SAR EVALUATION REPORT

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

Date of Testing:
03/08/12 - 03/15/12
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1203080268.A3L

FCC ID: **A3LSCHI405U**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SCH-I405

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
Cell. CDMA/EVDO	824.70 - 848.31 MHz	25.30	0.25	0.82	0.88
PCS CDMA/EVDO	1851.25 - 1908.75 MHz	25.09	0.19	0.71	0.71
LTE Band 12	701.5 - 713.5 MHz	23.31	0.38	0.30	0.30
LTE Band 5 (Cell)	824.7 - 848.3 MHz	23.08	0.55	0.37	0.37
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	23.03	0.99	0.45	0.45
LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	23.04	0.94	0.57	0.57
2.4 GHz WLAN	2412 - 2462 MHz	14.34	0.08	0.10	0.15
5.8 GHz WLAN	5745 - 5825 MHz	13.68	0.04	0.17	
5.2 GHz WLAN	5180 - 5240 MHz	13.70	0.03	0.04	
5.3 GHz WLAN	5260 - 5320 MHz	13.76	0.01	0.03	
5.5 GHz WLAN	5500 - 5700 MHz	13.51	0.00	0.05	
Bluetooth	2402 - 2480 MHz	9.97	N/A		
Simultaneous SAR per KDB 690783 D01:			1.26	1.49	1.49

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.

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

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

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

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Tx Frequency
Cell. CDMA/EVDO	824.70 - 848.31 MHz
PCS CDMA/EVDO	1851.25 - 1908.75 MHz
LTE Band 12	701.5 - 713.5 MHz
LTE Band 5 (Cell)	824.7 - 848.3 MHz
LTE Band 4 (AWS)	1712.5 - 1752.5 MHz
LTE Band 2 (PCS)	1850.7 - 1909.3 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

1.2 DUT Antenna Locations

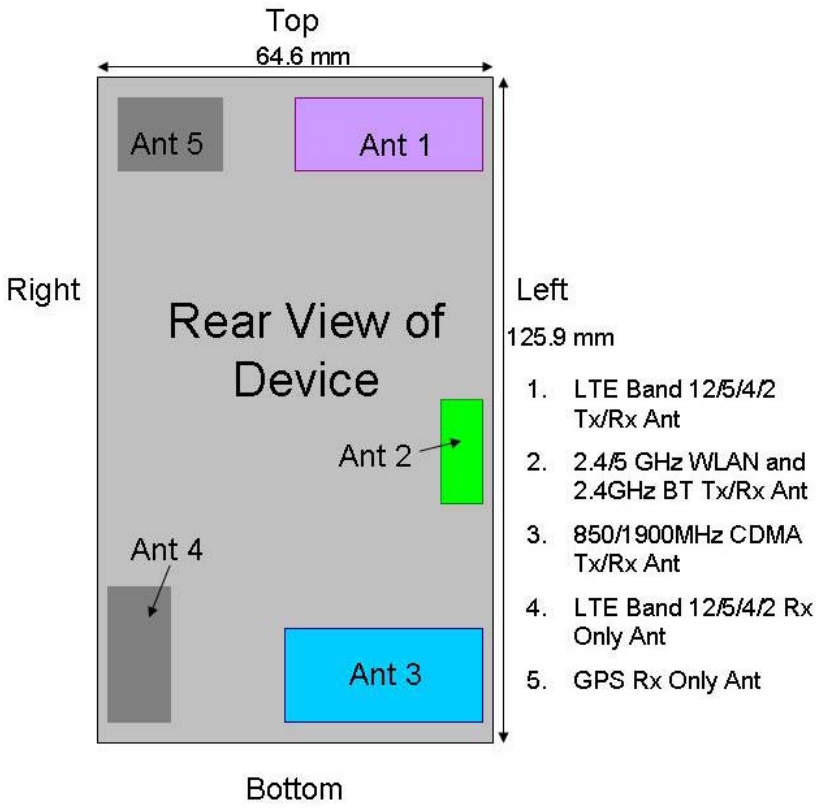


Figure 1-1
DUT Antenna Locations

Table 1-1
Mobile Hotspot Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
Cell. CDMA/EVDO	Yes	Yes	No	Yes	No	Yes
PCS CDMA/EVDO	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	Yes	No	No	Yes
LTE Band 5 (Cell)	Yes	Yes	Yes	No	No	Yes
LTE Band 4 (AWS)	Yes	Yes	Yes	No	No	Yes
LTE Band 2 (PCS)	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN	Yes	Yes	No	No	No	Yes

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.

1.3 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 **1-2** and are color-coded and numbered to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Figure 1-2
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. Simultaneous transmission scenarios for this device are shown in Table 1-2.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Note
		IEEE 1528, Supp C	Supplement C	FCC KDB 941225 D06 edges/sides	
1	1X CDMA 850/1900 Voice + LTE 700/800/1700/1900 MHz Data	√	√	N/A	SVLTE
2	1X CDMA 850/1900 Voice + LTE 700/800/1700/1900 MHz Data + 2.4 GHz WIFI	√	√	√	Voice and LTE+WIFI Hotspot
3	1X CDMA 850/1900 Voice + 2.4 GHz WIFI	√	√	N/A	1X voice and WiFi Data
4	1X CDMA 850/1900 Voice + 5 GHz WIFI	√	√	N/A	1X voice and WiFi Data
5	1X/EVDO 850/1900 Data + 2.4 GHz WIFI	N/A	N/A	√	EVDO+WIFI Hotspot
6	LTE 700/800/1700/1900 MHz Data + 2.4 GHz WIFI	N/A	N/A	√	LTE+WIFI Hotspot
7	LTE 700/800/1700/1900 MHz Data + 5 GHz WIFI	N/A	N/A	N/A	5GHz WiFi Hotspot Not available by SW
8	1X/EVDO 800/1900 Data + 5 GHz WIFI	N/A	N/A	N/A	5GHz WiFi Hotspot Not available by SW
9	1X CDMA 800/1900 Voice + LTE 700/800/1700/1900 MHz Data + 5 GHz WIFI	N/A	N/A	N/A	5GHz WiFi Hotspot Not available by SW
10	1X CDMA 800/1900 Voice + EVDO	N/A	N/A	N/A	Not available by HW
11	850/1900 EVDO data + LTE 700/800/1700/1900 MHz Data	N/A	N/A	N/A	Not available by SW

Notes:
1. CDMA and EVDO share the same antenna path and cannot transmit simultaneously.
2. Bluetooth and 2.4 GHz WLAN share the same antenna path and cannot transmit simultaneously.

1.4 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 CDMA antenna and the Bluetooth and WLAN antenna is 20.0 mm. The separation distance between the LTE antenna and the Bluetooth and WLAN antenna is 42.0 mm. RF Conducted Power of Bluetooth Tx is 9.936 mW. RF Conducted Power of WLAN is 27.353 mW.

2.4 GHz and 5 GHz WIFI and Bluetooth share the same antenna path and cannot transmit simultaneously.

Per KDB Publication 648474, **Bluetooth SAR was not required** based on the maximum conducted power, the Bluetooth/WLAN to CDMA and LTE antennas separation distances and Body-SAR of the CDMA and LTE antennas.

(B) **Licensed Transmitter(s)**

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.

1.5 Power Reduction for SAR

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

1.6 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)

1.7 Samples Used for SAR Testing

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

Table 1-3
SAR Test Sample Serial Numbers

	Cell. CDMA/EVDO	PCS CDMA/EVDO	LTE Band 12	LTE Band 5	LTE Band 4	LTE Band 2	2.4 GHz WLAN	5 GHz WLAN
Head	37	37	36	35	34	37	38	38
Body	37	37	36	35	34	32	38	37

2 LTE CHECKLIST PER KDB 941225 D05

KDB 941225 Pub LTE Information				
KDB 941225 Section	FCC ID	A3LSCHI405U		
	Form Factor	Smartphone		
1)	Frequency Range of each LTE transmission band	BAND2 : Tx (1850.7 - 1909.3 MHz) BAND4 : Tx (1712.5 - 1752.5 MHz) BAND5 : Tx (824.7 - 848.3 MHz) BAND12: Tx (701.5 - 713.5 MHz)		
2)	Channel Bandwidths	Band2 : 1.4MHz, 3MHz, 5 MHz, Band4 : 5MHz, 10 MHz, Band5 : 1.4 MHz, 3MHz, 5 MHz, Band12: 5MHz, 10 MHz		
3)	Channel Numbers and Frequencies (MHz)	Low	Mid	High
	LTE Band 2 and BW 1.4MHz	1850.7 MHz(18607)	1880 MHz(18900)	1909.3 MHz(19193)
	LTE Band 2 and BW 3MHz	1851.5 MHz(18615)	1880 MHz(18900)	1908.5 MHz(19185)
	LTE Band 2 and BW 5MHz	1852.5 MHz(18625)	1880 MHz(18900)	1907.5 MHz(19175)
	LTE Band 4 and BW 5MHz	1712.5 MHz(19975)	1732.5 MHz(20175)	1752.5 MHz(20375)
	LTE Band 4 and BW 10MHz	1715MHz(20000)	1732.5MHz(20175)	1750 MHz(20350)
	LTE Band 5 and BW 1.4MHz	824.7 MHz(20407)	836.5 MHz(20525)	848.3 MHz(20643)
	LTE Band 5 and BW 3MHz	825.5 MHz(20415)	836.5 MHz(20525)	847.5 MHz(20635)
	LTE Band 5 and BW 5MHz	826.5 MHz(20425)	836.5 MHz(20525)	846.5 MHz(20625)
	LTE Band 12 and BW 5MHz	701.5MHz(23035)	707.5 MHz(23095)	713.5 MHz(23155)
	LTE Band 12 and BW 10MHz	704 MHz(23060)	707.5 MHz(23095)	711 MHz(23130)
4)(a)	UE Category	3		
(b)	Modulations Supported in UL	QPSK, 16QAM		
	LTE Transmitter and Antenna Implementation	All LTE bands share same transmission path; LTE and CDMA do not share same transmission path		
5)	Description of LTE Tx and Ant. Implementation	1 TX/RX Ant and 1 RX only Ant		
6)	LTE Voice available?	No		
	Hotspot with LTE+WIFI	Yes		
	Hotspot with LTE+WIFI active with 1XVoice sessions?	Yes		
7)	LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	Yes		
	A-MPR (Additional MPR) disabled for SAR Testing?	Yes		
8)	Conducted power Table provided for 1RB (low and high offset), 50% RB (centered), 100% RB	Yes		
9-10)	Non-LTE US Wireless Operating Modes/Band	RF Output Power	RF Exposure Configurations	
	850 MHz CDMA	See page 1		
	1900 MHz CDMA			
	2.4GHz Bluetooth			
	2.4GHz WI-FI			
	5GHz WI-FI			
11)	Simultaneous Tx Conditions (Voice and Data Configurations)	See Section 1.3		
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. SR 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

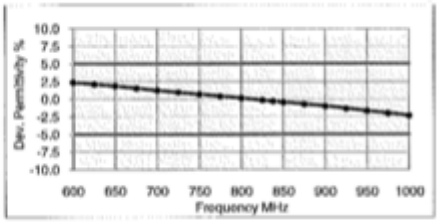
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

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	4.8
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



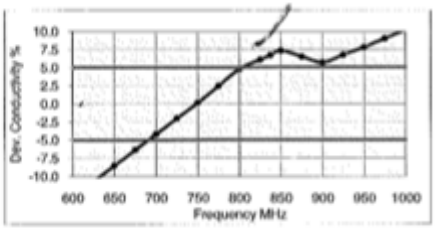


Figure 4-3
750MHz Body Tissue Equivalent Matter

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

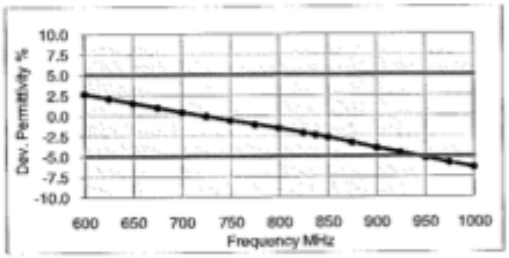
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	8-Jun-11

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



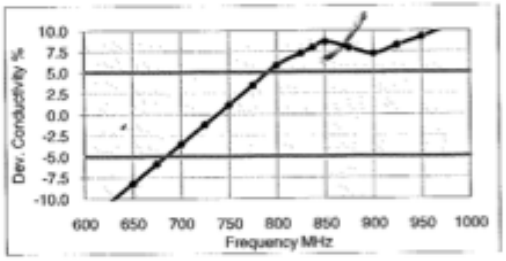


Figure 4-4
750MHz Head Tissue Equivalent Matter

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.

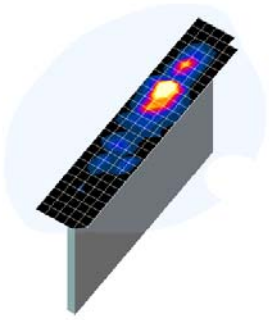


Figure 5-1
Sample SAR Area Scan

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 6-2 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 6-1. 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].

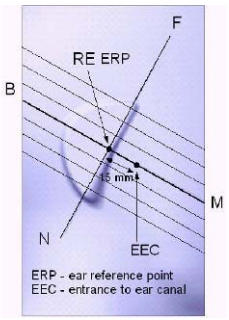


Figure 6-1
Close-Up Side view of ERP

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.

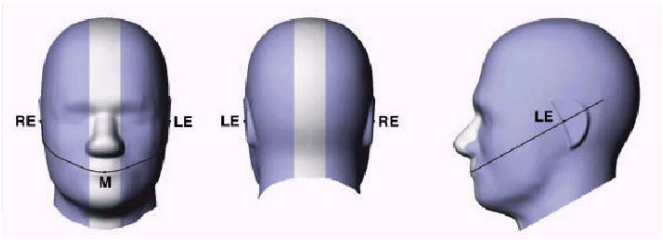


Figure 6-2
Front, back and side view of SAM Twin Phantom

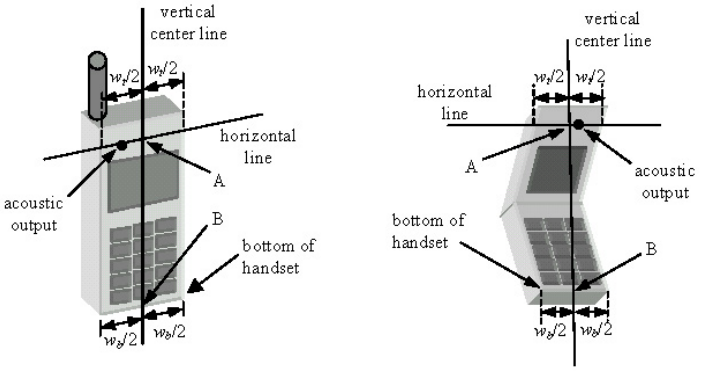


Figure 6-3
Handset Vertical Center & Horizontal Line Reference Points

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.

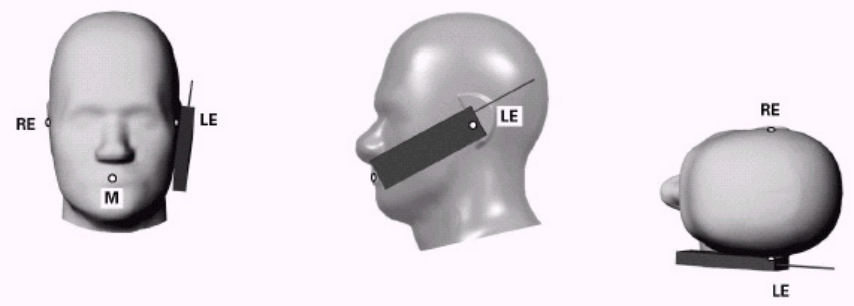


Figure 7-1 Front, Side and Top View of Cheek/Touch Position

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 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
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).

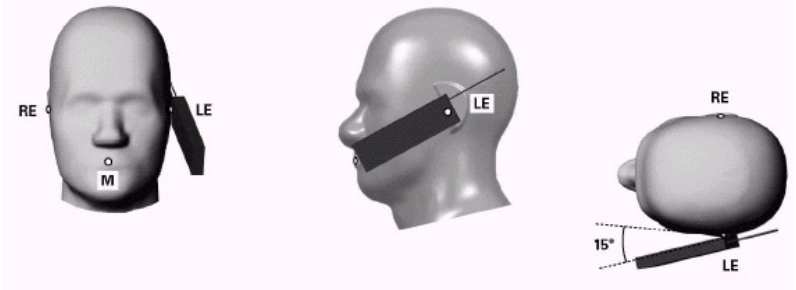


Figure 7-2 Front, Side and Top View of Ear/15º Tilt Position

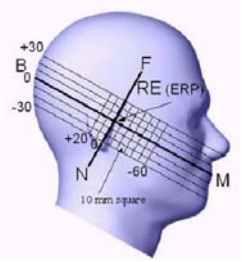


Figure 7-3
Side view w/ relevant markings

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.

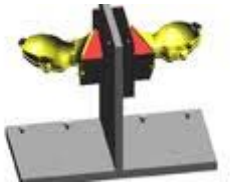


Figure 7-5 Twin SAM Chin20

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. The EUT meets this size requirement, therefore KDB Publication 941225 D06 guidance for SAR testing is applicable.

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 CDMA2000

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

9.2.1 Output Power Verification

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

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 9-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 9-2 was applied.
5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

Table 9-1
Parameters for Max. Power for RC1

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

Table 9-2
Parameters for Max. Power for RC3

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

9.2.2 Head SAR Measurements

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

SAR is measured on the maximum output channel in RC1 using the exposure configuration that results in the highest SAR for that channel in RC3.

9.2.3 Body SAR Measurements

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

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

9.2.4 Handsets with EVDO

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

9.2.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 per KDB Publication 941225 D01 procedures for "1x Ev-Do data Devices". SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. AT power control should be in "All Bits Up" conditions for TAP/ETAP

SAR is not required for 1x RTT for Ev-Do devices that also support 1x RTT voice and/or data operations, when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, CDMA "Body-SAR Measurement" procedures for "CDMA 2000 1x Handsets" were applied.

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. See Section 10.2 for MPR targets.

9.3.2 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=1.

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. 1 RB low and high offset configurations are considered together for a single channel selection.
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. 1 RB low and high offset configurations are considered together for a single channel selection.
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 CDMA Conducted Powers

Band	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC	MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	824.7	25.00	25.05	25.14	25.13	25.04	24.88
	384	836.52	25.09	25.12	25.32	25.29	25.13	25.09
	777	848.31	25.27	25.34	25.27	25.30	25.09	24.87
PCS	25	1851.25	25.36	25.32	24.72	25.27	25.10	24.91
	600	1880	24.99	25.03	24.75	25.09	24.91	24.61
	1175	1908.75	24.96	24.98	25.28	25.17	25.05	24.77

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

Per KDB Publication 941225 D01:
1. Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. Ev-Do and TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.
3. Hotspot SAR is measured using Subtype 0/1 Physical Layer configurations for Rev.0. If the average output power of Subtype 2 for Rev.A is less than the Rev.0 power levels, then Rev.A SAR is not required. Otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channel in Rev.0. SAR was additionally tested for 1x RTT hotspot using TDSO / SO32 FCH to address the CDMA Voice + LTE WIFI hotspot simultaneous transmission scenarios.

Figure 10-1
Power Measurement Setup

10.2 LTE Conducted Powers

10.2.1 LTE Band 12

Table 10-1
LTE Band 12 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	701.5	23035	5	QPSK	1	0	23.28	0	0
	701.5	23035	5	QPSK	1	24	23.33	0	0
	701.5	23035	5	QPSK	12	6	22.26	1	0-1
	701.5	23035	5	QPSK	25	0	22.27	1	0-1
	701.5	23035	5	16-QAM	1	0	22.10	1	0-1
	701.5	23035	5	16-QAM	1	24	21.83	1	0-1
	701.5	23035	5	16-QAM	12	6	21.24	2	0-2
	701.5	23035	5	16-QAM	25	0	21.49	2	0-2
Mid	707.5	23095	5	QPSK	1	0	23.42	0	0
	707.5	23095	5	QPSK	1	24	23.49	0	0
	707.5	23095	5	QPSK	12	6	22.48	1	0-1
	707.5	23095	5	QPSK	25	0	22.38	1	0-1
	707.5	23095	5	16-QAM	1	0	22.14	1	0-1
	707.5	23095	5	16-QAM	1	24	22.15	1	0-1
	707.5	23095	5	16-QAM	12	6	21.31	2	0-2
	707.5	23095	5	16-QAM	25	0	21.47	2	0-2
High	713.5	23155	5	QPSK	1	0	23.33	0	0
	713.5	23155	5	QPSK	1	24	23.46	0	0
	713.5	23155	5	QPSK	12	6	22.32	1	0-1
	713.5	23155	5	QPSK	25	0	22.49	1	0-1
	713.5	23155	5	16-QAM	1	0	22.16	1	0-1
	713.5	23155	5	16-QAM	1	24	22.03	1	0-1
	713.5	23155	5	16-QAM	12	6	21.46	2	0-2
	713.5	23155	5	16-QAM	25	0	21.36	2	0-2

Table 10-2
LTE Band 12 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	704	23060	10	QPSK	1	0	23.09	0	0
	704	23060	10	QPSK	1	49	23.30	0	0
	704	23060	10	QPSK	25	12	22.48	1	0-1
	704	23060	10	QPSK	50	0	22.46	1	0-1
	704	23060	10	16QAM	1	0	22.14	1	0-1
	704	23060	10	16QAM	1	49	22.21	1	0-1
	704	23060	10	16QAM	25	12	21.49	2	0-2
	704	23060	10	16QAM	50	0	21.49	2	0-2
Mid	707.5	23095	10	QPSK	1	0	**23.12**	0	0
	707.5	23095	10	QPSK	1	49	**23.31**	0	0
	707.5	23095	10	QPSK	25	12	**22.35**	1	0-1
	707.5	23095	10	QPSK	50	0	22.45	1	0-1
	707.5	23095	10	16QAM	1	0	22.41	1	0-1
	707.5	23095	10	16QAM	1	49	22.41	1	0-1
	707.5	23095	10	16QAM	25	12	**21.43**	2	0-2
	707.5	23095	10	16QAM	50	0	21.25	2	0-2
High	711	23130	10	QPSK	1	0	22.97	0	0
	711	23130	10	QPSK	1	49	23.26	0	0
	711	23130	10	QPSK	25	12	22.50	1	0-1
	711	23130	10	QPSK	50	0	22.42	1	0-1
	711	23130	10	16QAM	1	0	**22.45**	1	0-1
	711	23130	10	16QAM	1	49	**22.16**	1	0-1
	711	23130	10	16QAM	25	12	21.27	2	0-2
	711	23130	10	16QAM	50	0	21.48	2	0-2

10.2.2 LTE Band 5 (Cell)

Table 10-3
LTE Band 5 (Cell) Conducted Powers - 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	824.7	20407	1.4	QPSK	1	0	22.93	0	0
	824.7	20407	1.4	QPSK	1	5	22.95	0	0
	824.7	20407	1.4	QPSK	3	2	23.32	0	0
	824.7	20407	1.4	QPSK	6	0	21.95	1	0-1
	824.7	20407	1.4	16-QAM	1	0	22.10	1	0-1
	824.7	20407	1.4	16-QAM	1	5	21.65	1	0-1
	824.7	20407	1.4	16-QAM	3	2	21.95	1	0-1
	824.7	20407	1.4	16-QAM	6	0	20.88	2	0-2
Mid	836.5	20525	1.4	QPSK	1	0	23.03	0	0
	836.5	20525	1.4	QPSK	1	5	23.17	0	0
	836.5	20525	1.4	QPSK	3	2	23.34	0	0
	836.5	20525	1.4	QPSK	6	0	22.25	1	0-1
	836.5	20525	1.4	16-QAM	1	0	21.66	1	0-1
	836.5	20525	1.4	16-QAM	1	5	21.64	1	0-1
	836.5	20525	1.4	16-QAM	3	2	22.03	1	0-1
	836.5	20525	1.4	16-QAM	6	0	21.15	2	0-2
High	848.3	20643	1.4	QPSK	1	0	23.30	0	0
	848.3	20643	1.4	QPSK	1	5	23.27	0	0
	848.3	20643	1.4	QPSK	3	2	23.35	0	0
	848.3	20643	1.4	QPSK	6	0	22.26	1	0-1
	848.3	20643	1.4	16-QAM	1	0	22.00	1	0-1
	848.3	20643	1.4	16-QAM	1	5	21.95	1	0-1
	848.3	20643	1.4	16-QAM	3	2	22.36	1	0-1
	848.3	20643	1.4	16-QAM	6	0	21.20	2	0-2

Table 10-4
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	825.5	20415	3	QPSK	1	0	22.88	0	0
	825.5	20415	3	QPSK	1	14	22.75	0	0
	825.5	20415	3	QPSK	8	4	22.00	1	0-1
	825.5	20415	3	QPSK	15	0	22.20	1	0-1
	825.5	20415	3	16-QAM	1	0	22.10	1	0-1
	825.5	20415	3	16-QAM	1	14	22.00	1	0-1
	825.5	20415	3	16-QAM	8	4	20.95	2	0-2
	825.5	20415	3	16-QAM	15	0	20.90	2	0-2
Mid	836.5	20525	3	QPSK	1	0	22.94	0	0
	836.5	20525	3	QPSK	1	14	22.92	0	0
	836.5	20525	3	QPSK	8	4	22.00	1	0-1
	836.5	20525	3	QPSK	15	0	22.15	1	0-1
	836.5	20525	3	16-QAM	1	0	21.96	1	0-1
	836.5	20525	3	16-QAM	1	14	22.20	1	0-1
	836.5	20525	3	16-QAM	8	4	20.70	2	0-2
	836.5	20525	3	16-QAM	15	0	21.14	2	0-2
High	847.5	20635	3	QPSK	1	0	22.91	0	0
	847.5	20635	3	QPSK	1	14	23.10	0	0
	847.5	20635	3	QPSK	8	4	22.30	1	0-1
	847.5	20635	3	QPSK	15	0	22.15	1	0-1
	847.5	20635	3	16-QAM	1	0	21.75	1	0-1
	847.5	20635	3	16-QAM	1	14	21.82	1	0-1
	847.5	20635	3	16-QAM	8	4	21.20	2	0-2
	847.5	20635	3	16-QAM	15	0	21.10	2	0-2

Table 10-5
LTE Band 5 (Cell) 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	826.5	20425	5	QPSK	1	0	23.00	0	0
	826.5	20425	5	QPSK	1	24	23.01	0	0
	826.5	20425	5	QPSK	12	6	21.83	1	0-1
	826.5	20425	5	QPSK	25	0	21.86	1	0-1
	826.5	20425	5	16-QAM	1	0	21.80	1	0-1
	826.5	20425	5	16-QAM	1	24	21.88	1	0-1
	826.5	20425	5	16-QAM	12	6	20.94	2	0-2
	826.5	20425	5	16-QAM	25	0	20.88	2	0-2
Mid	836.5	20525	5	QPSK	1	0	23.00	0	0
	836.5	20525	5	QPSK	1	24	23.04	0	0
	836.5	20525	5	QPSK	12	6	**21.90**	1	0-1
	836.5	20525	5	QPSK	25	0	21.85	1	0-1
	836.5	20525	5	16-QAM	1	0	**21.95**	1	0-1
	836.5	20525	5	16-QAM	1	24	**21.81**	1	0-1
	836.5	20525	5	16-QAM	12	6	**21.00**	2	0-2
	836.5	20525	5	16-QAM	25	0	20.95	2	0-2
High	846.5	20625	5	QPSK	1	0	**23.03**	0	0
	846.5	20625	5	QPSK	1	24	**23.08**	0	0
	846.5	20625	5	QPSK	12	6	22.20	1	0-1
	846.5	20625	5	QPSK	25	0	22.32	1	0-1
	846.5	20625	5	16-QAM	1	0	21.67	1	0-1
	846.5	20625	5	16-QAM	1	24	21.76	1	0-1
	846.5	20625	5	16-QAM	12	6	21.25	2	0-2
	846.5	20625	5	16-QAM	25	0	21.05	2	0-2

10.2.3 LTE Band 4 (AWS)

Table 10-6
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	23.05	0	0
	1712.5	19975	5	QPSK	1	24	23.13	0	0
	1712.5	19975	5	QPSK	12	6	22.12	1	0-1
	1712.5	19975	5	QPSK	25	0	22.34	1	0-1
	1712.5	19975	5	16-QAM	1	0	21.62	1	0-1
	1712.5	19975	5	16-QAM	1	24	21.67	1	0-1
	1712.5	19975	5	16-QAM	12	6	21.30	2	0-2
	1712.5	19975	5	16-QAM	25	0	21.12	2	0-2
Mid	1732.5	20175	5	QPSK	1	0	22.97	0	0
	1732.5	20175	5	QPSK	1	24	22.87	0	0
	1732.5	20175	5	QPSK	12	6	22.18	1	0-1
	1732.5	20175	5	QPSK	25	0	22.15	1	0-1
	1732.5	20175	5	16-QAM	1	0	21.55	1	0-1
	1732.5	20175	5	16-QAM	1	24	21.51	1	0-1
	1732.5	20175	5	16-QAM	12	6	21.13	2	0-2
	1732.5	20175	5	16-QAM	25	0	20.83	2	0-2
High	1752.5	20375	5	QPSK	1	0	23.17	0	0
	1752.5	20375	5	QPSK	1	24	23.07	0	0
	1752.5	20375	5	QPSK	12	6	22.45	1	0-1
	1752.5	20375	5	QPSK	25	0	22.41	1	0-1
	1752.5	20375	5	16-QAM	1	0	22.14	1	0-1
	1752.5	20375	5	16-QAM	1	24	22.00	1	0-1
	1752.5	20375	5	16-QAM	12	6	21.43	2	0-2
	1752.5	20375	5	16-QAM	25	0	21.48	2	0-2

Table 10-7
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	22.94	0	0
	1715	20000	10	QPSK	1	49	23.02	0	0
	1715	20000	10	QPSK	25	12	22.45	1	0-1
	1715	20000	10	QPSK	50	0	22.22	1	0-1
	1715	20000	10	16QAM	1	0	21.67	1	0-1
	1715	20000	10	16QAM	1	49	22.00	1	0-1
	1715	20000	10	16QAM	25	12	21.19	2	0-2
	1715	20000	10	16QAM	50	0	21.19	2	0-2
Mid	1732.5	20175	10	QPSK	1	0	22.95	0	0
	1732.5	20175	10	QPSK	1	49	22.89	0	0
	1732.5	20175	10	QPSK	25	12	**22.03**	1	0-1
	1732.5	20175	10	QPSK	50	0	22.13	1	0-1
	1732.5	20175	10	16QAM	1	0	21.94	1	0-1
	1732.5	20175	10	16QAM	1	49	21.64	1	0-1
	1732.5	20175	10	16QAM	25	12	**21.05**	2	0-2
	1732.5	20175	10	16QAM	50	0	20.85	2	0-2
High	1750	20350	10	QPSK	1	0	**23.03**	0	0
	1750	20350	10	QPSK	1	49	**23.02**	0	0
	1750	20350	10	QPSK	25	12	22.07	1	0-1
	1750	20350	10	QPSK	50	0	22.48	1	0-1
	1750	20350	10	16QAM	1	0	**22.04**	1	0-1
	1750	20350	10	16QAM	1	49	**22.03**	1	0-1
	1750	20350	10	16QAM	25	12	21.08	2	0-2
	1750	20350	10	16QAM	50	0	21.31	2	0-2

10.2.4 LTE Band 2 (PCS)

Table 10-8
LTE Band 2 (PCS) Conducted Powers - 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1850.7	18607	1.4	QPSK	1	0	23.03	0	0
	1850.7	18607	1.4	QPSK	1	5	23.00	0	0
	1850.7	18607	1.4	QPSK	3	2	22.93	0	0
	1850.7	18607	1.4	QPSK	6	0	22.06	1	0-1
	1850.7	18607	1.4	16-QAM	1	0	21.76	1	0-1
	1850.7	18607	1.4	16-QAM	1	5	21.88	1	0-1
	1850.7	18607	1.4	16-QAM	3	2	21.95	1	0-1
	1850.7	18607	1.4	16-QAM	6	0	20.97	2	0-2
Mid	1880.0	18900	1.4	QPSK	1	0	23.03	0	0
	1880.0	18900	1.4	QPSK	1	5	23.11	0	0
	1880.0	18900	1.4	QPSK	3	2	23.12	0	0
	1880.0	18900	1.4	QPSK	6	0	22.17	1	0-1
	1880.0	18900	1.4	16-QAM	1	0	21.60	1	0-1
	1880.0	18900	1.4	16-QAM	1	5	21.55	1	0-1
	1880.0	18900	1.4	16-QAM	3	2	21.93	1	0-1
	1880.0	18900	1.4	16-QAM	6	0	20.89	2	0-2
High	1909.3	19193	1.4	QPSK	1	0	22.93	0	0
	1909.3	19193	1.4	QPSK	1	5	22.79	0	0
	1909.3	19193	1.4	QPSK	3	2	22.99	0	0
	1909.3	19193	1.4	QPSK	6	0	22.36	1	0-1
	1909.3	19193	1.4	16-QAM	1	0	21.60	1	0-1
	1909.3	19193	1.4	16-QAM	1	5	21.69	1	0-1
	1909.3	19193	1.4	16-QAM	3	2	21.81	1	0-1
	1909.3	19193	1.4	16-QAM	6	0	20.91	2	0-2

Table 10-9
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	Allowed per 3GPP [dB]
Low	1851.5	18615	3	QPSK	1	0	22.80	0	0
	1851.5	18615	3	QPSK	1	14	22.74	0	0
	1851.5	18615	3	QPSK	8	4	22.40	1	0-1
	1851.5	18615	3	QPSK	15	0	22.50	1	0-1
	1851.5	18615	3	16-QAM	1	0	22.08	1	0-1
	1851.5	18615	3	16-QAM	1	14	21.70	1	0-1
	1851.5	18615	3	16-QAM	8	4	21.50	2	0-2
	1851.5	18615	3	16-QAM	15	0	21.50	2	0-2
Mid	1880.0	18900	3	QPSK	1	0	22.54	0	0
	1880.0	18900	3	QPSK	1	14	22.80	0	0
	1880.0	18900	3	QPSK	8	4	22.20	1	0-1
	1880.0	18900	3	QPSK	15	0	22.10	1	0-1
	1880.0	18900	3	16-QAM	1	0	21.70	1	0-1
	1880.0	18900	3	16-QAM	1	14	21.52	1	0-1
	1880.0	18900	3	16-QAM	8	4	20.86	2	0-2
	1880.0	18900	3	16-QAM	15	0	21.09	2	0-2
High	1908.5	19185	3	QPSK	1	0	22.71	0	0
	1908.5	19185	3	QPSK	1	14	22.80	0	0
	1908.5	19185	3	QPSK	8	4	21.90	1	0-1
	1908.5	19185	3	QPSK	15	0	22.03	1	0-1
	1908.5	19185	3	16-QAM	1	0	21.59	1	0-1
	1908.5	19185	3	16-QAM	1	14	21.68	1	0-1
	1908.5	19185	3	16-QAM	8	4	20.74	2	0-2
	1908.5	19185	3	16-QAM	15	0	21.00	2	0-2

Table 10-10
LTE Band 2 (PCS) 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	1852.5	18625	5	QPSK	1	0	22.85	0	0
	1852.5	18625	5	QPSK	1	24	23.03	0	0
	1852.5	18625	5	QPSK	12	6	22.37	1	0-1
	1852.5	18625	5	QPSK	25	0	21.90	1	0-1
	1852.5	18625	5	16-QAM	1	0	21.60	1	0-1
	1852.5	18625	5	16-QAM	1	24	21.51	1	0-1
	1852.5	18625	5	16-QAM	12	6	21.22	2	0-2
	1852.5	18625	5	16-QAM	25	0	20.96	2	0-2
Mid	1880.0	18900	5	QPSK	1	0	**23.04**	0	0
	1880.0	18900	5	QPSK	1	24	**22.78**	0	0
	1880.0	18900	5	QPSK	12	6	**22.19**	1	0-1
	1880.0	18900	5	QPSK	25	0	22.07	1	0-1
	1880.0	18900	5	16-QAM	1	0	21.55	1	0-1
	1880.0	18900	5	16-QAM	1	24	21.53	1	0-1
	1880.0	18900	5	16-QAM	12	6	**20.92**	2	0-2
	1880.0	18900	5	16-QAM	25	0	21.16	2	0-2
High	1907.5	19175	5	QPSK	1	0	22.90	0	0
	1907.5	19175	5	QPSK	1	24	22.92	0	0
	1907.5	19175	5	QPSK	12	6	22.10	1	0-1
	1907.5	19175	5	QPSK	25	0	21.85	1	0-1
	1907.5	19175	5	16-QAM	1	0	**21.90**	1	0-1
	1907.5	19175	5	16-QAM	1	24	**21.80**	1	0-1
	1907.5	19175	5	16-QAM	12	6	20.86	2	0-2
	1907.5	19175	5	16-QAM	25	0	21.00	2	0-2

10.2.5 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. 1 RB low and high offset configurations are considered together for a single channel selection.
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. 1 RB low and high offset configurations are considered together for a single channel selection.
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 bold powers in Section 10.2 were evaluated for SAR.

10.3 WLAN Conducted Powers

Table 10-11
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	14.16	14.16	14.14	14.13
802.11b	2437	6	14.22	14.24	14.23	14.23
802.11b	2462	11	14.34	14.31	14.36	14.37

Table 10-12
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	14.07	14.05	14.08	14.05	14.06	14.10	14.09	14.04
802.11g	2437	6	14.16	14.13	14.16	14.23	14.20	14.15	14.12	14.18
802.11g	2462	11	14.28	14.29	14.27	14.28	14.35	14.29	14.20	14.29

Table 10-13
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	2412	1	12.09	12.11	11.99	12.08	12.09	11.97	11.99	12.00
802.11n	2437	6	12.21	12.15	12.16	12.16	12.09	12.17	12.20	12.09
802.11n	2462	11	12.34	12.29	12.23	12.23	12.22	12.21	12.22	12.25

Table 10-14
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	13.63	13.73	13.64	13.75	13.70	13.74	13.80	13.77
802.11a	5200	40	13.70	13.66	13.73	13.73	13.74	13.80	13.79	13.81
802.11a	5220	44	13.70	13.69	13.67	13.71	13.72	13.76	13.81	13.80
802.11a	5240	48*	13.65	13.72	13.74	13.71	13.77	13.75	13.81	13.88
802.11a	5260	52*	13.76	13.79	13.76	13.74	13.76	13.78	13.82	13.81
802.11a	5280	56	13.70	13.70	13.74	13.75	13.79	13.86	13.79	13.87
802.11a	5300	60	13.66	13.66	13.69	13.82	13.76	13.79	13.78	13.80
802.11a	5320	64*	13.62	13.64	13.68	13.72	13.67	13.76	13.74	13.81
802.11a	5500	100	13.51	13.56	13.50	13.60	13.67	13.56	13.67	13.58
802.11a	5520	104*	13.39	13.38	13.44	13.46	13.51	13.55	13.62	13.56
802.11a	5540	108	13.36	13.38	13.37	13.39	13.45	13.45	13.46	13.53
802.11a	5560	112	13.25	13.29	13.40	13.45	13.27	13.41	13.42	13.48
802.11a	5580	116*	13.19	13.20	13.15	13.26	13.26	13.31	13.30	13.33
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	12.96	12.95	12.99	13.11	13.08	12.99	13.02	13.07
802.11a	5680	136*	12.94	12.96	12.92	13.05	12.86	13.00	12.98	13.05
802.11a	5700	140	12.97	12.82	12.85	12.80	12.92	12.88	12.93	12.91
802.11a	5745	149*	13.67	13.76	13.56	13.70	13.60	13.63	13.67	13.68
802.11a	5765	153	13.68	13.62	13.65	13.66	13.74	13.67	13.68	13.78
802.11a	5785	157*	13.68	13.71	13.60	13.53	13.63	13.73	13.70	13.63
802.11a	5805	161*	13.52	13.63	13.63	13.64	13.76	13.66	13.72	13.71
802.11a	5825	165	13.49	13.61	13.65	13.58	13.61	13.58	13.73	13.70

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 10-15
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	Conducted Power [dBm] Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	5180	36*	12.18	12.25	12.30	12.33	12.29	12.36	12.39	12.37
802.11n	5200	40	12.26	12.27	12.28	12.31	12.22	12.35	12.27	12.42
802.11n	5220	44	12.26	12.32	12.36	12.33	12.40	12.39	12.49	12.48
802.11n	5240	48*	12.32	12.31	12.39	12.42	12.44	12.55	12.47	12.49
802.11n	5260	52*	12.31	12.29	12.34	12.35	12.40	12.30	12.43	12.39
802.11n	5280	56	12.27	12.37	12.39	12.37	12.39	12.46	12.53	12.44
802.11n	5300	60	12.29	12.33	12.40	12.40	12.44	12.46	12.42	12.41
802.11n	5320	64*	12.28	12.27	12.27	12.34	12.42	12.40	12.44	12.47
802.11n	5500	100	12.05	12.12	12.08	12.12	12.20	12.29	12.25	12.28
802.11n	5520	104*	12.04	11.99	12.15	12.11	12.24	12.15	12.16	12.09
802.11n	5540	108	12.01	12.01	12.10	12.16	12.02	12.13	12.09	12.15
802.11n	5560	112	11.96	12.02	12.08	11.92	12.02	12.17	12.07	12.09
802.11n	5580	116*	11.95	11.93	11.94	11.93	12.05	11.92	12.06	11.97
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	11.71	11.71	11.57	11.73	11.63	11.70	11.70	11.75
802.11n	5680	136*	11.60	11.44	11.46	11.78	11.75	11.66	11.72	11.72
802.11n	5700	140	11.55	11.50	11.61	11.47	11.73	11.58	11.55	11.76
802.11n	5745	149*	12.23	12.26	12.34	12.33	12.37	12.39	12.39	12.50
802.11n	5765	153	12.14	12.23	12.27	12.22	12.25	12.23	12.41	12.21
802.11n	5785	157*	12.09	12.06	12.20	12.19	12.22	12.16	12.20	12.29
802.11n	5805	161*	12.07	12.12	12.13	12.25	12.25	12.27	12.29	12.14
802.11n	5825	165	12.04	12.08	12.10	12.18	12.21	12.26	12.26	12.22

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) 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.

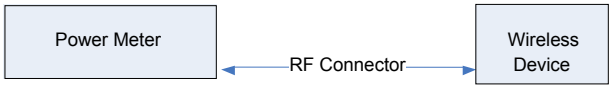


Figure 10-2
Power Measurement Setup

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
3/13/2012	750H	23.5	680	0.847	41.70	0.885	42.273	-4.29%	-1.36%
			695	0.859	41.47	0.886	42.193	-3.05%	-1.71%
			710	0.874	41.28	0.887	42.113	-1.47%	-1.98%
			725	0.879	40.69	0.888	42.033	-1.01%	-3.20%
			740	0.891	40.49	0.889	41.953	0.22%	-3.49%
			755	0.904	40.27	0.891	41.876	1.46%	-3.84%
3/8/2012	835H	23.5	820	0.898	39.83	0.898	41.571	0.00%	-4.19%
			835	0.912	39.65	0.900	41.500	1.33%	-4.46%
			850	0.925	39.46	0.916	41.500	0.98%	-4.92%
3/13/2012	835H	23.2	820	0.866	40.55	0.898	41.571	-3.56%	-2.46%
			835	0.879	40.35	0.900	41.500	-2.33%	-2.77%
			850	0.890	40.06	0.916	41.500	-2.84%	-3.47%
3/13/2012	1750H	24.0	1710	1.291	39.91	1.348	40.136	-4.23%	-0.56%
			1750	1.330	39.72	1.370	40.100	-2.92%	-0.95%
			1790	1.370	39.55	1.394	40.020	-1.72%	-1.17%
3/9/2012	1900H	22.3	1850	1.403	38.38	1.400	40.000	0.21%	-4.05%
			1880	1.438	38.25	1.400	40.000	2.71%	-4.38%
			1910	1.468	38.12	1.400	40.000	4.86%	-4.70%
3/12/2012	1900H	24.1	1850	1.383	38.27	1.400	40.000	-1.21%	-4.32%
			1880	1.410	38.15	1.400	40.000	0.71%	-4.63%
			1910	1.442	38.02	1.400	40.000	3.00%	-4.95%
3/15/2012	2450H	23.9	2401	1.787	39.70	1.758	39.298	1.65%	1.02%
			2450	1.853	39.55	1.800	39.200	2.94%	0.89%
			2499	1.900	39.33	1.852	39.135	2.59%	0.50%
03/14/2012	5200H-5800H	24.6	5200	4.450	36.88	4.660	36.000	-4.51%	2.44%
			5220	4.465	36.89	4.680	35.980	-4.59%	2.53%
			5260	4.514	36.85	4.720	35.940	-4.36%	2.53%
			5500	4.728	36.48	4.965	35.650	-4.77%	2.33%
			5785	5.024	36.19	5.255	35.315	-4.40%	2.48%
			5800	5.038	36.17	5.270	35.300	-4.40%	2.46%
3/12/2012	750B	22.5	680	0.910	55.63	0.956	56.069	-4.81%	-0.78%
			695	0.924	55.45	0.957	55.985	-3.45%	-0.96%
			710	0.937	55.23	0.958	55.901	-2.19%	-1.20%
			725	0.950	55.08	0.960	55.817	-1.04%	-1.32%
			740	0.964	54.89	0.961	55.733	0.31%	-1.51%
			755	0.979	54.71	0.963	55.649	1.66%	-1.69%
3/8/2012	835B	22.6	820	1.002	54.05	0.969	55.284	3.41%	-2.23%
			835	1.017	53.91	0.970	55.200	4.85%	-2.34%
			850	1.034	53.78	0.988	55.154	4.66%	-2.49%
3/12/2012	835B	22.0	820	0.985	53.27	0.969	55.284	1.65%	-3.64%
			835	0.996	53.11	0.970	55.200	2.68%	-3.79%
			850	1.011	53.03	0.988	55.154	2.33%	-3.85%
3/12/2012	1750B	22.3	1710	1.421	53.14	1.460	53.540	-2.67%	-0.75%
			1750	1.460	53.01	1.490	53.430	-2.01%	-0.79%
			1790	1.505	52.83	1.510	53.330	-0.33%	-0.94%
3/8/2012	1900B	22.4	1850	1.495	51.47	1.520	53.300	-1.64%	-3.43%
			1880	1.526	51.32	1.520	53.300	0.39%	-3.71%
			1910	1.566	51.21	1.520	53.300	3.03%	-3.92%
3/15/2012	2450B	23.8	2401	1.953	50.37	1.903	52.765	2.63%	-4.54%
			2450	2.004	50.21	1.950	52.700	2.77%	-4.72%
			2499	2.070	50.05	2.019	52.638	2.53%	-4.92%
03/12/2012	5200B-5800B	24.2	5200	5.229	47.71	5.299	49.014	-1.32%	-2.66%
			5220	5.269	47.72	5.323	48.987	-1.01%	-2.59%
			5260	5.338	47.60	5.369	48.906	-0.58%	-2.67%
			5500	5.690	47.02	5.650	48.580	0.71%	-3.21%
			5785	6.129	46.32	5.982	48.242	2.46%	-3.98%
			5800	6.169	46.28	6.000	48.200	2.82%	-3.98%

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.

11.2 Measurement Procedure for Tissue verification

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

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

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

11.3 Test System Verification

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

Table 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	03/13/2012	24.0	22.3	0.100	1046	3263	0.87	8.400	8.700	3.57%
835	Head	03/08/2012	24.3	22.6	0.100	4d047	3258	0.99	9.410	9.900	5.21%
835	Head	03/13/2012	23.4	22.4	0.100	4d026	3258	0.955	9.460	9.550	0.95%
1750	Head	03/13/2012	24.7	22.8	0.100	1051	3213	3.66	37.000	36.600	-1.08%
1900	Head	03/09/2012	24.6	22.2	0.100	5d141	3213	4.14	39.500	41.400	4.81%
1900	Head	03/12/2012	22.8	22.1	0.040	5d141	3022	1.58	39.500	39.500	0.00%
2450	Head	03/15/2012	23.6	22.9	0.100	797	3263	5.38	52.100	53.800	3.26%
5200	Head	03/14/2012	23.7	22.6	0.100	1007	3589	7.31	79.800	73.100	-8.40%
5500	Head	03/14/2012	23.8	22.8	0.100	1007	3589	8.14	86.300	81.400	-5.68%
5800	Head	03/14/2012	24.0	22.9	0.100	1007	3589	7.99	79.400	79.900	0.63%
750	Body	03/12/2012	23.1	22.3	0.100	1046	3561	0.899	8.800	8.990	2.16%
835	Body	03/08/2012	24.5	23.8	0.100	4d047	3258	0.994	9.410	9.940	5.63%
835	Body	03/12/2012	24.0	22.3	0.100	4d026	3258	0.998	9.660	9.980	3.31%
1750	Body	03/12/2012	24.5	23.1	0.100	1008	3213	3.72	37.000	37.200	0.54%
1900	Body	03/08/2012	24.1	22.2	0.100	5d141	3213	4.27	41.400	42.700	3.14%
2450	Body	03/15/2012	24.4	23.8	0.100	719	3022	5.31	51.300	53.100	3.51%
5200	Body	03/12/2012	24.6	23.1	0.100	1007	3589	7.59	75.500	75.900	0.53%
5500	Body	03/12/2012	24.4	23.0	0.100	1007	3589	8.15	81.300	81.500	0.25%
5800	Body	03/12/2012	24.8	23.2	0.100	1007	3589	7.17	75.300	71.700	-4.78%

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.

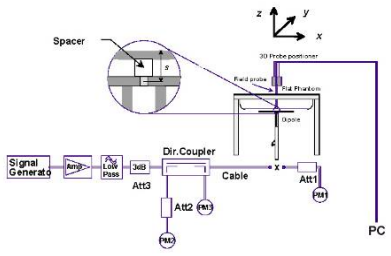


Figure 11-1
System Verification Setup Diagram

Figure 11-2
System Verification Setup Photo

12 SAR DATA SUMMARY

12.1 Standalone Head SAR Data

Table 12-1
Cell. CDMA 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)
836.52	384	Cell. CDMA	25.12	0.00	Right	Touch	37	0.216
836.52	384	Cell. CDMA	25.12	0.05	Right	Tilt	37	0.150
836.52	384	Cell. CDMA	25.12	0.02	Left	Touch	37	**0.254**
836.52	384	Cell. CDMA	25.12	0.03	Left	Tilt	37	0.169
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
PCS CDMA 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	600	PCS CDMA	25.03	-0.06	Right	Touch	37	0.163
1880.00	600	PCS CDMA	25.03	0.07	Right	Tilt	37	0.185
1880.00	600	PCS CDMA	25.03	-0.09	Left	Touch	37	**0.185**
1880.00	600	PCS CDMA	25.03	0.05	Left	Tilt	37	0.170
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
LTE Band 12 Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.													(W/kg)
707.50	23095	Mid	LTE Band 12	10	22.35	0.00	1	Right	Touch	QPSK	25	12	36	0.273
707.50	23095	Mid	LTE Band 12	10	23.12	0.03	0	Right	Touch	QPSK	1	0	36	0.304
707.50	23095	Mid	LTE Band 12	10	23.31	0.08	0	Right	Touch	QPSK	1	49	36	**0.378**
707.50	23095	Mid	LTE Band 12	10	21.43	0.04	2	Right	Touch	16 QAM	25	12	36	0.231
711.00	23130	High	LTE Band 12	10	22.45	0.06	1	Right	Touch	16 QAM	1	0	36	0.260
711.00	23130	High	LTE Band 12	10	22.16	0.09	1	Right	Touch	16 QAM	1	49	36	0.298
707.50	23095	Mid	LTE Band 12	10	22.35	-0.19	1	Right	Tilt	QPSK	25	12	36	0.207
707.50	23095	Mid	LTE Band 12	10	23.12	-0.05	0	Right	Tilt	QPSK	1	0	36	0.220
707.50	23095	Mid	LTE Band 12	10	23.31	-0.09	0	Right	Tilt	QPSK	1	49	36	0.270
707.50	23095	Mid	LTE Band 12	10	21.43	0.19	2	Right	Tilt	16 QAM	25	12	36	0.166
711.00	23130	High	LTE Band 12	10	22.45	0.09	1	Right	Tilt	16 QAM	1	0	36	0.190
711.00	23130	High	LTE Band 12	10	22.16	0.14	1	Right	Tilt	16 QAM	1	49	36	0.225
707.50	23095	Mid	LTE Band 12	10	22.35	-0.10	1	Left	Touch	QPSK	25	12	36	0.192
707.50	23095	Mid	LTE Band 12	10	23.12	-0.07	0	Left	Touch	QPSK	1	0	36	0.217
707.50	23095	Mid	LTE Band 12	10	23.31	0.03	0	Left	Touch	QPSK	1	49	36	0.264
707.50	23095	Mid	LTE Band 12	10	21.43	-0.17	2	Left	Touch	16 QAM	25	12	36	0.167
711.00	23130	High	LTE Band 12	10	22.45	-0.03	1	Left	Touch	16 QAM	1	0	36	0.179
711.00	23130	High	LTE Band 12	10	22.16	0.08	1	Left	Touch	16 QAM	1	49	36	0.221
707.50	23095	Mid	LTE Band 12	10	22.35	-0.07	1	Left	Tilt	QPSK	25	12	36	0.175
707.50	23095	Mid	LTE Band 12	10	23.12	0.03	0	Left	Tilt	QPSK	1	0	36	0.187
707.50	23095	Mid	LTE Band 12	10	23.31	-0.10	0	Left	Tilt	QPSK	1	49	36	0.230
707.50	23095	Mid	LTE Band 12	10	21.43	-0.04	2	Left	Tilt	16 QAM	25	12	36	0.133
711.00	23130	High	LTE Band 12	10	22.45	0.03	1	Left	Tilt	16 QAM	1	0	36	0.144
711.00	23130	High	LTE Band 12	10	22.16	0.04	1	Left	Tilt	16 QAM	1	49	36	0.156
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the 16 QAM, 1 RB allocation configurations for LTE Band 12.

Table 12-4
LTE Band 5 (Cell) Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.													(W/kg)
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	-0.09	1	Right	Touch	QPSK	12	6	35	0.244
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	0.14	0	Right	Touch	QPSK	1	0	35	0.360
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.00	0	Right	Touch	QPSK	1	24	35	0.486
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.11	2	Right	Touch	16 QAM	12	6	35	0.192
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	0.03	1	Right	Touch	16 QAM	1	0	35	0.276
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	0.05	1	Right	Touch	16 QAM	1	24	35	0.226
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.02	1	Right	Tilt	QPSK	12	6	35	0.167
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	0.16	0	Right	Tilt	QPSK	1	0	35	0.213
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.03	0	Right	Tilt	QPSK	1	24	35	0.296
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.15	2	Right	Tilt	16 QAM	12	6	35	0.130
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	0.01	1	Right	Tilt	16 QAM	1	0	35	0.185
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	0.05	1	Right	Tilt	16 QAM	1	24	35	0.151
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	-0.06	1	Left	Touch	QPSK	12	6	35	0.261
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	0.02	0	Left	Touch	QPSK	1	0	35	0.403
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	-0.04	0	Left	Touch	QPSK	1	24	35	**0.549**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.08	2	Left	Touch	16 QAM	12	6	35	0.221
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	-0.05	1	Left	Touch	16 QAM	1	0	35	0.304
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	0.05	1	Left	Touch	16 QAM	1	24	35	0.246
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	-0.02	1	Left	Tilt	QPSK	12	6	35	0.157
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	-0.04	0	Left	Tilt	QPSK	1	0	35	0.210
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	-0.08	0	Left	Tilt	QPSK	1	24	35	0.298
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.04	2	Left	Tilt	16 QAM	12	6	35	0.124
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	0.05	1	Left	Tilt	16 QAM	1	0	35	0.178
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	-0.11	1	Left	Tilt	16 QAM	1	24	35	0.137
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the QPSK, 1 RB allocation configurations for LTE Band 5 (Cell).

Table 12-5
LTE Band 4 (AWS) Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target 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)	10	22.03	0.14	1	Right	Touch	QPSK	25	12	34	0.614
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	0.13	0	Right	Touch	QPSK	1	0	34	0.861
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	0.01	0	Right	Touch	QPSK	1	49	34	**0.991**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.16	2	Right	Touch	16 QAM	25	12	34	0.523
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.21	1	Right	Touch	16 QAM	1	0	34	0.663
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.12	1	Right	Touch	16 QAM	1	49	34	0.895
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	-0.08	1	Right	Tilt	QPSK	25	12	34	0.381
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	0.10	0	Right	Tilt	QPSK	1	0	34	0.603
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	0.01	0	Right	Tilt	QPSK	1	49	34	0.681
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.05	2	Right	Tilt	16 QAM	25	12	34	0.326
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.07	1	Right	Tilt	16 QAM	1	0	34	0.466
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.10	1	Right	Tilt	16 QAM	1	49	34	0.563
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	-0.13	1	Left	Touch	QPSK	25	12	34	0.255
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	0.13	0	Left	Touch	QPSK	1	0	34	0.404
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.03	0	Left	Touch	QPSK	1	49	34	0.494
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	-0.11	2	Left	Touch	16 QAM	25	12	34	0.210
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.03	1	Left	Touch	16 QAM	1	0	34	0.316
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	-0.11	1	Left	Touch	16 QAM	1	49	34	0.376
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	-0.18	1	Left	Tilt	QPSK	25	12	34	0.228
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	-0.17	0	Left	Tilt	QPSK	1	0	34	0.351
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.08	0	Left	Tilt	QPSK	1	49	34	0.420
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.02	2	Left	Tilt	16 QAM	25	12	34	0.205
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.06	1	Left	Tilt	16 QAM	1	0	34	0.286
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.13	1	Left	Tilt	16 QAM	1	49	34	0.327
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								**Head 1.6 W/kg (mW/g) averaged over 1 gram**						

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the QPSK, 1 RB allocation and 16 QAM, 1 RB allocation configurations for LTE Band 4 (AWS).

Table 12-6
LTE Band 2 (PCS) Head SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.													(W/kg)
1852.50	18625	Low	LTE Band 2 (PCS)	5	22.37	0.19	1	Right	Touch	QPSK	12	6	37	0.755
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.03	1	Right	Touch	QPSK	12	6	37	0.809
1907.50	19175	High	LTE Band 2 (PCS)	5	22.10	0.07	1	Right	Touch	QPSK	12	6	37	0.705
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	-0.17	0	Right	Touch	QPSK	1	0	37	0.875
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	-0.09	0	Right	Touch	QPSK	1	24	37	**0.940**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	-0.07	2	Right	Touch	16 QAM	12	6	37	0.530
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.15	1	Right	Touch	16 QAM	1	0	37	0.652
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	-0.06	1	Right	Touch	16 QAM	1	24	37	0.624
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.15	1	Right	Tilt	QPSK	12	6	37	0.547
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.14	0	Right	Tilt	QPSK	1	0	37	0.647
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.11	0	Right	Tilt	QPSK	1	24	37	0.613
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.08	2	Right	Tilt	16 QAM	12	6	37	0.387
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.08	1	Right	Tilt	16 QAM	1	0	37	0.478
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.11	1	Right	Tilt	16 QAM	1	24	37	0.480
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.03	1	Left	Touch	QPSK	12	6	37	0.414
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	-0.01	0	Left	Touch	QPSK	1	0	37	0.472
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.02	0	Left	Touch	QPSK	1	24	37	0.457
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.18	2	Left	Touch	16 QAM	12	6	37	0.278
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.09	1	Left	Touch	16 QAM	1	0	37	0.347
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.03	1	Left	Touch	16 QAM	1	24	37	0.422
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.02	1	Left	Tilt	QPSK	12	6	37	0.334
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.05	0	Left	Tilt	QPSK	1	0	37	0.368
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	-0.03	0	Left	Tilt	QPSK	1	24	37	0.384
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	-0.20	2	Left	Tilt	16 QAM	12	6	37	0.024
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.30	1	Left	Tilt	16 QAM	1	0	37	0.301
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.03	1	Left	Tilt	16 QAM	1	24	37	0.303
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Head** **1.6 W/kg (mW/g)** averaged over 1 gram						

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the 16 QAM, 1 RB allocation configurations for LTE Band 2 (PCS).

Table 12-7
2.4 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)
2462	11	IEEE 802.11b	DSSS	14.34	0.04	Right	Touch	38	1	0.055
2462	11	IEEE 802.11b	DSSS	14.34	0.19	Right	Tilt	38	1	0.036
2462	11	IEEE 802.11b	DSSS	14.34	-0.06	Left	Touch	38	1	**0.077**
2462	11	IEEE 802.11b	DSSS	14.34	0.03	Left	Tilt	38	1	0.040
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)
5785	157	IEEE 802.11a	OFDM	13.68	0.14	Right	Touch	38	6	0.016
5785	157	IEEE 802.11a	OFDM	13.68	0.15	Right	Tilt	38	6	0.000
5785	157	IEEE 802.11a	OFDM	13.68	0.13	Left	Touch	38	6	**0.036**
5785	157	IEEE 802.11a	OFDM	13.68	0.14	Left	Tilt	38	6	0.002
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)
5220	44	IEEE 802.11a	OFDM	13.70	0.18	Right	Touch	38	6	0.012
5220	44	IEEE 802.11a	OFDM	13.70	0.00	Right	Tilt	38	6	0.000
5220	44	IEEE 802.11a	OFDM	13.70	0.19	Left	Touch	38	6	**0.025**
5220	44	IEEE 802.11a	OFDM	13.70	0.16	Left	Tilt	38	6	0.000
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)
5260	52	IEEE 802.11a	OFDM	13.76	0.12	Right	Touch	38	6	**0.011**
5260	52	IEEE 802.11a	OFDM	13.76	0.18	Right	Tilt	38	6	0.000
5260	52	IEEE 802.11a	OFDM	13.76	0.13	Left	Touch	38	6	0.003
5260	52	IEEE 802.11a	OFDM	13.76	0.13	Left	Tilt	38	6	0.000
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)
5500	100	IEEE 802.11a	OFDM	13.51	-0.20	Right	Touch	38	6	**0.001**
5500	100	IEEE 802.11a	OFDM	13.51	0.15	Right	Tilt	38	6	0.000
5500	100	IEEE 802.11a	OFDM	13.51	0.00	Left	Touch	38	6	0.001
5500	100	IEEE 802.11a	OFDM	13.51	0.00	Left	Tilt	38	6	0.000
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
CDMA Body-Worn SAR Results

MEASUREMENT RESULTS									
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.								(W/kg)
824.70	1013	Cell. CDMA	TDSO / SO32	25.13	0.07	1.0 cm	37	back	0.754
836.52	384	Cell. CDMA	TDSO / SO32	25.29	0.04	1.0 cm	37	back	**0.816**
848.31	777	Cell. CDMA	TDSO / SO32	25.30	-0.11	1.0 cm	37	back	0.805
1880.00	600	PCS CDMA	TDSO / SO32	25.09	0.12	1.0 cm	37	back	0.712
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 12-13
LTE Body-Worn SAR Results

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
707.50	23095	Mid	LTE Band 12	10	22.35	-0.20	1	36	QPSK	25	12	1.0 cm	back	0.237
707.50	23095	Mid	LTE Band 12	10	23.12	-0.12	0	36	QPSK	1	0	1.0 cm	back	0.255
707.50	23095	Mid	LTE Band 12	10	23.31	0.03	0	36	QPSK	1	49	1.0 cm	back	**0.300**
707.50	23095	Mid	LTE Band 12	10	21.43	0.12	2	36	16 QAM	25	12	1.0 cm	back	0.197
711.00	23130	High	LTE Band 12	10	22.45	0.11	1	36	16 QAM	1	0	1.0 cm	back	0.224
711.00	23130	High	LTE Band 12	10	22.16	0.14	1	36	16 QAM	1	49	1.0 cm	back	0.238
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.15	1	35	QPSK	12	6	1.0 cm	back	0.228
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	-0.02	0	35	QPSK	1	0	1.0 cm	back	0.240
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.02	0	35	QPSK	1	24	1.0 cm	back	**0.367**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.12	2	35	16 QAM	12	6	1.0 cm	back	0.183
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	-0.13	1	35	16 QAM	1	0	1.0 cm	back	0.265
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	-0.02	1	35	16 QAM	1	24	1.0 cm	back	0.196
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	0.13	1	34	QPSK	25	12	1.0 cm	back	0.316
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	-0.02	0	34	QPSK	1	0	1.0 cm	back	0.385
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.14	0	34	QPSK	1	49	1.0 cm	back	**0.448**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.20	2	34	16 QAM	25	12	1.0 cm	back	0.265
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	-0.07	1	34	16 QAM	1	0	1.0 cm	back	0.299
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.19	1	34	16 QAM	1	49	1.0 cm	back	0.359
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.15	1	32	QPSK	12	6	1.0 cm	back	0.493
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.00	0	32	QPSK	1	0	1.0 cm	back	0.553
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.06	0	32	QPSK	1	24	1.0 cm	back	**0.571**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.04	2	32	16 QAM	12	6	1.0 cm	back	0.376
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.03	1	32	16 QAM	1	0	1.0 cm	back	0.318
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.17	1	32	16 QAM	1	24	1.0 cm	back	0.345
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**									**Body** **1.6 W/kg (mW/g)** averaged over 1 gram					

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the QPSK, 1 RB allocation configurations for LTE Band 5 (Cell) and Band 4 (AWS); high channel was tested for the 16 QAM, 1 RB allocation configurations for LTE Band 12, Band 4 (AWS), and Band 2 (PCS).

Note: for LTE modes, 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	14.34	-0.02	1.0 cm	38	1	back	0.100
5785	157	IEEE 802.11a	OFDM	13.68	0.10	1.0 cm	37	6	back	**0.166**
5220	44	IEEE 802.11a	OFDM	13.70	-0.02	1.0 cm	37	6	back	0.040
5260	52	IEEE 802.11a	OFDM	13.76	0.11	1.0 cm	37	6	back	0.031
5500	100	IEEE 802.11a	OFDM	13.51	-0.13	1.0 cm	37	6	back	0.049
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 802.11b mode, 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
CDMA Hotspot SAR Data

MEASUREMENT RESULTS									
FREQUENCY		Mode	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.								(W/kg)
824.70	1013	Cell. CDMA	TDSO / SO32	25.13	0.07	1.0 cm	37	back	0.754
836.52	384	Cell. CDMA	TDSO / SO32	25.29	0.04	1.0 cm	37	back	**0.816**
848.31	777	Cell. CDMA	TDSO / SO32	25.30	-0.11	1.0 cm	37	back	0.805
836.52	384	Cell. CDMA	TDSO / SO32	25.29	0.02	1.0 cm	37	front	0.311
836.52	384	Cell. CDMA	TDSO / SO32	25.29	0.12	1.0 cm	37	bottom	0.076
836.52	384	Cell. CDMA	TDSO / SO32	25.29	0.04	1.0 cm	37	left	0.434
824.70	1013	Cell. CDMA	EVDO Rev. 0	25.04	0.03	1.0 cm	37	back	0.844
836.52	384	Cell. CDMA	EVDO Rev. 0	25.13	-0.03	1.0 cm	37	back	**0.875**
848.31	777	Cell. CDMA	EVDO Rev. 0	25.09	-0.03	1.0 cm	37	back	0.738
836.52	384	Cell. CDMA	EVDO Rev. 0	25.13	-0.04	1.0 cm	37	front	0.347
836.52	384	Cell. CDMA	EVDO Rev. 0	25.13	-0.14	1.0 cm	37	bottom	0.008
836.52	384	Cell. CDMA	EVDO Rev. 0	25.13	0.03	1.0 cm	37	left	0.374
1880.00	600	PCS CDMA	TDSO / SO32	25.09	0.12	1.0 cm	37	back	**0.712**
1880.00	600	PCS CDMA	TDSO / SO32	25.09	-0.20	1.0 cm	37	front	0.283
1880.00	600	PCS CDMA	TDSO / SO32	25.09	0.16	1.0 cm	37	bottom	0.214
1880.00	600	PCS CDMA	TDSO / SO32	25.09	-0.03	1.0 cm	37	left	0.170
1880.00	600	PCS CDMA	EVDO Rev. 0	24.91	-0.01	1.0 cm	37	back	**0.566**
1880.00	600	PCS CDMA	EVDO Rev. 0	24.91	-0.05	1.0 cm	37	front	0.255
1880.00	600	PCS CDMA	EVDO Rev. 0	24.91	-0.15	1.0 cm	37	bottom	0.196
1880.00	600	PCS CDMA	EVDO Rev. 0	24.91	0.05	1.0 cm	37	left	0.167
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 12 Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
707.50	23095	Mid	LTE Band 12	10	22.35	-0.20	1	36	QPSK	25	12	1.0 cm	back	0.237
707.50	23095	Mid	LTE Band 12	10	23.12	-0.12	0	36	QPSK	1	0	1.0 cm	back	0.255
707.50	23095	Mid	LTE Band 12	10	23.31	0.03	0	36	QPSK	1	49	1.0 cm	back	**0.300**
707.50	23095	Mid	LTE Band 12	10	21.43	0.12	2	36	16 QAM	25	12	1.0 cm	back	0.197
711.00	23130	High	LTE Band 12	10	22.45	0.11	1	36	16 QAM	1	0	1.0 cm	back	0.224
711.00	23130	High	LTE Band 12	10	22.16	0.14	1	36	16 QAM	1	49	1.0 cm	back	0.238
707.50	23095	Mid	LTE Band 12	10	22.35	-0.03	1	36	QPSK	25	12	1.0 cm	front	0.107
707.50	23095	Mid	LTE Band 12	10	23.12	0.03	0	36	QPSK	1	0	1.0 cm	front	0.117
707.50	23095	Mid	LTE Band 12	10	23.31	0.15	0	36	QPSK	1	49	1.0 cm	front	**0.151**
707.50	23095	Mid	LTE Band 12	10	21.43	0.21	2	36	16 QAM	25	12	1.0 cm	front	0.088
711.00	23130	High	LTE Band 12	10	22.45	0.10	1	36	16 QAM	1	0	1.0 cm	front	0.100
711.00	23130	High	LTE Band 12	10	22.16	-0.03	1	36	16 QAM	1	49	1.0 cm	front	0.116
707.50	23095	Mid	LTE Band 12	10	22.35	0.18	1	36	QPSK	25	12	1.0 cm	top	0.032
707.50	23095	Mid	LTE Band 12	10	23.12	0.04	0	36	QPSK	1	0	1.0 cm	top	0.035
707.50	23095	Mid	LTE Band 12	10	23.31	0.01	0	36	QPSK	1	49	1.0 cm	top	**0.042**
707.50	23095	Mid	LTE Band 12	10	21.43	0.15	2	36	16 QAM	25	12	1.0 cm	top	0.027
711.00	23130	High	LTE Band 12	10	22.45	-0.18	1	36	16 QAM	1	0	1.0 cm	top	0.028
711.00	23130	High	LTE Band 12	10	22.16	0.03	1	36	16 QAM	1	49	1.0 cm	top	0.033
707.50	23095	Mid	LTE Band 12	10	22.35	-0.02	1	36	QPSK	25	12	1.0 cm	left	0.112
707.50	23095	Mid	LTE Band 12	10	23.12	-0.02	0	36	QPSK	1	0	1.0 cm	left	0.128
707.50	23095	Mid	LTE Band 12	10	23.31	0.07	0	36	QPSK	1	49	1.0 cm	left	**0.154**
707.50	23095	Mid	LTE Band 12	10	21.43	-0.11	2	36	16 QAM	25	12	1.0 cm	left	0.091
711.00	23130	High	LTE Band 12	10	22.45	0.18	1	36	16 QAM	1	0	1.0 cm	left	0.106
711.00	23130	High	LTE Band 12	10	22.16	-0.05	1	36	16 QAM	1	49	1.0 cm	left	0.119
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**									**Body** **1.6 W/kg (mW/g)** averaged over 1 gram					

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the 16 QAM, 1 RB allocation configurations for LTE Band 12.

Table 12-17
LTE Band 5 (Cell) Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.15	1	35	QPSK	12	6	1.0 cm	back	0.228
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	-0.02	0	35	QPSK	1	0	1.0 cm	back	0.240
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.02	0	35	QPSK	1	24	1.0 cm	back	**0.367**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.12	2	35	16 QAM	12	6	1.0 cm	back	0.183
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	-0.13	1	35	16 QAM	1	0	1.0 cm	back	0.265
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	-0.02	1	35	16 QAM	1	24	1.0 cm	back	0.196
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.13	1	35	QPSK	12	6	1.0 cm	front	0.139
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	0.15	0	35	QPSK	1	0	1.0 cm	front	0.159
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.05	0	35	QPSK	1	24	1.0 cm	front	**0.247**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.04	2	35	16 QAM	12	6	1.0 cm	front	0.114
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	-0.03	1	35	16 QAM	1	0	1.0 cm	front	0.155
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	0.06	1	35	16 QAM	1	24	1.0 cm	front	0.133
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.02	1	35	QPSK	12	6	1.0 cm	top	0.025
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	-0.09	0	35	QPSK	1	0	1.0 cm	top	0.036
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.19	0	35	QPSK	1	24	1.0 cm	top	**0.049**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.16	2	35	16 QAM	12	6	1.0 cm	top	0.019
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	0.11	1	35	16 QAM	1	0	1.0 cm	top	0.026
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	-0.09	1	35	16 QAM	1	24	1.0 cm	top	0.022
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.90	0.18	1	35	QPSK	12	6	1.0 cm	left	0.142
846.50	20625	High	LTE Band 5 (Cell)	5	23.03	-0.10	0	35	QPSK	1	0	1.0 cm	left	0.122
846.50	20625	High	LTE Band 5 (Cell)	5	23.08	0.07	0	35	QPSK	1	24	1.0 cm	left	**0.248**
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.00	0.15	2	35	16 QAM	12	6	1.0 cm	left	0.119
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.95	0.01	1	35	16 QAM	1	0	1.0 cm	left	0.162
836.50	20525	Mid	LTE Band 5 (Cell)	5	21.81	0.03	1	35	16 QAM	1	24	1.0 cm	left	0.122
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**									**Body** **1.6 W/kg (mW/g)** averaged over 1 gram					

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the QPSK, 1 RB allocation configurations for LTE Band 5 (Cell).

Table 12-18
LTE Band 4 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target 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)	10	22.03	0.13	1	34	QPSK	25	12	1.0 cm	back	0.316
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	-0.02	0	34	QPSK	1	0	1.0 cm	back	0.385
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.14	0	34	QPSK	1	49	1.0 cm	back	**0.448**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.20	2	34	16 QAM	25	12	1.0 cm	back	0.265
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	-0.07	1	34	16 QAM	1	0	1.0 cm	back	0.299
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.19	1	34	16 QAM	1	49	1.0 cm	back	0.359
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	0.01	1	34	QPSK	25	12	1.0 cm	front	0.217
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	0.03	0	34	QPSK	1	0	1.0 cm	front	0.335
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	0.00	0	34	QPSK	1	49	1.0 cm	front	**0.362**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.10	2	34	16 QAM	25	12	1.0 cm	front	0.182
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.13	1	34	16 QAM	1	0	1.0 cm	front	0.262
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.18	1	34	16 QAM	1	49	1.0 cm	front	0.312
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	-0.17	1	34	QPSK	25	12	1.0 cm	top	0.172
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	-0.14	0	34	QPSK	1	0	1.0 cm	top	0.231
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.19	0	34	QPSK	1	49	1.0 cm	top	**0.231**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.17	2	34	16 QAM	25	12	1.0 cm	top	0.156
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	0.17	1	34	16 QAM	1	0	1.0 cm	top	0.186
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.06	1	34	16 QAM	1	49	1.0 cm	top	0.185
1732.50	20175	Mid	LTE Band 4 (AWS)	10	22.03	0.15	1	34	QPSK	25	12	1.0 cm	left	0.137
1750.00	20350	High	LTE Band 4 (AWS)	10	23.03	0.07	0	34	QPSK	1	0	1.0 cm	left	0.195
1750.00	20350	High	LTE Band 4 (AWS)	10	23.02	-0.03	0	34	QPSK	1	49	1.0 cm	left	**0.223**
1732.50	20175	Mid	LTE Band 4 (AWS)	10	21.05	0.08	2	34	16 QAM	25	12	1.0 cm	left	0.107
1750.00	20350	High	LTE Band 4 (AWS)	10	22.04	-0.03	1	34	16 QAM	1	0	1.0 cm	left	0.155
1750.00	20350	High	LTE Band 4 (AWS)	10	22.03	0.07	1	34	16 QAM	1	49	1.0 cm	left	0.176
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**										**Body** **1.6 W/kg (mW/g)** averaged over 1 gram				

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the QPSK, 1 RB allocation and 16 QAM, 1 RB allocation configurations for LTE Band 4 (AWS).

Table 12-19
LTE Band 2 (PCS) Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY			Mode	Bandwidth [MHz]	Conducted Power [dBm]	Power Drift [dB]	Target MPR [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.													(W/kg)
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.15	1	32	QPSK	12	6	1.0 cm	back	0.493
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.00	0	32	QPSK	1	0	1.0 cm	back	0.553
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.06	0	32	QPSK	1	24	1.0 cm	back	**0.571**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.04	2	32	16 QAM	12	6	1.0 cm	back	0.376
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	-0.03	1	32	16 QAM	1	0	1.0 cm	back	0.318
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.17	1	32	16 QAM	1	24	1.0 cm	back	0.345
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	0.13	1	32	QPSK	12	6	1.0 cm	front	0.352
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.05	0	32	QPSK	1	0	1.0 cm	front	0.399
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.13	0	32	QPSK	1	24	1.0 cm	front	**0.430**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.13	2	32	16 QAM	12	6	1.0 cm	front	0.267
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	0.03	1	32	16 QAM	1	0	1.0 cm	front	0.226
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.02	1	32	16 QAM	1	24	1.0 cm	front	0.253
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	-0.02	1	32	QPSK	12	6	1.0 cm	top	0.249
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	-0.04	0	32	QPSK	1	0	1.0 cm	top	0.290
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.04	0	32	QPSK	1	24	1.0 cm	top	**0.310**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	-0.09	2	32	16 QAM	12	6	1.0 cm	top	0.197
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	0.05	1	32	16 QAM	1	0	1.0 cm	top	0.210
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.01	1	32	16 QAM	1	24	1.0 cm	top	0.243
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.19	0.18	1	32	QPSK	12	6	1.0 cm	left	0.245
1880.00	18900	Mid	LTE Band 2 (PCS)	5	23.04	0.03	0	32	QPSK	1	0	1.0 cm	left	0.263
1880.00	18900	Mid	LTE Band 2 (PCS)	5	22.78	0.13	0	32	QPSK	1	24	1.0 cm	left	**0.300**
1880.00	18900	Mid	LTE Band 2 (PCS)	5	20.92	0.17	2	32	16 QAM	12	6	1.0 cm	left	0.174
1907.50	19175	High	LTE Band 2 (PCS)	5	21.90	0.20	1	32	16 QAM	1	0	1.0 cm	left	0.160
1907.50	19175	High	LTE Band 2 (PCS)	5	21.80	0.20	1	32	16 QAM	1	24	1.0 cm	left	0.194
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**									**Body** **1.6 W/kg (mW/g)** averaged over 1 gram					

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, high channel was tested for the 16 QAM, 1 RB allocation configurations for LTE Band 2 (PCS).

Table 12-20
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	14.34	-0.02	1.0 cm	38	1	back	0.100
2462	11	IEEE 802.11b	DSSS	14.34	0.07	1.0 cm	38	1	front	0.035
2462	11	IEEE 802.11b	DSSS	14.34	0.10	1.0 cm	38	1	left	**0.150**
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. All samples tested were electrically identical per the applicant.
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. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was tested because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per KDB Publication 941225 D01.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. Ev-Do and TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.
3. Hotspot SAR is measured using Subtype 0/1 Physical Layer configurations for Rev.0. If the average output power of Subtype 2 for Rev.A is less than the Rev.0 power levels, then Rev.A SAR is not required. Otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channel in Rev.0. SAR was additionally tested for 1x RTT hotspot using TDSO / SO32 FCH to address the CDMA Voice + LTE WIFI hotspot simultaneous transmission scenarios.

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 determined independent of testing 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. Only the primary Tx/Rx LTE antenna was transmitting during testing. The secondary LTE antenna was for receive-only and cannot transmit.
4. A-MPR was disabled for all SAR tests by setting NS=1.
5. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally 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.
6. 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) 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 an uncalibrated spectrum analyzer.
5. Since 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 default (and corresponding required) channels was not required.
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 and Right Edge for the Cell./PCS EVDO transmitter were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 1.2).
2. Bottom Edge and Right Edge for the LTE transmitter were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 1.2).
3. Top Edge, Bottom Edge, and Right 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 1.2).
4. 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

According to Figure 13-1 and Figure 13-2, simultaneous transmission analysis of SAR may be required for this device for the licensed and unlicensed transmitters. Possible simultaneous transmissions for this device indicated in Table 1-2 were numerically summed using stand-alone SAR data and are shown in the following tables.

13.3 Head SAR Simultaneous Transmission Analysis

Table 13-1
Simultaneous Transmission Scenario (Held to Ear)

Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)			Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
	1	2	3	1+2	1+3	1+2+3		1	2	3	1+2	1+3	1+2+3
Right Cheek	0.216	0.378	0.055	0.594	0.271	**0.649**	Right Cheek	0.163	0.378	0.055	0.541	0.218	**0.596**
Right Tilt	0.150	0.270	0.036	0.420	0.186	0.456	Right Tilt	0.185	0.270	0.036	0.455	0.221	0.491
Left Cheek	0.254	0.264	0.077	0.518	0.331	0.595	Left Cheek	0.185	0.264	0.077	0.449	0.262	0.526
Left Tilt	0.169	0.230	0.040	0.399	0.209	0.439	Left Tilt	0.170	0.230	0.040	0.400	0.210	0.440
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)			Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
	1	2	3	1+2	1+3	1+2+3		1	2	3	1+2	1+3	1+2+3
Right Cheek	0.216	0.486	0.055	0.702	0.271	0.757	Right Cheek	0.163	0.486	0.055	0.649	0.218	0.704
Right Tilt	0.150	0.296	0.036	0.446	0.186	0.482	Right Tilt	0.185	0.296	0.036	0.481	0.221	0.517
Left Cheek	0.254	0.549	0.077	0.803	0.331	**0.880**	Left Cheek	0.185	0.549	0.077	0.734	0.262	**0.811**
Left Tilt	0.169	0.298	0.040	0.467	0.209	0.507	Left Tilt	0.170	0.298	0.040	0.468	0.210	0.508
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)			Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
	1	2	3	1+2	1+3	1+2+3		1	2	3	1+2	1+3	1+2+3
Right Cheek	0.216	0.991	0.055	1.207	0.271	**1.262**	Right Cheek	0.163	0.991	0.055	1.154	0.218	**1.209**
Right Tilt	0.150	0.681	0.036	0.831	0.186	0.867	Right Tilt	0.185	0.681	0.036	0.866	0.221	0.902
Left Cheek	0.254	0.494	0.077	0.748	0.331	0.825	Left Cheek	0.185	0.494	0.077	0.679	0.262	0.756
Left Tilt	0.169	0.420	0.040	0.589	0.209	0.629	Left Tilt	0.170	0.420	0.040	0.590	0.210	0.630
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)			Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
	1	2	3	1+2	1+3	1+2+3		1	2	3	1+2	1+3	1+2+3
Right Cheek	0.216	0.940	0.055	1.156	0.271	**1.211**	Right Cheek	0.163	0.940	0.055	1.103	0.218	**1.158**
Right Tilt	0.150	0.647	0.036	0.797	0.186	0.833	Right Tilt	0.185	0.647	0.036	0.832	0.221	0.868
Left Cheek	0.254	0.472	0.077	0.726	0.331	0.803	Left Cheek	0.185	0.472	0.077	0.657	0.262	0.734
Left Tilt	0.169	0.384	0.040	0.553	0.209	0.593	Left Tilt	0.170	0.384	0.040	0.554	0.210	0.594

The above tables represent a held to ear voice call: (1+2) potentially simultaneously operating with LTE, (1+3) potentially simultaneously operating with 2.4 GHz WLAN, and (1+2+3) potentially simultaneously operating with LTE+WIFI hotspot.

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

Configuration	Cell. CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Cheek	0.216	0.016	0.232	Right Cheek	0.163	0.016	0.179
Right Tilt	0.150	0.000	0.150	Right Tilt	0.185	0.000	0.185
Left Cheek	0.254	0.036	**0.290**	Left Cheek	0.185	0.036	**0.221**
Left Tilt	0.169	0.002	0.171	Left Tilt	0.170	0.002	0.172

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	CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Back Side	Cell. CDMA	0.816	0.300	0.100	1.116	0.916	**1.216**
Back Side	PCS CDMA	0.712	0.300	0.100	1.012	0.812	1.112
Configuration	Mode	CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Back Side	Cell. CDMA	0.816	0.367	0.100	1.183	0.916	**1.283**
Back Side	PCS CDMA	0.712	0.367	0.100	1.079	0.812	1.179
Configuration	Mode	CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Back Side	Cell. CDMA	0.816	0.448	0.100	1.264	0.916	**1.364**
Back Side	PCS CDMA	0.712	0.448	0.100	1.160	0.812	1.260
Configuration	Mode	CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Back Side	Cell. CDMA	0.816	0.571	0.100	1.387	0.916	**1.487**
Back Side	PCS CDMA	0.712	0.571	0.100	1.283	0.812	1.383

The above tables represent a body-worn voice call: (1+2) potentially simultaneously operating with LTE, (1+3) potentially simultaneously operating with 2.4 GHz WLAN, and (1+2+3) potentially simultaneously operating with LTE+WIFI hotspot.

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

Configuration	Mode	CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.816	0.166	**0.982**
Back Side	PCS CDMA	0.712	0.166	0.878

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)

Configuration	Cell. EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back	0.875	0.100	**0.975**	Back	0.566	0.100	**0.666**
Front	0.347	0.035	0.382	Front	0.255	0.035	0.290
Top	-	-	0.000	Top	-	-	0.000
Bottom	0.008	-	0.008	Bottom	0.196	-	0.196
Right	-	-	0.000	Right	-	-	0.000
Left	0.374	0.150	0.524	Left	0.167	0.150	0.317

Configuration	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back	0.300	0.100	**0.400**	Back	0.367	0.100	**0.467**
Front	0.151	0.035	0.186	Front	0.247	0.035	0.282
Top	0.042	-	0.042	Top	0.049	-	0.049
Bottom	-	-	0.000	Bottom	-	-	0.000
Right	-	-	0.000	Right	-	-	0.000
Left	0.154	0.150	0.304	Left	0.248	0.150	0.398

Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back	0.448	0.100	**0.548**	Back	0.571	0.100	**0.671**
Front	0.362	0.035	0.397	Front	0.430	0.035	0.465
Top	0.231	-	0.231	Top	-	-	0.000
Bottom	-	-	0.000	Bottom	0.310	-	0.310
Right	-	-	0.000	Right	-	-	0.000
Left	0.223	0.150	0.373	Left	0.300	0.150	0.450

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.

Table 13-6
Simultaneous Transmission Scenario (Hotspot with Voice Call at 1.0 cm)

Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	3	1+2+3		1	2	3	1+2+3
Back	0.816	0.300	0.100	**1.216**	Back	0.712	0.300	0.100	**1.112**
Front	0.311	0.151	0.035	0.497	Front	0.283	0.151	0.035	0.469
Top	-	0.042	-	0.042	Top	-	0.042	-	0.042
Bottom	0.076	-	-	0.076	Bottom	0.214	-	-	0.214
Right	-	-	-	0.000	Right	-	-	-	0.000
Left	0.434	0.154	0.150	0.738	Left	0.170	0.154	0.150	0.474
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	3	1+2+3		1	2	3	1+2+3
Back	0.816	0.367	0.100	**1.283**	Back	0.712	0.367	0.100	**1.179**
Front	0.311	0.247	0.035	0.593	Front	0.283	0.247	0.035	0.565
Top	-	0.049	-	0.049	Top	-	0.049	-	0.049
Bottom	0.076	-	-	0.076	Bottom	0.214	-	-	0.214
Right	-	-	-	0.000	Right	-	-	-	0.000
Left	0.434	0.248	0.150	0.832	Left	0.170	0.248	0.150	0.568
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	3	1+2+3		1	2	3	1+2+3
Back	0.816	0.448	0.100	**1.364**	Back	0.712	0.448	0.100	**1.260**
Front	0.311	0.362	0.035	0.708	Front	0.283	0.362	0.035	0.680
Top	-	0.231	-	0.231	Top	-	0.231	-	0.231
Bottom	0.076	-	-	0.076	Bottom	0.214	-	-	0.214
Right	-	-	-	0.000	Right	-	-	-	0.000
Left	0.434	0.223	0.150	0.807	Left	0.170	0.223	0.150	0.543
Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	3	1+2+3		1	2	3	1+2+3
Back	0.816	0.571	0.100	**1.487**	Back	0.712	0.571	0.100	**1.383**
Front	0.311	0.430	0.035	0.776	Front	0.283	0.430	0.035	0.748
Top	-	-	-	0.000	Top	-	-	-	0.000
Bottom	0.076	0.310	-	0.386	Bottom	0.214	0.310	-	0.524
Right	-	-	-	0.000	Right	-	-	-	0.000
Left	0.434	0.300	0.150	0.884	Left	0.170	0.300	0.150	0.620

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 potentially simultaneously operating with a voice call.

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
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	N/A
Index SAR	IXTL-030	30MM TEM line for 6 GHz	N/A	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	D1765V2	1765 MHz SAR Dipole	6/16/2011	Annual	6/16/2012	1008
SPEAG	D2450V2	2450 MHz SAR Dipole	1/24/2012	Annual	1/24/2013	797
SPEAG	D5GHzV2	5 GHz SAR Dipole	7/26/2011	Annual	7/26/2012	1007
SPEAG	D835V2	835 MHz SAR Dipole	1/25/2012	Annual	1/25/2013	4d047
SPEAG	D835V2	835 MHz SAR Dipole	8/15/2011	Annual	8/15/2012	4d026
SPEAG	DAE3	Dasy Data Acquisition Electronics	11/9/2011	Annual	11/9/2012	455
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2011	Annual	4/20/2012	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/20/2012	Annual	2/20/2013	649
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	EX3DV4	SAR Probe	7/27/2011	Annual	7/27/2012	3561
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/19/2011	Annual	5/19/2012	859
SPEAG	ES3DV3	SAR Probe	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	N/A	N/A	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	N/A	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	ES3DV3	SAR Probe	2/21/2012	Annual	2/21/2013	3258
SPEAG	D1750V2	1750 MHz SAR Dipole	5/24/2011	Annual	5/24/2012	1051
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	N/A	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT	N/A	N/A	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	N/A	120
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	N/A	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	N/A	N/A
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43163447
SPEAG	ES3DV3	SAR Probe	11/18/2011	Annual	11/18/2012	3263
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/18/2012	Annual	1/18/2013	1272
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
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	N/A	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	N/A	N/A
VWR	61220-416	Long Stem Thermometer	7/1/2011	Biennial	7/1/2013	111642834
VWR	61220-416	Long stem thermometer	7/1/2011	Biennial	7/1/2013	111642916
VWR	61220-416	Long Stem Thermometer	7/1/2011	Biennial	7/1/2013	111642941
VWR	36934-158	Wall Thermometer	9/30/2011	Biennial	9/30/2013	111859323
VWR	36934-158	Wall Thermometer	9/30/2011	Biennial	9/30/2013	111859332
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	11/30/2011	Annual	11/30/2012	101699
Agilent	E5515C	Wireless Communications Test Set	2/9/2012	Annual	2/9/2013	GB43460554
Speag	DAK-3.5	Dielectric Assessment Kit	12/1/2011	Annual	12/1/2012	1031
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	N/A	N/A
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/5/2012	Annual	3/5/2013	102060

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, attenuator, coupler, amplifier, 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]

17 REFERENCES

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

[2] ANSI/IEEE C95.1-2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, 2006.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

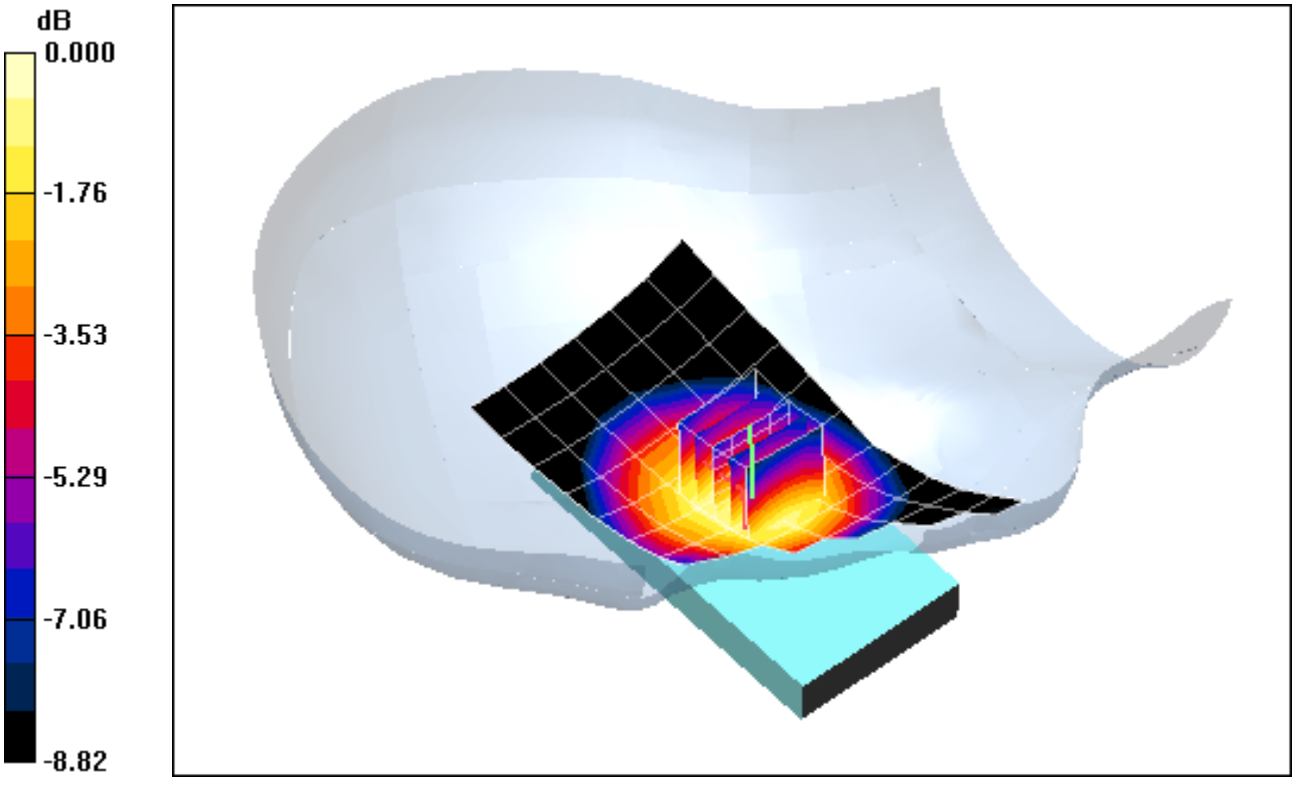
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.913$ mho/m; $\varepsilon_r = 39.6$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 03-08-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA, Right Head, Touch, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.3 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.264 W/kg
SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.164 mW/g



0 dB = 0.228mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

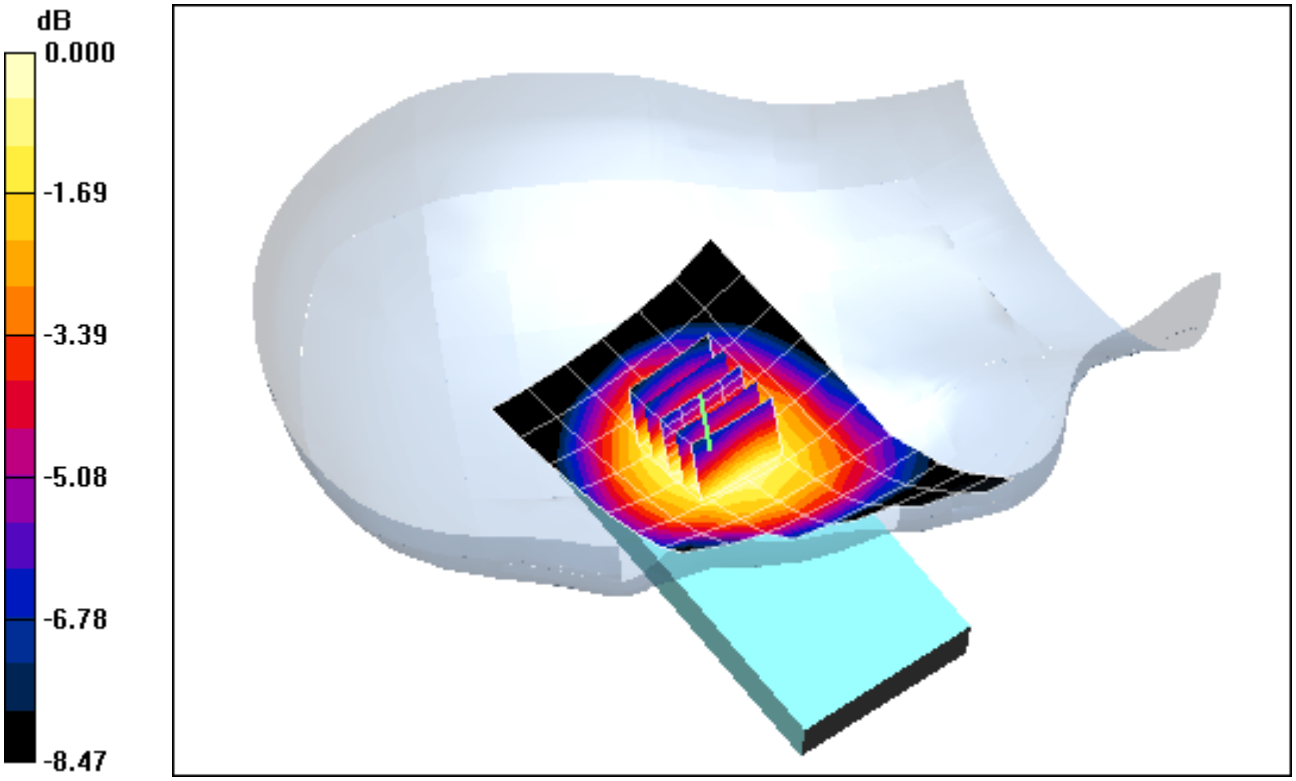
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.913$ mho/m; $\varepsilon_r = 39.6$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 03-08-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA, Right Head, Tilt, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.114 mW/g



0 dB = 0.158mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

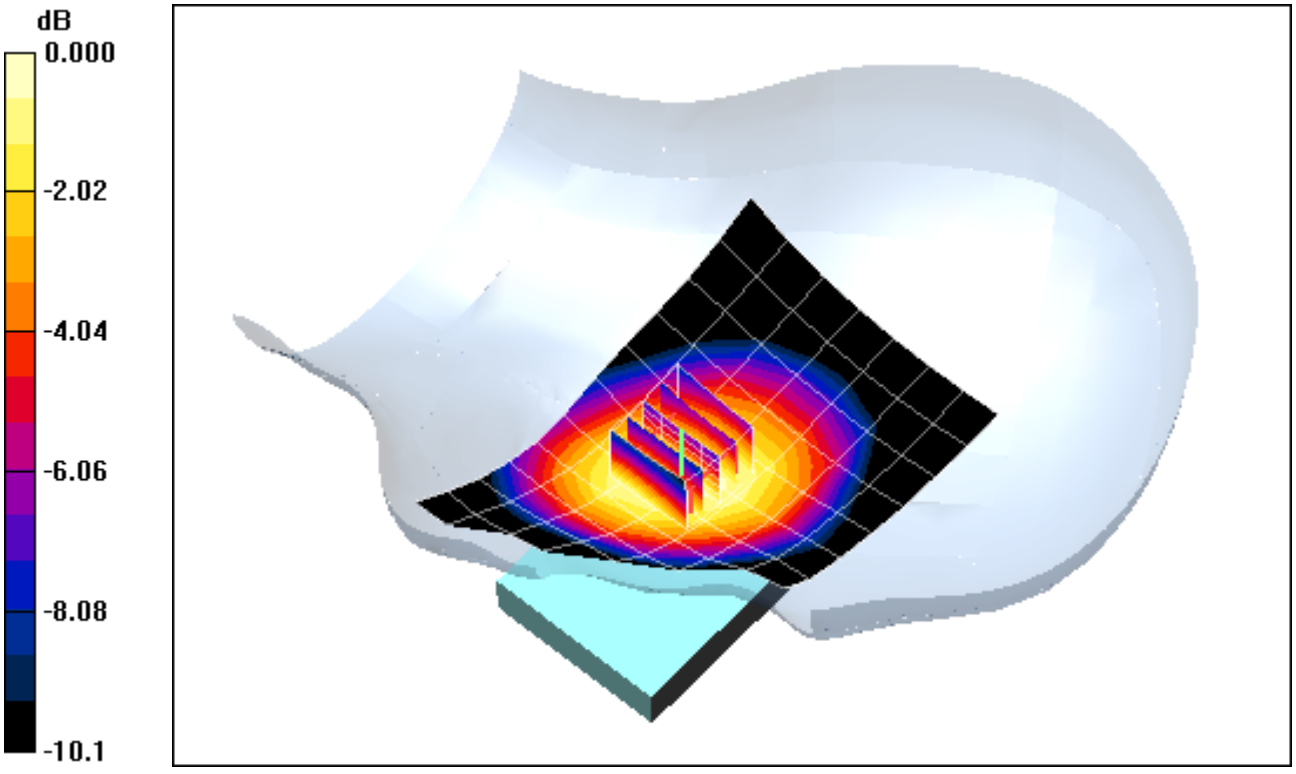
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.913$ mho/m; $\varepsilon_r = 39.6$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-08-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA, Left Head, Touch, Mid.ch

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.189 mW/g



0 dB = 0.270mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

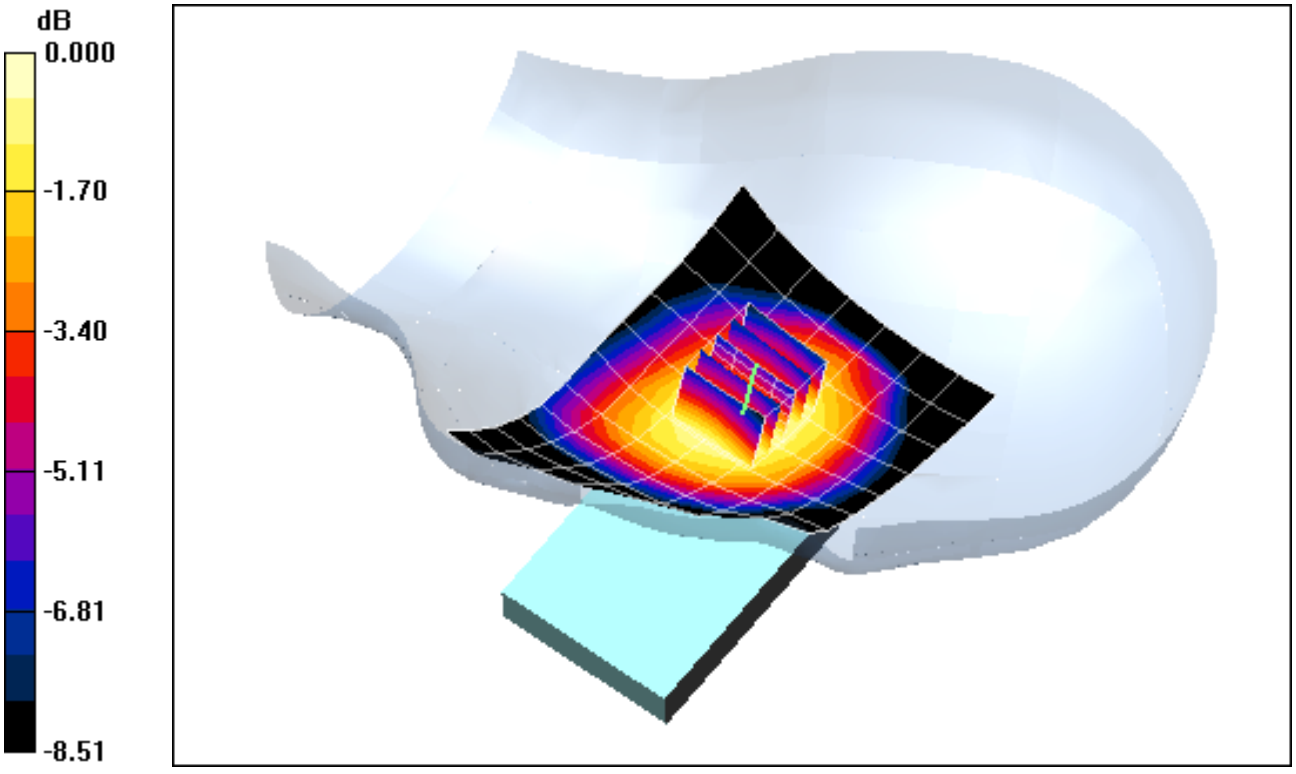
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.913$ mho/m; $\varepsilon_r = 39.6$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-08-2012; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular CDMA, Left Head, Tilt, Mid.ch

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = 0.034 dB
Peak SAR (extrapolated) = 0.209 W/kg
SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.128 mW/g



0 dB = 0.177mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

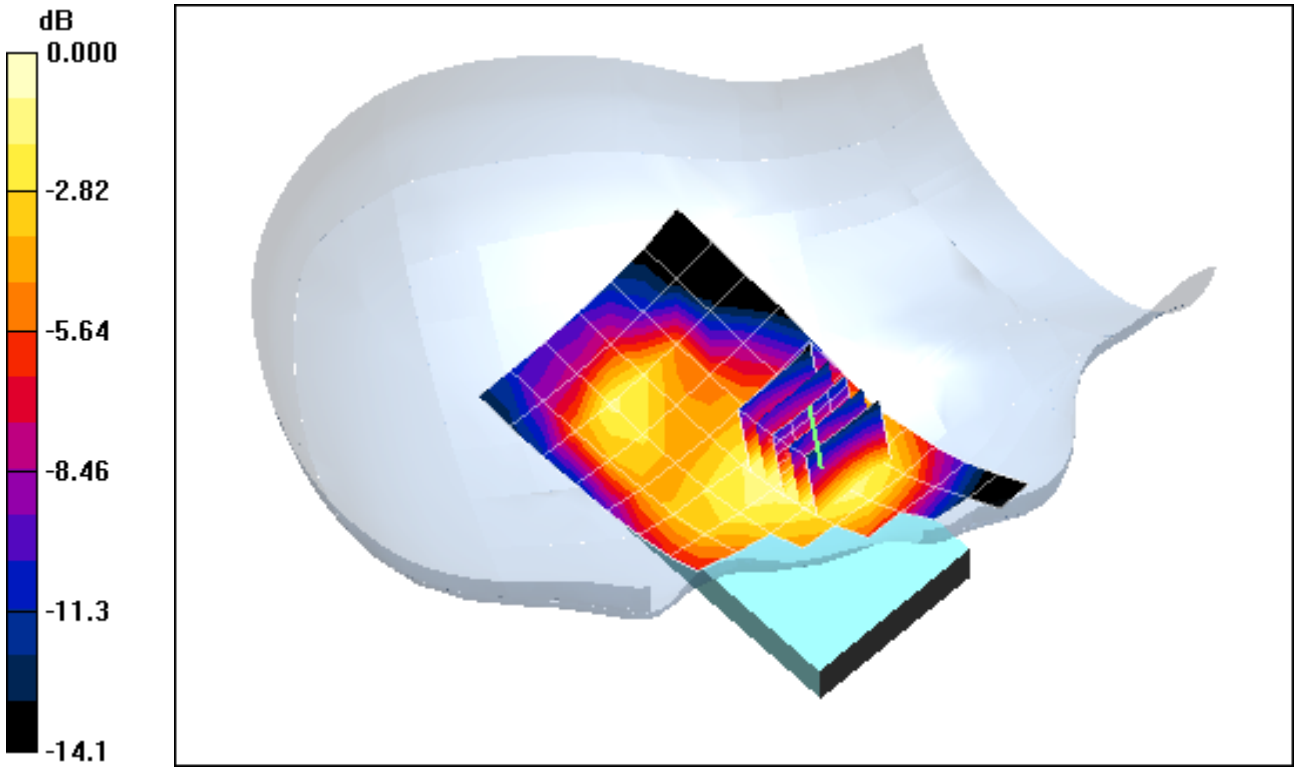
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-09-2012; Ambient Temp: 24.6°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(5.02, 5.02, 5.02); 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: PCS CDMA, Right Head, Touch, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.103 mW/g



0 dB = 0.176mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

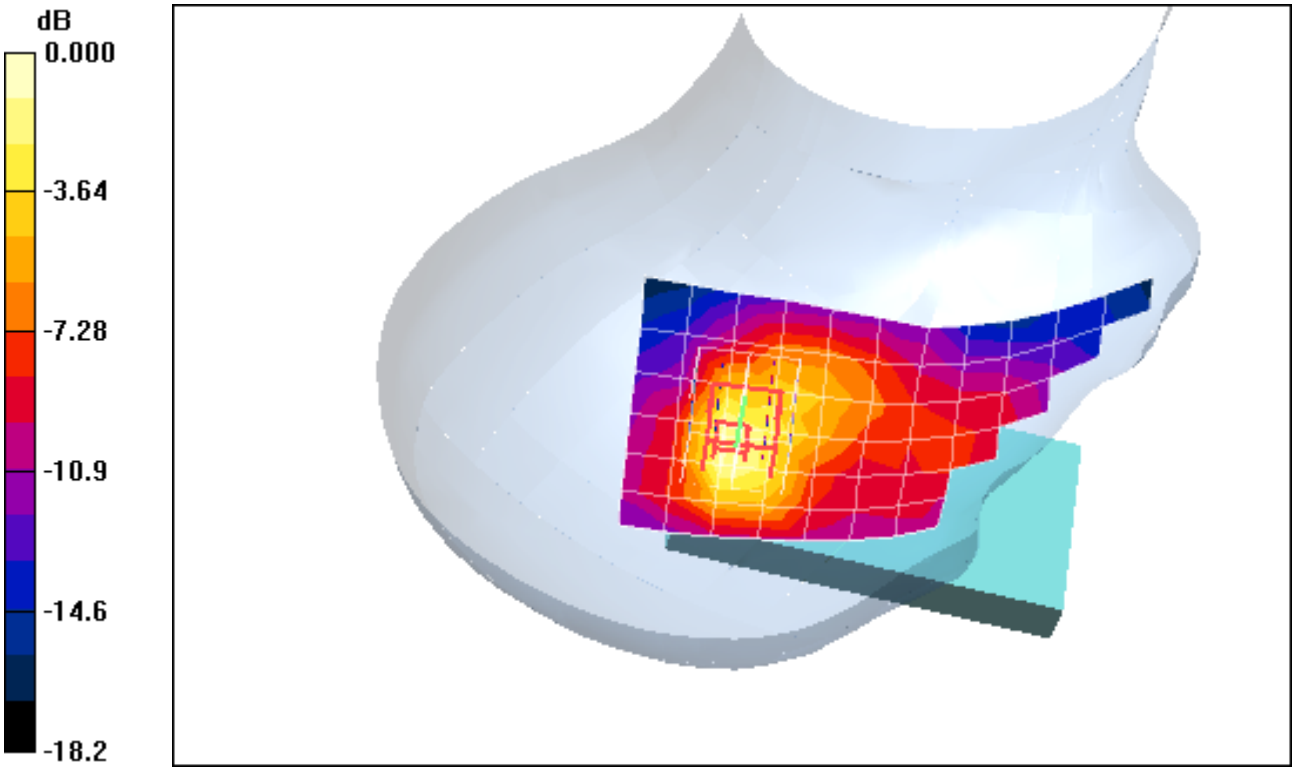
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-09-2012; Ambient Temp: 24.6°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(5.02, 5.02, 5.02); 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: PCS CDMA, Right Head, Tilt, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.359 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.097 mW/g



0 dB = 0.205mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

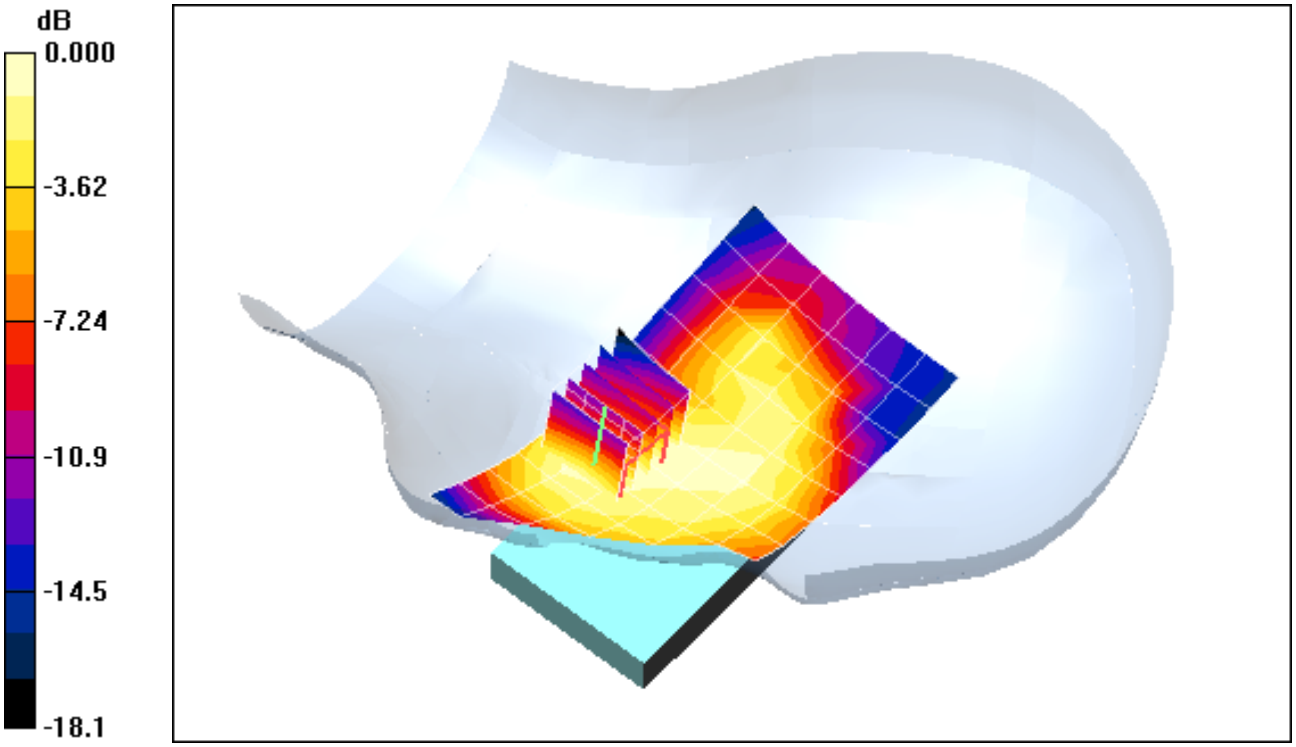
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-09-2012; Ambient Temp: 24.6°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(5.02, 5.02, 5.02); 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: PCS CDMA, Left Head, Touch, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = -0.093 dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.116 mW/g



0 dB = 0.196mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

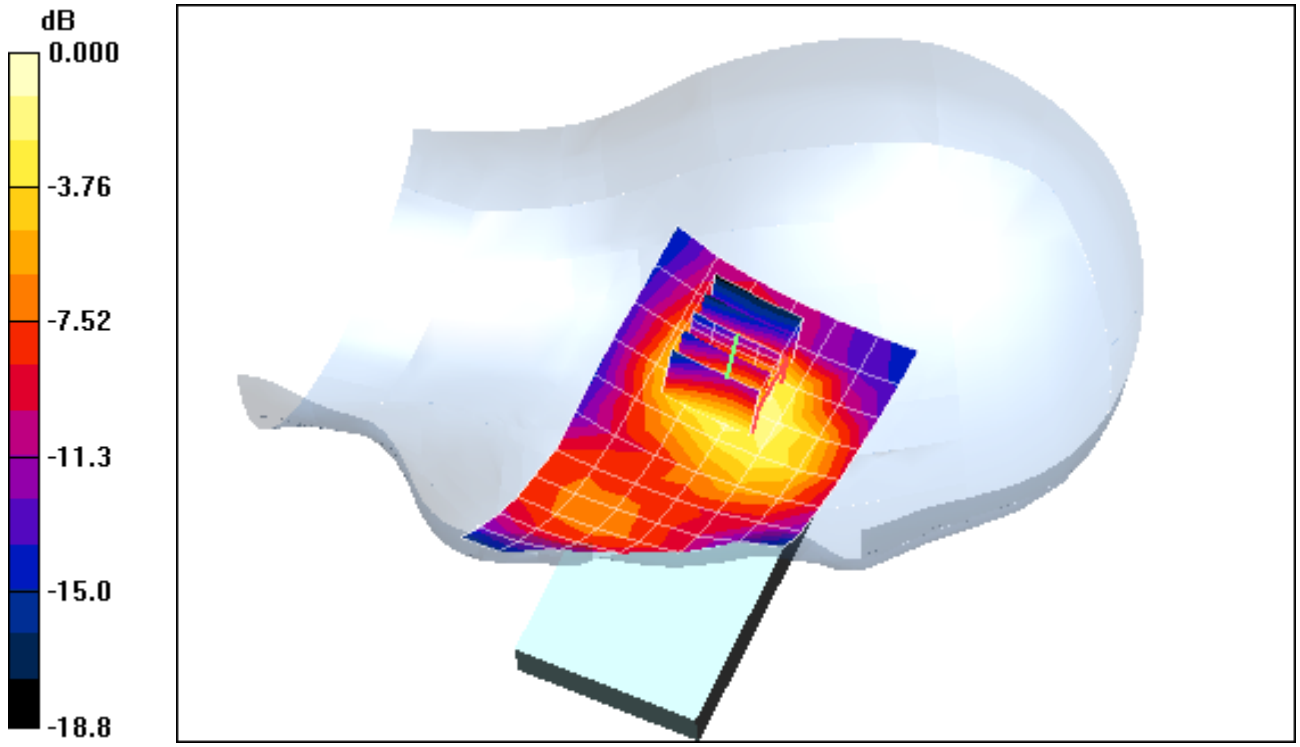
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.44 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-09-2012; Ambient Temp: 24.6°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(5.02, 5.02, 5.02); 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: PCS CDMA, Left Head, Tilt, Mid.ch

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.170 mW/g; SAR(10 g) = 0.099 mW/g



0 dB = 0.186mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

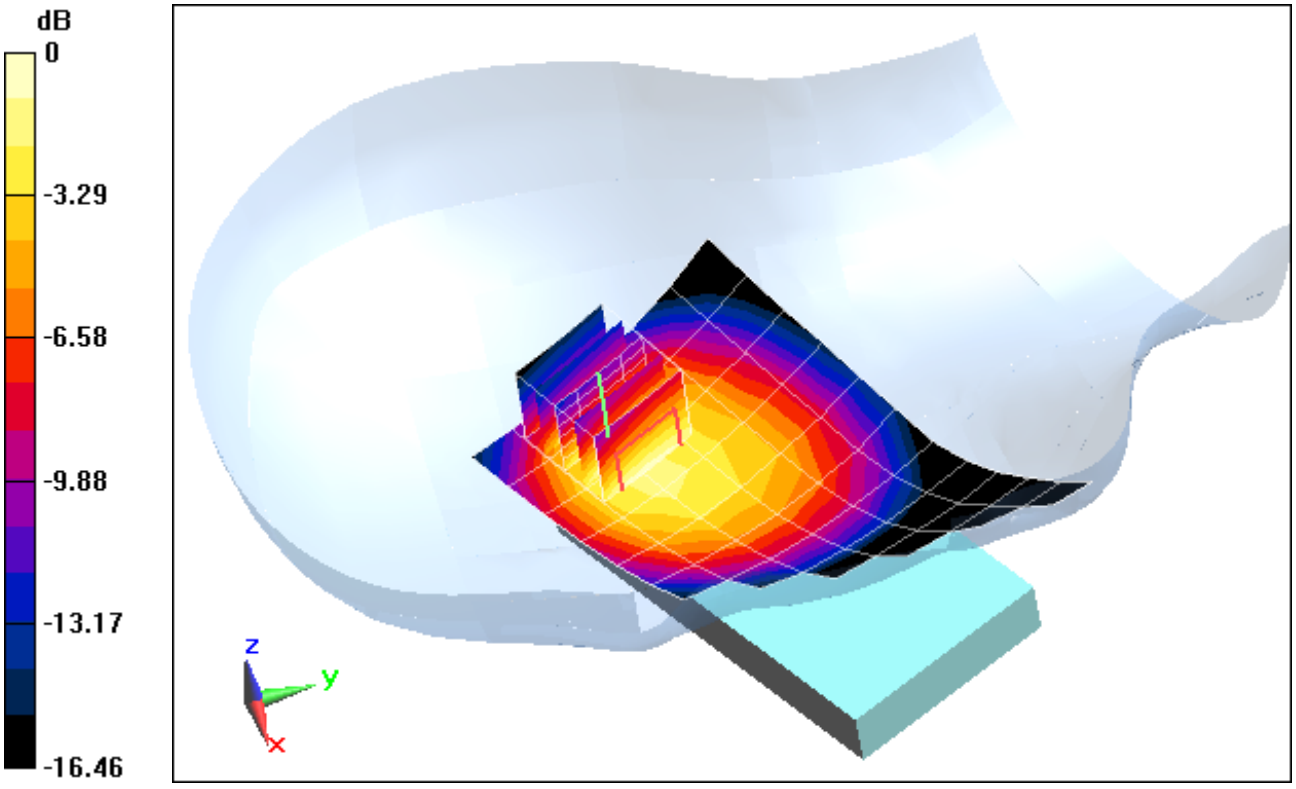
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.872 mho/m; ε_r = 41.312; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.41, 6.41, 6.41); Calibrated: 11/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Right Head, Touch, Mid.ch, QPSK,
10 MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.345 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.6880
SAR(1 g) = 0.378 mW/g; SAR(10 g) = 0.235 mW/g



0 dB = 0.400mW/g = -7.96 dB mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

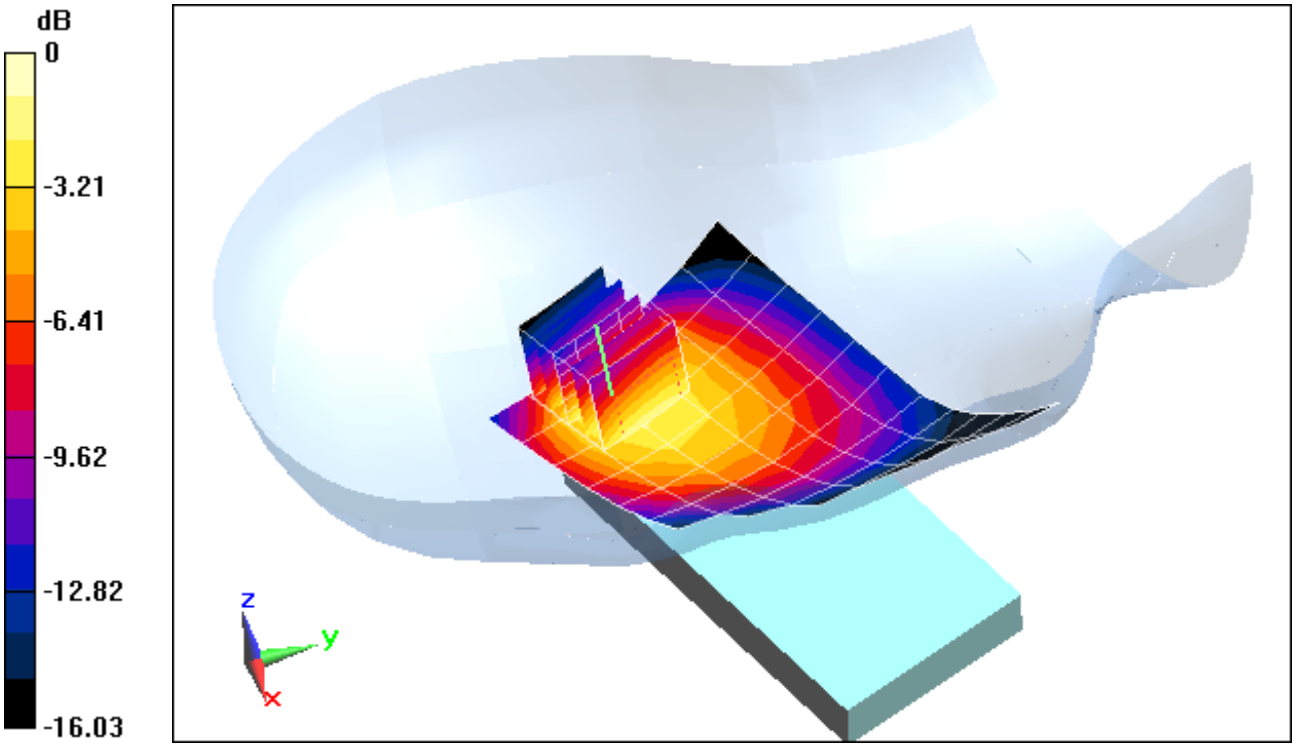
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.872 mho/m; ε_r = 41.312; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.41, 6.41, 6.41); Calibrated: 11/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Right Head, Tilt, Mid.ch, QPSK,
10 MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.423 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.5510
SAR(1 g) = 0.270 mW/g; SAR(10 g) = 0.161 mW/g



0 dB = 0.290mW/g = -10.75 dB mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

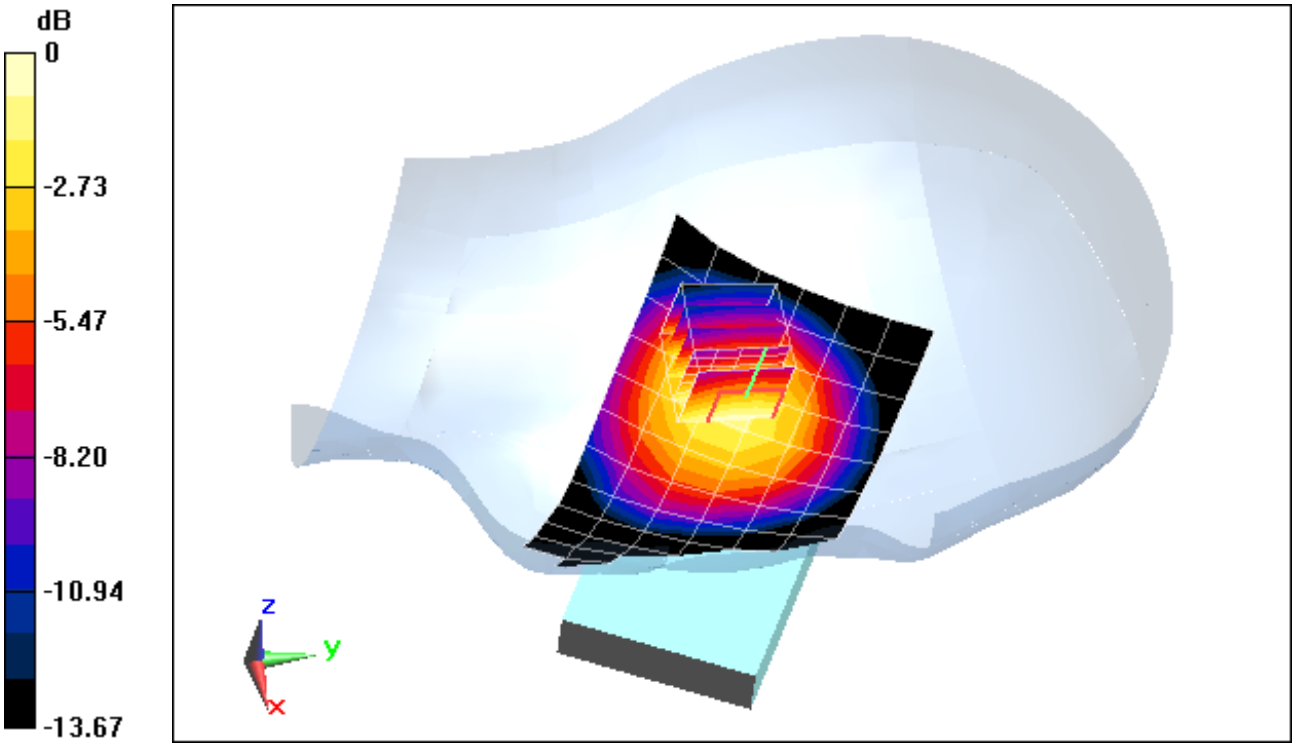
Communication System: LTE RF; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used (interpolated):
$f = 707.5$ MHz; $\sigma = 0.872$ mho/m; $\varepsilon_r = 41.312$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.41, 6.41, 6.41); Calibrated: 11/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Left Head, Touch, Mid.Ch, QPSK, 10MHz Bandwidth, 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 = 18.493 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.3850
SAR(1 g) = 0.264 mW/g; SAR(10 g) = 0.186 mW/g



0 dB = 0.280mW/g = -11.06 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

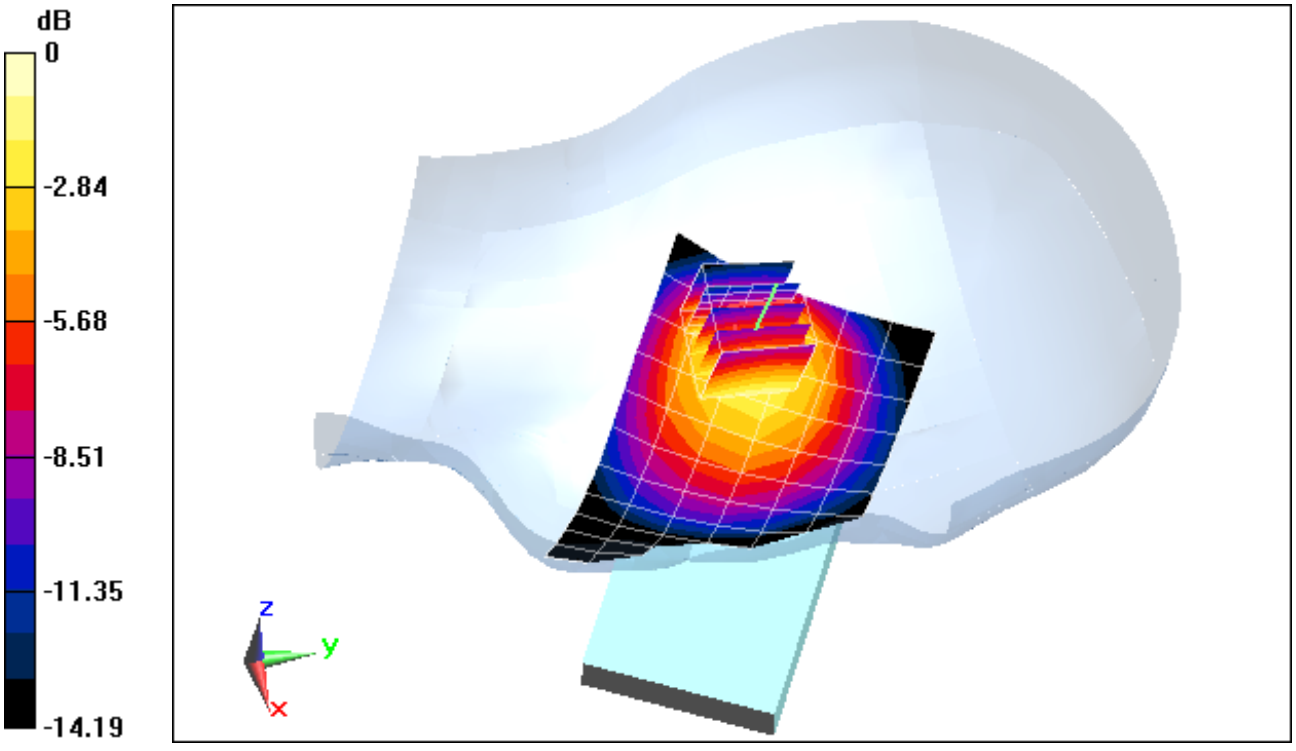
Communication System: LTE RF; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Head Medium parameters used (interpolated):
$f = 707.5$ MHz; $\sigma = 0.872$ mho/m; $\varepsilon_r = 41.312$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.41, 6.41, 6.41); Calibrated: 11/18/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Left Head, Tilt, Mid.ch, QPSK, 10MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.083 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.4090
SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.148 mW/g



0 dB = 0.250mW/g = -12.04 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

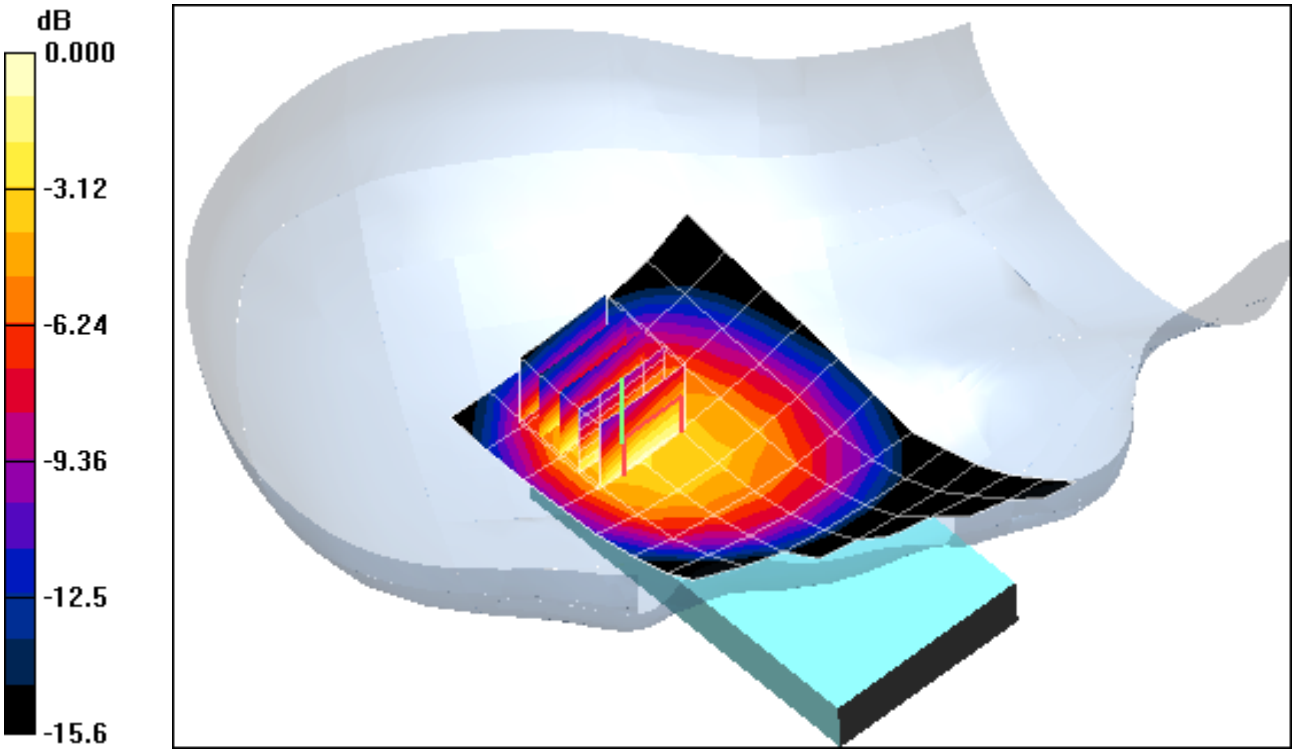
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 846.5$ MHz; $\sigma = 0.887$ mho/m; $\varepsilon_r = 40.1$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 23.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Right Head, Touch, High.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.1 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 0.824 W/kg
SAR(1 g) = 0.486 mW/g; SAR(10 g) = 0.312 mW/g



0 dB = 0.513mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

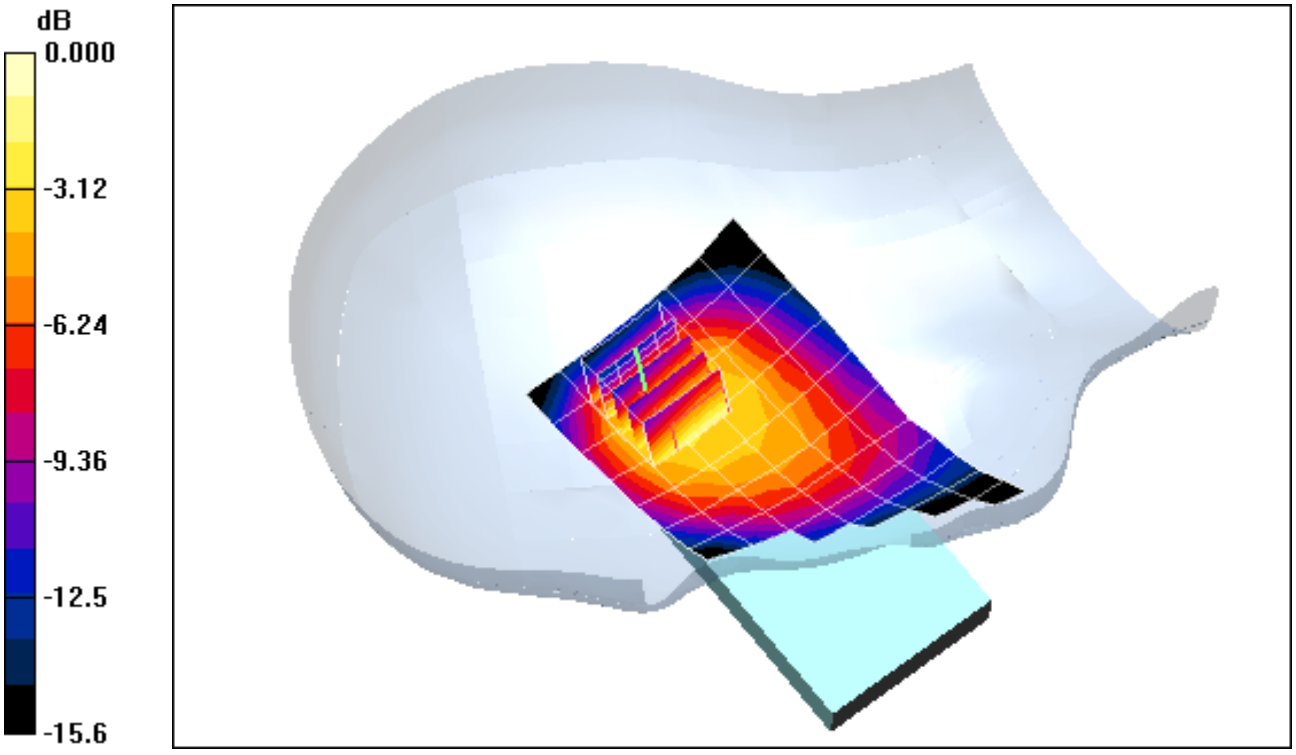
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 846.5$ MHz; $\sigma = 0.887$ mho/m; $\varepsilon_r = 40.1$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 23.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Right Head, Tilt, High.ch,
QPSK, 5 MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.8 V/m; Power Drift = 0.034 dB
Peak SAR (extrapolated) = 0.542 W/kg
SAR(1 g) = 0.296 mW/g; SAR(10 g) = 0.189 mW/g



0 dB = 0.318mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

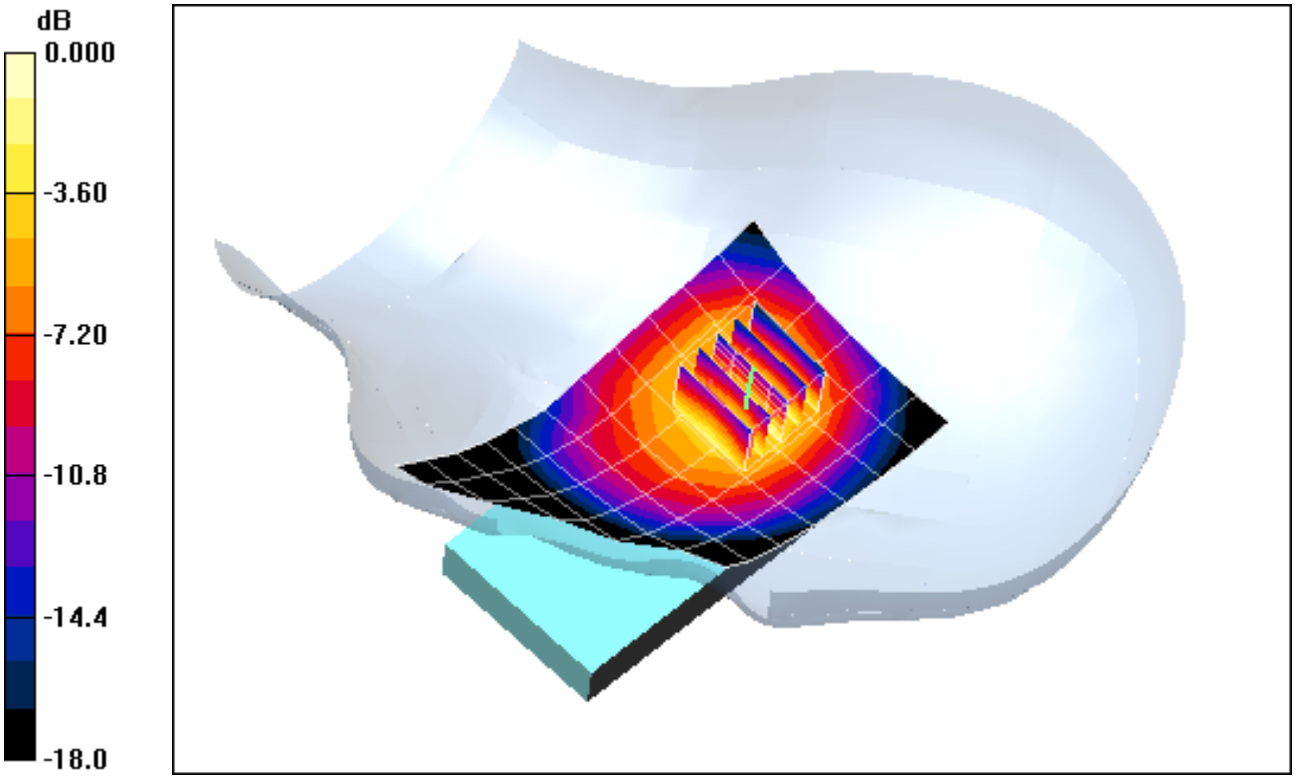
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 846.5$ MHz; $\sigma = 0.887$ mho/m; $\varepsilon_r = 40.1$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 23.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Left Head, Touch, High.Ch,
QPSK, 5 MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.1 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.721 W/kg
SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.390 mW/g



0 dB = 0.576mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

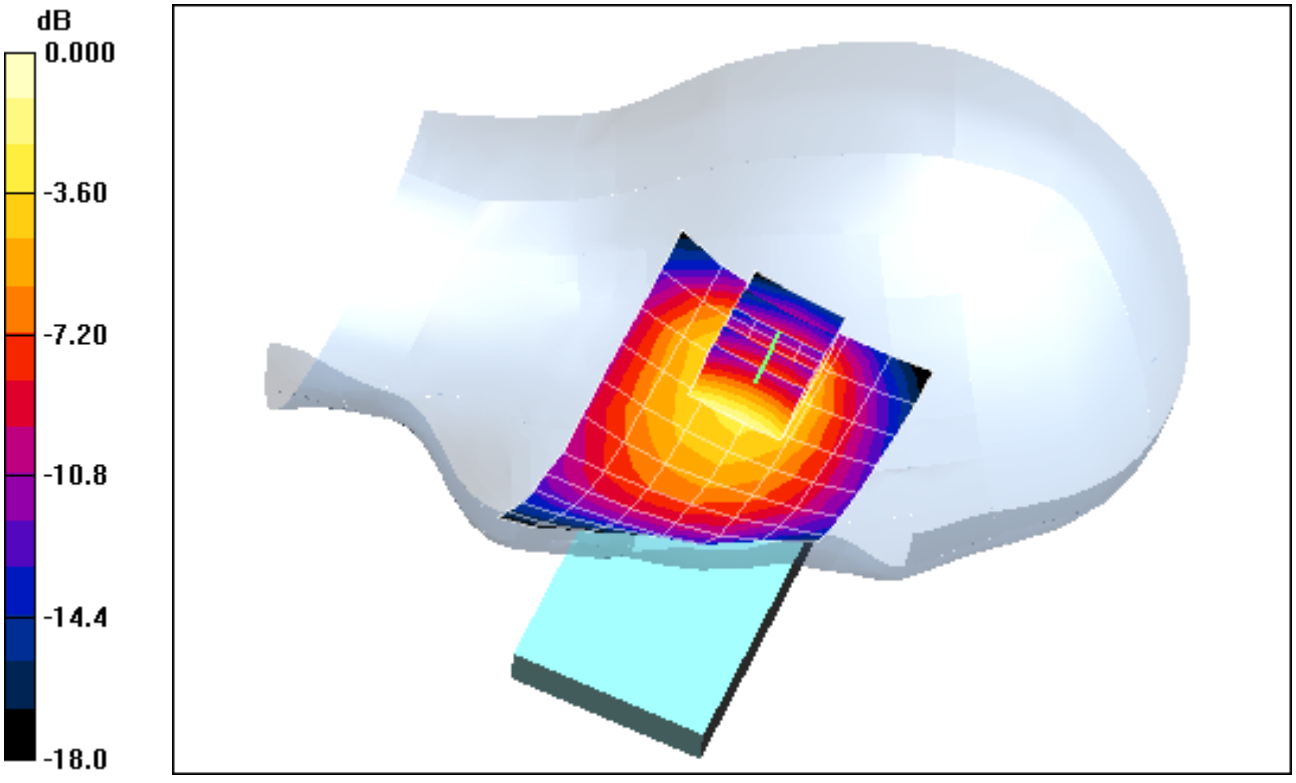
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 846.5$ MHz; $\sigma = 0.887$ mho/m; $\varepsilon_r = 40.1$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 23.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(6.01, 6.01, 6.01); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Left Head, Tilt, High.ch,
QPSK, 5 MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.1 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 0.436 W/kg
SAR(1 g) = 0.298 mW/g; SAR(10 g) = 0.211 mW/g



0 dB = 0.317mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

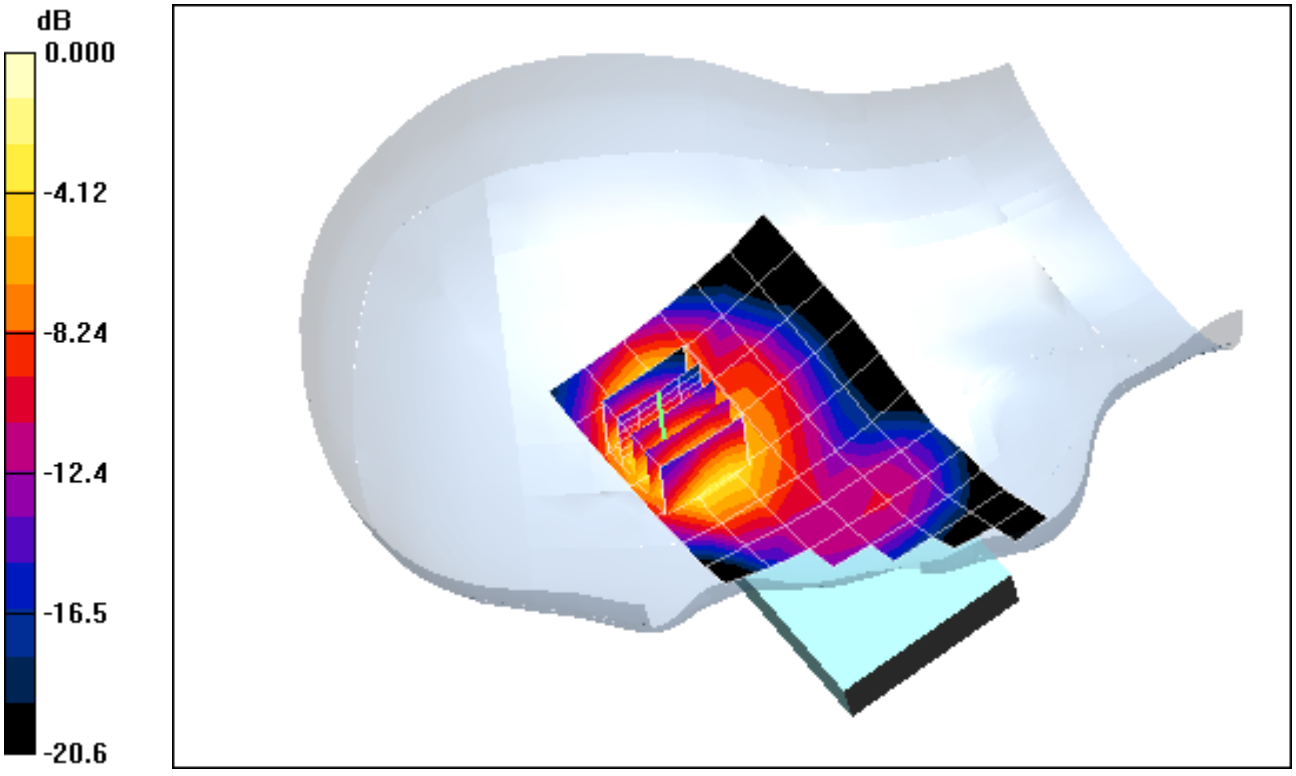
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.33 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.8°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, Right Head, Touch, High.ch,
QPSK, 10 MHz Bandwidth, 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 = 29.7 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.991 mW/g; SAR(10 g) = 0.538 mW/g



0 dB = 1.14mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

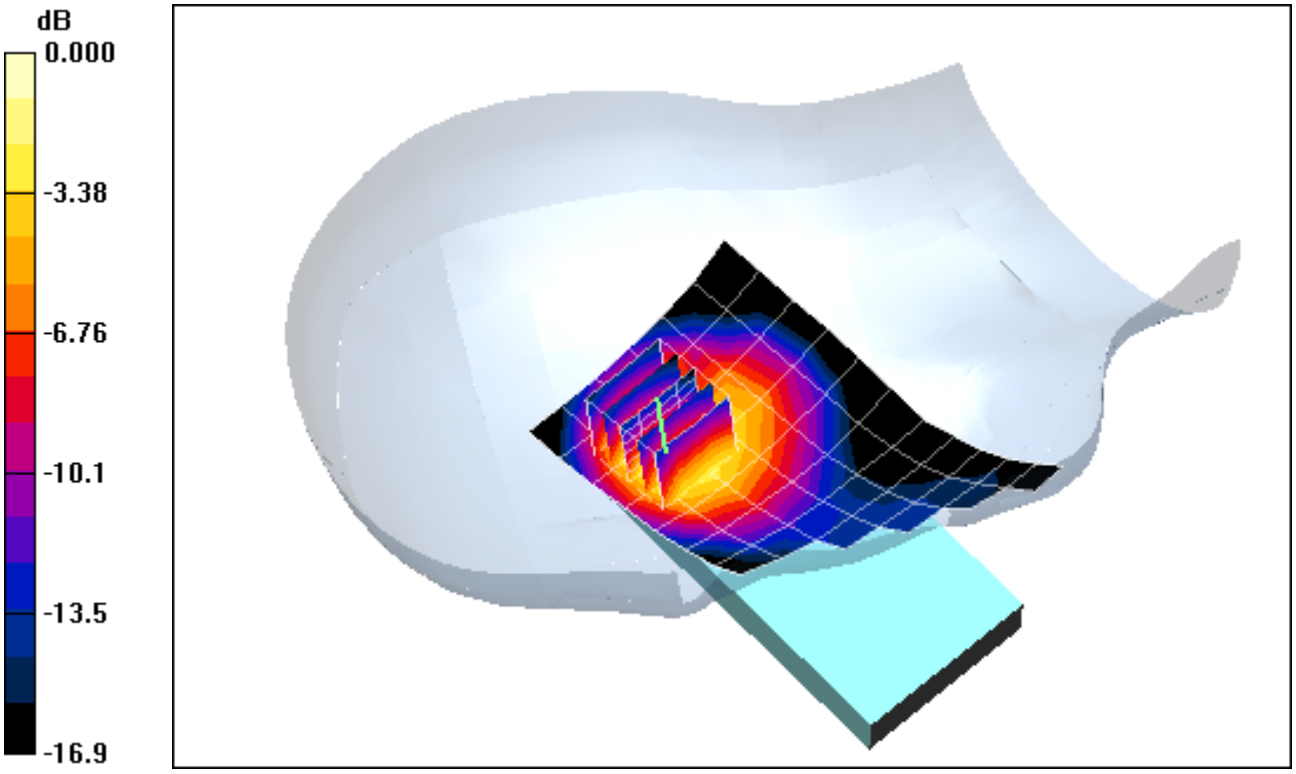
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.33 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-13-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.8°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, Right Head, Tilt, High.ch,
QPSK, 10MHz Bandwidth, 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 = 23.8 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.367 mW/g



0 dB = 0.769mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

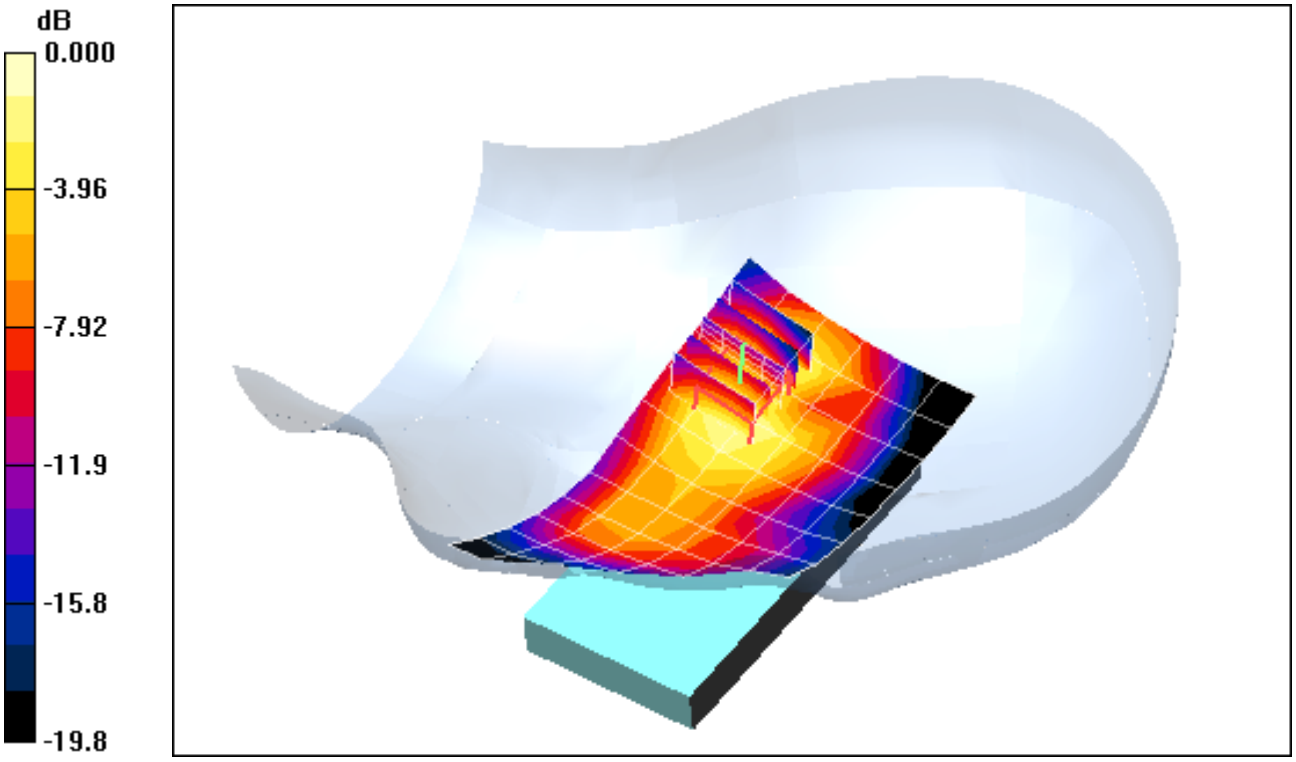
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.33 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.8°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, Left Head, Touch, High.ch,
QPSK, 10MHz Bandwidth, 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 = 20.3 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.800 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.288 mW/g



0 dB = 0.523mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

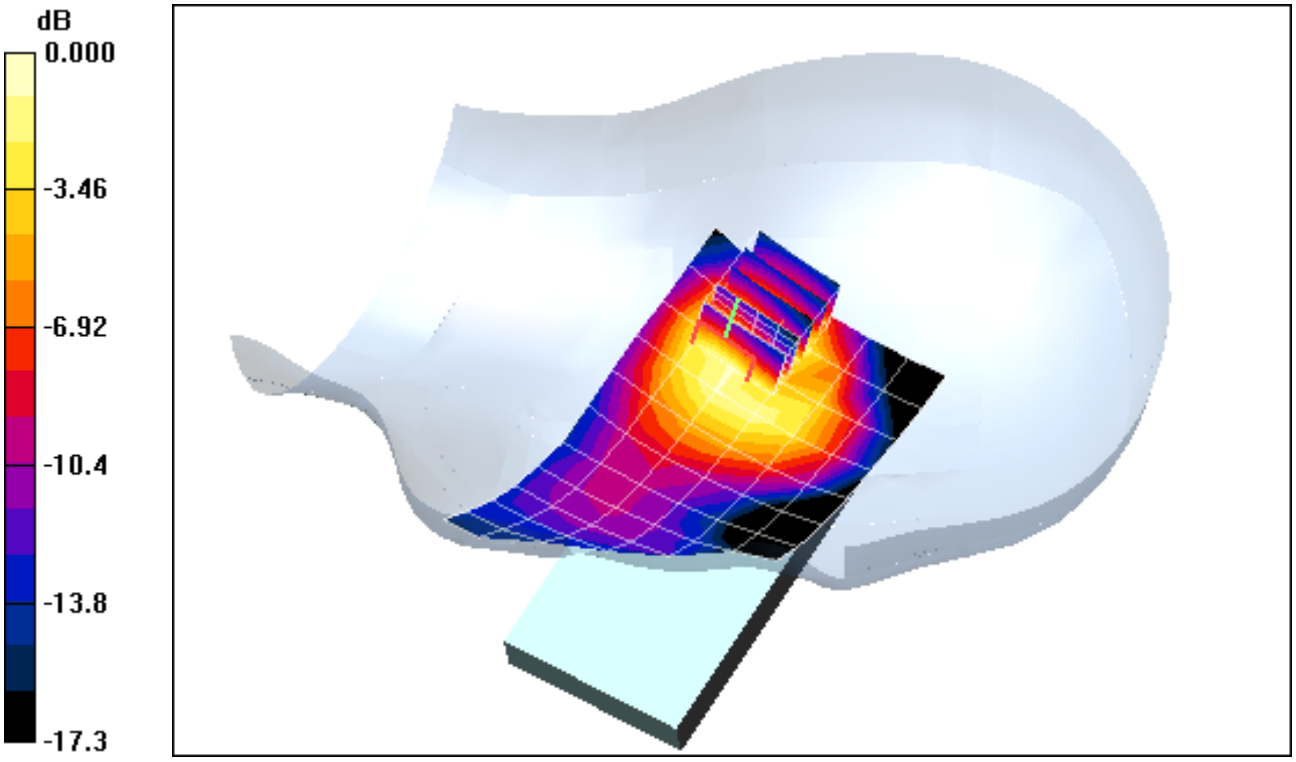
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.33 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-13-2012; Ambient Temp: 24.7°C; Tissue Temp: 22.8°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, Left Head, Tilt, High.ch,
QPSK, 10MHz Bandwidth, 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 = 19.2 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.730 W/kg
SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.231 mW/g



0 dB = 0.461mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

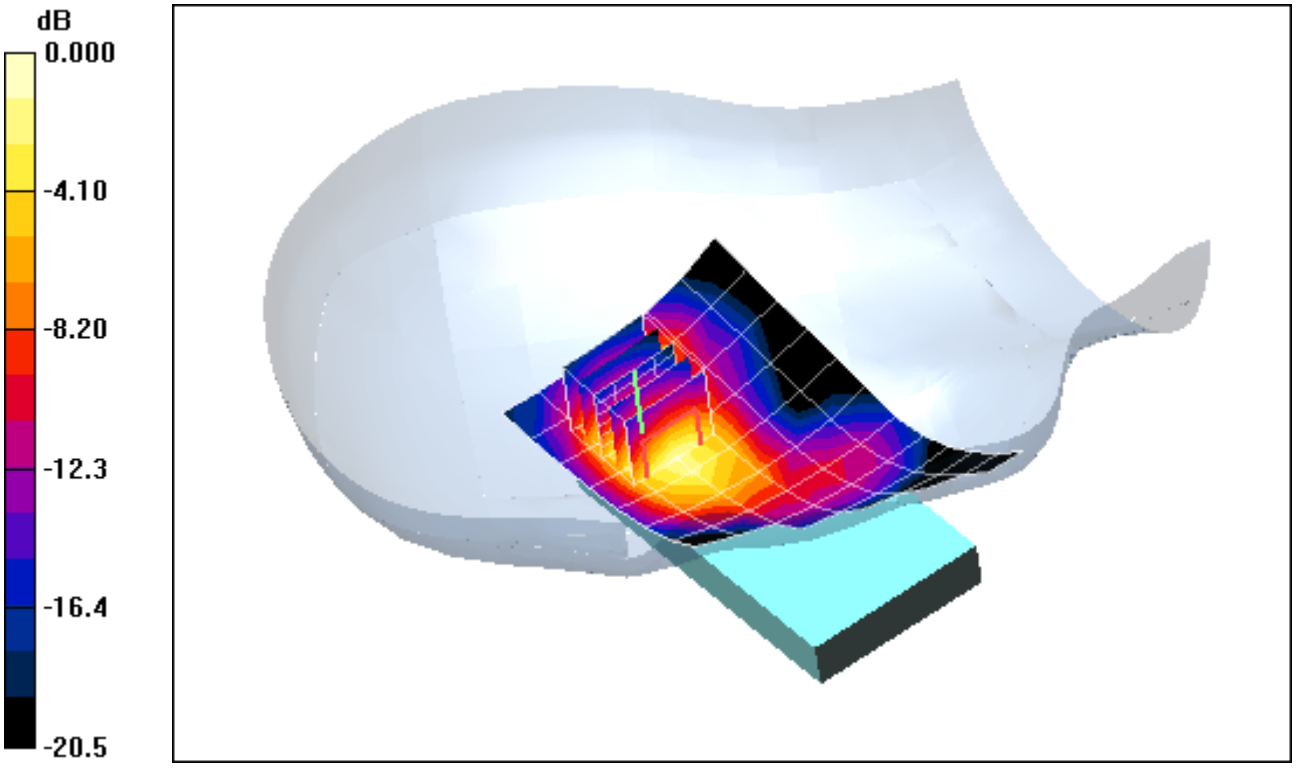
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-12-2012; Ambient Temp: 22.8°C; Tissue Temp: 22.1°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: LTE Band 2, Right Head, Touch, Mid.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.5 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 0.940 mW/g; SAR(10 g) = 0.493 mW/g



0 dB = 1.03mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

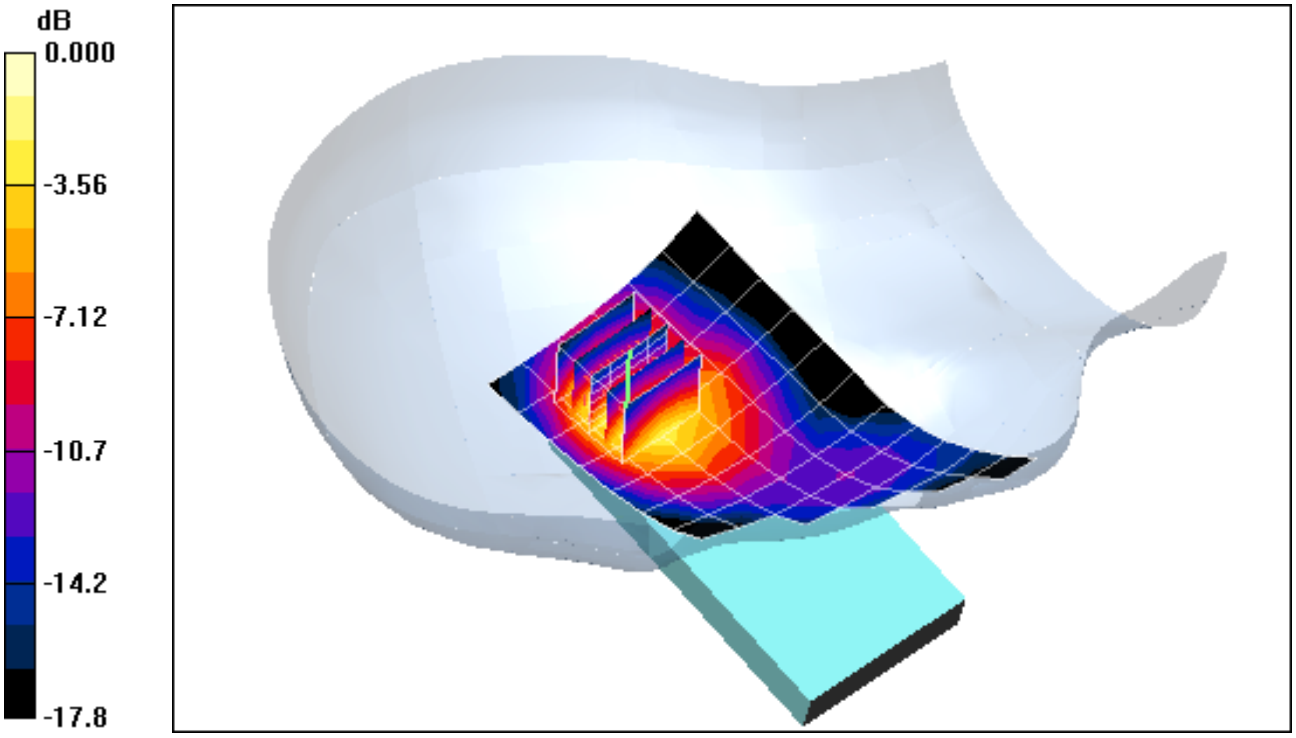
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-12-2012; Ambient Temp: 22.8°C; Tissue Temp: 22.1°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: LTE Band 2, Right Head, Tilt, Mid.ch,
QPSK, 5MHz Bandwidth, 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 = 23.7 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.647 mW/g; SAR(10 g) = 0.337 mW/g



0 dB = 0.730mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

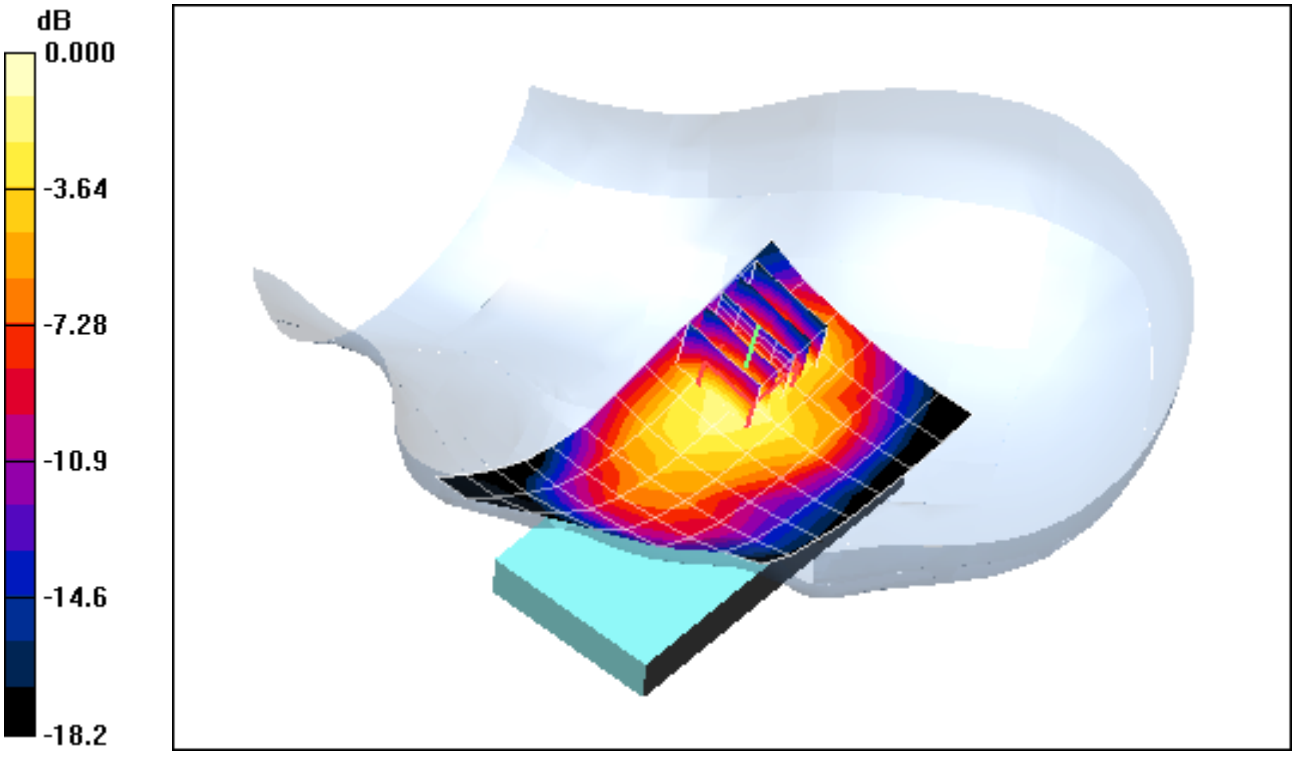
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-12-2012; Ambient Temp: 22.8°C; Tissue Temp: 22.1°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: LTE Band 2, Left Head, Touch, Mid.Ch,
QPSK, 5MHz Bandwidth, 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 = 20.3 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 0.800 W/kg
SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.276 mW/g



0 dB = 0.506mW/g

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DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

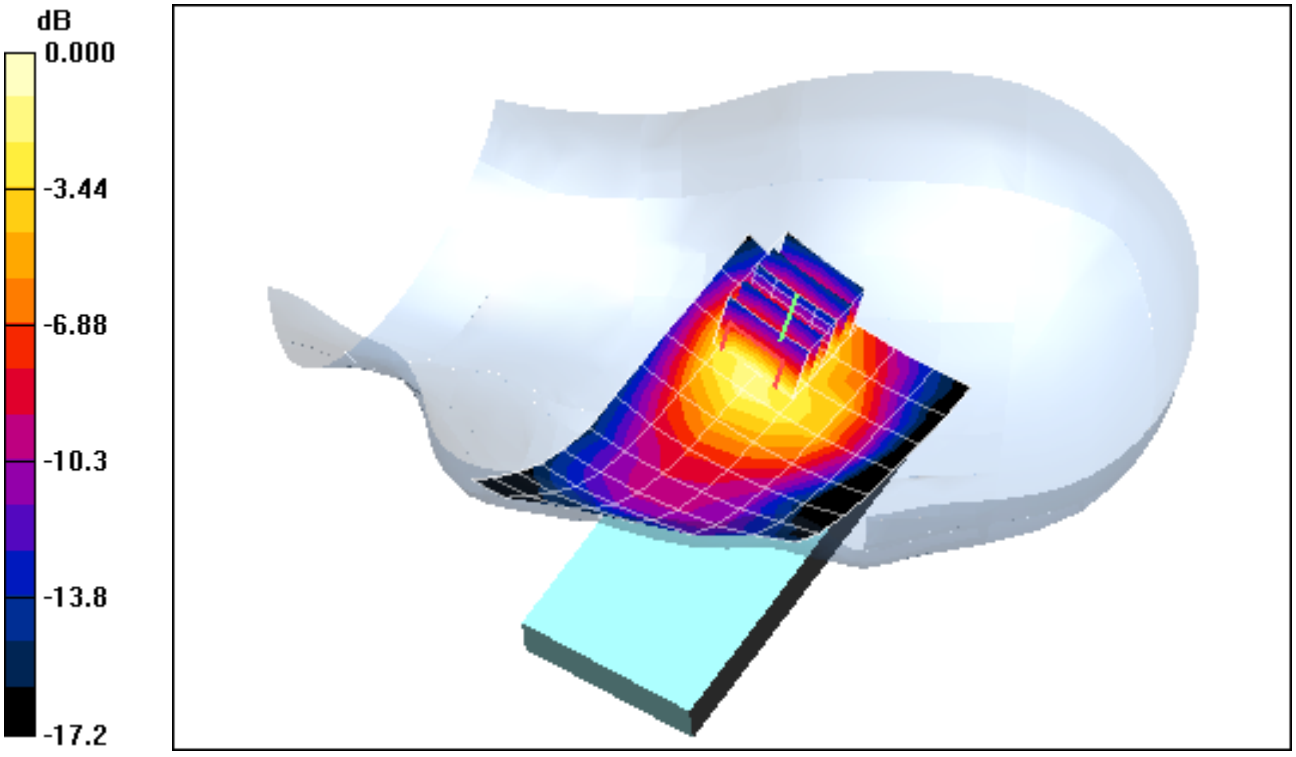
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-12-2012; Ambient Temp: 22.8°C; Tissue Temp: 22.1°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: LTE Band 2, Left Head, Tilt, Mid.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.4 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.212 mW/g



0 dB = 0.397mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

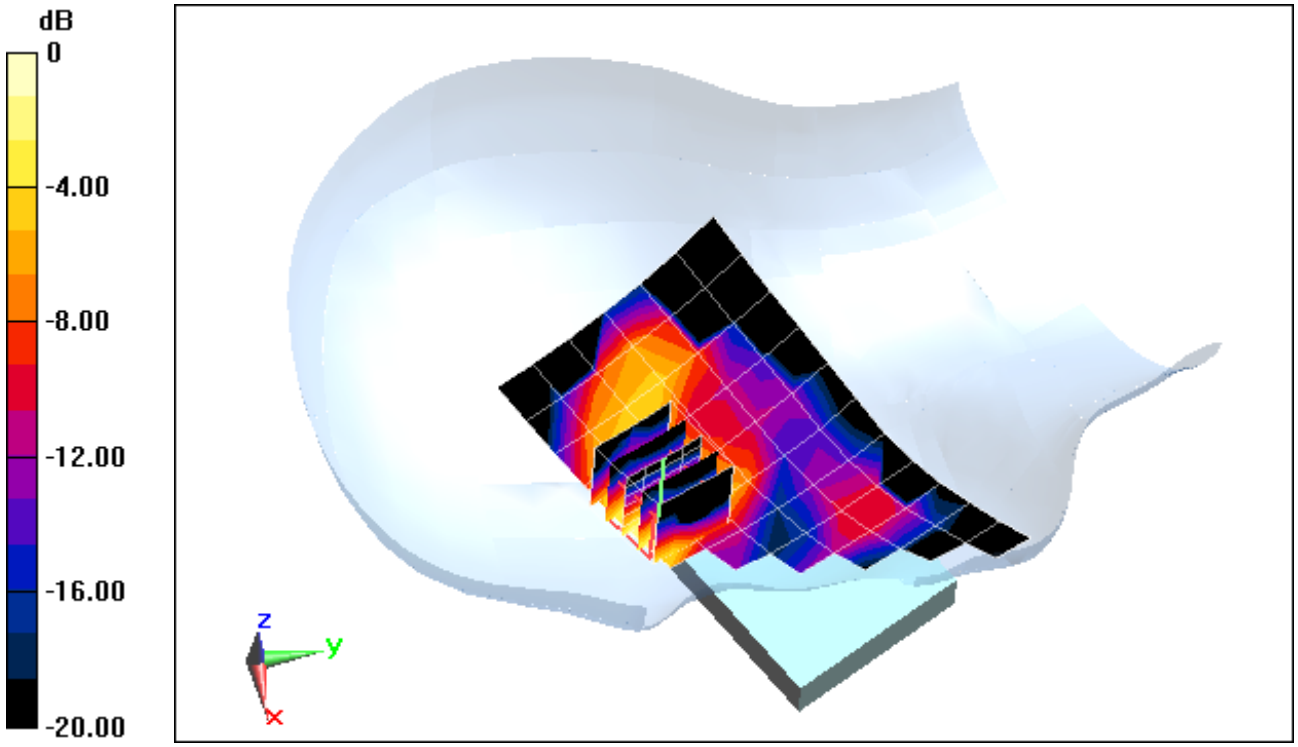
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.865 mho/m; ε_r = 39.496; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-15-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.55, 4.55, 4.55); Calibrated: 11/18/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.141 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.1150
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.026 mW/g



0 dB = 0.070mW/g = -23.10 dB mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

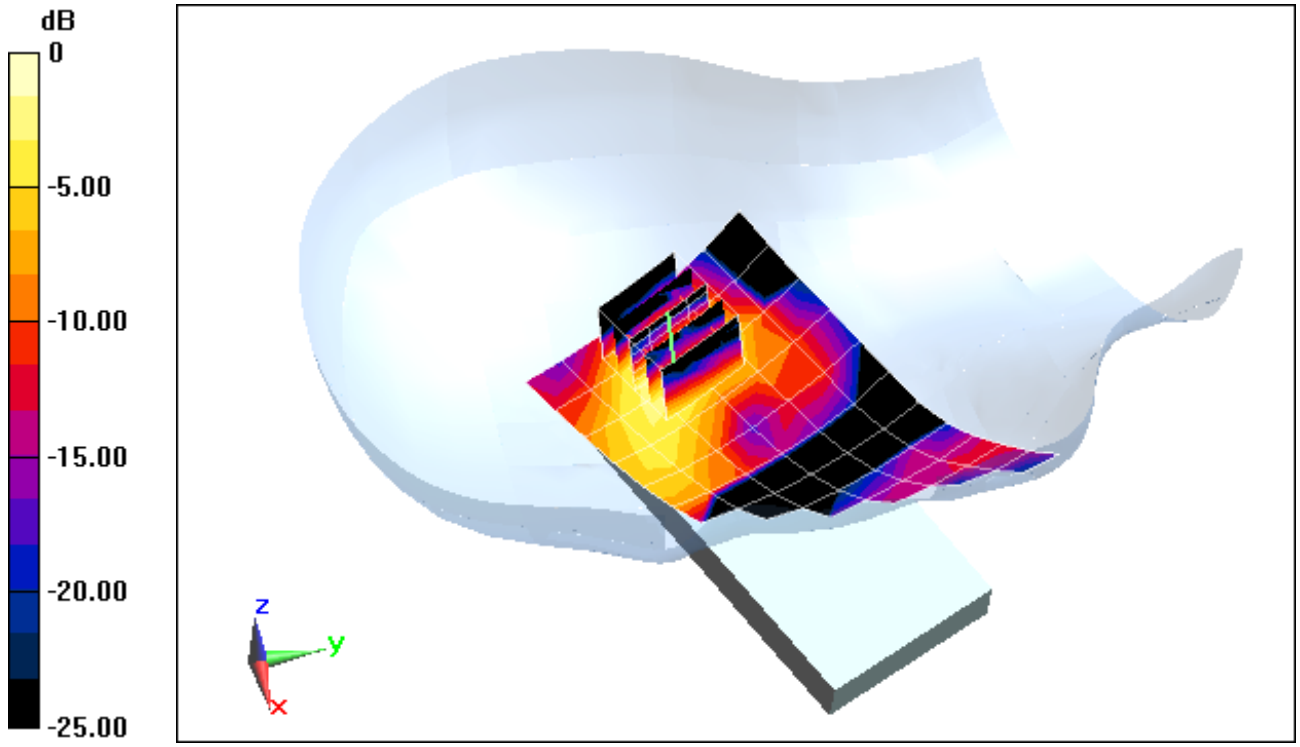
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.865 mho/m; ε_r = 39.496; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-15-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.55, 4.55, 4.55); Calibrated: 11/18/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.283 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0720
SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.017 mW/g



0 dB = 0.050mW/g = -26.02 dB mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

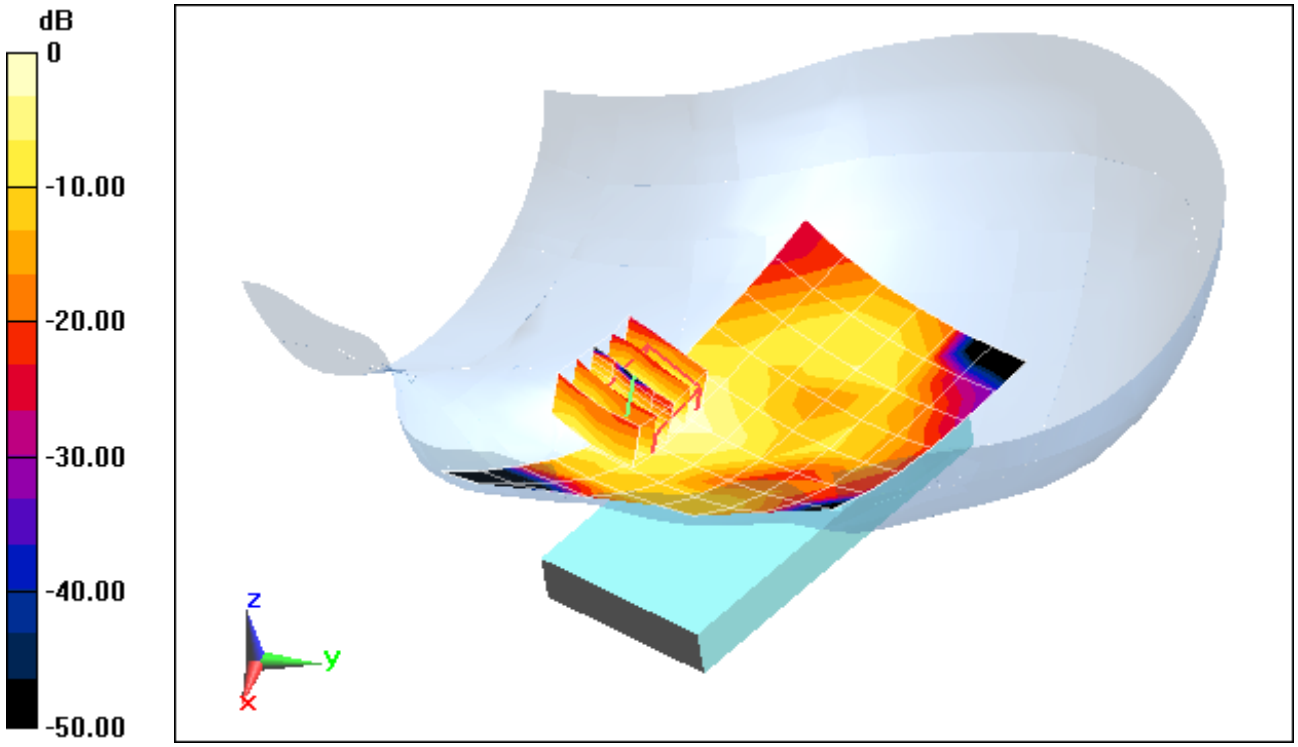
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2462$ MHz; $\sigma = 1.865$ mho/m; $\varepsilon_r = 39.496$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 03-15-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.55, 4.55, 4.55); Calibrated: 11/18/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.889 V/m; Power Drift = -0.057 dB
Peak SAR (extrapolated) = 0.1710
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.035 mW/g



0 dB = 0.110mW/g = -19.17 dB mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

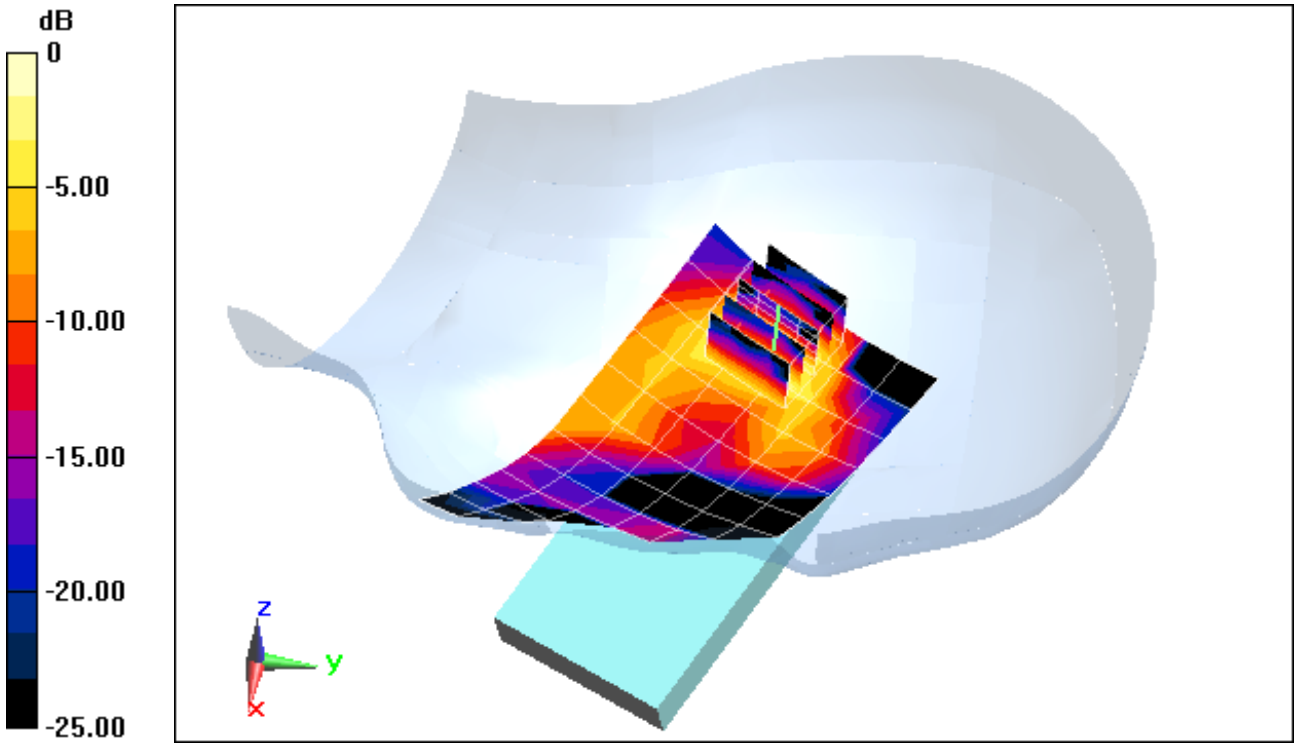
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.865 mho/m; ε_r = 39.496; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-15-2012; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3263; ConvF(4.55, 4.55, 4.55); Calibrated: 11/18/2011
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/20/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.133 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0800
SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.019 mW/g



0 dB = 0.050mW/g = -26.02 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

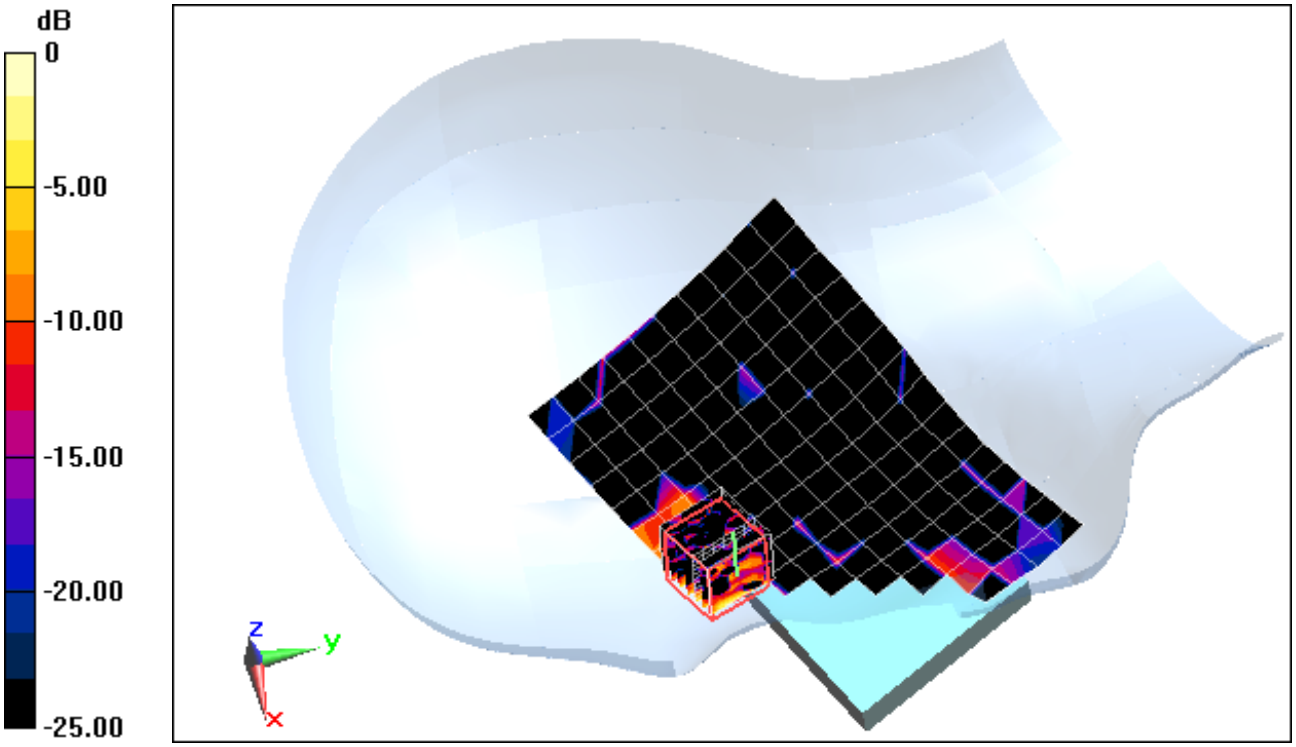
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5785 MHz; σ = 5.024 mho/m; ε_r = 36.19; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-14-2012; 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: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: IEEE 802.11a 5.8 GHz, Right Head, Touch, Ch 157, 6 Mbps

Area Scan (11x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.485 V/m; Power Drift = 0.140 dB
Peak SAR (extrapolated) = 0.1910
SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00482 mW/g



0 dB = 0.040mW/g = -27.96 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

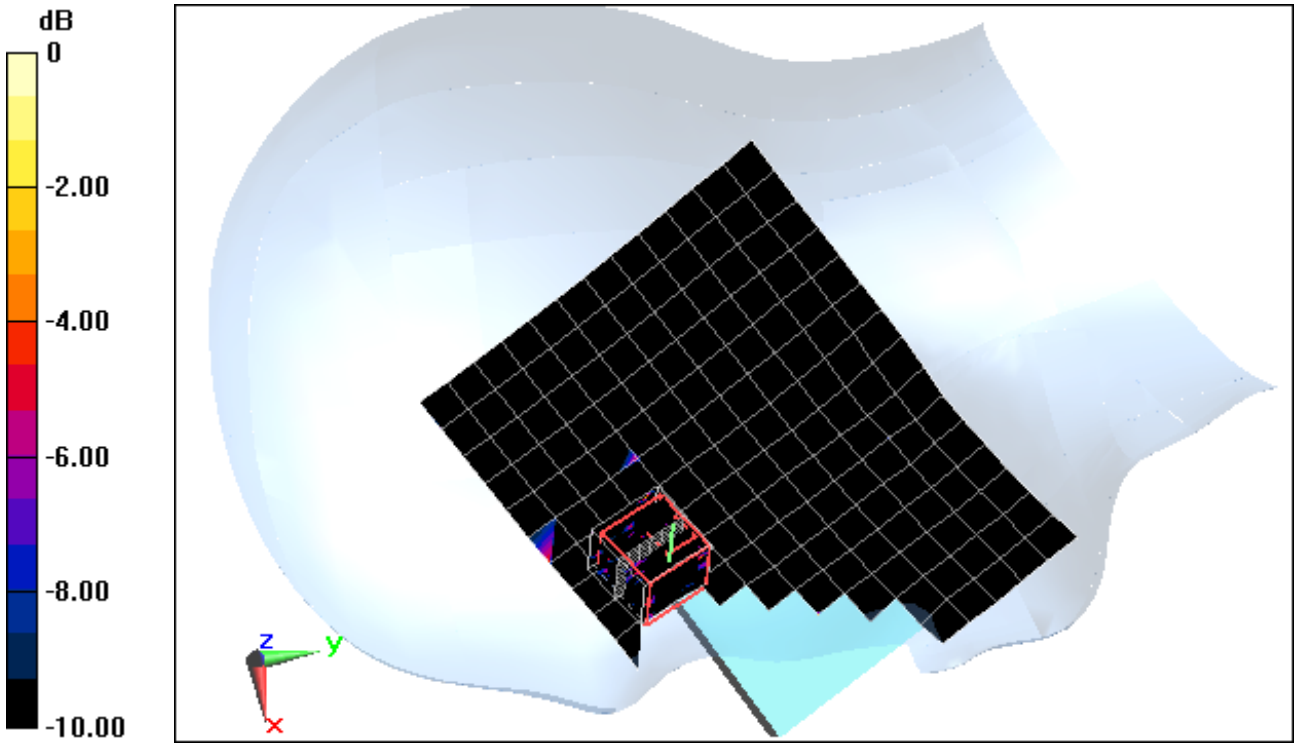
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5785 MHz; σ = 5.024 mho/m; ε_r = 36.19; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 03-14-2012; 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: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: IEEE 802.11a 5.8 GHz, Right Head, Tilt, Ch 157, 6 Mbps

Area Scan (13x16x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.554 V/m; Power Drift = 0.147 dB
Peak SAR (extrapolated) = 0.0110
SAR(1 g) = 3.96e-005 mW/g; SAR(10 g) = 5.5e-006 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

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DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

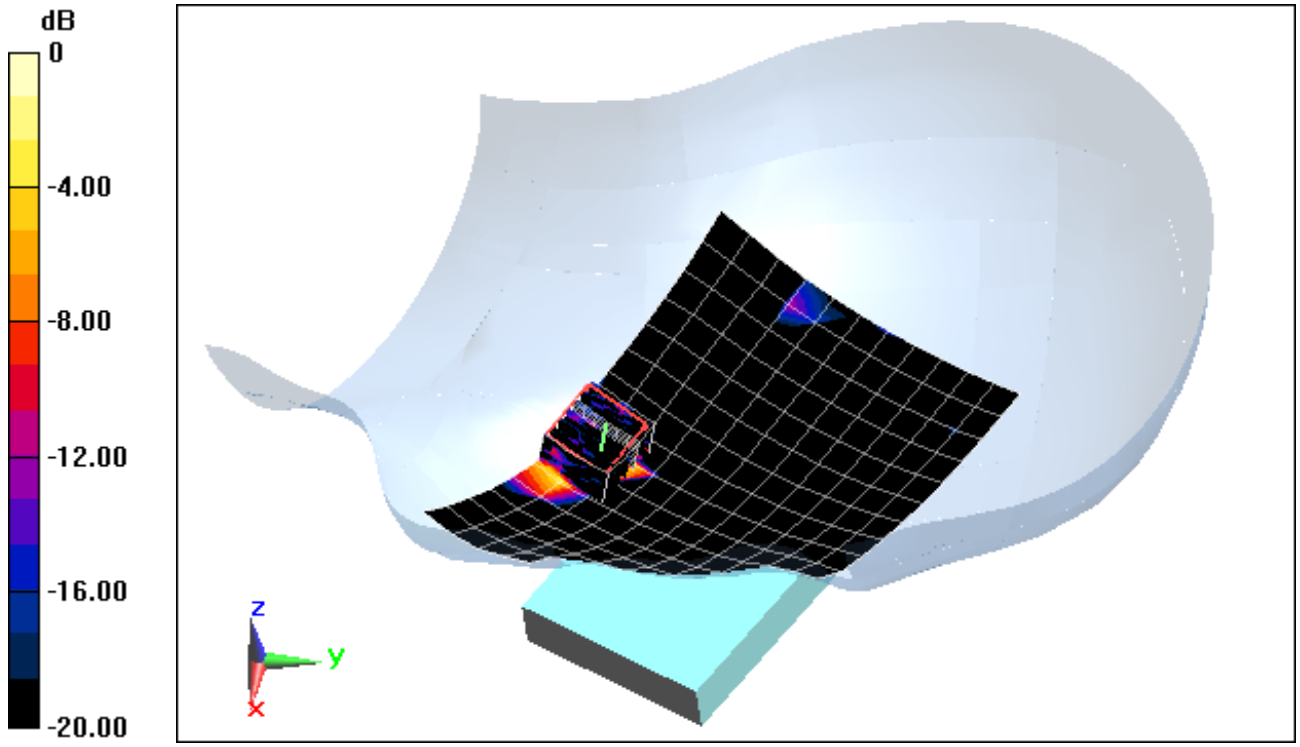
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5785 MHz; σ = 5.024 mho/m; ε_r = 36.19; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-14-2012; 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: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: IEEE 802.11a, 5.8 GHz Left Head, Touch, Ch 157, 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 = 2.209 V/m; Power Drift = 0.131 dB
Peak SAR (extrapolated) = 0.4570
SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.00969 mW/g



0 dB = 0.070mW/g = -23.10 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

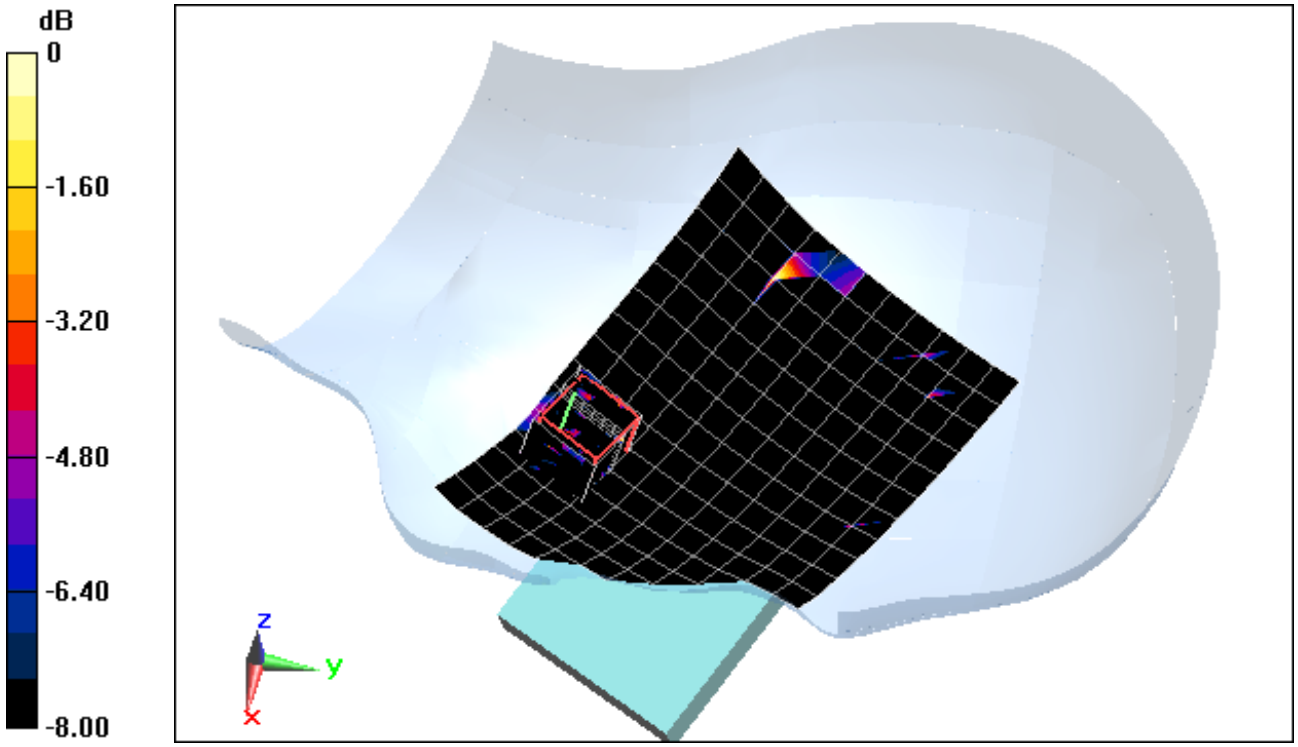
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5785 MHz; σ = 5.024 mho/m; ε_r = 36.19; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 03-14-2012; 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: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: IEEE 802.11a, 5.8 GHz Left Head, Tilt, Ch 157, 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 = 0 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 0.0350
SAR(1 g) = 0.00236 mW/g; SAR(10 g) = 0.000273 mW/g



0 dB = 0.010mW/g = -40.00 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

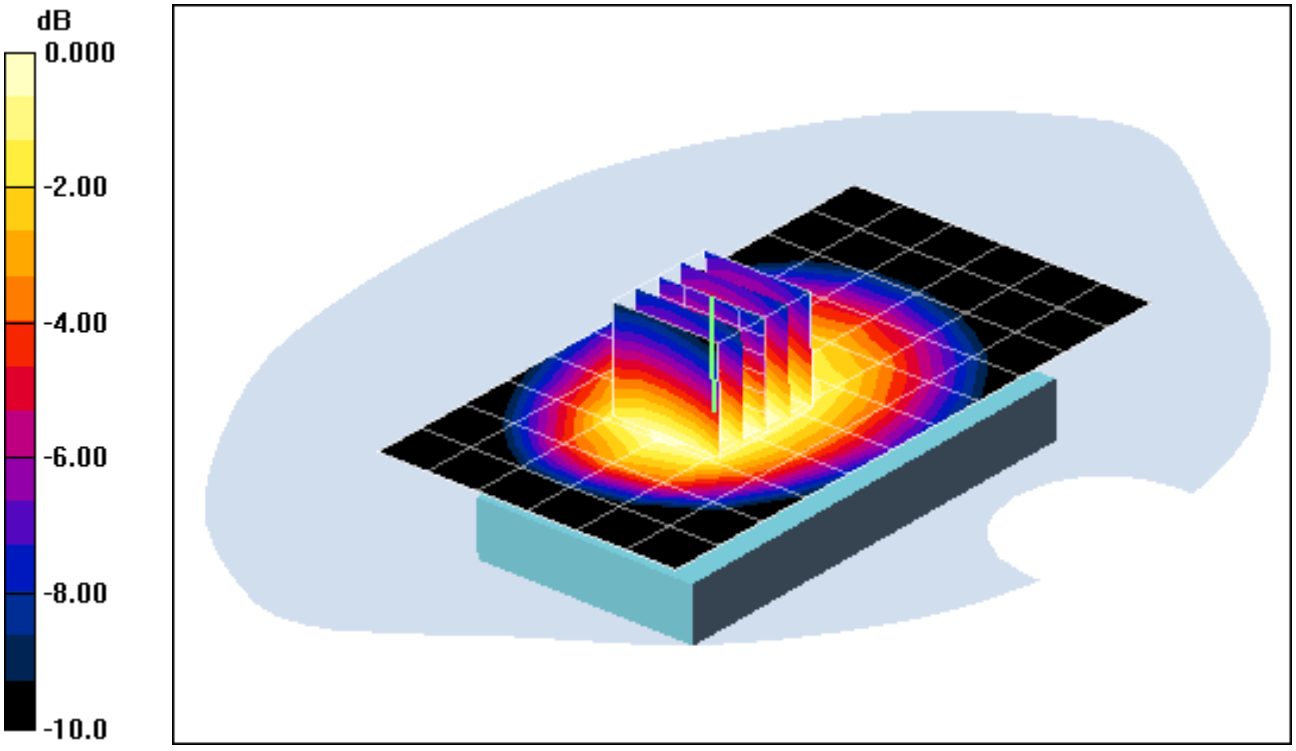
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO32, 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 = 31.0 V/m; Power Drift = 0.037 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.600 mW/g



0 dB = 0.855mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

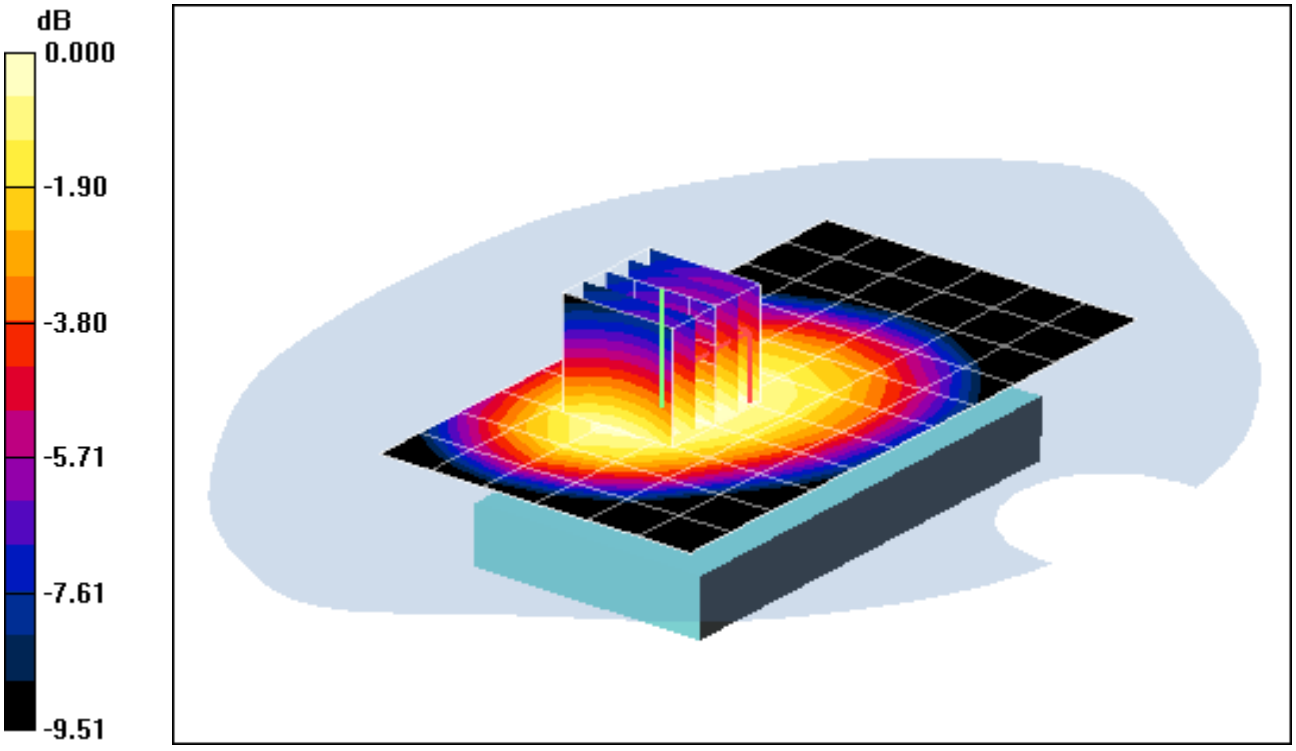
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO32, 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 = 19.1 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.395 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.234 mW/g



0 dB = 0.327mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

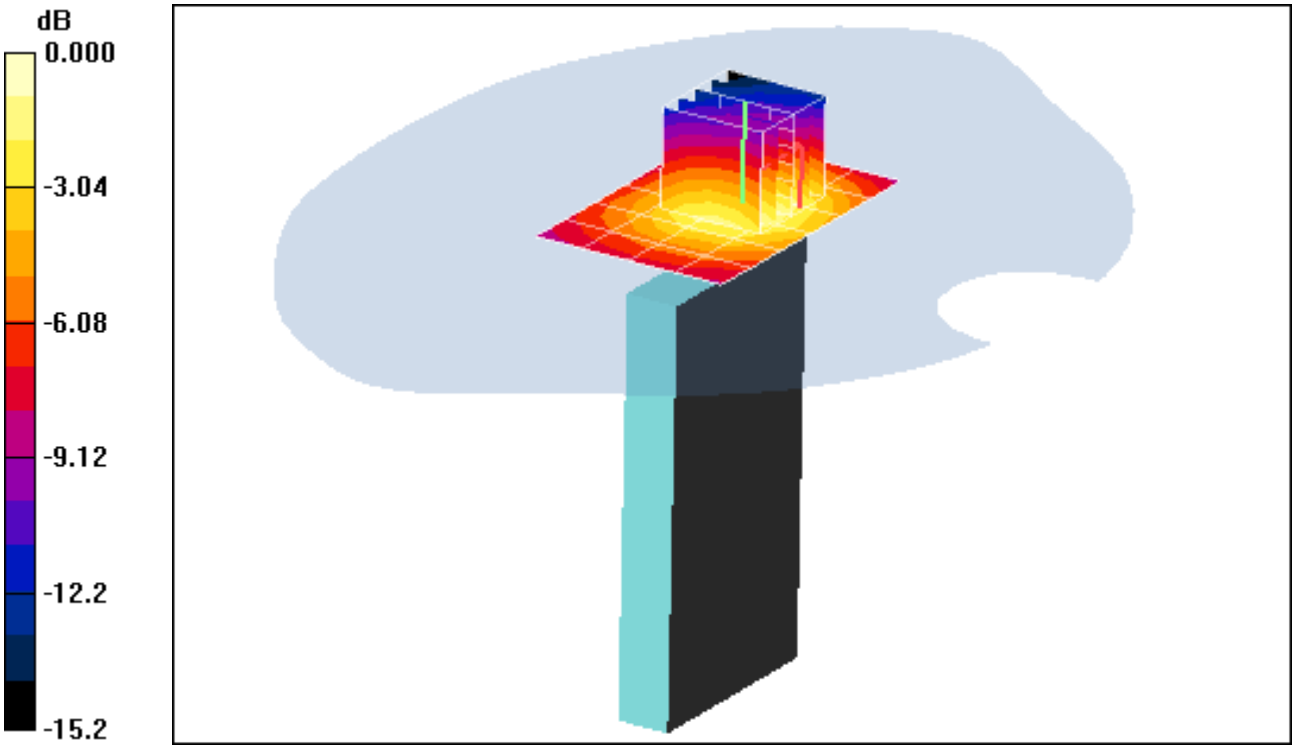
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO32, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.27 V/m; Power Drift = 0.121 dB
Peak SAR (extrapolated) = 0.132 W/kg
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.046 mW/g



0 dB = 0.083mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

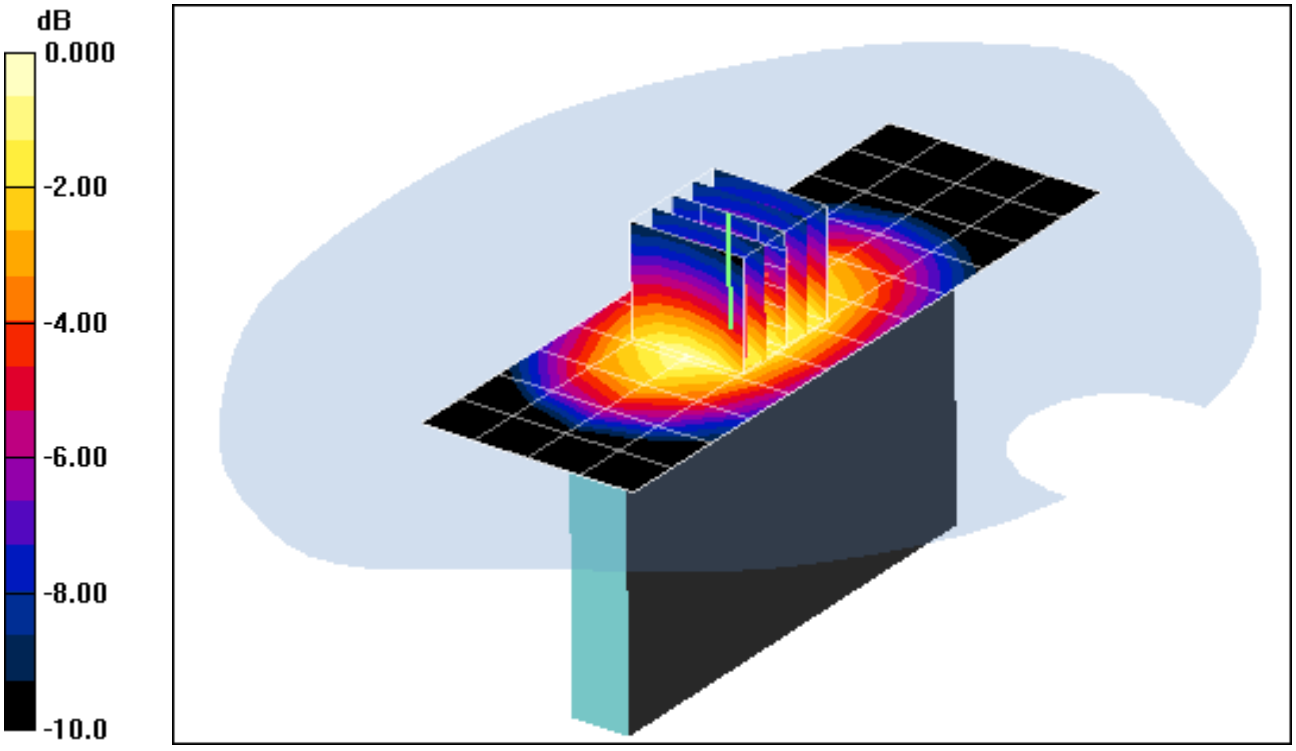
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular TDSO32, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.6 V/m; Power Drift = 0.035 dB
Peak SAR (extrapolated) = 0.601 W/kg
SAR(1 g) = 0.434 mW/g; SAR(10 g) = 0.300 mW/g



0 dB = 0.463mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

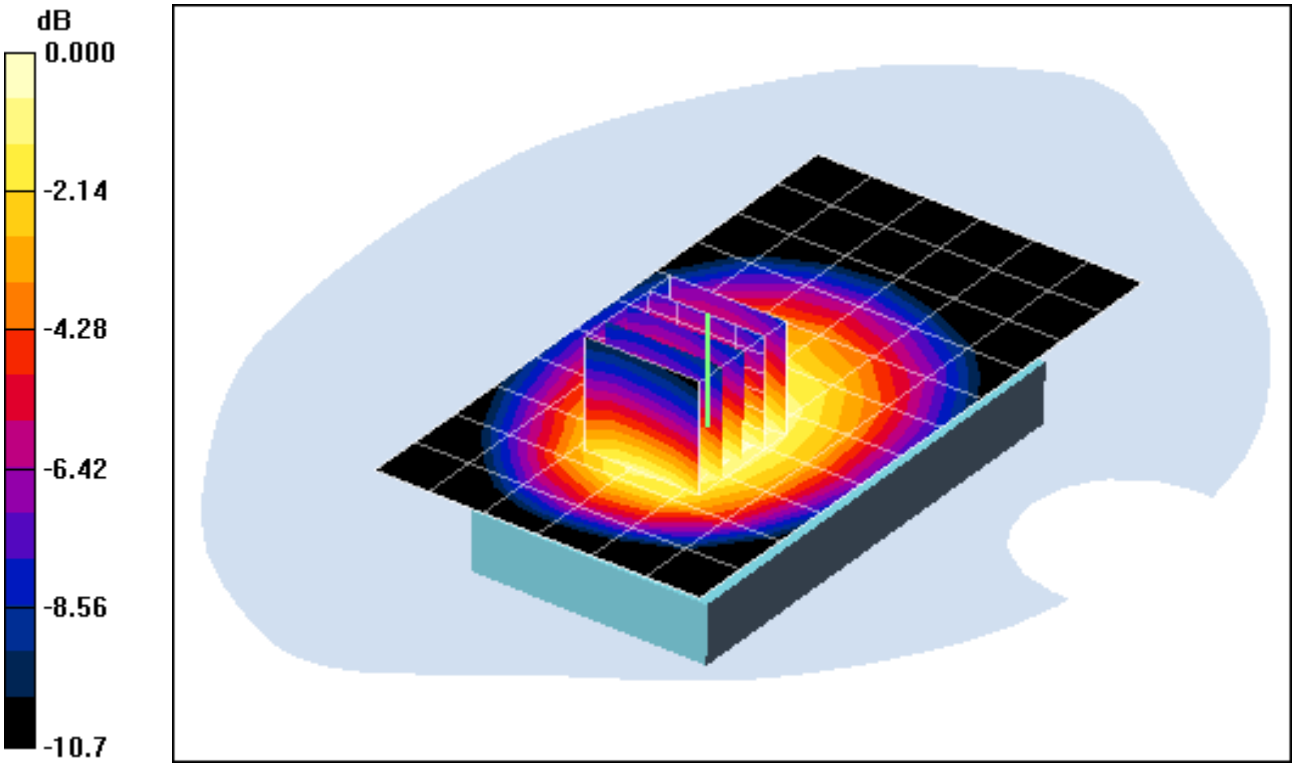
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO, 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 = 31.8 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.875 mW/g; SAR(10 g) = 0.641 mW/g



0 dB = 0.927mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

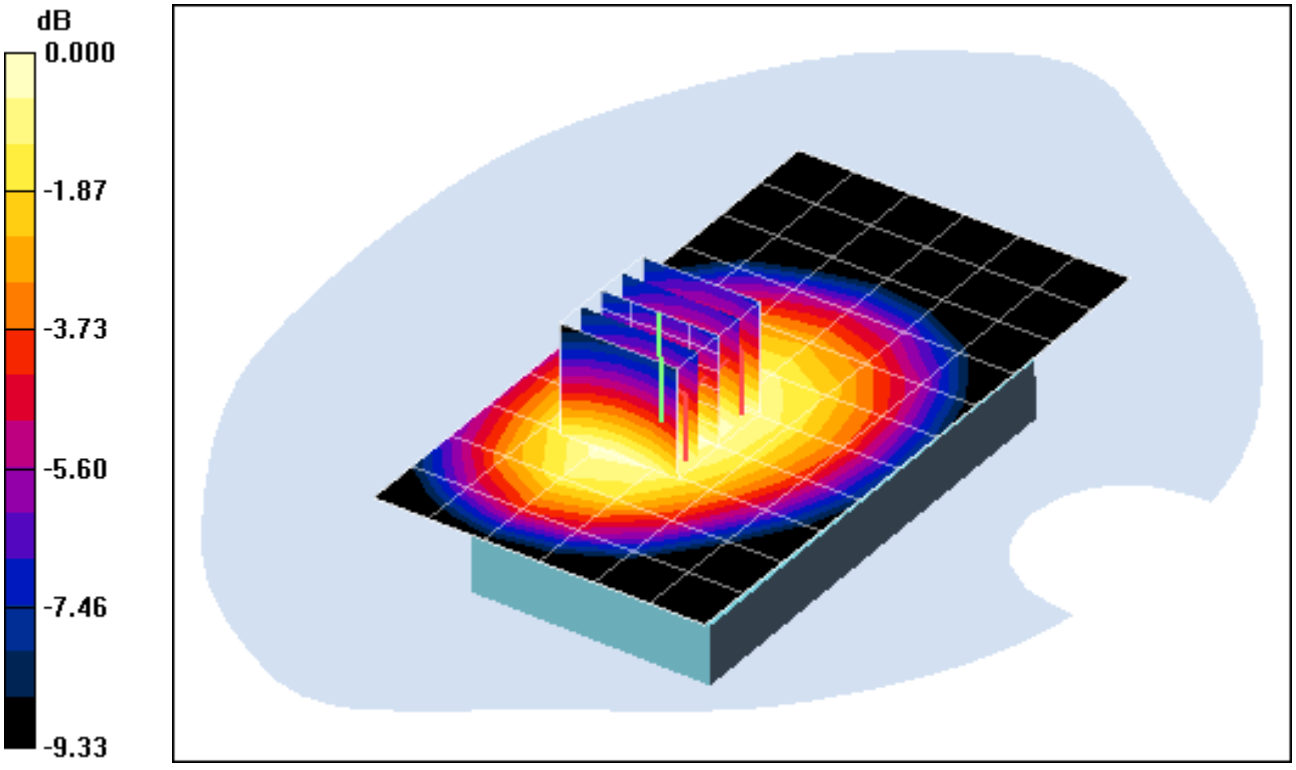
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO, 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 = 20.0 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 0.442 W/kg
SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.260 mW/g



0 dB = 0.365mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

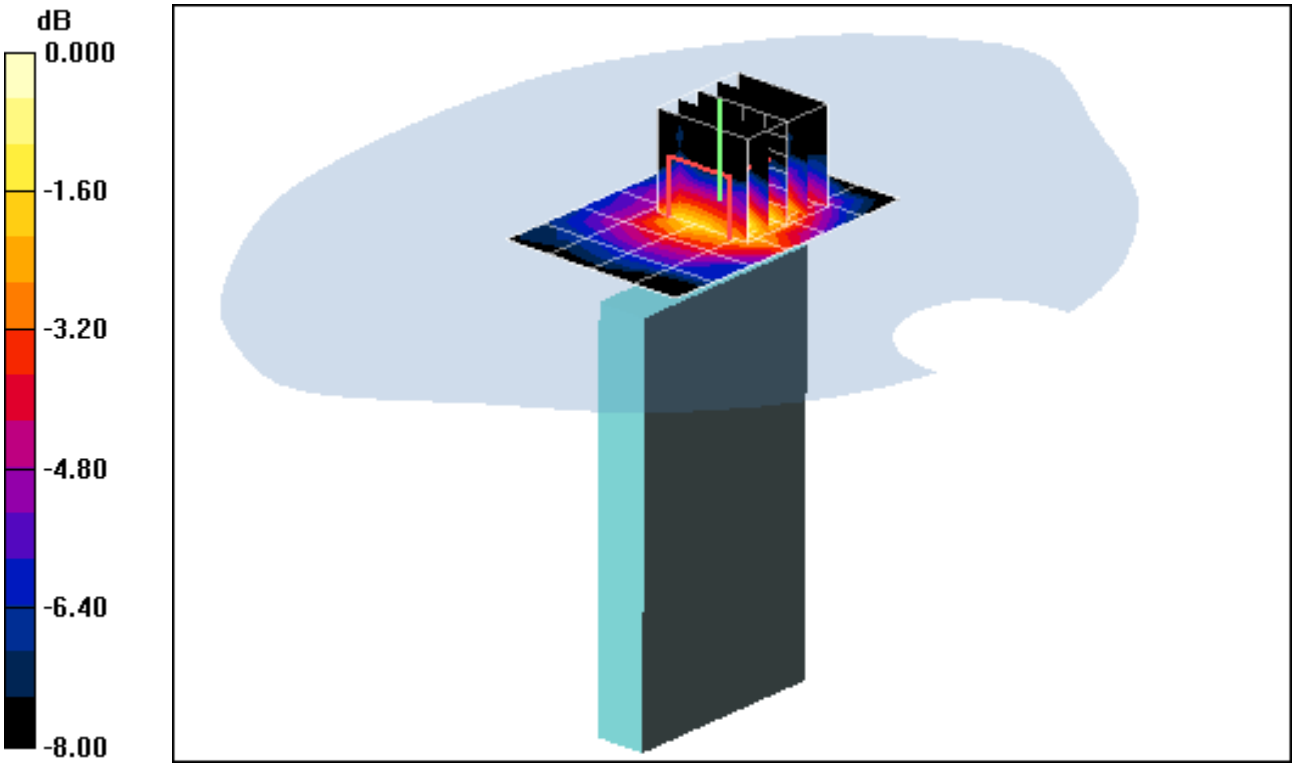
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.06 V/m; Power Drift = -0.138 dB
Peak SAR (extrapolated) = 0.017 W/kg
SAR(1 g) = 0.00833 mW/g; SAR(10 g) = 0.00485 mW/g



0 dB = 0.009mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

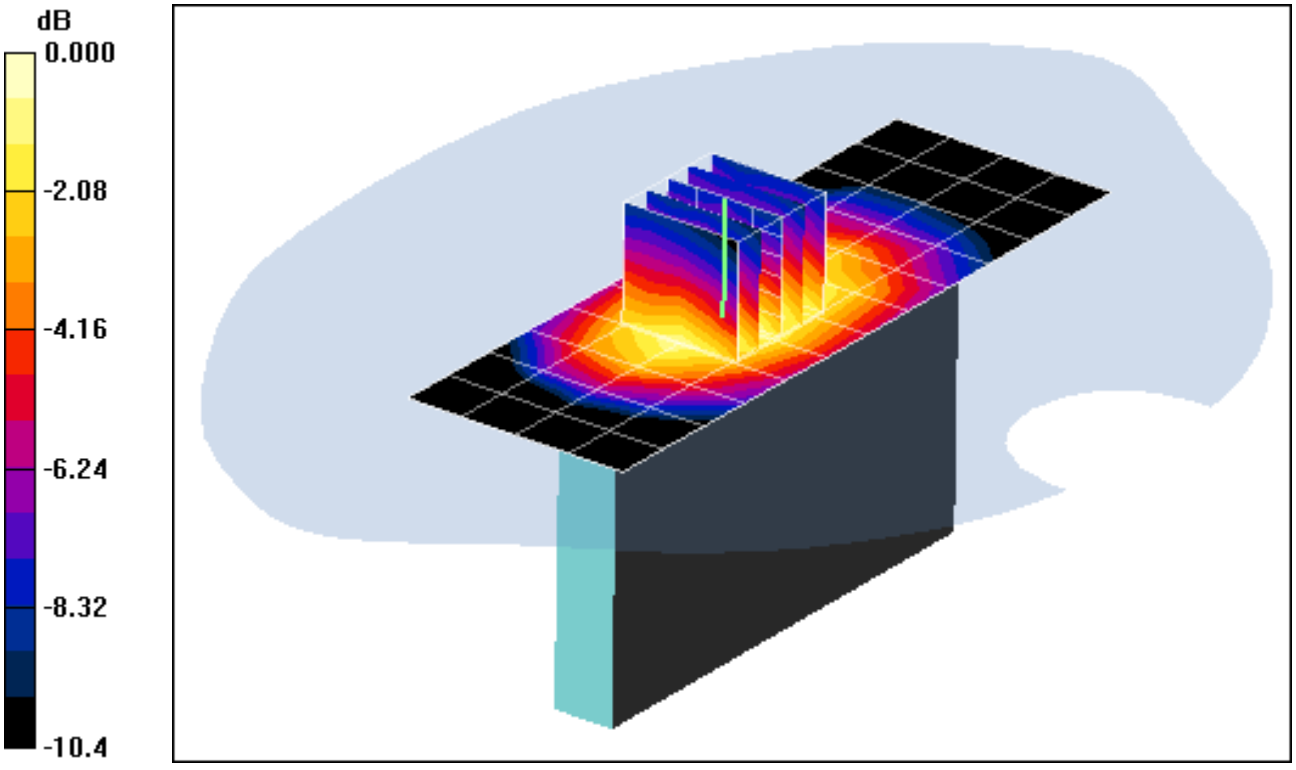
Communication System: Cellular CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.02$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: Cellular EVDO, 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 = 20.8 V/m; Power Drift = 0.032 dB
Peak SAR (extrapolated) = 0.566 W/kg
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.254 mW/g



0 dB = 0.403mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

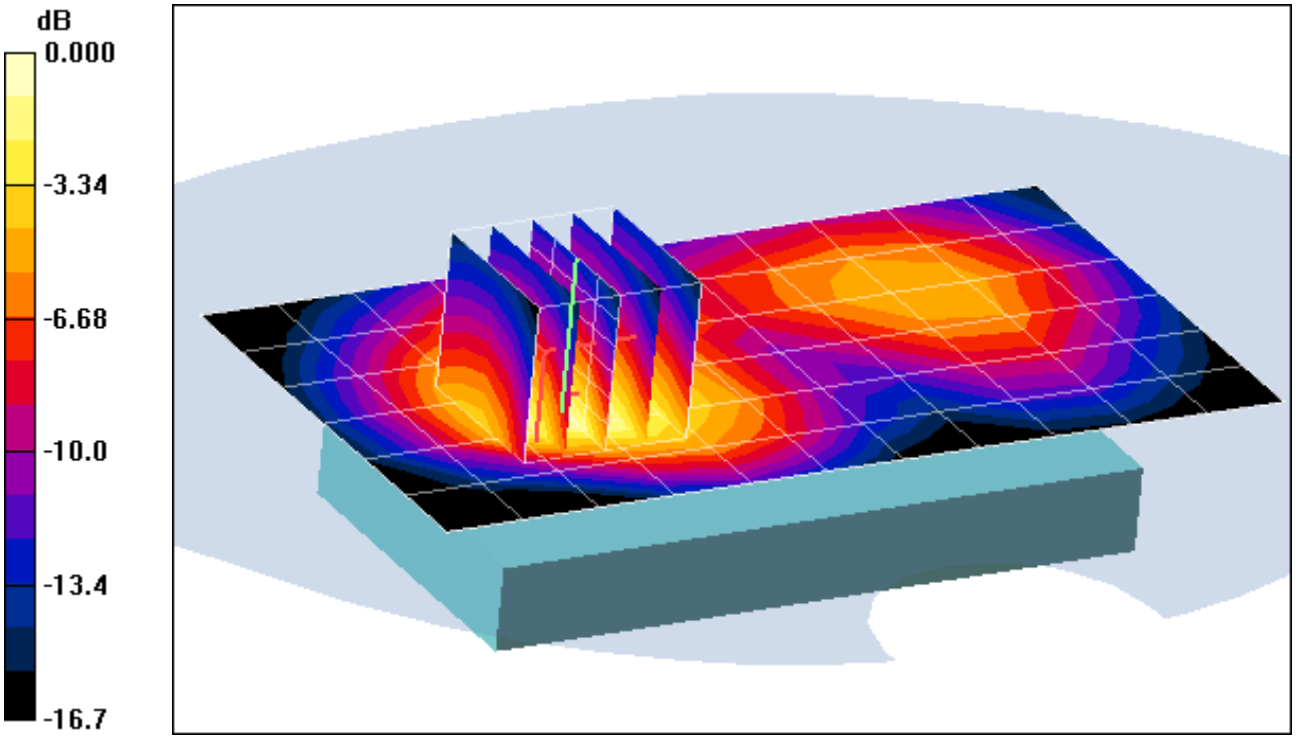
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS TDSO32, 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 = 22.7 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.712 mW/g; SAR(10 g) = 0.395 mW/g



0 dB = 0.798mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

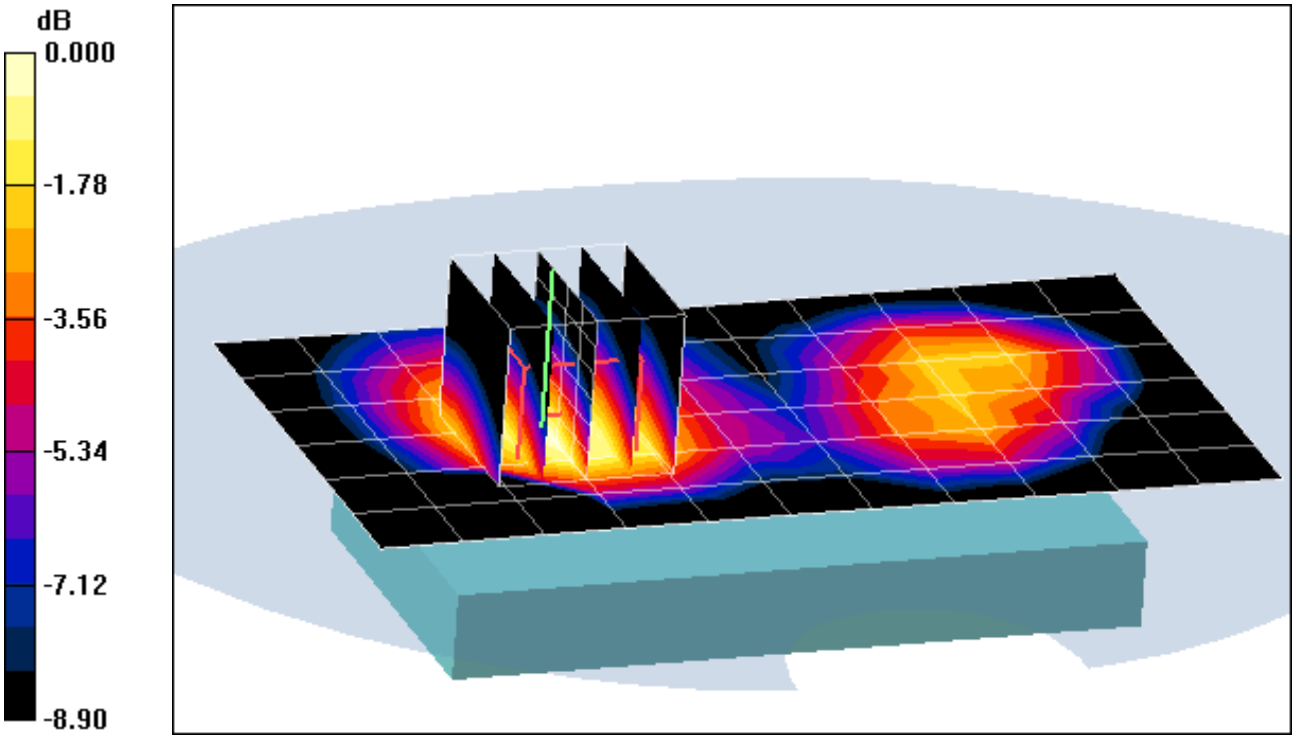
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS TDSO32, 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 = 15.3 V/m; Power Drift = -0.202 dB
Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.177 mW/g



0 dB = 0.300mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

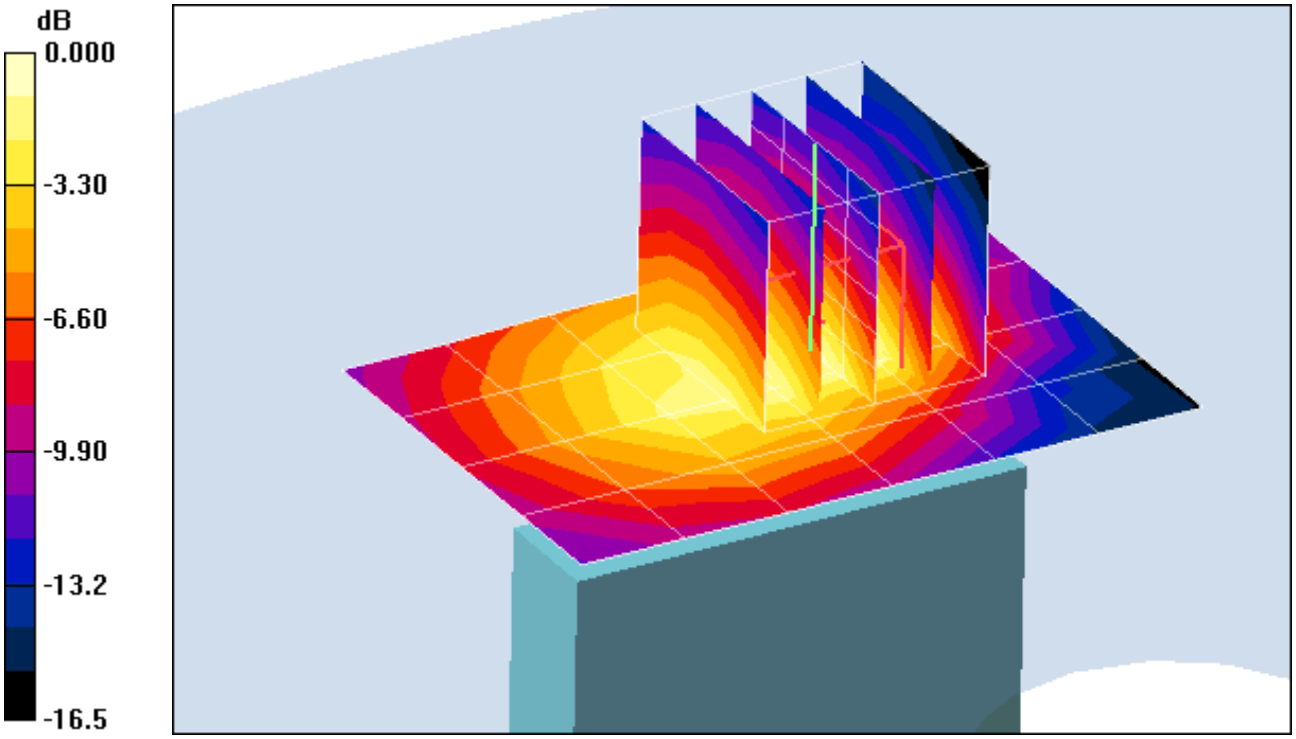
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS TDSO32, Body SAR, Bottom Edge, Mid.ch

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = 0.162 dB
Peak SAR (extrapolated) = 0.367 W/kg
SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.123 mW/g



0 dB = 0.237mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

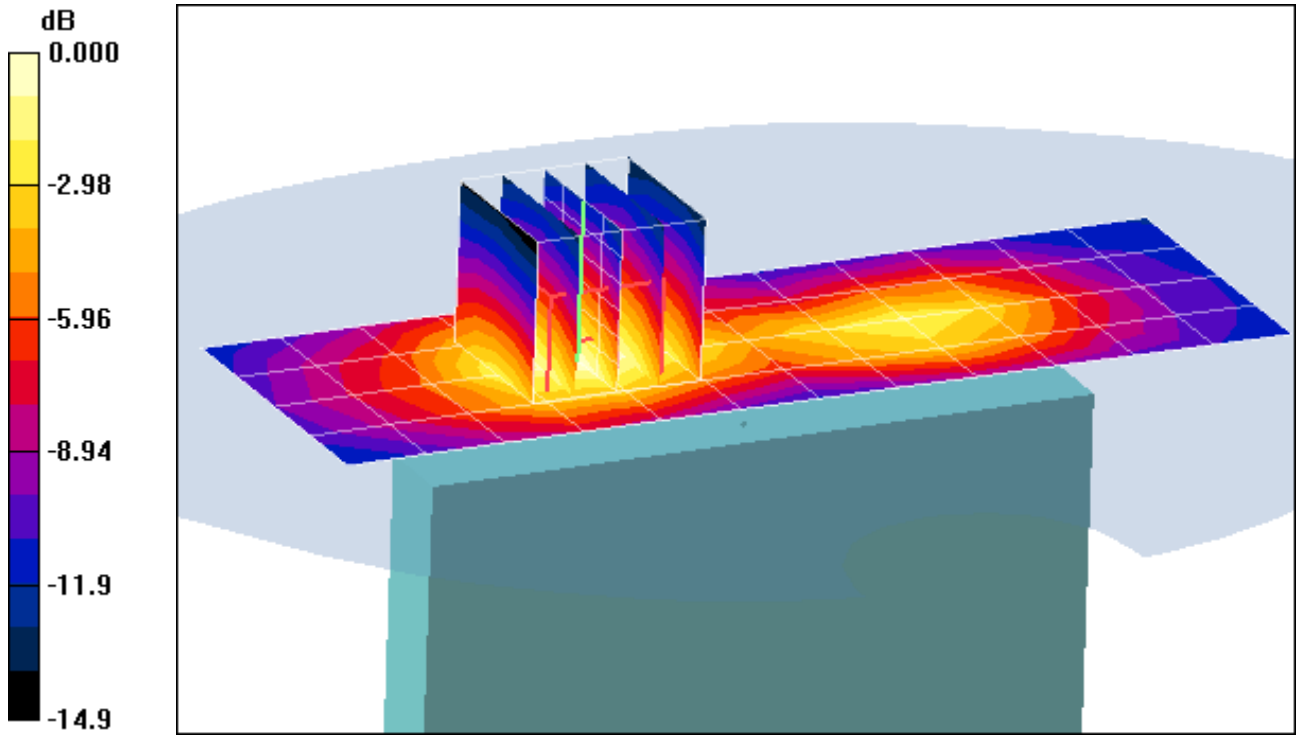
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS TDSO32, Body SAR, Left Edge, Mid.ch

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.281 W/kg
SAR(1 g) = 0.170 mW/g; SAR(10 g) = 0.098 mW/g



0 dB = 0.188mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

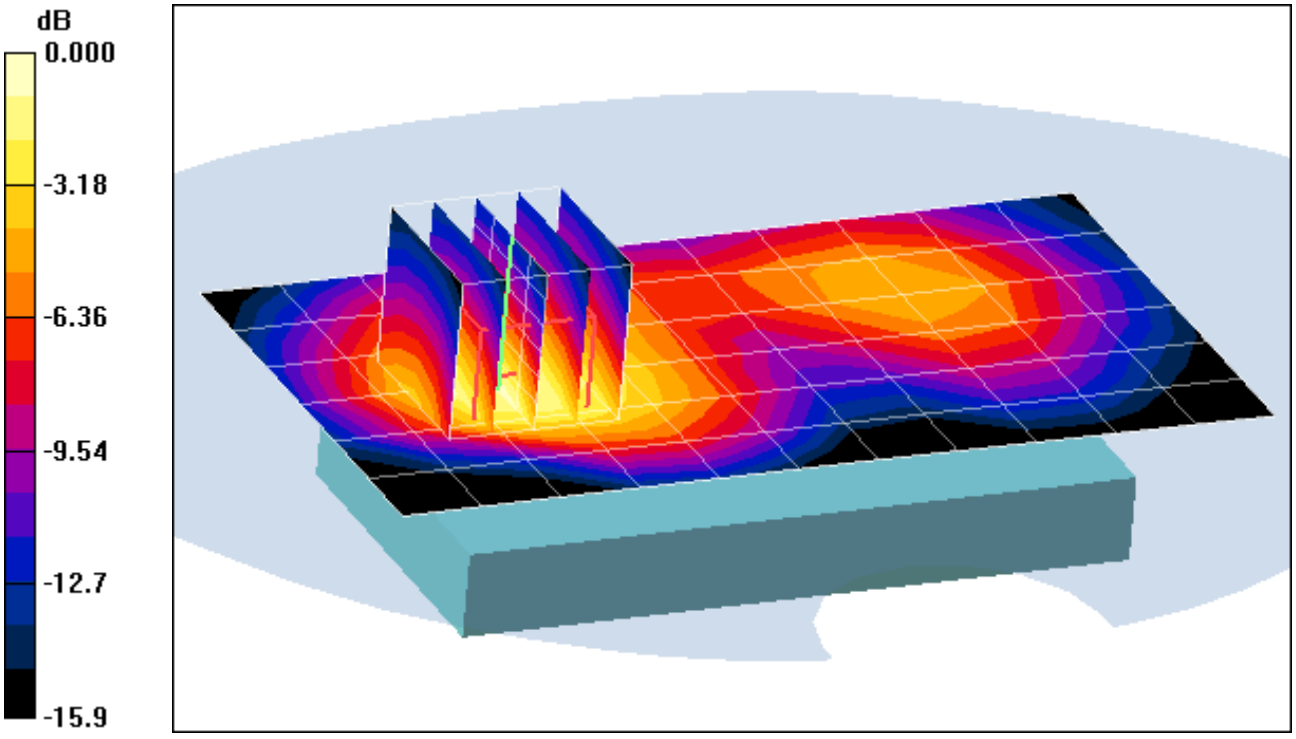
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS EVDO, 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 = 20.6 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 0.975 W/kg
SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.317 mW/g



0 dB = 0.632mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

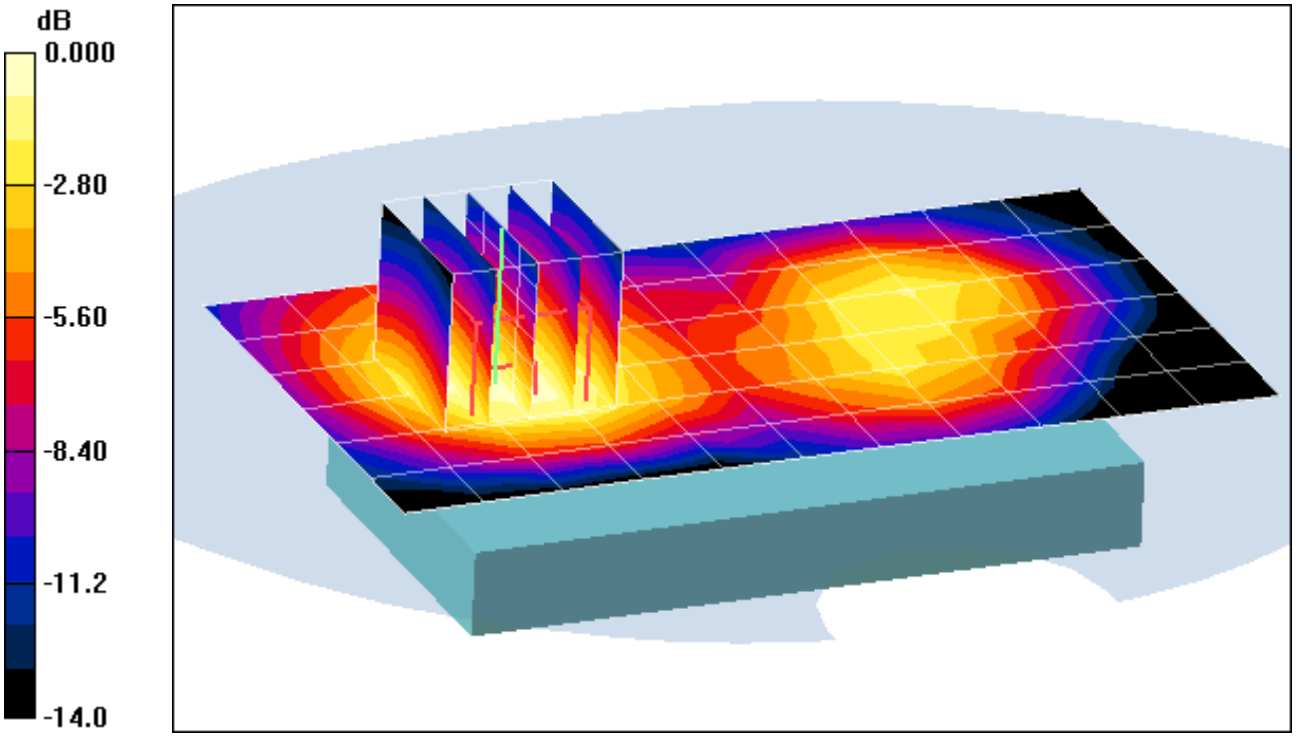
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS EVDO, 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 = 14.3 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.394 W/kg
SAR(1 g) = 0.255 mW/g; SAR(10 g) = 0.160 mW/g



0 dB = 0.276mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

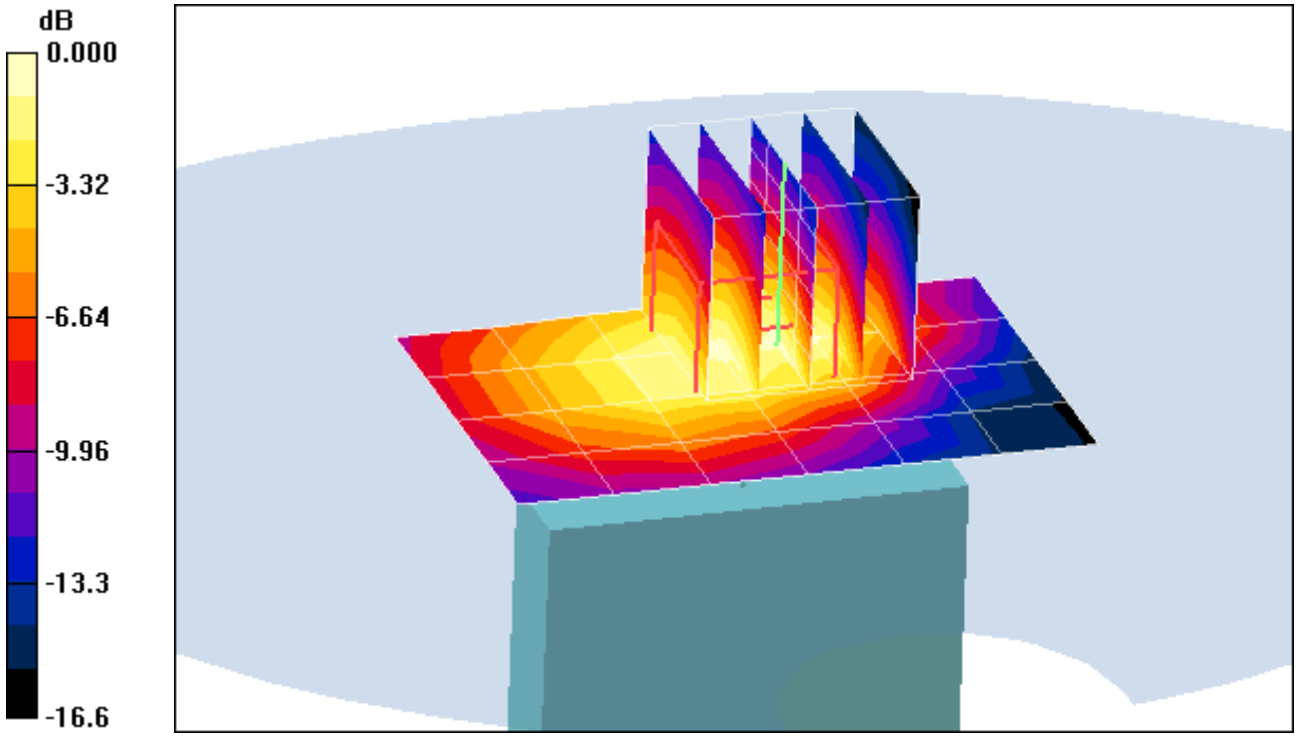
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS EVDO, 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 = 12.2 V/m; Power Drift = -0.153 dB
Peak SAR (extrapolated) = 0.333 W/kg
SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.114 mW/g



0 dB = 0.219mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

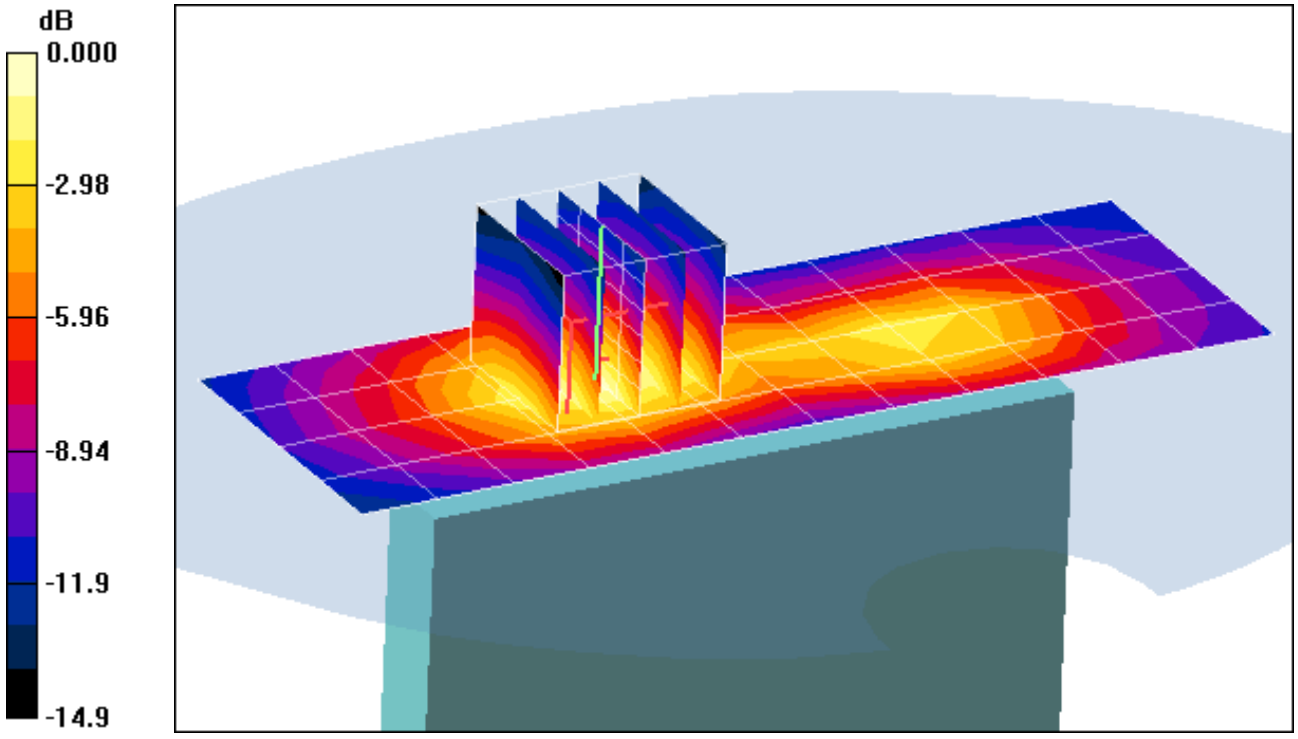
Communication System: PCS CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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: PCS EVDO, 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 = 11.9 V/m; Power Drift = 0.053 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.167 mW/g; SAR(10 g) = 0.096 mW/g



0 dB = 0.183mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

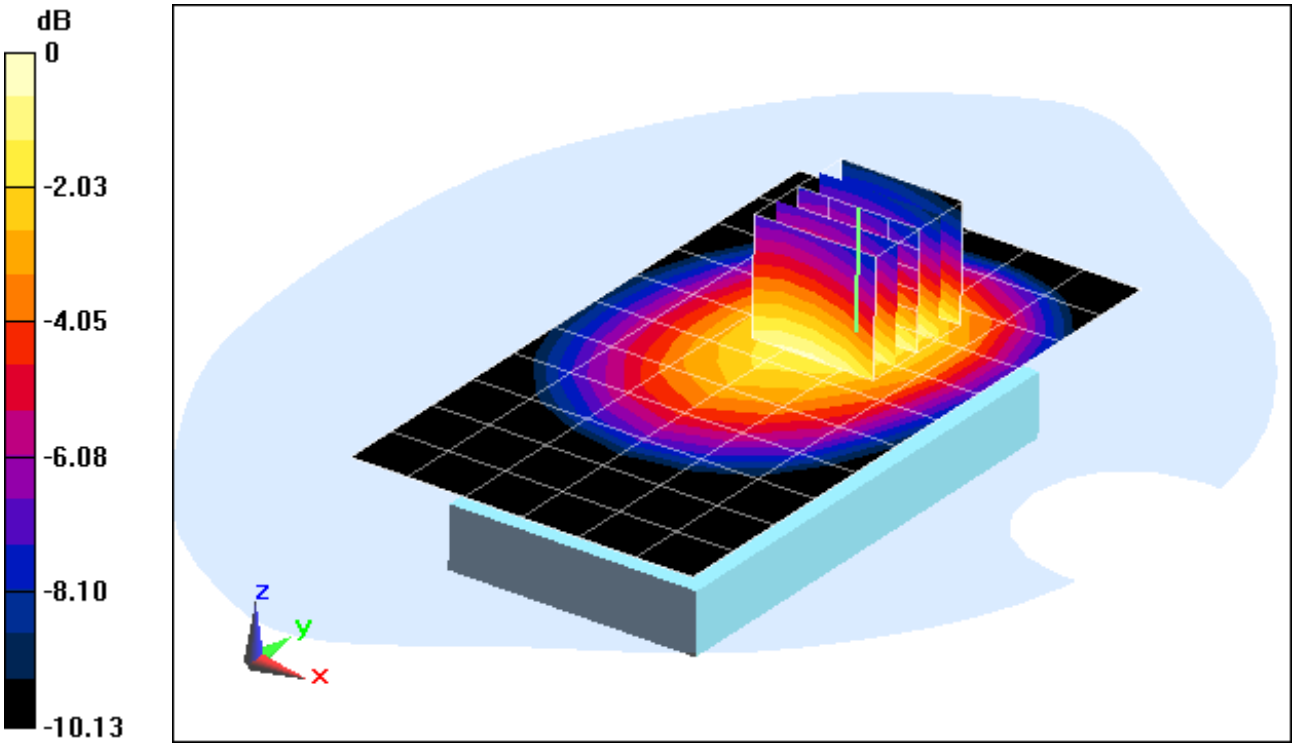
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 mho/m; ε_r = 55.267; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn455; Calibrated: 11/9/2011
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch,
QPSK, 10MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.378 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.3920
SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.221 mW/g



0 dB = 0.320mW/g = -9.90 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

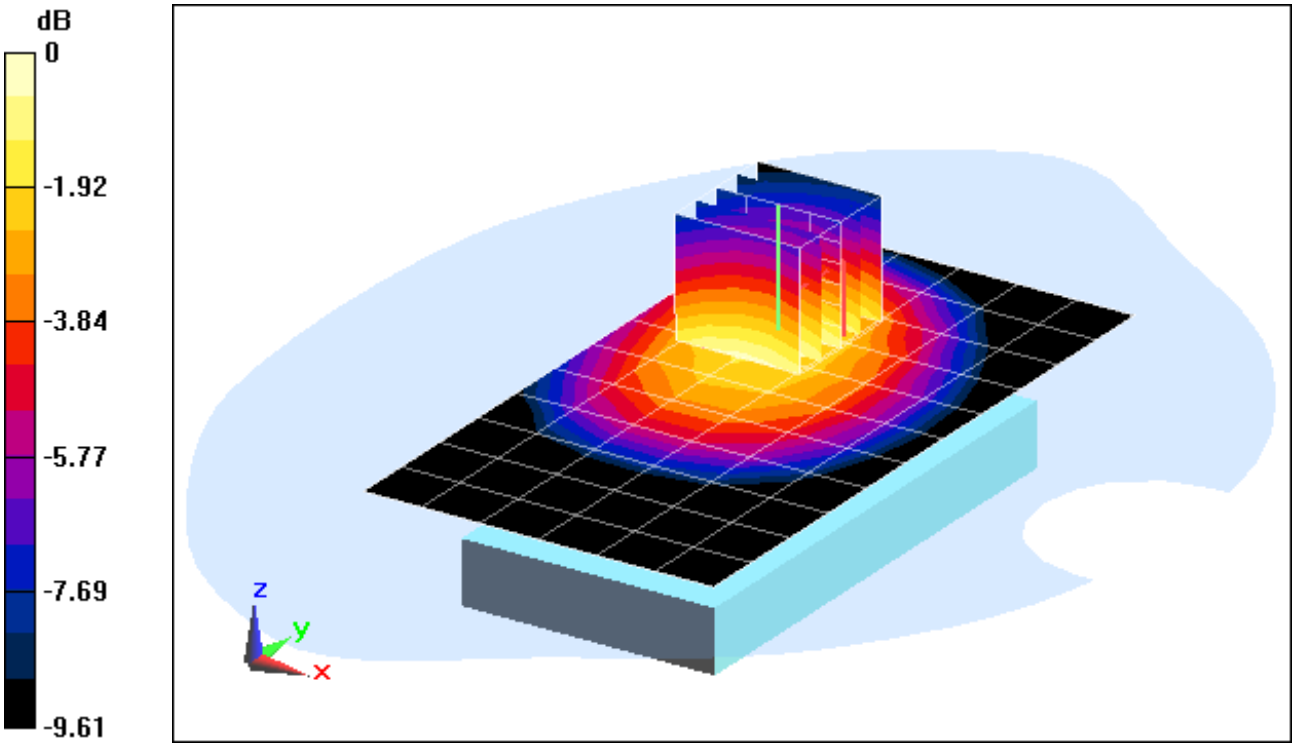
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 mho/m; ε_r = 55.267; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn455; Calibrated: 11/9/2011
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Body SAR, Front side, Mid.ch,
QPSK, 10MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.888 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.2010
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.112 mW/g



0 dB = 0.160mW/g = -15.92 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

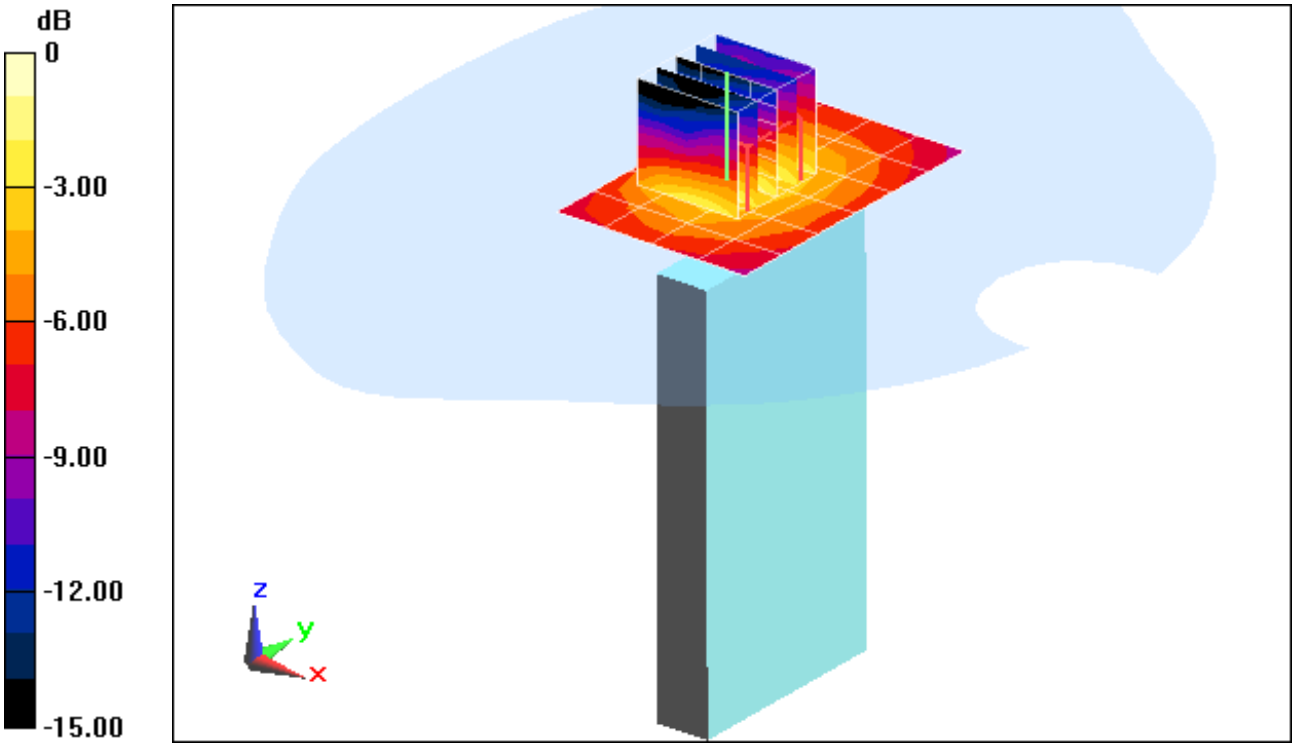
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 mho/m; ε_r = 55.267; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn455; Calibrated: 11/9/2011
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Body SAR, Top Edge, Mid.ch,
QPSK, 10MHz Bandwidth, 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 = 7.079 V/m; Power Drift = 0.0096 dB
Peak SAR (extrapolated) = 0.0820
SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.024 mW/g



0 dB = 0.050mW/g = -26.02 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 36

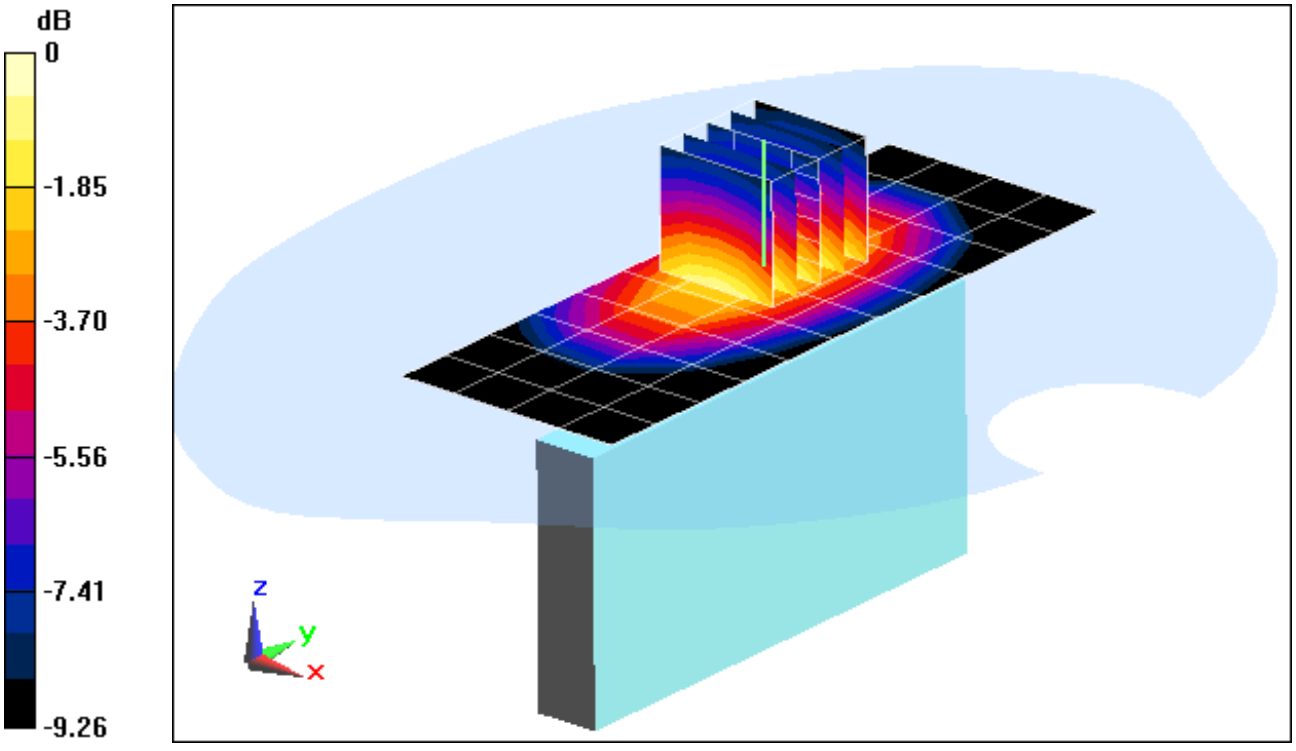
Communication System: LTE Band 12; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: 695 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 mho/m; ε_r = 55.267; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(8.34, 8.34, 8.34); Calibrated: 7/27/2011
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE3 Sn455; Calibrated: 11/9/2011
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Mode: LTE Band 12, Body SAR, Left Edge, Mid.ch,
QPSK, 10MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.248 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.2140
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.109 mW/g



0 dB = 0.170mW/g = -15.39 dB mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

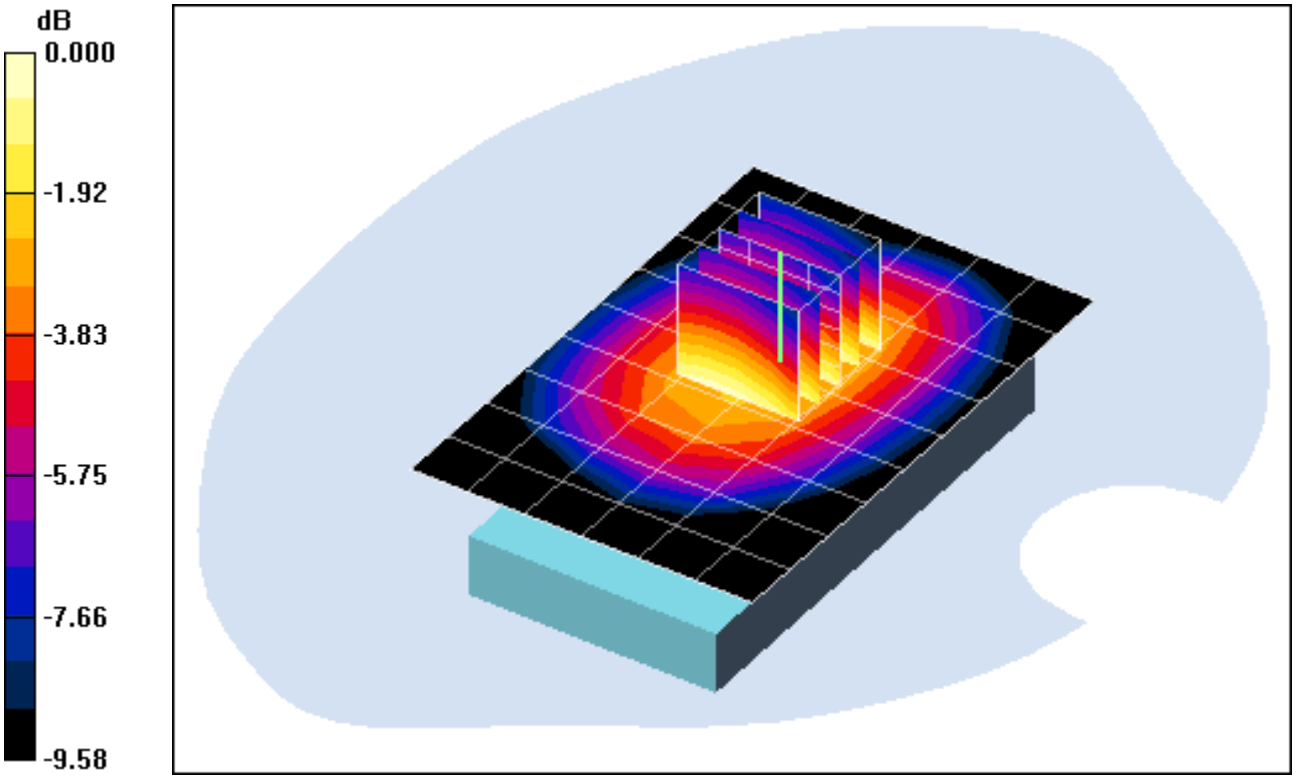
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 846.5 MHz; σ = 1.01 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Body SAR, Back side, High.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.8 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.460 W/kg
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.277 mW/g



0 dB = 0.384mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

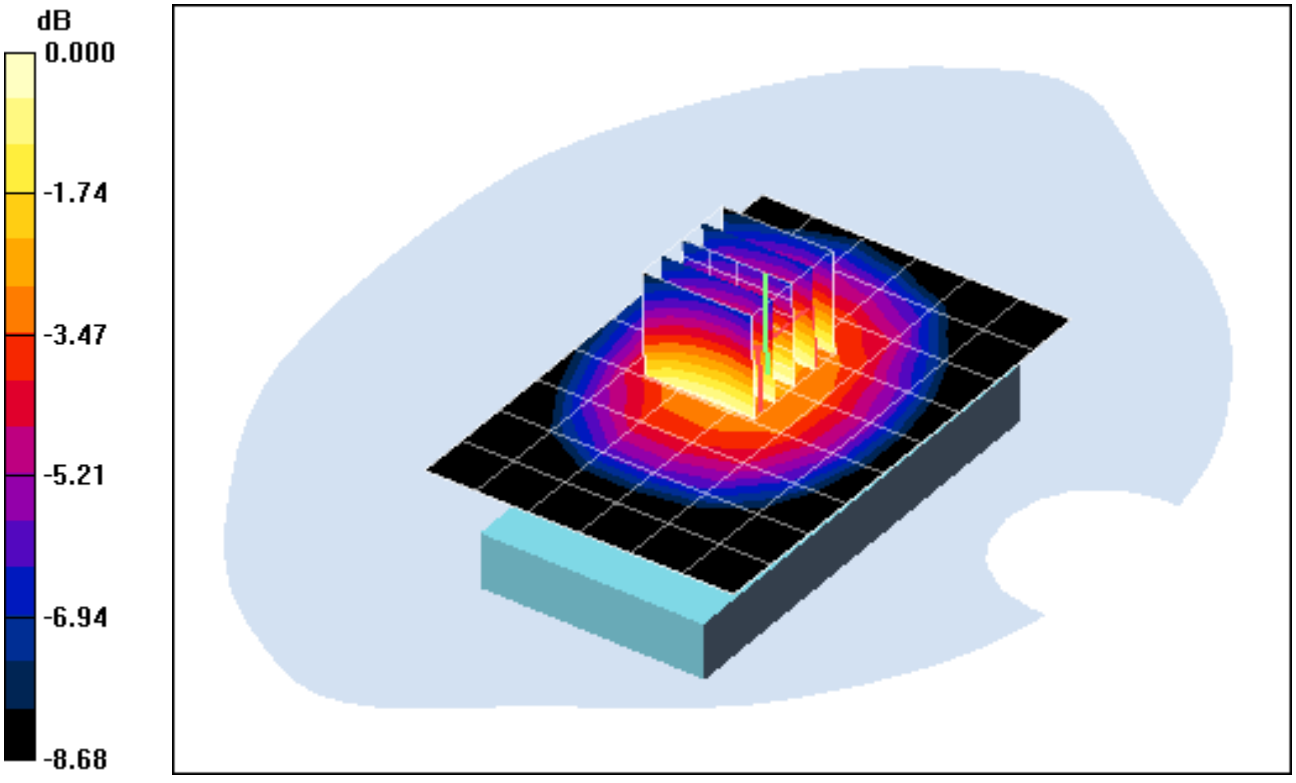
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 846.5$ MHz; $\sigma = 1.01$ mho/m; $\varepsilon_r = 53$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Body SAR, Front side, High.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x10x1): 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 = 0.050 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.247 mW/g; SAR(10 g) = 0.191 mW/g



0 dB = 0.257mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

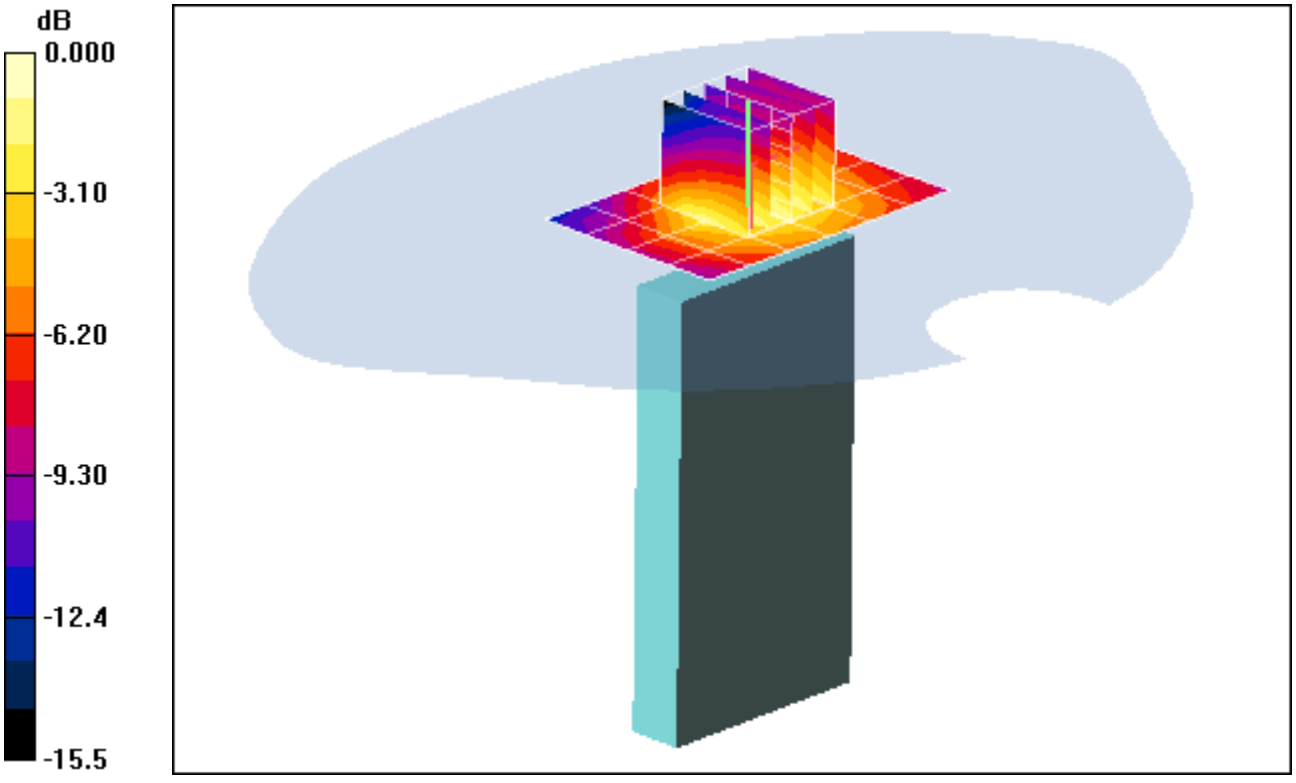
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 846.5 MHz; σ = 1.01 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Body SAR, Top Edge, High.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.21 V/m; Power Drift = 0.191 dB
Peak SAR (extrapolated) = 0.084 W/kg
SAR(1 g) = 0.049 mW/g; SAR(10 g) = 0.031 mW/g



0 dB = 0.053mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 35

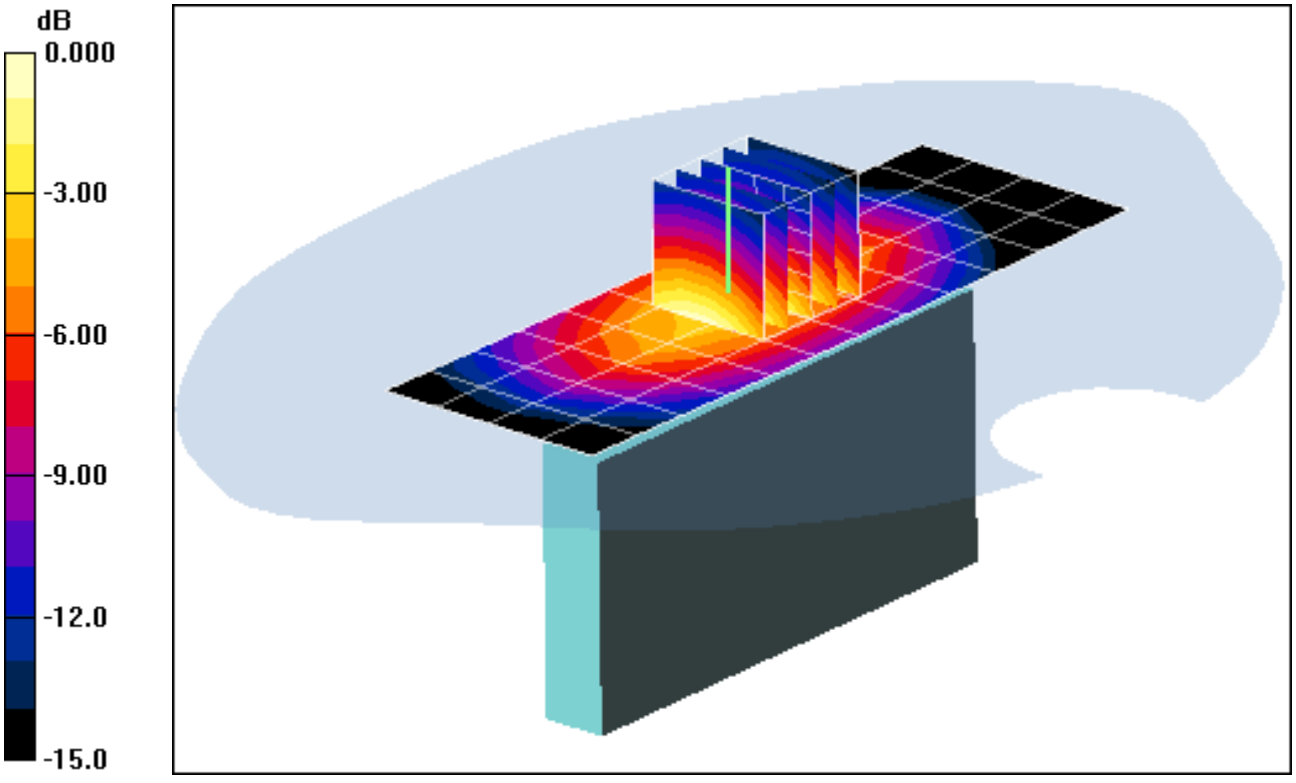
Communication System: LTE BAND 5; Frequency: 846.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 846.5 MHz; σ = 1.01 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.0°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3258; ConvF(6.06, 6.06, 6.06); Calibrated: 2/21/2012
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/18/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: LTE Band 5, Body SAR, Left Edge, High.ch,
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = 0.066 dB
Peak SAR (extrapolated) = 0.343 W/kg
SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.172 mW/g



0 dB = 0.258mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

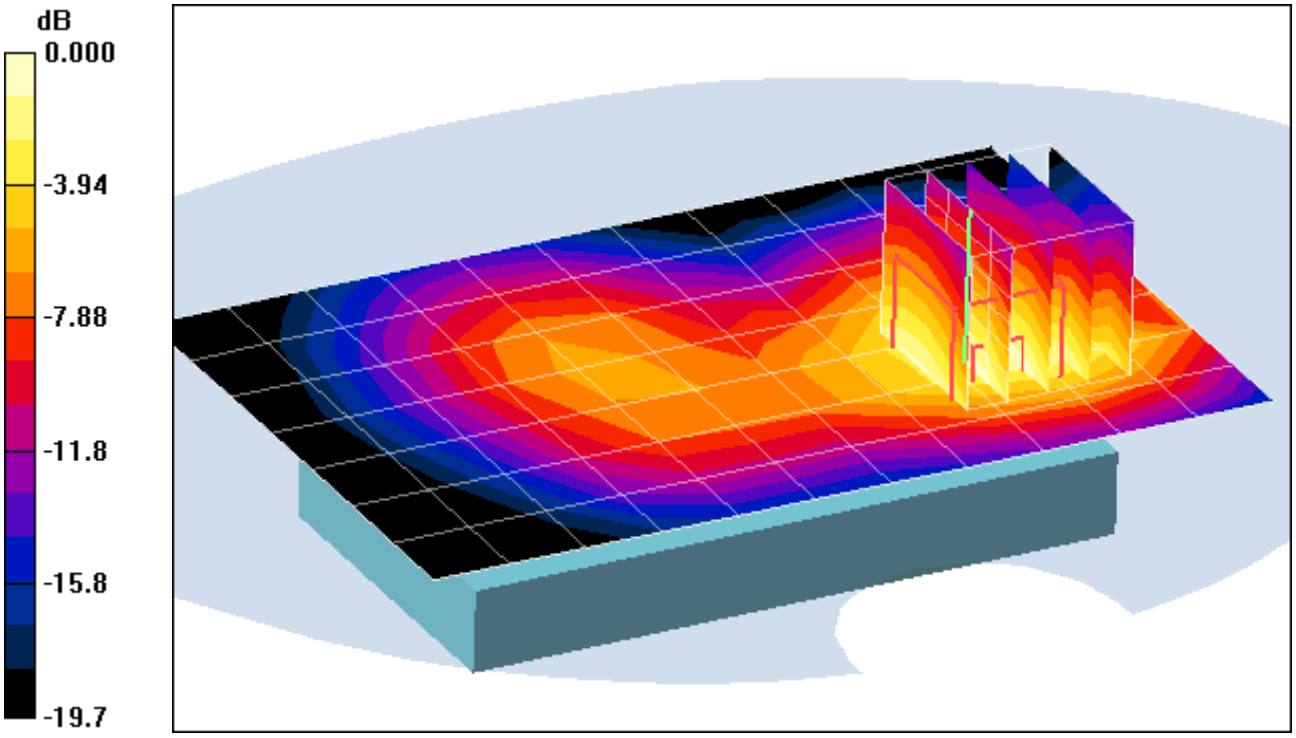
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.46 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.1°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 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), Body SAR, Back side, High.ch
QPSK, 10MHz Bandwidth, 1 RB, RB Offset 49

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.4 V/m; Power Drift = -0.141 dB
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.269 mW/g



0 dB = 0.475mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

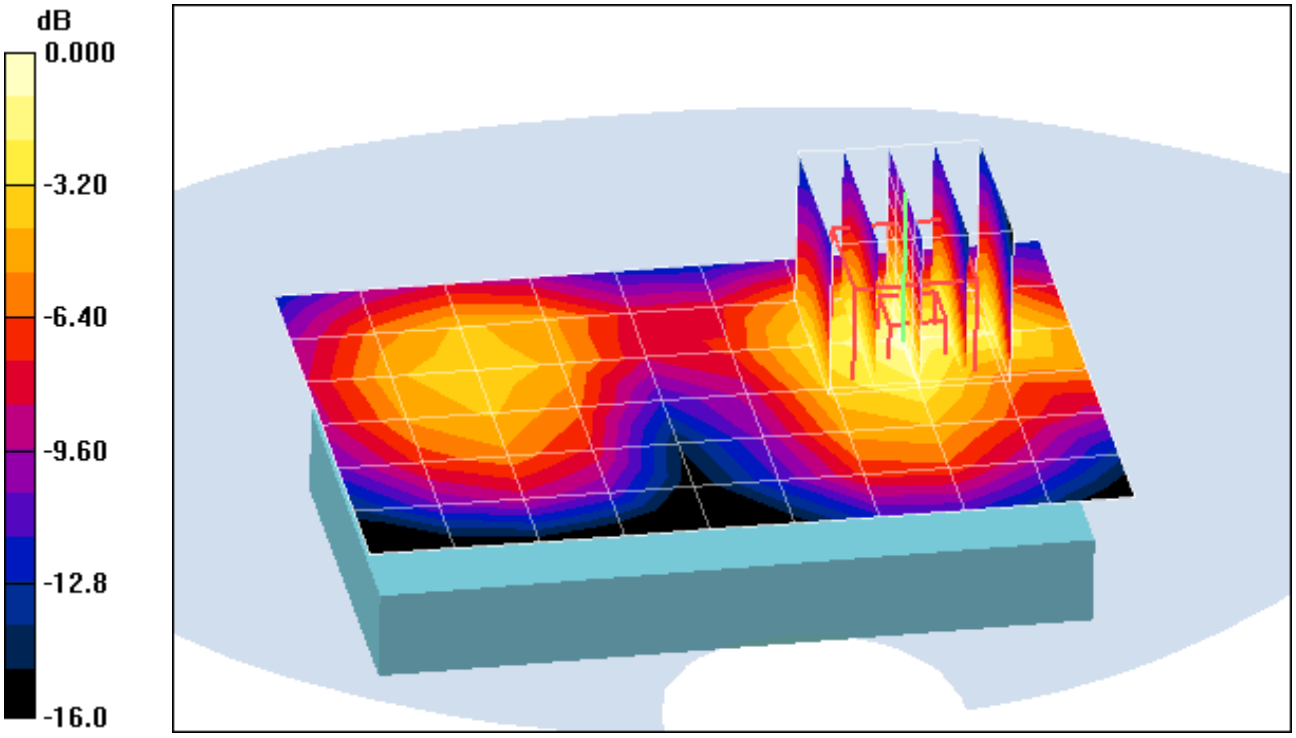
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.46 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.1°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 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), Body SAR, Front side, High.ch
QPSK, 10MHz Bandwidth, 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 = 16.6 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.562 W/kg
SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.217 mW/g



0 dB = 0.394mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

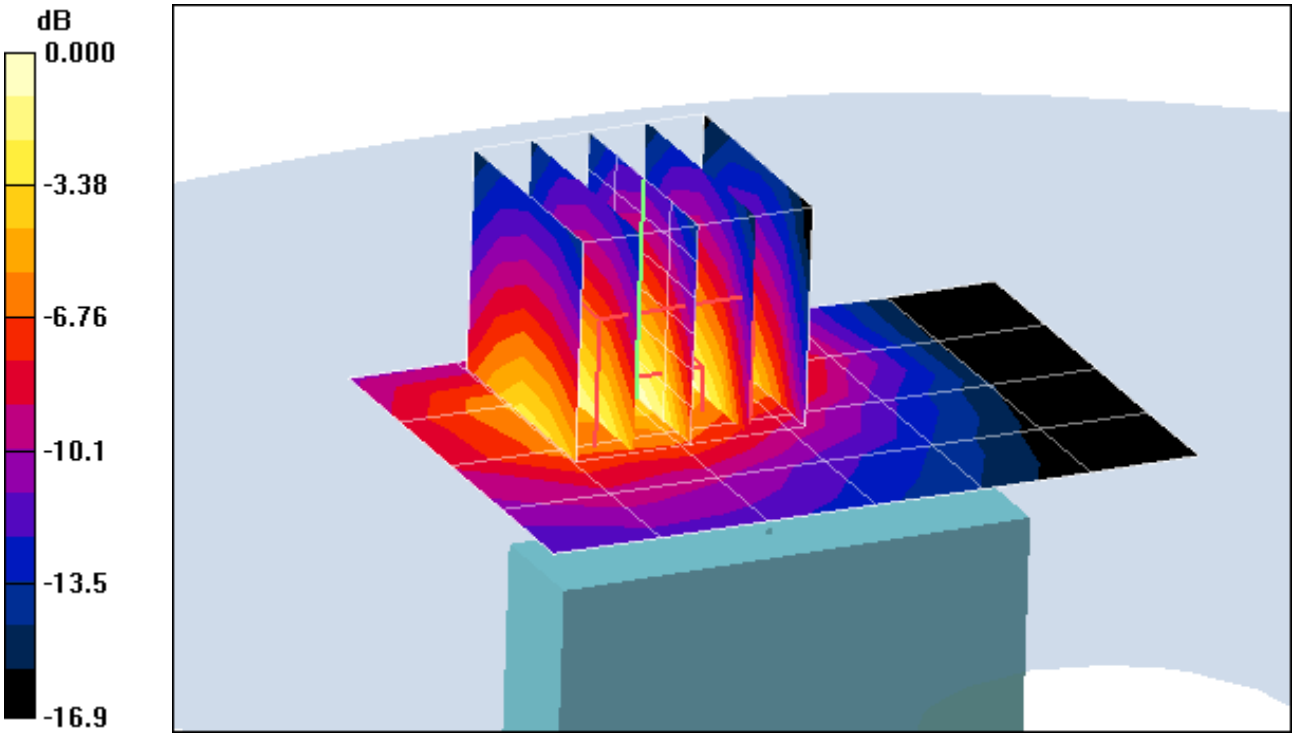
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.46 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.1°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 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), Body SAR, Top Edge, High.ch
QPSK, 10MHz Bandwidth, 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 = 13.7 V/m; Power Drift = -0.187 dB
Peak SAR (extrapolated) = 0.405 W/kg
SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.118 mW/g



0 dB = 0.273mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 34

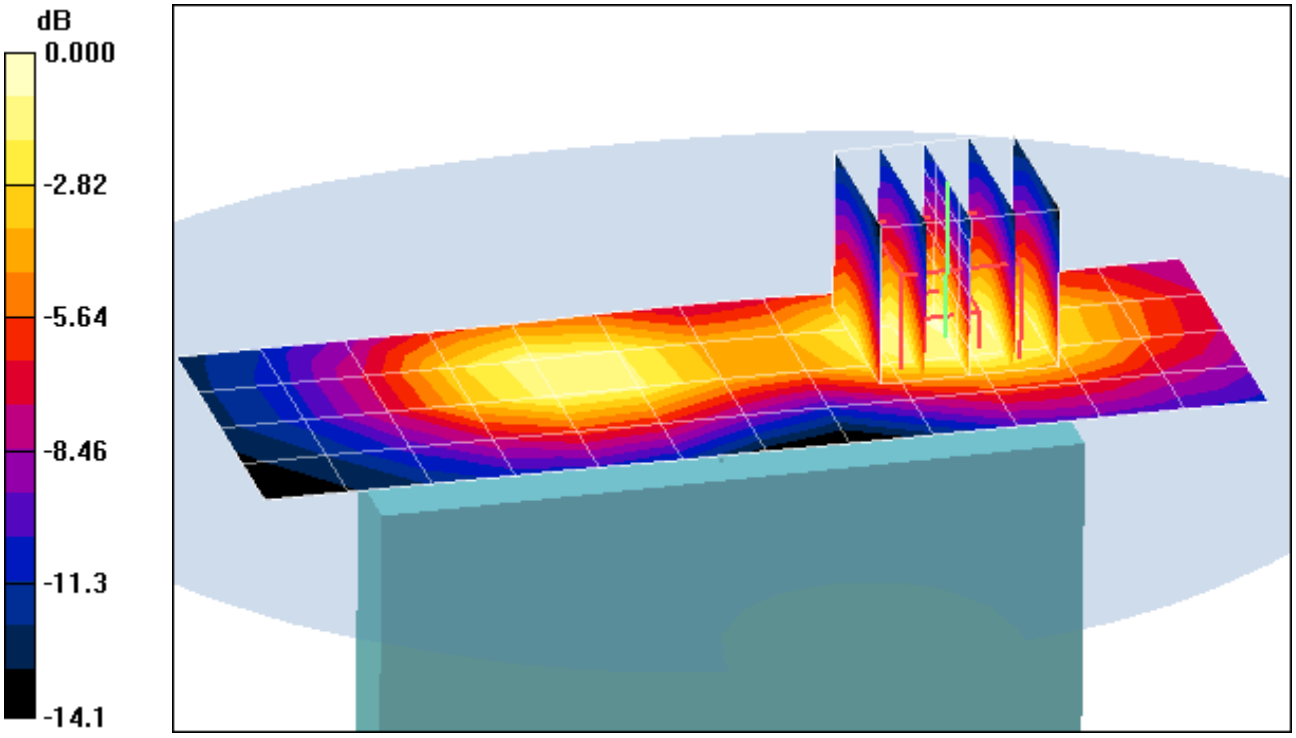
Communication System: LTE RF; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.46 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.5°C; Tissue Temp: 23.1°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 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), Body SAR, Left Edge, High.ch
QPSK, 10MHz Bandwidth, 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 = 13.1 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 0.354 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.134 mW/g



0 dB = 0.245mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 32

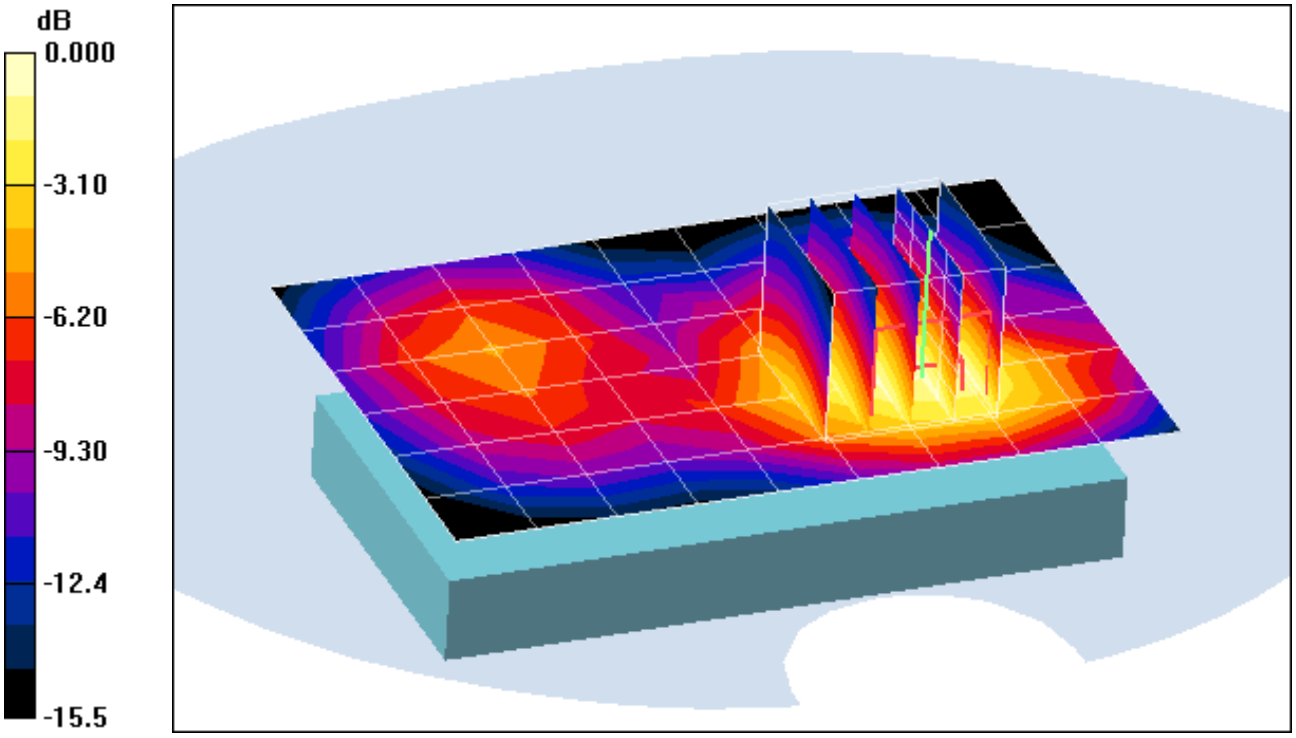
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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 2 (PCS), Body SAR, Back side, Mid.ch
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = 0.062 dB
Peak SAR (extrapolated) = 0.917 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.345 mW/g



0 dB = 0.618mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 32

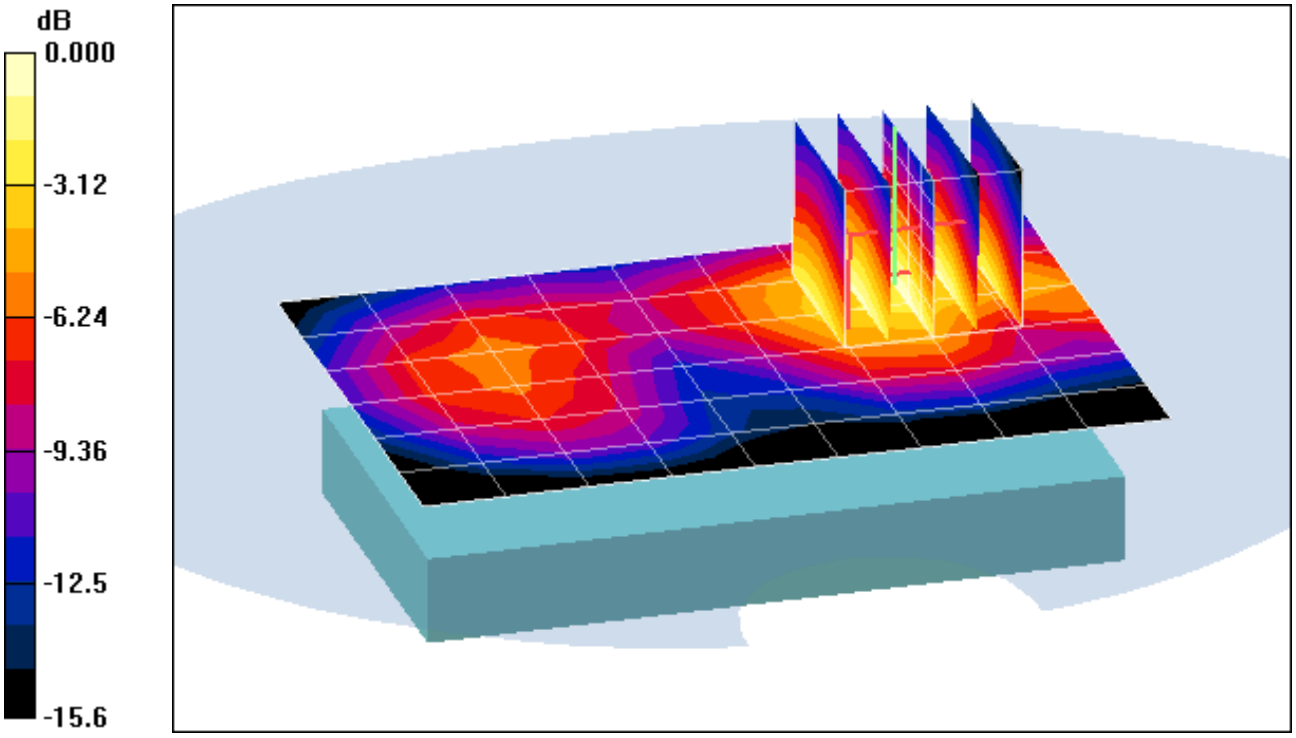
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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 2 (PCS), Body SAR, Front side, Mid.ch
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.6 V/m; Power Drift = 0.133 dB
Peak SAR (extrapolated) = 0.683 W/kg
SAR(1 g) = 0.430 mW/g; SAR(10 g) = 0.258 mW/g



0 dB = 0.454mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 32

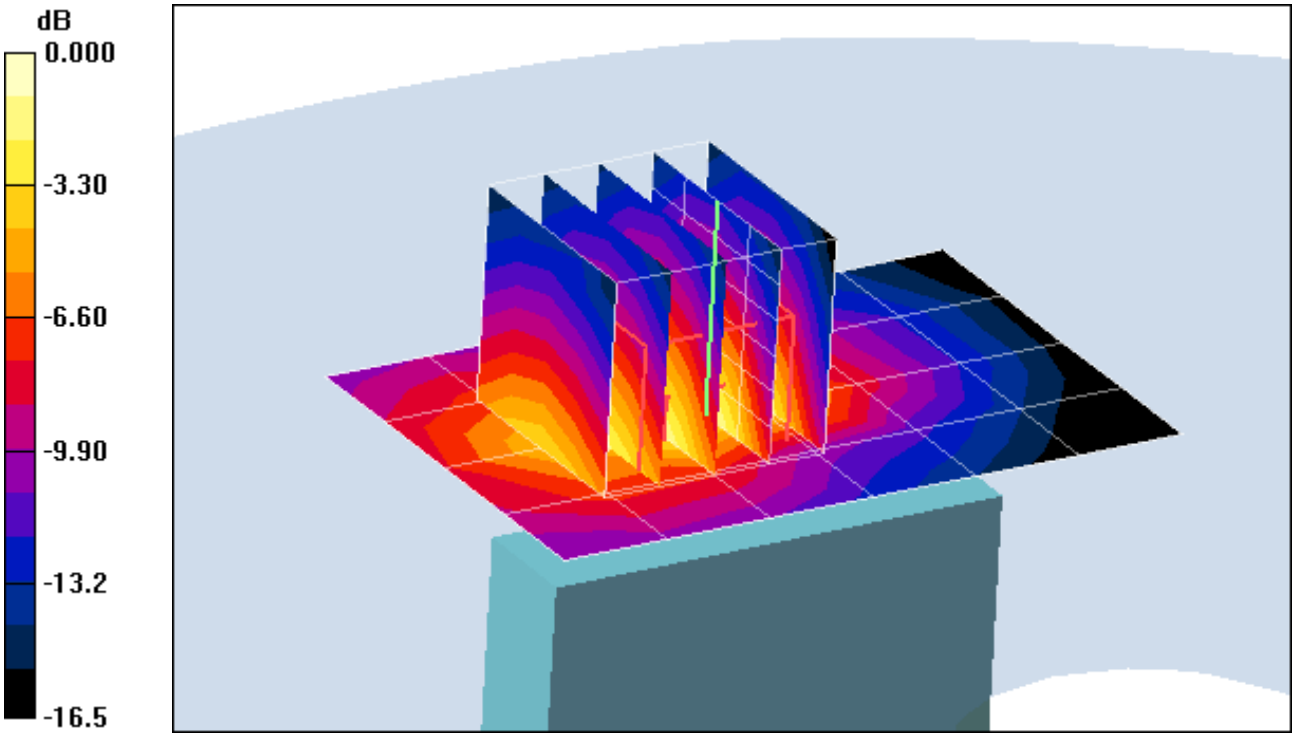
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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 2 (PCS), Body SAR, Top Edge, Mid.ch
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.159 mW/g



0 dB = 0.356mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 32

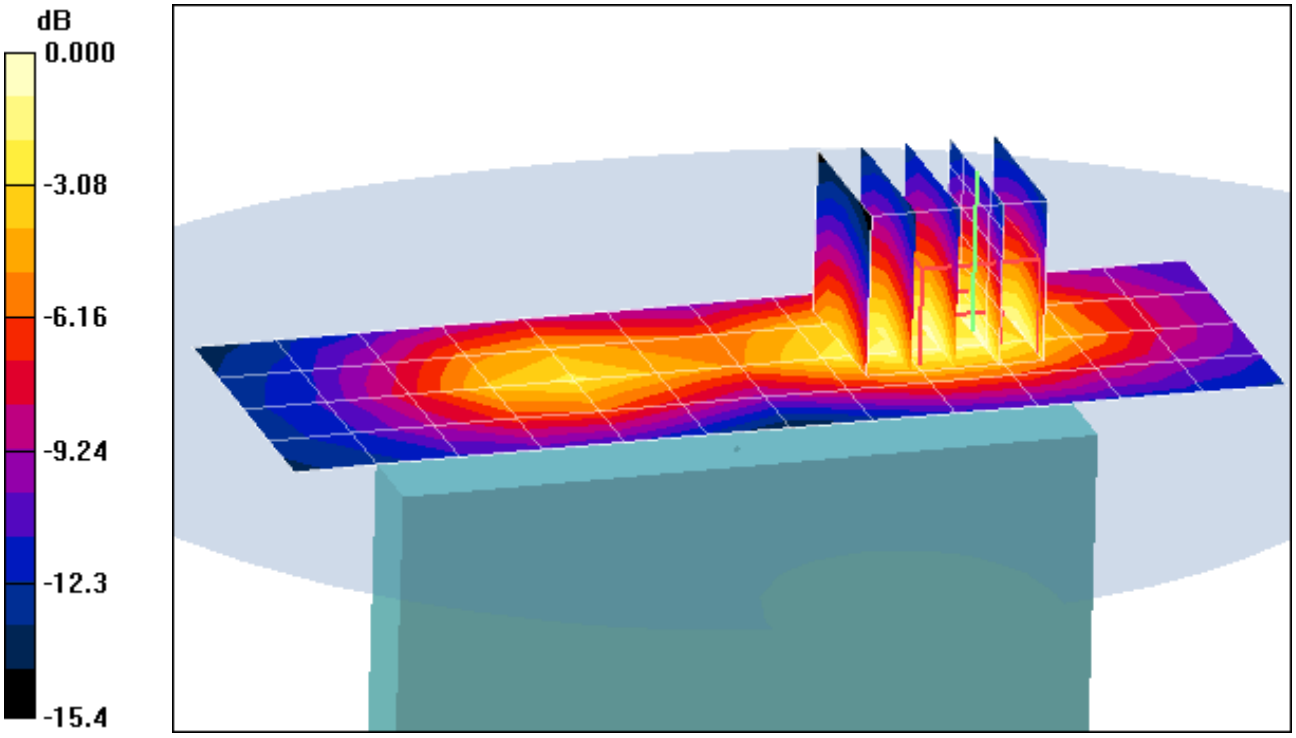
Communication System: LTE PCS 5 Mhz; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-08-2012; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3213; ConvF(4.58, 4.58, 4.58); 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 2 (PCS), Body SAR, Left Edge, Mid.ch
QPSK, 5MHz Bandwidth, 1 RB, RB Offset 24

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = 0.134 dB
Peak SAR (extrapolated) = 0.492 W/kg
SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.175 mW/g



0 dB = 0.327mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

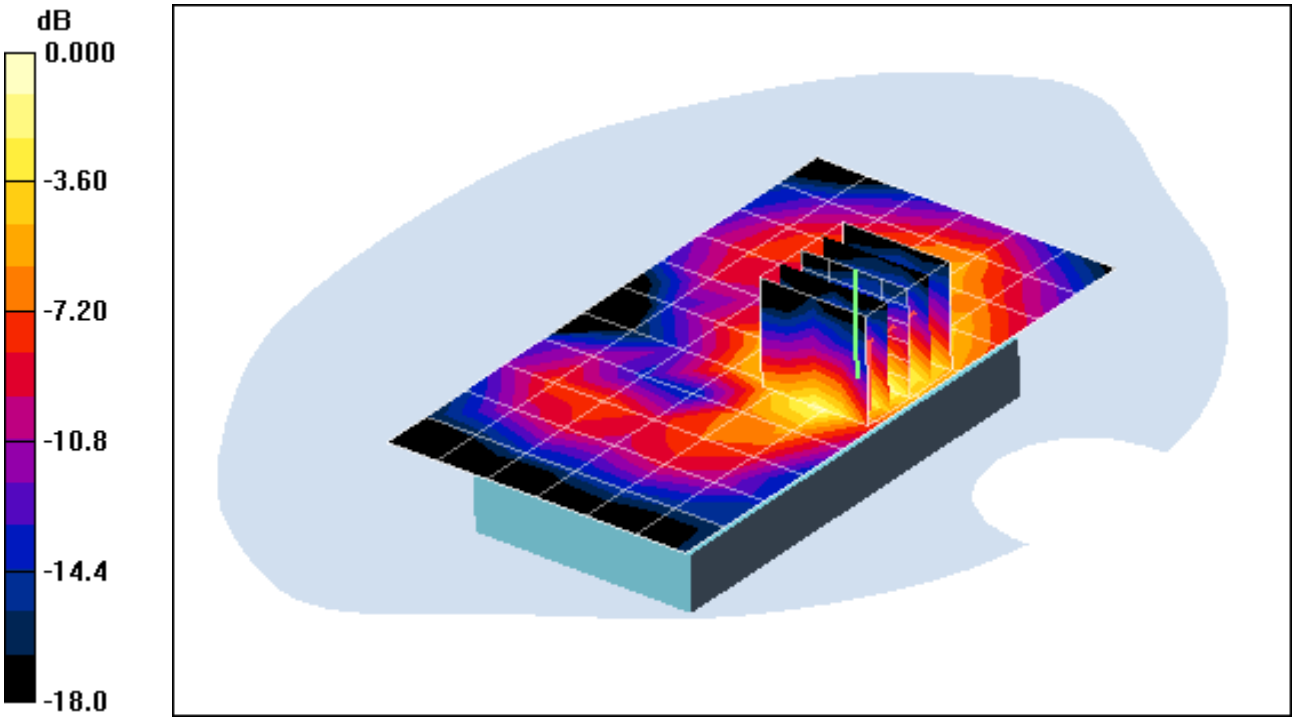
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.02 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.8°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 with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 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 = 7.65 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.052 mW/g



0 dB = 0.124mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

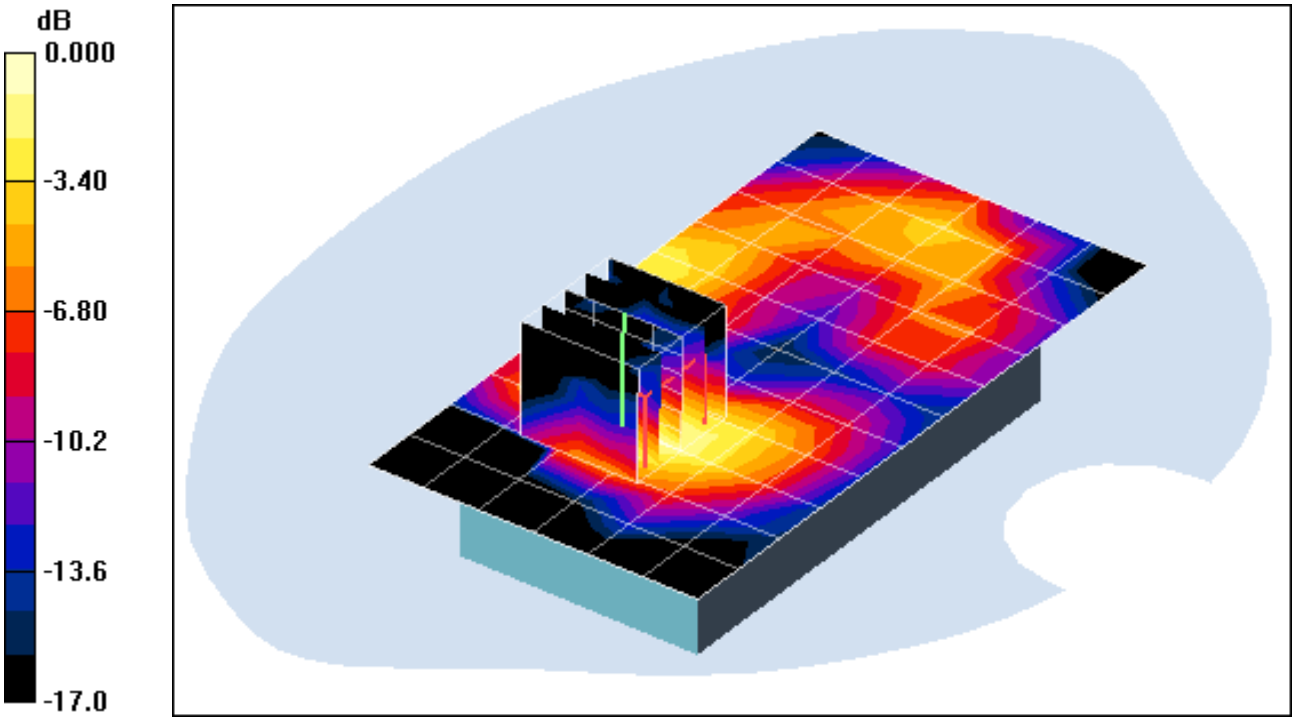
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.02 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.8°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 with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Front Side

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.22 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 0.067 W/kg
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.018 mW/g



0 dB = 0.045mW/g

DUT: A3LSCHI405U; Type: Portable Handset; Serial: 38

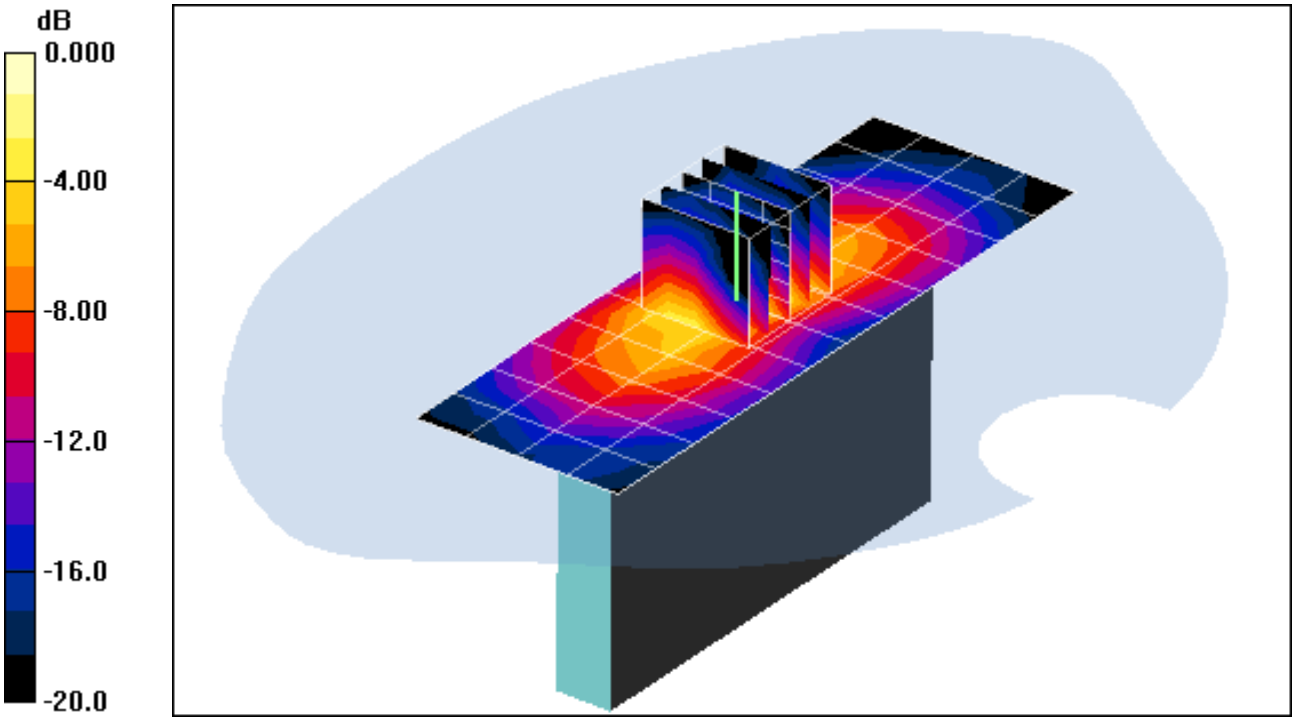
Communication System: IEEE 802.11b; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.02 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2012; Ambient Temp: 24.4°C; Tissue Temp: 23.8°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 with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Left Edge

Area Scan (5x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.26 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 0.335 W/kg
SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.064 mW/g



0 dB = 0.200mW/g

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DUT: A3LSCHI405U; Type: Portable Handset; Serial: 37

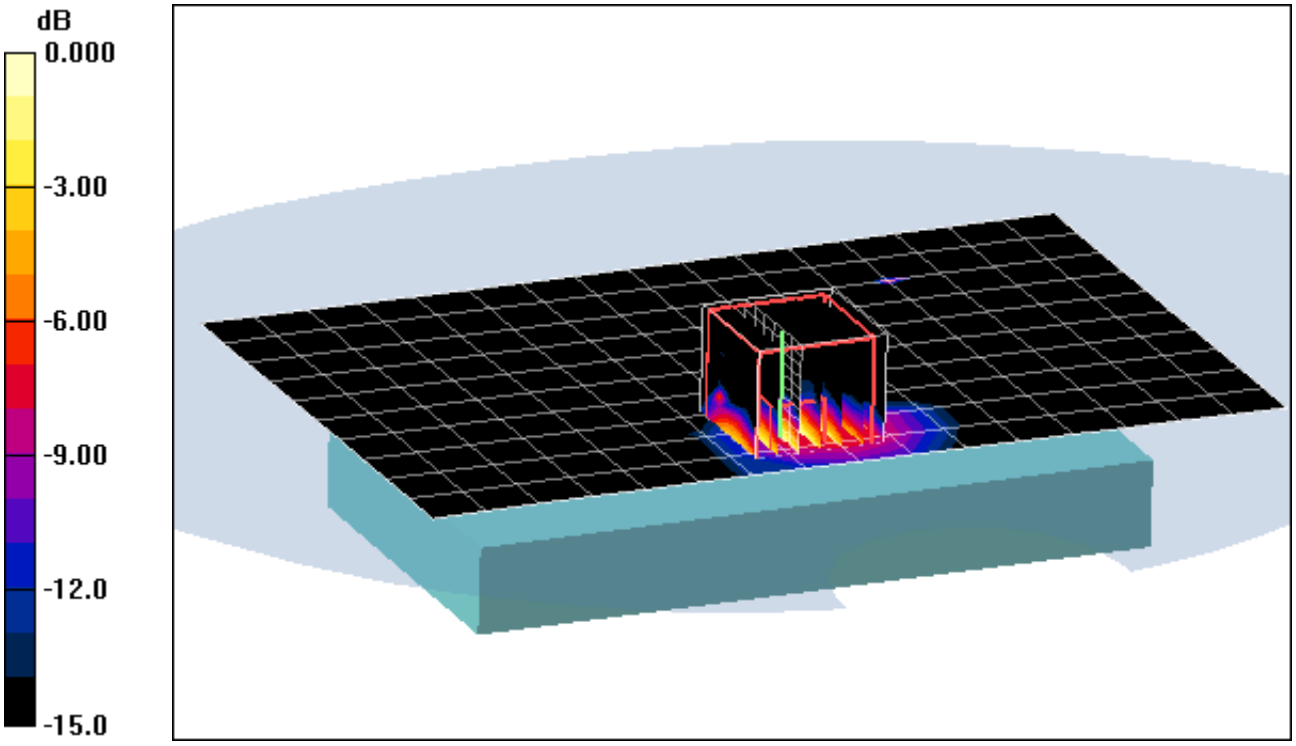
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; σ = 6.129 mho/m; ε_r = 46.32; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-12-2012; Ambient Temp: 24.8°C; Tissue Temp: 23.2°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

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Ch 157, 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 = 4.07 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.651 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.048 mW/g



0 dB = 0.324mW/g