.13	0	SAR #3	QPSK	1	99	1.0 cm	front	0.607
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	-0.20	2	SAR #3	16 QAM	50	25	1.0 cm	front	0.497
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	-0.02	1	SAR #3	16 QAM	1	0	1.0 cm	front	0.269
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.05	1	SAR #3	16 QAM	1	99	1.0 cm	front	0.136
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.08	1	SAR #3	QPSK	50	25	1.0 cm	bottom	0.188
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	0.18	0	SAR #3	QPSK	1	0	1.0 cm	bottom	**0.253**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.04	0	SAR #3	QPSK	1	99	1.0 cm	bottom	0.216
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	-0.13	2	SAR #3	16 QAM	50	25	1.0 cm	bottom	0.137
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.04	1	SAR #3	16 QAM	1	0	1.0 cm	bottom	0.095
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	0.06	1	SAR #3	16 QAM	1	99	1.0 cm	bottom	0.052
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.14	1	SAR #3	QPSK	50	25	1.0 cm	right	0.070
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	0.15	0	SAR #3	QPSK	1	0	1.0 cm	right	**0.090**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	0.07	0	SAR #3	QPSK	1	99	1.0 cm	right	0.075
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	0.18	2	SAR #3	16 QAM	50	25	1.0 cm	right	0.052
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.09	1	SAR #3	16 QAM	1	0	1.0 cm	right	0.041
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	0.03	1	SAR #3	16 QAM	1	99	1.0 cm	right	0.069
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.11	-0.11	1	SAR #3	QPSK	50	25	1.0 cm	left	0.224
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.74	-0.21	0	SAR #3	QPSK	1	0	1.0 cm	left	**0.335**
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.70	-0.09	0	SAR #3	QPSK	1	99	1.0 cm	left	0.243
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.18	0.11	2	SAR #3	16 QAM	50	25	1.0 cm	left	0.167
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.24	0.07	1	SAR #3	16 QAM	1	0	1.0 cm	left	0.133
1720.00	20050	Low	LTE Band 4 (AWS)	20	22.26	-0.04	1	SAR #3	16 QAM	1	99	1.0 cm	left	0.064
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 FCC KDB 941225 D05 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 when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Therefore, low channel was tested for LTE Band 4 (AWS) 16 QAM 1 RB cases.

Table 12-17
LTE Band 17 Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
710.00	23790	Mid	LTE Band 17	10	22.04	-0.01	1	SAR #4	QPSK	25	12	1.0 cm	back	0.361
710.00	23790	Mid	LTE Band 17	10	22.70	0.05	0	SAR #4	QPSK	1	0	1.0 cm	back	0.349
710.00	23790	Mid	LTE Band 17	10	22.78	-0.01	0	SAR #4	QPSK	1	49	1.0 cm	back	**0.405**
710.00	23790	Mid	LTE Band 17	10	20.95	0.04	2	SAR #4	16 QAM	25	12	1.0 cm	back	0.320
710.00	23790	Mid	LTE Band 17	10	21.42	0.04	1	SAR #4	16 QAM	1	0	1.0 cm	back	0.265
710.00	23790	Mid	LTE Band 17	10	21.55	0.03	1	SAR #4	16 QAM	1	49	1.0 cm	back	0.307
710.00	23790	Mid	LTE Band 17	10	22.04	0.03	1	SAR #4	QPSK	25	12	1.0 cm	front	0.183
710.00	23790	Mid	LTE Band 17	10	22.70	-0.01	0	SAR #4	QPSK	1	0	1.0 cm	front	0.165
710.00	23790	Mid	LTE Band 17	10	22.78	-0.11	0	SAR #4	QPSK	1	49	1.0 cm	front	**0.197**
710.00	23790	Mid	LTE Band 17	10	20.95	0.00	2	SAR #4	16 QAM	25	12	1.0 cm	front	0.162
710.00	23790	Mid	LTE Band 17	10	21.42	0.08	1	SAR #4	16 QAM	1	0	1.0 cm	front	0.127
710.00	23790	Mid	LTE Band 17	10	21.55	0.07	1	SAR #4	16 QAM	1	49	1.0 cm	front	0.148
710.00	23790	Mid	LTE Band 17	10	22.04	-0.15	1	SAR #4	QPSK	25	12	1.0 cm	bottom	0.045
710.00	23790	Mid	LTE Band 17	10	22.70	-0.12	0	SAR #4	QPSK	1	0	1.0 cm	bottom	0.042
710.00	23790	Mid	LTE Band 17	10	22.78	-0.05	0	SAR #4	QPSK	1	49	1.0 cm	bottom	**0.051**
710.00	23790	Mid	LTE Band 17	10	20.95	-0.15	2	SAR #4	16 QAM	25	12	1.0 cm	bottom	0.039
710.00	23790	Mid	LTE Band 17	10	21.42	-0.14	1	SAR #4	16 QAM	1	0	1.0 cm	bottom	0.030
710.00	23790	Mid	LTE Band 17	10	21.55	-0.17	1	SAR #4	16 QAM	1	49	1.0 cm	bottom	0.037
710.00	23790	Mid	LTE Band 17	10	22.04	0.13	1	SAR #4	QPSK	25	12	1.0 cm	right	0.138
710.00	23790	Mid	LTE Band 17	10	22.70	0.05	0	SAR #4	QPSK	1	0	1.0 cm	right	0.127
710.00	23790	Mid	LTE Band 17	10	22.78	0.10	0	SAR #4	QPSK	1	49	1.0 cm	right	**0.151**
710.00	23790	Mid	LTE Band 17	10	20.95	0.11	2	SAR #4	16 QAM	25	12	1.0 cm	right	0.120
710.00	23790	Mid	LTE Band 17	10	21.42	0.13	1	SAR #4	16 QAM	1	0	1.0 cm	right	0.098
710.00	23790	Mid	LTE Band 17	10	21.55	0.16	1	SAR #4	16 QAM	1	49	1.0 cm	right	0.109
710.00	23790	Mid	LTE Band 17	10	22.04	0.05	1	SAR #4	QPSK	25	12	1.0 cm	left	0.137
710.00	23790	Mid	LTE Band 17	10	22.70	0.14	0	SAR #4	QPSK	1	0	1.0 cm	left	0.121
710.00	23790	Mid	LTE Band 17	10	22.78	-0.02	0	SAR #4	QPSK	1	49	1.0 cm	left	**0.143**
710.00	23790	Mid	LTE Band 17	10	20.95	-0.01	2	SAR #4	16 QAM	25	12	1.0 cm	left	0.119
710.00	23790	Mid	LTE Band 17	10	21.42	0.14	1	SAR #4	16 QAM	1	0	1.0 cm	left	0.094
710.00	23790	Mid	LTE Band 17	10	21.55	0.09	1	SAR #4	16 QAM	1	49	1.0 cm	left	0.108
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 12-18
WLAN Hotspot SAR Data

MEASUREMENT RESULTS										
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.									(W/kg)
2462	11	IEEE 802.11b	DSSS	16.28	0.09	1.0 cm	SAR #7	1	back	**0.087**
2462	11	IEEE 802.11b	DSSS	16.28	-0.14	1.0 cm	SAR #7	1	front	0.008
2462	11	IEEE 802.11b	DSSS	16.28	-0.18	1.0 cm	SAR #7	1	top	0.006
2462	11	IEEE 802.11b	DSSS	16.28	0.17	1.0 cm	SAR #7	1	right	0.030
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram				

12.4 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. The 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. 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.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. Per FCC/OET Bulletin 65 Supplement C and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
7. Only the primary Tx/Rx antenna was transmitting during testing. The secondary antenna was for receive-only and cannot transmit.
8. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR using headphones.
2. Per FCC guidance, GPRS Data Mode is additionally required for body-worn configuration. Per KDB 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 configurations additionally shows body-worn compliance at the same distance.
3. Justification for reduced test configurations per KDB Publication 941225 D03: The source-based time-averaged output power was evaluated for all multi-slot operations. In addition to the worst-case reported, all source-based time-averaged powers within 10% of the worst-case were additionally included in the evaluation for data modes.

WCDMA Notes:

1. 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.
2. 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. LTE Considerations: LTE test configurations are determined according to SAR Test Considerations for LTE handsets and Data Modems KDB 941225 D05 Publication and are evaluated independently per test position. General test procedures can be found in Section 9.3.3.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01.

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.
5. LTE Band 4 (AWS) SAR was measured with a probe calibrated at 1750 MHz and is valid for measuring SAR from ± 50 MHz. The 1750MHz specific liquid was verified with specific probe calibration factors as required per FCC KDB Publication 450824 D01.

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. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz Bandwidth and 802.11n 40 MHz Bandwidth) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
3. When Hotspot is enabled, all 5 GHz bands are disabled.
4. WLAN transmission was verified using a spectrum analyzer.
5. 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.
6. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

Hotspot Notes:

1. Top Edge for the licensed 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 1.3).
2. Bottom Edge and Left Edge for the WLAN transmitter were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 1.3).
3. During SAR Testing for the Wireless Router conditions per KDB 941225 D06, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 7.6.)

13 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

13.1 Introduction

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

13.2 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 13-1
Output Power Thresholds for Unlicensed Transmitters

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

Figure 13-2
SAR Evaluation Requirements for Multiple Transmitter Handsets

The separation between the main antenna and the Bluetooth and WLAN antennas is 84 mm.
RF Conducted Power of Bluetooth Tx is 10.52 mW. RF Conducted Power of WLAN is 42.462 mW.

Per KDB Publication 648474, **Bluetooth SAR was not required** based on the maximum conducted power, the Bluetooth/WLAN to main antenna separation distance and Body-SAR of the main antenna

13.3 Head SAR Simultaneous Transmission Analysis

Table 13-1
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)
Head SAR	Right Cheek	0.224	0.018	**0.242**
	Right Tilt	0.112	0.010	0.122
	Left Cheek	0.175	0.028	0.203
	Left Tilt	0.103	0.015	0.118

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.271	0.018	0.289
	Right Tilt	0.239	0.010	0.249
	Left Cheek	0.531	0.028	**0.559**
	Left Tilt	0.225	0.015	0.240

Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.180	0.018	**0.198**
	Right Tilt	0.094	0.010	0.104
	Left Cheek	0.143	0.028	0.171
	Left Tilt	0.099	0.015	0.114

Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.289	0.018	0.307
	Right Tilt	0.223	0.010	0.233
	Left Cheek	0.617	0.028	**0.645**
	Left Tilt	0.237	0.015	0.252

The above tables represent a held to ear voice call potentially simultaneously operating with 2.4 GHz WLAN.

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.258	0.018	0.276
	Right Tilt	0.285	0.010	0.295
	Left Cheek	0.585	0.028	**0.613**
	Left Tilt	0.277	0.015	0.292

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.018	0.144
	Right Tilt	0.078	0.010	0.088
	Left Cheek	0.119	0.028	**0.147**
	Left Tilt	0.073	0.015	0.088

The above tables represent a held to ear LTE VoIP call (when hotspot is enabled) potentially simultaneously operating with 2.4 GHz WLAN.

Table 13-2
Simultaneous Transmission Scenario (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.224	0.091	**0.315**
	Right Tilt	0.112	0.095	0.207
	Left Cheek	0.175	0.126	0.301
	Left Tilt	0.103	0.125	0.228

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.271	0.091	0.362
	Right Tilt	0.239	0.095	0.334
	Left Cheek	0.531	0.126	**0.657**
	Left Tilt	0.225	0.125	0.350

Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.180	0.091	**0.271**
	Right Tilt	0.094	0.095	0.189
	Left Cheek	0.143	0.126	0.269
	Left Tilt	0.099	0.125	0.224

Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.289	0.091	0.380
	Right Tilt	0.223	0.095	0.318
	Left Cheek	0.617	0.126	**0.743**
	Left Tilt	0.237	0.125	0.362

The above tables represent a held to ear voice call potentially simultaneously operating with 5 GHz WLAN.

13.4 Body-Worn Simultaneous Transmission Analysis

Table 13-3
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	0.420	0.087	0.507
Back Side	GSM 1900	0.342	0.087	0.429
Back Side	WCDMA 850	0.389	0.087	0.476
Back Side	WCDMA 1900	0.495	0.087	0.582

The above tables represent a body-worn voice call potentially simultaneously operating with 2.4 GHz WLAN.

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 4 (AWS)	0.734	0.087	**0.821**
Back Side	LTE Band 17	0.405	0.087	0.492

The above tables represent a body-worn LTE VoIP call (when hotspot is enabled) potentially simultaneously operating with 2.4 GHz WLAN.

Table 13-4
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.420	0.272	0.692
Back Side	GSM 1900	0.342	0.272	0.614
Back Side	WCDMA 850	0.389	0.272	0.661
Back Side	WCDMA 1900	0.495	0.272	0.767

The above tables represent a body-worn voice call potentially simultaneously operating with 5 GHz WLAN.

13.5 Hotspot SAR Simultaneous Transmission Analysis

Table 13-5
Simultaneous Transmission Scenario (Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.567	0.087	**0.654**
	Front	0.396	0.008	0.404
	Top	-	0.006	0.006
	Bottom	0.077	-	0.077
	Right	0.472	0.030	0.502
	Left	0.440	-	0.440

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.513	0.087	0.600
	Front	0.609	0.008	**0.617**
	Top	-	0.006	0.006
	Bottom	0.328	-	0.328
	Right	0.158	0.030	0.188
	Left	0.439	-	0.439

Simult Tx	Configuration	WCDMA 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.389	0.087	**0.476**
	Front	0.240	0.008	0.248
	Top	-	0.006	0.006
	Bottom	0.064	-	0.064
	Right	0.269	0.030	0.299
	Left	0.238	-	0.238

Simult Tx	Configuration	WCDMA 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.495	0.087	**0.582**
	Front	0.561	0.008	0.569
	Top	-	0.006	0.006
	Bottom	0.309	-	0.309
	Right	0.142	0.030	0.172
	Left	0.410	-	0.410

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.734	0.087	**0.821**
	Front	0.741	0.008	0.749
	Top	-	0.006	0.006
	Bottom	0.253	-	0.253
	Right	0.090	0.030	0.120
	Left	0.335	-	0.335

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.405	0.087	**0.492**
	Front	0.197	0.008	0.205
	Top	-	0.006	0.006
	Bottom	0.051	-	0.051
	Right	0.151	0.030	0.181
	Left	0.143	-	0.143

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.

13.6 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.

14 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
Agilent	N9340A	Spectrum Analyzer	CBT		CBT	CN0147000638
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	6/3/2011	Annual	6/3/2012	N/A
Pasternack	PE2209-10	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	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	D2450V2	2450 MHz SAR Dipole	8/19/2011	Annual	8/19/2012	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	7/26/2011	Annual	7/26/2012	1007
SPEAG	D835V2	835 MHz SAR Dipole	8/15/2011	Annual	8/15/2012	4d026
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2011	Annual	4/20/2012	665
SPEAG	ES3DV2	SAR Probe	8/25/2011	Annual	8/25/2012	3022
SPEAG	EX3DV4	SAR Probe	1/27/2012	Annual	1/27/2013	3589
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/19/2011	Annual	5/19/2012	859
SPEAG	ES3DV3	SAR Probe	3/24/2011	Annual	3/24/2012	3213
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	2/14/2012	Annual	2/14/2013	5318
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	5442
Anritsu	ML2438A	Power Meter	2/14/2012	Annual	2/14/2013	1190013
Anritsu	ML2438A	Power Meter	2/14/2012	Annual	2/14/2013	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	2/14/2012	Annual	2/14/2013	5821
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	8013
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	2400
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	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	CBT		CBT	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/12/2012	Annual	2/12/2013	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
SPEAG	D1750V2	1750 MHz SAR Dipole	5/24/2011	Annual	5/24/2012	1051
MiniCircuits	SLP-2400+	Low Pass Filter	CBT		CBT	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT		CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT		CBT	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		CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43163447
SPEAG	D1900V2	1900 MHz SAR Dipole	7/11/2011	Annual	7/11/2012	5d141
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

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing an amplifier, 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.

15 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	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.2	23.5	

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

Applicable for frequencies up to 6 GHz.

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**IEEE 1528 Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)			RSS				12.4	12.0	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.7	24.0	

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

16 CONCLUSION

16.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

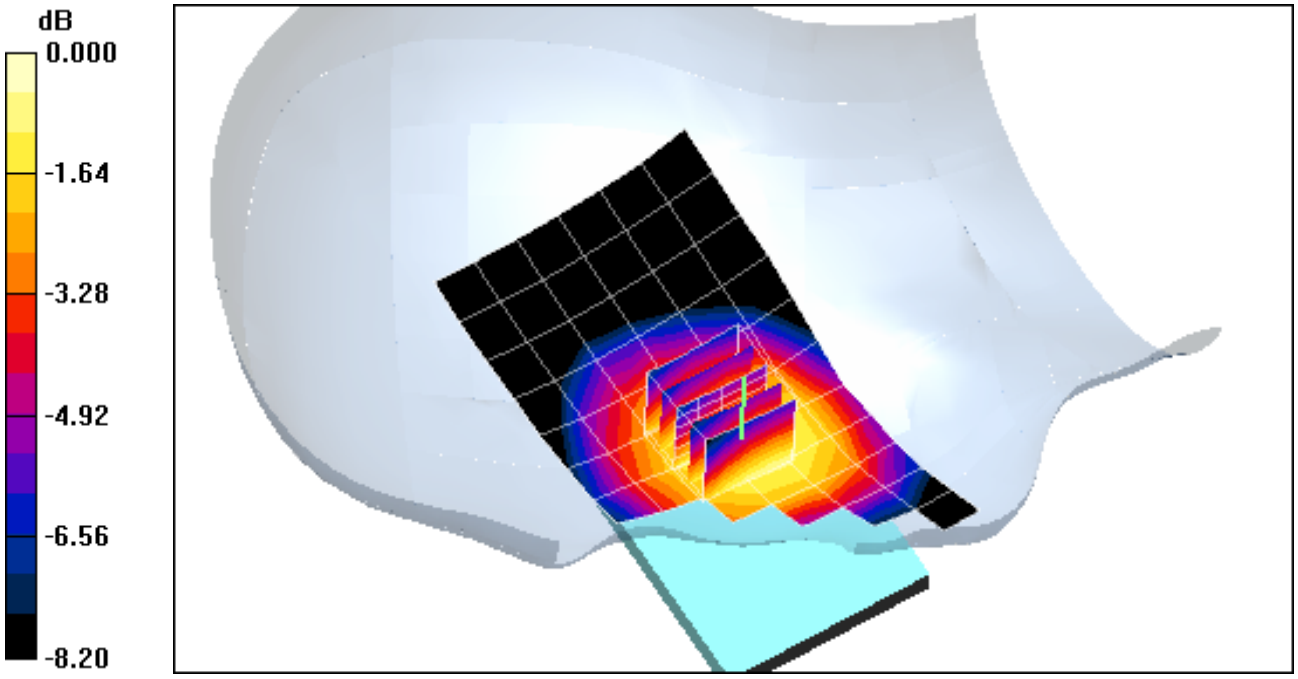
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.875 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 0.153 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.132mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

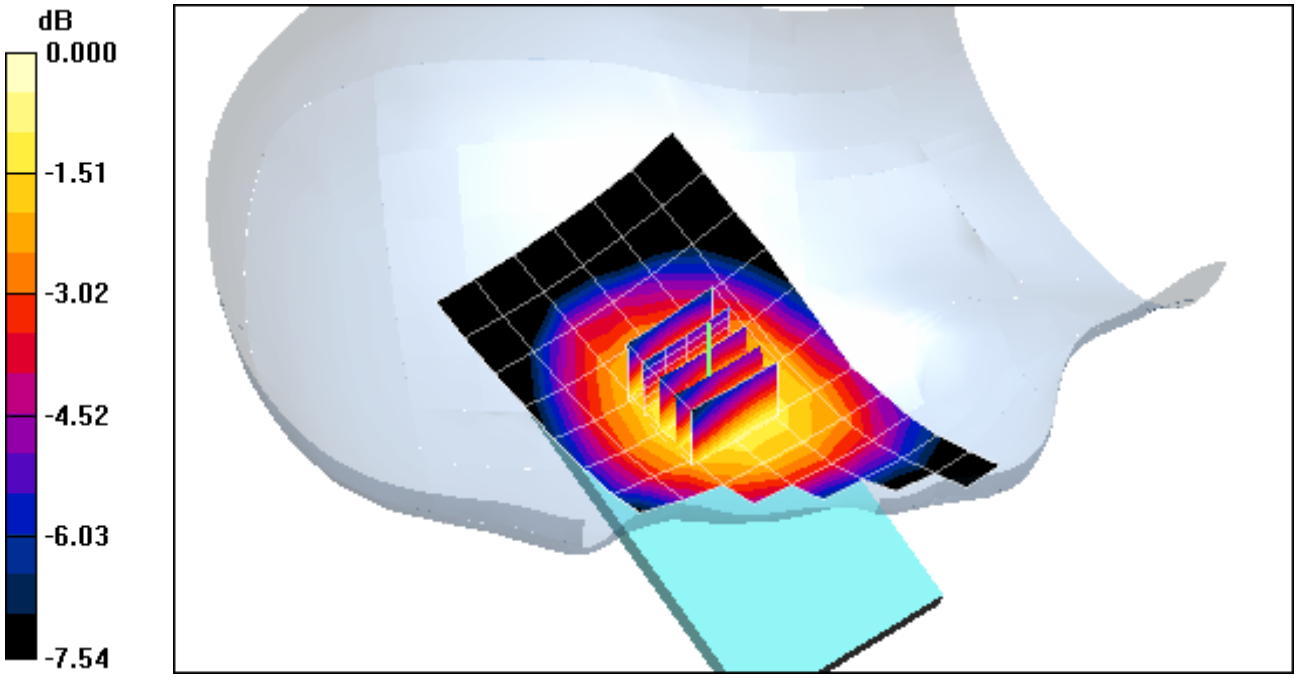
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.875 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.91 V/m; Power Drift = 0.136 dB
Peak SAR (extrapolated) = 0.093 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.062 mW/g



0 dB = 0.081mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

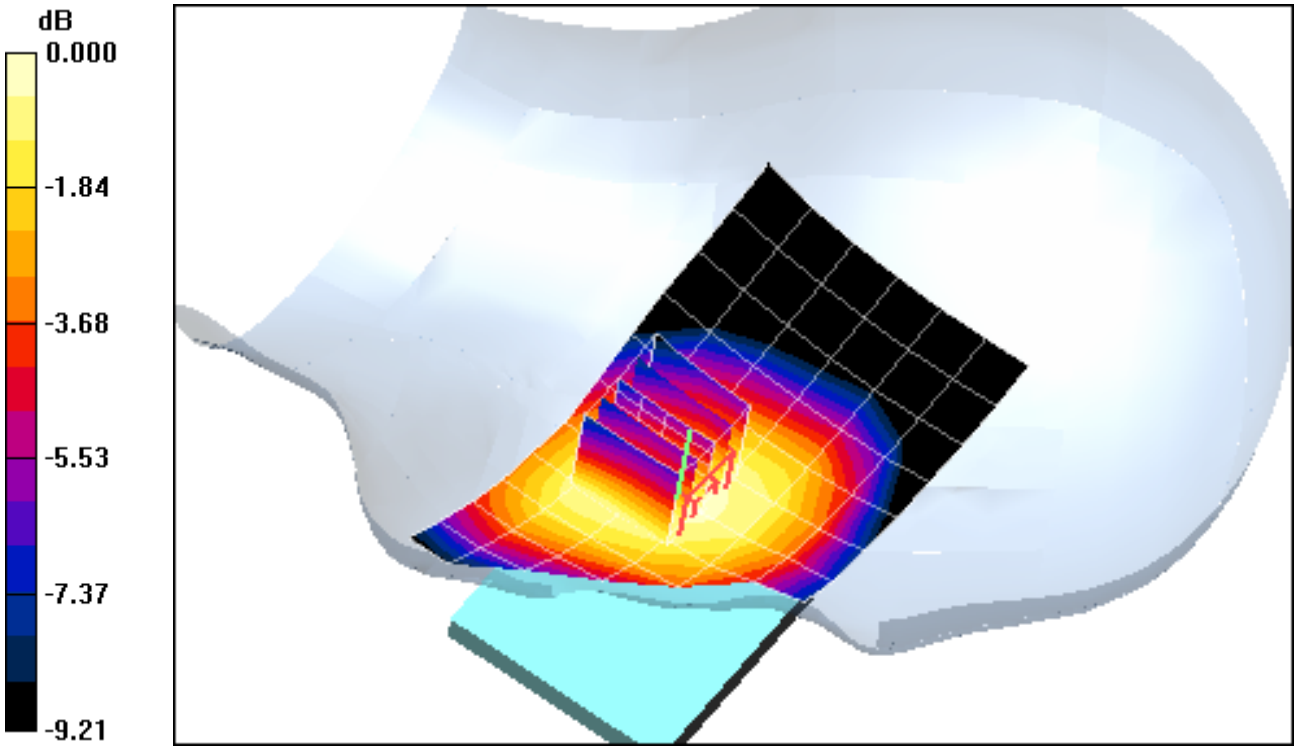
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.875 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 0.145 W/kg
SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.091 mW/g



0 dB = 0.123mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

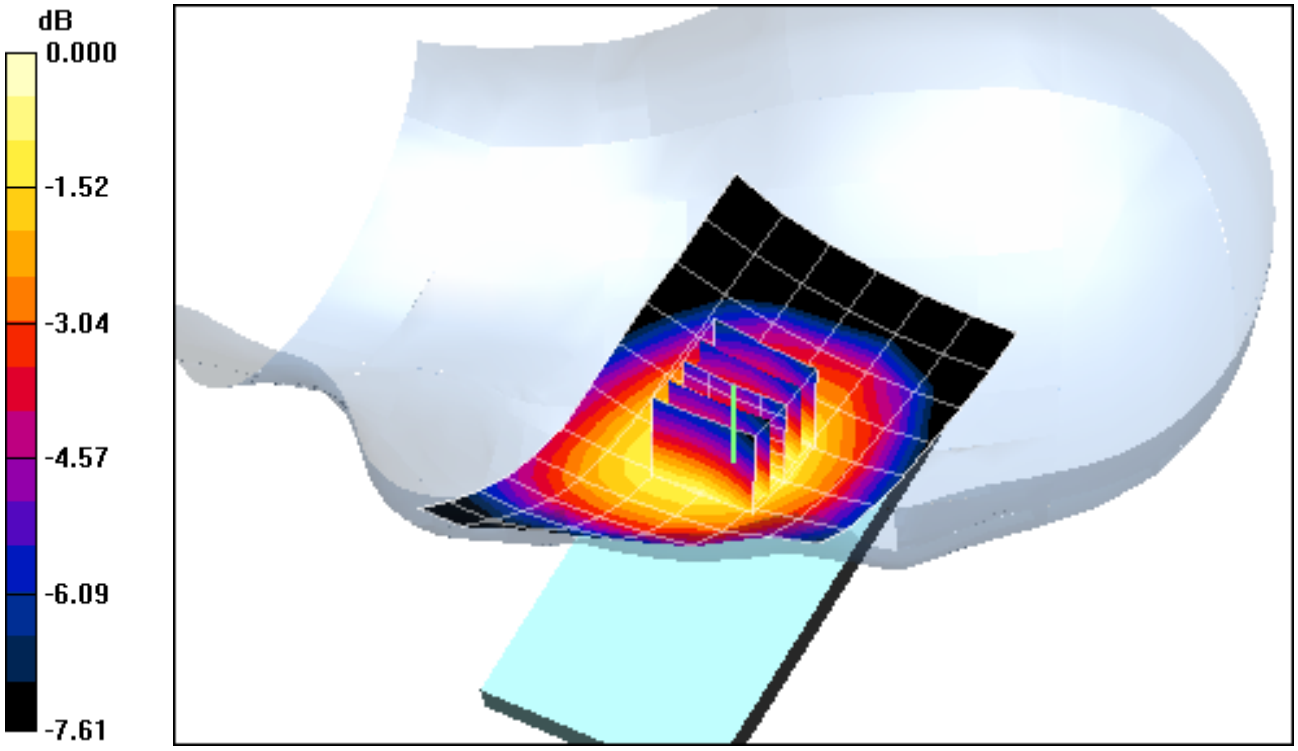
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used:
f = 710 MHz; σ = 0.875 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.67 V/m; Power Drift = -0.136 dB
Peak SAR (extrapolated) = 0.086 W/kg
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.058 mW/g



0 dB = 0.077mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

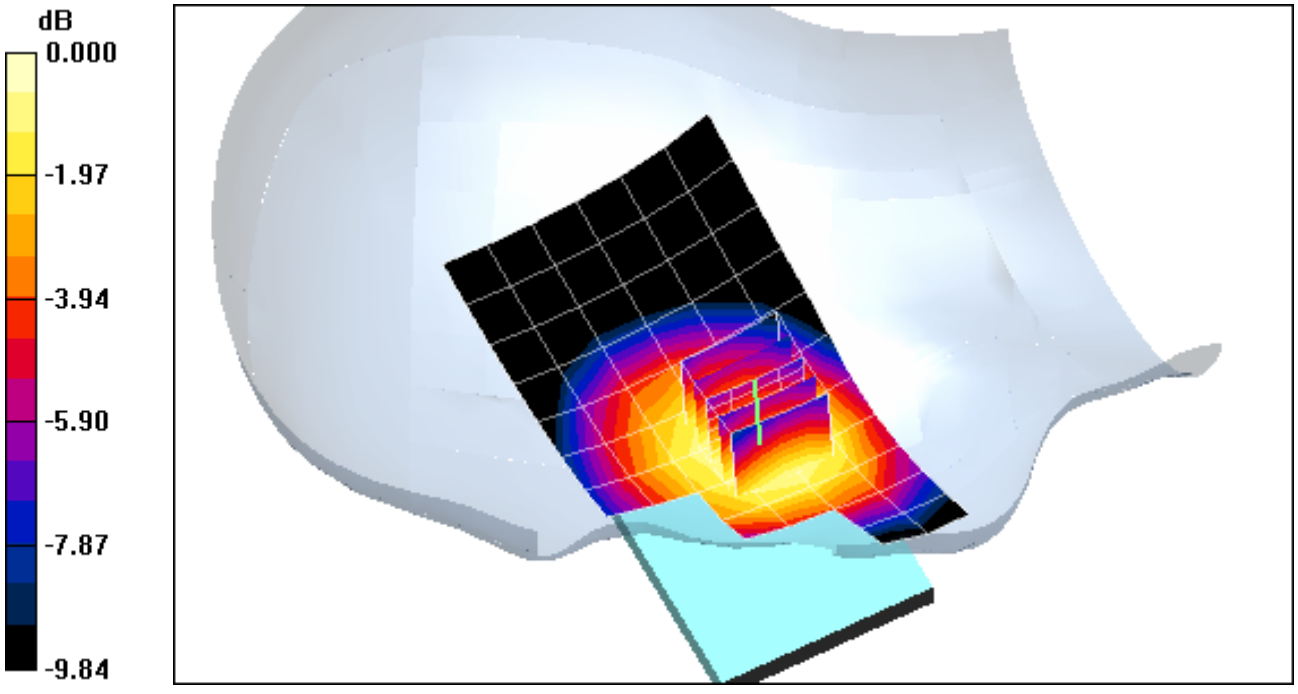
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 0.283 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.169 mW/g



0 dB = 0.235mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

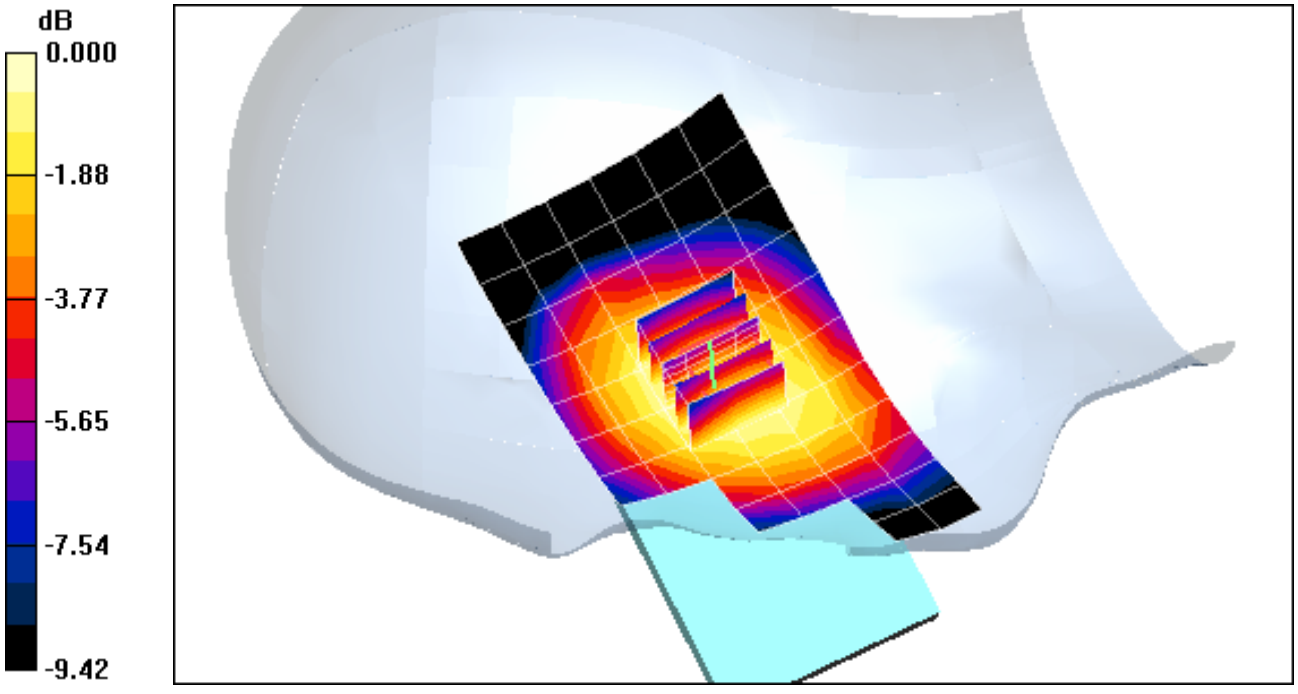
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.084 dB
Peak SAR (extrapolated) = 0.136 W/kg
SAR(1 g) = 0.112 mW/g; SAR(10 g) = 0.086 mW/g



0 dB = 0.118mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

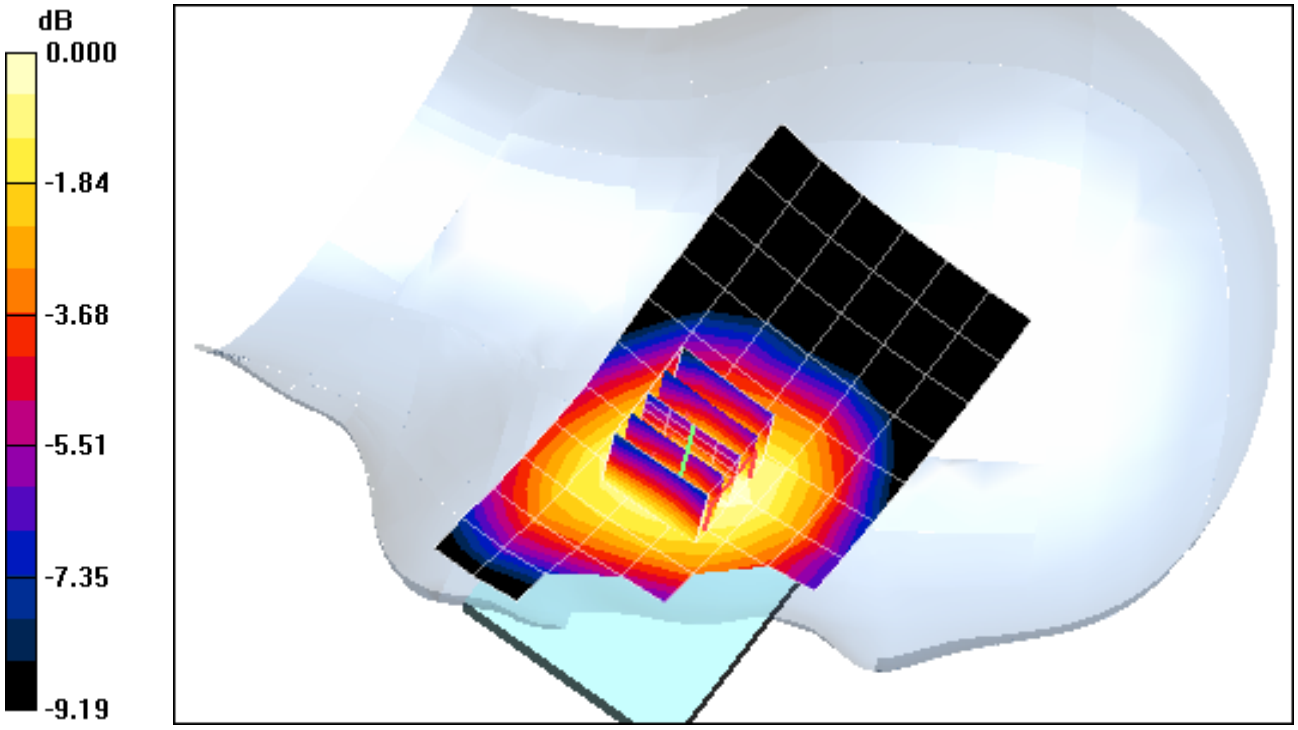
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 0.212 W/kg
SAR(1 g) = 0.175 mW/g; SAR(10 g) = 0.134 mW/g



0 dB = 0.183mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

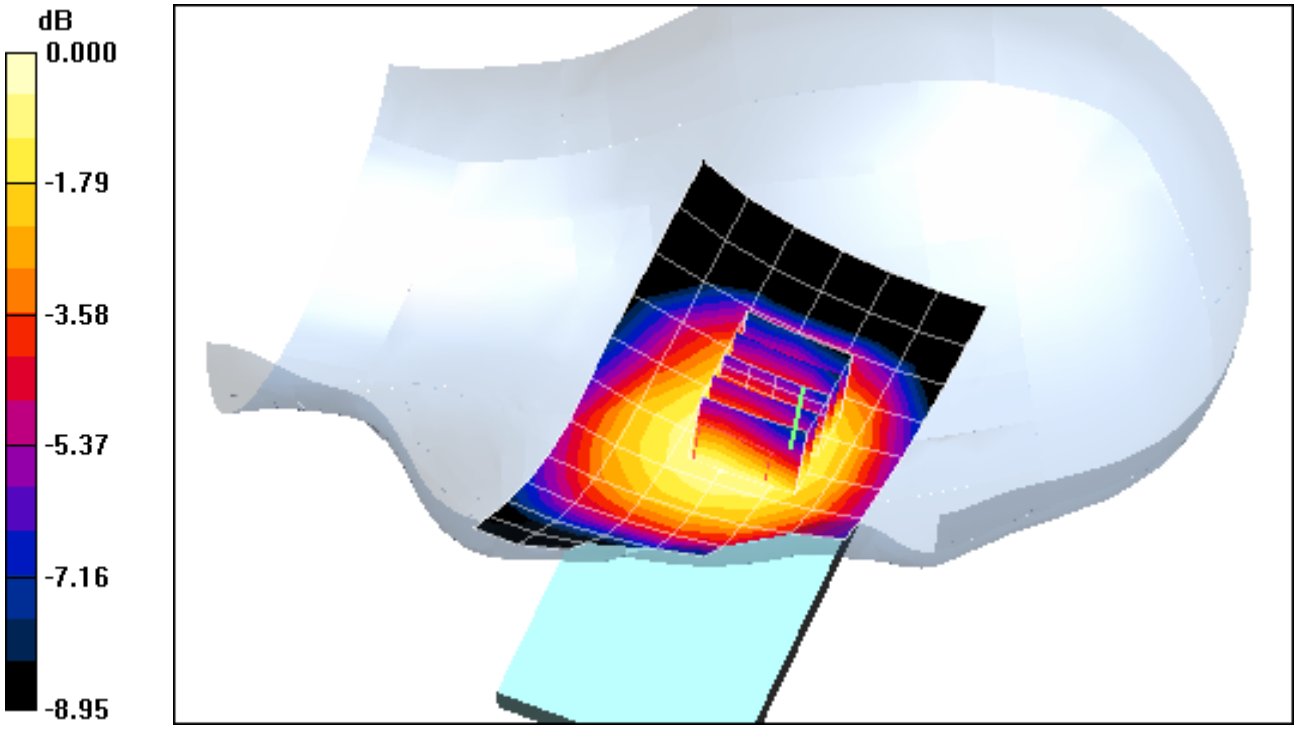
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.128 W/kg
SAR(1 g) = 0.103 mW/g; SAR(10 g) = 0.080 mW/g



0 dB = 0.109mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

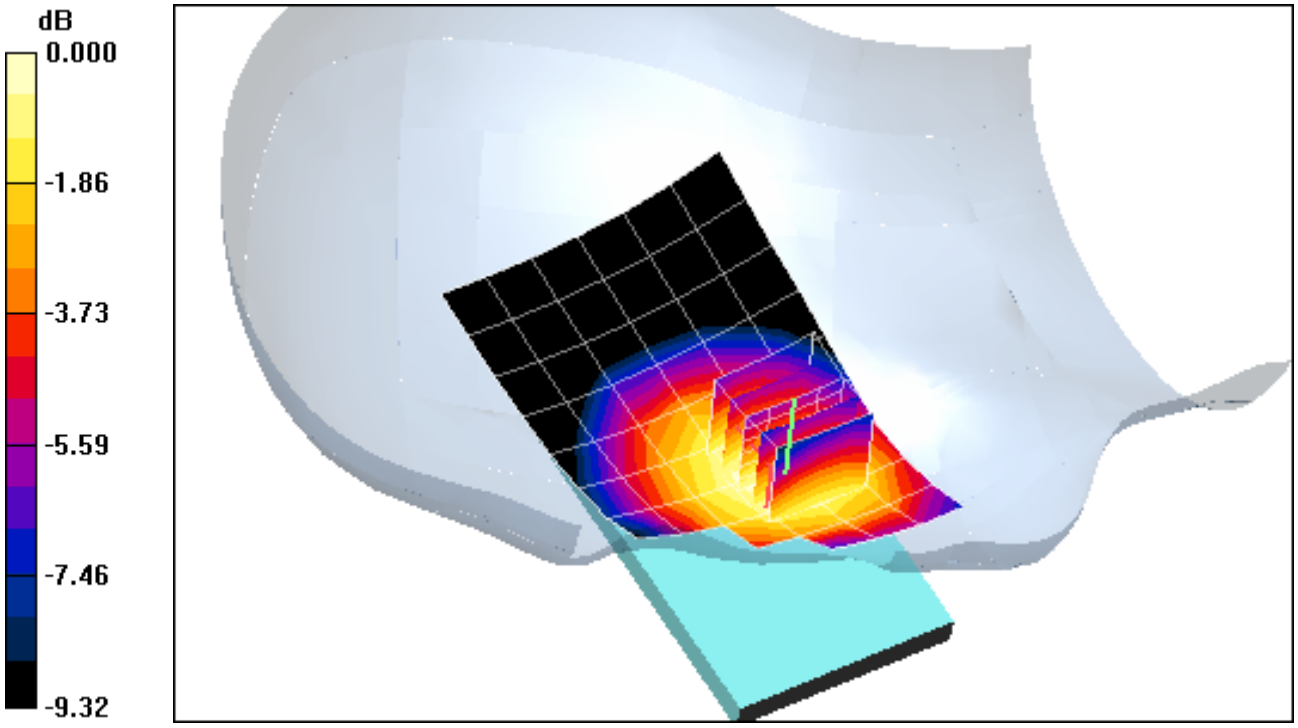
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.139 mW/g



0 dB = 0.188mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

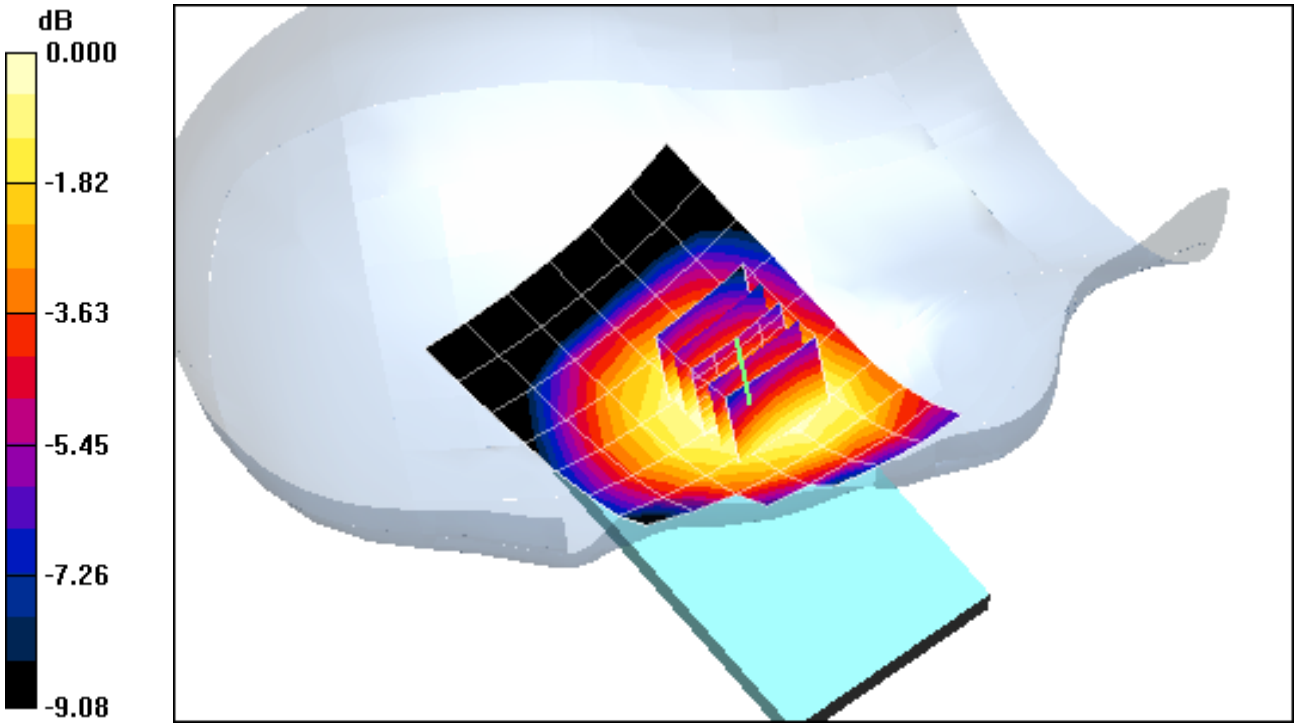
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.111 W/kg
SAR(1 g) = 0.094 mW/g; SAR(10 g) = 0.073 mW/g



0 dB = 0.098mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

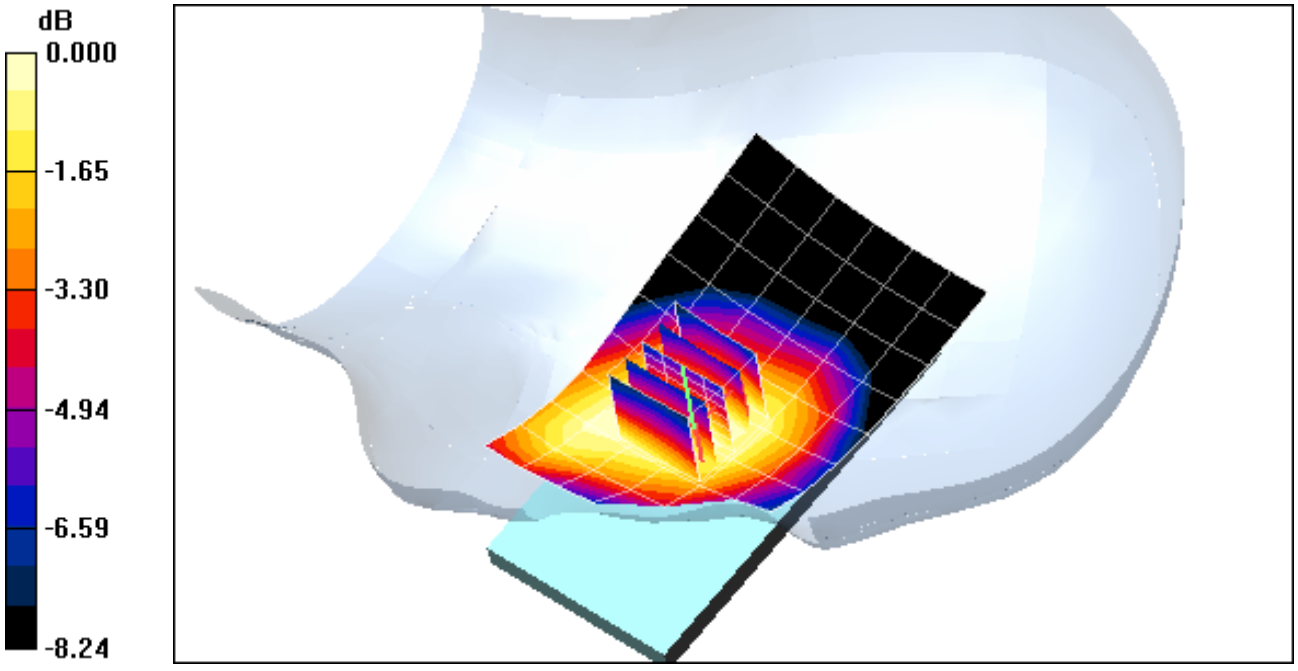
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.176 W/kg
SAR(1 g) = 0.143 mW/g; SAR(10 g) = 0.110 mW/g



0 dB = 0.151mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

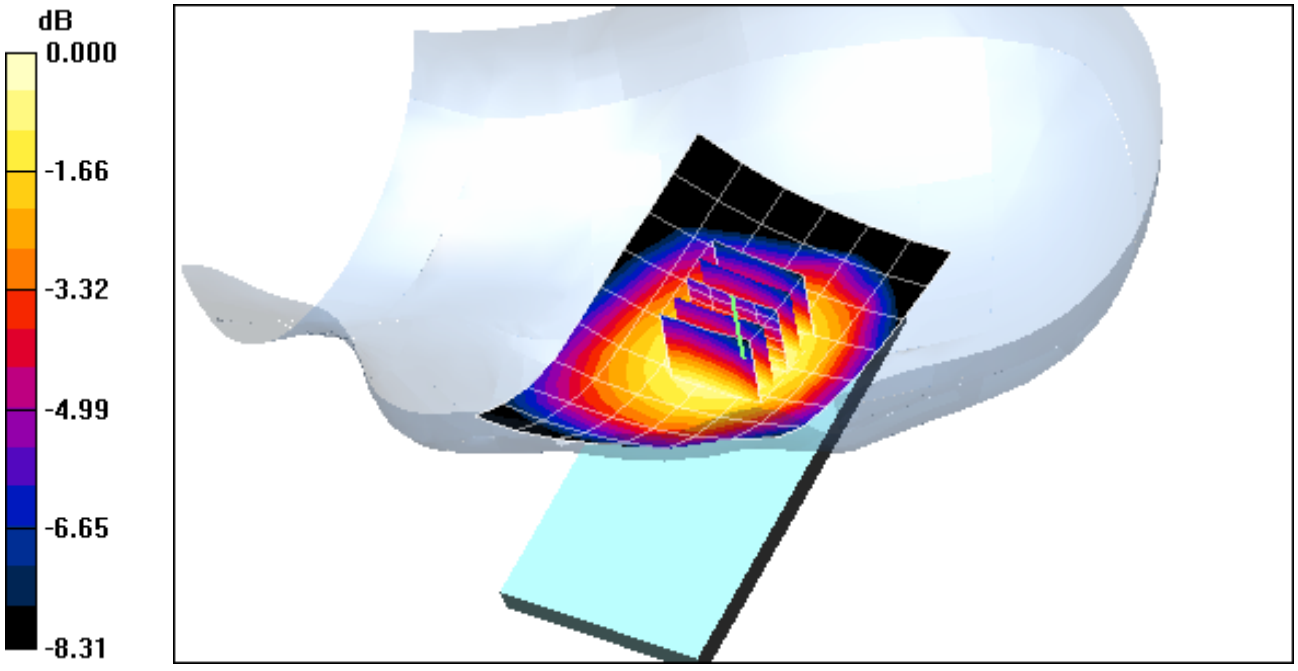
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.922 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.152 dB
Peak SAR (extrapolated) = 0.125 W/kg
SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.076 mW/g



0 dB = 0.103mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

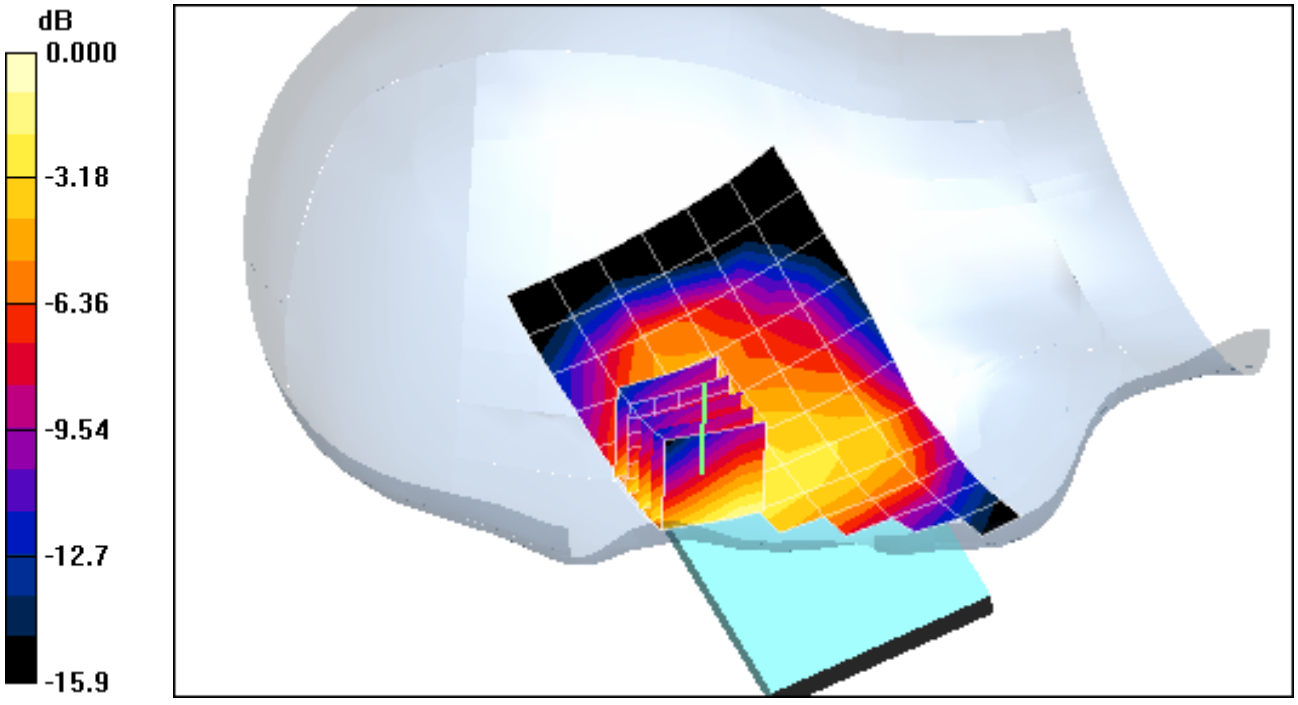
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.39 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Right Head, Touch, Mid ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.39 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.382 W/kg
SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.167 mW/g



0 dB = 0.273mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

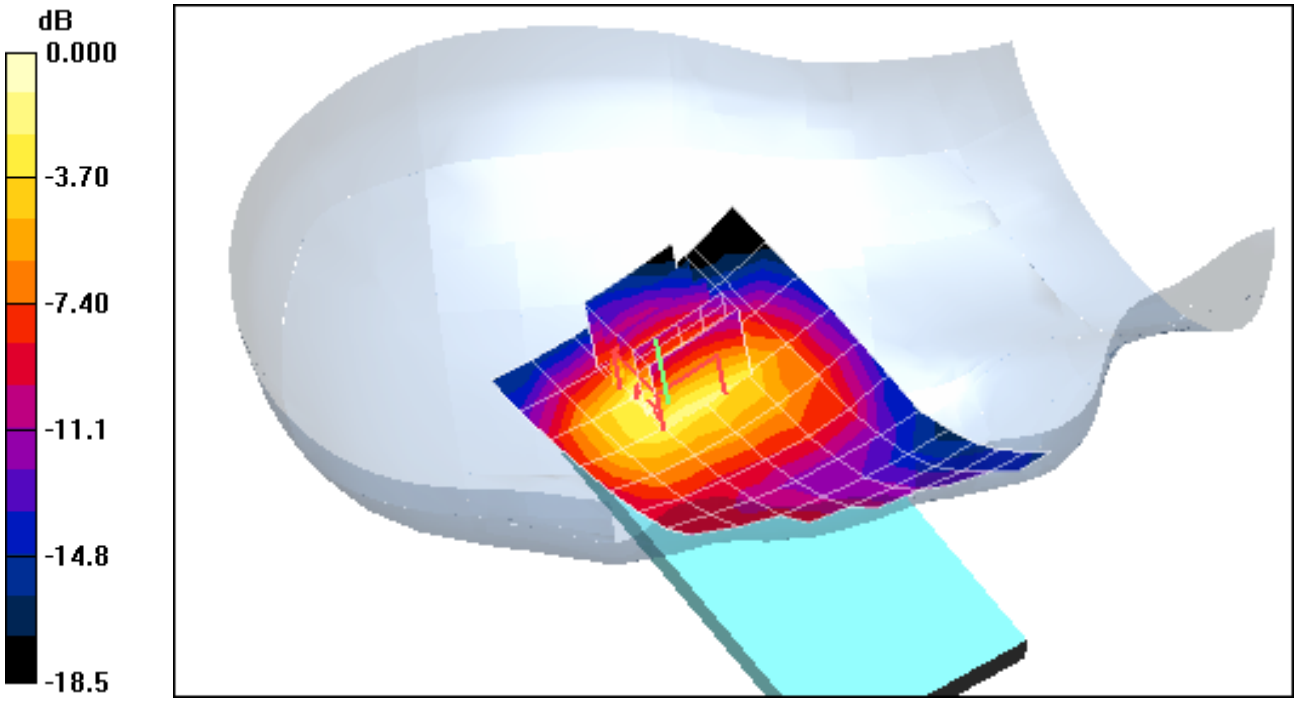
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.39 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Right Head, Tilt, Mid ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.61 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.445 W/kg
SAR(1 g) = 0.285 mW/g; SAR(10 g) = 0.171 mW/g



0 dB = 0.308mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

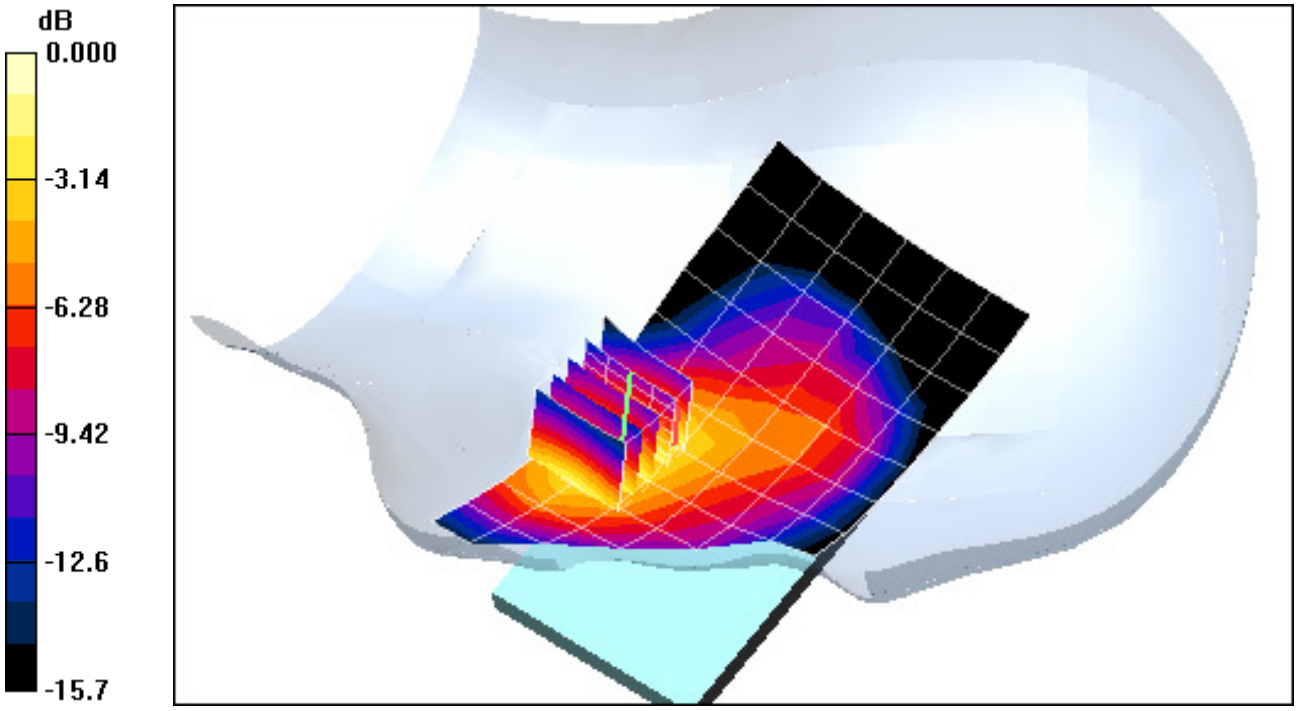
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.39 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Left Head, Touch, Mid. Ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.76 V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 0.894 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.370 mW/g



0 dB = 0.636mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

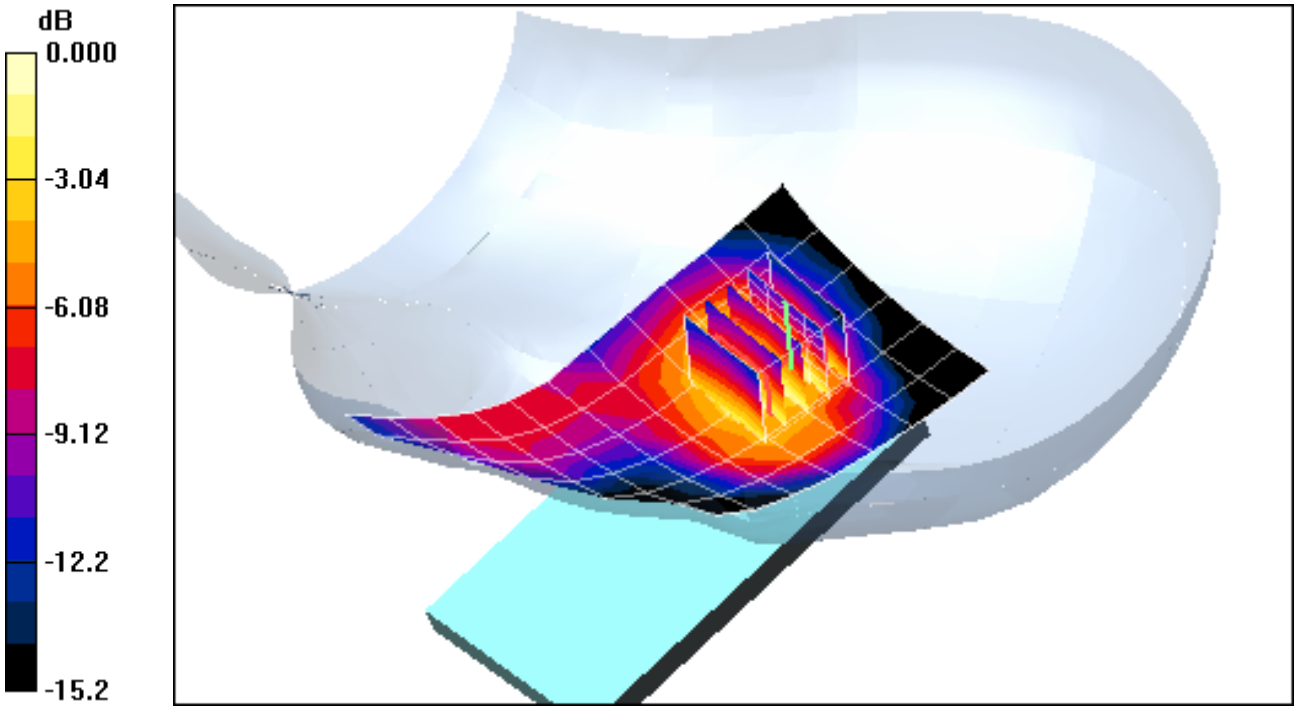
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.39 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Left Head, Tilt, Mid.ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.16 V/m; Power Drift = 0.00499 dB
Peak SAR (extrapolated) = 0.418 W/kg
SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.176 mW/g



0 dB = 0.298mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

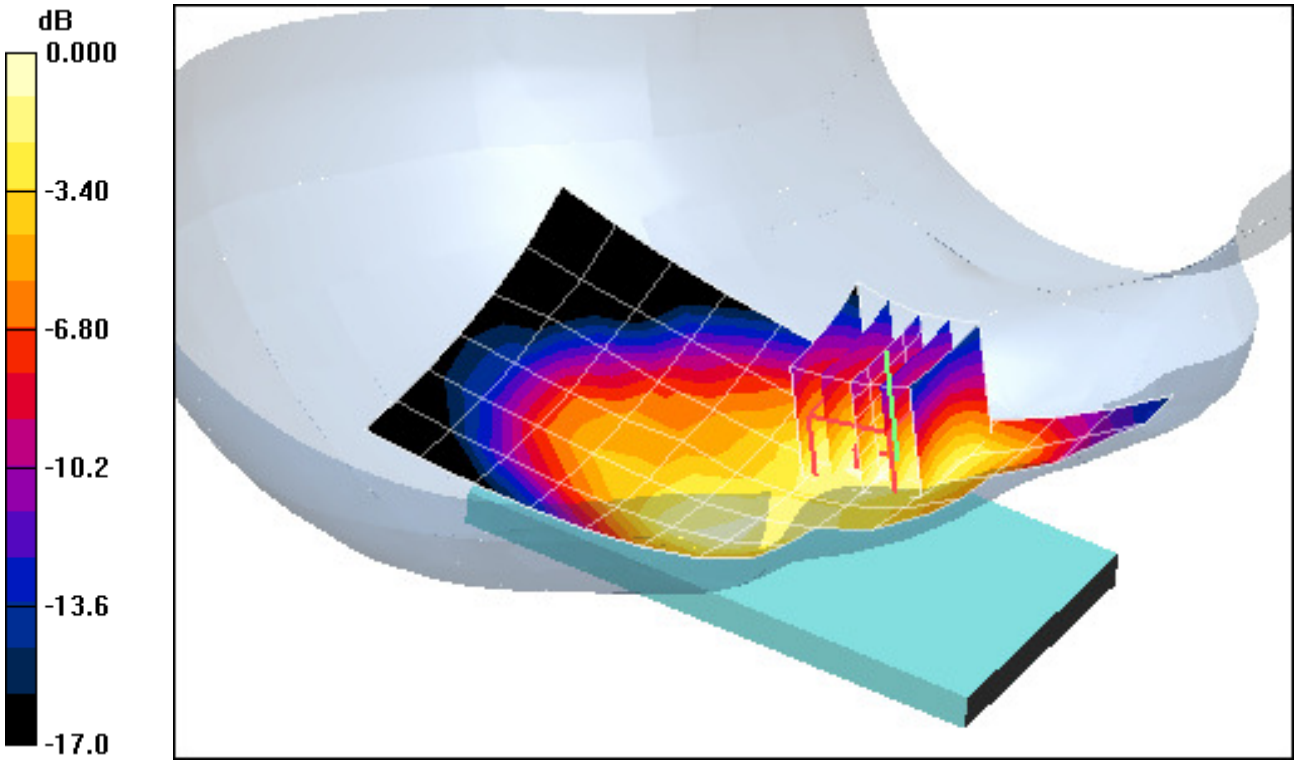
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.418 W/kg
SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.170 mW/g



0 dB = 0.295mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

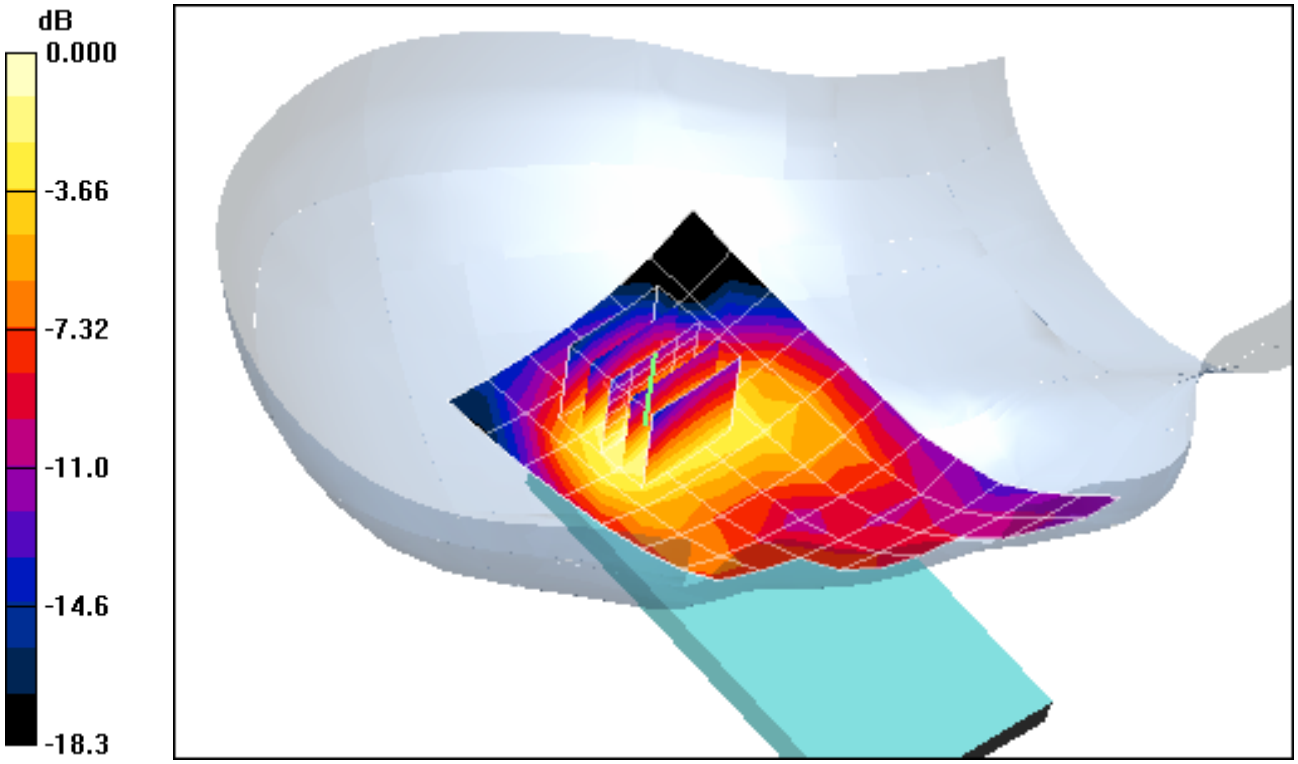
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.377 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.142 mW/g



0 dB = 0.265mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

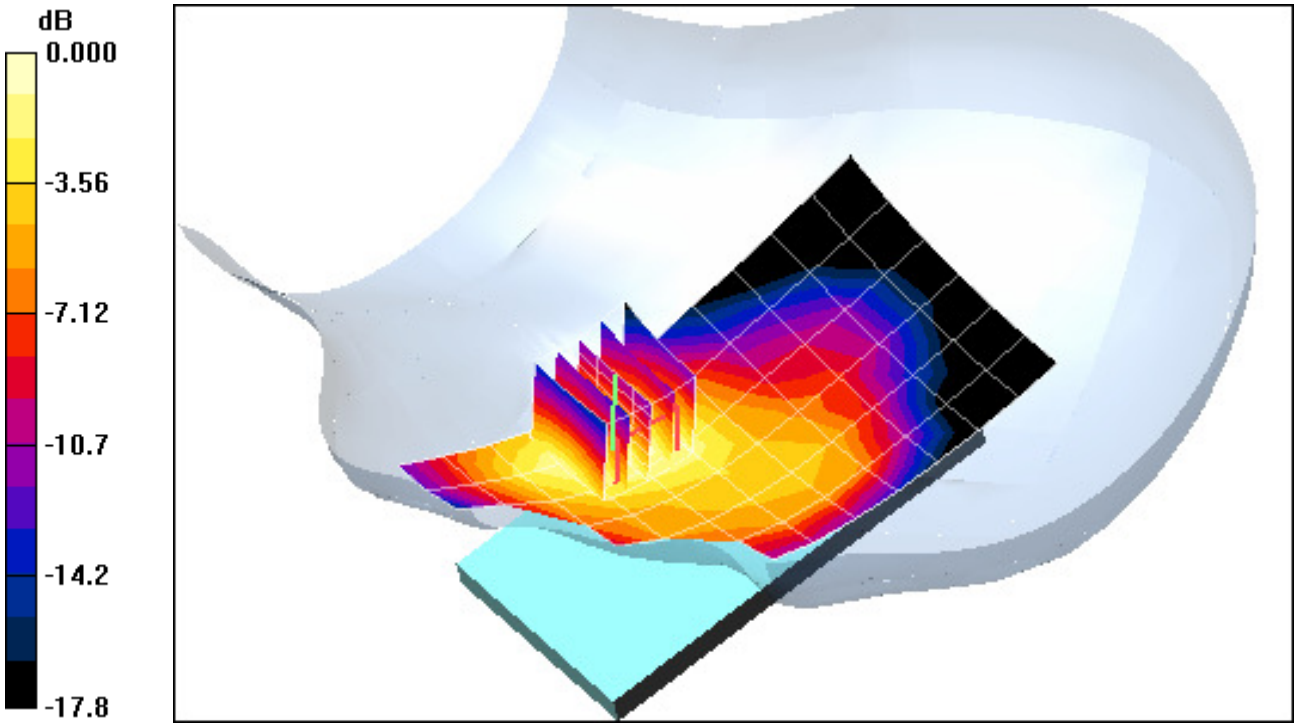
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.7 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 0.822 W/kg
SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.325 mW/g



0 dB = 0.571mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

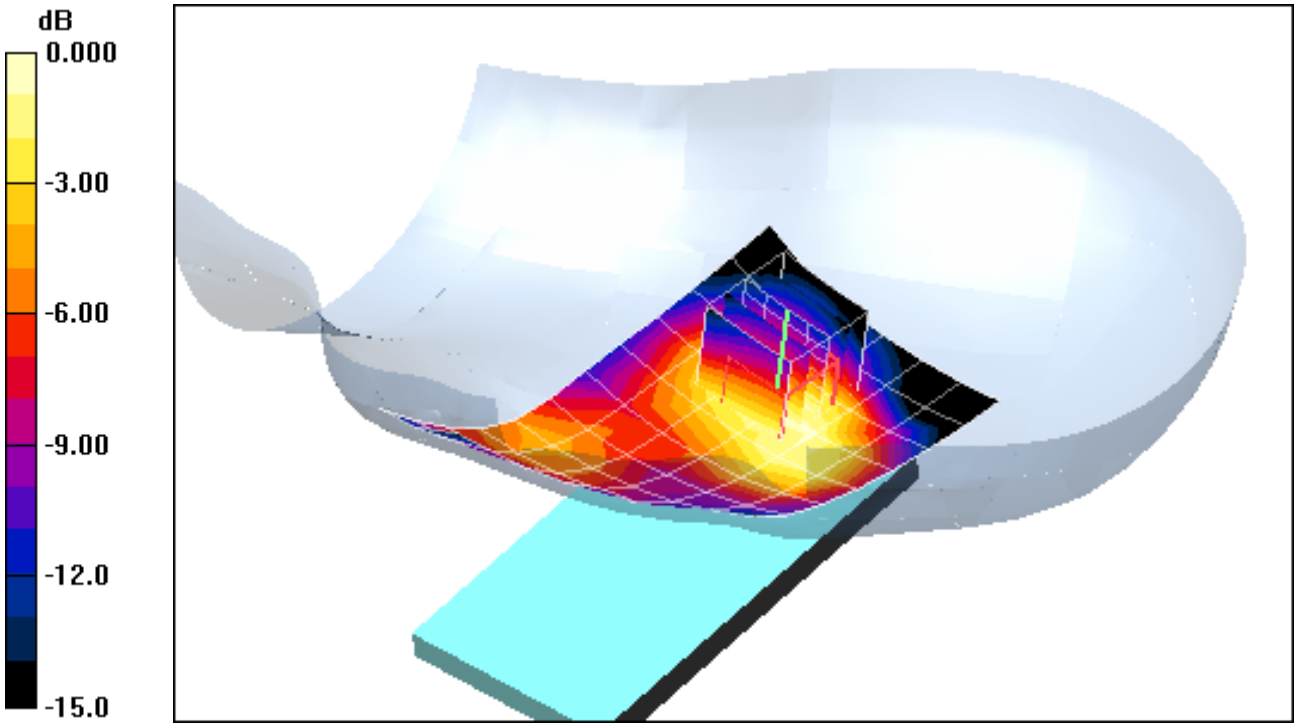
Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.348 W/kg
SAR(1 g) = 0.225 mW/g; SAR(10 g) = 0.140 mW/g



0 dB = 0.243mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

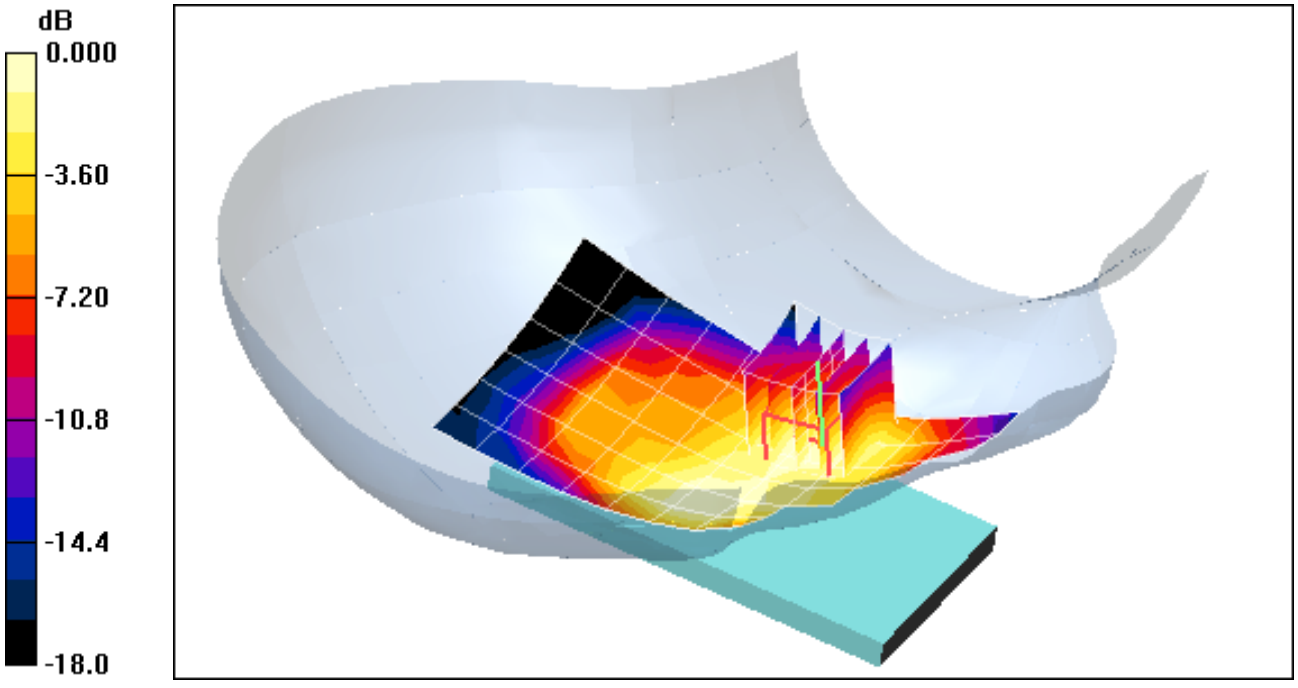
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.5 V/m; Power Drift = 0.149 dB
Peak SAR (extrapolated) = 0.423 W/kg
SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.187 mW/g



0 dB = 0.312mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

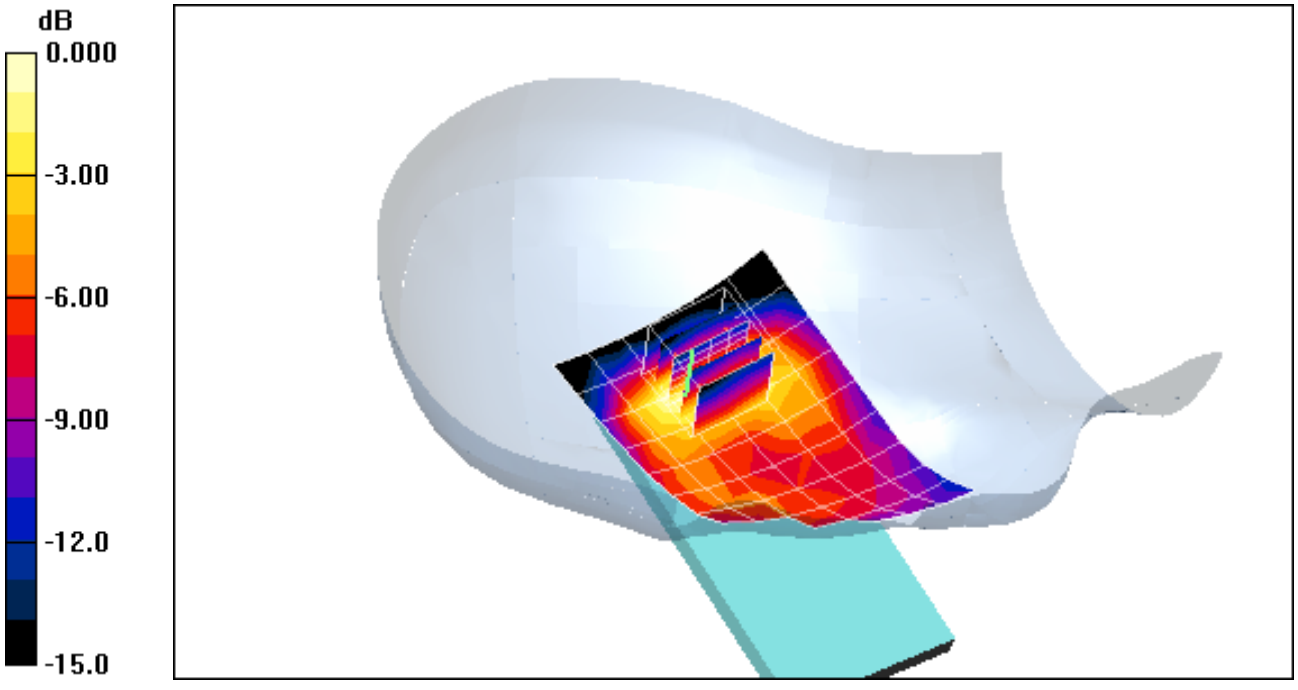
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = 0.181 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.132 mW/g



0 dB = 0.241mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

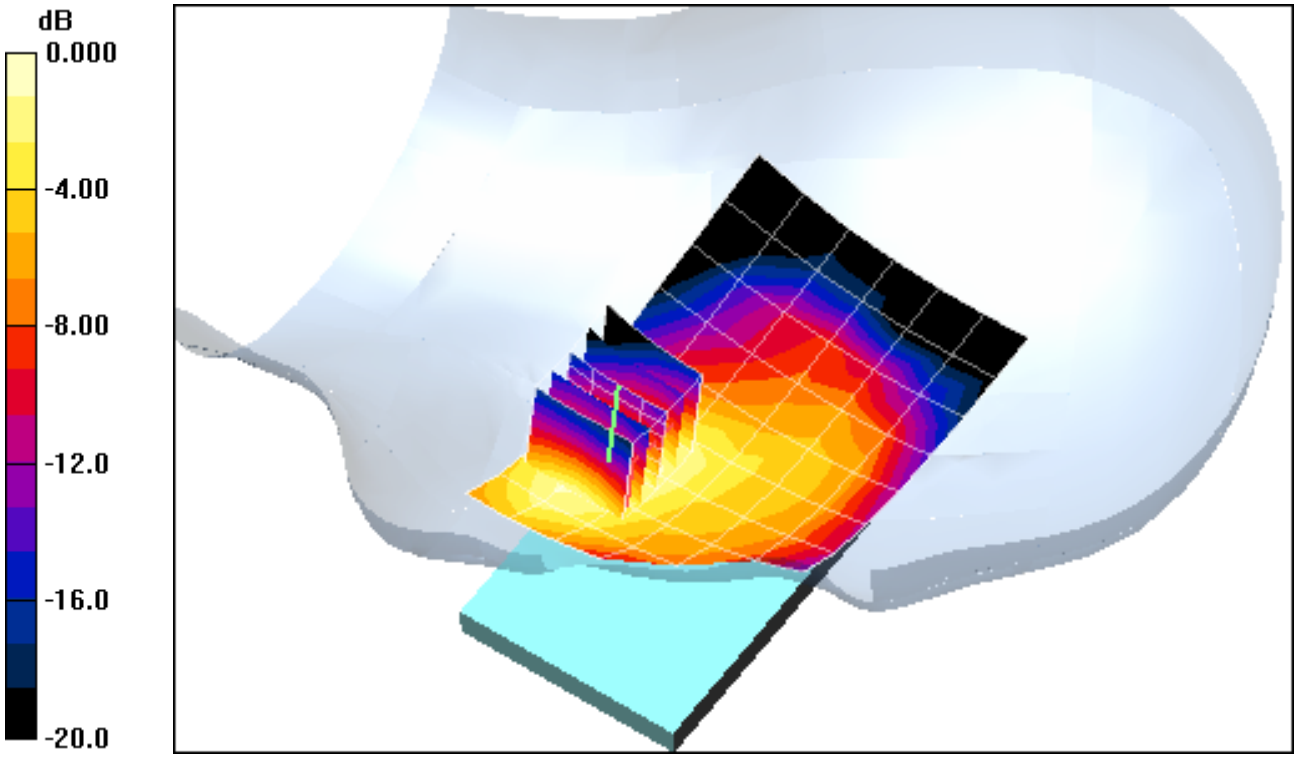
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.4 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 0.933 W/kg
SAR(1 g) = 0.617 mW/g; SAR(10 g) = 0.384 mW/g



0 dB = 0.666mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

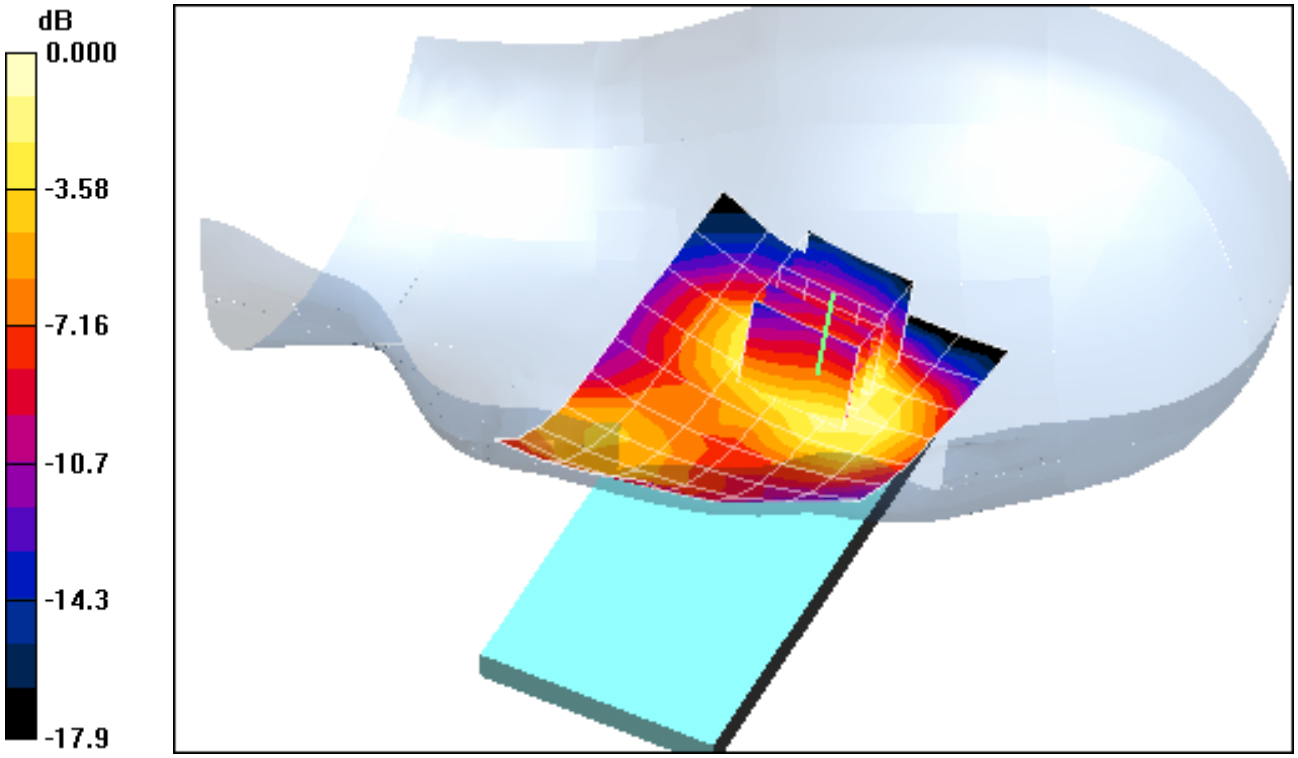
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.371 W/kg
SAR(1 g) = 0.237 mW/g; SAR(10 g) = 0.145 mW/g



0 dB = 0.253mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

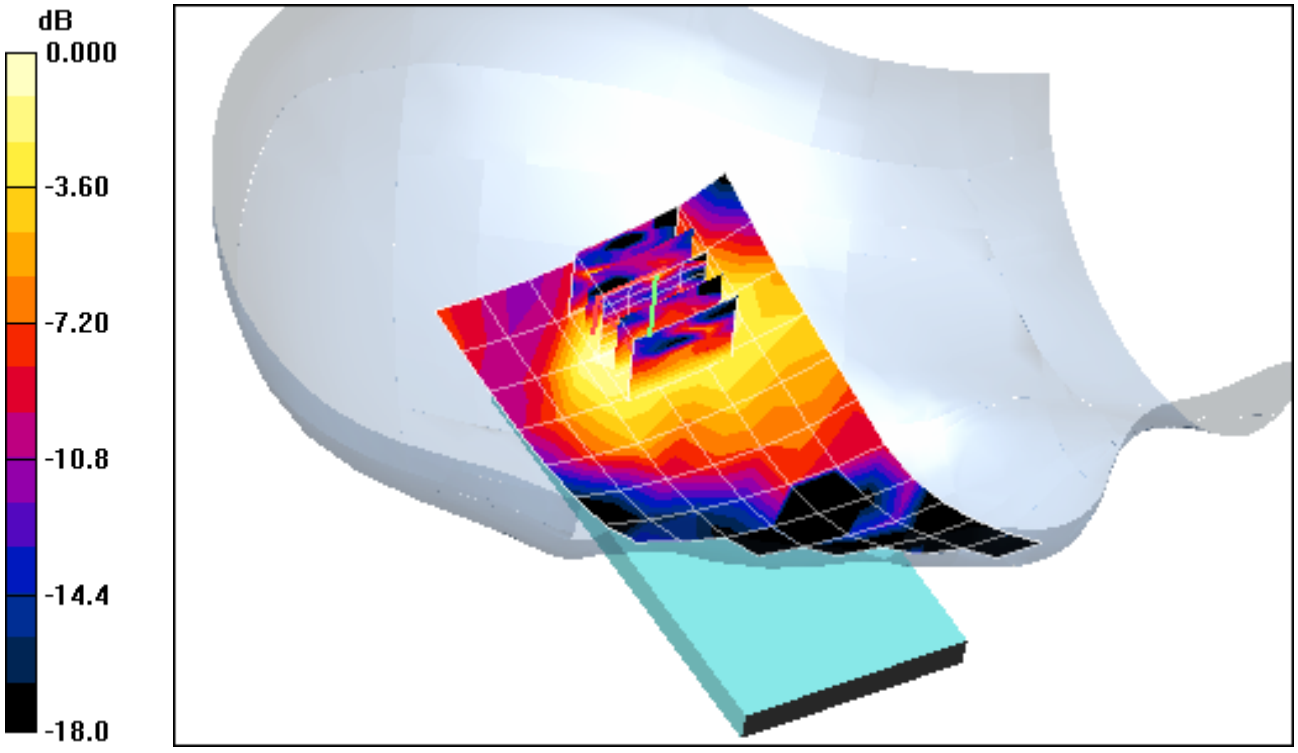
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.85 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Touch, Ch 11, 1 Mbps

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.34 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.055 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.0069 mW/g



0 dB = 0.021mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

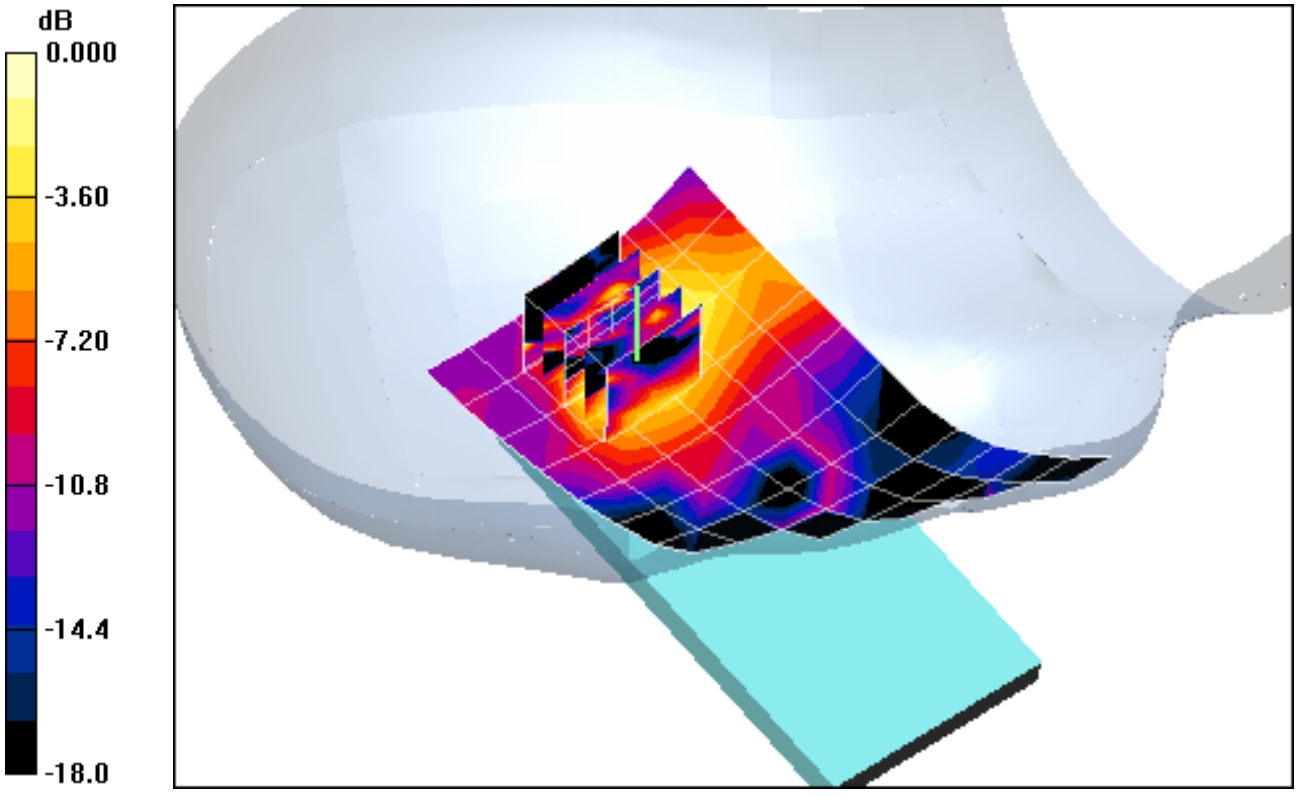
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.85 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Right Head, Tilt, Ch 11, 1 Mbps

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.02 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.055 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00213 mW/g



0 dB = 0.019mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

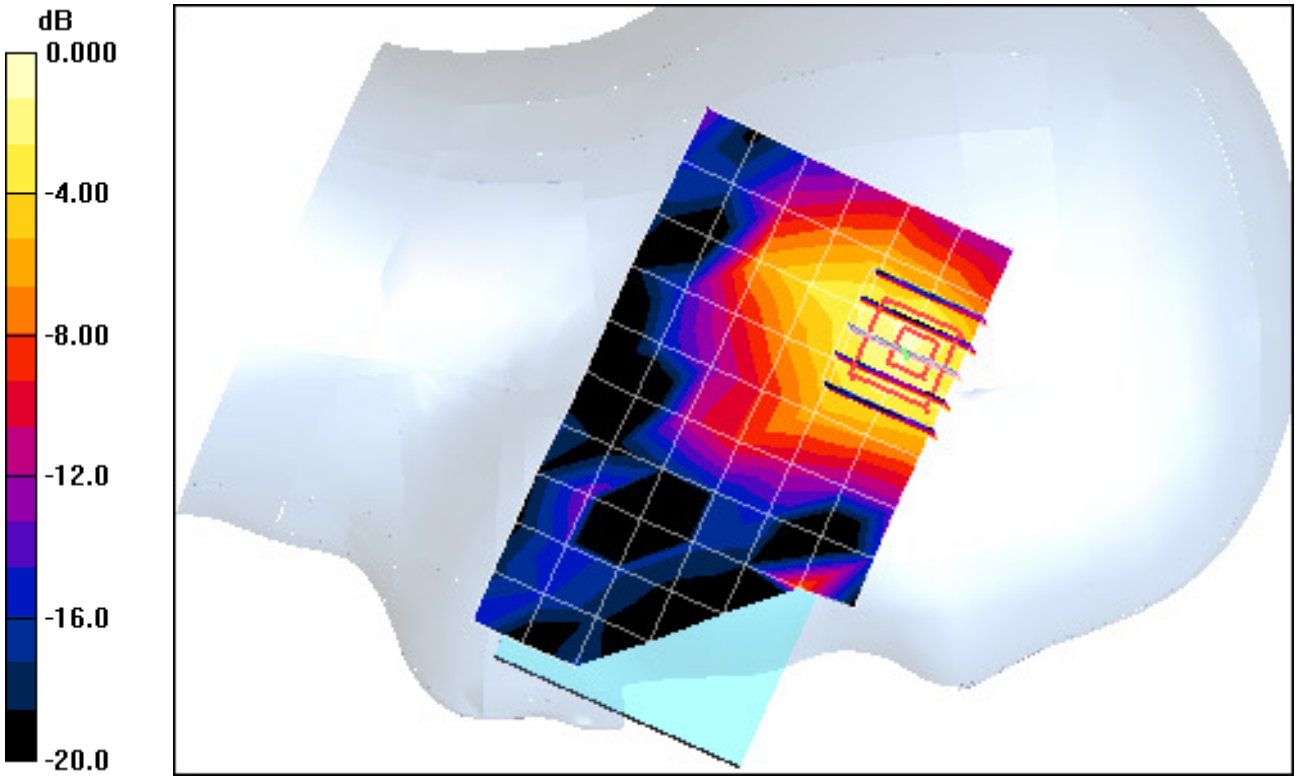
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.85 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Touch, Ch 11, 1 Mbps

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.02 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.013 mW/g



0 dB = 0.037mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

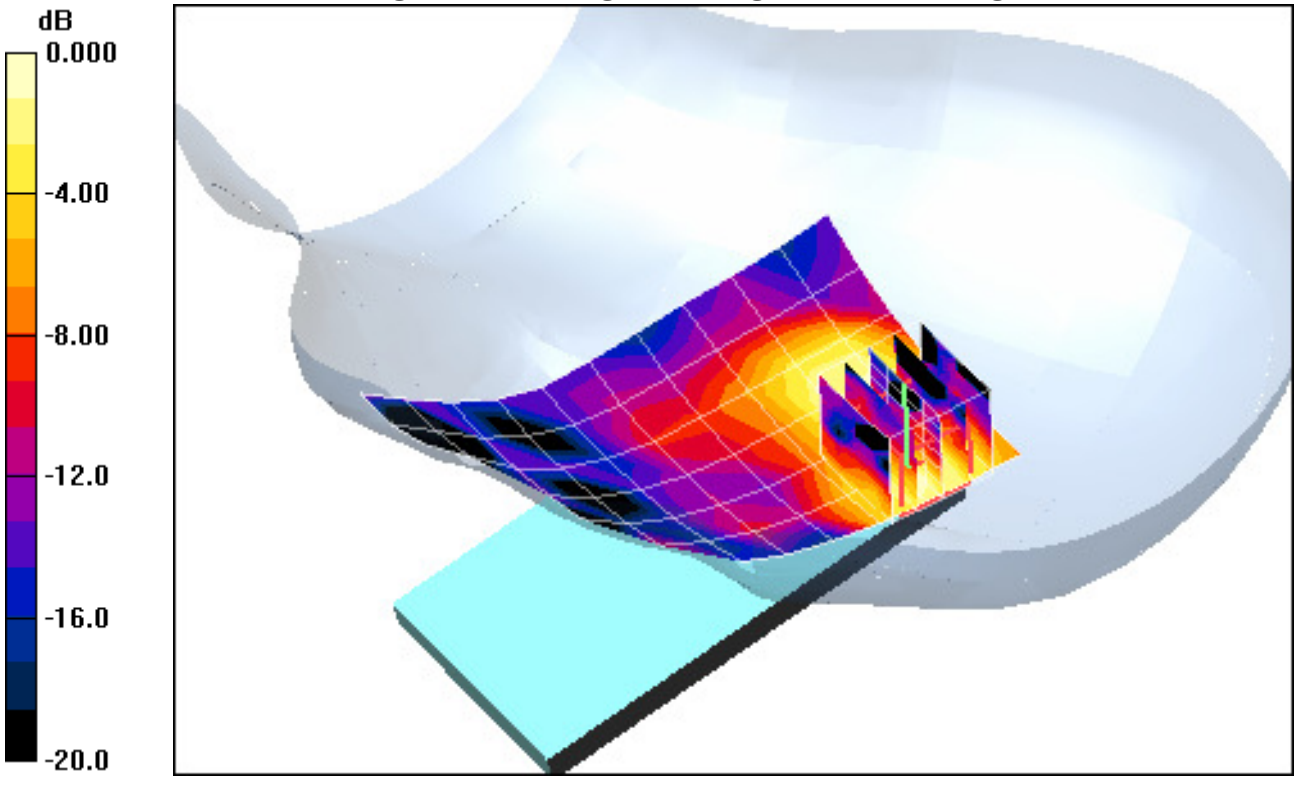
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.85 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Left Head, Tilt, Ch 11, 1 Mbps

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.93 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.028 W/kg
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00709 mW/g



0 dB = 0.018mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

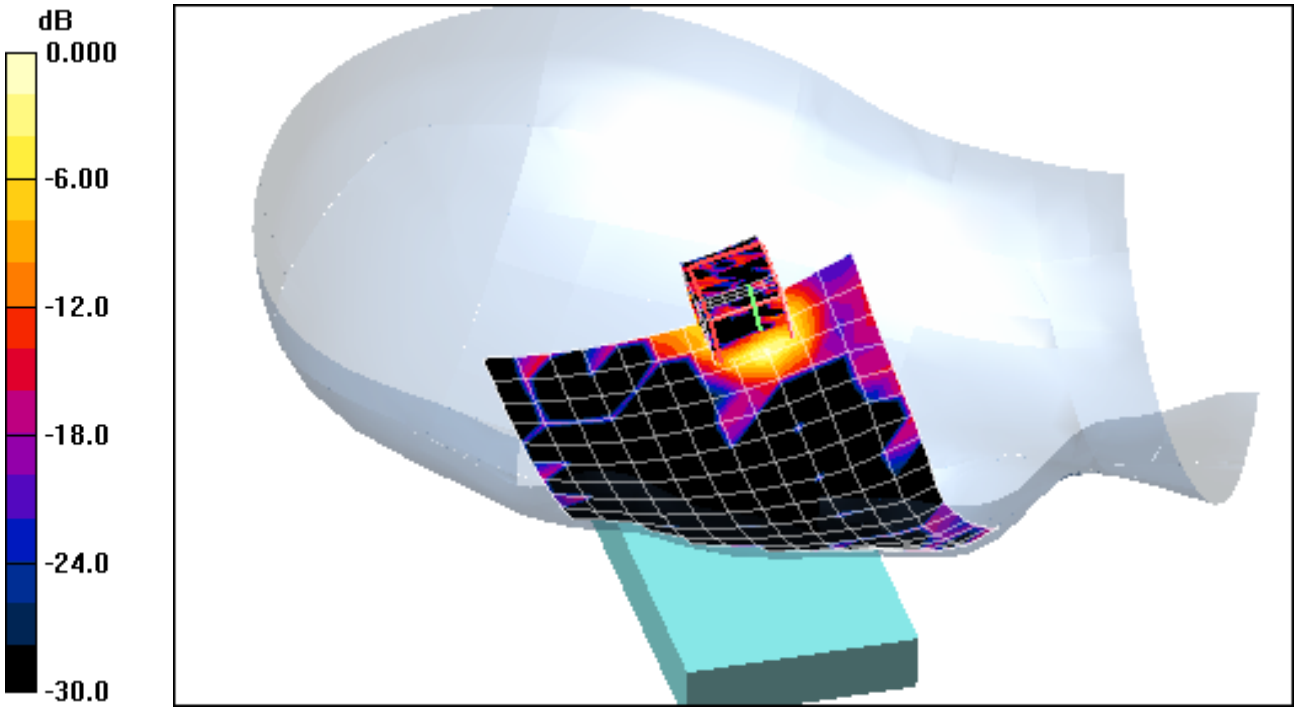
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5660 MHz; σ = 5.014 mho/m; ε_r = 35.16; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-27-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(4.04, 4.04, 4.04); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.5 GHz, Right Head, Touch, Ch 132, 6 Mbps

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.02 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.323 W/kg
SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.024 mW/g



0 dB = 0.186mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

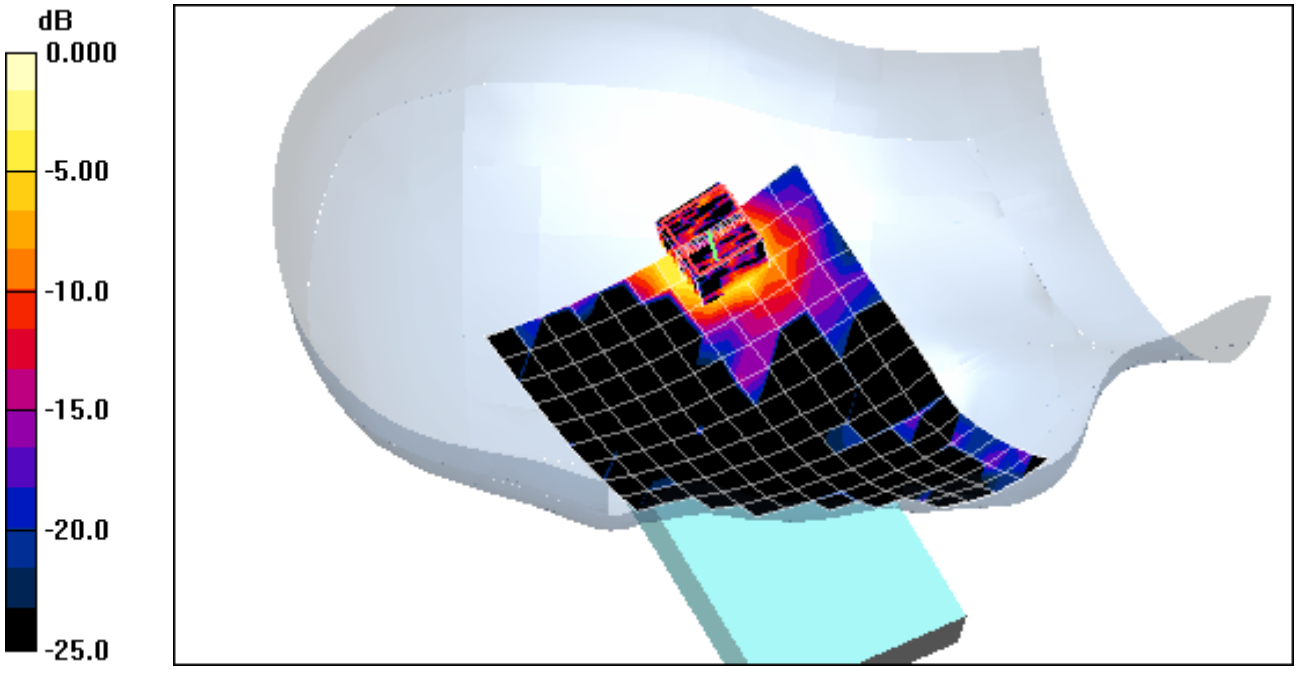
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5660 MHz; σ = 5.014 mho/m; ε_r = 35.16; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-27-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(4.04, 4.04, 4.04); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a 5.5 GHz, Right Head, Tilt, Ch 132, 6 Mbps

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.68 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.354 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.029 mW/g



0 dB = 0.187mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

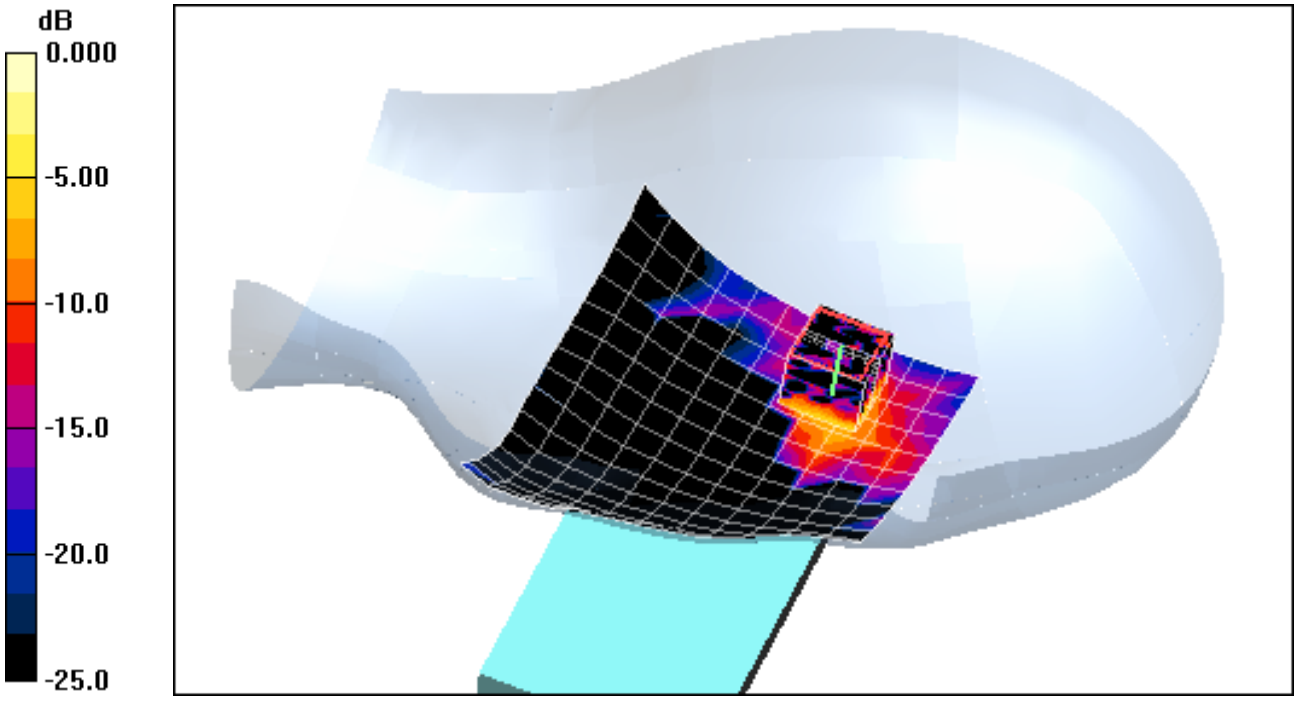
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5660 MHz; σ = 5.014 mho/m; ε_r = 35.16; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-27-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(4.04, 4.04, 4.04); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.5 GHz Left Head, Touch, Ch 132, 6 Mbps

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.64 V/m; Power Drift = 0.206 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.029 mW/g



0 dB = 0.281mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

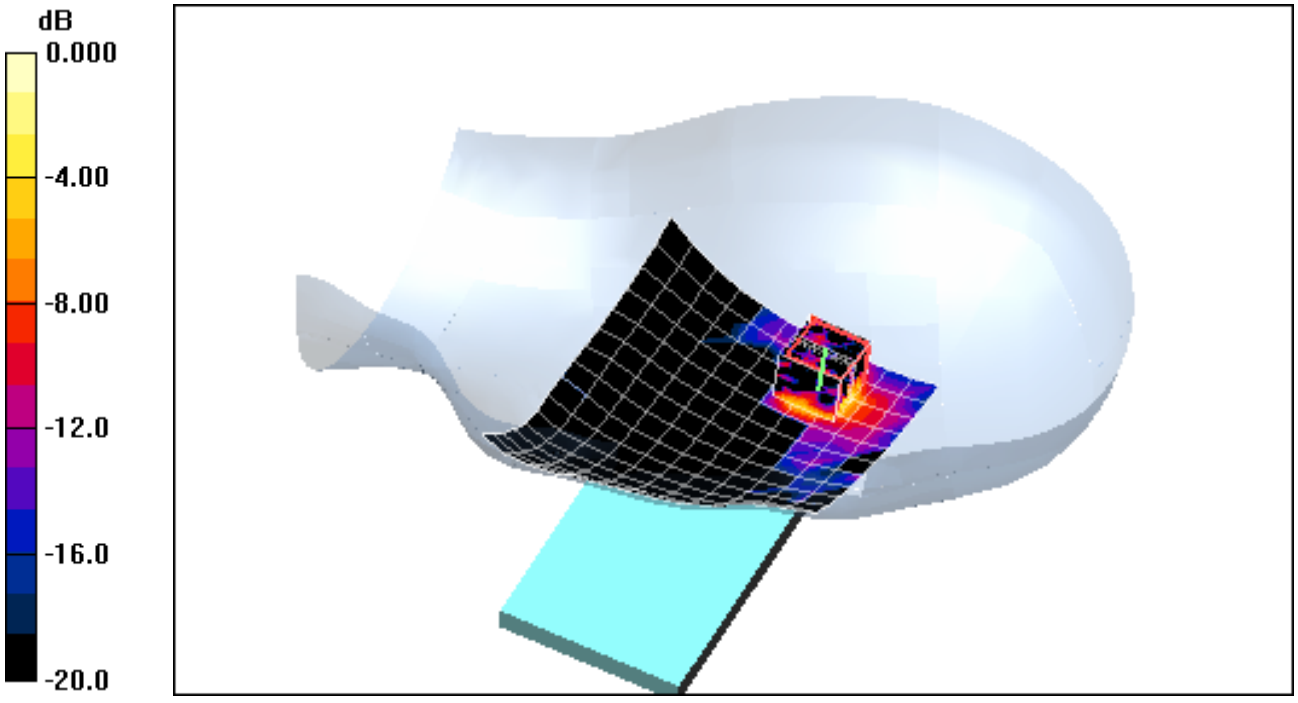
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5660 MHz; σ = 5.014 mho/m; ε_r = 35.16; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-27-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(4.04, 4.04, 4.04); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.5 GHz Left Head, Tilt, Ch 132, 6 Mbps

Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.54 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.504 W/kg
SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.030 mW/g



0 dB = 0.183mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

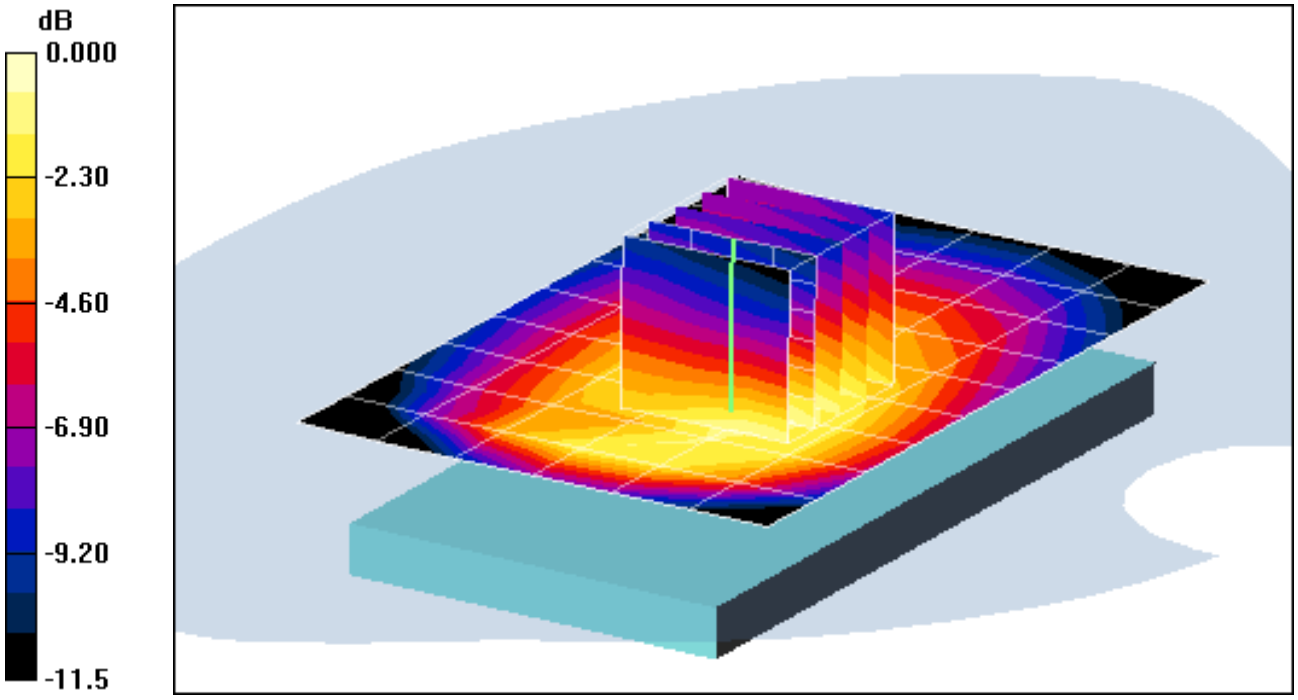
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.994 mho/m; ε_r = 56.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Back side, Mid.ch
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.8 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 0.628 W/kg
SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.279 mW/g



0 dB = 0.430mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

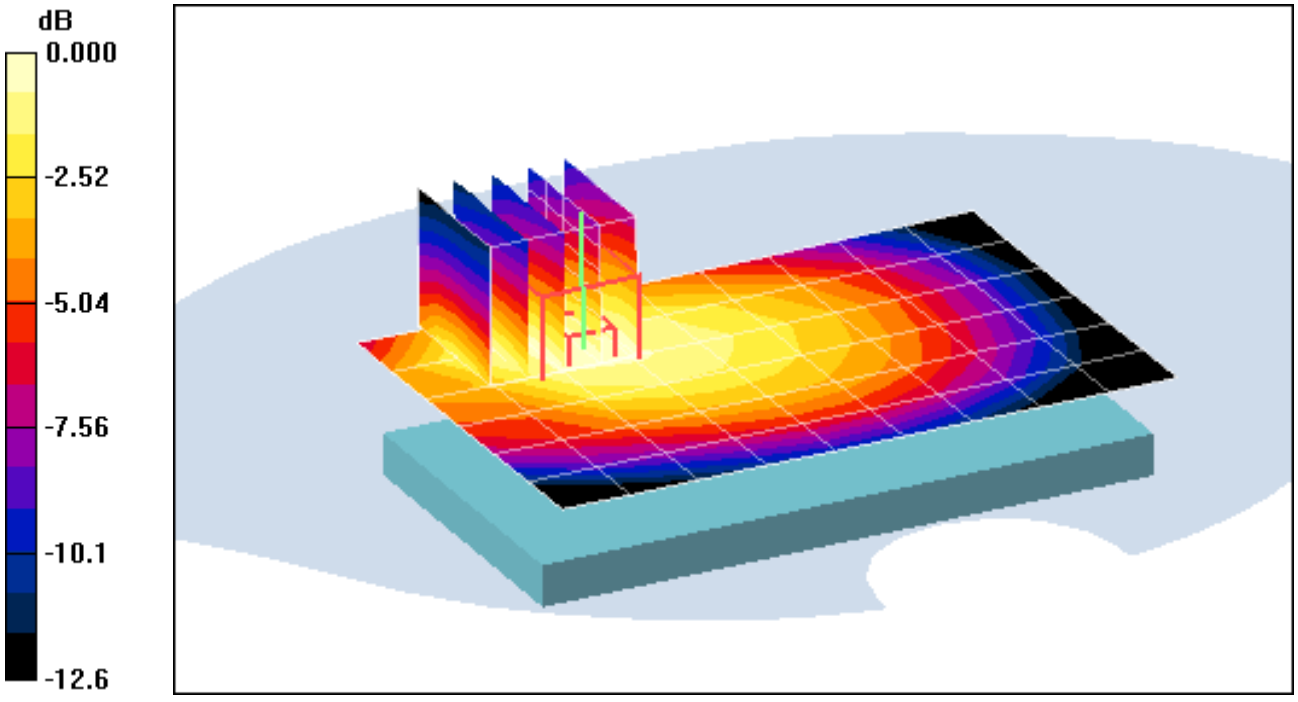
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.994 mho/m; ε_r = 56.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Front side, Mid.ch
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.197 mW/g; SAR(10 g) = 0.136 mW/g



0 dB = 0.209mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

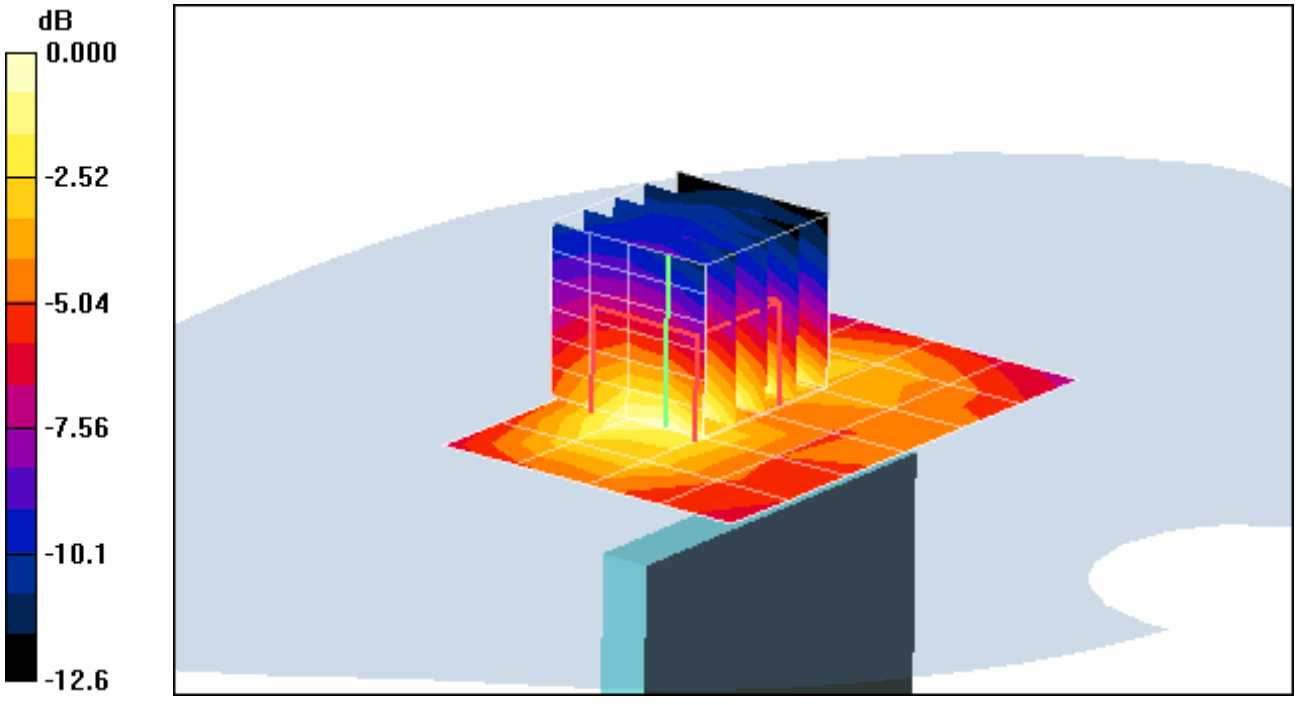
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.994 mho/m; ε_r = 56.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Bottom Edge, Mid.ch
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.19 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 0.088 W/kg
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.030 mW/g



0 dB = 0.054mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

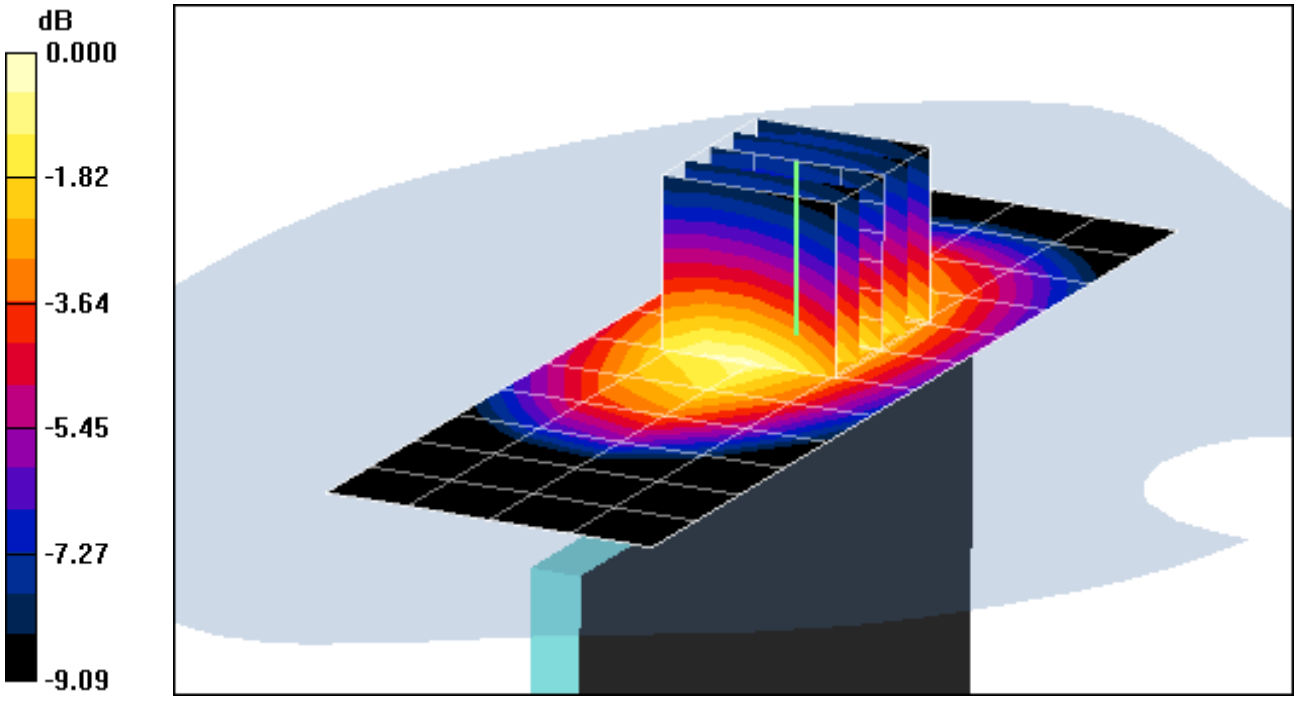
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.994 mho/m; ε_r = 56.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Right Edge, Mid.ch
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.106 mW/g



0 dB = 0.158mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

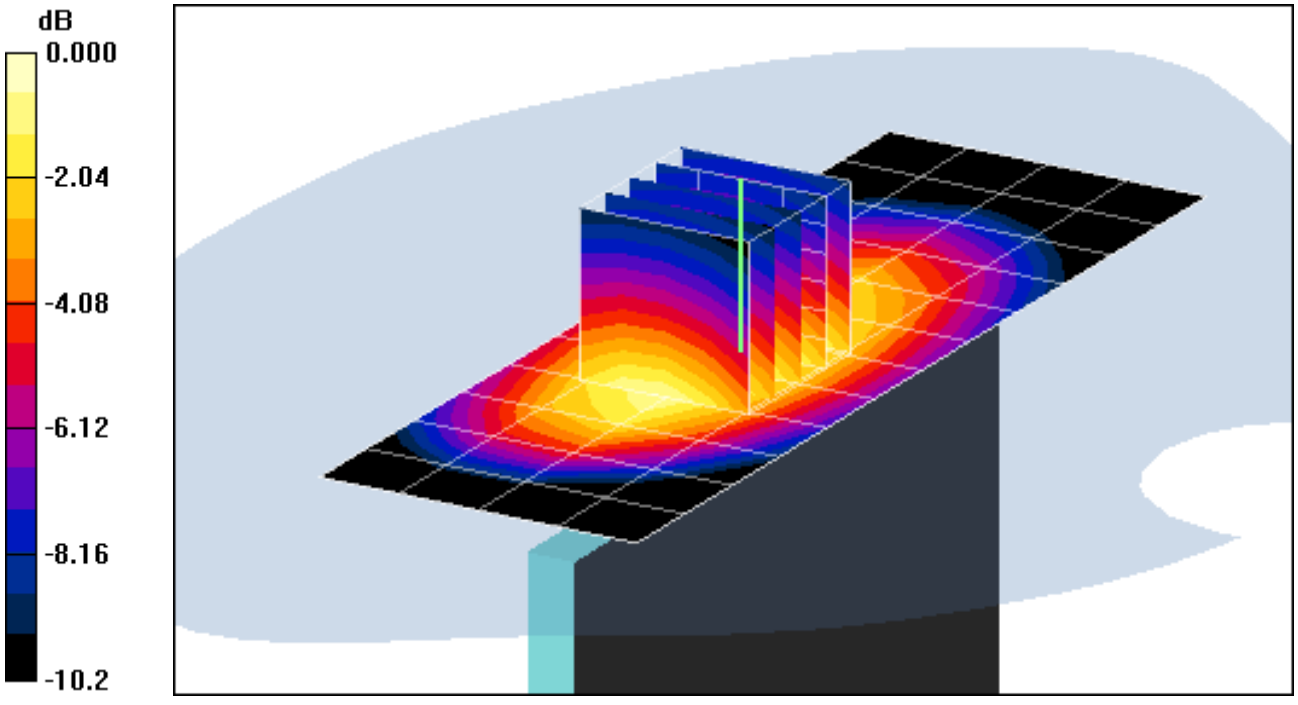
Communication System: LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used:
f = 710 MHz; σ = 0.994 mho/m; ε_r = 56.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 17, Body SAR, Left Edge, Mid.ch
10 MHz BW, QPSK, 1 RB, RB Offset 49

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.143 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.152mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

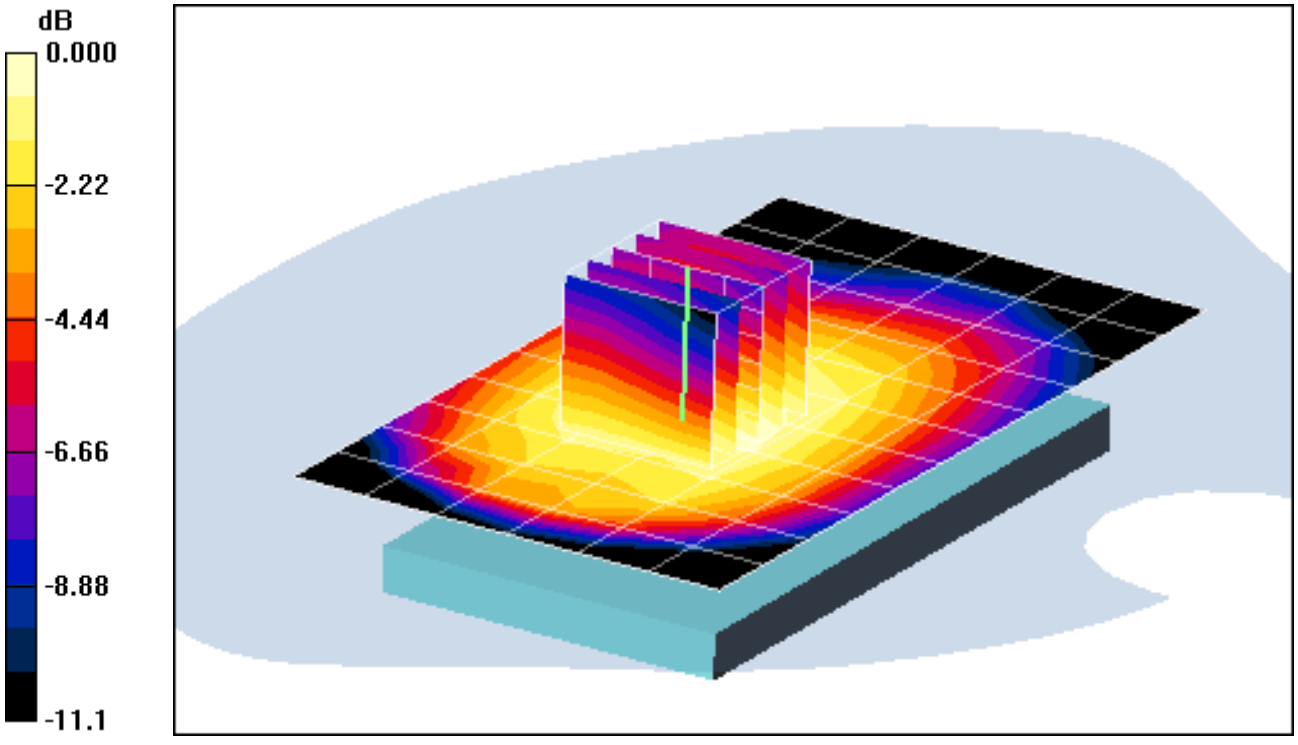
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 0.708 W/kg
SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.430 mW/g



0 dB = 0.596mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

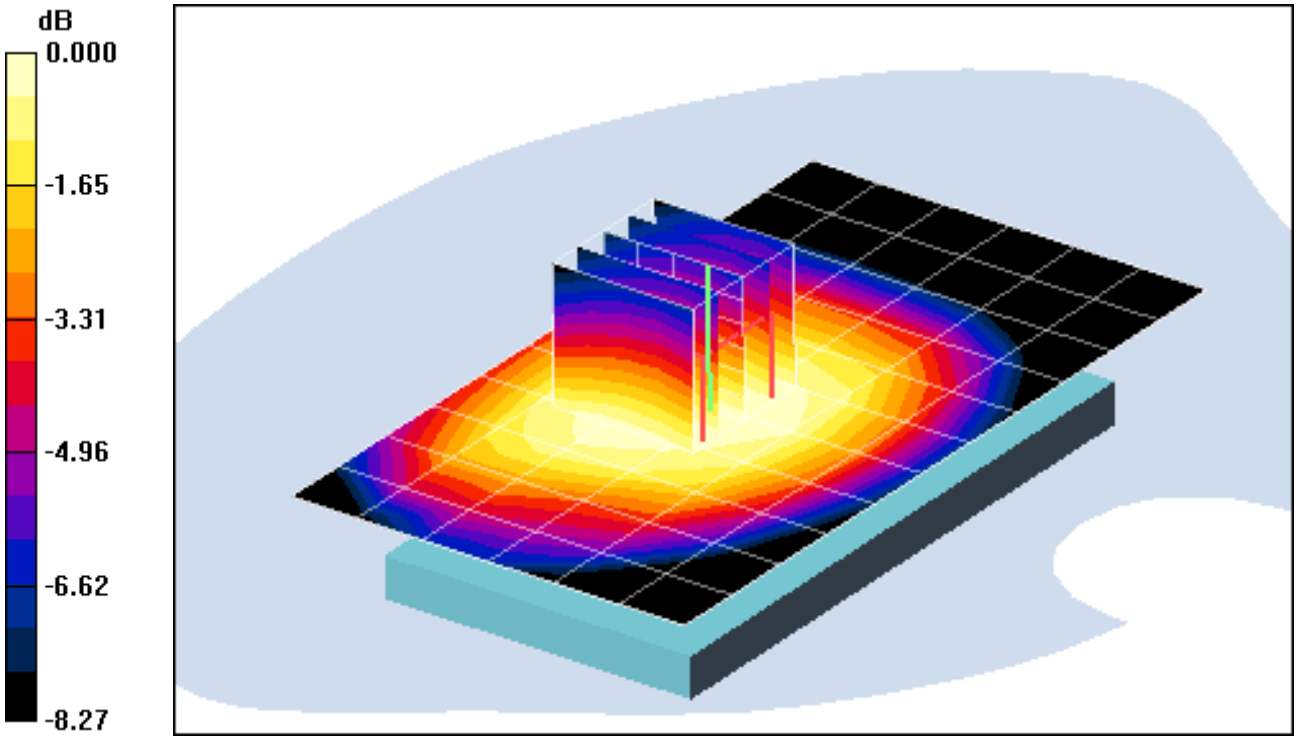
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.8 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.485 W/kg
SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.309 mW/g



0 dB = 0.412mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

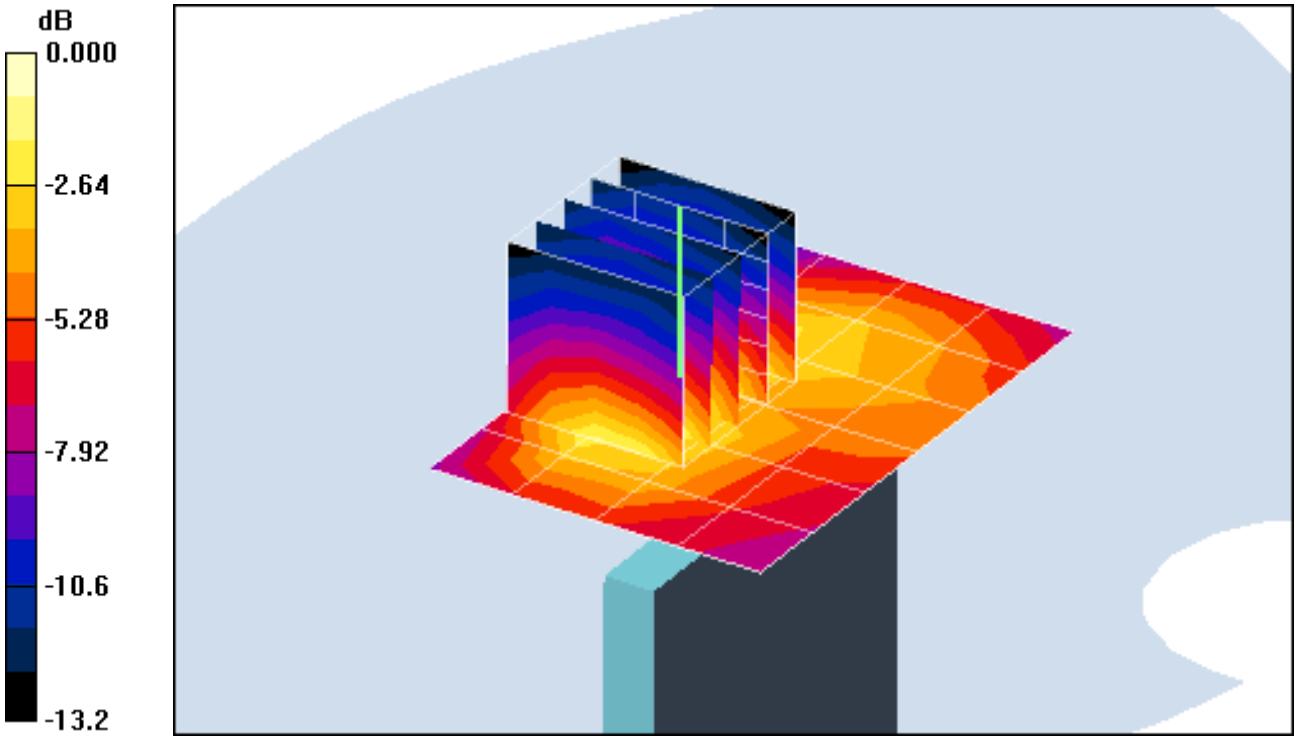
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.42 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.131 W/kg
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.045 mW/g



0 dB = 0.084mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

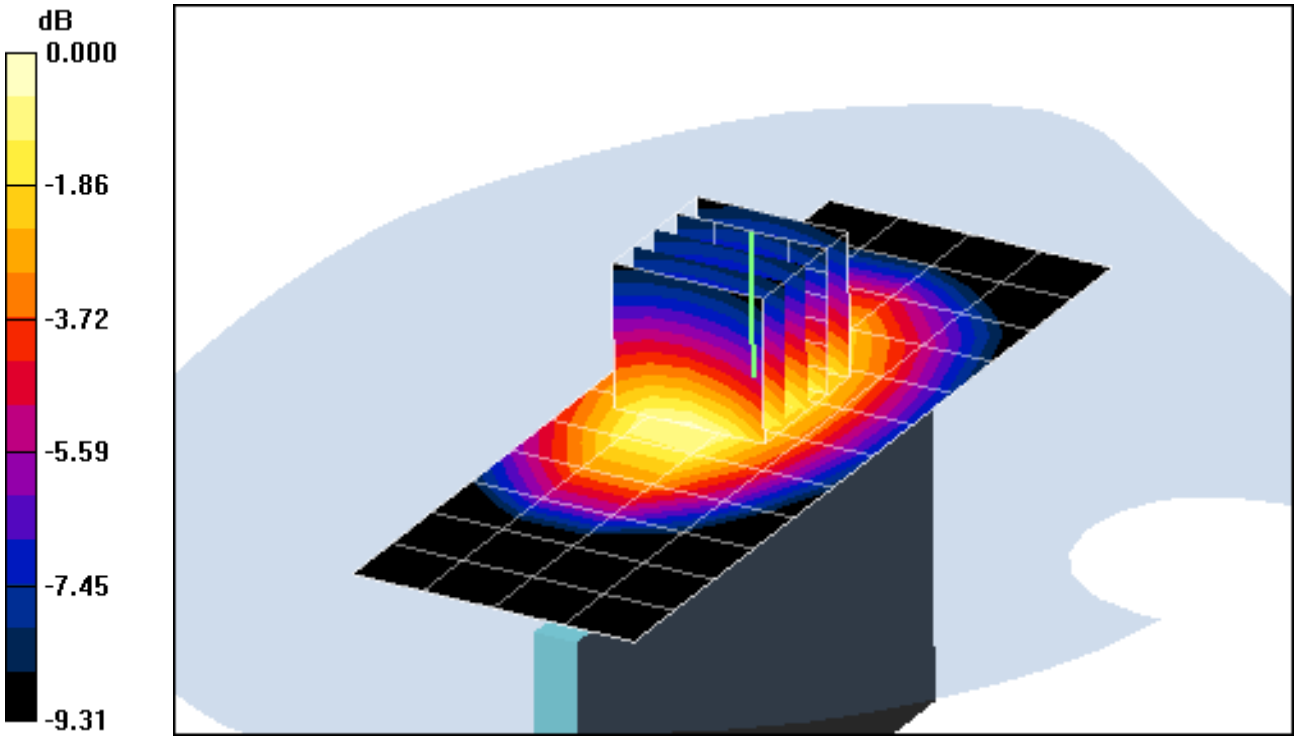
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 0.648 W/kg
SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.329 mW/g



0 dB = 0.503mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

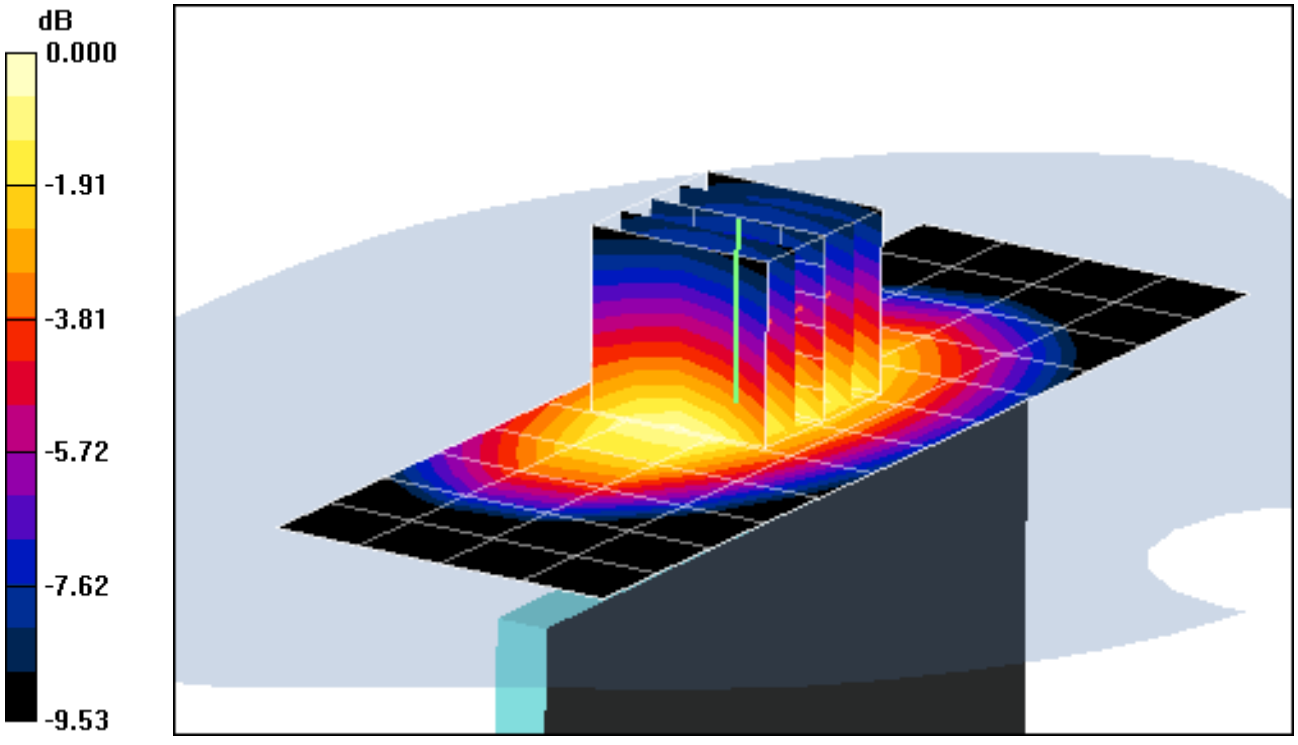
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.6 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 0.609 W/kg
SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.302 mW/g



0 dB = 0.476mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

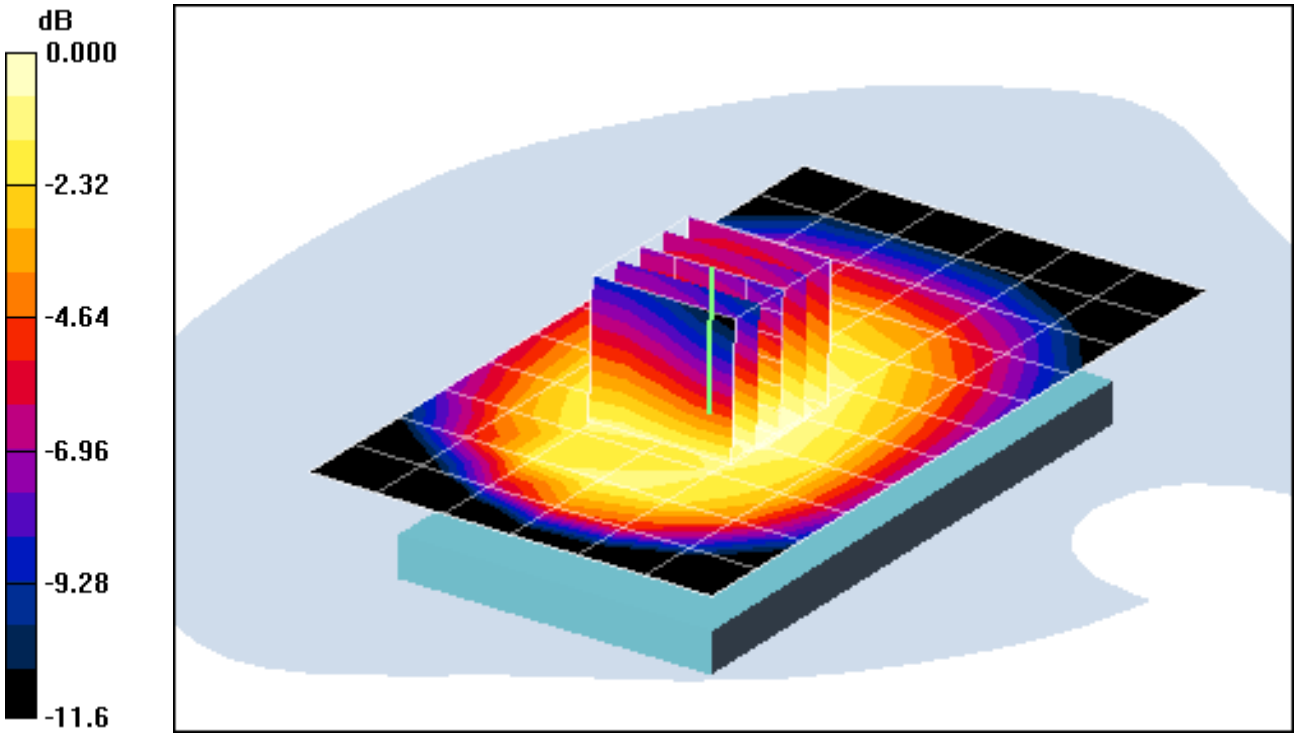
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Back side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.4 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.499 W/kg
SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.291 mW/g



0 dB = 0.409mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

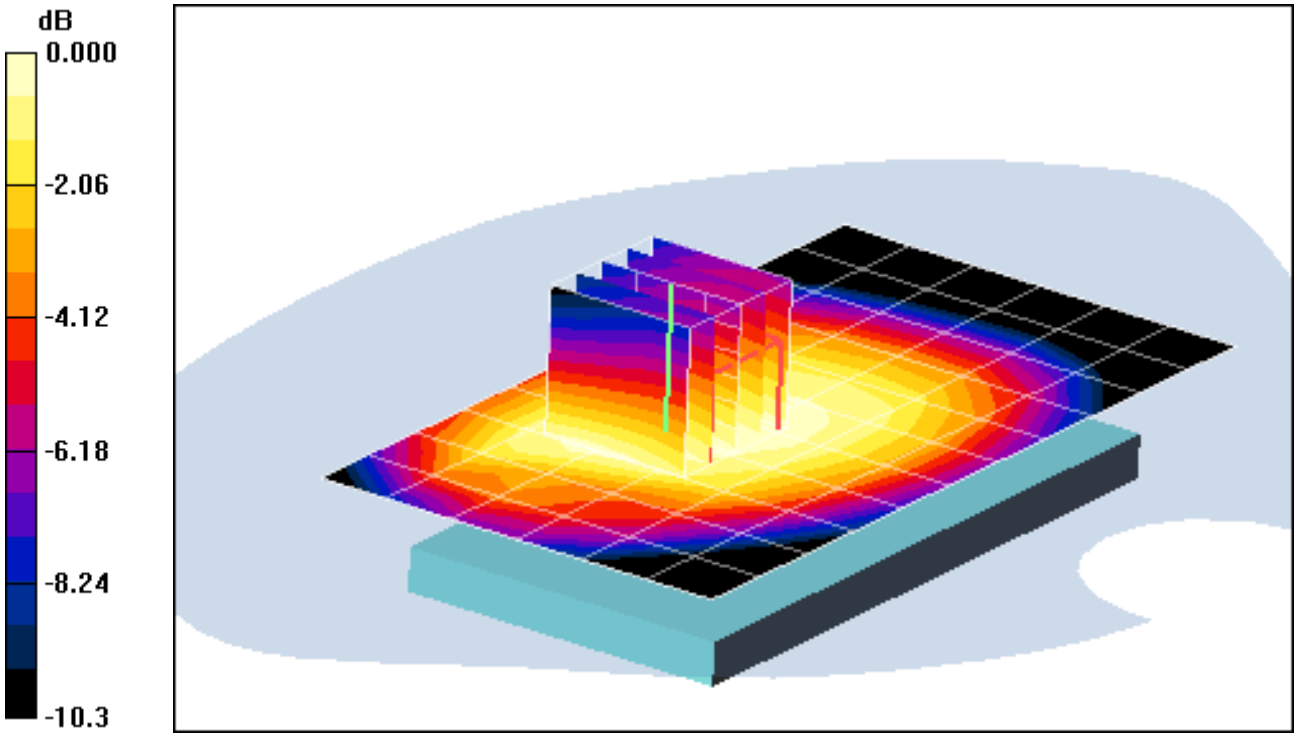
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Front side, Mid.ch

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 0.315 W/kg
SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.183 mW/g



0 dB = 0.251mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

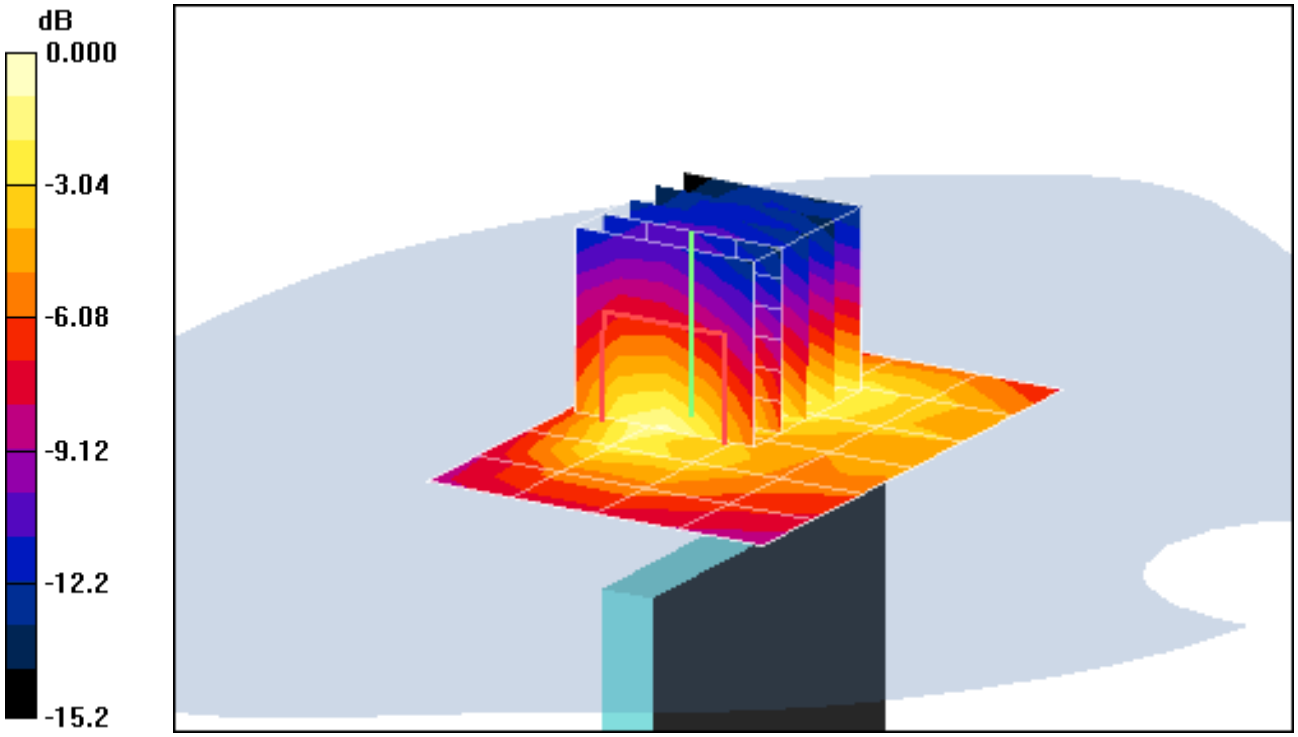
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.28 V/m; Power Drift = 0.119 dB
Peak SAR (extrapolated) = 0.108 W/kg
SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.036 mW/g



0 dB = 0.072mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

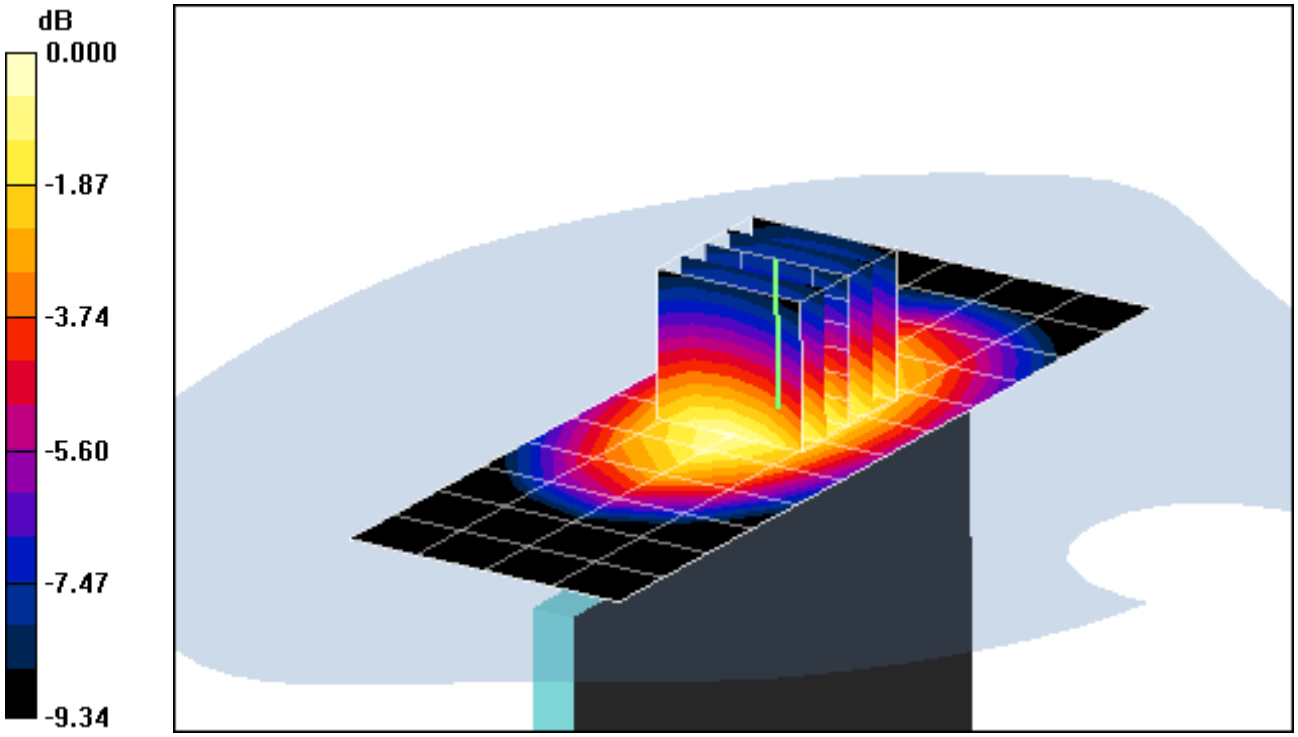
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Right Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.370 W/kg
SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.188 mW/g



0 dB = 0.287mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

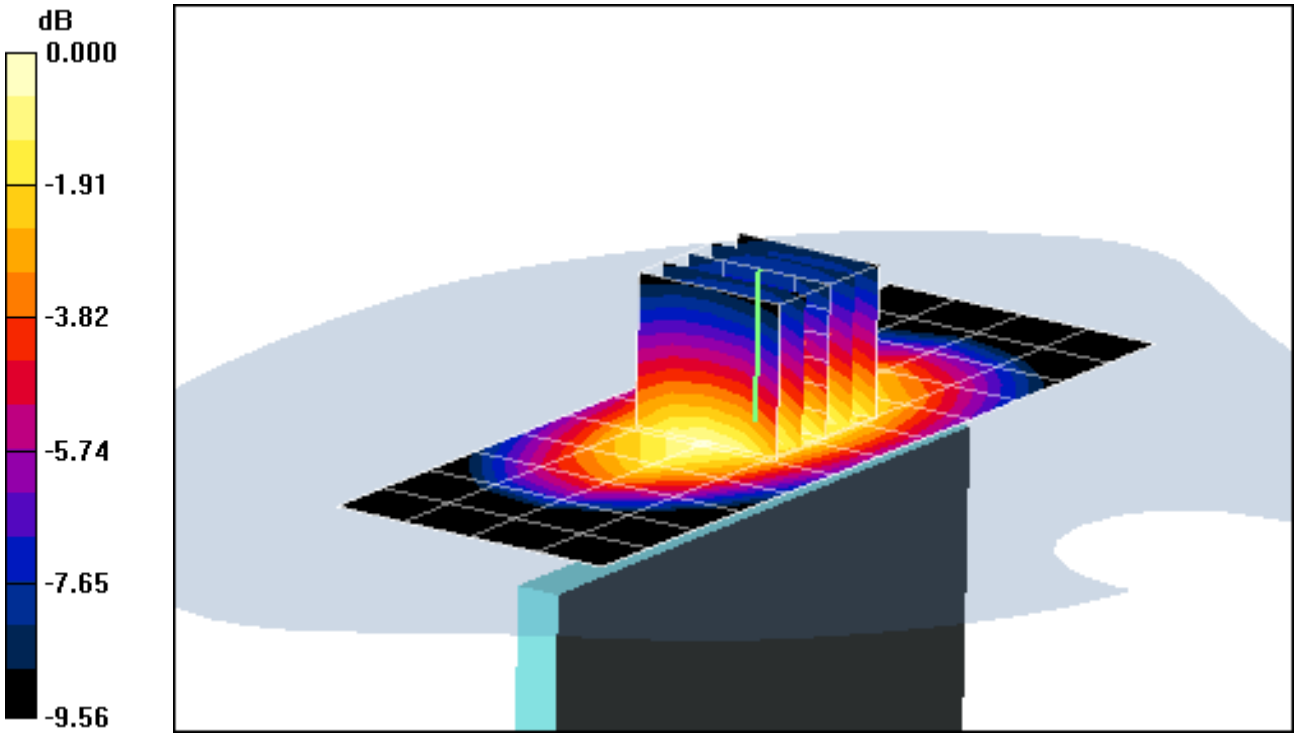
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.973 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: WCDMA 850, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.3 V/m; Power Drift = 0.110 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.165 mW/g



0 dB = 0.254mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

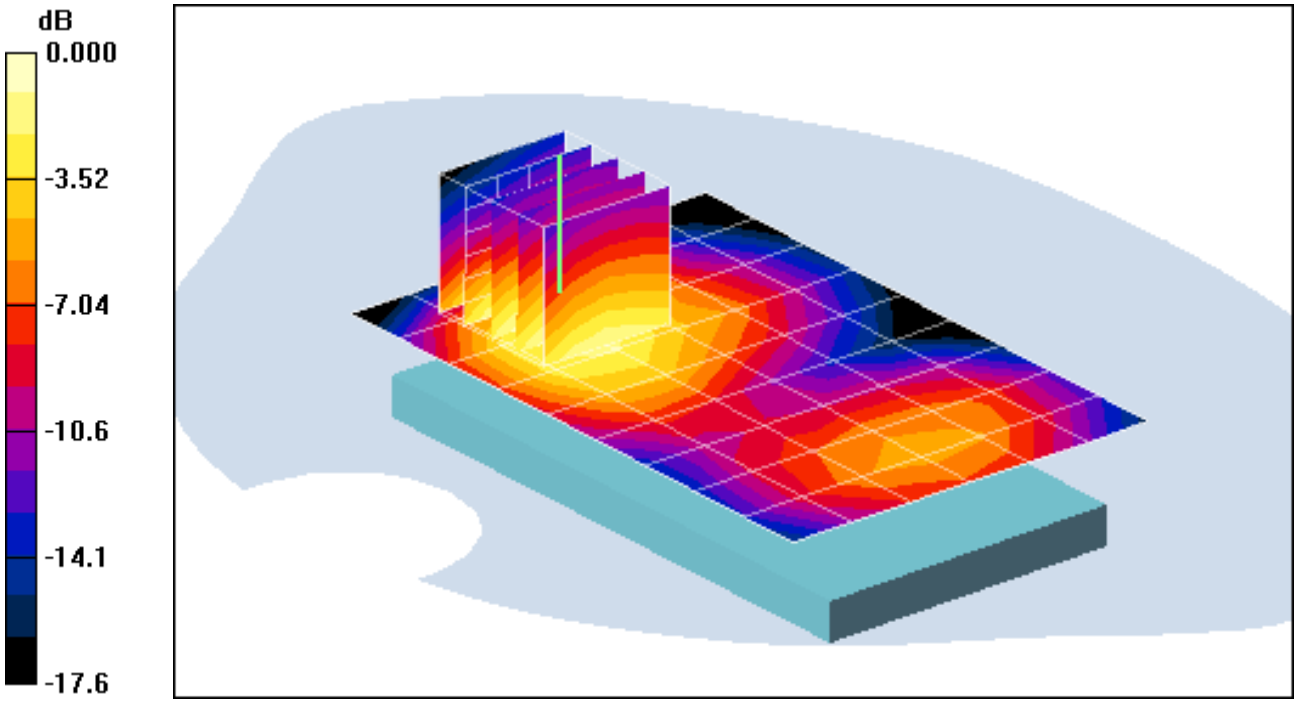
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.49 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid. ch
20 MHz BW, QPSK, 1 RB Size, RB Offset 0

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = -0.198 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.734 mW/g; SAR(10 g) = 0.457 mW/g



0 dB = 0.777mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

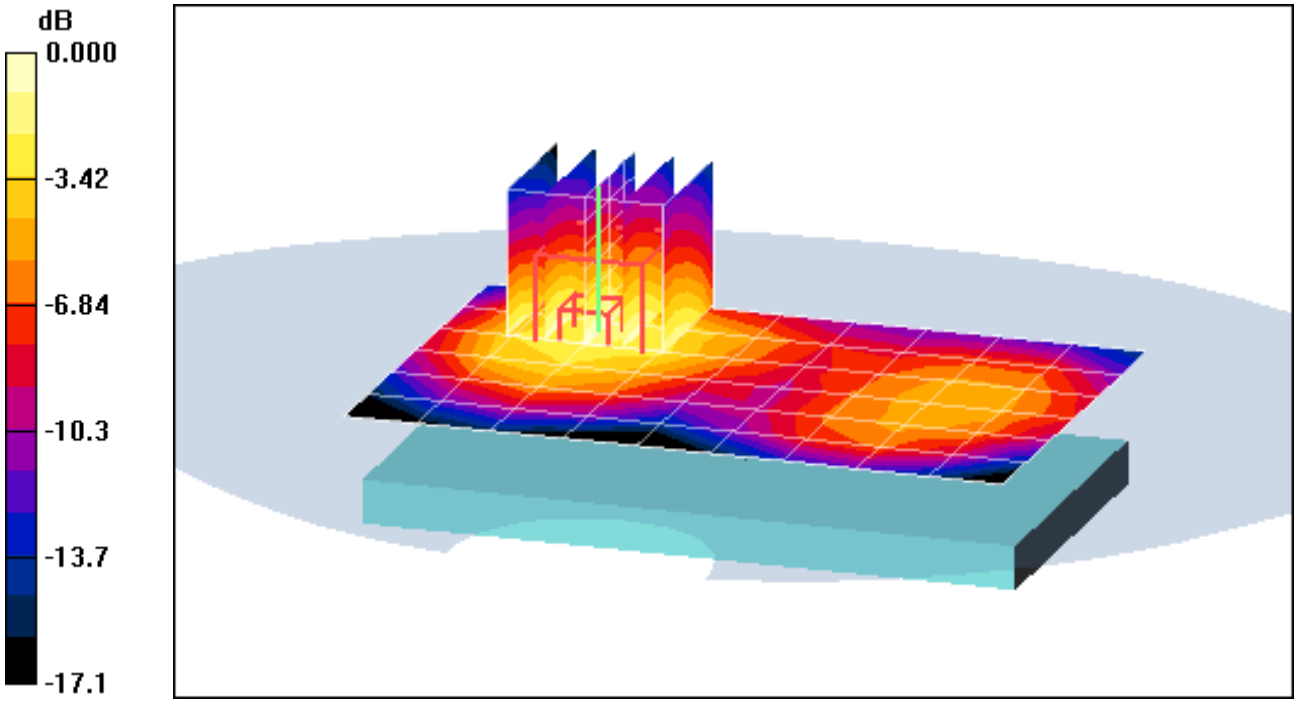
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.49 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Front side, Mid.ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.447 mW/g



0 dB = 0.797mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

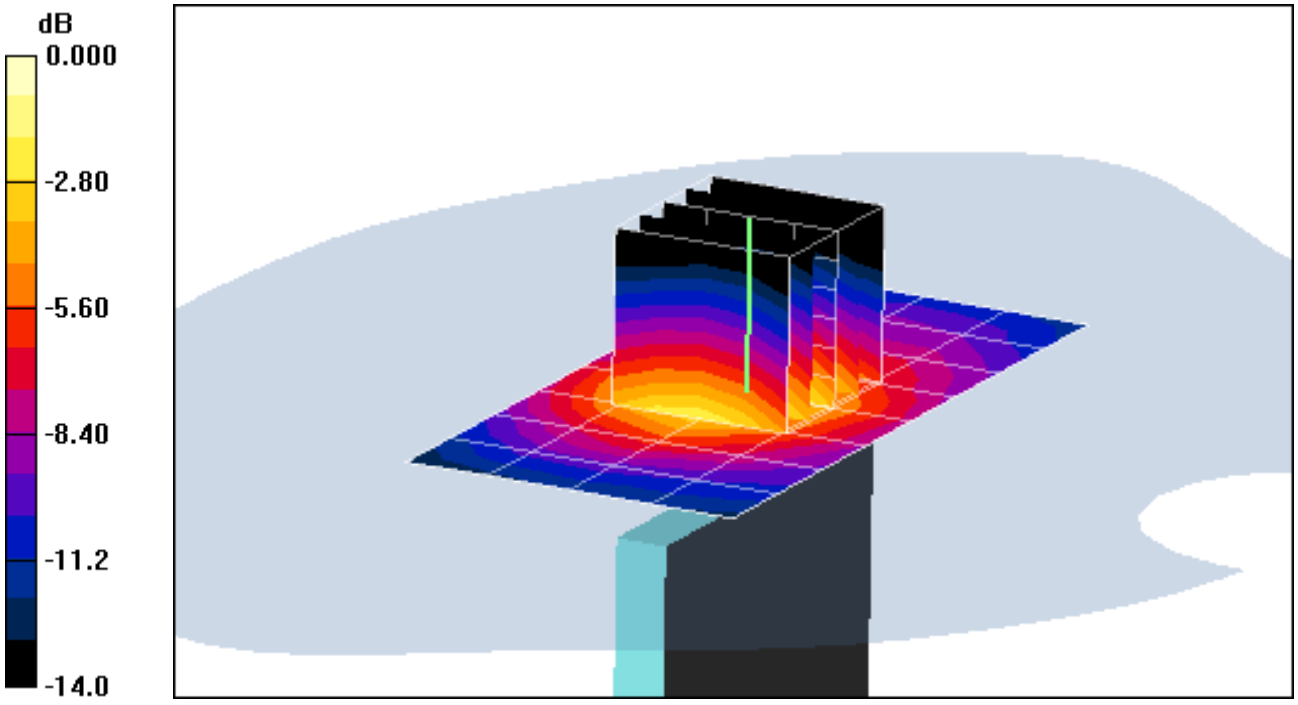
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.49 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Bottom Edge, High.ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = 0.182 dB
Peak SAR (extrapolated) = 0.432 W/kg
SAR(1 g) = 0.253 mW/g; SAR(10 g) = 0.146 mW/g



0 dB = 0.273mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

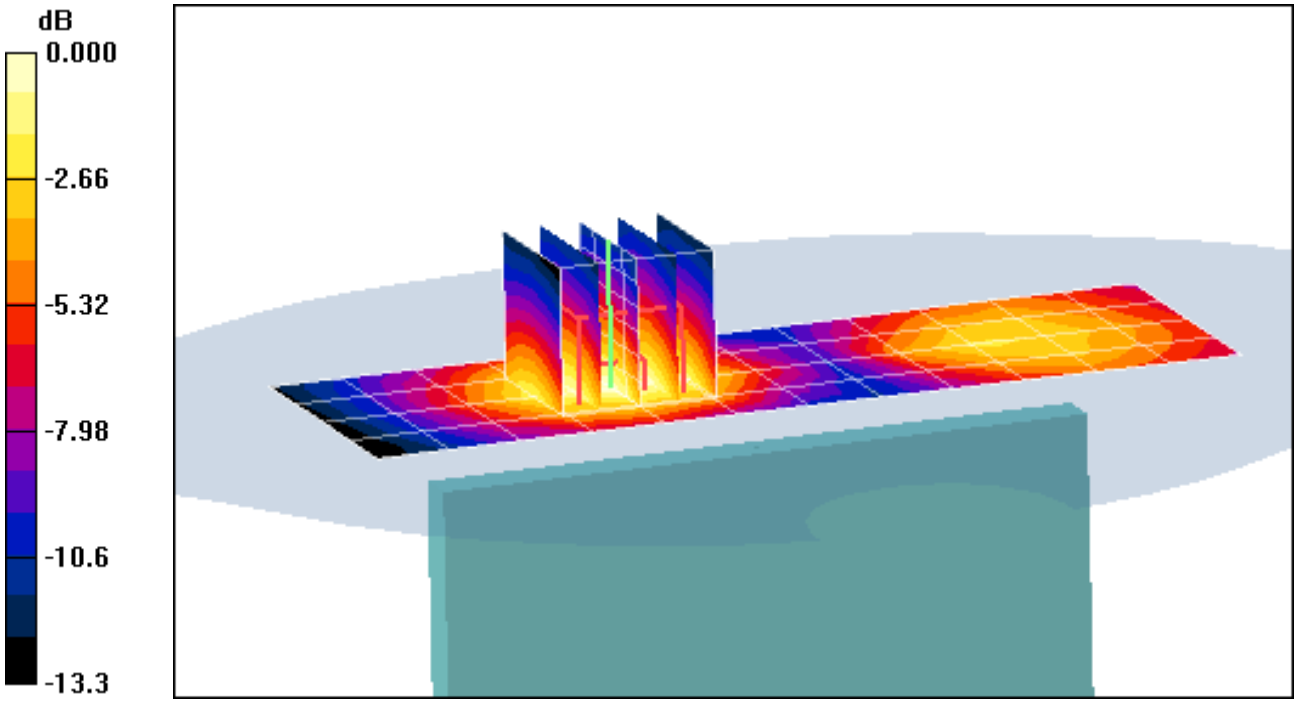
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.49 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode:LTE Band 4 (AWS), Body SAR, Right Edge, Mid.ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.16 V/m; Power Drift = 0.149 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.090 mW/g; SAR(10 g) = 0.054 mW/g



0 dB = 0.097mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

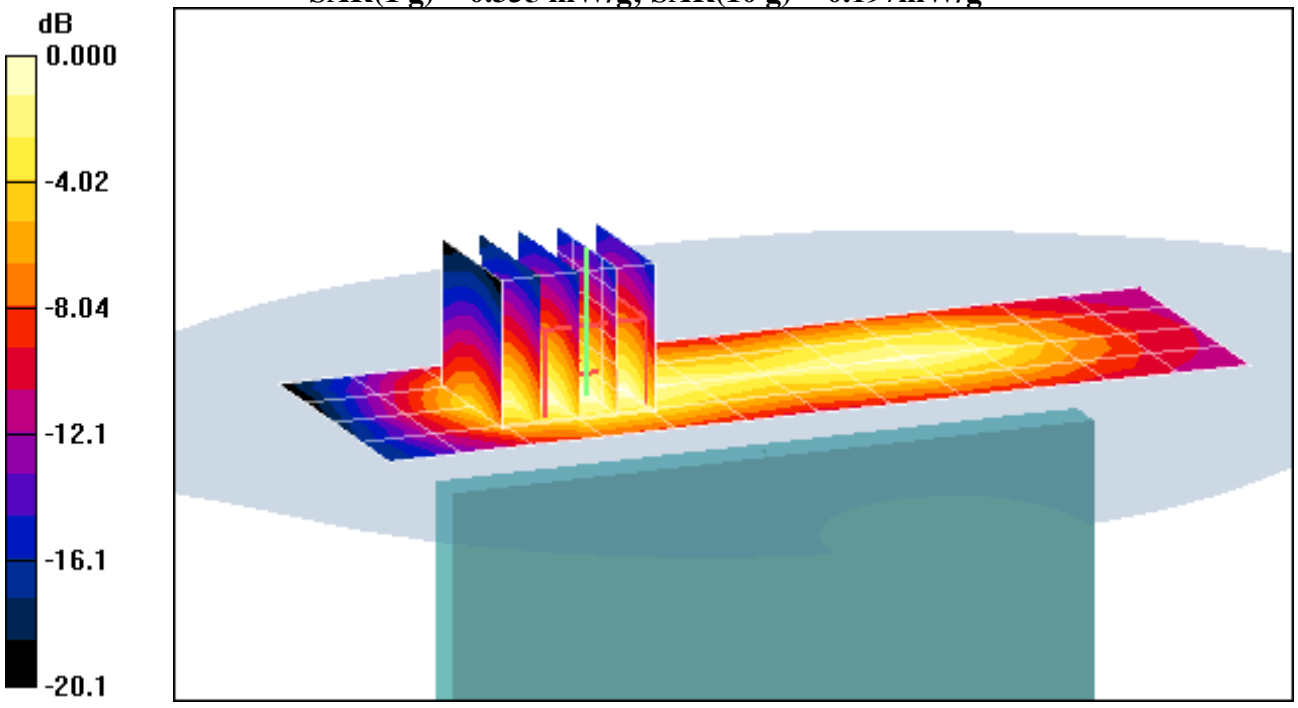
Communication System: LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.49 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 4 (AWS), Body SAR, Left Edge, Mid.ch
20 MHz BW, QPSK, 1 RB, RB Offset 0

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m; Power Drift = -0.206 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.197mW/g



0 dB = 0.368 mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

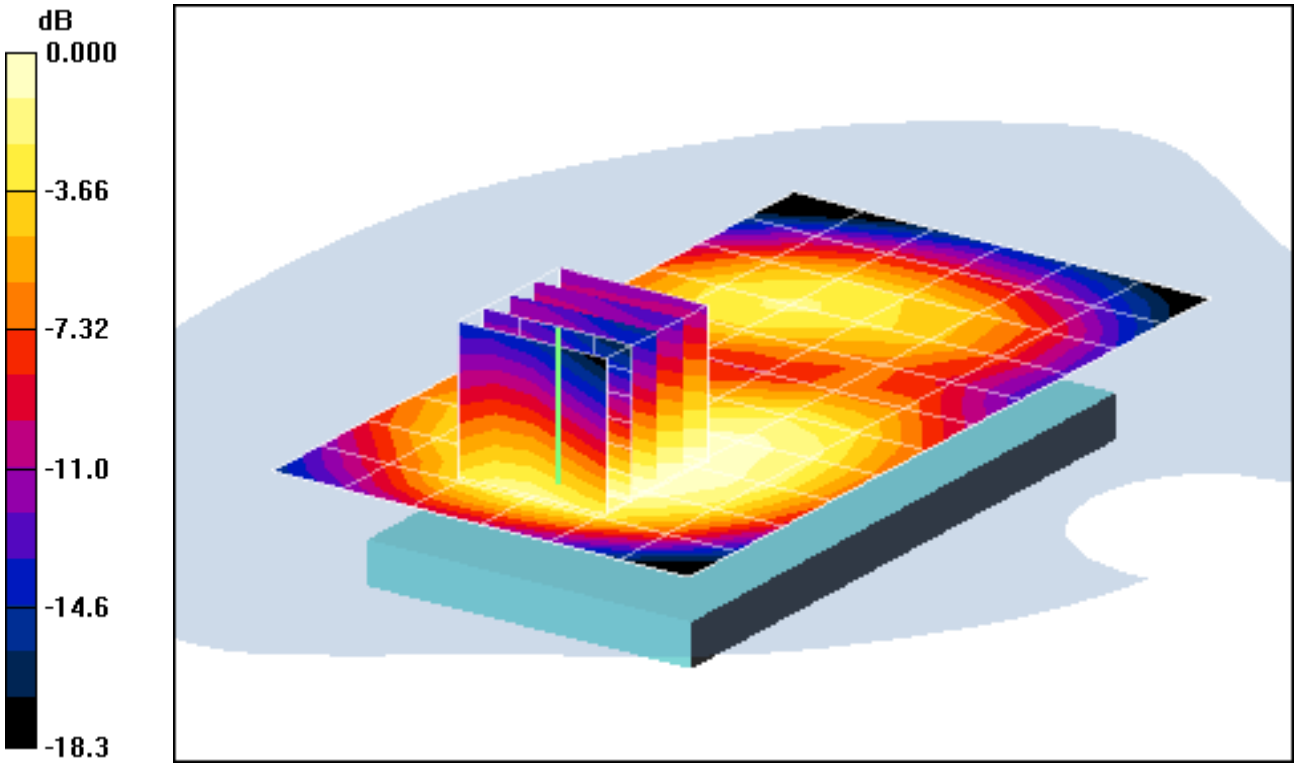
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 2 Tx Slots

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 0.917 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.307 mW/g



0 dB = 0.565mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

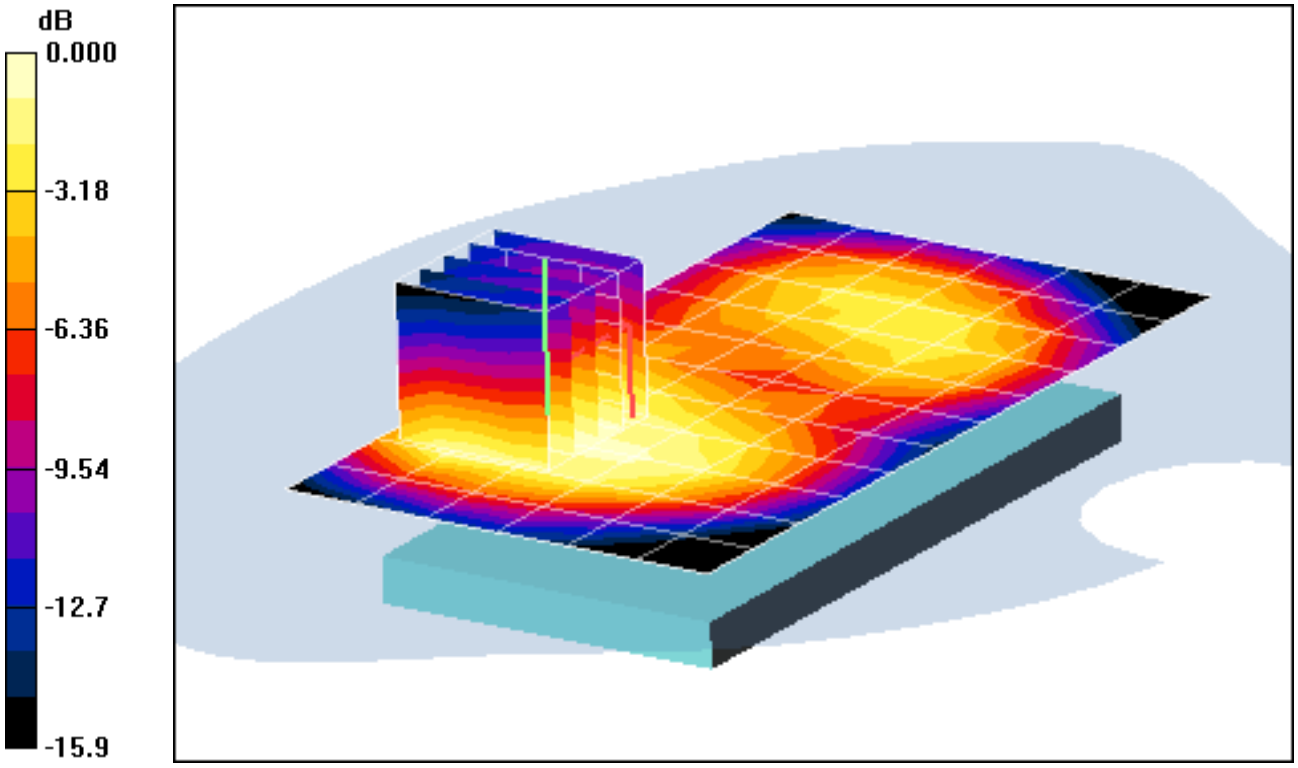
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Front side, Mid.ch, 2 Tx Slots

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.5 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 0.931 W/kg
SAR(1 g) = 0.609 mW/g; SAR(10 g) = 0.390 mW/g



0 dB = 0.650mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

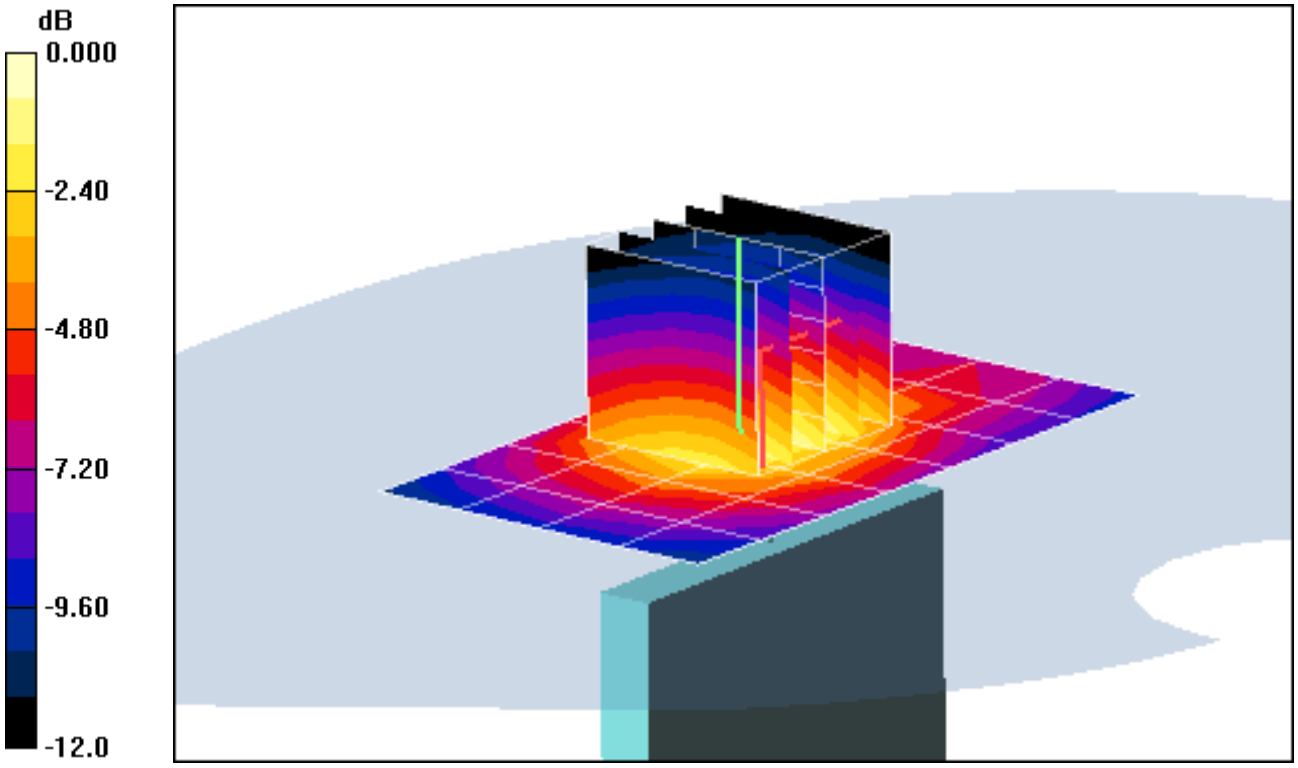
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Bottom Edge, Mid.ch, 2 Tx Slots

Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 0.547 W/kg
SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.187 mW/g



0 dB = 0.359mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

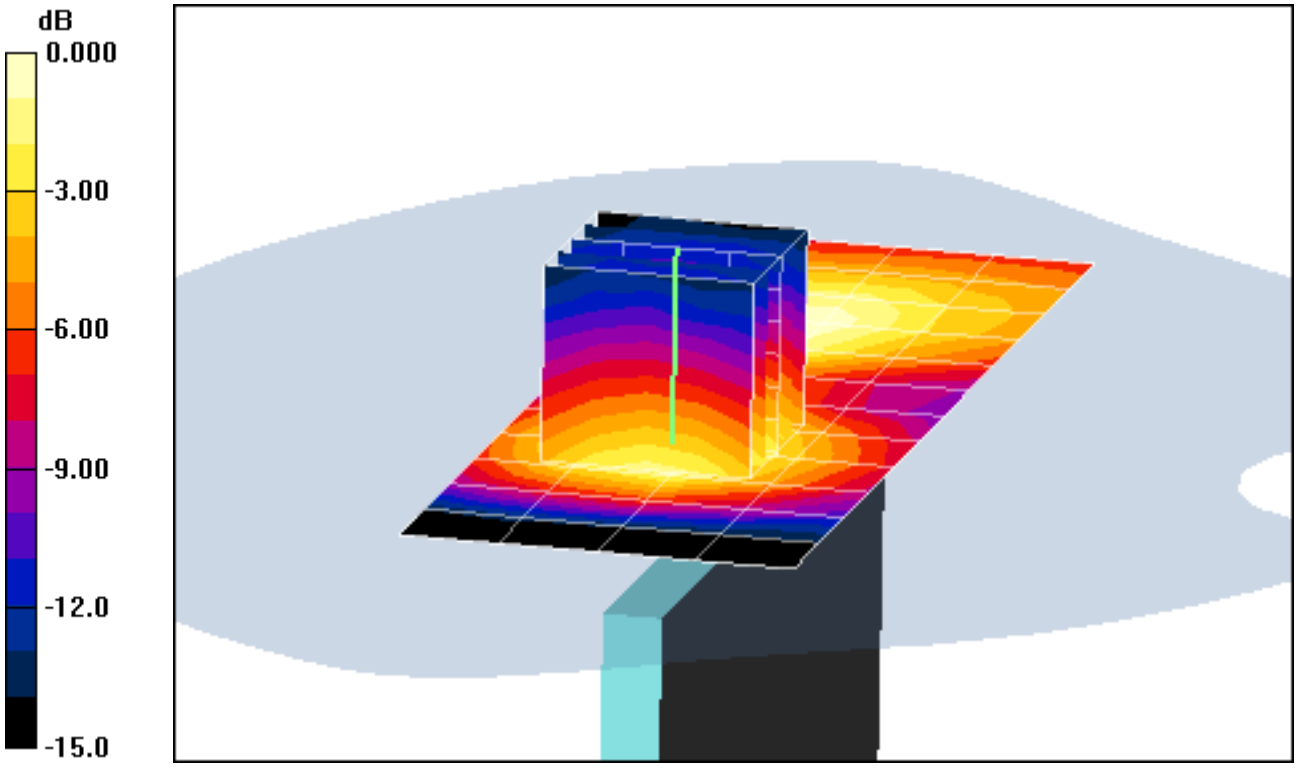
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Right Edge, Mid.ch, 2 Tx Slots

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.158 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.173mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #4

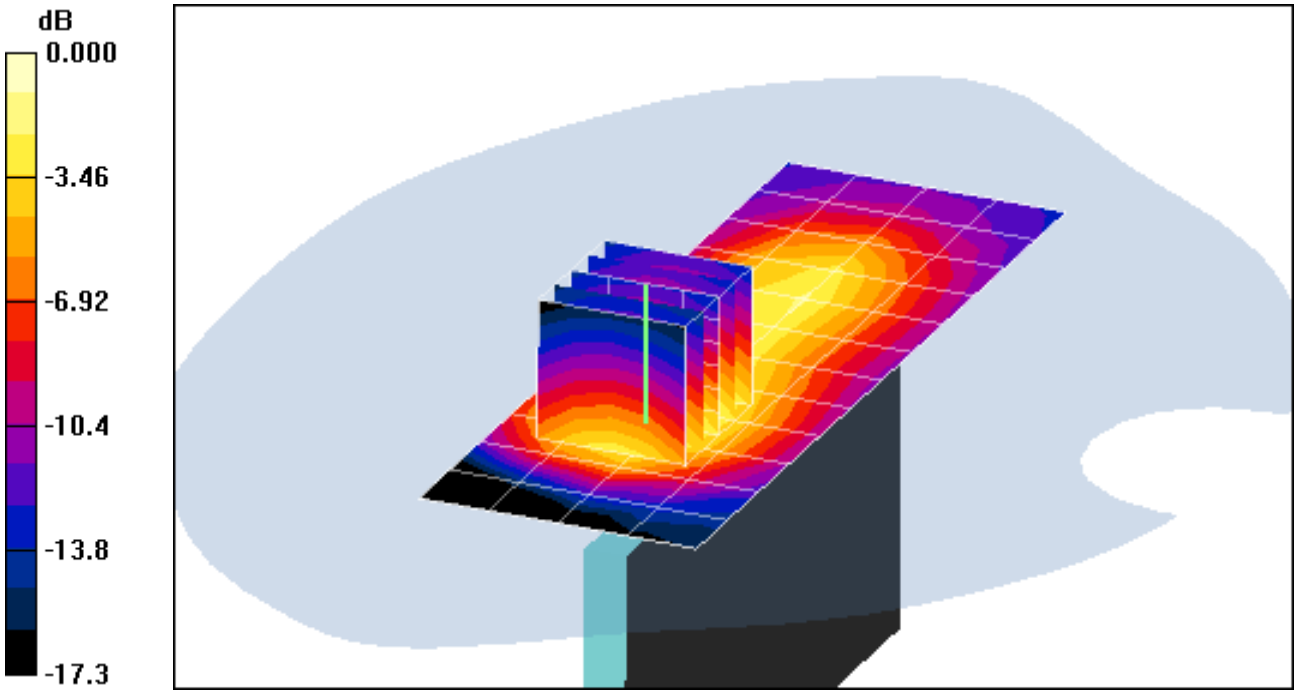
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: GPRS 1900, Body SAR, Left Edge, Mid.ch, 2 Tx Slots

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 0.704 W/kg
SAR(1 g) = 0.439 mW/g; SAR(10 g) = 0.257 mW/g



0 dB = 0.475mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

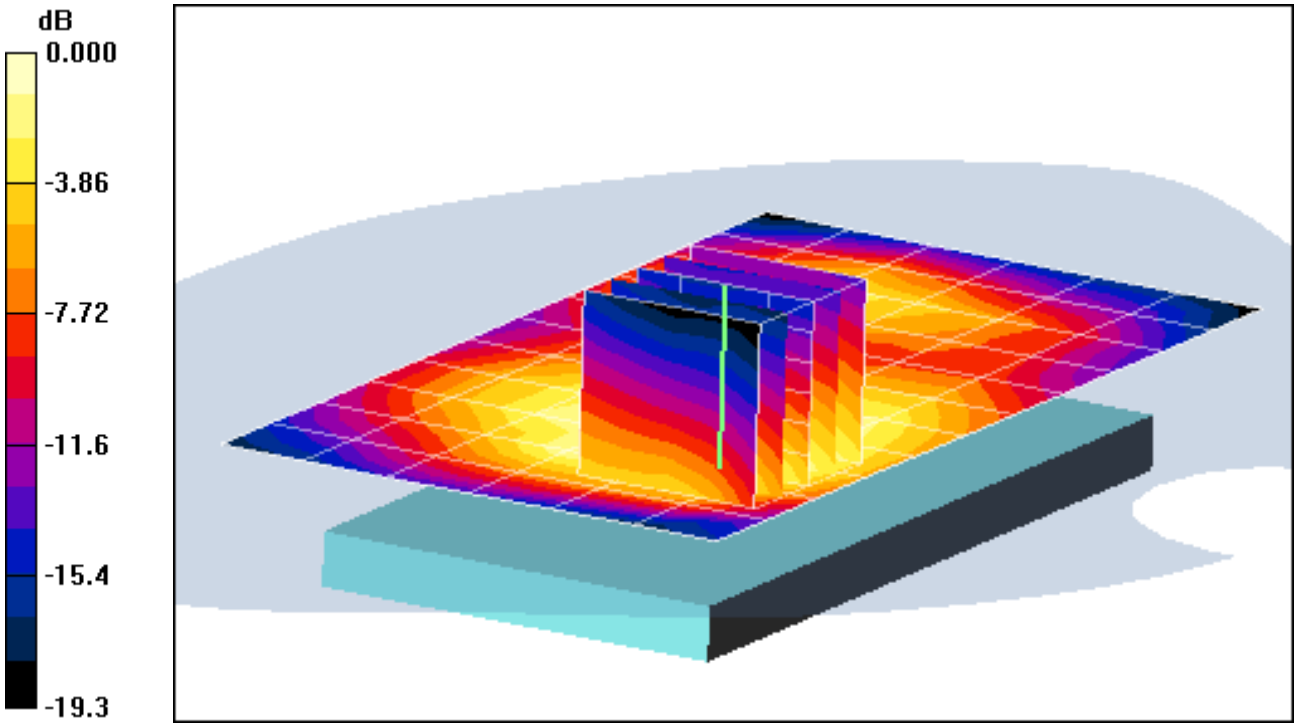
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section: Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.946 W/kg
SAR(1 g) = 0.495 mW/g; SAR(10 g) = 0.290 mW/g



0 dB = 0.547mW/g

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

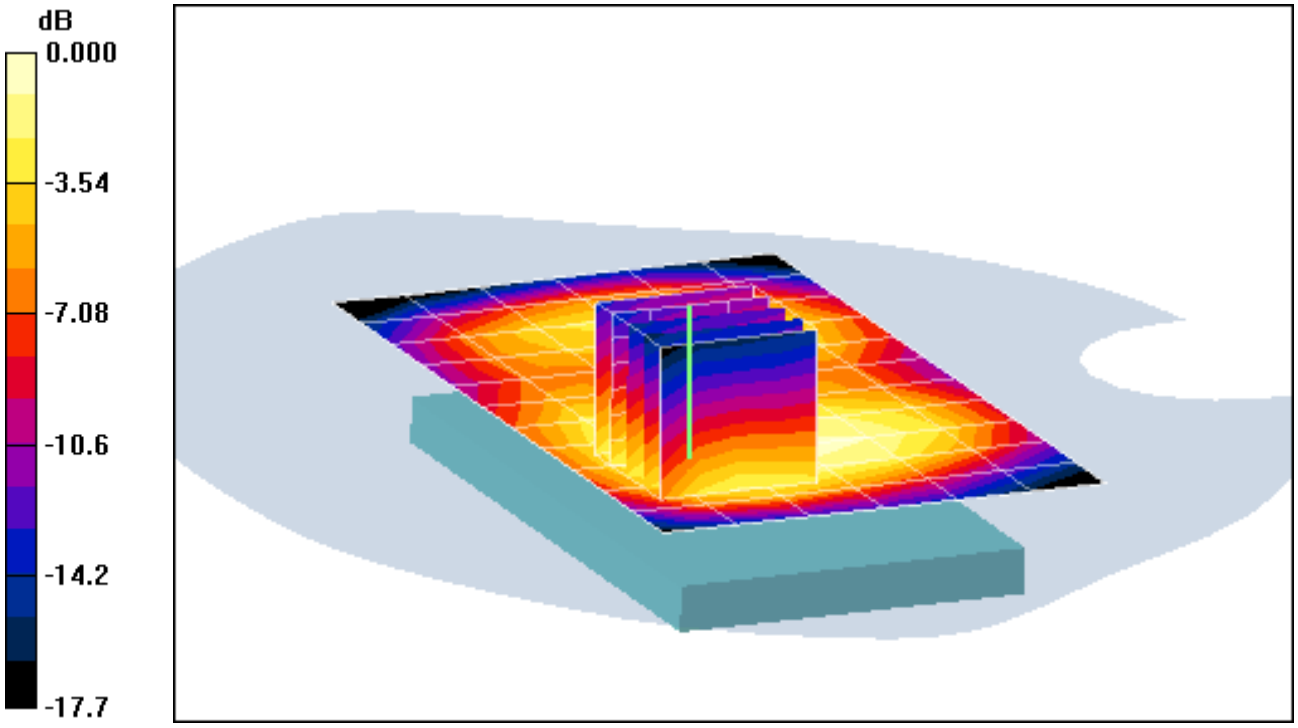
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.7 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.355 mW/g



0 dB = 0.606mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

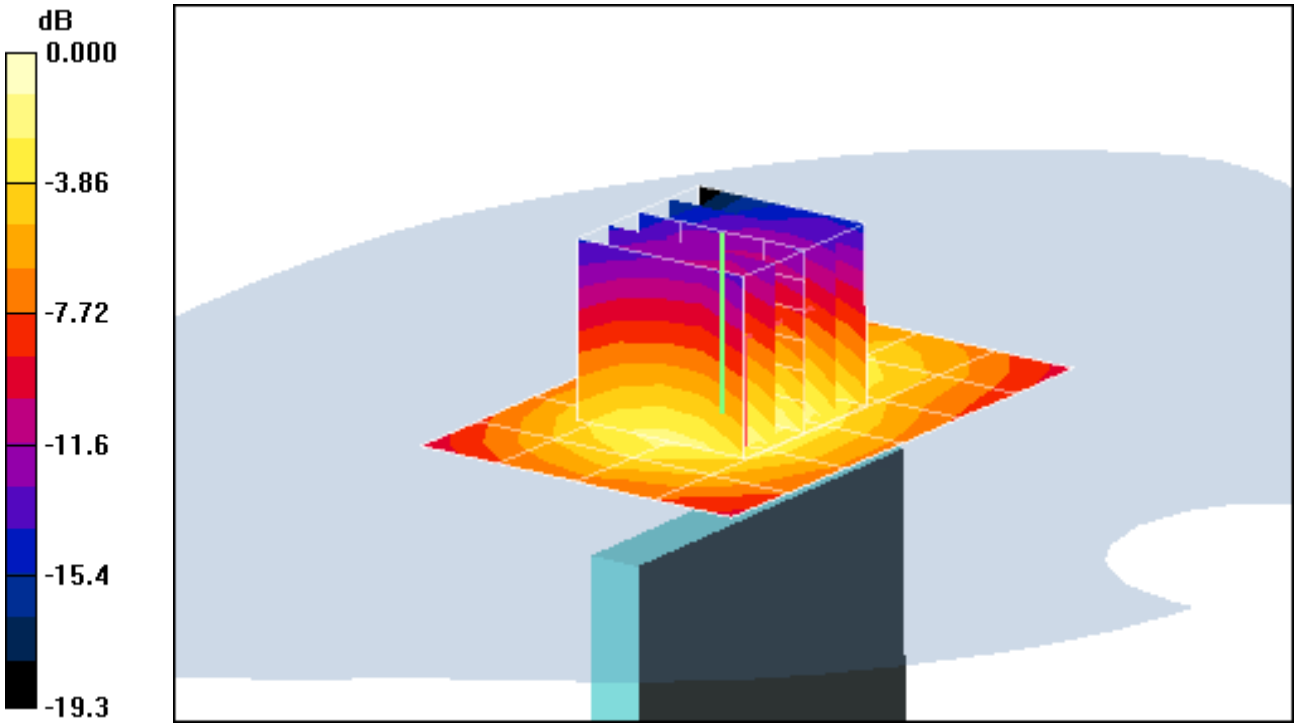
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.513 W/kg
SAR(1 g) = 0.309 mW/g; SAR(10 g) = 0.179 mW/g



0 dB = 0.337mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

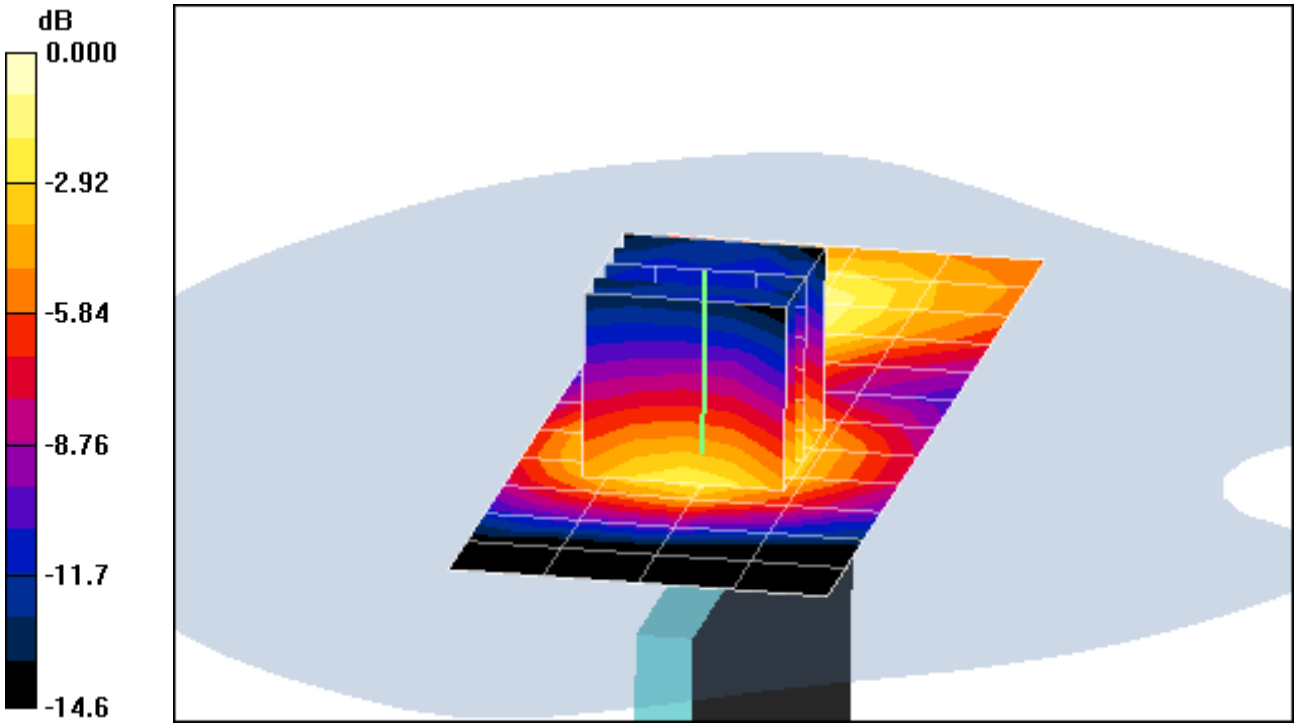
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.85 V/m; Power Drift = -0.139 dB
Peak SAR (extrapolated) = 0.223 W/kg
SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.085 mW/g



0 dB = 0.156mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #3

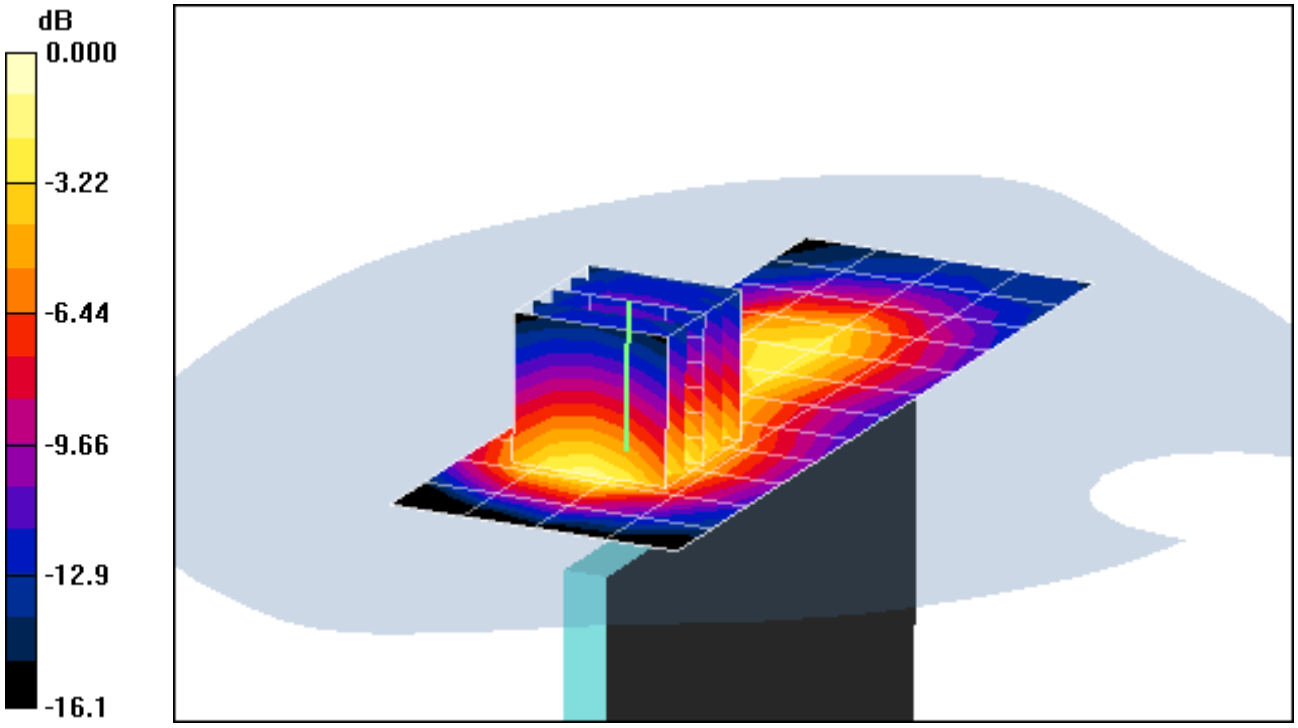
Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.57 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.410 mW/g; SAR(10 g) = 0.241 mW/g



0 dB = 0.447mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

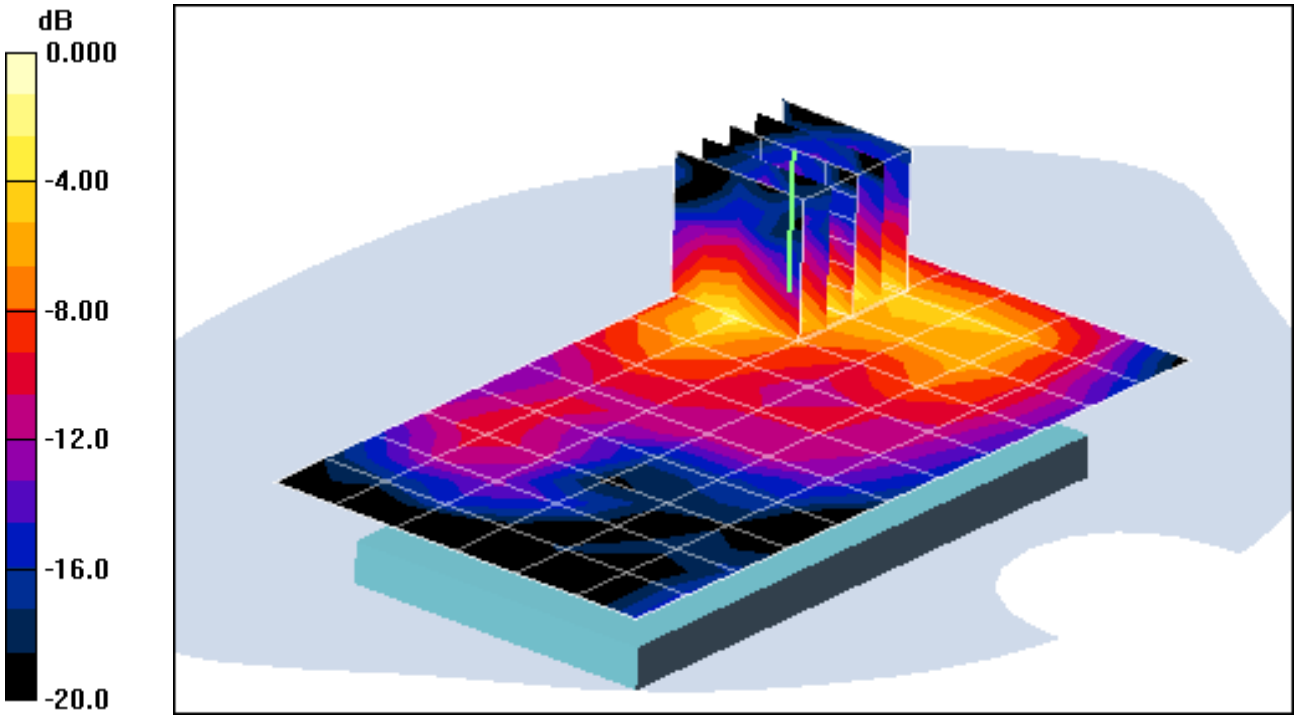
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Back Side

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.25 V/m; Power Drift = 0.089 dB
Peak SAR (extrapolated) = 0.190 W/kg
SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.039 mW/g



0 dB = 0.115mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

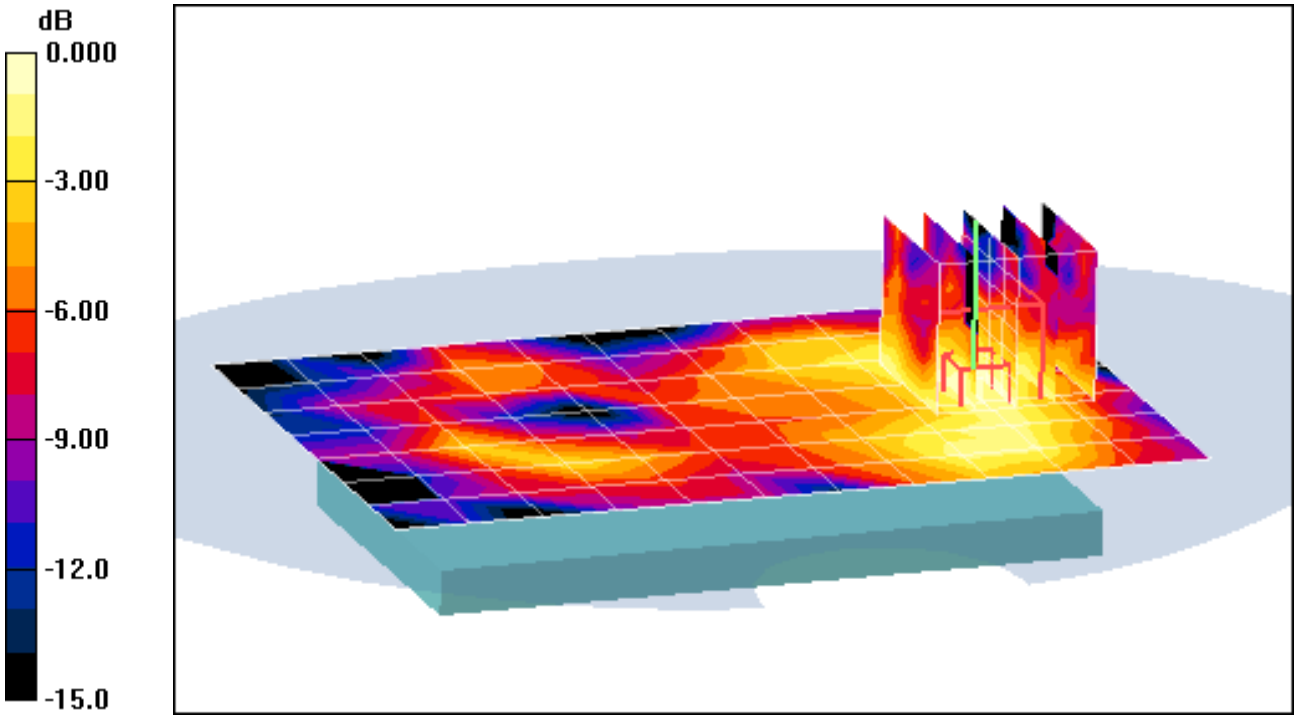
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Front Side

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.23 V/m; Power Drift = -0.137 dB
Peak SAR (extrapolated) = 0.014 W/kg
SAR(1 g) = 0.00825 mW/g; SAR(10 g) = 0.00429 mW/g



0 dB = 0.012mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

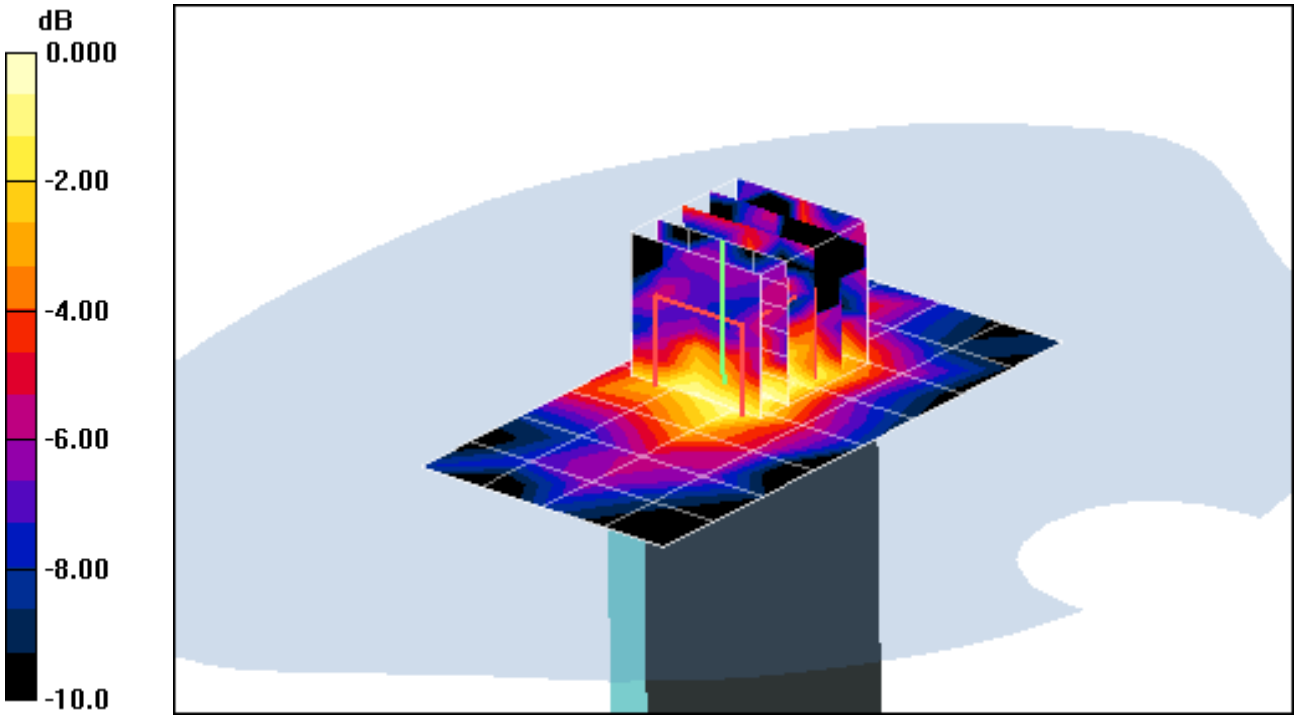
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Top Edge

Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.67 V/m; Power Drift = -0.177 dB
Peak SAR (extrapolated) = 0.016 W/kg
SAR(1 g) = 0.00569 mW/g; SAR(10 g) = 0.00238 mW/g



0 dB = 0.007mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

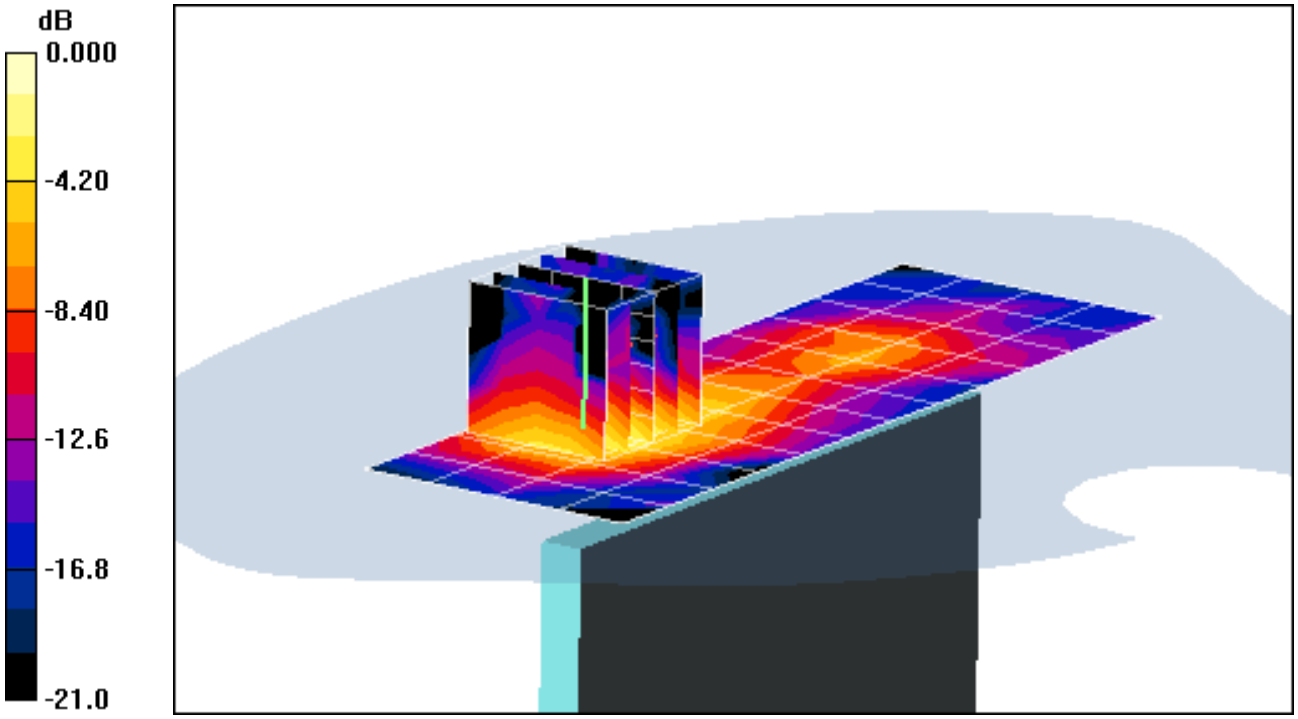
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Right Edge

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.08 V/m; Power Drift = 0.174 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.014 mW/g



0 dB = 0.040mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSGHI747; Type: Portable Handset; Serial: SAR #7

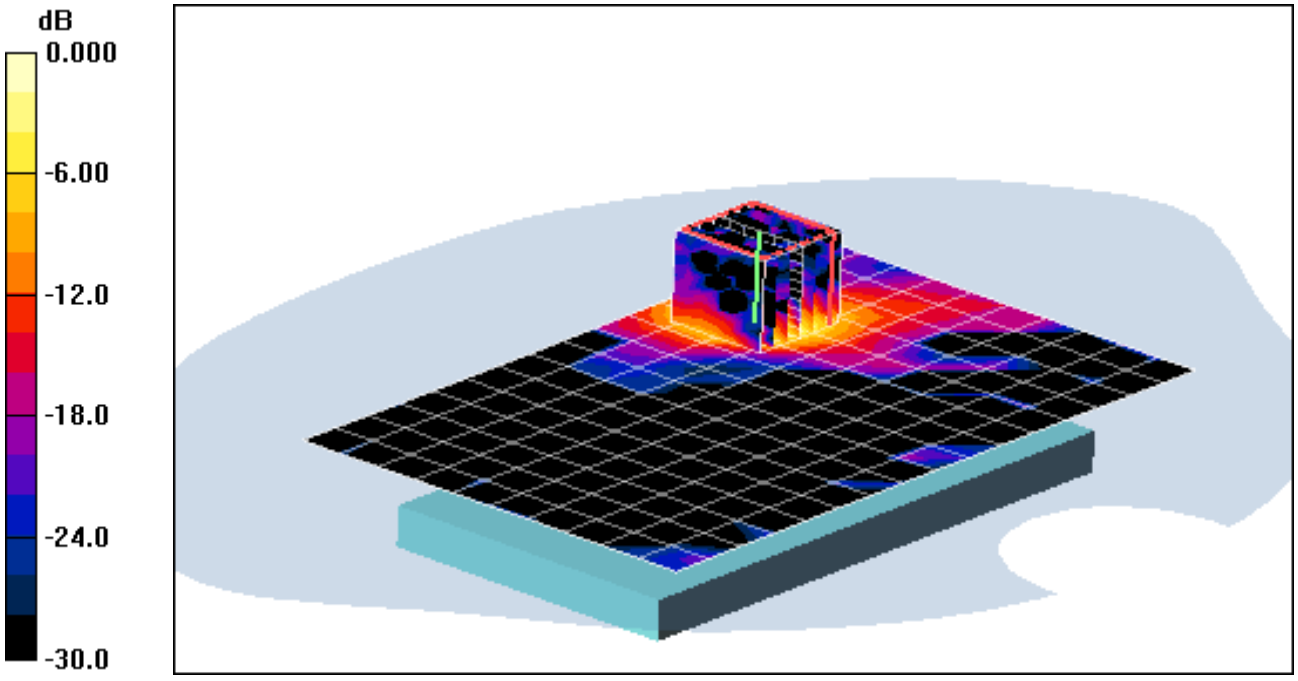
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5660 MHz; σ = 5.903 mho/m; ε_r = 46.51; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3589; ConvF(3.25, 3.25, 3.25); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11a, 5.5 GHz, Body SAR, Ch 132, 6 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.06 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.074 mW/g



0 dB = 0.570mW/g

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

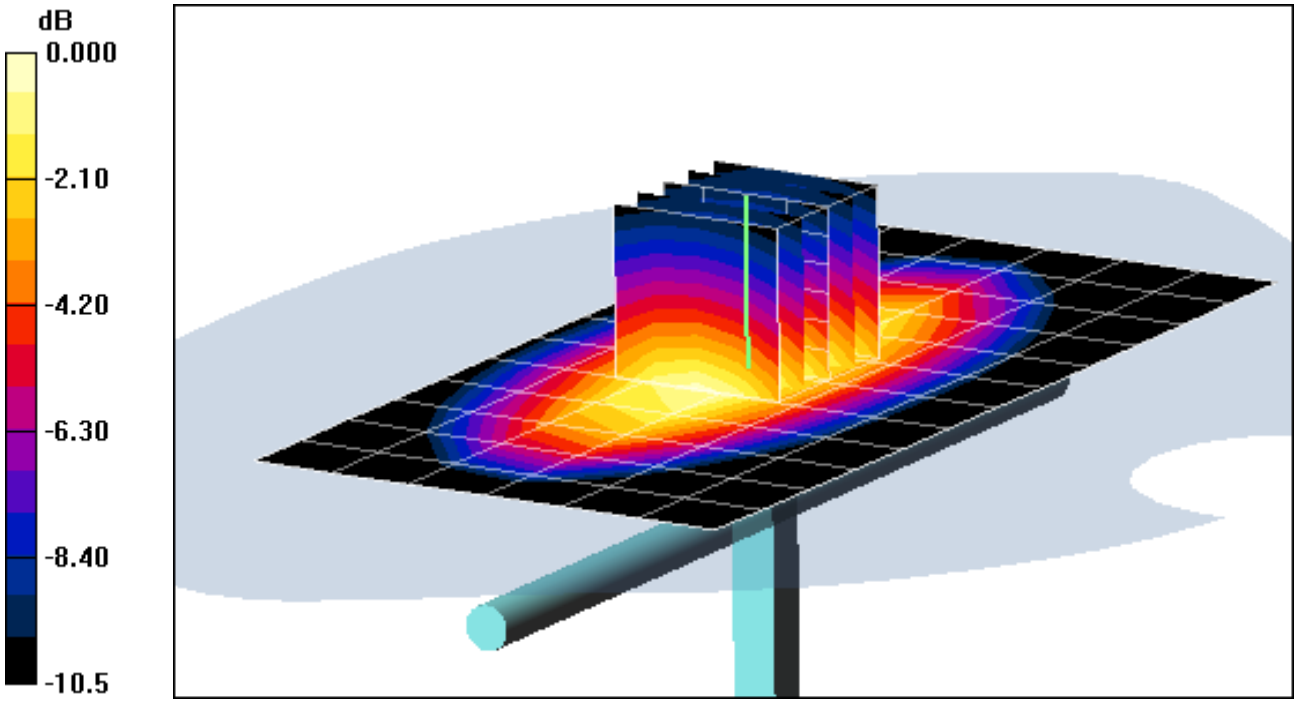
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.912 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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 (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) = 0.856 mW/g; SAR(10 g) = 0.558 mW/g
Deviation = 1.90 %



0 dB = 0.928mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

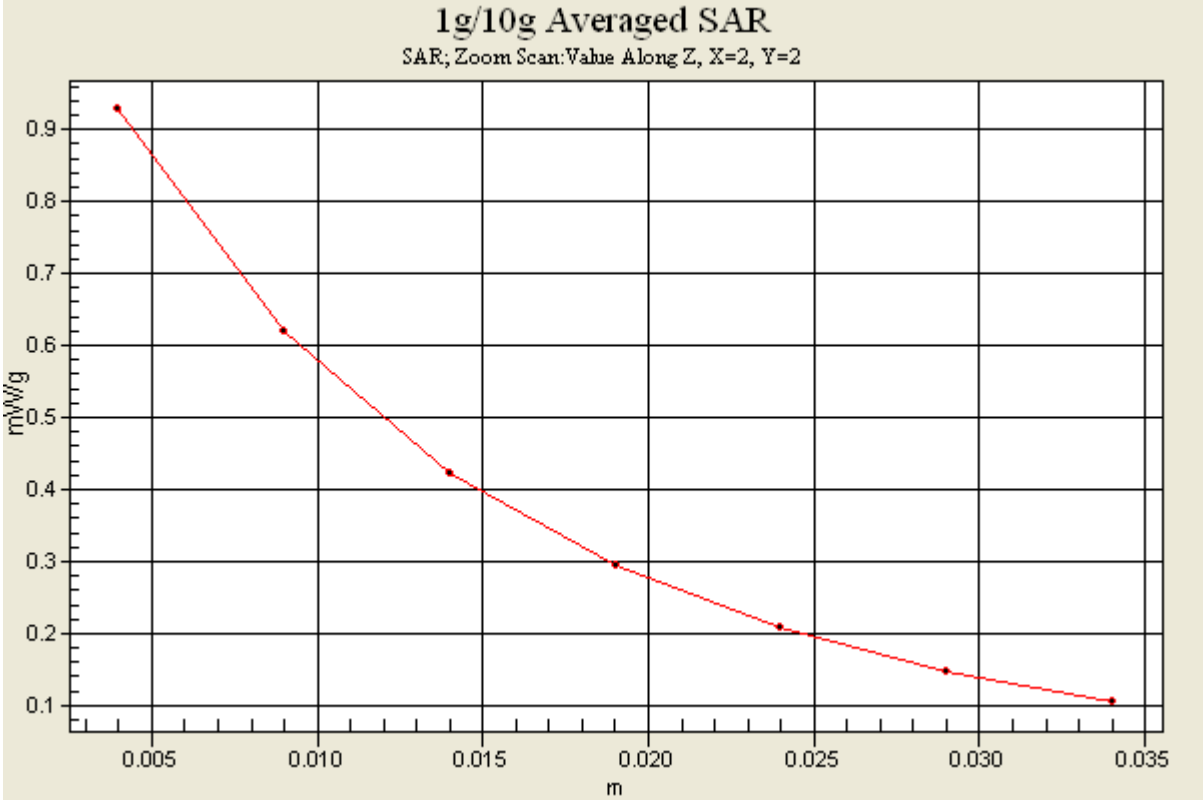
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.912 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.26, 6.26, 6.26); Calibrated: 3/24/2011
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 (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) = 0.856 mW/g; SAR(10 g) = 0.558 mW/g
Deviation = 1.90 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

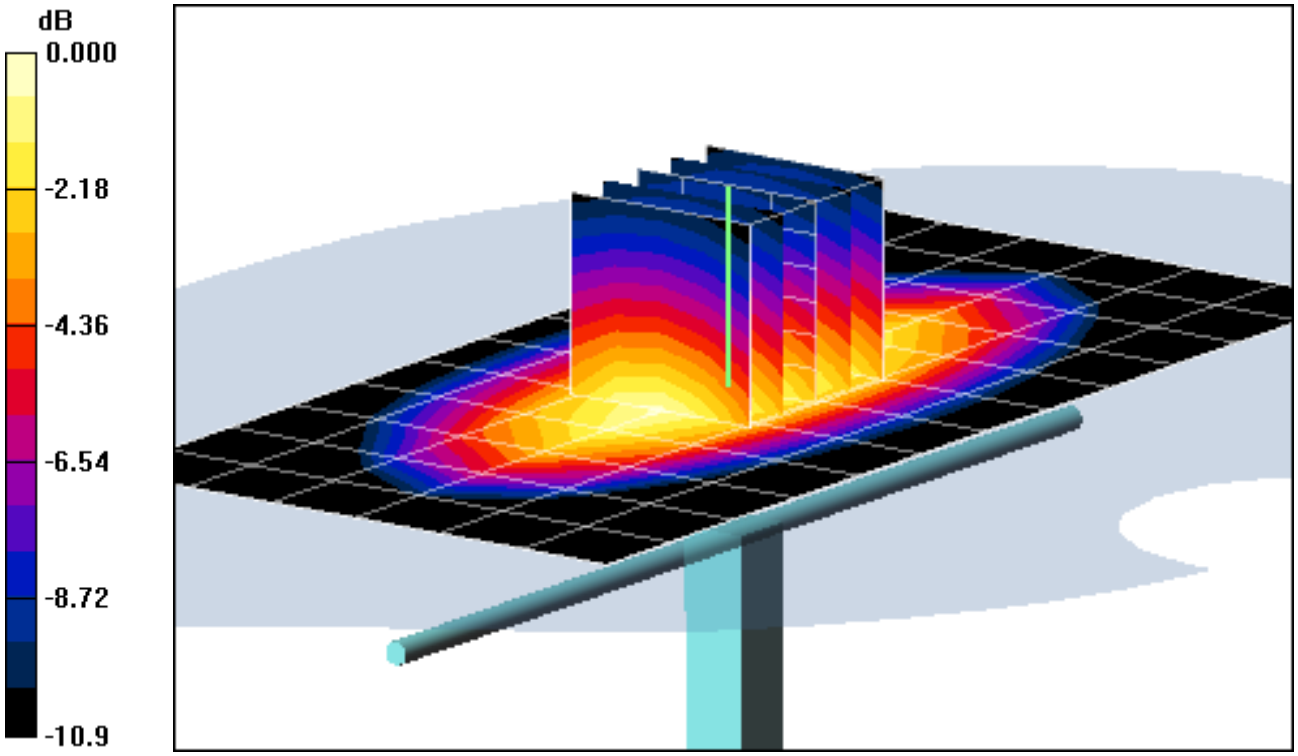
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.921 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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 mW/g; SAR(10 g) = 0.648 mW/g
Deviation = 5.71 %



0 dB = 1.08mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

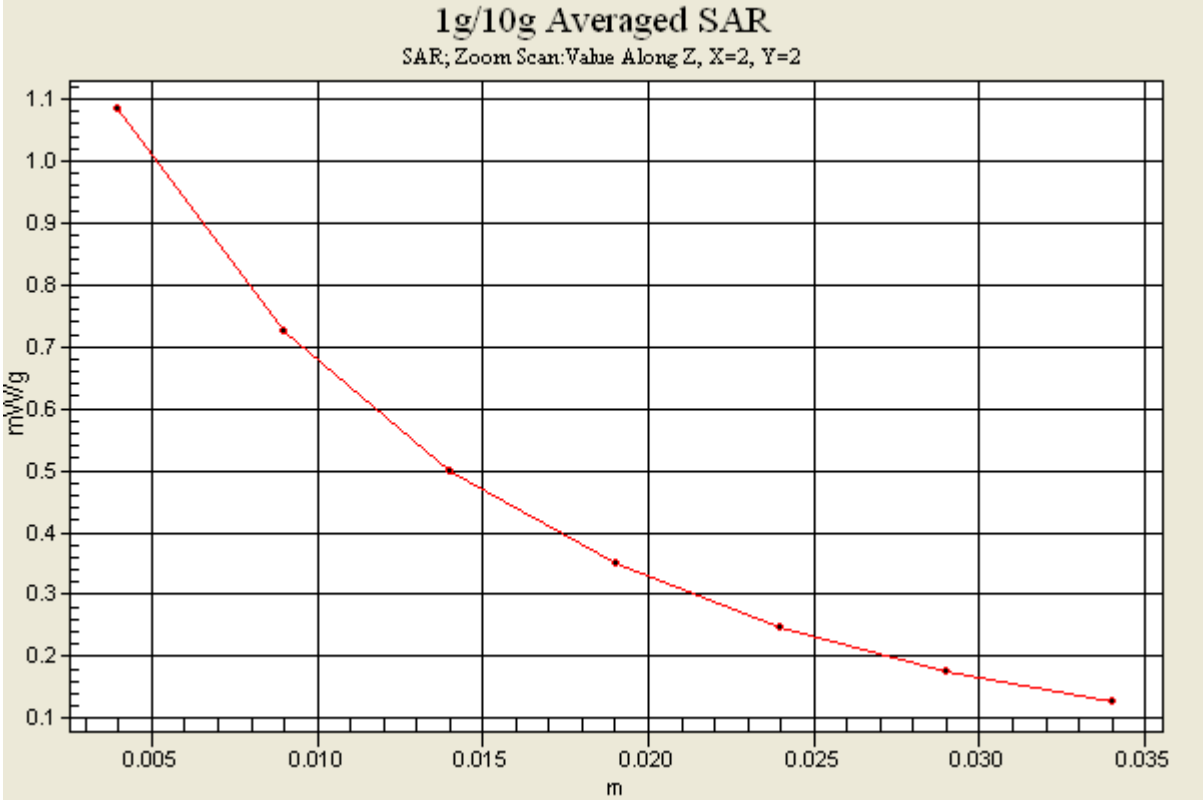
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.921 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.05, 6.05, 6.05); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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 mW/g; SAR(10 g) = 0.648 mW/g
Deviation = 5.71 %



PCTEST ENGINEERING LABORATORY, INC.

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

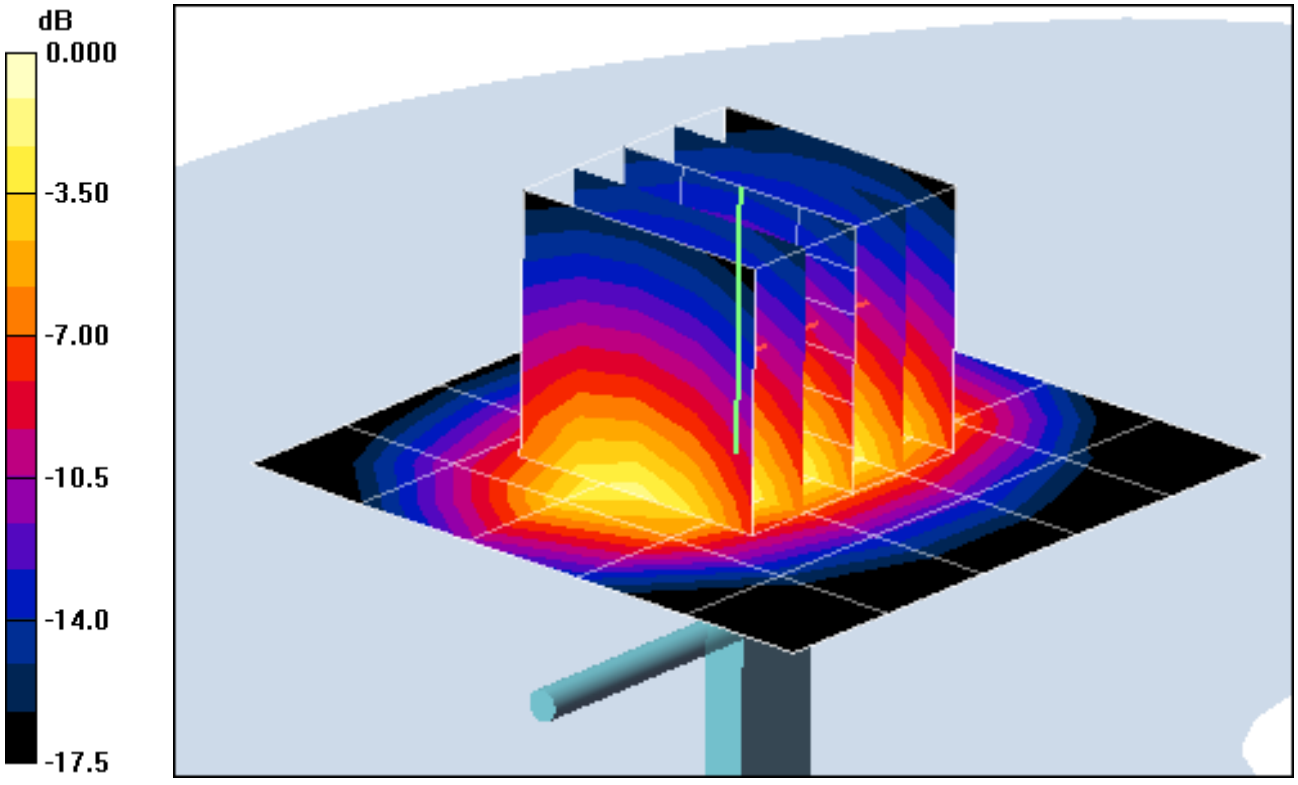
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.41 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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) = 3.62 mW/g; SAR(10 g) = 1.87 mW/g
Deviation = -2.16 %



0 dB = 4.07mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

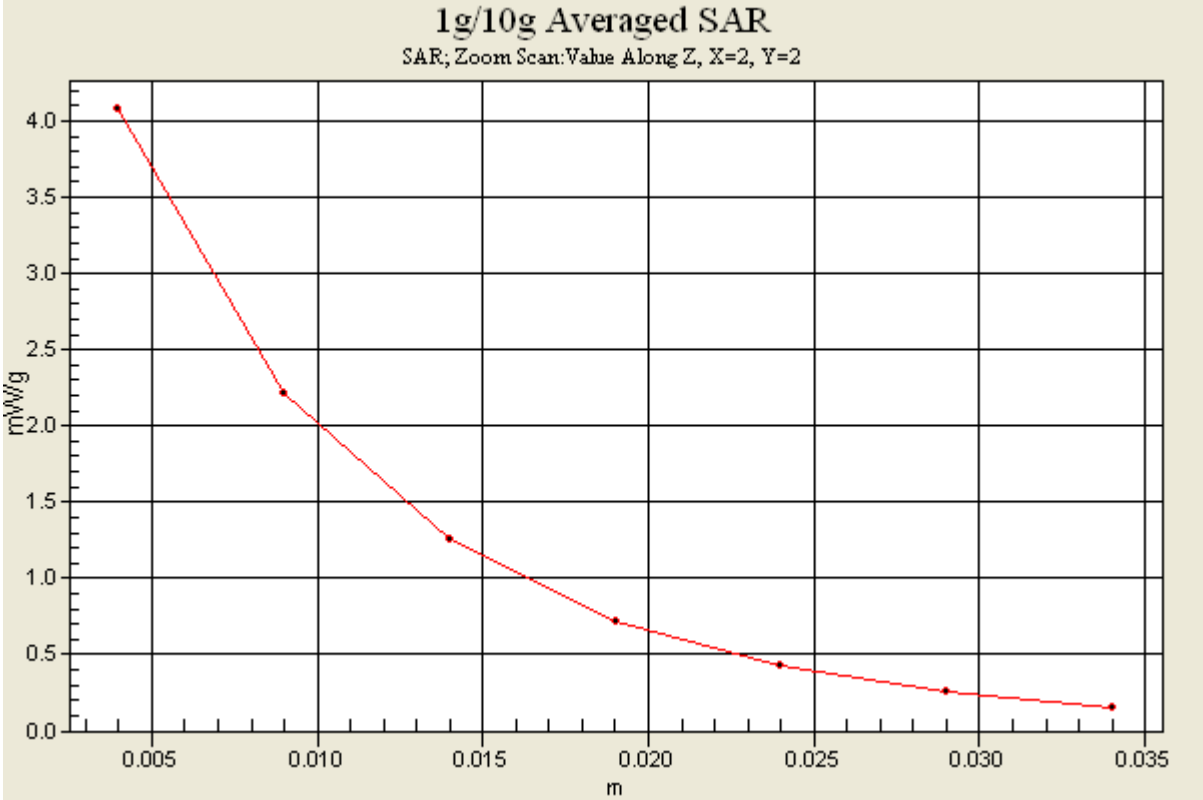
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.41 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3213; ConvF(5.2, 5.2, 5.2); Calibrated: 3/24/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1750 MHz System Verification

Area Scan (6x6x1): 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) = 3.62 mW/g; SAR(10 g) = 1.87 mW/g
Deviation = -2.16 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

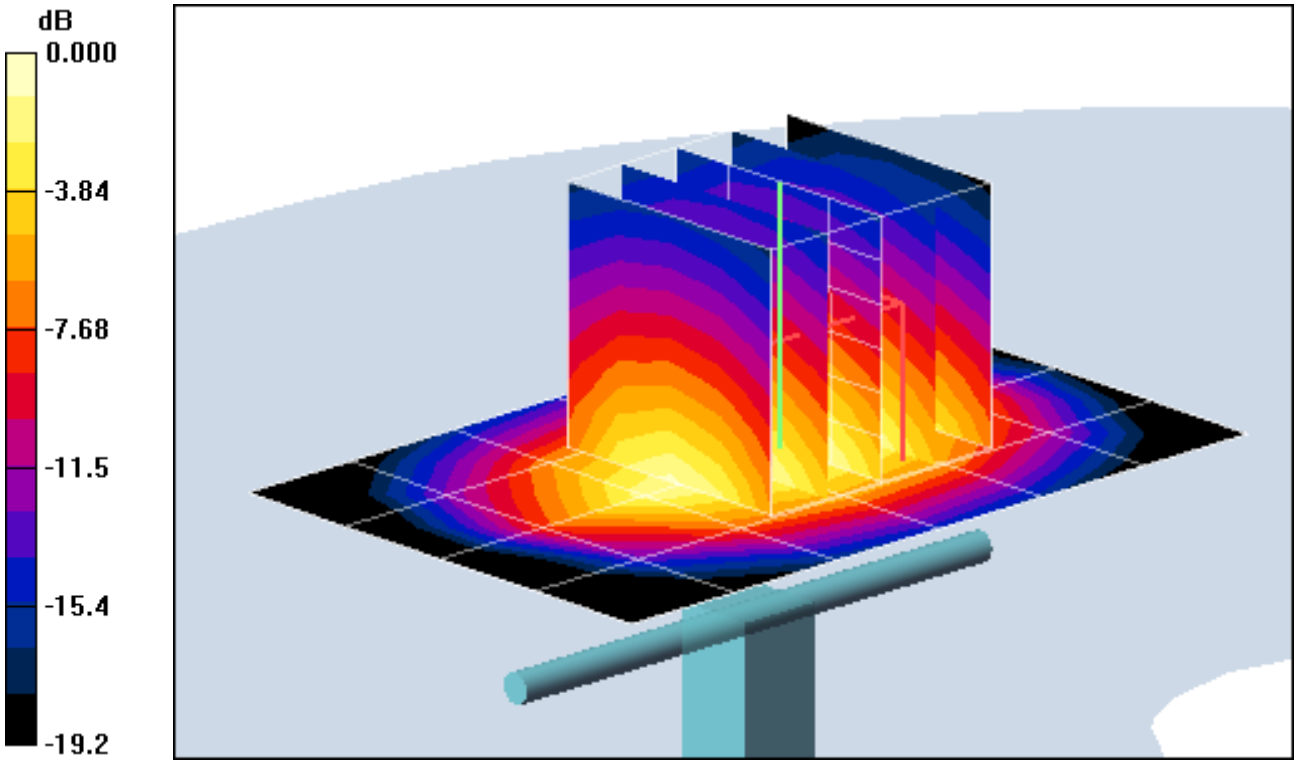
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 1.51 mW/g; SAR(10 g) = 0.789 mW/g
Deviation = -4.43 %



0 dB = 1.65mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

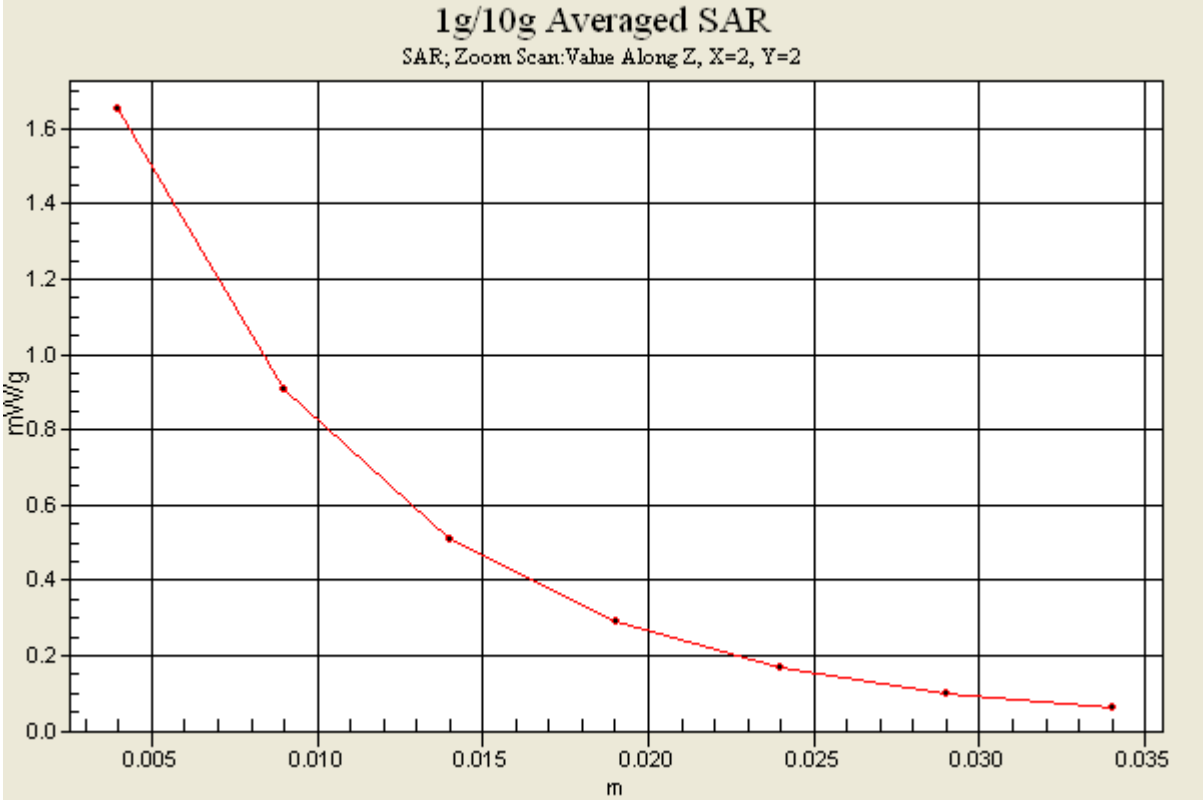
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV2 - SN3022; ConvF(4.98, 4.98, 4.98); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 1.51 mW/g; SAR(10 g) = 0.789 mW/g
Deviation = -4.43 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

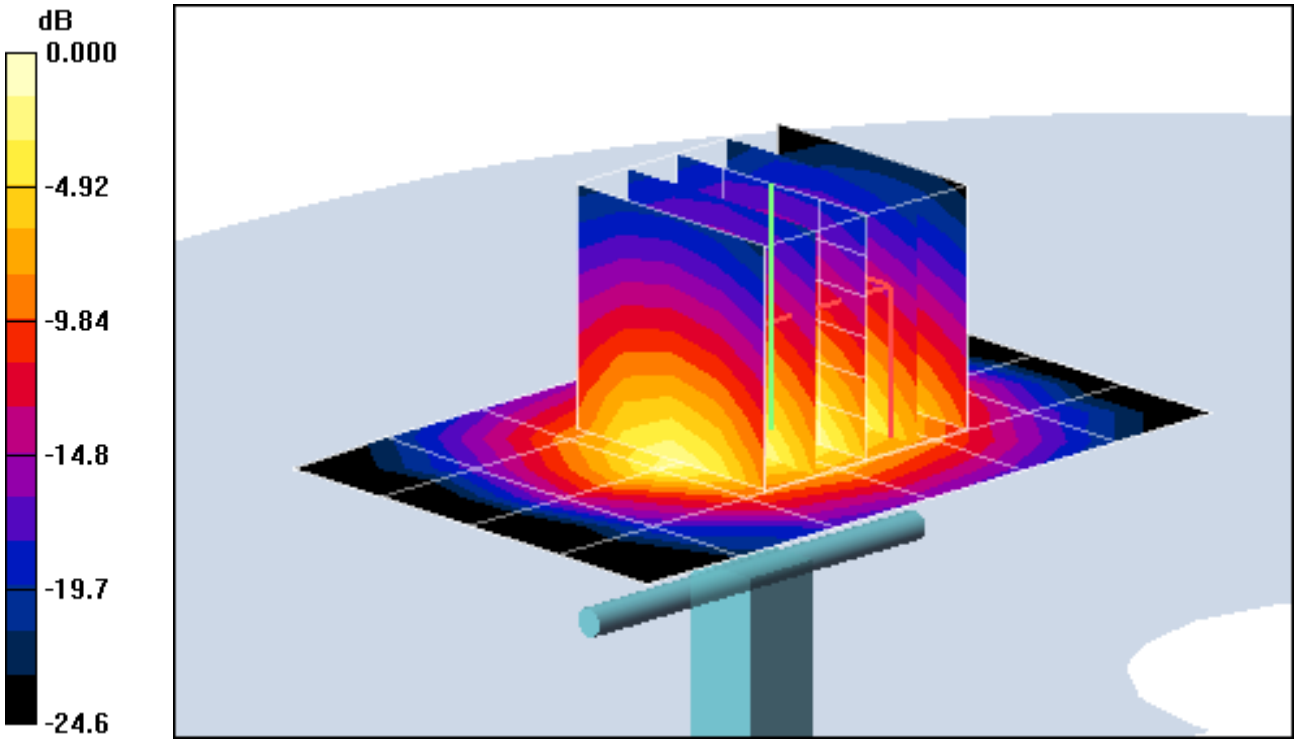
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.83 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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) = 2.04 mW/g; SAR(10 g) = 0.936 mW/g
Deviation = -5.20 %



0 dB = 2.65mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

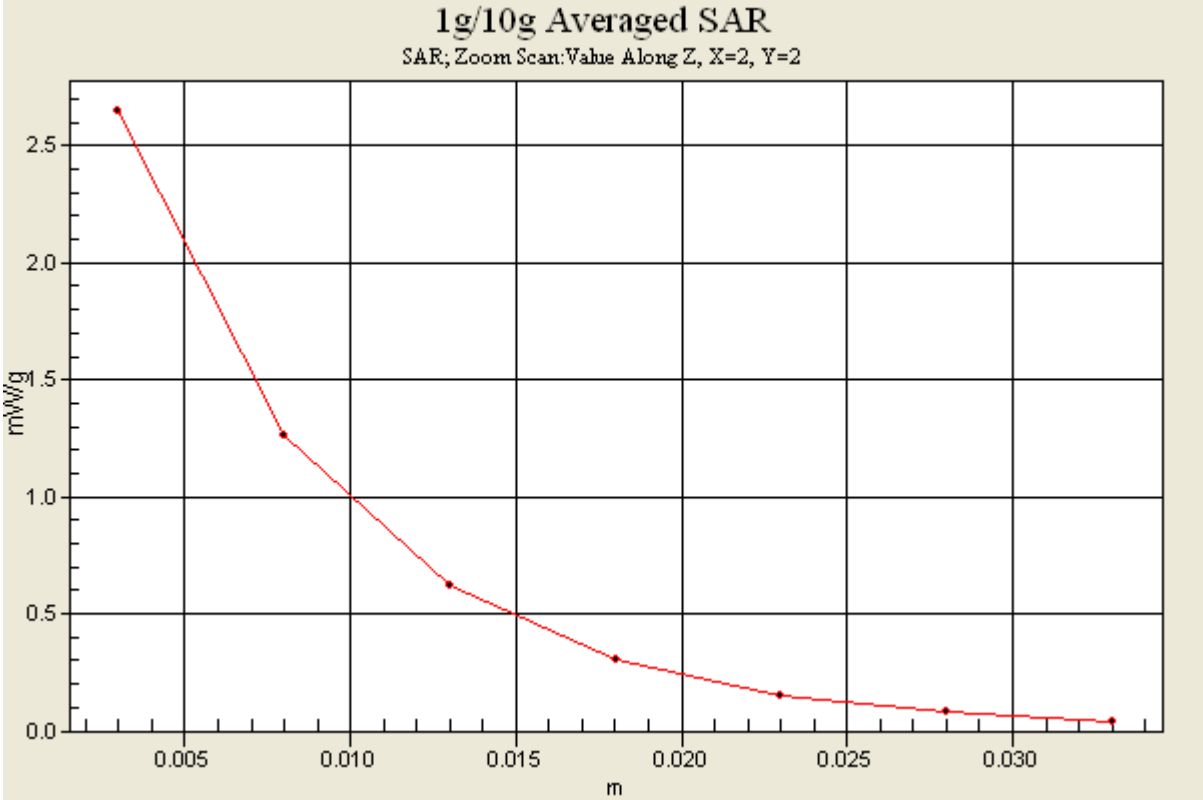
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.83 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(4.3, 4.3, 4.3); Calibrated: 8/25/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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) = 2.04 mW/g; SAR(10 g) = 0.936 mW/g
Deviation = -5.20 %



PCTEST ENGINEERING LABORATORY, INC.

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

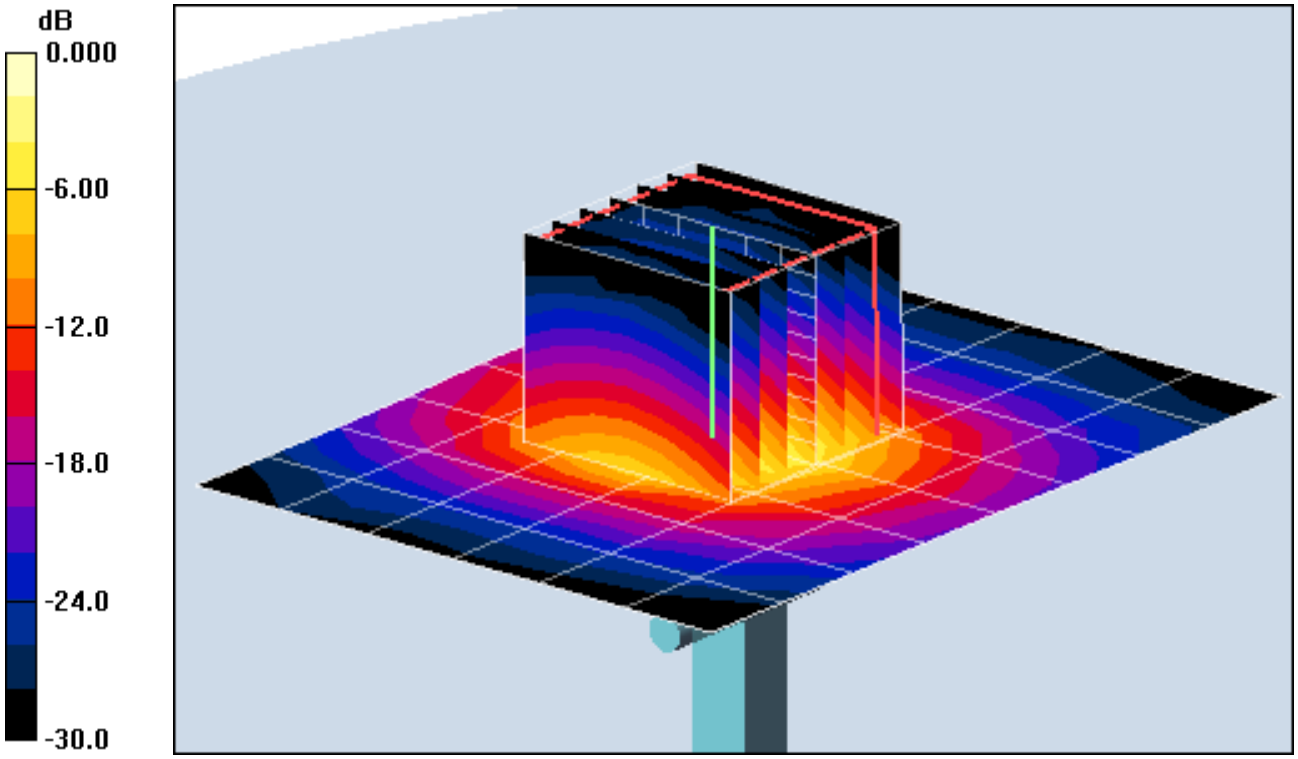
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.553 mho/m; ε_r = 35.71; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 23.8° C; Tissue Temp: 22.7° C

Probe: EX3DV4 - SN3589; ConvF(4.59, 4.59, 4.59); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.27 mW/g; SAR(10 g) = 2.04 mW/g
Deviation = -8.90 %



0 dB = 15.2mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

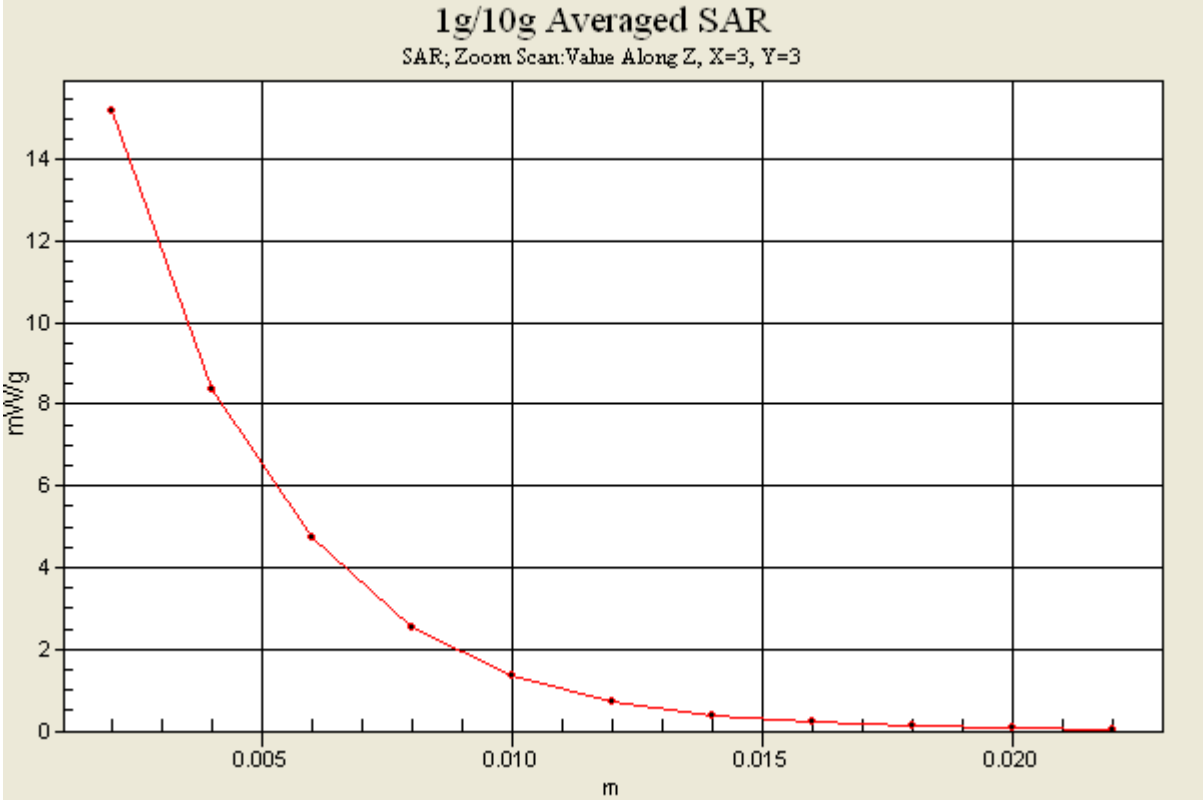
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5200 MHz; σ = 4.553 mho/m; ε_r = 35.71; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 23.8° C; Tissue Temp: 22.7° C

Probe: EX3DV4 - SN3589; ConvF(4.59, 4.59, 4.59); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.27 mW/g; SAR(10 g) = 2.04 mW/g
Deviation = -8.90 %



PCTEST ENGINEERING LABORATORY, INC.

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

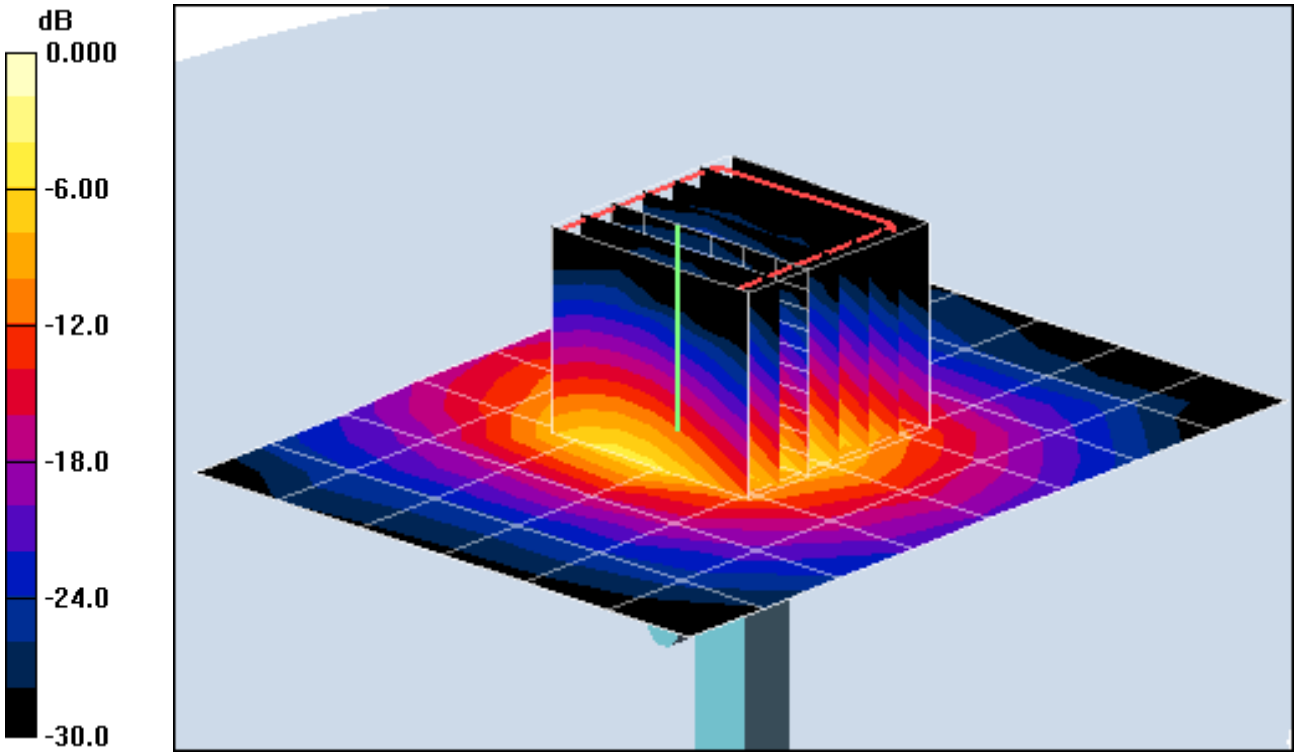
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5500 MHz; σ = 4.847 mho/m; ε_r = 35.27; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3589; ConvF(4.33, 4.33, 4.33); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.17 mW/g
Deviation = -8.46 %



0 dB = 15.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

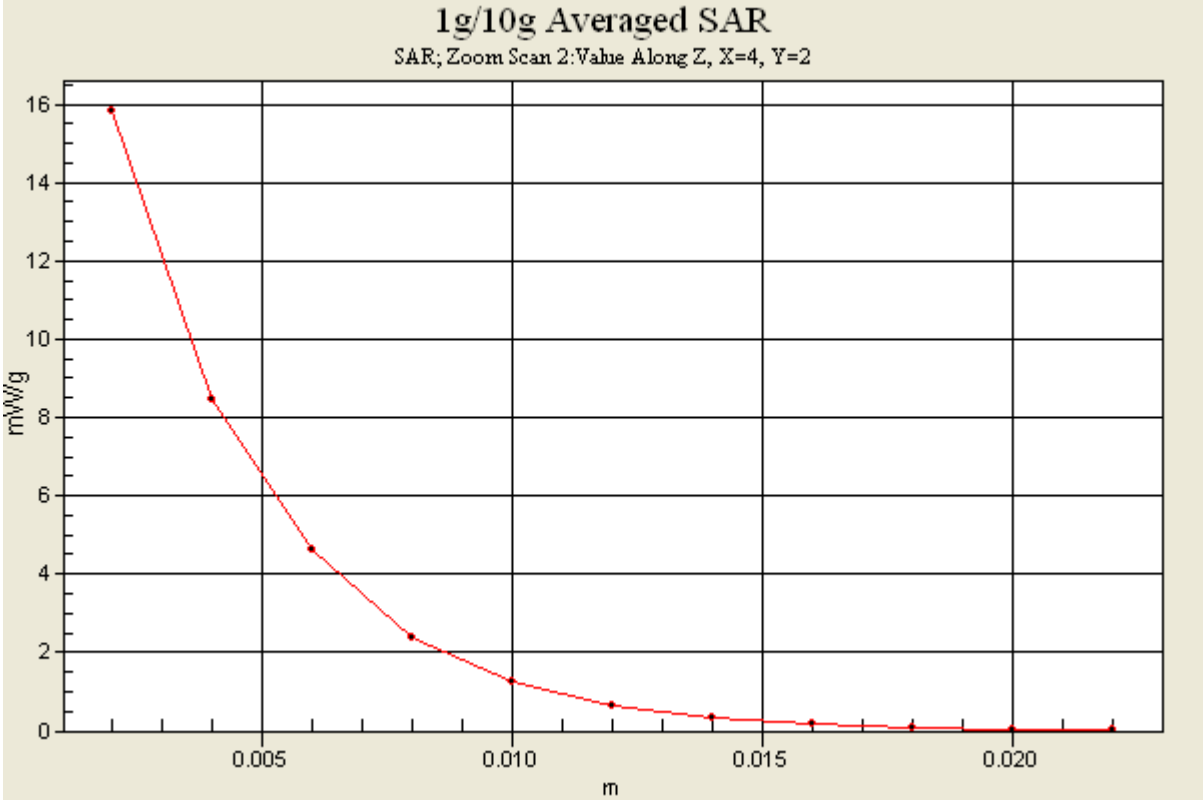
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5500 MHz; σ = 4.847 mho/m; ε_r = 35.27; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3589; ConvF(4.33, 4.33, 4.33); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.17 mW/g
Deviation = -8.46 %



PCTEST ENGINEERING LABORATORY, INC.

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

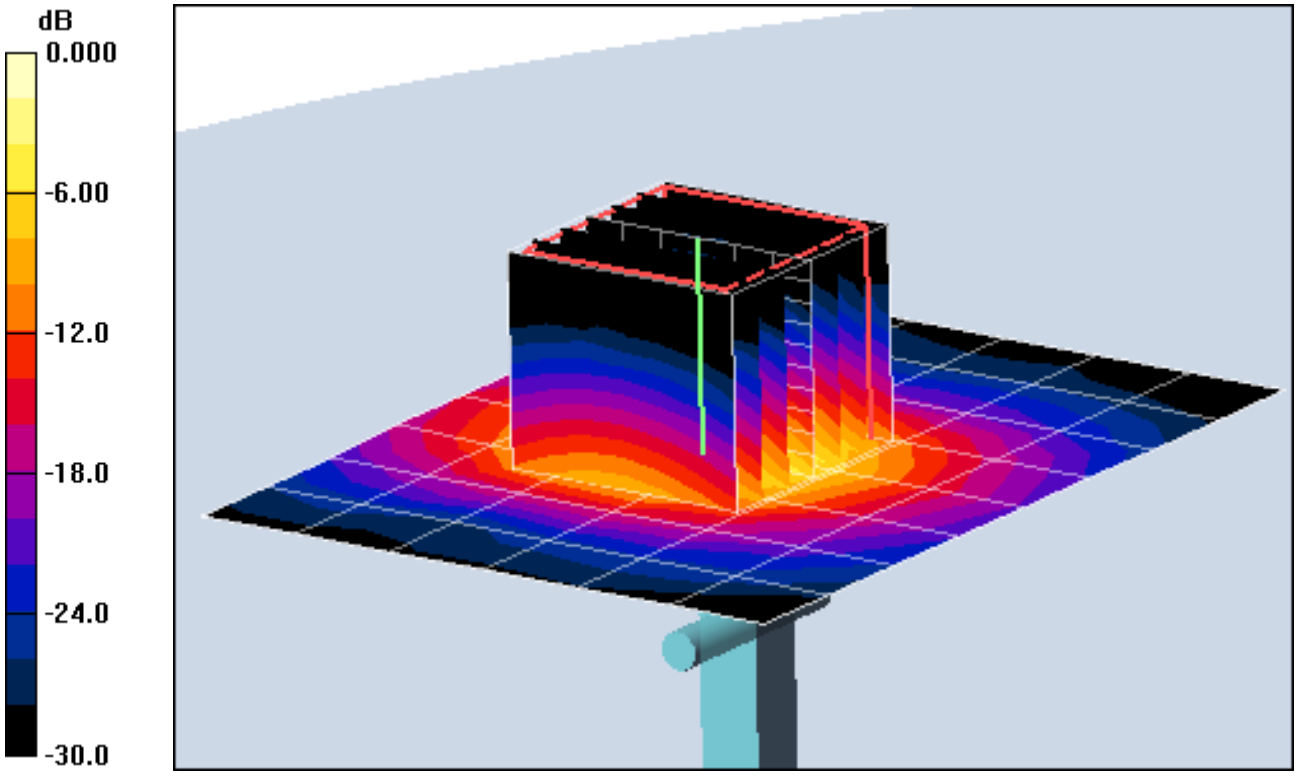
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5800 MHz; σ = 5.159 mho/m; ε_r = 34.94; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.0° C; Tissue Temp: 22.9° C

Probe: EX3DV4 - SN3589; ConvF(4.05, 4.05, 4.05); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.58 mW/g; SAR(10 g) = 2.11 mW/g
Deviation = -4.53 %



0 dB = 15.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

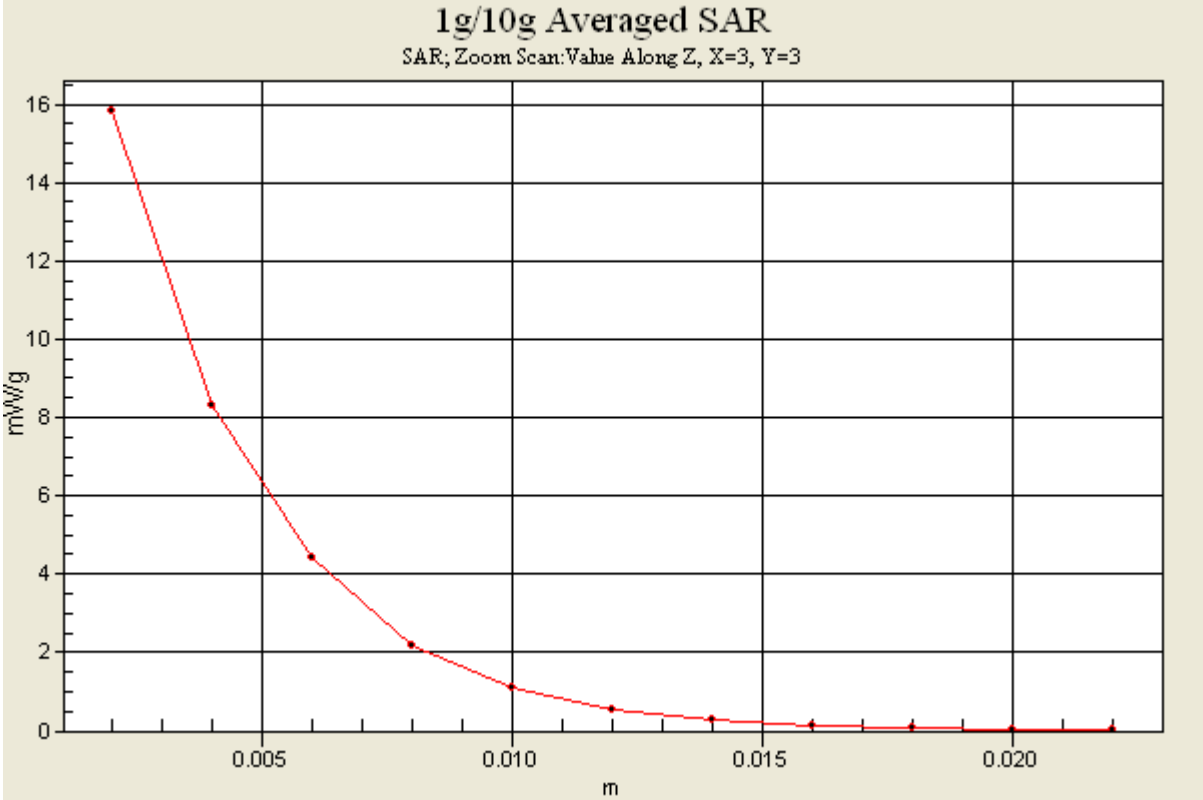
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5800 MHz; σ = 5.159 mho/m; ε_r = 34.94; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.0° C; Tissue Temp: 22.9° C

Probe: EX3DV4 - SN3589; ConvF(4.05, 4.05, 4.05); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.58 mW/g; SAR(10 g) = 2.11 mW/g
Deviation = -4.53 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

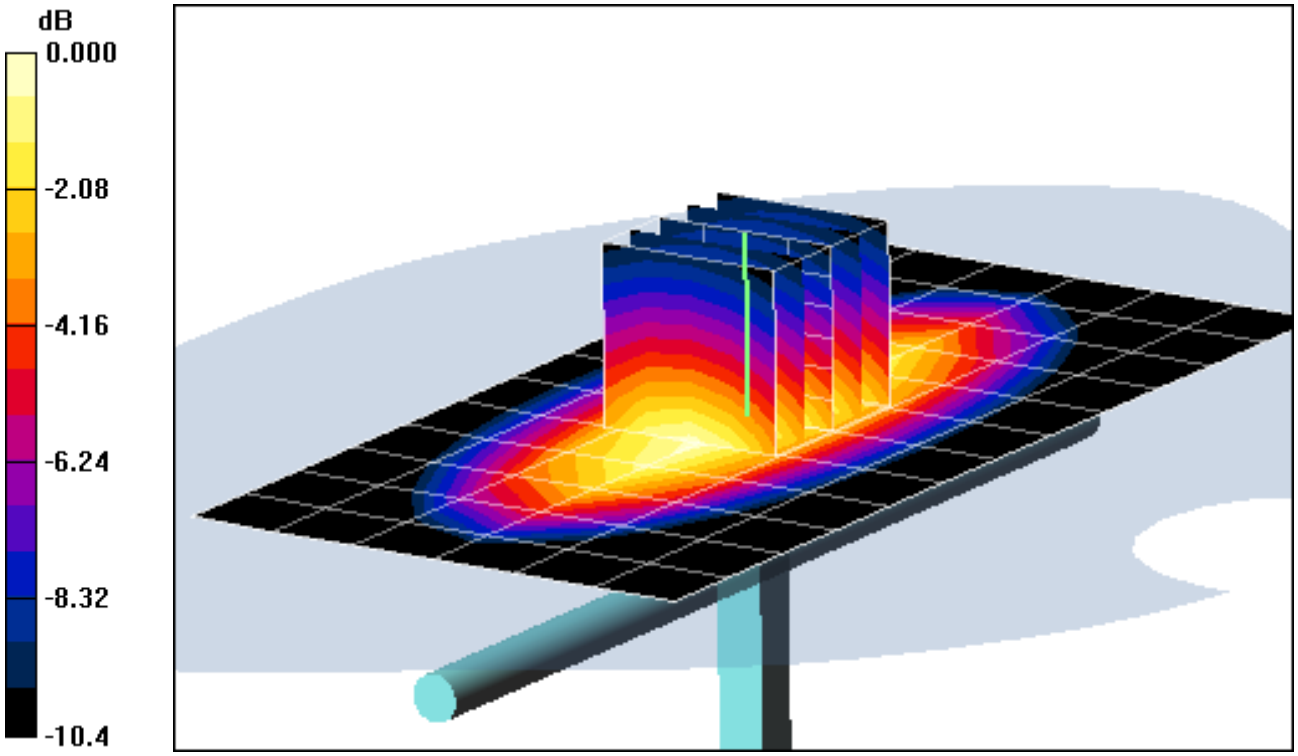
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
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) = 0.917 mW/g; SAR(10 g) = 0.602 mW/g
Deviation = 4.20 %



0 dB = 0.995mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

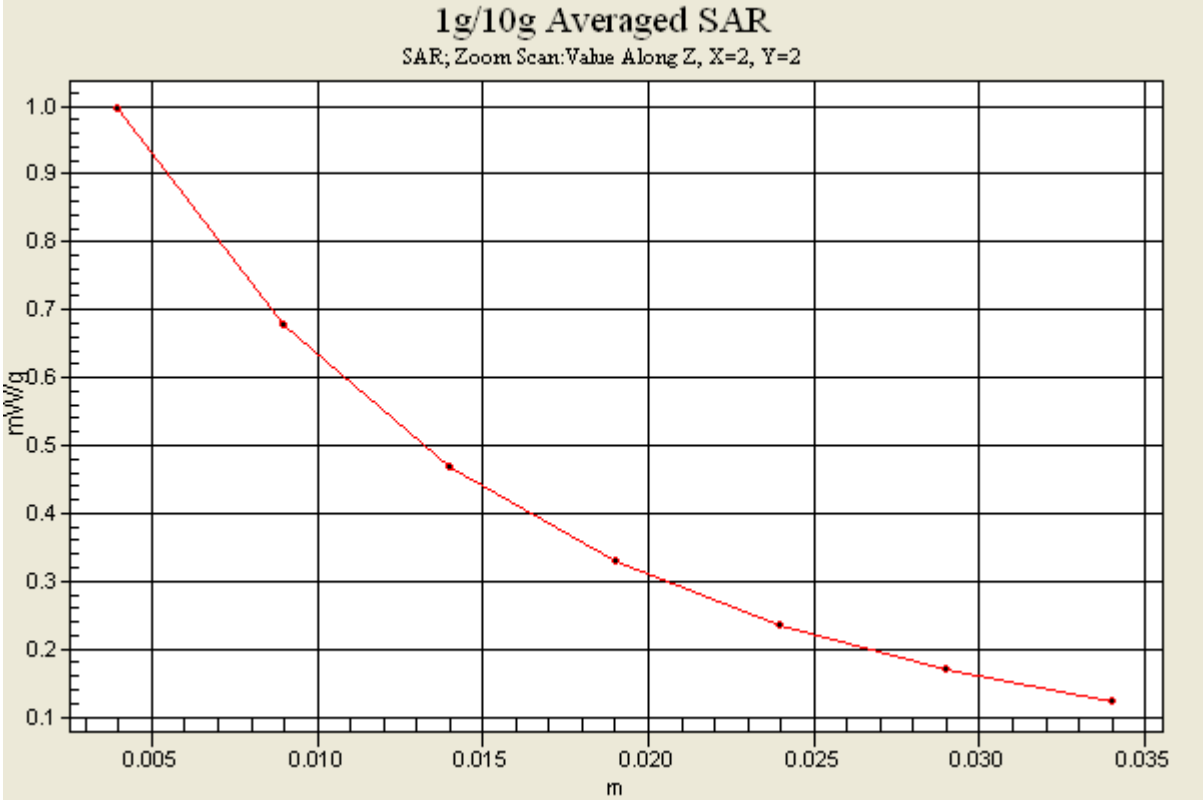
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 740 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 23.1° C

Probe: ES3DV3 - SN3213; ConvF(6.03, 6.03, 6.03); Calibrated: 3/24/2011
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) = 0.917 mW/g; SAR(10 g) = 0.602 mW/g
Deviation = 4.20 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

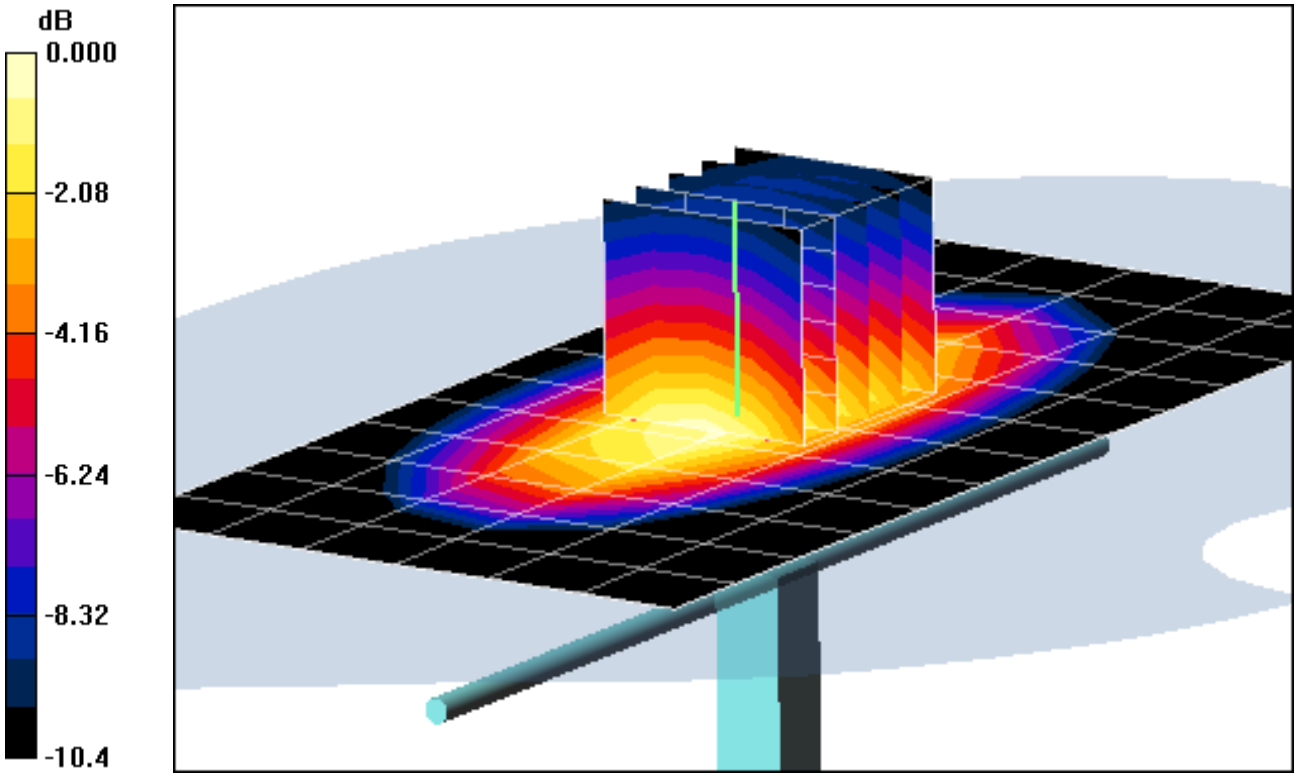
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.972 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4° C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 0.965 mW/g; SAR(10 g) = 0.636 mW/g
Deviation = -0.10 %



0 dB = 1.04mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d026

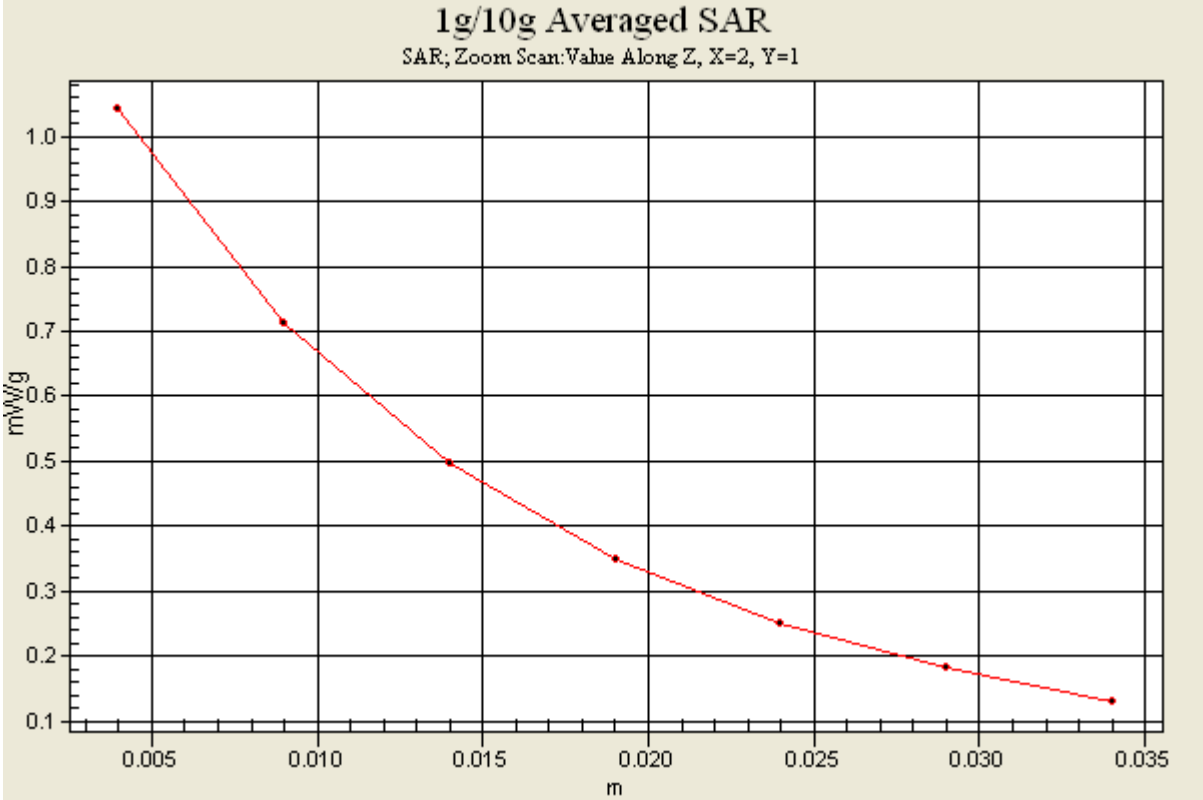
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.972 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-23-2012; Ambient Temp: 23.2°C; Tissue Temp: 22.4° C

Probe: ES3DV2 - SN3022; ConvF(6.06, 6.06, 6.06); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 0.965 mW/g; SAR(10 g) = 0.636 mW/g
Deviation = -0.10 %



PCTEST ENGINEERING LABORATORY, INC.

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

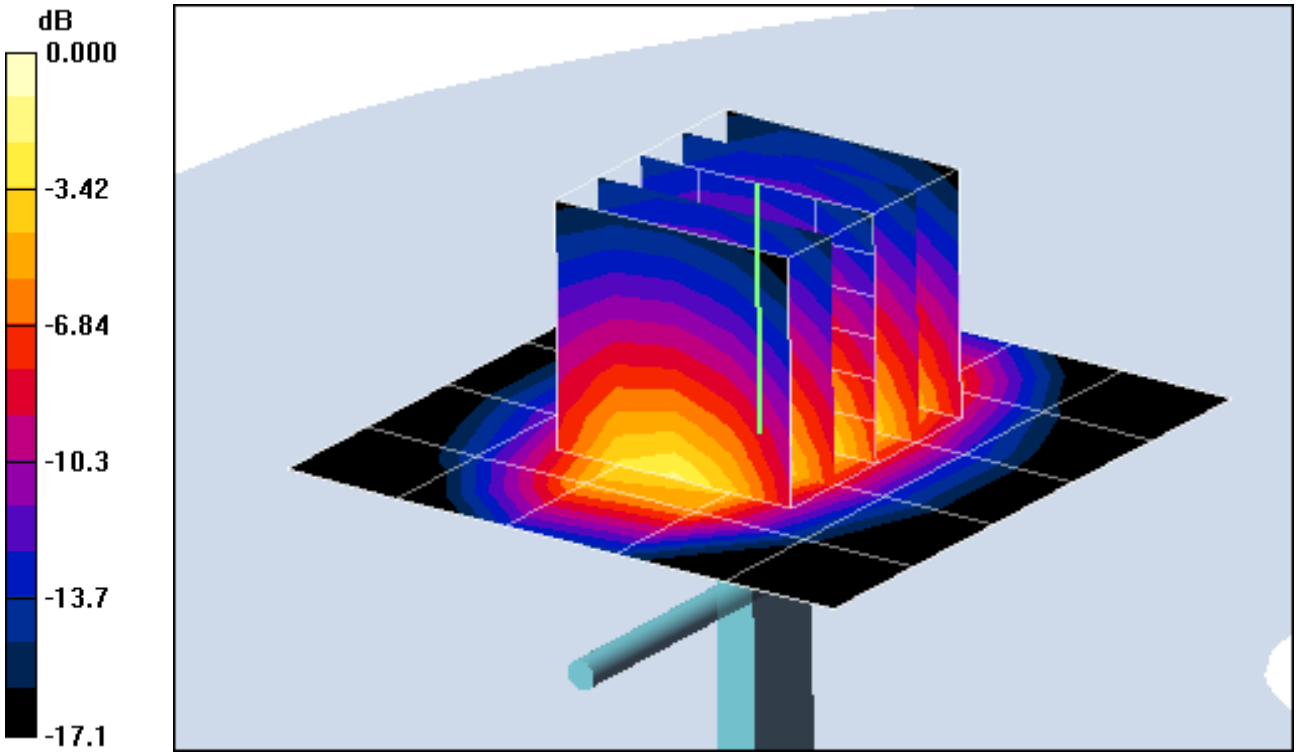
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.51 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
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 = 20.0 dBm (100 mW)
SAR(1 g) = 3.98 mW/g; SAR(10 g) = 2.08 mW/g
Deviation = 7.57 %



0 dB = 4.47mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

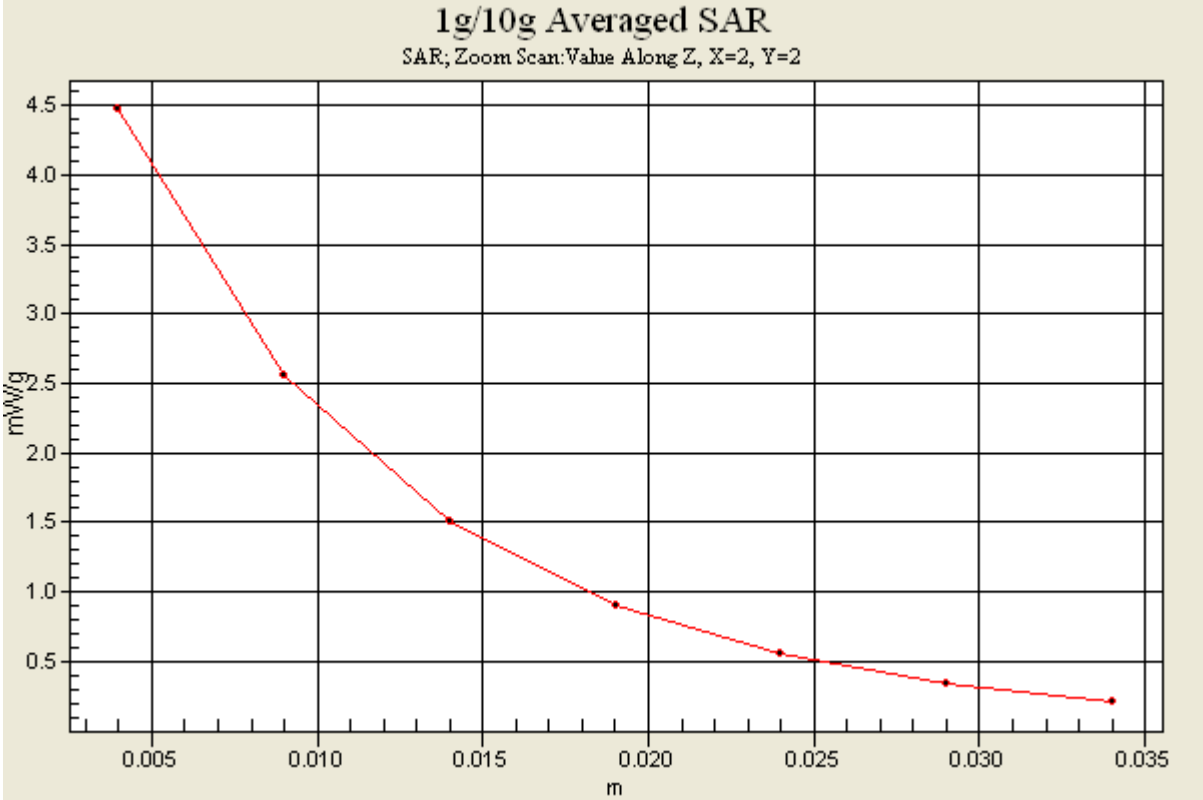
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.51 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-21-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3213; ConvF(4.81, 4.81, 4.81); Calibrated: 3/24/2011
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 = 20.0 dBm (100 mW)
SAR(1 g) = 3.98 mW/g; SAR(10 g) = 2.08 mW/g
Deviation = 7.57 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

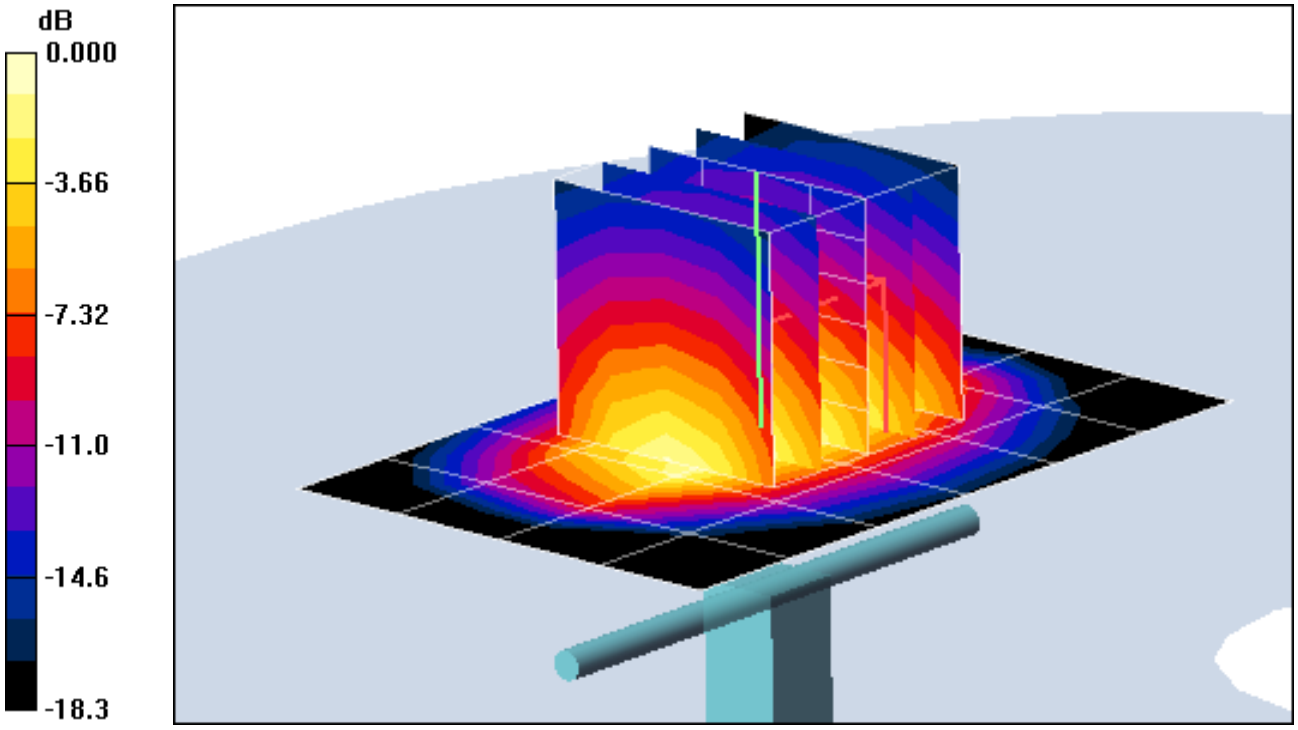
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.58 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 1.64 mW/g; SAR(10 g) = 0.867 mW/g
Deviation = -0.97 %



0 dB = 1.77mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

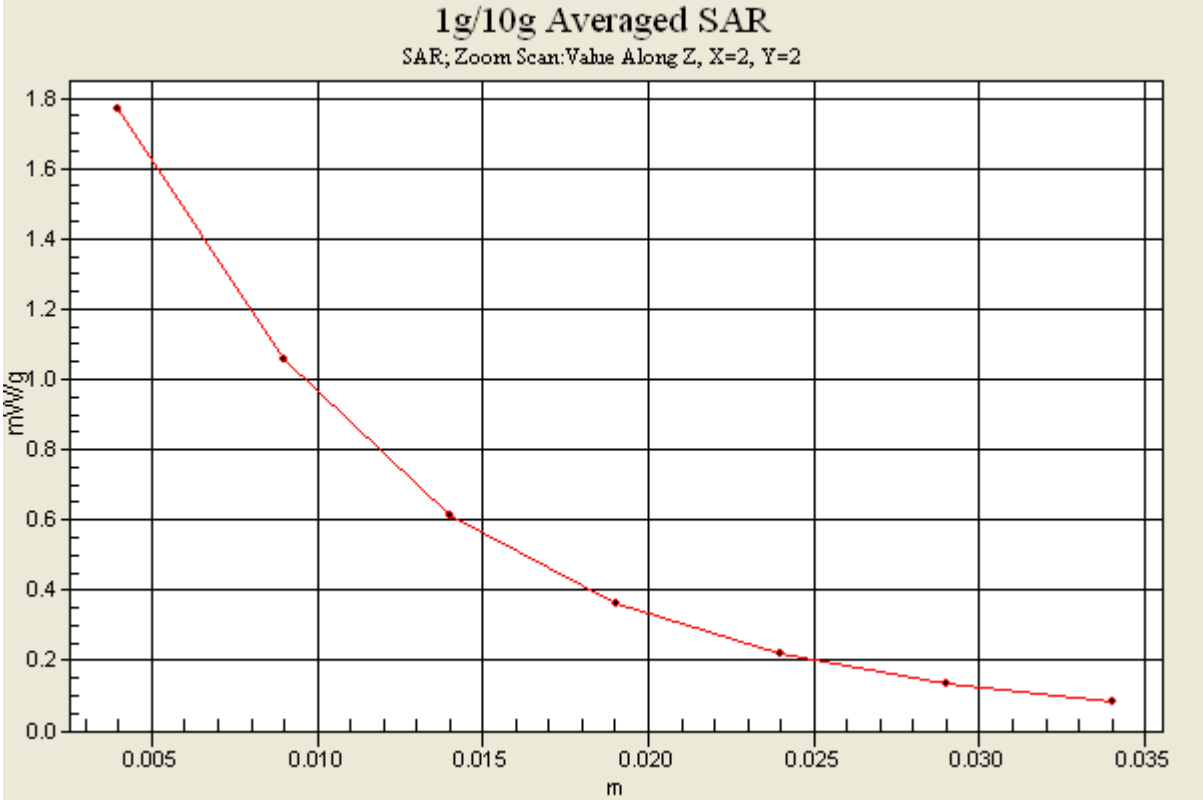
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.58 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-22-2012; Ambient Temp: 22.5°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(4.41, 4.41, 4.41); Calibrated: 8/25/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/19/2011
Phantom: SAM Sub Dasy B; Type: SAM 4.0; Serial: TP-1626
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
SAR(1 g) = 1.64 mW/g; SAR(10 g) = 0.867 mW/g
Deviation = -0.97 %



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

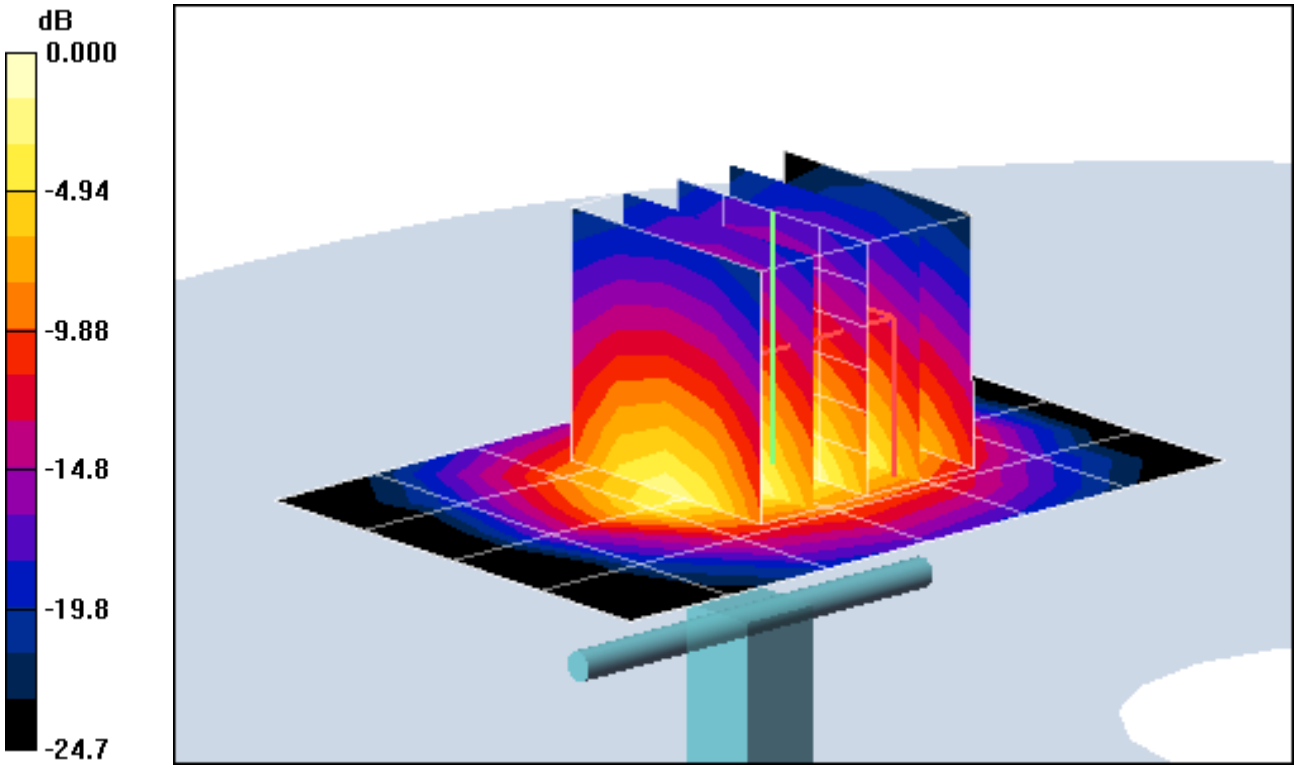
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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

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) = 2.09 mW/g; SAR(10 g) = 0.949 mW/g
Deviation = 1.85 %



0 dB = 2.73mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

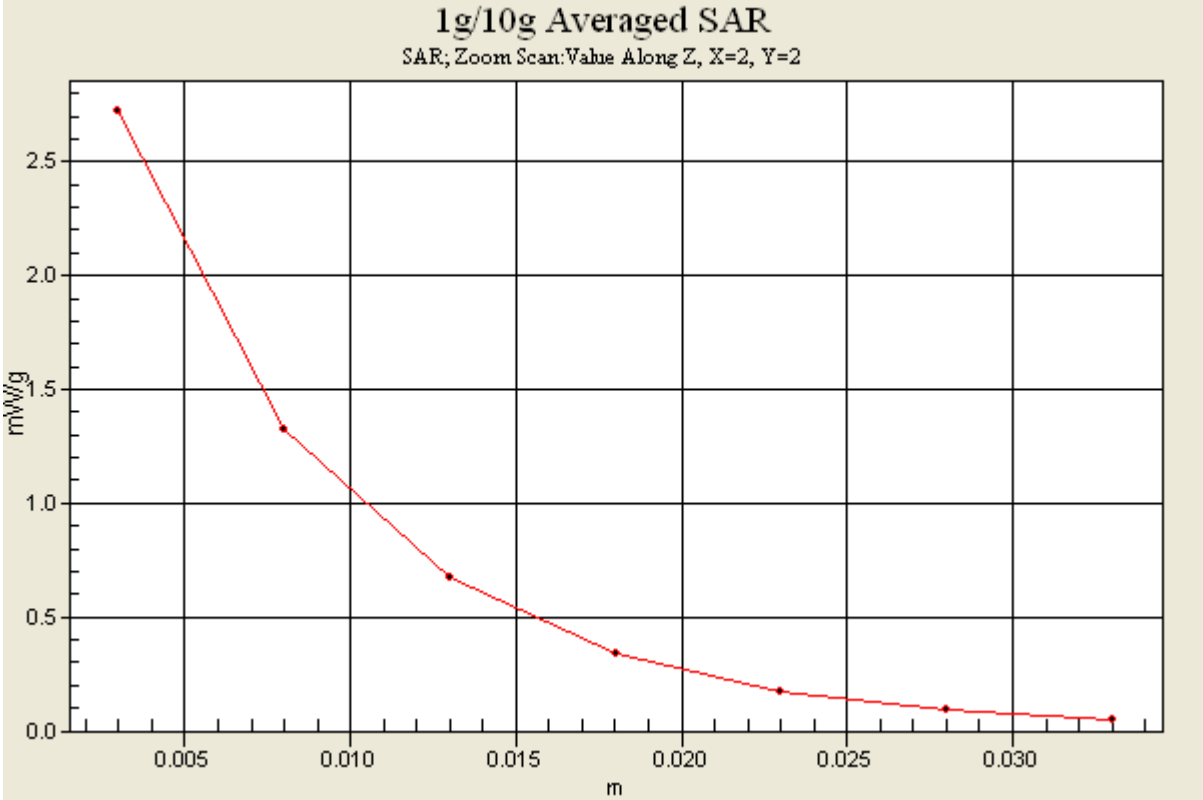
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.97 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2012; Ambient Temp: 23.3°C; Tissue Temp: 22.4°C

Probe: ES3DV2 - SN3022; ConvF(4.01, 4.01, 4.01); Calibrated: 8/25/2011
Sensor-Surface: 3mm (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

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) = 2.09 mW/g; SAR(10 g) = 0.949 mW/g
Deviation = 1.85 %



PCTEST ENGINEERING LABORATORY, INC.

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

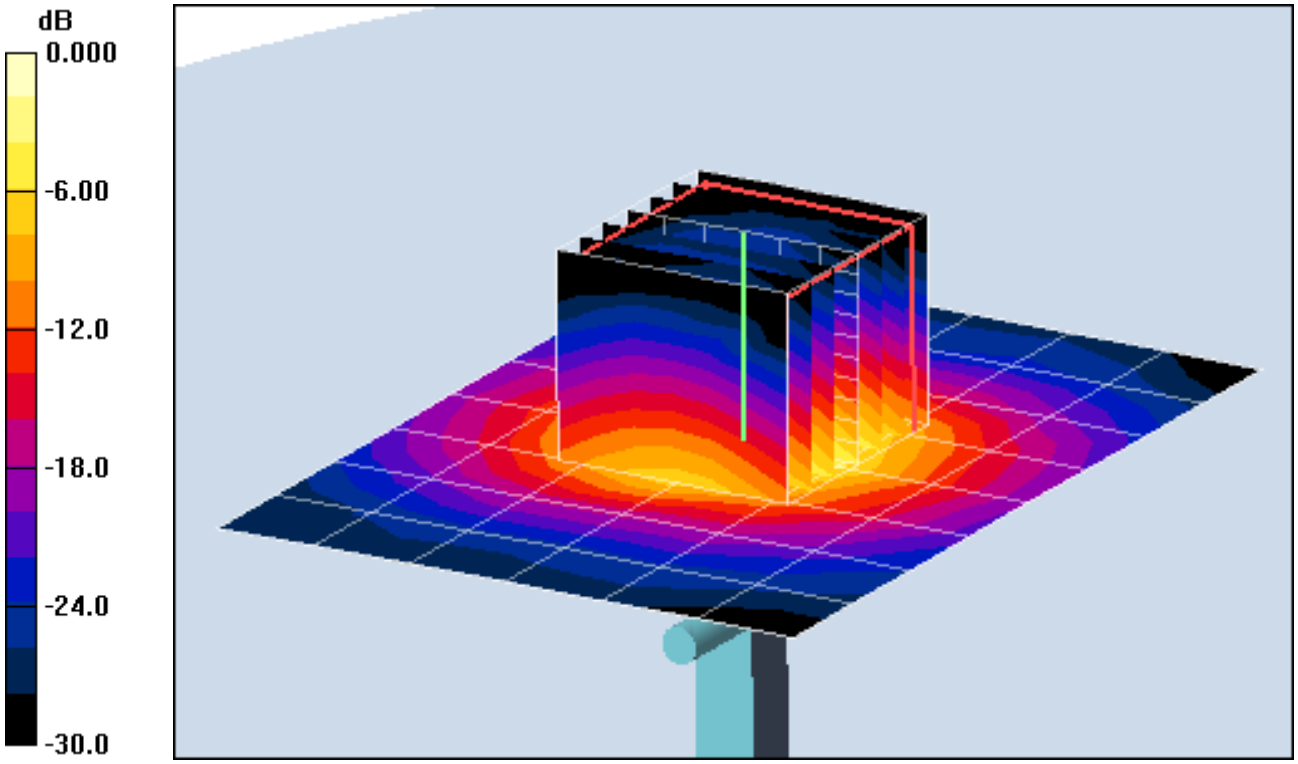
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.210 mho/m; ε_r = 47.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 23.8° C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3589; ConvF(3.92, 3.92, 3.92); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.79 mW/g; SAR(10 g) = 2.2 mW/g
Deviation = 3.18 %



0 dB = 15.7mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

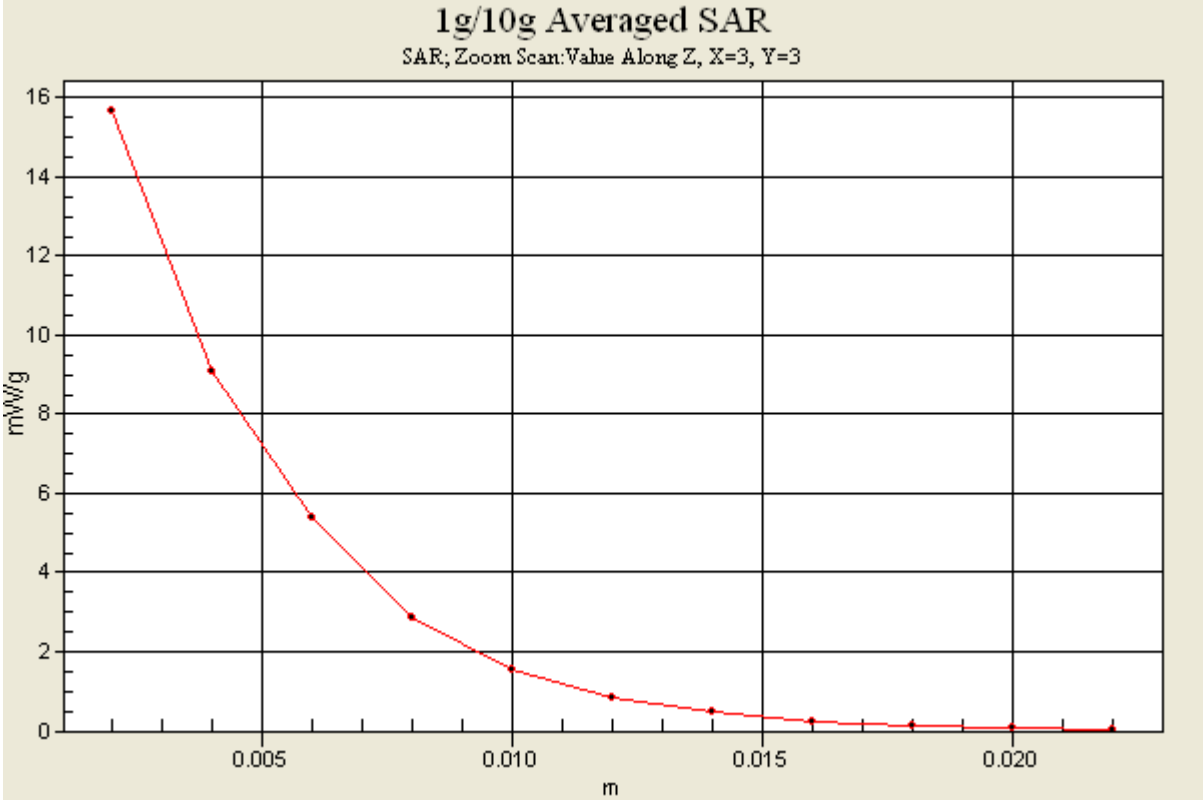
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.210 mho/m; ε_r = 47.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 23.8° C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3589; ConvF(3.92, 3.92, 3.92); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.79 mW/g; SAR(10 g) = 2.2 mW/g
Deviation = 3.18 %



PCTEST ENGINEERING LABORATORY, INC.

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

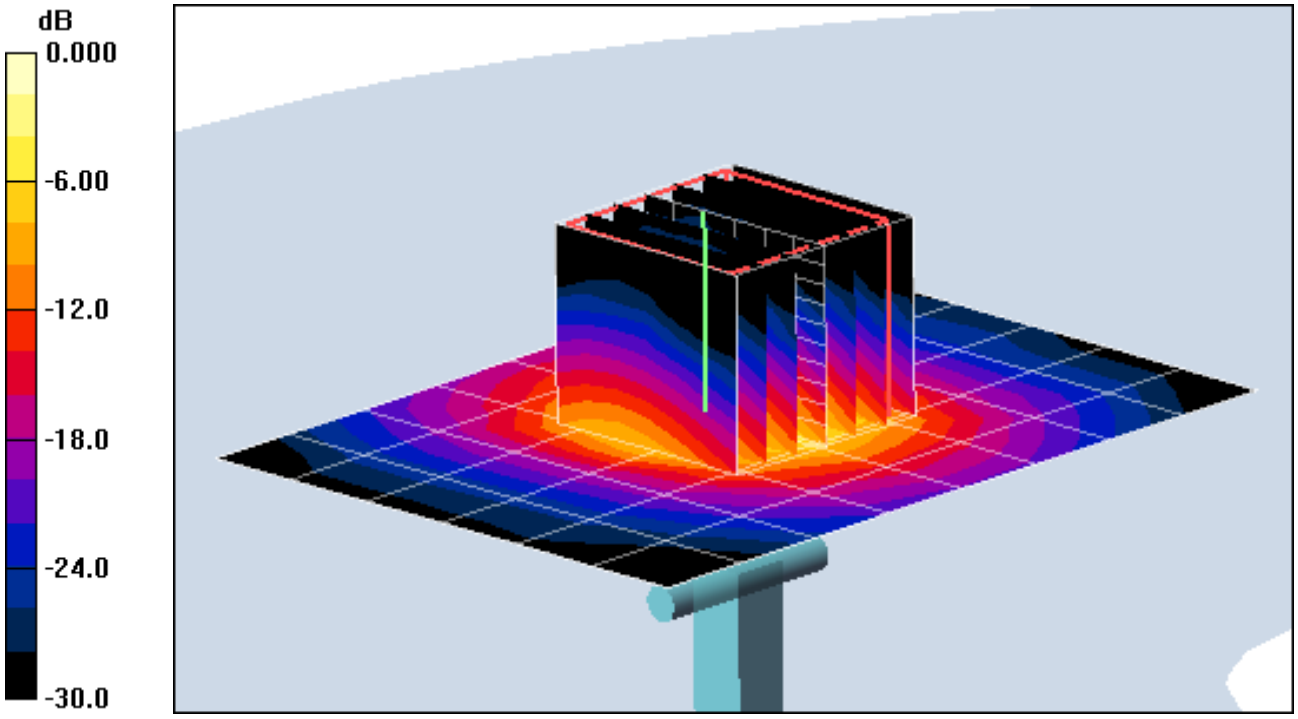
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.656 mho/m; ε_r = 46.78; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3589; ConvF(3.4, 3.4, 3.4); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 8.74 mW/g; SAR(10 g) = 2.33 mW/g
Deviation = 7.50 %



0 dB = 18.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

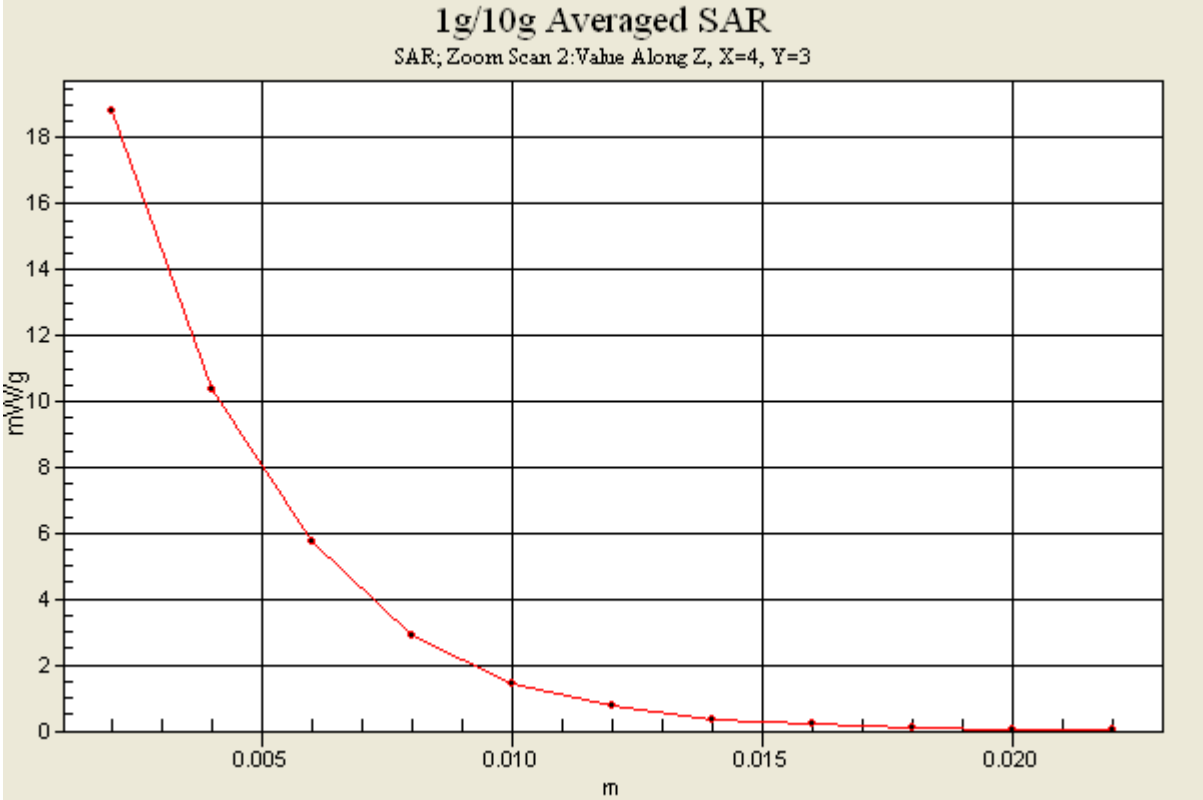
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.656 mho/m; ε_r = 46.78; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3589; ConvF(3.4, 3.4, 3.4); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 8.74 mW/g; SAR(10 g) = 2.33 mW/g
Deviation = 7.50 %



PCTEST ENGINEERING LABORATORY, INC.

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

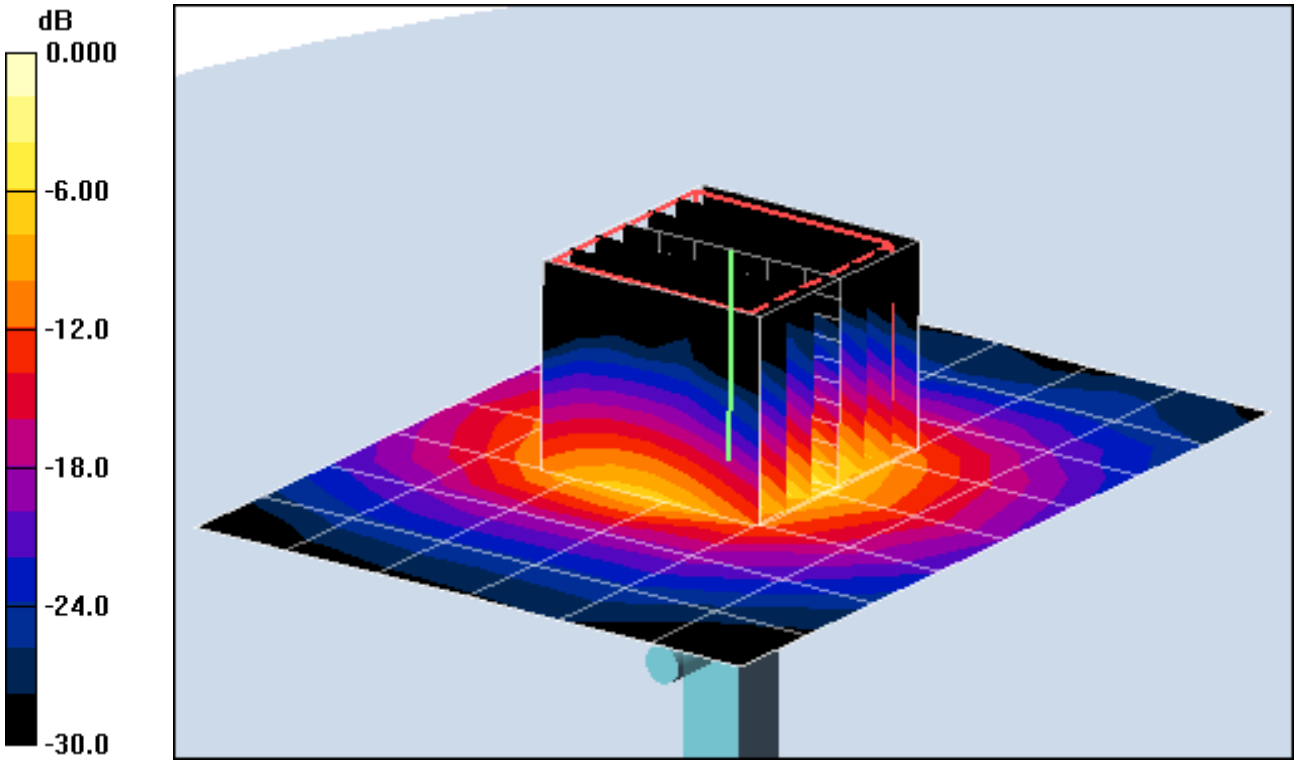
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.116 mho/m; ε_r = 46.12; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.0° C; Tissue Temp: 22.8° C

Probe: EX3DV4 - SN3589; ConvF(3.59, 3.59, 3.59); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.96 mW/g; SAR(10 g) = 2.19 mW/g
Deviation = 5.71 %



0 dB = 16.8mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.116 mho/m; ε_r = 46.12; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2012; Ambient Temp: 24.0° C; Tissue Temp: 22.8° C

Probe: EX3DV4 - SN3589; ConvF(3.59, 3.59, 3.59); Calibrated: 1/27/2012
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 4/20/2011
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Input Power = 20.0 dBm (100 mW)
SAR(1 g) = 7.96 mW/g; SAR(10 g) = 2.19 mW/g
Deviation = 5.71 %