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SAR EVALUATION REPORT

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
07/08/13 - 07/25/13
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1307031174-R2.ZNF

FCC ID: **ZNFLS980**

APPLICANT: **LG ELECTRONICS MOBILECOMM U.S.A., INC.**

DUT Type:	Portable Handset
Application Type:	Class II Permissive Change
FCC Rule Part(s):	CFR §2.1093
Model(s):	LG-LS980, LGLS980, LS980
Permissive Change(s):	See FCC Change Document
Date of Original Certification:	*07/23/2013*

Equipment Class	Band & Mode	Tx Frequency	Measured Conducted Power [dBm]	SAR		
				1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Wireless Router (W/kg)
PCE	CDMA/EVDO BC10 (§90S)	817.90 - 823.10 MHz	25.33	0.52	0.72	1.01
PCE	CDMA/EVDO BC0 (§22H)	824.70 - 848.31 MHz	25.06	0.39	0.49	0.73
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	24.90	0.25	1.08	1.13
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	33.14	0.43	0.47	0.69
PCE	UMTS 850	826.40 - 846.60 MHz	23.70	0.37	0.40	0.59
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	30.19	< 0.1	0.27	0.29
PCE	UMTS 1900	1852.4 - 1907.6 MHz	23.69	0.20	0.72	0.72
PCE	LTE Band 26	814.7 - 848.3 MHz	24.50	0.32	0.45	0.53
PCE	LTE Band 25 (PCS)	1851.5 - 1913.5 MHz	23.70	0.29	1.11	1.19
PCE	LTE Band 41	2501 - 2685 MHz	21.69	0.15	0.13	0.14
DTS	2.4 GHz WLAN	2412 - 2462 MHz	15.43	0.30	< 0.1	< 0.1
DTS/NII	5.8 GHz WLAN	5745 - 5825 MHz	9.74	0.11	0.14	0.14
NII	5.2 GHz WLAN	5180 - 5240 MHz	9.07	0.10	< 0.1	
NII	5.3 GHz WLAN	5260 - 5320 MHz	9.29	0.16	0.19	
NII	5.5 GHz WLAN	5500 - 5700 MHz	9.39	0.11	0.17	
DSS/DTS	Bluetooth	2402 - 2480 MHz	10.04	N/A		
Simultaneous SAR per KDB 690783 D01v01r02:				0.82	1.34	1.27

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

Note: This revised test report (S/N: 0Y1307031174-R2.A3L) supersedes and replaces the previously issued test report on the same subject DUT for the same type of testing indicated. Please discard or destroy the previously issued tests report(s) and dispose of accordingly.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 of this report; 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.

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 26	Data	814.7 - 848.3 MHz
LTE Band 25 (PCS)	Data	1851.5 - 1913.5 MHz
LTE Band 41	Data	2501 - 2685 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
5.8 GHz WLAN	Data	5745 - 5825 MHz
5.2 GHz WLAN	Data	5180 - 5240 MHz
5.3 GHz WLAN	Data	5260 - 5320 MHz
5.5 GHz WLAN	Data	5500 - 5700 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05r01.

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*1 TX Slots*	*2 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**33.2**	**33.2**	**31.2**	**26.8**	**26.8**
	Nominal	**32.7**	**32.7**	**30.7**	**26.3**	**26.3**
GSM/GPRS/EDGE 1900	Maximum	**30.2**	**30.2**	**27.2**	**26.0**	**26.0**
	Nominal	**29.7**	**29.7**	**26.7**	**25.5**	**25.5**

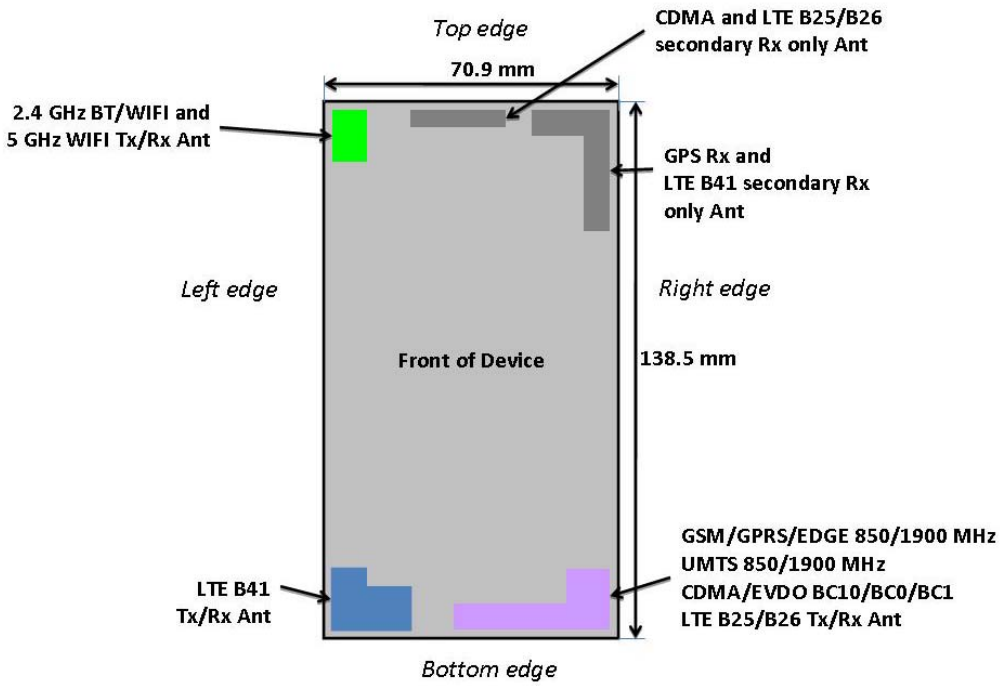
Mode / Band		Modulated Average		
		3GPP RMC	*3GPP HSDPA*	*3GPP HSUPA*
UMTS Band 5 (850 MHz)	Maximum	**23.7**	**23.7**	**23.7**
	Nominal	**23.2**	**23.2**	**23.2**
UMTS Band 2 (1900 MHz)	Maximum	**23.7**	**23.7**	**23.7**
	Nominal	**23.2**	**23.2**	**23.2**

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO BC10 (§90S)	Maximum	**25.5**
	Nominal	**25.0**
Cell. CDMA/EVDO BC0 (§22H)	Maximum	**25.2**
	Nominal	**24.7**
PCS CDMA/EVDO	Maximum	**24.9**
	Nominal	**24.4**

Mode / Band		Modulated Average (dBm)
LTE Band 26	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 25 (PCS)	Maximum	**23.7**
	Nominal	**23.2**
LTE Band 41	Maximum	**21.7**
	Nominal	**21.2**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**16.0**
	Nominal	**15.0**
IEEE 802.11g (2.4 GHz)	Maximum	**12.0**
	Nominal	**11.0**
IEEE 802.11n (2.4 GHz)	Maximum	**11.0**
	Nominal	**10.0**
IEEE 802.11a (5 GHz)	Maximum	**10.0**
	Nominal	**9.0**
IEEE 802.11n (5 GHz)	Maximum	**10.0**
	Nominal	**9.0**
IEEE 802.11ac (80 MHz BW)	Maximum	**9.0**
	Nominal	**8.0**
Bluetooth	Maximum	**10.5**
	Nominal	**8.5**

1.3 DUT Antenna Locations



Note: Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.

Figure 1-1
DUT Antenna Locations

Table 1-1
Mobile Hotspot Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
Cell. EVDO BC10 (§ 90S)	Yes	Yes	No	Yes	Yes	No
Cell. EVDO BC0 (§ 22H)	Yes	Yes	No	Yes	Yes	No
PCS EVDO	Yes	Yes	No	Yes	Yes	No
GPRS 850	Yes	Yes	No	Yes	Yes	No
UMTS 850	Yes	Yes	No	Yes	Yes	No
GPRS 1900	Yes	Yes	No	Yes	Yes	No
UMTS 1900	Yes	Yes	No	Yes	Yes	No
LTE Band 26	Yes	Yes	No	Yes	Yes	No
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	No
LTE Band 41	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
5.8 GHz WLAN	Yes	Yes	Yes	No	No	Yes

Notes:

1. 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 D06v01r01 guidance, page 2. When Hotspot is enabled, all 5 GHz bands are disabled. Therefore no 5 GHz WIFI Wireless Router SAR Data was required.
2. 5 GHz Wifi Direct GO is supported in the 5.8 GHz band only. The manufacturer expects 5.8 GHz Wifi Direct GO may be used similar to wireless router usage. Therefore, 5.8 GHz Wifi Direct GO was evaluated for SAR similar to wireless router SAR procedures in FCC KDB Publication 941225.

1.4 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the battery cover. The SAR tests were performed with the battery cover containing the NFC antenna.

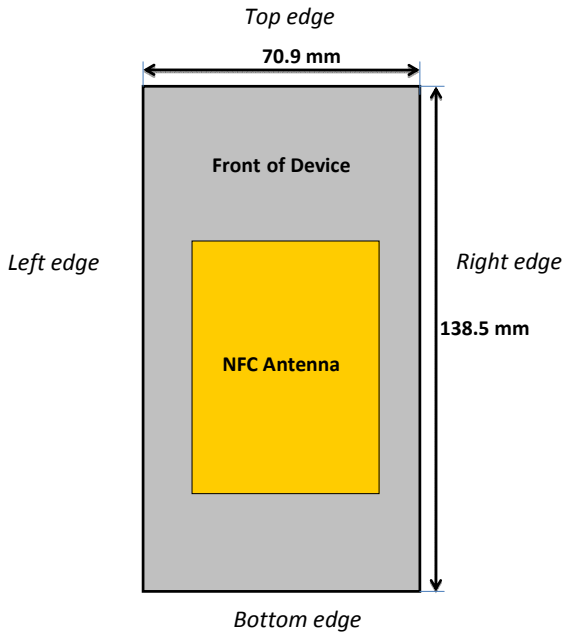


Figure 1-2
NFC Antenna Locations

1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v05r01, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in **Figure 1-3** and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Figure 1-3
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05r01 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable TX Configration	Head SAR	Body Worn SAR	Hotspot SAR	Note
1	CDMA BC10/BC0/BC1 voice + WiFi 2.4GHz	yes	yes	no	
2	CDMA BC10/BC0/BC1 voice + WiFi 5GHz	yes	yes	no	
3	CDMA BC10/BC0/BC1 data + WiFi 2.4GHz	yes*	yes*	yes	
4	CDMA BC10/BC0/BC1 data + WiFi 5GHz	yes*	yes*	yes	
5	GSM 850/1900 Voice + WiFi 2.4Ghz	yes	yes	no	
6	GSM 850/1900 Voice + WiFi 5Ghz	yes	yes	no	
7	850/1900 GPRS/EDGE + WiFi 2.4Ghz	yes*	yes*	yes	
8	850/1900 GPRS/EDGE + WiFi 5Ghz	yes*	yes*	yes	
9	UMTS 850/1900 + WiFi 2.4Ghz	yes	yes	yes	
10	UMTS 850/1900 + WiFi 5Ghz	yes	yes	yes	
11	LTE B26/B25/B41 + WiFi 2.4Ghz	yes*	yes*	yes	
12	LTE B26/B25/B41 + WiFi 5Ghz	yes*	yes*	yes	
13	CDMA BC10/BC0/BC1 voice + Bluetooth	no	yes	no	
14	GSM 850/1900 Voice + Bluetooth	no	yes	no	
15	UMTS 850/1900 + Bluetooth	no	yes	no	
16	LTE B26/B25/B41 + Bluetooth	no	yes	no	

1. WiFi 2.4Ghz is supported Hotspot and WiFi-Direct(GO/GC).
2. WiFi 5Ghz is not supported Hotspot and supported WiFi-Direct(GC; 5.8 GHz only GO).
3. EVDO, LTE, UMTS, GPRS/EDGE is supported Hotspot.
4. VoIP is supported in EVDO, LTE, UMTS, GSM (e.g. 3rd part VoIP and VoLTE)
5. Bluetooth and WiFi cannot transmit simultaneously since they share the same chip.
6. CDMA, GSM, UMTS and LTE cannot transmit simultaneously since they share the same chip.

(*) = for VOIP 3rd party applications possibly installed and used by the end-user
When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
Per the manufacturer, WIFI Direct is expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Simultaneous transmission scenarios involving WIFI direct are specified above.

1.6 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 according to FCC KDB 941225 D06v01r01.

5 GHz Wifi Direct GO is supported in the 5.8 GHz band only. The manufacturer expects 5.8 GHz Wifi Direct GO may be used similar to wireless router usage. Therefore, 5.8 GHz Wifi Direct GO was evaluated for SAR similar to wireless router SAR procedures in FCC KDB Publication 941225.

Per FCC KDB 447498 D01v05r01, the SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth SAR was not required; [(11/10)* √2.441] = 1.7 < 3.0. Based on the maximum conducted power of Bluetooth LE (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth LE SAR was not required; [(2/10)* √2.440] = 0.3 < 3.0. Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.

This device supports 20 MHz and 40 MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only. IEEE 802.11n was not evaluated for SAR since the average output power of 20 MHz and 40 MHz bandwidths was not more than 0.25 dB higher than the average output power of IEEE 802.11a.

This device supports IEEE 802.11ac with the following features:
a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 1 Tx antenna output
d) 256 QAM is supported

Full SAR evaluations for all IEEE 802.11ac configurations were not required since the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

Per FCC KDB 941225 D03v01r01, EDGE SAR was not required since the source-based time-averaged EDGE output powers were lower than those of the GSM and GPRS modes.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v02r02.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r02.

CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg.

1.7 Power Reduction for SAR

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

1.8 Guidance Applied

- FCC OET Bulletin 65 Supplement C [June 2001]
- IEEE 1528-2003
- FCC KDB Publication 941225 D01-D06 (2G/3G/4G, Hotspot, and 1x Advanced)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r01 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)
- 3GPP TS 36.211 Section 4

1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number
CDMA/EVDO BC10 (§90S)	150	150	150
CDMA/EVDO BC0 (§22H)	150	150	150
PCS CDMA/EVDO	150	150	150
GSM/GPRS/EDGE 850	167	167	167
UMTS 850	167	167	167
GSM/GPRS/EDGE 1900	167	167	167
UMTS 1900	167	167	167
LTE Band 26	161	161	161
LTE Band 25 (PCS)	161	161	161
LTE Band 41	151	151	151
2.4 GHz WLAN	152	152	152
5 GHz WLAN	152	152	152

2 LTE INFORMATION

LTE Information					
FCC ID	**ZNFLS980**				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 26 (814.7 - 848.3 MHz)				
	LTE Band 25 (PCS) (1851.5 - 1913.5 MHz)				
	LTE Band 41 (2501 - 2685 MHz)				
Channel Bandwidths	LTE Band 26: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 25 (PCS): 3 MHz, 5 MHz, 10 MHz				
	LTE Band 41: 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low Mid	Mid	Mid High	High
LTE Band 26: 1.4 MHz	814.7 (26697)	N/A	831.5 (26865)	N/A	848.3 (27033)
LTE Band 26: 3 MHz	815.5 (26705)	N/A	831.5 (26865)	N/A	847.5 (27025)
LTE Band 26: 5 MHz	816.5 (26715)	N/A	831.5 (26865)	N/A	846.5 (27015)
LTE Band 26: 10 MHz	819 (26990)	N/A	831.5 (26865)	N/A	844 (26740)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)	N/A	1882.5 (26365)	N/A	1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)	N/A	1882.5 (26365)	N/A	1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)	N/A	1882.5 (26365)	N/A	1910 (26640)
LTE Band 41: 10 MHz	2501 (39700)	2547 (40160)	2593 (40620)	2639 (41080)	2685 (41540)
LTE Band 41: 15 MHz	2503.5 (39725)	2548.25 (40173)	2593 (40620)	2637.75 (41068)	2682.5 (41515)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	3				
Modulations Supported in UL	QPSK, 16QAM				
LTE Transmitter and Antenna Implementation	This device uses 1 Tx/Rx antenna for GSM/UMTS/CDMA/LTE B25/B26, 1 Tx/Rx antenna for LTE B41, 1 secondary Rx only antenna for CDMA/LTE B25/B26, and 1 secondary Rx only antenna for LTE B41				
Description of LTE Tx and Ant.	CDMA/GSM/UMTS/LTE operate on the same transmission path				
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				

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 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 and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r01 (See Table 4-1).

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 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.

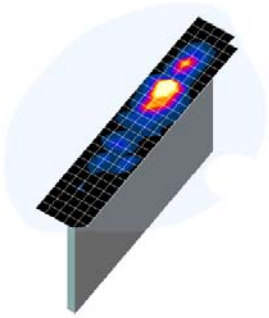


Figure 4-1
Sample SAR Area Scan

3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r01 (See Table 4-1). On the 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.

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r01

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

Figure 5-2 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 5-1. 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 5-1). 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].

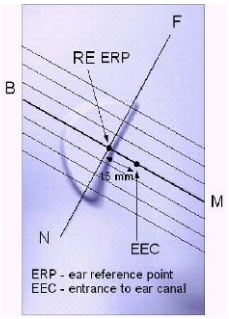


Figure 5-1
Close-Up Side view of ERP

5.2 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 5-3). 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 its 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 5-2
Front, back and side view of SAM Twin Phantom

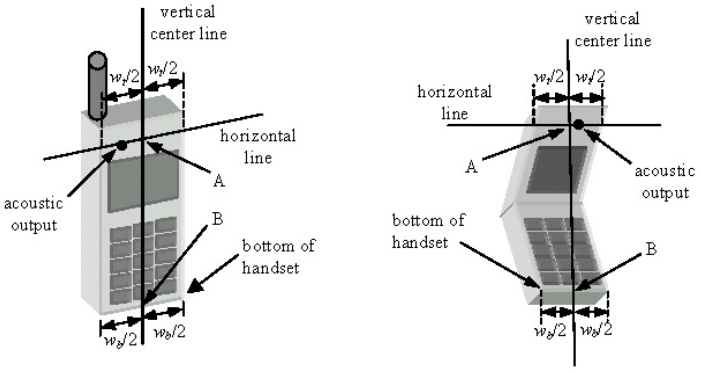


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

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

6.2 Positioning for Cheek

1. The test device was positioned with the device 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 6-1), 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.

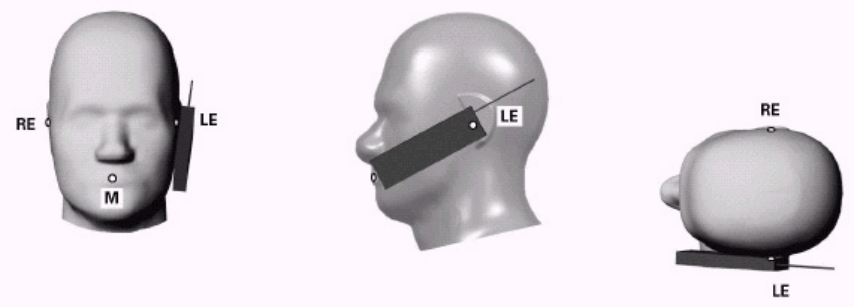


Figure 6-1 Front, Side and Top View of Cheek Position

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 device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

6.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek 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 15degrees.
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 handset touched 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 6-2).

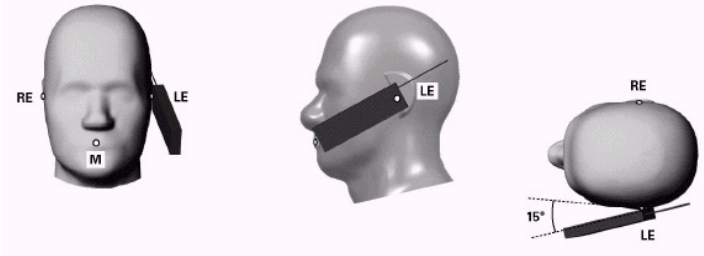


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

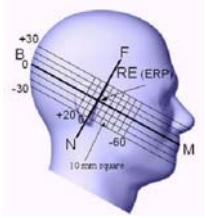


Figure 6-3
Side view w/ relevant markings

6.4 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 FCC KDB Publication 648474 D04v01r01. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

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.

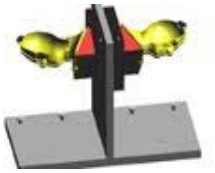


Figure 6-4 Twin SAM Chin20

6.5 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 6-5). Per FCC KDB Publication 648474 D04v01r01, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v05r01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

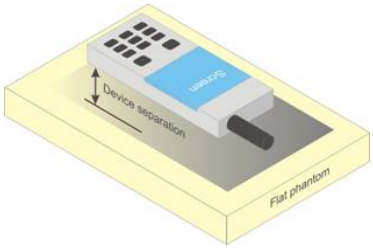


Figure 6-5
Sample Body-Worn Diagram

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.

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 44798 D01v05 should be applied to determine SAR test requirements.

Per KDB Publication 44798 D01v05, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v01r01 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 containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r01 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

7 RF EXPOSURE LIMITS

7.1 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.

7.2 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 7-1
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)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	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.

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05r01, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r02.

8.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v02r02 "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.

8.3 SAR Measurement Conditions for CDMA2000

The following procedures were performed according to FCC KDB Publication 941225 D01v02r02 "SAR Measurement Procedures for 3G Devices", October 2007.

8.3.1 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 8-1 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 8-2 was applied.

Table 8-1
Parameters for Max. Power for RC1

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

Table 8-2
Parameters for Max. Power for RC3

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

5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

8.3.2 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers were measured using SO75 with RC8 on the uplink and RC11 on the downlink per KDB publication 941225 D02. Smart blanking was disabled for all measurements. The EUT was configured with forward power control Mode 000 and reverse power control at 400 bps. Conducted powers were measured on an Agilent 8960 Series 10 Wireless Communications Test Set, Model E5515C using the CDMA2000 1x Advanced application, Option E1962B-410.

Based on the maximum output power measured for 1x Advanced, SAR is required for 1x advanced when if the maximum output for 1x Advanced is more than 0.25 dB higher than the maximum measured for 1x. Also, if the measured SAR in any 1x mode exposure conditions (head, body etc.) is larger than 1.2 W/kg, the highest of those configurations above 1.2 W/kg for each exposure condition in 1x Advanced has to be repeated. All measured SAR in 1x mode higher than 1.5 W/kg must be repeated for 1x Advanced.

8.3.3 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.

Head SAR was additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.3.5 for EVDO Rev. A configuration parameters.

8.3.4 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.

8.3.5 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.

8.3.6 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 D01v02r02 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.

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.

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121 (release 5), using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.4.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all "1s". SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in

12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements for Handsets with Rel 5 HSDPA

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

The H-set used in FRC for HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HSPDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the applicable H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the FRC for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 2 ms to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors of βc=9 and βd=15, and power offset parameters of ΔACK= ΔNACK =5 and ΔCQI=2 is used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

Sub-Test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c$ = 30/15 ⇔ β_{hs}= 30/15 *β_c.
Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 8 (A_{hs} = 30/15) with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 7 (A_{hs} = 24/15) with β_{hs} = 24/15 * β_c.
Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Figure 8-1
Table C.10.1.4 of TS 234.121-1

8.4.5 SAR Measurements for Handsets with Rel 6 HSUPA

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

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

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

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

8.5 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02r02 publication. Please see notes after the tabulated 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.

8.5.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.5.2 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.

8.5.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r01:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.

ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8.5.5 TDD

LTE TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225. SAR testing was performed using the normal cyclic prefix and then scaling up the measured SAR result to the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

8.6 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n /ac 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 D01v01r02 for more details.

8.6.1 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.

8.6.2 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. 802.11ac SAR was evaluated for highest 802.11a configuration in each 5 GHz band and each exposure condition. 802.11ac modes were additionally evaluated for SAR if the output power for the respective mode was more than 0.25 dB higher than powers of 802.11a modes.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg and 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.

9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	25.22	25.26	25.47	25.29	25.25	25.33	25.32
Cellular	1013	22H	824.7	24.96	24.97	25.20	24.99	25.01	25.12	25.09
	384	22H	836.52	24.95	25.06	25.18	24.94	24.96	24.96	24.95
	777	22H	848.31	24.99	25.01	25.17	25.03	25.07	25.12	25.07
PCS	25	24E	1851.25	24.85	24.89	24.90	24.87	24.88	24.90	24.89
	600	24E	1880	24.85	24.83	24.89	24.86	24.81	24.82	24.81
	1175	24E	1908.75	24.58	24.60	24.75	24.61	24.65	24.64	24.62

Note: RC1 is only applicable for IS-95 compatibility. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v05r01 4.1.6, only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

Per KDB Publication 941225 D01v02r02:

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 is not required for 1x RTT for Ev-Do hotspot devices 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
4. Head SAR was additionally evaluated with EVDO Rev. A to determine compliance for held-to-ear VoIP operations.

1x Advanced Considerations per FCC KDB Publication 941225 D02v02r02:
1. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg. See Section 8.3.2 for 1x Advanced test set up.

Figure 9-1
Power Measurement Setup

9.2 GSM Conducted Powers

		Maximum Burst-Averaged Output Power				
		Voice	*GPRS/EDGE Data (GMSK)*		*EDGE Data (8-PSK)*	
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	32.99	33.00	**31.20**	26.80	26.72
	190	33.14	33.18	**30.65**	26.70	26.50
	251	33.13	33.16	**31.11**	26.64	26.52
GSM 1900	512	29.89	**29.98**	26.82	25.62	25.60
	661	30.17	**30.19**	26.98	25.49	25.54
	810	30.02	**30.06**	27.05	25.40	25.37
		Calculated Maximum Frame-Averaged Output Power				
		Voice	*GPRS/EDGE Data (GMSK)*		*EDGE Data (8-PSK)*	
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	23.96	23.97	**25.18**	17.77	20.70
	190	24.11	24.15	**24.63**	17.67	20.48
	251	24.10	24.13	**25.09**	17.61	20.50
GSM 1900	512	20.86	**20.95**	20.80	16.59	19.58
	661	21.14	**21.16**	20.96	16.46	19.52
	810	20.99	**21.03**	21.03	16.37	19.35

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

The bolded GPRS modes were selected for SAR testing according to the highest frame-averaged output power table according to KDB 941225 D03v01.

GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.

EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

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

Figure 9-2
Power Measurement Setup

9.3 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.67	23.70	23.60	23.70	23.69	23.70	-
99		12.2 kbps AMR	23.58	23.60	23.65	23.68	23.59	23.70	-
6	HSDPA	Subtest 1	23.59	23.68	23.58	23.69	23.62	23.69	0
6		Subtest 2	23.65	23.63	23.61	23.68	23.63	23.70	0
6		Subtest 3	23.15	23.15	23.24	23.24	23.03	23.50	0.5
6		Subtest 4	23.20	23.16	23.12	23.17	23.01	23.46	0.5
6	HSUPA	Subtest 1	23.46	23.32	23.29	23.22	23.42	23.40	0
6		Subtest 2	21.93	22.20	21.90	22.19	21.89	21.44	2
6		Subtest 3	22.76	22.57	22.65	22.96	22.76	23.07	1
6		Subtest 4	22.19	22.15	22.10	22.12	22.18	22.11	2
6		Subtest 5	23.23	23.54	23.36	23.53	23.51	22.88	0

UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02r02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

This device does not support DC-HSDPA.

It is expected by the manufacturer that MPR for some HSUPA subtests may be as low as 0 dB according to the chipset implementation in this model.

Figure 9-3
Power Measurement Setup

9.4 LTE Conducted Powers

9.4.1 LTE Band 26

Table 9-1
LTE Band 26 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	819	26740	10	QPSK	1	0	24.44	0	0
	819	26740	10	QPSK	1	25	24.43	0	0
	819	26740	10	QPSK	1	49	24.15	0	0
	819	26740	10	QPSK	25	0	23.12	1	0-1
	819	26740	10	QPSK	25	12	23.18	1	0-1
	819	26740	10	QPSK	25	25	23.34	1	0-1
	819	26740	10	QPSK	50	0	23.24	1	0-1
	819	26740	10	16QAM	1	0	23.50	1	0-1
	819	26740	10	16QAM	1	25	23.43	1	0-1
	819	26740	10	16QAM	1	49	23.22	1	0-1
	819	26740	10	16QAM	25	0	22.20	2	0-2
	819	26740	10	16QAM	25	12	22.28	2	0-2
	819	26740	10	16QAM	25	25	22.43	2	0-2
	819	26740	10	16QAM	50	0	22.18	2	0-2
Mid	831.5	26865	10	QPSK	1	0	24.39	0	0
	831.5	26865	10	QPSK	1	25	24.39	0	0
	831.5	26865	10	QPSK	1	49	**24.50**	0	0
	831.5	26865	10	QPSK	25	0	23.11	1	0-1
	831.5	26865	10	QPSK	25	12	**23.35**	1	0-1
	831.5	26865	10	QPSK	25	25	23.20	1	0-1
	831.5	26865	10	QPSK	50	0	23.10	1	0-1
	831.5	26865	10	16QAM	1	0	23.39	1	0-1
	831.5	26865	10	16QAM	1	25	23.38	1	0-1
	831.5	26865	10	16QAM	1	49	23.50	1	0-1
	831.5	26865	10	16QAM	25	0	22.24	2	0-2
	831.5	26865	10	16QAM	25	12	22.26	2	0-2
	831.5	26865	10	16QAM	25	25	22.24	2	0-2
	831.5	26865	10	16QAM	50	0	22.15	2	0-2
High	844	26990	10	QPSK	1	0	24.20	0	0
	844	26990	10	QPSK	1	25	24.00	0	0
	844	26990	10	QPSK	1	49	24.05	0	0
	844	26990	10	QPSK	25	0	23.10	1	0-1
	844	26990	10	QPSK	25	12	23.23	1	0-1
	844	26990	10	QPSK	25	25	23.34	1	0-1
	844	26990	10	QPSK	50	0	23.23	1	0-1
	844	26990	10	16QAM	1	0	23.47	1	0-1
	844	26990	10	16QAM	1	25	23.37	1	0-1
	844	26990	10	16QAM	1	49	23.50	1	0-1
	844	26990	10	16QAM	25	0	22.18	2	0-2
	844	26990	10	16QAM	25	12	22.23	2	0-2
	844	26990	10	16QAM	25	25	22.45	2	0-2
	844	26990	10	16QAM	50	0	22.21	2	0-2

Table 9-2
LTE Band 26 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	816.5	26715	5	QPSK	1	0	24.25	0	0
	816.5	26715	5	QPSK	1	12	24.50	0	0
	816.5	26715	5	QPSK	1	24	24.10	0	0
	816.5	26715	5	QPSK	12	0	23.27	1	0-1
	816.5	26715	5	QPSK	12	6	23.17	1	0-1
	816.5	26715	5	QPSK	12	13	23.26	1	0-1
	816.5	26715	5	QPSK	25	0	23.12	1	0-1
	816.5	26715	5	16-QAM	1	0	23.37	1	0-1
	816.5	26715	5	16-QAM	1	12	23.15	1	0-1
	816.5	26715	5	16-QAM	1	24	23.18	1	0-1
	816.5	26715	5	16-QAM	12	0	22.30	2	0-2
	816.5	26715	5	16-QAM	12	6	22.20	2	0-2
	816.5	26715	5	16-QAM	12	13	22.24	2	0-2
	816.5	26715	5	16-QAM	25	0	22.08	2	0-2
Mid	831.5	26865	5	QPSK	1	0	24.35	0	0
	831.5	26865	5	QPSK	1	12	24.38	0	0
	831.5	26865	5	QPSK	1	24	24.42	0	0
	831.5	26865	5	QPSK	12	0	23.21	1	0-1
	831.5	26865	5	QPSK	12	6	23.29	1	0-1
	831.5	26865	5	QPSK	12	13	23.28	1	0-1
	831.5	26865	5	QPSK	25	0	23.23	1	0-1
	831.5	26865	5	16-QAM	1	0	23.10	1	0-1
	831.5	26865	5	16-QAM	1	12	23.11	1	0-1
	831.5	26865	5	16-QAM	1	24	23.16	1	0-1
	831.5	26865	5	16-QAM	12	0	22.29	2	0-2
	831.5	26865	5	16-QAM	12	6	22.32	2	0-2
	831.5	26865	5	16-QAM	12	13	22.35	2	0-2
	831.5	26865	5	16-QAM	25	0	22.31	2	0-2
High	846.5	27015	5	QPSK	1	0	24.07	0	0
	846.5	27015	5	QPSK	1	12	24.07	0	0
	846.5	27015	5	QPSK	1	24	24.10	0	0
	846.5	27015	5	QPSK	12	0	23.30	1	0-1
	846.5	27015	5	QPSK	12	6	23.27	1	0-1
	846.5	27015	5	QPSK	12	13	23.29	1	0-1
	846.5	27015	5	QPSK	25	0	23.21	1	0-1
	846.5	27015	5	16-QAM	1	0	23.50	1	0-1
	846.5	27015	5	16-QAM	1	12	23.50	1	0-1
	846.5	27015	5	16-QAM	1	24	23.50	1	0-1
	846.5	27015	5	16-QAM	12	0	22.28	2	0-2
	846.5	27015	5	16-QAM	12	6	22.26	2	0-2
	846.5	27015	5	16-QAM	12	13	22.26	2	0-2
	846.5	27015	5	16-QAM	25	0	22.15	2	0-2

Table 9-3
LTE Band 26 Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	815.5	26705	3	QPSK	1	0	24.50	0	0
	815.5	26705	3	QPSK	1	7	24.43	0	0
	815.5	26705	3	QPSK	1	14	24.39	0	0
	815.5	26705	3	QPSK	8	0	23.30	1	0-1
	815.5	26705	3	QPSK	8	4	23.35	1	0-1
	815.5	26705	3	QPSK	8	7	23.37	1	0-1
	815.5	26705	3	QPSK	15	0	23.29	1	0-1
	815.5	26705	3	16-QAM	1	0	23.29	1	0-1
	815.5	26705	3	16-QAM	1	7	23.21	1	0-1
	815.5	26705	3	16-QAM	1	14	23.09	1	0-1
	815.5	26705	3	16-QAM	8	0	22.41	2	0-2
	815.5	26705	3	16-QAM	8	4	22.37	2	0-2
	815.5	26705	3	16-QAM	8	7	22.38	2	0-2
	815.5	26705	3	16-QAM	15	0	22.25	2	0-2
Mid	831.5	26865	3	QPSK	1	0	24.35	0	0
	831.5	26865	3	QPSK	1	7	24.43	0	0
	831.5	26865	3	QPSK	1	14	24.45	0	0
	831.5	26865	3	QPSK	8	0	23.38	1	0-1
	831.5	26865	3	QPSK	8	4	23.33	1	0-1
	831.5	26865	3	QPSK	8	7	23.27	1	0-1
	831.5	26865	3	QPSK	15	0	23.26	1	0-1
	831.5	26865	3	16-QAM	1	0	23.39	1	0-1
	831.5	26865	3	16-QAM	1	7	23.47	1	0-1
	831.5	26865	3	16-QAM	1	14	23.42	1	0-1
	831.5	26865	3	16-QAM	8	0	22.50	2	0-2
	831.5	26865	3	16-QAM	8	4	22.41	2	0-2
	831.5	26865	3	16-QAM	8	7	22.37	2	0-2
	831.5	26865	3	16-QAM	15	0	22.38	2	0-2
High	847.5	27025	3	QPSK	1	0	24.44	0	0
	847.5	27025	3	QPSK	1	7	24.50	0	0
	847.5	27025	3	QPSK	1	14	24.50	0	0
	847.5	27025	3	QPSK	8	0	23.26	1	0-1
	847.5	27025	3	QPSK	8	4	23.27	1	0-1
	847.5	27025	3	QPSK	8	7	23.35	1	0-1
	847.5	27025	3	QPSK	15	0	23.28	1	0-1
	847.5	27025	3	16-QAM	1	0	23.26	1	0-1
	847.5	27025	3	16-QAM	1	7	23.34	1	0-1
	847.5	27025	3	16-QAM	1	14	23.41	1	0-1
	847.5	27025	3	16-QAM	8	0	22.19	2	0-2
	847.5	27025	3	16-QAM	8	4	22.21	2	0-2
	847.5	27025	3	16-QAM	8	7	22.27	2	0-2
	847.5	27025	3	16-QAM	15	0	22.25	2	0-2

Table 9-4
LTE Band 26 Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	814.7	26697	1.4	QPSK	1	0	24.01	0	0
	814.7	26697	1.4	QPSK	1	2	24.50	0	0
	814.7	26697	1.4	QPSK	1	5	24.45	0	0
	814.7	26697	1.4	QPSK	3	0	24.09	0	0
	814.7	26697	1.4	QPSK	3	2	24.05	0	0
	814.7	26697	1.4	QPSK	3	3	24.50	0	0
	814.7	26697	1.4	QPSK	6	0	23.43	1	0-1
	814.7	26697	1.4	16-QAM	1	0	23.28	1	0-1
	814.7	26697	1.4	16-QAM	1	2	23.25	1	0-1
	814.7	26697	1.4	16-QAM	1	5	23.17	1	0-1
	814.7	26697	1.4	16-QAM	3	0	23.40	1	0-1
	814.7	26697	1.4	16-QAM	3	2	23.32	1	0-1
	814.7	26697	1.4	16-QAM	3	3	23.31	1	0-1
	814.7	26697	1.4	16-QAM	6	0	22.40	2	0-2
Mid	831.5	26865	1.4	QPSK	1	0	24.50	0	0
	831.5	26865	1.4	QPSK	1	2	24.50	0	0
	831.5	26865	1.4	QPSK	1	5	24.50	0	0
	831.5	26865	1.4	QPSK	3	0	24.00	0	0
	831.5	26865	1.4	QPSK	3	2	24.49	0	0
	831.5	26865	1.4	QPSK	3	3	24.49	0	0
	831.5	26865	1.4	QPSK	6	0	23.38	1	0-1
	831.5	26865	1.4	16-QAM	1	0	23.27	1	0-1
	831.5	26865	1.4	16-QAM	1	2	23.30	1	0-1
	831.5	26865	1.4	16-QAM	1	5	23.31	1	0-1
	831.5	26865	1.4	16-QAM	3	0	23.45	1	0-1
	831.5	26865	1.4	16-QAM	3	2	23.46	1	0-1
	831.5	26865	1.4	16-QAM	3	3	23.43	1	0-1
	831.5	26865	1.4	16-QAM	6	0	22.37	2	0-2
High	848.3	27033	1.4	QPSK	1	0	24.04	0	0
	848.3	27033	1.4	QPSK	1	2	24.13	0	0
	848.3	27033	1.4	QPSK	1	5	24.27	0	0
	848.3	27033	1.4	QPSK	3	0	24.50	0	0
	848.3	27033	1.4	QPSK	3	2	24.50	0	0
	848.3	27033	1.4	QPSK	3	3	24.50	0	0
	848.3	27033	1.4	QPSK	6	0	23.36	1	0-1
	848.3	27033	1.4	16-QAM	1	0	23.36	1	0-1
	848.3	27033	1.4	16-QAM	1	2	23.39	1	0-1
	848.3	27033	1.4	16-QAM	1	5	23.41	1	0-1
	848.3	27033	1.4	16-QAM	3	0	23.39	1	0-1
	848.3	27033	1.4	16-QAM	3	2	23.35	1	0-1
	848.3	27033	1.4	16-QAM	3	3	23.34	1	0-1
	848.3	27033	1.4	16-QAM	6	0	22.20	2	0-2

9.4.2 LTE Band 25 (PCS)

Table 9-5
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1855	26090	10	QPSK	1	0	23.58	0	0
	1855	26090	10	QPSK	1	25	23.57	0	0
	1855	26090	10	QPSK	1	49	23.65	0	0
	1855	26090	10	QPSK	25	0	22.15	1	0-1
	1855	26090	10	QPSK	25	12	22.23	1	0-1
	1855	26090	10	QPSK	25	25	22.31	1	0-1
	1855	26090	10	QPSK	50	0	22.22	1	0-1
	1855	26090	10	16QAM	1	0	22.31	1	0-1
	1855	26090	10	16QAM	1	25	22.35	1	0-1
	1855	26090	10	16QAM	1	49	22.19	1	0-1
	1855	26090	10	16QAM	25	0	21.17	2	0-2
	1855	26090	10	16QAM	25	12	21.23	2	0-2
	1855	26090	10	16QAM	25	25	21.38	2	0-2
	1855	26090	10	16QAM	50	0	21.30	2	0-2
Mid	1882.5	26365	10	QPSK	1	0	23.61	0	0
	1882.5	26365	10	QPSK	1	25	23.44	0	0
	1882.5	26365	10	QPSK	1	49	23.57	0	0
	1882.5	26365	10	QPSK	25	0	22.42	1	0-1
	1882.5	26365	10	QPSK	25	12	22.32	1	0-1
	1882.5	26365	10	QPSK	25	25	22.31	1	0-1
	1882.5	26365	10	QPSK	50	0	22.31	1	0-1
	1882.5	26365	10	16QAM	1	0	22.42	1	0-1
	1882.5	26365	10	16QAM	1	25	22.21	1	0-1
	1882.5	26365	10	16QAM	1	49	22.21	1	0-1
	1882.5	26365	10	16QAM	25	0	21.52	2	0-2
	1882.5	26365	10	16QAM	25	12	21.38	2	0-2
	1882.5	26365	10	16QAM	25	25	21.35	2	0-2
	1882.5	26365	10	16QAM	50	0	21.35	2	0-2
High	1910	26640	10	QPSK	1	0	23.61	0	0
	1910	26640	10	QPSK	1	25	**23.70**	0	0
	1910	26640	10	QPSK	1	49	23.63	0	0
	1910	26640	10	QPSK	25	0	22.48	1	0-1
	1910	26640	10	QPSK	25	12	22.62	1	0-1
	1910	26640	10	QPSK	25	25	**22.70**	1	0-1
	1910	26640	10	QPSK	50	0	22.57	1	0-1
	1910	26640	10	16QAM	1	0	22.33	1	0-1
	1910	26640	10	16QAM	1	25	22.42	1	0-1
	1910	26640	10	16QAM	1	49	22.46	1	0-1
	1910	26640	10	16QAM	25	0	21.43	2	0-2
	1910	26640	10	16QAM	25	12	21.56	2	0-2
	1910	26640	10	16QAM	25	25	21.65	2	0-2
	1910	26640	10	16QAM	50	0	21.61	2	0-2

Table 9-6
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1852.5	26065	5	QPSK	1	0	23.67	0	0
	1852.5	26065	5	QPSK	1	12	23.65	0	0
	1852.5	26065	5	QPSK	1	24	23.66	0	0
	1852.5	26065	5	QPSK	12	0	22.26	1	0-1
	1852.5	26065	5	QPSK	12	6	22.29	1	0-1
	1852.5	26065	5	QPSK	12	13	22.25	1	0-1
	1852.5	26065	5	QPSK	25	0	22.19	1	0-1
	1852.5	26065	5	16-QAM	1	0	22.61	1	0-1
	1852.5	26065	5	16-QAM	1	12	22.59	1	0-1
	1852.5	26065	5	16-QAM	1	24	22.58	1	0-1
	1852.5	26065	5	16-QAM	12	0	21.33	2	0-2
	1852.5	26065	5	16-QAM	12	6	21.29	2	0-2
	1852.5	26065	5	16-QAM	12	13	21.24	2	0-2
	1852.5	26065	5	16-QAM	25	0	21.18	2	0-2
Mid	1882.5	26365	5	QPSK	1	0	23.59	0	0
	1882.5	26365	5	QPSK	1	12	23.40	0	0
	1882.5	26365	5	QPSK	1	24	23.58	0	0
	1882.5	26365	5	QPSK	12	0	22.43	1	0-1
	1882.5	26365	5	QPSK	12	6	22.36	1	0-1
	1882.5	26365	5	QPSK	12	13	22.46	1	0-1
	1882.5	26365	5	QPSK	25	0	22.35	1	0-1
	1882.5	26365	5	16-QAM	1	0	22.27	1	0-1
	1882.5	26365	5	16-QAM	1	12	22.17	1	0-1
	1882.5	26365	5	16-QAM	1	24	22.32	1	0-1
	1882.5	26365	5	16-QAM	12	0	21.43	2	0-2
	1882.5	26365	5	16-QAM	12	6	21.36	2	0-2
	1882.5	26365	5	16-QAM	12	13	21.46	2	0-2
	1882.5	26365	5	16-QAM	25	0	21.40	2	0-2
High	1912.5	26665	5	QPSK	1	0	23.69	0	0
	1912.5	26665	5	QPSK	1	12	23.68	0	0
	1912.5	26665	5	QPSK	1	24	23.65	0	0
	1912.5	26665	5	QPSK	12	0	22.64	1	0-1
	1912.5	26665	5	QPSK	12	6	22.69	1	0-1
	1912.5	26665	5	QPSK	12	13	22.61	1	0-1
	1912.5	26665	5	QPSK	25	0	22.66	1	0-1
	1912.5	26665	5	16-QAM	1	0	22.51	1	0-1
	1912.5	26665	5	16-QAM	1	12	22.59	1	0-1
	1912.5	26665	5	16-QAM	1	24	22.44	1	0-1
	1912.5	26665	5	16-QAM	12	0	21.65	2	0-2
	1912.5	26665	5	16-QAM	12	6	21.70	2	0-2
	1912.5	26665	5	16-QAM	12	13	21.70	2	0-2
	1912.5	26665	5	16-QAM	25	0	21.67	2	0-2

Table 9-7
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1851.5	26055	3	QPSK	1	0	23.63	0	0
	1851.5	26055	3	QPSK	1	7	23.60	0	0
	1851.5	26055	3	QPSK	1	14	23.63	0	0
	1851.5	26055	3	QPSK	8	0	22.28	1	0-1
	1851.5	26055	3	QPSK	8	4	22.27	1	0-1
	1851.5	26055	3	QPSK	8	7	22.28	1	0-1
	1851.5	26055	3	QPSK	15	0	22.26	1	0-1
	1851.5	26055	3	16-QAM	1	0	22.42	1	0-1
	1851.5	26055	3	16-QAM	1	7	22.34	1	0-1
	1851.5	26055	3	16-QAM	1	14	22.37	1	0-1
	1851.5	26055	3	16-QAM	8	0	21.32	2	0-2
	1851.5	26055	3	16-QAM	8	4	21.25	2	0-2
	1851.5	26055	3	16-QAM	8	7	21.29	2	0-2
	1851.5	26055	3	16-QAM	15	0	21.31	2	0-2
Mid	1882.5	26365	3	QPSK	1	0	23.65	0	0
	1882.5	26365	3	QPSK	1	7	23.50	0	0
	1882.5	26365	3	QPSK	1	14	23.60	0	0
	1882.5	26365	3	QPSK	8	0	22.42	1	0-1
	1882.5	26365	3	QPSK	8	4	22.35	1	0-1
	1882.5	26365	3	QPSK	8	7	22.31	1	0-1
	1882.5	26365	3	QPSK	15	0	22.41	1	0-1
	1882.5	26365	3	16-QAM	1	0	22.56	1	0-1
	1882.5	26365	3	16-QAM	1	7	22.53	1	0-1
	1882.5	26365	3	16-QAM	1	14	22.54	1	0-1
	1882.5	26365	3	16-QAM	8	0	21.39	2	0-2
	1882.5	26365	3	16-QAM	8	4	21.41	2	0-2
	1882.5	26365	3	16-QAM	8	7	21.39	2	0-2
	1882.5	26365	3	16-QAM	15	0	21.42	2	0-2
High	1913.5	26675	3	QPSK	1	0	23.68	0	0
	1913.5	26675	3	QPSK	1	7	23.54	0	0
	1913.5	26675	3	QPSK	1	14	23.56	0	0
	1913.5	26675	3	QPSK	8	0	22.62	1	0-1
	1913.5	26675	3	QPSK	8	4	22.59	1	0-1
	1913.5	26675	3	QPSK	8	7	22.56	1	0-1
	1913.5	26675	3	QPSK	15	0	22.61	1	0-1
	1913.5	26675	3	16-QAM	1	0	22.62	1	0-1
	1913.5	26675	3	16-QAM	1	7	22.42	1	0-1
	1913.5	26675	3	16-QAM	1	14	22.48	1	0-1
	1913.5	26675	3	16-QAM	8	0	21.70	2	0-2
	1913.5	26675	3	16-QAM	8	4	21.70	2	0-2
	1913.5	26675	3	16-QAM	8	7	21.67	2	0-2
	1913.5	26675	3	16-QAM	15	0	21.70	2	0-2

9.4.3 LTE Band 41

Table 9-8
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	2506	39750	20	QPSK	1	0	21.35	0	0
	2506	39750	20	QPSK	1	50	21.54	0	0
	2506	39750	20	QPSK	1	99	21.43	0	0
	2506	39750	20	QPSK	50	0	20.13	1	0-1
	2506	39750	20	QPSK	50	25	20.10	1	0-1
	2506	39750	20	QPSK	50	50	20.04	1	0-1
	2506	39750	20	QPSK	100	0	20.06	1	0-1
	2506	39750	20	16QAM	1	0	20.02	1	0-1
	2506	39750	20	16QAM	1	50	20.23	1	0-1
	2506	39750	20	16QAM	1	99	20.47	1	0-1
	2506	39750	20	16QAM	50	0	19.21	2	0-2
	2506	39750	20	16QAM	50	25	19.15	2	0-2
	2506	39750	20	16QAM	50	50	19.02	2	0-2
	2506	39750	20	16QAM	100	0	19.08	2	0-2
Low Mid	2549.5	40185	20	QPSK	1	0	21.45	0	0
	2549.5	40185	20	QPSK	1	50	**21.69**	0	0
	2549.5	40185	20	QPSK	1	99	21.64	0	0
	2549.5	40185	20	QPSK	50	0	20.35	1	0-1
	2549.5	40185	20	QPSK	50	25	**20.43**	1	0-1
	2549.5	40185	20	QPSK	50	50	20.34	1	0-1
	2549.5	40185	20	QPSK	100	0	20.41	1	0-1
	2549.5	40185	20	16-QAM	1	0	20.53	1	0-1
	2549.5	40185	20	16-QAM	1	50	20.67	1	0-1
	2549.5	40185	20	16-QAM	1	99	20.45	1	0-1
	2549.5	40185	20	16-QAM	50	0	19.32	2	0-2
	2549.5	40185	20	16-QAM	50	25	19.42	2	0-2
	2549.5	40185	20	16-QAM	50	50	19.34	2	0-2
	2549.5	40185	20	16-QAM	100	0	19.39	2	0-2
Mid	2593	40620	20	QPSK	1	0	21.64	0	0
	2593	40620	20	QPSK	1	50	21.61	0	0
	2593	40620	20	QPSK	1	99	21.58	0	0
	2593	40620	20	QPSK	50	0	20.27	1	0-1
	2593	40620	20	QPSK	50	25	20.30	1	0-1
	2593	40620	20	QPSK	50	50	20.26	1	0-1
	2593	40620	20	QPSK	100	0	20.25	1	0-1
	2593	40620	20	16-QAM	1	0	20.11	1	0-1
	2593	40620	20	16-QAM	1	50	20.09	1	0-1
	2593	40620	20	16-QAM	1	99	20.01	1	0-1
	2593	40620	20	16-QAM	50	0	19.18	2	0-2
	2593	40620	20	16-QAM	50	25	19.26	2	0-2
	2593	40620	20	16-QAM	50	50	19.22	2	0-2
	2593	40620	20	16-QAM	100	0	19.24	2	0-2
Mid High	2636.5	41055	20	QPSK	1	0	21.56	0	0
	2636.5	41055	20	QPSK	1	50	21.55	0	0
	2636.5	41055	20	QPSK	1	99	21.41	0	0
	2636.5	41055	20	QPSK	50	0	20.33	1	0-1
	2636.5	41055	20	QPSK	50	25	20.34	1	0-1
	2636.5	41055	20	QPSK	50	50	20.13	1	0-1
	2636.5	41055	20	QPSK	100	0	20.28	1	0-1
	2636.5	41055	20	16-QAM	1	0	20.46	1	0-1
	2636.5	41055	20	16-QAM	1	50	20.28	1	0-1
	2636.5	41055	20	16-QAM	1	99	20.37	1	0-1
	2636.5	41055	20	16-QAM	50	0	19.34	2	0-2
	2636.5	41055	20	16-QAM	50	25	19.25	2	0-2
	2636.5	41055	20	16-QAM	50	50	19.19	2	0-2
	2636.5	41055	20	16-QAM	100	0	19.32	2	0-2
High	2680	41490	20	QPSK	1	0	21.40	0	0
	2680	41490	20	QPSK	1	50	21.34	0	0
	2680	41490	20	QPSK	1	99	21.54	0	0
	2680	41490	20	QPSK	50	0	20.08	1	0-1
	2680	41490	20	QPSK	50	25	20.03	1	0-1
	2680	41490	20	QPSK	50	50	20.17	1	0-1
	2680	41490	20	QPSK	100	0	20.11	1	0-1
	2680	41490	20	16-QAM	1	0	20.27	1	0-1
	2680	41490	20	16-QAM	1	50	20.23	1	0-1
	2680	41490	20	16-QAM	1	99	20.46	1	0-1
	2680	41490	20	16-QAM	50	0	19.15	2	0-2
	2680	41490	20	16-QAM	50	25	19.10	2	0-2
	2680	41490	20	16-QAM	50	50	19.17	2	0-2
	2680	41490	20	16-QAM	100	0	19.09	2	0-2

Note: LTE Band 41 has 5 required test channels per FCC KDB Publication 447498 D01v05r01.

Table 9-9
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	2503.5	39725	15	QPSK	1	0	21.51	0	0
	2503.5	39725	15	QPSK	1	36	21.35	0	0
	2503.5	39725	15	QPSK	1	74	21.38	0	0
	2503.5	39725	15	QPSK	36	0	20.21	1	0-1
	2503.5	39725	15	QPSK	36	18	20.13	1	0-1
	2503.5	39725	15	QPSK	36	37	20.09	1	0-1
	2503.5	39725	15	QPSK	75	0	19.98	1	0-1
	2503.5	39725	15	16QAM	1	0	20.42	1	0-1
	2503.5	39725	15	16QAM	1	36	20.38	1	0-1
	2503.5	39725	15	16QAM	1	74	20.34	1	0-1
	2503.5	39725	15	16QAM	36	0	19.31	2	0-2
	2503.5	39725	15	16QAM	36	18	19.27	2	0-2
	2503.5	39725	15	16QAM	36	37	19.25	2	0-2
	2503.5	39725	15	16QAM	75	0	19.02	2	0-2
Low Mid	2548.25	40173	15	QPSK	1	0	21.57	0	0
	2548.25	40173	15	QPSK	1	36	21.59	0	0
	2548.25	40173	15	QPSK	1	74	21.70	0	0
	2548.25	40173	15	QPSK	36	0	20.40	1	0-1
	2548.25	40173	15	QPSK	36	18	20.33	1	0-1
	2548.25	40173	15	QPSK	36	37	20.41	1	0-1
	2548.25	40173	15	QPSK	75	0	20.34	1	0-1
	2548.25	40173	15	16-QAM	1	0	20.55	1	0-1
	2548.25	40173	15	16-QAM	1	36	20.56	1	0-1
	2548.25	40173	15	16-QAM	1	74	20.58	1	0-1
	2548.25	40173	15	16-QAM	36	0	19.40	2	0-2
	2548.25	40173	15	16-QAM	36	18	19.43	2	0-2
	2548.25	40173	15	16-QAM	36	37	19.58	2	0-2
	2548.25	40173	15	16-QAM	75	0	19.31	2	0-2
Mid	2593	40620	15	QPSK	1	0	21.37	0	0
	2593	40620	15	QPSK	1	36	21.49	0	0
	2593	40620	15	QPSK	1	74	21.49	0	0
	2593	40620	15	QPSK	36	0	20.25	1	0-1
	2593	40620	15	QPSK	36	18	20.18	1	0-1
	2593	40620	15	QPSK	36	37	20.24	1	0-1
	2593	40620	15	QPSK	75	0	20.19	1	0-1
	2593	40620	15	16-QAM	1	0	20.07	1	0-1
	2593	40620	15	16-QAM	1	36	20.02	1	0-1
	2593	40620	15	16-QAM	1	74	20.00	1	0-1
	2593	40620	15	16-QAM	36	0	19.25	2	0-2
	2593	40620	15	16-QAM	36	18	19.30	2	0-2
	2593	40620	15	16-QAM	36	37	19.31	2	0-2
	2593	40620	15	16-QAM	75	0	19.12	2	0-2
Mid High	2637.75	41068	15	QPSK	1	0	21.48	0	0
	2637.75	41068	15	QPSK	1	36	21.45	0	0
	2637.75	41068	15	QPSK	1	74	21.39	0	0
	2637.75	41068	15	QPSK	36	0	20.29	1	0-1
	2637.75	41068	15	QPSK	36	18	20.19	1	0-1
	2637.75	41068	15	QPSK	36	37	20.13	1	0-1
	2637.75	41068	15	QPSK	75	0	20.18	1	0-1
	2637.75	41068	15	16-QAM	1	0	20.49	1	0-1
	2637.75	41068	15	16-QAM	1	36	20.37	1	0-1
	2637.75	41068	15	16-QAM	1	74	20.41	1	0-1
	2637.75	41068	15	16-QAM	36	0	19.40	2	0-2
	2637.75	41068	15	16-QAM	36	18	19.32	2	0-2
	2637.75	41068	15	16-QAM	36	37	19.31	2	0-2
	2637.75	41068	15	16-QAM	75	0	19.22	2	0-2
High	2682.5	41515	15	QPSK	1	0	21.22	0	0
	2682.5	41515	15	QPSK	1	36	21.32	0	0
	2682.5	41515	15	QPSK	1	74	21.48	0	0
	2682.5	41515	15	QPSK	36	0	20.06	1	0-1
	2682.5	41515	15	QPSK	36	18	20.03	1	0-1
	2682.5	41515	15	QPSK	36	37	20.09	1	0-1
	2682.5	41515	15	QPSK	75	0	20.09	1	0-1
	2682.5	41515	15	16-QAM	1	0	20.23	1	0-1
	2682.5	41515	15	16-QAM	1	36	20.37	1	0-1
	2682.5	41515	15	16-QAM	1	74	20.52	1	0-1
	2682.5	41515	15	16-QAM	36	0	19.23	2	0-2
	2682.5	41515	15	16-QAM	36	18	19.20	2	0-2
	2682.5	41515	15	16-QAM	36	37	19.31	2	0-2
	2682.5	41515	15	16-QAM	75	0	19.08	2	0-2

Table 9-10
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	2501	39700	10	QPSK	1	0	21.57	0	0
	2501	39700	10	QPSK	1	25	21.56	0	0
	2501	39700	10	QPSK	1	49	21.36	0	0
	2501	39700	10	QPSK	25	0	20.42	1	0-1
	2501	39700	10	QPSK	25	12	20.40	1	0-1
	2501	39700	10	QPSK	25	25	20.39	1	0-1
	2501	39700	10	QPSK	50	0	20.20	1	0-1
	2501	39700	10	16QAM	1	0	20.48	1	0-1
	2501	39700	10	16QAM	1	25	20.51	1	0-1
	2501	39700	10	16QAM	1	49	20.35	1	0-1
	2501	39700	10	16QAM	25	0	19.45	2	0-2
	2501	39700	10	16QAM	25	12	19.35	2	0-2
	2501	39700	10	16QAM	25	25	19.45	2	0-2
	2501	39700	10	16QAM	50	0	19.15	2	0-2
Low Mid	2547	40160	10	QPSK	1	0	21.58	0	0
	2547	40160	10	QPSK	1	25	21.64	0	0
	2547	40160	10	QPSK	1	49	21.69	0	0
	2547	40160	10	QPSK	25	0	20.57	1	0-1
	2547	40160	10	QPSK	25	12	20.59	1	0-1
	2547	40160	10	QPSK	25	25	20.52	1	0-1
	2547	40160	10	QPSK	50	0	20.49	1	0-1
	2547	40160	10	16-QAM	1	0	20.63	1	0-1
	2547	40160	10	16-QAM	1	25	20.58	1	0-1
	2547	40160	10	16-QAM	1	49	20.66	1	0-1
	2547	40160	10	16-QAM	25	0	19.58	2	0-2
	2547	40160	10	16-QAM	25	12	19.57	2	0-2
	2547	40160	10	16-QAM	25	25	19.61	2	0-2
	2547	40160	10	16-QAM	50	0	19.41	2	0-2
Mid	2593	40620	10	QPSK	1	0	21.53	0	0
	2593	40620	10	QPSK	1	25	21.57	0	0
	2593	40620	10	QPSK	1	49	21.54	0	0
	2593	40620	10	QPSK	25	0	20.40	1	0-1
	2593	40620	10	QPSK	25	12	20.44	1	0-1
	2593	40620	10	QPSK	25	25	20.41	1	0-1
	2593	40620	10	QPSK	50	0	20.44	1	0-1
	2593	40620	10	16-QAM	1	0	20.41	1	0-1
	2593	40620	10	16-QAM	1	25	20.53	1	0-1
	2593	40620	10	16-QAM	1	49	20.45	1	0-1
	2593	40620	10	16-QAM	25	0	19.44	2	0-2
	2593	40620	10	16-QAM	25	12	19.45	2	0-2
	2593	40620	10	16-QAM	25	25	19.42	2	0-2
	2593	40620	10	16-QAM	50	0	19.37	2	0-2
Mid High	2639	41080	10	QPSK	1	0	21.54	0	0
	2639	41080	10	QPSK	1	25	21.49	0	0
	2639	41080	10	QPSK	1	49	21.43	0	0
	2639	41080	10	QPSK	25	0	20.38	1	0-1
	2639	41080	10	QPSK	25	12	20.40	1	0-1
	2639	41080	10	QPSK	25	25	20.38	1	0-1
	2639	41080	10	QPSK	50	0	20.29	1	0-1
	2639	41080	10	16-QAM	1	0	20.58	1	0-1
	2639	41080	10	16-QAM	1	25	20.47	1	0-1
	2639	41080	10	16-QAM	1	49	20.37	1	0-1
	2639	41080	10	16-QAM	25	0	19.47	2	0-2
	2639	41080	10	16-QAM	25	12	19.41	2	0-2
	2639	41080	10	16-QAM	25	25	19.43	2	0-2
	2639	41080	10	16-QAM	50	0	19.25	2	0-2
High	2685	41540	10	QPSK	1	0	21.42	0	0
	2685	41540	10	QPSK	1	25	21.44	0	0
	2685	41540	10	QPSK	1	49	21.66	0	0
	2685	41540	10	QPSK	25	0	20.39	1	0-1
	2685	41540	10	QPSK	25	12	20.37	1	0-1
	2685	41540	10	QPSK	25	25	20.47	1	0-1
	2685	41540	10	QPSK	50	0	20.25	1	0-1
	2685	41540	10	16-QAM	1	0	20.33	1	0-1
	2685	41540	10	16-QAM	1	25	20.45	1	0-1
	2685	41540	10	16-QAM	1	49	20.67	1	0-1
	2685	41540	10	16-QAM	25	0	19.35	2	0-2
	2685	41540	10	16-QAM	25	12	19.41	2	0-2
	2685	41540	10	16-QAM	25	25	19.45	2	0-2
	2685	41540	10	16-QAM	50	0	19.19	2	0-2

9.5 WLAN Conducted Powers

Per the FCC change document for this device, the 2.4/5 GHz WLAN chipset remains the same as the original certified device. Therefore, conducted powers for IEEE 802.11a/ac/b/g/n remain the same as the original certification.

Table 9-11
IEEE 802.11b Average RF Power

Mode	Freq	Channel	802.11b (2.4 GHz) Conducted Power [dBm]			
			Data Rate [Mbps]			
	[MHz]		1	2	5.5	11
802.11b	2412	1*	15.01	15.04	15.08	15.06
802.11b	2437	6*	**15.43**	15.44	15.38	15.41
802.11b	2462	11*	15.24	15.26	15.22	15.25

Table 9-12
IEEE 802.11g Average RF Power

Mode	Freq	Channel	802.11g (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11g	2412	1	11.27	11.33	11.31	11.24	11.46	11.47	11.44	11.42
802.11g	2437	6	11.62	11.59	11.58	11.52	11.72	11.78	11.63	11.65
802.11g	2462	11	11.48	11.36	11.49	11.47	11.71	11.56	11.49	11.64

Table 9-13
IEEE 802.11n Average RF Power

Mode	Freq	Channel	802.11n (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	2412	1	10.35	10.48	10.52	10.38	10.53	10.61	10.67	10.66
802.11n	2437	6	10.67	10.74	10.65	10.77	10.76	10.83	10.89	10.87
802.11n	2462	11	10.59	10.65	10.67	10.62	10.57	10.74	10.75	10.93

Table 9-14
IEEE 802.11a Average RF Power

Mode	Freq	Channel	802.11a (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11a	5180	36*	**9.07**	9.02	8.96	8.94	9.09	9.07	8.97	8.94
802.11a	5200	40	9.03	8.95	8.94	8.91	9.01	8.99	8.81	8.93
802.11a	5220	44	9.01	8.92	8.92	8.76	8.94	8.84	8.86	8.92
802.11a	5240	48*	8.84	8.81	8.72	8.89	8.93	8.83	8.87	8.76
802.11a	5260	52*	**9.29**	9.06	9.10	9.05	9.11	9.07	9.02	9.08
802.11a	5280	56	9.12	9.03	9.02	8.98	9.06	9.01	8.92	9.06
802.11a	5300	60	9.08	8.92	9.03	8.89	9.10	9.04	8.95	8.99
802.11a	5320	64*	9.07	8.89	8.95	8.84	9.02	8.97	8.83	8.91
802.11a	5500	100	9.02	8.86	8.98	8.83	8.87	8.85	8.67	8.89
802.11a	5520	104*	8.92	8.73	8.83	8.68	8.76	8.81	8.68	8.86
802.11a	5540	108	8.79	8.74	8.77	8.69	8.65	8.66	8.57	8.74
802.11a	5560	112	8.89	8.68	8.72	8.71	8.72	8.70	8.61	8.75
802.11a	5580	116*	8.87	8.74	8.69	8.62	8.73	8.68	8.52	8.72
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	8.59	8.52	8.54	8.46	8.57	8.56	8.37	8.57
802.11a	5680	136*	8.58	8.41	8.52	8.44	8.59	8.50	8.38	8.49
802.11a	5700	140	**9.39**	9.32	9.38	9.24	9.38	9.29	9.23	9.37
802.11a	5720	144	8.40	8.39	8.49	8.32	8.34	8.39	8.25	8.44
802.11a	5745	149*	**9.74**	9.51	9.66	9.43	9.49	9.52	9.44	9.52
802.11a	5765	153	9.61	9.48	9.64	9.42	9.59	9.47	9.31	9.59
802.11a	5785	157*	9.61	9.54	9.54	9.39	9.51	9.42	9.38	9.45
802.11a	5805	161*	9.58	9.49	9.46	9.37	9.48	9.37	9.32	9.49
802.11a	5825	165	9.51	9.44	9.52	9.33	9.45	9.46	9.36	9.47

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 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

Table 9-15
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	5180	36	9.29	9.25	9.14	9.11	9.06	9.18	9.16	9.09
802.11n	5200	40	9.14	9.13	9.12	9.02	8.98	9.08	9.04	8.97
802.11n	5220	44	8.99	9.01	8.91	8.93	8.89	8.93	8.91	8.92
802.11n	5240	48	9.06	8.87	8.84	8.82	8.93	8.87	8.85	8.94
802.11n	5260	52	9.27	9.26	9.11	9.22	9.13	9.20	9.17	9.18
802.11n	5280	56	9.22	9.17	9.18	9.07	9.03	9.09	9.04	9.03
802.11n	5300	60	9.13	9.16	9.14	9.09	9.01	8.99	9.07	9.04
802.11n	5320	64	9.06	9.13	9.08	8.96	8.95	9.04	8.98	8.94
802.11n	5500	100	9.01	9.02	8.87	8.91	8.94	8.87	8.86	8.91
802.11n	5520	104	8.89	8.94	8.88	8.86	8.82	8.81	8.77	8.84
802.11n	5540	108	8.85	8.80	8.67	8.71	8.72	8.69	8.67	8.65
802.11n	5560	112	8.81	8.55	8.62	8.49	8.57	8.58	8.66	8.51
802.11n	5580	116	8.61	8.51	8.58	8.61	8.55	8.61	8.58	8.57
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	8.59	8.48	8.37	8.31	8.27	8.36	8.48	8.44
802.11n	5680	136	8.64	8.63	8.46	8.49	8.43	8.42	8.42	8.45
802.11n	5700	140	9.44	9.40	9.27	9.25	9.19	9.18	9.17	9.21
802.11n	5720	144	8.39	8.34	8.25	8.27	8.32	8.33	8.36	8.45
802.11n	5745	149	9.61	9.58	9.68	9.54	9.34	9.39	9.47	9.43
802.11n	5765	153	9.51	9.46	9.47	9.41	9.46	9.40	9.48	9.39
802.11n	5785	157	9.22	9.34	9.43	9.27	9.38	9.30	9.35	9.41
802.11n	5805	161	9.29	9.34	9.34	9.34	9.26	9.41	9.26	9.22
802.11n	5825	165	9.38	9.38	9.28	9.31	9.34	9.58	9.29	9.24

Table 9-16
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	9.22	9.21	8.93	8.77	8.84	9.14	9.26	9.17
802.11n	5230	46	8.99	9.02	8.95	8.58	8.66	8.54	8.97	8.52
802.11n	5270	54	9.26	9.08	8.98	9.28	9.11	9.29	9.27	9.31
802.11n	5310	62	9.21	8.84	8.79	8.83	8.82	9.14	8.67	8.68
802.11n	5510	102	8.67	8.49	8.71	8.87	8.65	8.69	8.66	8.58
802.11n	5550	110	8.72	8.76	8.65	8.51	8.56	8.64	8.51	8.64
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	9.14	9.18	9.17	9.19	9.08	9.03	9.12	9.03
802.11n	5710	142	8.36	8.12	8.04	8.09	8.08	8.01	8.04	7.98
802.11n	5755	151	8.78	9.11	8.89	9.47	9.12	8.84	8.85	9.02
802.11n	5795	159	9.28	9.28	9.29	9.24	9.36	8.59	9.22	9.24

Table 9-17
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
			Data Rate [Mbps]									
			29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
802.11ac	5210	42	**7.95**	7.97	7.91	7.86	7.91	7.85	7.78	7.86	7.91	7.76
802.11ac	5290	58	**7.77**	7.74	7.76	7.69	7.70	7.75	7.61	7.68	7.67	7.66
802.11ac	5530	106	7.82	7.89	7.75	7.73	7.83	7.77	7.67	7.78	7.69	7.72
802.11ac	5690	138	**8.03**	8.07	8.05	8.09	8.02	7.98	7.89	7.93	7.87	7.84
802.11ac	5775	155	**8.38**	8.59	8.33	8.28	8.38	8.31	8.32	8.29	8.31	8.23

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz) 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.
- Full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.

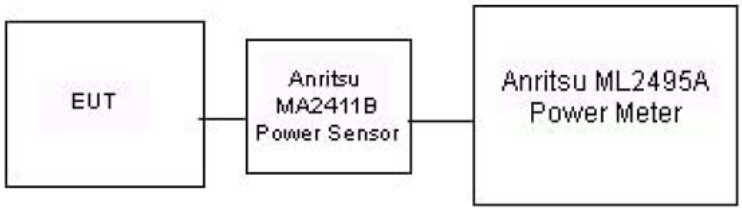


Figure 9-4
Power Measurement Setup for Bandwidths < 50 MHz

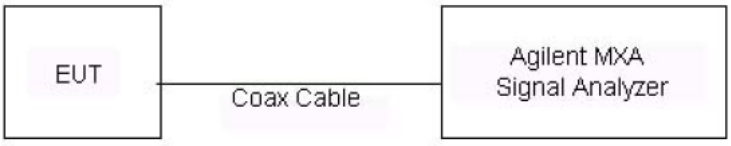


Figure 9-5
Power Measurement Setup for Bandwidths > 50 MHz

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
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
7/18/2013	835H	23.6	820	0.903	41.073	0.898	41.571	0.56%	-1.20%
			835	0.917	40.856	0.900	41.500	1.89%	-1.55%
			850	0.931	40.659	0.916	41.500	1.64%	-2.03%
7/23/2013	835H	23.4	820	0.904	40.855	0.898	41.571	0.67%	-1.72%
			835	0.918	40.674	0.900	41.500	2.00%	-1.99%
			850	0.932	40.490	0.916	41.500	1.75%	-2.43%
7/17/2013	1900H	22.0	1850	1.371	40.385	1.400	40.000	-2.07%	0.96%
			1880	1.399	40.231	1.400	40.000	-0.07%	0.58%
			1910	1.428	40.100	1.400	40.000	2.00%	0.25%
7/11/2013	2450H	24.2	2401	1.813	38.475	1.758	39.298	3.13%	-2.09%
			2450	1.870	38.283	1.800	39.200	3.89%	-2.34%
			2499	1.925	38.090	1.852	39.135	3.94%	-2.67%
7/18/2013	2600H	24.0	2500	1.903	38.276	1.853	39.133	2.70%	-2.19%
			2550	1.962	38.070	1.907	39.067	2.88%	-2.55%
			2600	2.018	37.879	1.960	39.000	2.96%	-2.87%
07/08/2013	5200H-5800H	23.1	5180	4.447	35.102	4.639	36.020	-4.14%	-2.55%
			5200	4.468	35.069	4.660	36.000	-4.12%	-2.59%
			5220	4.485	35.044	4.680	35.980	-4.17%	-2.60%
			5260	4.525	34.989	4.720	35.940	-4.13%	-2.65%
			5280	4.545	34.956	4.740	35.920	-4.11%	-2.68%
			5300	4.565	34.928	4.760	35.900	-4.10%	-2.71%
			5600	4.868	34.489	5.070	35.500	-3.98%	-2.85%
			5680	4.951	34.373	5.150	35.420	-3.86%	-2.96%
			5700	4.973	34.353	5.170	35.400	-3.81%	-2.96%
			5745	5.019	34.293	5.215	35.355	-3.76%	-3.00%
			5765	5.039	34.263	5.235	35.335	-3.74%	-3.03%
			5785	5.057	34.238	5.255	35.315	-3.77%	-3.05%
			5800	5.075	34.216	5.270	35.300	-3.70%	-3.07%
7/15/2013	835B	22.9	820	0.996	55.657	0.969	55.258	2.79%	0.72%
			835	1.011	55.520	0.970	55.200	4.23%	0.58%
			850	1.026	55.376	0.988	55.154	3.85%	0.40%
7/19/2013	835B	23.0	820	0.983	54.534	0.969	55.258	1.44%	-1.31%
			835	0.998	54.368	0.970	55.200	2.89%	-1.51%
			850	1.012	54.214	0.988	55.154	2.43%	-1.70%
7/23/2013	835B	22.7	820	0.983	54.480	0.969	55.258	1.44%	-1.41%
			835	0.999	54.331	0.970	55.200	2.99%	-1.57%
			850	1.013	54.182	0.988	55.154	2.53%	-1.76%
7/8/2013	1900B	22.6	1850	1.482	54.208	1.520	53.300	-2.50%	1.70%
			1880	1.511	54.125	1.520	53.300	-0.59%	1.55%
			1910	1.553	54.032	1.520	53.300	2.17%	1.37%
7/15/2013	1900B	23.3	1850	1.466	52.752	1.520	53.300	-3.55%	-1.03%
			1880	1.510	52.658	1.520	53.300	-0.66%	-1.20%
			1910	1.543	52.667	1.520	53.300	1.51%	-1.19%
7/25/2013	1900B	23.7	1850	1.468	53.286	1.520	53.300	-3.42%	-0.03%
			1880	1.498	53.173	1.520	53.300	-1.45%	-0.24%
			1910	1.527	53.079	1.520	53.300	0.46%	-0.41%
7/22/2013	2450B	22.6	2401	1.966	52.854	1.903	52.765	3.31%	0.17%
			2450	2.031	52.669	1.950	52.700	4.15%	-0.06%
			2499	2.099	52.471	2.019	52.638	3.96%	-0.32%
7/22/2013	2600B	22.6	2500	2.101	52.454	2.021	52.636	3.96%	-0.35%
			2550	2.171	52.260	2.092	52.573	3.78%	-0.60%
			2600	2.239	52.077	2.163	52.509	3.51%	-0.82%
07/08/2013	5200B-5800B	22.3	5180	5.236	46.810	5.276	49.041	-0.76%	-4.55%
			5200	5.215	46.814	5.299	49.014	-1.59%	-4.49%
			5220	5.257	46.901	5.323	48.987	-1.24%	-4.26%
			5260	5.331	46.752	5.369	48.906	-0.71%	-4.40%
			5280	5.384	46.690	5.393	48.879	-0.17%	-4.48%
			5300	5.366	46.619	5.416	48.851	-0.92%	-4.57%
			5600	5.899	46.249	5.766	48.444	2.31%	-4.53%
			5680	6.016	46.163	5.860	48.336	2.66%	-4.50%
			5700	6.080	46.195	5.880	48.275	3.40%	-4.31%
			5745	6.139	46.170	5.936	48.248	3.42%	-4.31%
			5765	6.146	46.109	5.959	48.220	3.14%	-4.38%
			5785	6.186	46.222	5.982	48.242	3.41%	-4.19%
			5800	6.218	46.037	6.000	48.200	3.63%	-4.49%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per IEEE 1528 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

10.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix E.

Table 10-2
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	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$_{1g}$ (%)
E	835	HEAD	07/18/2013	24.4	23.7	0.100	4d026	3920	0.971	9.390	9.710	3.41%
D	835	HEAD	07/23/2013	23.5	23.4	0.100	4d026	3288	0.918	9.390	9.180	-2.24%
G	1900	HEAD	07/17/2013	23.9	22.0	0.100	5d148	3209	3.830	39.700	38.300	-3.53%
C	2450	HEAD	07/11/2013	24.4	24.2	0.100	719	3022	5.160	52.700	51.600	-2.09%
C	2600	HEAD	07/18/2013	23.0	23.5	0.100	1004	3022	6.220	58.200	62.200	6.87%
E	5200	HEAD	07/08/2013	24.7	23.1	0.040	1120	3920	3.030	76.000	75.750	-0.33%
E	5300	HEAD	07/08/2013	24.8	23.1	0.040	1120	3920	2.970	78.700	74.250	-5.65%
E	5600	HEAD	07/08/2013	24.6	23.2	0.040	1120	3920	3.170	79.900	79.250	-0.81%
E	5800	HEAD	07/08/2013	24.9	23.2	0.040	1120	3920	2.980	74.900	74.500	-0.53%
G	835	BODY	07/15/2013	24.4	23.0	0.100	4d132	3209	1.000	9.360	10.000	6.84%
G	835	BODY	07/19/2013	24.9	23.5	0.100	4d026	3209	0.974	9.580	9.740	1.67%
G	835	BODY	07/23/2013	24.1	22.9	0.100	4d026	3209	0.992	9.580	9.920	3.55%
B	1900	BODY	07/08/2013	23.2	22.8	0.100	5d080	3287	4.250	40.300	42.500	5.46%
B	1900	BODY	07/15/2013	23.5	23.1	0.100	5d080	3287	3.990	40.300	39.900	-0.99%
E	1900	BODY	07/25/2013	24.2	23.7	0.100	5d148	3920	4.100	40.800	41.000	0.49%
C	2450	BODY	07/22/2013	23.0	22.6	0.100	719	3022	5.480	51.600	54.800	6.20%
C	2600	BODY	07/22/2013	23.0	22.6	0.100	1004	3022	5.670	57.500	56.700	-1.39%
A	5200	BODY	07/08/2013	24.4	23.2	0.100	1057	3589	7.160	75.500	71.600	-5.17%
A	5300	BODY	07/08/2013	24.4	23.2	0.100	1057	3589	7.870	75.300	78.700	4.52%
A	5600	BODY	07/08/2013	24.5	23.4	0.100	1057	3589	7.890	80.300	78.900	-1.74%
A	5800	BODY	07/08/2013	24.5	23.4	0.100	1057	3589	7.330	75.100	73.300	-2.40%

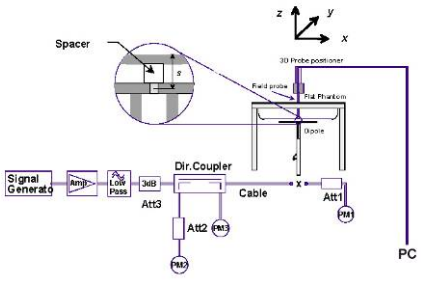


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
Cell. CDMA/EVDO BC10 (§90S) Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
820.10	564	Cell. CDMA BC10 (§90S)	RC3 / SO55	25.5	25.26	0.10	Right	Cheek	150	1:1	0.488	1.057	**0.516**	A1
820.10	564	Cell. CDMA BC10 (§90S)	RC3 / SO55	25.5	25.26	0.13	Right	Tilt	150	1:1	0.338	1.057	0.357	
820.10	564	Cell. CDMA BC10 (§90S)	RC3 / SO55	25.5	25.26	0.12	Left	Cheek	150	1:1	0.345	1.057	0.365	
820.10	564	Cell. CDMA BC10 (§90S)	RC3 / SO55	25.5	25.26	0.03	Left	Tilt	150	1:1	0.296	1.057	0.313	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. A	25.5	25.32	-0.03	Right	Cheek	150	1:1	0.450	1.042	0.469	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. A	25.5	25.32	0.17	Right	Tilt	150	1:1	0.304	1.042	0.317	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. A	25.5	25.32	0.03	Left	Cheek	150	1:1	0.353	1.042	0.368	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. A	25.5	25.32	-0.02	Left	Tilt	150	1:1	0.296	1.042	0.308	
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 11-2
Cell. CDMA/EVDO BC0 (§22H) Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	Cell. CDMA BC0 (§22H)	RC3 / SO55	25.2	25.06	-0.04	Right	Cheek	150	1:1	0.374	1.033	0.386	A2
836.52	384	Cell. CDMA BC0 (§22H)	RC3 / SO55	25.2	25.06	0.13	Right	Tilt	150	1:1	0.226	1.033	0.233	
836.52	384	Cell. CDMA BC0 (§22H)	RC3 / SO55	25.2	25.06	0.05	Left	Cheek	150	1:1	0.296	1.033	0.306	
836.52	384	Cell. CDMA BC0 (§22H)	RC3 / SO55	25.2	25.06	0.02	Left	Tilt	150	1:1	0.232	1.033	0.240	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. A	25.2	24.95	0.14	Right	Cheek	150	1:1	0.367	1.059	0.389	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. A	25.2	24.95	0.14	Right	Tilt	150	1:1	0.226	1.059	0.239	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. A	25.2	24.95	0.13	Left	Cheek	150	1:1	0.292	1.059	0.309	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. A	25.2	24.95	0.02	Left	Tilt	150	1:1	0.223	1.059	0.236	
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 11-3
PCS/EVDO CDMA Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	24.9	24.83	0.05	Right	Cheek	150	1:1	0.182	1.016	0.185	
1880.00	600	PCS CDMA	RC3 / SO55	24.9	24.83	-0.17	Right	Tilt	150	1:1	0.057	1.016	0.058	
1880.00	600	PCS CDMA	RC3 / SO55	24.9	24.83	0.02	Left	Cheek	150	1:1	0.232	1.016	0.236	
1880.00	600	PCS CDMA	RC3 / SO55	24.9	24.83	0.19	Left	Tilt	150	1:1	0.069	1.016	0.070	
1880.00	600	PCS CDMA	EVDO Rev. A	24.9	24.81	-0.07	Right	Cheek	150	1:1	0.206	1.021	0.210	
1880.00	600	PCS CDMA	EVDO Rev. A	24.9	24.81	0.05	Right	Tilt	150	1:1	0.063	1.021	0.064	
1880.00	600	PCS CDMA	EVDO Rev. A	24.9	24.81	-0.04	Left	Cheek	150	1:1	0.244	1.021	0.249	A3
1880.00	600	PCS CDMA	EVDO Rev. A	24.9	24.81	0.06	Left	Tilt	150	1:1	0.067	1.021	0.068	
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 11-4
GSM/GPRS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.2	33.14	0.03	Right	Cheek	167	1	1:8.3	0.340	1.014	0.345	
836.60	190	GSM 850	GSM	33.2	33.14	0.01	Right	Tilt	167	1	1:8.3	0.203	1.014	0.206	
836.60	190	GSM 850	GSM	33.2	33.14	-0.02	Left	Cheek	167	1	1:8.3	0.261	1.014	0.265	
836.60	190	GSM 850	GSM	33.2	33.14	-0.06	Left	Tilt	167	1	1:8.3	0.170	1.014	0.172	
824.20	128	GSM 850	GPRS	31.2	31.20	0.04	Right	Cheek	167	2	1:4.15	0.434	1.000	0.434	A4
824.20	128	GSM 850	GPRS	31.2	31.20	-0.16	Right	Tilt	167	2	1:4.15	0.265	1.000	0.265	
824.20	128	GSM 850	GPRS	31.2	31.20	-0.13	Left	Cheek	167	2	1:4.15	0.386	1.000	0.386	
824.20	128	GSM 850	GPRS	31.2	31.20	0.09	Left	Tilt	167	2	1:4.15	0.283	1.000	0.283	
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 11-5
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	23.7	23.70	0.00	Right	Cheek	167	1:1	0.367	1.000	0.367	A5
836.60	4183	UMTS 850	RMC	23.7	23.70	0.04	Right	Tilt	167	1:1	0.230	1.000	0.230	
836.60	4183	UMTS 850	RMC	23.7	23.70	0.06	Left	Cheek	167	1:1	0.276	1.000	0.276	
836.60	4183	UMTS 850	RMC	23.7	23.70	0.02	Left	Tilt	167	1:1	0.196	1.000	0.196	
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 11-6
GSM/GPRS 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
1880.00	661	GSM 1900	GSM	30.2	30.17	-0.04	Right	Cheek	167	1	1:8.3	0.062	1.007	0.062	
1880.00	661	GSM 1900	GSM	30.2	30.17	0.05	Right	Tilt	167	1	1:8.3	0.017	1.007	0.017	
1880.00	661	GSM 1900	GSM	30.2	30.17	0.05	Left	Cheek	167	1	1:8.3	0.090	1.007	0.091	A6
1880.00	661	GSM 1900	GSM	30.2	30.17	-0.01	Left	Tilt	167	1	1:8.3	0.025	1.007	0.025	
1880.00	661	GSM 1900	GPRS	30.2	30.19	-0.04	Right	Cheek	167	1	1:8.3	0.061	1.002	0.061	
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.15	Right	Tilt	167	1	1:8.3	0.016	1.002	0.016	
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.07	Left	Cheek	167	1	1:8.3	0.086	1.002	0.086	
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.01	Left	Tilt	167	1	1:8.3	0.019	1.002	0.019	
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 11-7
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.													
1880.00	9400	UMTS 1900	RMC	23.7	23.69	0.04	Right	Cheek	167	1:1	0.158	1.002	0.158	
1880.00	9400	UMTS 1900	RMC	23.7	23.69	0.16	Right	Tilt	167	1:1	0.039	1.002	0.039	
1880.00	9400	UMTS 1900	RMC	23.7	23.69	0.04	Left	Cheek	167	1:1	0.197	1.002	0.197	A7
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.08	Left	Tilt	167	1:1	0.059	1.002	0.059	
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 11-8
LTE Band 26 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	0.13	0	Right	Cheek	QPSK	1	49	161	1:1	0.324	1.000	0.324	A8
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.11	1	Right	Cheek	QPSK	25	12	161	1:1	0.278	1.035	0.288	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	-0.03	0	Right	Tilt	QPSK	1	49	161	1:1	0.181	1.000	0.181	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.14	1	Right	Tilt	QPSK	25	12	161	1:1	0.164	1.035	0.170	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	0.01	0	Left	Cheek	QPSK	1	49	161	1:1	0.255	1.000	0.255	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.08	1	Left	Cheek	QPSK	25	12	161	1:1	0.223	1.035	0.231	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	-0.01	0	Left	Tilt	QPSK	1	49	161	1:1	0.174	1.000	0.174	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.09	1	Left	Tilt	QPSK	25	12	161	1:1	0.160	1.035	0.166	
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 11-9
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	-0.08	0	Right	Cheek	QPSK	1	25	161	1:1	0.187	1.000	0.187	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.04	1	Right	Cheek	QPSK	25	25	161	1:1	0.131	1.000	0.131	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	-0.04	0	Right	Tilt	QPSK	1	25	161	1:1	0.071	1.000	0.071	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.10	1	Right	Tilt	QPSK	25	25	161	1:1	0.047	1.000	0.047	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.05	0	Left	Cheek	QPSK	1	25	161	1:1	0.287	1.000	0.287	A9
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	-0.01	1	Left	Cheek	QPSK	25	25	161	1:1	0.200	1.000	0.200	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.01	0	Left	Tilt	QPSK	1	25	161	1:1	0.088	1.000	0.088	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.01	1	Left	Tilt	QPSK	25	25	161	1:1	0.059	1.000	0.059	
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 11-10
LTE Band 41 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor (Conducted Power)	Scaling Factor (CP duty)	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)			(W/kg)	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	-0.19	0	Right	Cheek	QPSK	1	50	151	1:1.59	0.096	1.002	1.01	0.097	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.03	1	Right	Cheek	QPSK	50	25	151	1:1.59	0.083	1.064	1.01	0.089	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	0.02	0	Right	Tilt	QPSK	1	50	151	1:1.59	0.100	1.002	1.01	0.101	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.04	1	Right	Tilt	QPSK	50	25	151	1:1.59	0.088	1.064	1.01	0.095	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	0.01	0	Left	Cheek	QPSK	1	50	151	1:1.59	0.151	1.002	1.01	0.153	A10
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.07	1	Left	Cheek	QPSK	50	25	151	1:1.59	0.133	1.064	1.01	0.143	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	0.07	0	Left	Tilt	QPSK	1	50	151	1:1.59	0.070	1.002	1.01	0.071	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.18	1	Left	Tilt	QPSK	50	25	151	1:1.59	0.062	1.064	1.01	0.067	
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 11-11
DTS Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.03	Right	Cheek	152	1	1:1	0.262	1.140	**0.299**	A11
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.01	Right	Tilt	152	1	1:1	0.168	1.140	0.192	
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.07	Left	Cheek	152	1	1:1	0.213	1.140	0.243	
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.05	Left	Tilt	152	1	1:1	0.170	1.140	0.194	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.17	Right	Cheek	152	6	1:1	0.104	1.062	0.110	A13
5775	155	IEEE 802.11ac	OFDM	9.0	8.38	0.18	Right	Cheek	152	29.3	1:1	0.066	1.153	0.076	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.03	Right	Tilt	152	6	1:1	0.077	1.062	0.082	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.16	Left	Cheek	152	6	1:1	0.069	1.062	0.073	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.09	Left	Tilt	152	6	1:1	0.071	1.062	0.075	
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 11-12
NII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
5180	36	IEEE 802.11a	OFDM	10.0	9.07	0.11	Right	Cheek	152	6	1:1	0.081	1.239	0.100	
5210	42	IEEE 802.11ac	OFDM	9.0	7.95	0.14	Right	Cheek	152	29.3	1:1	0.048	1.274	0.061	
5180	36	IEEE 802.11a	OFDM	10.0	9.07	0.03	Right	Tilt	152	6	1:1	0.052	1.239	0.064	
5180	36	IEEE 802.11a	OFDM	10.0	9.07	0.14	Left	Cheek	152	6	1:1	0.047	1.239	0.058	
5180	36	IEEE 802.11a	OFDM	10.0	9.07	0.13	Left	Tilt	152	6	1:1	0.043	1.239	0.053	
5260	52	IEEE 802.11a	OFDM	10.0	9.29	0.11	Right	Cheek	152	6	1:1	0.137	1.178	0.161	A12
5290	58	IEEE 802.11ac	OFDM	9.0	7.77	0.13	Right	Cheek	152	29.3	1:1	0.087	1.327	0.115	
5260	52	IEEE 802.11a	OFDM	10.0	9.29	0.17	Right	Tilt	152	6	1:1	0.101	1.178	0.119	
5260	52	IEEE 802.11a	OFDM	10.0	9.29	0.20	Left	Cheek	152	6	1:1	0.083	1.178	0.098	
5260	52	IEEE 802.11a	OFDM	10.0	9.29	0.15	Left	Tilt	152	6	1:1	0.082	1.178	0.097	
5700	140	IEEE 802.11a	OFDM	10.0	9.39	0.13	Right	Cheek	152	6	1:1	0.099	1.151	0.114	
5690	138	IEEE 802.11ac	OFDM	9.0	8.03	0.17	Right	Cheek	152	29.3	1:1	0.071	1.250	0.089	
5700	140	IEEE 802.11a	OFDM	10.0	9.39	0.08	Right	Tilt	152	6	1:1	0.074	1.151	0.085	
5700	140	IEEE 802.11a	OFDM	10.0	9.39	0.03	Left	Cheek	152	6	1:1	0.072	1.151	0.083	
5700	140	IEEE 802.11a	OFDM	10.0	9.39	0.19	Left	Tilt	152	6	1:1	0.069	1.151	0.079	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

11.2 Standalone Body-Worn SAR Data

Table 11-13
CDMA/GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
820.10	564	Cell. CDMA BC10 (§90S)	TDSO / SO32	25.5	25.25	-0.07	10 mm	150	N/A	1:1	back	0.677	1.059	0.717	A14
836.52	384	Cell. CDMA BC0 (§22H)	TDSO / SO32	25.2	24.96	0.09	10 mm	150	N/A	1:1	back	0.467	1.057	0.494	A16
1851.25	25	PCS CDMA	TDSO / SO32	24.9	24.88	-0.11	10 mm	150	N/A	1:1	back	0.708	1.005	0.712	
1880.00	600	PCS CDMA	TDSO / SO32	24.9	24.81	-0.05	10 mm	150	N/A	1:1	back	0.876	1.021	0.894	
1908.75	1175	PCS CDMA	TDSO / SO32	24.9	24.65	-0.17	10 mm	150	N/A	1:1	back	1.020	1.059	1.080	A18
836.60	190	GSM 850	GSM	33.2	33.14	0.03	10 mm	167	1	1:8.3	back	0.372	1.014	0.377	
824.20	128	GSM 850	GPRS	31.2	31.20	0.08	10 mm	167	2	1:4.15	back	0.467	1.000	0.467	A20
836.60	4183	UMTS 850	RMC	23.7	23.70	0.02	10 mm	167	N/A	1:1	back	0.404	1.000	0.404	A22
1880.00	661	GSM 1900	GSM	30.2	30.17	0.11	10 mm	167	1	1:8.3	back	0.255	1.005	0.256	
1880.00	661	GSM 1900	GPRS	30.2	30.19	-0.14	10 mm	167	1	1:8.3	back	0.271	1.002	0.272	A24
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.04	10 mm	167	N/A	1:1	back	0.722	1.002	0.723	A26
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 11-14
LTE Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor (Conducted Power)	Scaling Factor (CP duty)	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	0.00	0	161	QPSK	1	49	10 mm	back	1:1	0.445	1.000	N/A	0.445	A27
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.05	1	161	QPSK	25	12	10 mm	back	1:1	0.404	1.035	N/A	0.418	
1855.00	26090	Low	LTE Band 25 (PCS)	10	23.7	23.65	0.05	0	161	QPSK	1	49	10 mm	back	1:1	0.592	1.012	N/A	0.599	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.7	23.61	0.08	0	161	QPSK	1	0	10 mm	back	1:1	0.730	1.021	N/A	0.745	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.00	0	161	QPSK	1	25	10 mm	back	1:1	1.110	1.000	N/A	**1.110**	A29
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.16	1	161	QPSK	25	25	10 mm	back	1:1	0.785	1.000	N/A	0.785	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.57	-0.05	1	161	QPSK	50	0	10 mm	back	1:1	0.740	1.030	N/A	0.762	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	-0.02	0	151	QPSK	1	50	10 mm	back	1:1.59	0.133	1.002	1.01	0.134	A31
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	-0.02	1	151	QPSK	50	25	10 mm	back	1:1.59	0.101	1.064	1.01	0.108	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Body 1.6 W/kg (mW/g) averaged over 1 gram

Table 11-15
DTS Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.02	10 mm	152	1	back	1:1	0.071	1.140	0.081	A33
5745	149	IEEE 802.11a	OFDM	10.0	9.74	-0.15	10 mm	152	6	back	1:1	0.135	1.062	**0.143**	A35
5775	155	IEEE 802.11ac	OFDM	9.0	8.38	0.16	10 mm	152	29.3	back	1:1	0.079	1.153	0.091	

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 11-16
NII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
5180	36	IEEE 802.11a	OFDM	10.0	9.07	0.11	10 mm	152	6	back	1:1	0.063	1.239	0.078	
5210	42	IEEE 802.11ac	OFDM	9.0	7.95	0.18	10 mm	152	29.3	back	1:1	0.043	1.274	0.055	
5260	52	IEEE 802.11a	OFDM	10.0	9.29	0.15	10 mm	152	6	back	1:1	0.163	1.178	**0.192**	A34
5290	58	IEEE 802.11ac	OFDM	9.0	7.77	0.21	10 mm	152	29.3	back	1:1	0.099	1.327	0.131	
5700	140	IEEE 802.11a	OFDM	10.0	9.39	0.19	10 mm	152	6	back	1:1	0.145	1.151	0.167	
5690	138	IEEE 802.11ac	OFDM	9.0	8.03	-0.05	10 mm	152	29.3	back	1:1	0.068	1.250	0.085	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population	Body 1.6 W/kg (mW/g) averaged over 1 gram

11.3 Standalone Wireless Router SAR Data

Table 11-17
EVDO/GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. 0	25.5	25.33	0.12	10 mm	150	N/A	1:1	back	0.652	1.040	0.678	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. 0	25.5	25.33	0.09	10 mm	150	N/A	1:1	front	0.493	1.040	0.513	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. 0	25.5	25.33	0.11	10 mm	150	N/A	1:1	bottom	0.503	1.040	0.523	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. 0	25.5	25.33	-0.01	10 mm	150	N/A	1:1	right	0.946	1.040	0.984	
820.10	564	Cell. CDMA BC10 (§90S)	EVDO Rev. 0	25.5	25.33	-0.02	10 mm	150	N/A	1:1	right	0.974	1.040	1.013	A15
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.96	-0.02	10 mm	150	N/A	1:1	back	0.419	1.057	0.443	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.96	0.08	10 mm	150	N/A	1:1	front	0.434	1.057	0.459	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.96	0.06	10 mm	150	N/A	1:1	bottom	0.485	1.057	0.513	
836.52	384	Cell. CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.96	-0.05	10 mm	150	N/A	1:1	right	0.693	1.057	0.733	A17
1851.25	25	PCS CDMA	EVDO Rev. 0	24.9	24.90	-0.08	10 mm	150	N/A	1:1	back	0.718	1.000	0.718	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.9	24.82	-0.09	10 mm	150	N/A	1:1	back	0.904	1.019	0.921	
1908.75	1175	PCS CDMA	EVDO Rev. 0	24.9	24.64	-0.09	10 mm	150	N/A	1:1	back	1.060	1.062	1.126	A19
1880.00	600	PCS CDMA	EVDO Rev. 0	24.9	24.82	0.11	10 mm	150	N/A	1:1	front	0.410	1.019	0.418	
1851.25	25	PCS CDMA	EVDO Rev. 0	24.9	24.90	0.05	10 mm	150	N/A	1:1	bottom	0.786	1.000	0.786	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.9	24.82	0.11	10 mm	150	N/A	1:1	bottom	0.836	1.019	0.852	
1908.75	1175	PCS CDMA	EVDO Rev. 0	24.9	24.64	-0.09	10 mm	150	N/A	1:1	bottom	0.950	1.062	1.009	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.9	24.82	-0.13	10 mm	150	N/A	1:1	right	0.094	1.019	0.096	
824.20	128	GSM 850	GPRS	31.2	31.20	0.08	10 mm	167	2	1:4.15	back	0.467	1.000	0.467	
824.20	128	GSM 850	GPRS	31.2	31.20	-0.03	10 mm	167	2	1:4.15	front	0.470	1.000	0.470	
824.20	128	GSM 850	GPRS	31.2	31.20	-0.09	10 mm	167	2	1:4.15	bottom	0.371	1.000	0.371	
824.20	128	GSM 850	GPRS	31.2	31.20	0.00	10 mm	167	2	1:4.15	right	0.691	1.000	0.691	A21
836.60	4183	UMTS 850	RMC	23.7	23.70	0.02	10 mm	167	N/A	1:1	back	0.404	1.000	0.404	
836.60	4183	UMTS 850	RMC	23.7	23.70	-0.03	10 mm	167	N/A	1:1	front	0.420	1.000	0.420	
836.60	4183	UMTS 850	RMC	23.7	23.70	-0.05	10 mm	167	N/A	1:1	bottom	0.354	1.000	0.354	
836.60	4183	UMTS 850	RMC	23.7	23.70	-0.02	10 mm	167	N/A	1:1	right	0.592	1.000	0.592	A23
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.11	10 mm	167	1	1:8.3	back	0.271	1.002	0.272	
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.02	10 mm	167	1	1:8.3	front	0.127	1.002	0.127	
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.04	10 mm	167	1	1:8.3	bottom	0.293	1.002	0.294	A25
1880.00	661	GSM 1900	GPRS	30.2	30.19	0.06	10 mm	167	1	1:8.3	right	0.041	1.002	0.041	
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.04	10 mm	167	N/A	1:1	back	0.722	1.002	0.723	A26
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.07	10 mm	167	N/A	1:1	front	0.423	1.002	0.424	
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.10	10 mm	167	N/A	1:1	bottom	0.662	1.002	0.663	
1880.00	9400	UMTS 1900	RMC	23.7	23.69	-0.10	10 mm	167	N/A	1:1	right	0.107	1.002	0.107	
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: Variability data is highlighted blue in the above table.

Table 11-18
LTE Band 26 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	0.00	0	161	QPSK	1	49	10 mm	back	1:1	0.445	1.000	0.445	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.05	1	161	QPSK	25	12	10 mm	back	1:1	0.404	1.035	0.418	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	0.00	0	161	QPSK	1	49	10 mm	front	1:1	0.381	1.000	0.381	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.08	1	161	QPSK	25	12	10 mm	front	1:1	0.338	1.035	0.350	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	-0.10	0	161	QPSK	1	49	10 mm	bottom	1:1	0.289	1.000	0.289	
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.11	1	161	QPSK	25	12	10 mm	bottom	1:1	0.245	1.035	0.254	
831.50	26865	Mid	LTE Band 26	10	24.5	24.50	-0.07	0	161	QPSK	1	49	10 mm	right	1:1	0.527	1.000	0.527	A28
831.50	26865	Mid	LTE Band 26	10	23.5	23.35	0.10	1	161	QPSK	25	12	10 mm	right	1:1	0.453	1.035	0.469	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-19
LTE Band 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1855.00	26090	Low	LTE Band 25 (PCS)	10	23.7	23.65	0.05	0	161	QPSK	1	49	10 mm	back	1:1	0.592	1.012	0.599	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.7	23.61	0.08	0	161	QPSK	1	0	10 mm	back	1:1	0.730	1.021	0.745	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.00	0	161	QPSK	1	25	10 mm	back	1:1	1.110	1.000	1.110	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.16	1	161	QPSK	25	25	10 mm	back	1:1	0.785	1.000	0.785	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.57	-0.05	1	161	QPSK	50	0	10 mm	back	1:1	0.740	1.030	0.762	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.05	0	161	QPSK	1	25	10 mm	front	1:1	0.522	1.000	0.522	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.01	1	161	QPSK	25	25	10 mm	front	1:1	0.358	1.000	0.358	
1855.00	26090	Low	LTE Band 25 (PCS)	10	23.7	23.65	0.12	0	161	QPSK	1	49	10 mm	bottom	1:1	0.700	1.012	0.708	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.7	23.61	-0.01	0	161	QPSK	1	0	10 mm	bottom	1:1	0.804	1.021	0.821	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	0.02	0	161	QPSK	1	25	10 mm	bottom	1:1	1.190	1.000	**1.190**	A30
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	0.10	1	161	QPSK	25	25	10 mm	bottom	1:1	0.798	1.000	0.798	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.57	0.05	1	161	QPSK	50	0	10 mm	bottom	1:1	0.767	1.030	0.790	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	-0.06	0	161	QPSK	1	25	10 mm	right	1:1	0.164	1.000	0.164	
1910.00	26640	High	LTE Band 25 (PCS)	10	22.7	22.70	-0.04	1	161	QPSK	25	25	10 mm	right	1:1	0.105	1.000	0.105	
1910.00	26640	High	LTE Band 25 (PCS)	10	23.7	23.70	-0.11	0	161	QPSK	1	25	10 mm	bottom	1:1	1.000	1.000	1.000	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Note: Variability data is highlighted blue in the above table.

Table 11-20
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor (Conducted Power)	Scaling Factor (CP duty)	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	-0.02	0	151	QPSK	1	50	10 mm	back	1:1.59	0.133	1.002	1.01	0.134	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	-0.02	1	151	QPSK	50	25	10 mm	back	1:1.59	0.101	1.064	1.01	0.108	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	0.11	0	151	QPSK	1	50	10 mm	front	1:1.59	0.142	1.002	1.01	0.143	A32
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.10	1	151	QPSK	50	25	10 mm	front	1:1.59	0.110	1.064	1.01	0.118	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	-0.02	0	151	QPSK	1	50	10 mm	bottom	1:1.59	0.132	1.002	1.01	0.133	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	-0.02	1	151	QPSK	50	25	10 mm	bottom	1:1.59	0.100	1.064	1.01	0.107	
2549.50	40185	Low Mid	LTE Band 41	20	21.7	21.69	0.01	0	151	QPSK	1	50	10 mm	left	1:1.59	0.122	1.002	1.01	0.123	
2549.50	40185	Low Mid	LTE Band 41	20	20.7	20.43	0.06	1	151	QPSK	50	25	10 mm	left	1:1.59	0.094	1.064	1.01	0.101	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-21
WLAN Hotspot/WIFI Direct SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.														
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.02	10 mm	152	1	back	1:1	0.071	1.140	0.081	A33
2437	6	IEEE 802.11b	DSSS	16.0	15.43	-0.03	10 mm	152	1	front	1:1	0.061	1.140	0.070	
2437	6	IEEE 802.11b	DSSS	16.0	15.43	-0.04	10 mm	152	1	top	1:1	0.047	1.140	0.054	
2437	6	IEEE 802.11b	DSSS	16.0	15.43	0.10	10 mm	152	1	left	1:1	0.030	1.140	0.034	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	-0.15	10 mm	152	6	back	1:1	0.135	1.062	**0.143**	A35
5775	155	IEEE 802.11ac	OFDM	9.0	8.38	0.16	10 mm	152	29.3	back	1:1	0.079	1.153	0.091	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.00	10 mm	152	6	front	1:1	0.011	1.062	0.012	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.04	10 mm	152	6	top	1:1	0.044	1.062	0.047	
5745	149	IEEE 802.11a	OFDM	10.0	9.74	0.04	10 mm	152	6	left	1:1	0.073	1.062	0.078	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**				**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC/OET Bulletin 65, Supplement C [June 2001] and FCC KDB Publication 447498 D01v05r01.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. This DUT has NFC operations. The NFC antenna is integrated into the battery cover. The SAR tests were performed with the battery cover containing the NFC antenna.
4. Liquid tissue depth was at least 15.0 cm for all frequencies.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05r01.
7. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
8. Per FCC KDB Publication 648474 D04v01r01, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
9. Per FCC KDB 865664 D01v01r01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
10. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v01r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).

GSM Test Notes:

1. This device supports GSM VOIP in the head and body-worn configurations, therefore GPRS was additionally evaluated for head and body-worn compliance.
2. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

3. Justification for reduced test configurations per KDB Publication 941225 D03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR for hotspot SAR.
4. Per FCC KDB Publication 447498 D01v05r01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v02r02.
2. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01v02r02 procedures for data devices. Since the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, then EVDO Rev. A SAR is not required. SAR is not required for 1x RTT for Ev-Do hotspot devices 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.
3. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
4. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO 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, per FCC KDB Publication 941225 D01v02.
5. Per FCC KDB Publication 447498 D01v05r01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
6. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg.

UMTS Notes:

1. UMTS mode in Body SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02r02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v05r01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r02. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.

4. “Scaling Factor (CP duty)”: TDD LTE was tested using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using normal cyclic prefix only and special subframe configuration 6. Due to equipment setup issues with extended cyclic prefix as a result of test samples configured for normal cyclic prefix, SAR tests were performed at maximum output power and worst-case transmission duty factor in normal cyclic prefix. Results were then scaled to the duty factor required for extended cyclic prefix listed in 3GPP TS 36.211 Section 4. The cyclic prefix scaling factor for LTE Band 41 was calculated by dividing the extended cyclic prefix duty factor by the normal cyclic prefix duty factor. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using normal cyclic prefix is 0.629. The duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
5. Per FCC KDB Publication 447498 D01v05r01, if the reported (scaled) LTE Band 41 SAR measured at the highest output power channel for each test configuration is ≤ 0.6 W/kg then testing at the other channels is not required for such test configuration(s). If the reported (scaled) LTE Band 25 or LTE Band 26 SAR measured at the highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).
6. LTE B41 low mid channel SAR was evaluated using probe S/N 3022 and DASY software measurement version 4.7. Per KDB Publication 865664 D01v01r01 Section 2.6, at 300 MHz to 6 GHz, measurements must be within +/- 100 MHz of the probe calibration point frequency or the valid frequency range supported by the probe calibration, whichever is less. Footnote C on page 5 and page 6 of the calibration certificate for probe S/N 3022 states that a frequency validity of +/- 100 MHz applies when using DASY measurement software version 4.4 and higher. Therefore, there are no additional requirements for SAR measurements at LTE B41 low mid channel.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 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 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz bandwidths) 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. Per April 2013 TCB Workshop notes, full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
4. When Hotspot is enabled, all 5 GHz bands are disabled. Therefore no 5 GHz WIFI Wireless Router SAR Data was required.
5. 5 GHz WIFI Direct GO is supported in the 5.8 GHz band only. The manufacturer expects 5.8 GHz WIFI Direct GO may be used in a similar manner to wireless router usage. Therefore, 5.8 GHz WIFI Direct GO was evaluated for SAR similarly to wireless router SAR procedures in FCC KDB Publication 941225.
6. WIFI transmission was verified using an uncalibrated spectrum analyzer.
7. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other default channels was not required.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05r01 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05r01 IV.C.1.iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05r01 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Table 12-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	10.50	10	**0.229**

Note: Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.

12.3 Head SAR Simultaneous Transmission Analysis

Table 12-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Simult Tx	Configuration	Cell. CDMA BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.299	**0.815**	Head SAR	Right Cheek	0.469	0.299	**0.768**
	Right Tilt	0.357	0.192	0.549		Right Tilt	0.317	0.192	0.509
	Left Cheek	0.365	0.243	0.608		Left Cheek	0.368	0.243	0.611
	Left Tilt	0.313	0.194	0.507		Left Tilt	0.308	0.194	0.502
Simult Tx	Configuration	Cell. CDMA BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.386	0.299	**0.685**	Head SAR	Right Cheek	0.389	0.299	**0.688**
	Right Tilt	0.233	0.192	0.425		Right Tilt	0.239	0.192	0.431
	Left Cheek	0.306	0.243	0.549		Left Cheek	0.309	0.243	0.552
	Left Tilt	0.240	0.194	0.434		Left Tilt	0.236	0.194	0.430

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.185	0.299	**0.484**	Head SAR	Right Cheek	0.210	0.299	**0.509**
	Right Tilt	0.058	0.192	0.250		Right Tilt	0.064	0.192	0.256
	Left Cheek	0.236	0.243	0.479		Left Cheek	0.249	0.243	0.492
	Left Tilt	0.070	0.194	0.264		Left Tilt	0.068	0.194	0.262
Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.345	0.299	**0.644**	Head SAR	Right Cheek	0.434	0.299	**0.733**
	Right Tilt	0.206	0.192	0.398		Right Tilt	0.265	0.192	0.457
	Left Cheek	0.265	0.243	0.508		Left Cheek	0.386	0.243	0.629
	Left Tilt	0.172	0.194	0.366		Left Tilt	0.283	0.194	0.477
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.367	0.299	**0.666**	Head SAR	Right Cheek	0.062	0.299	**0.361**
	Right Tilt	0.230	0.192	0.422		Right Tilt	0.017	0.192	0.209
	Left Cheek	0.276	0.243	0.519		Left Cheek	0.091	0.243	0.334
	Left Tilt	0.196	0.194	0.390		Left Tilt	0.025	0.194	0.219
Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.061	0.299	**0.360**	Head SAR	Right Cheek	0.158	0.299	**0.457**
	Right Tilt	0.016	0.192	0.208		Right Tilt	0.039	0.192	0.231
	Left Cheek	0.086	0.243	0.329		Left Cheek	0.197	0.243	0.440
	Left Tilt	0.019	0.194	0.213		Left Tilt	0.059	0.194	0.253
Simult Tx	Configuration	LTE Band 26 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.324	0.299	**0.623**	Head SAR	Right Cheek	0.187	0.299	0.486
	Right Tilt	0.181	0.192	0.373		Right Tilt	0.071	0.192	0.263
	Left Cheek	0.255	0.243	0.498		Left Cheek	0.287	0.243	**0.530**
	Left Tilt	0.174	0.194	0.368		Left Tilt	0.088	0.194	0.282

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.097	0.299	**0.396**
	Right Tilt	0.101	0.192	0.293
	Left Cheek	0.153	0.243	0.396
	Left Tilt	0.071	0.194	0.265

Table 12-3
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Simult Tx	Configuration	Cell. CDMA BC10 (§90S) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC10 (§90S) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.161	**0.677**	Head SAR	Right Cheek	0.469	0.161	**0.630**
	Right Tilt	0.357	0.119	0.476		Right Tilt	0.317	0.119	0.436
	Left Cheek	0.365	0.098	0.463		Left Cheek	0.368	0.098	0.466
	Left Tilt	0.313	0.097	0.410		Left Tilt	0.308	0.097	0.405
Simult Tx	Configuration	Cell. CDMA BC0 (§22H) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC0 (§22H) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.386	0.161	**0.547**	Head SAR	Right Cheek	0.389	0.161	**0.550**
	Right Tilt	0.233	0.119	0.352		Right Tilt	0.239	0.119	0.358
	Left Cheek	0.306	0.098	0.404		Left Cheek	0.309	0.098	0.407
	Left Tilt	0.240	0.097	0.337		Left Tilt	0.236	0.097	0.333
Simult Tx	Configuration	PCS CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.185	0.161	**0.346**	Head SAR	Right Cheek	0.210	0.161	**0.371**
	Right Tilt	0.058	0.119	0.177		Right Tilt	0.064	0.119	0.183
	Left Cheek	0.236	0.098	0.334		Left Cheek	0.249	0.098	0.347
	Left Tilt	0.070	0.097	0.167		Left Tilt	0.068	0.097	0.165
Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.345	0.161	**0.506**	Head SAR	Right Cheek	0.434	0.161	**0.595**
	Right Tilt	0.206	0.119	0.325		Right Tilt	0.265	0.119	0.384
	Left Cheek	0.265	0.098	0.363		Left Cheek	0.386	0.098	0.484
	Left Tilt	0.172	0.097	0.269		Left Tilt	0.283	0.097	0.380
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.367	0.161	**0.528**	Head SAR	Right Cheek	0.062	0.161	**0.223**
	Right Tilt	0.230	0.119	0.349		Right Tilt	0.017	0.119	0.136
	Left Cheek	0.276	0.098	0.374		Left Cheek	0.091	0.098	0.189
	Left Tilt	0.196	0.097	0.293		Left Tilt	0.025	0.097	0.122
Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.061	0.161	**0.222**	Head SAR	Right Cheek	0.158	0.161	**0.319**
	Right Tilt	0.016	0.119	0.135		Right Tilt	0.039	0.119	0.158
	Left Cheek	0.086	0.098	0.184		Left Cheek	0.197	0.098	0.295
	Left Tilt	0.019	0.097	0.116		Left Tilt	0.059	0.097	0.156

Simult Tx	Configuration	LTE Band 26 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.324	0.161	**0.485**	Head SAR	Right Cheek	0.187	0.161	0.348
	Right Tilt	0.181	0.119	0.300		Right Tilt	0.071	0.119	0.190
	Left Cheek	0.255	0.098	0.353		Left Cheek	0.287	0.098	**0.385**
	Left Tilt	0.174	0.097	0.271		Left Tilt	0.088	0.097	0.185

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.097	0.161	**0.258**
	Right Tilt	0.101	0.119	0.220
	Left Cheek	0.153	0.098	0.251
	Left Tilt	0.071	0.097	0.168

Note: The worst case 5 GHz WLAN reported SAR for each head configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Direct capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA BC10 (§90S)	0.717	0.081	0.798
Back Side	Cell. CDMA BC0 (§22H)	0.494	0.081	0.575
Back Side	PCS CDMA	1.080	0.081	1.161
Back Side	GSM 850	0.377	0.081	0.458
Back Side	GPRS 850	0.467	0.081	0.548
Back Side	UMTS 850	0.404	0.081	0.485
Back Side	GSM 1900	0.256	0.081	0.337
Back Side	GPRS 1900	0.272	0.081	0.353
Back Side	UMTS 1900	0.723	0.081	0.804
Back Side	LTE Band 26	0.445	0.081	0.526
Back Side	LTE Band 25 (PCS)	1.110	0.081	**1.191**
Back Side	LTE Band 41	0.134	0.081	0.215

Table 12-5
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA BC10 (§90S)	0.717	0.192	0.909
Back Side	Cell. CDMA BC0 (§22H)	0.494	0.192	0.686
Back Side	PCS CDMA	1.080	0.192	**1.272**
Back Side	GSM 850	0.377	0.192	0.569
Back Side	GPRS 850	0.467	0.192	0.659
Back Side	UMTS 850	0.404	0.192	0.596
Back Side	GSM 1900	0.256	0.192	0.448
Back Side	GPRS 1900	0.272	0.192	0.464
Back Side	UMTS 1900	0.723	0.192	0.915
Back Side	LTE Band 26	0.445	0.192	0.637
Back Side	LTE Band 25 (PCS)	1.110	0.192	1.302
Back Side	LTE Band 41	0.134	0.192	0.326

Note: The worst case 5 GHz WLAN reported SAR for each body-worn configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Direct capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

Table 12-6
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 10 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA BC10 (§90S)	0.717	0.229	0.946
Back Side	Cell. CDMA BC0 (§22H)	0.494	0.229	0.723
Back Side	PCS CDMA	1.080	0.229	1.309
Back Side	GSM 850	0.377	0.229	0.606
Back Side	GPRS 850	0.467	0.229	0.696
Back Side	UMTS 850	0.404	0.229	0.633
Back Side	GSM 1900	0.256	0.229	0.485
Back Side	GPRS 1900	0.272	0.229	0.501
Back Side	UMTS 1900	0.723	0.229	0.952
Back Side	LTE Band 26	0.445	0.229	0.674
Back Side	LTE Band 25 (PCS)	1.110	0.229	**1.339**
Back Side	LTE Band 41	0.134	0.229	0.363

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

12.5 Wireless Router SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 12-7
Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	Cell. EVDO BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.678	0.081	0.759	Body SAR	Back	0.443	0.081	0.524
	Front	0.513	0.070	0.583		Front	0.459	0.070	0.529
	Top	-	0.054	0.054		Top	-	0.054	0.054
	Bottom	0.523	-	0.523		Bottom	0.513	-	0.513
	Right	1.013	-	**1.013**		Right	0.733	-	**0.733**
	Left	-	0.034	0.034		Left	-	0.034	0.034
Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.126	0.081	**1.207**	Body SAR	Back	0.467	0.081	0.548
	Front	0.418	0.070	0.488		Front	0.470	0.070	0.540
	Top	-	0.054	0.054		Top	-	0.054	0.054
	Bottom	1.009	-	1.009		Bottom	0.371	-	0.371
	Right	0.096	-	0.096		Right	0.691	-	**0.691**
	Left	-	0.034	0.034		Left	-	0.034	0.034

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.081	0.485	Body SAR	Back	0.272	0.081	**0.353**
	Front	0.420	0.070	0.490		Front	0.127	0.070	0.197
	Top	-	0.054	0.054		Top	-	0.054	0.054
	Bottom	0.354	-	0.354		Bottom	0.294	-	0.294
	Right	0.592	-	**0.592**		Right	0.041	-	0.041
	Left	-	0.034	0.034		Left	-	0.034	0.034
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 26 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.723	0.081	**0.804**	Body SAR	Back	0.445	0.081	0.526
	Front	0.424	0.070	0.494		Front	0.381	0.070	0.451
	Top	-	0.054	0.054		Top	-	0.054	0.054
	Bottom	0.663	-	0.663		Bottom	0.289	-	0.289
	Right	0.107	-	0.107		Right	0.527	-	**0.527**
	Left	-	0.034	0.034		Left	-	0.034	0.034
Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.110	0.081	**1.191**	Body SAR	Back	0.134	0.081	**0.215**
	Front	0.522	0.070	0.592		Front	0.143	0.070	0.213
	Top	-	0.054	0.054		Top	-	0.054	0.054
	Bottom	1.190	-	1.190		Bottom	0.133	-	0.133
	Right	0.164	-	0.164		Right	-	-	0.000
	Left	-	0.034	0.034		Left	0.123	0.034	0.157

Table 12-8
Simultaneous Transmission Scenario (5.8 GHz WIFI Direct at 1.0 cm)

Simult Tx	Configuration	Cell. EVDO BC10 (§90S) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO BC0 (§22H) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.678	0.143	0.821	Body SAR	Back	0.443	0.143	0.586
	Front	0.513	0.012	0.525		Front	0.459	0.012	0.471
	Top	-	0.047	0.047		Top	-	0.047	0.047
	Bottom	0.523	-	0.523		Bottom	0.513	-	0.513
	Right	1.013	-	**1.013**		Right	0.733	-	**0.733**
	Left	-	0.078	0.078		Left	-	0.078	0.078
Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.126	0.143	**1.269**	Body SAR	Back	0.467	0.143	0.610
	Front	0.418	0.012	0.430		Front	0.470	0.012	0.482
	Top	-	0.047	0.047		Top	-	0.047	0.047
	Bottom	1.009	-	1.009		Bottom	0.371	-	0.371
	Right	0.096	-	0.096		Right	0.691	-	**0.691**
	Left	-	0.078	0.078		Left	-	0.078	0.078

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.143	0.547	Body SAR	Back	0.272	0.143	**0.415**
	Front	0.420	0.012	0.432		Front	0.127	0.012	0.139
	Top	-	0.047	0.047		Top	-	0.047	0.047
	Bottom	0.354	-	0.354		Bottom	0.294	-	0.294
	Right	0.592	-	**0.592**		Right	0.041	-	0.041
	Left	-	0.078	0.078		Left	-	0.078	0.078
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 26 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.723	0.143	**0.866**	Body SAR	Back	0.445	0.143	**0.588**
	Front	0.424	0.012	0.436		Front	0.381	0.012	0.393
	Top	-	0.047	0.047		Top	-	0.047	0.047
	Bottom	0.663	-	0.663		Bottom	0.289	-	0.289
	Right	0.107	-	0.107		Right	0.527	-	0.527
	Left	-	0.078	0.078		Left	-	0.078	0.078
Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.110	0.143	**1.253**	Body SAR	Back	0.134	0.143	**0.277**
	Front	0.522	0.012	0.534		Front	0.143	0.012	0.155
	Top	-	0.047	0.047		Top	-	0.047	0.047
	Bottom	1.190	-	1.190		Bottom	0.133	-	0.133
	Right	0.164	-	0.164		Right	-	-	0.000
	Left	-	0.078	0.078		Left	0.123	0.078	0.201

12.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v05r01.

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

Table 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
835	820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	right	10 mm	0.946	0.974	1.03	N/A	N/A	N/A	N/A
1900	1910.00	26640	LTE Band 25 (PCS)	QPSK, 1 RB, 25 RB Offset	bottom	10 mm	1.190	1.000	1.19	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak						Body 1.6 W/kg (mW/g)							

13.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	85047A	S-Parameter Test Set	N/A	N/A	N/A	2904A00579
Agilent	E5515C	Wireless Communications Test Set	10/18/2012	Biennial	10/18/2014	GB43193563
Agilent	E5515C	Wireless Communications Test Set	9/24/2012	Annual	9/24/2013	GB43163447
Agilent	85070C	Dielectric Probe Kit	2/14/2013	Annual	2/14/2014	MY44300633
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/16/2013	Annual	4/16/2014	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
Anritsu	MA2481A	Power Sensor	2/14/2013	Annual	2/14/2014	5821
Anritsu	MA2411B	Pulse Sensor	9/19/2012	Annual	9/19/2013	1027293
Anritsu	ML2495A	Power Meter	10/11/2012	Annual	10/11/2013	1039008
Anritsu	ML2438A	Power Meter	12/4/2012	Annual	12/4/2013	1070030
Anritsu	MA2481A	Power Sensor	2/14/2013	Annual	2/14/2014	2400
Anritsu	ML2496A	Power Meter	11/28/2012	Annual	11/28/2013	1138001
Anritsu	MA2411B	Pulse Power Sensor	12/5/2012	Annual	12/5/2013	1126066
Anritsu	MA2481D	Universal Sensor	12/17/2012	Annual	12/17/2013	1204343
Anritsu	MA2481D	Universal Sensor	12/17/2012	Annual	12/17/2013	1204419
Anritsu	MA24106A	USB Power Sensor	12/7/2012	Annual	12/7/2013	1244515
Anritsu	MA24106A	USB Power Sensor	12/7/2012	Annual	12/7/2013	1244512
Anritsu	MT8820C	Radio Communication Tester	11/6/2012	Annual	11/6/2013	6200901190
Anritsu	ML2438A	Power Meter	2/14/2013	Annual	2/14/2014	98150041
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
Anritsu	ML2438A	Power Meter	2/14/2013	Annual	2/14/2014	1190013
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/10/2012	Annual	10/10/2013	1833460
Gigatronics	8651A	Universal Power Meter	10/10/2012	Annual	10/10/2013	8650319
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	2/8/2013	Annual	2/8/2014	101699
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	9/26/2012	Annual	9/26/2013	108798
Rohde & Schwarz	SME06	Signal Generator	10/11/2012	Annual	10/11/2013	832026
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
SPEAG	D2600V2	2600 MHz SAR Dipole	5/2/2013	Annual	5/2/2014	1004
SPEAG	D835V2	835 MHz SAR Dipole	8/23/2012	Annual	8/23/2013	4d026
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/6/2013	Annual	2/6/2014	649
SPEAG	ES3DV2	SAR Probe	8/28/2012	Annual	8/28/2013	3022
SPEAG	EX3DV4	SAR Probe	1/17/2013	Annual	1/17/2014	3589
SPEAG	ES3DV3	SAR Probe	3/15/2013	Annual	3/15/2014	3209
SPEAG	EX3DV4	SAR Probe	2/27/2013	Annual	2/27/2014	3920
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/17/2013	Annual	1/17/2014	1272
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/14/2013	Annual	2/14/2014	1120
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/13/2012	Annual	11/13/2013	1333
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2012	Annual	8/23/2013	719
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/19/2012	Annual	9/19/2013	1323
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/11/2013	Annual	1/11/2014	1057
SPEAG	ES3DV3	SAR Probe	9/20/2012	Annual	9/20/2013	3288
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2013	Annual	3/8/2014	1334
SPEAG	ES3DV3	SAR Probe	11/15/2012	Annual	11/15/2013	3287
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/24/2012	Annual	8/24/2013	1322
SPEAG	D1900V2	1900 MHz SAR Dipole	2/6/2013	Annual	2/6/2014	5d148
SPEAG	D835V2	835 MHz SAR Dipole	1/7/2013	Annual	1/7/2014	4d132
SPEAG	D1900V2	1900 MHz SAR Dipole	7/20/2012	Annual	7/20/2013	5d080
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
VWR	62344-925	Mini-Thermometer	10/24/2011	Biennial	10/24/2013	111886443
VWR	23226-658	Long Stem Thermometer	5/16/2012	Biennial	5/16/2014	122295544
VWR	23226-658	Long Stem Thermometer	7/11/2012	Biennial	7/11/2014	122389334
VWR	62344-925	Mini-Thermometer	10/24/2011	Biennial	10/24/2013	111886441

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

All calibrated equipments were used during their calibration periods.

15 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

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

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

Applicable for frequencies up to 6 GHz.

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

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

16 CONCLUSION

16.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

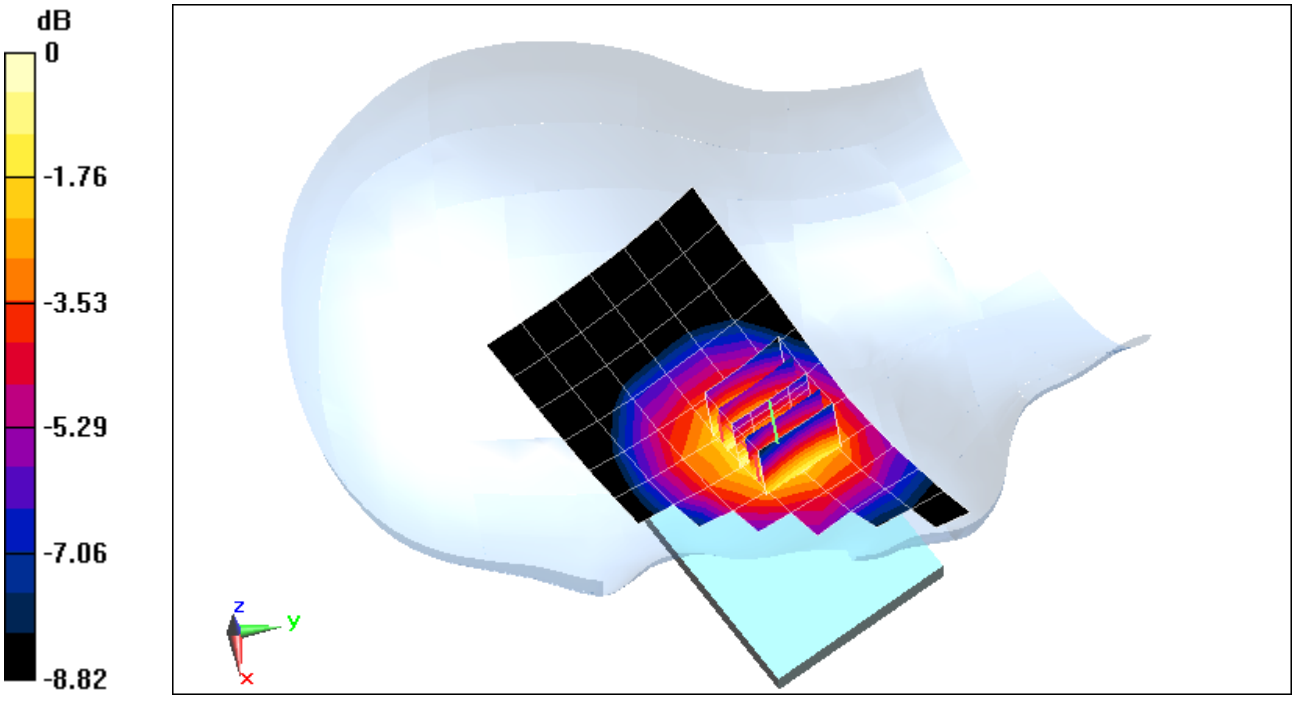
Communication System: CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 820.1$ MHz; $\sigma = 0.903$ S/m; $\varepsilon_r = 41.072$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-18-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN3920; ConvF(9.58, 9.58, 9.58); Calibrated: 2/27/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. CDMA BC10 (§90S), Right Head, Cheek, 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 = 23.767 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.607 W/kg
SAR(1 g) = 0.488 W/kg



0 dB = 0.511 W/kg = -2.92 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

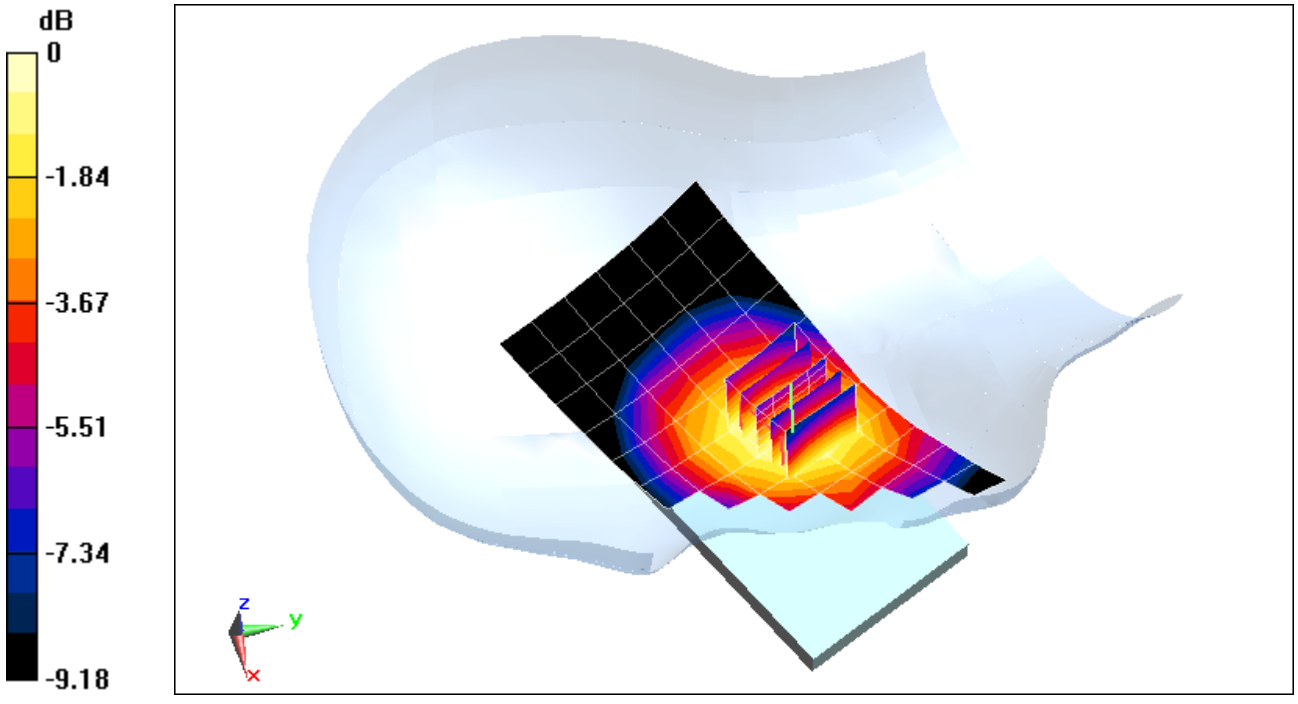
Communication System: CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.918$ S/m; $\varepsilon_r = 40.836$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-18-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN3920; ConvF(9.58, 9.58, 9.58); Calibrated: 2/27/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. CDMA BC0 (§22H), Right Head, Cheek, 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 = 20.753 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.470 W/kg
SAR(1 g) = 0.374 W/kg



0 dB = 0.391 W/kg = -4.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

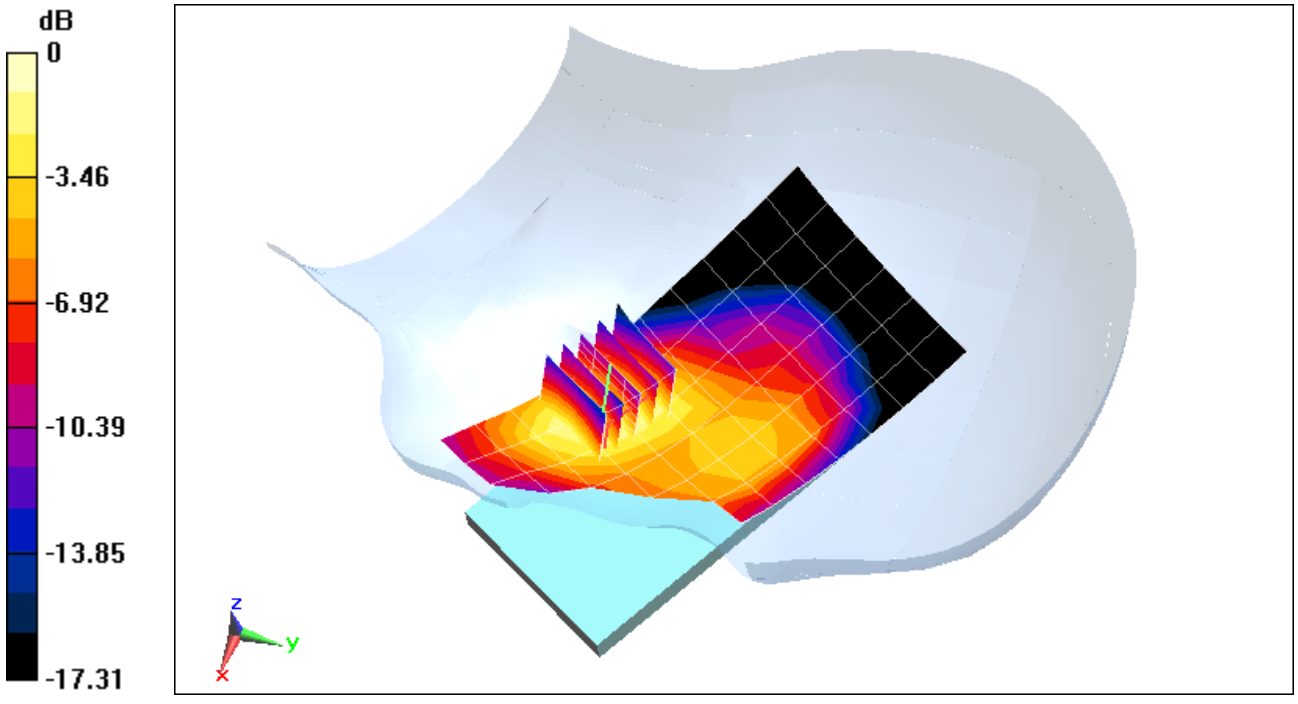
Communication System: CDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.399 S/m; ε_r = 40.231; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-17-2013; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO Rev.A, Left Head, Cheek, 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 = 13.725 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.244 W/kg



0 dB = 0.271 W/kg = -5.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

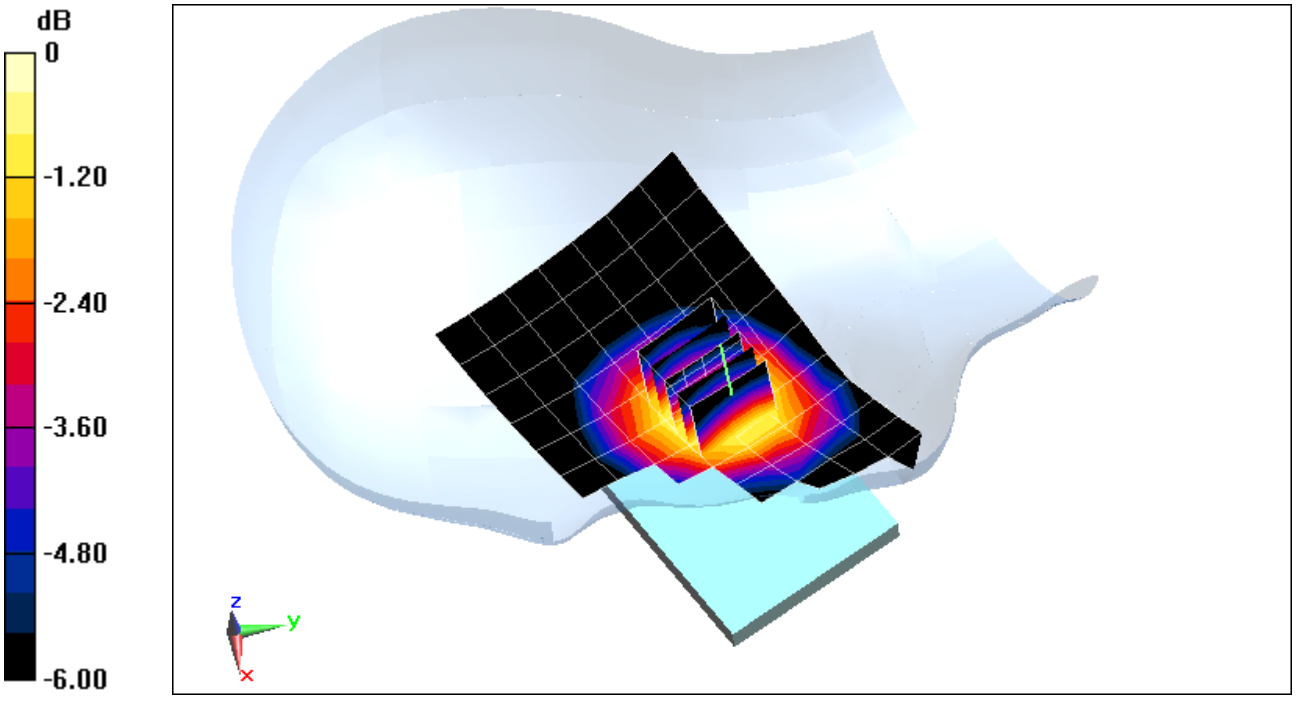
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium: 835 Head Medium parameters used (interpolated):
$f = 824.2$ MHz; $\sigma = 0.908$ S/m; $\varepsilon_r = 40.804$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-23-2013; Ambient Temp: 23.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3288; ConvF(6.41, 6.41, 6.41); Calibrated: 9/20/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/19/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 850, Right Head, Cheek, Low.ch, 2 Tx slots

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.416 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.556 W/kg
SAR(1 g) = 0.434 W/kg



0 dB = 0.448 W/kg = -3.49 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

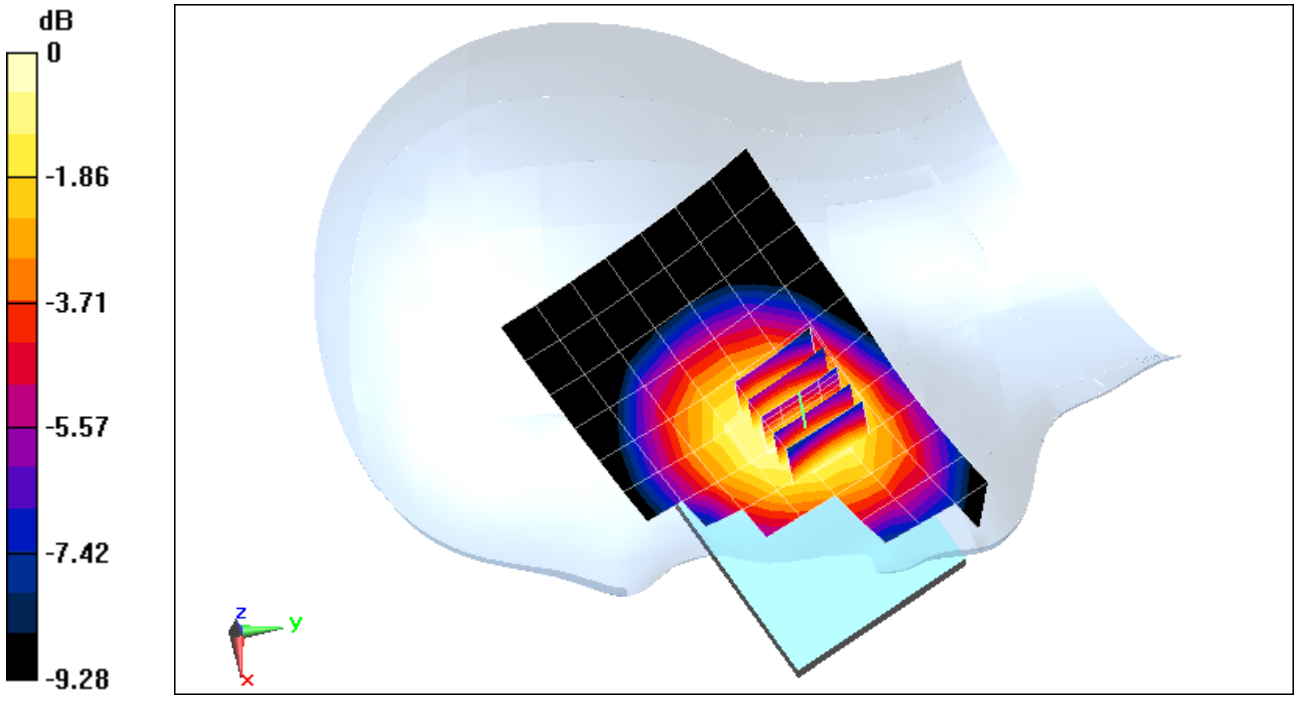
Communication System: UMTS; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.919$ S/m; $\varepsilon_r = 40.654$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-23-2013; Ambient Temp: 23.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3288; ConvF(6.41, 6.41, 6.41); Calibrated: 9/20/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/19/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Right Head, Cheek, Mid.ch

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.594 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.367 W/kg



0 dB = 0.382 W/kg = -4.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

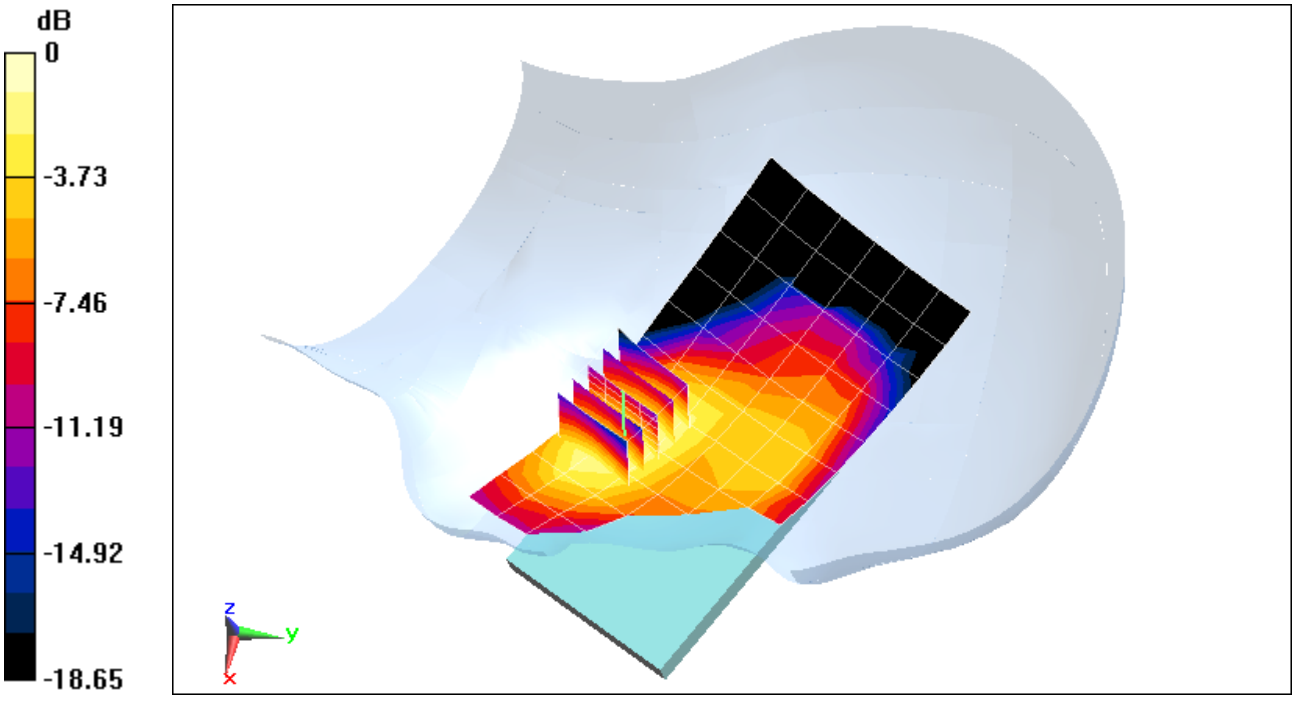
Communication System: GSM; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.399 S/m; ε_r = 40.231; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-17-2013; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GSM 1900, Left Head, Cheek, 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 = 8.337 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.090 W/kg



0 dB = 0.0991 W/kg = -10.04 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

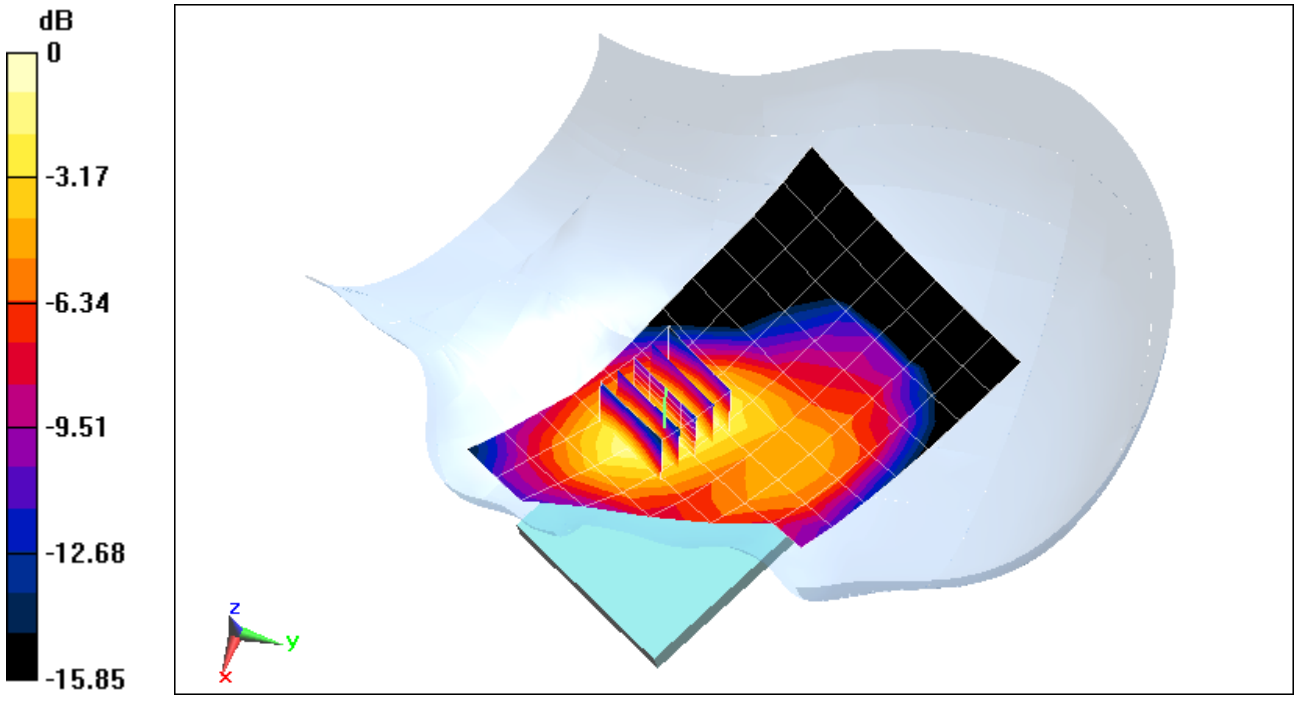
Communication System: UMTS; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.399 S/m; ε_r = 40.231; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-17-2013; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Left Head, Cheek, Mid.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.341 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.197 W/kg



0 dB = 0.211 W/kg = -6.76 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

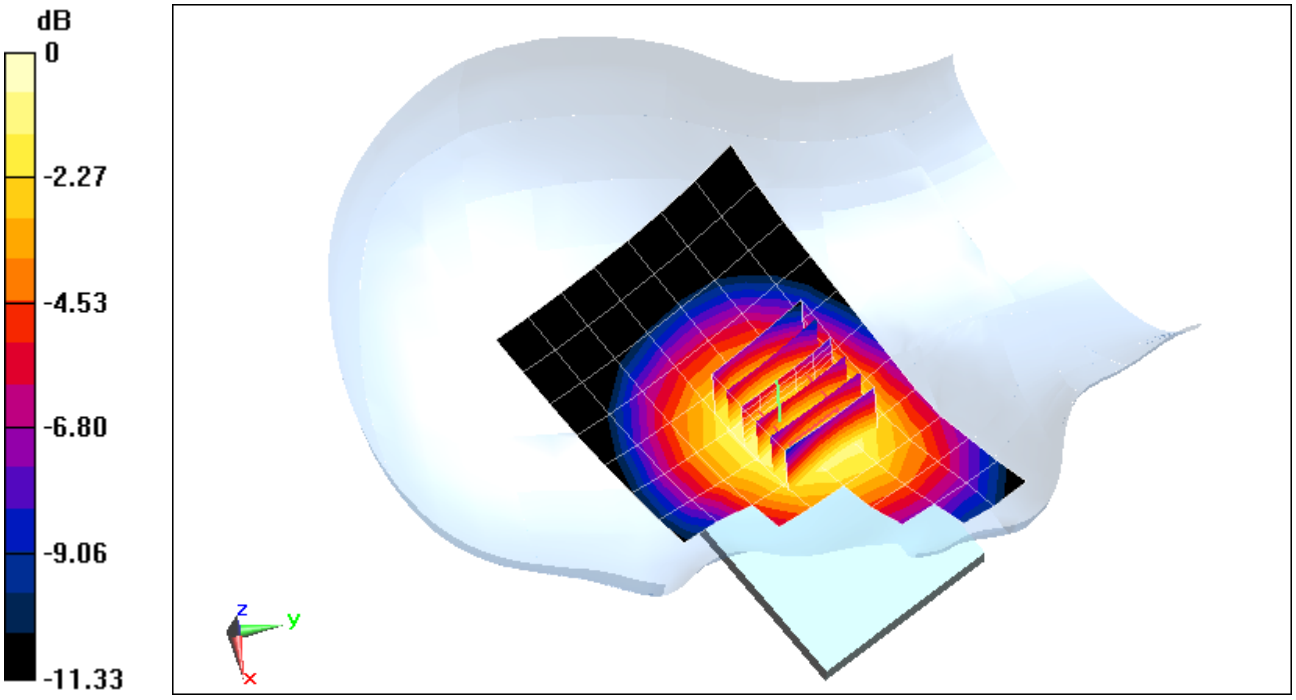
Communication System: LTE Band 26; Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 0.913$ S/m; $\varepsilon_r = 40.907$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-18-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN3920; ConvF(9.58, 9.58, 9.58); Calibrated: 2/27/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 26, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.467 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.410 W/kg
SAR(1 g) = 0.324 W/kg



0 dB = 0.336 W/kg = -4.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

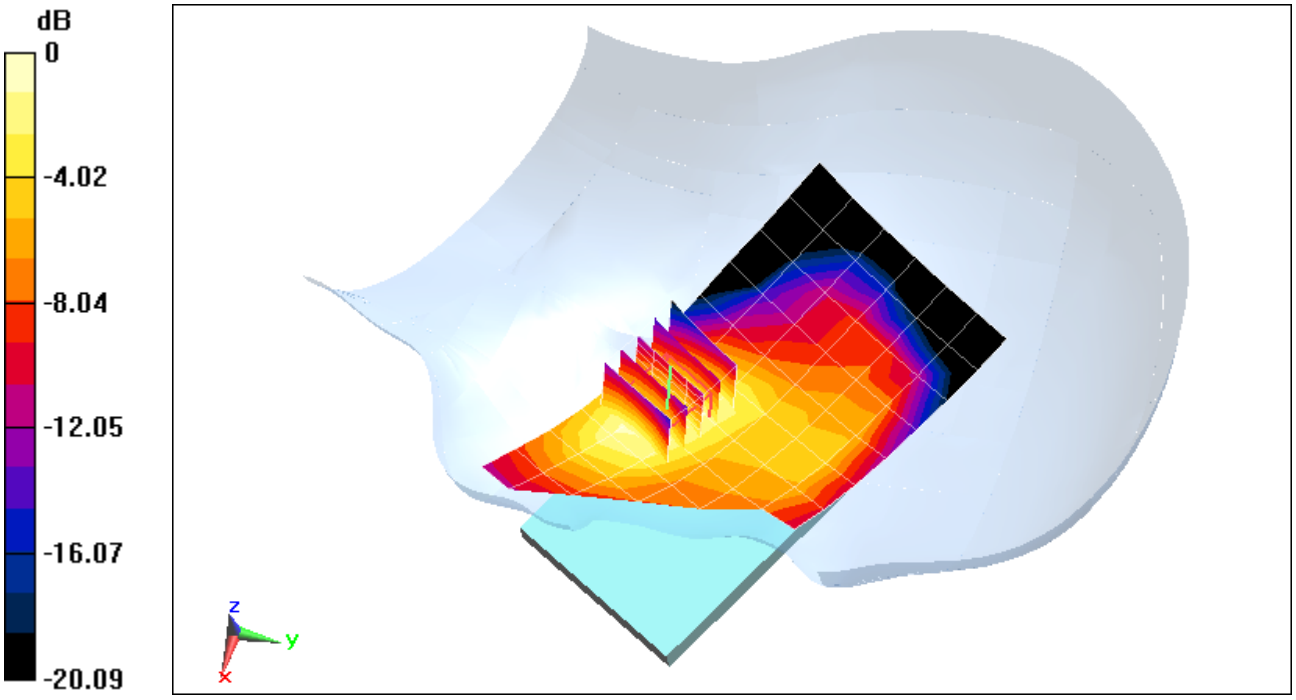
Communication System: LTE Band 25 (PCS); Frequency: 1910 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1910 MHz; σ = 1.428 S/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-17-2013; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 25 (PCS), Left Head, Cheek, High.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.354 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.450 W/kg
SAR(1 g) = 0.287 W/kg



0 dB = 0.313 W/kg = -5.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 151

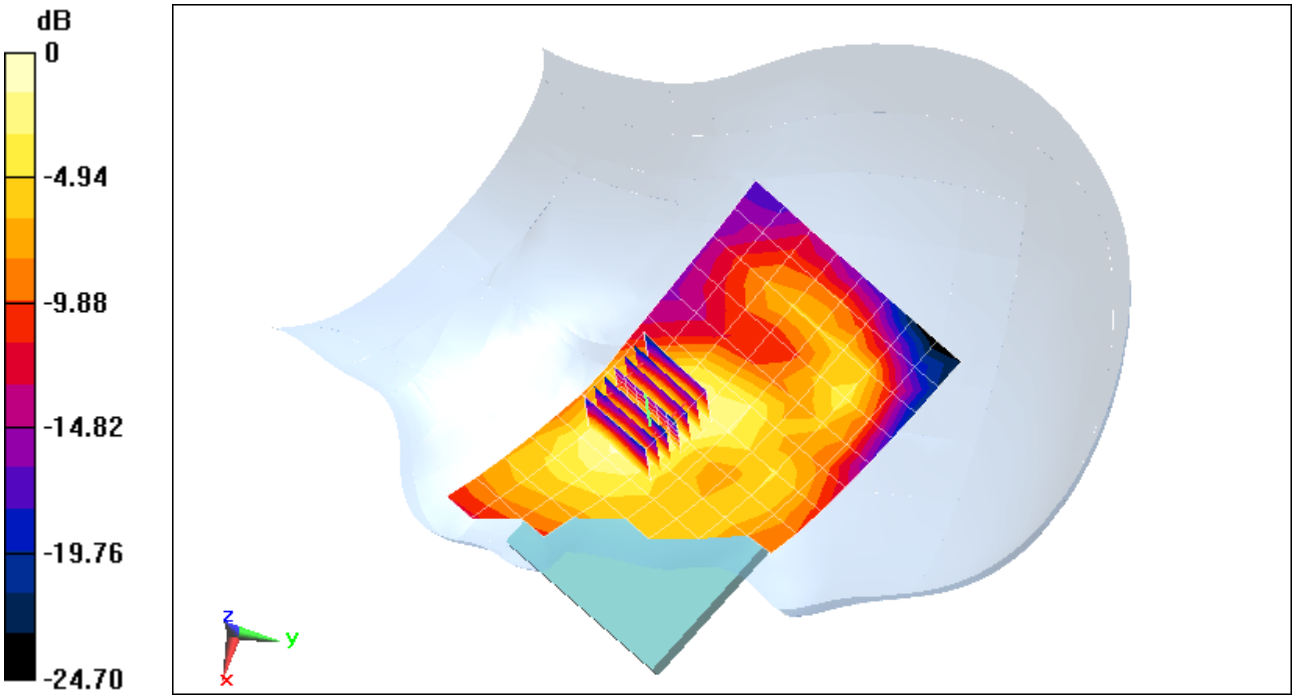
Communication System: LTE Band 41; Frequency: 2549.5 MHz;Duty Cycle: 1:1.59
Medium: 2600 Head Medium parameters used (interpolated):
$f = 2549.5$ MHz; $\sigma = 1.962$ S/m; $\varepsilon_r = 38.07$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 07-18-2013; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV2 - SN3022; ConvF(4.1, 4.1, 4.1); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 41, Left Head, Cheek, Low Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

Area Scan (9x15x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.317 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.284 W/kg
SAR(1 g) = 0.151 W/kg



0 dB = 0.186 W/kg = -7.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 152

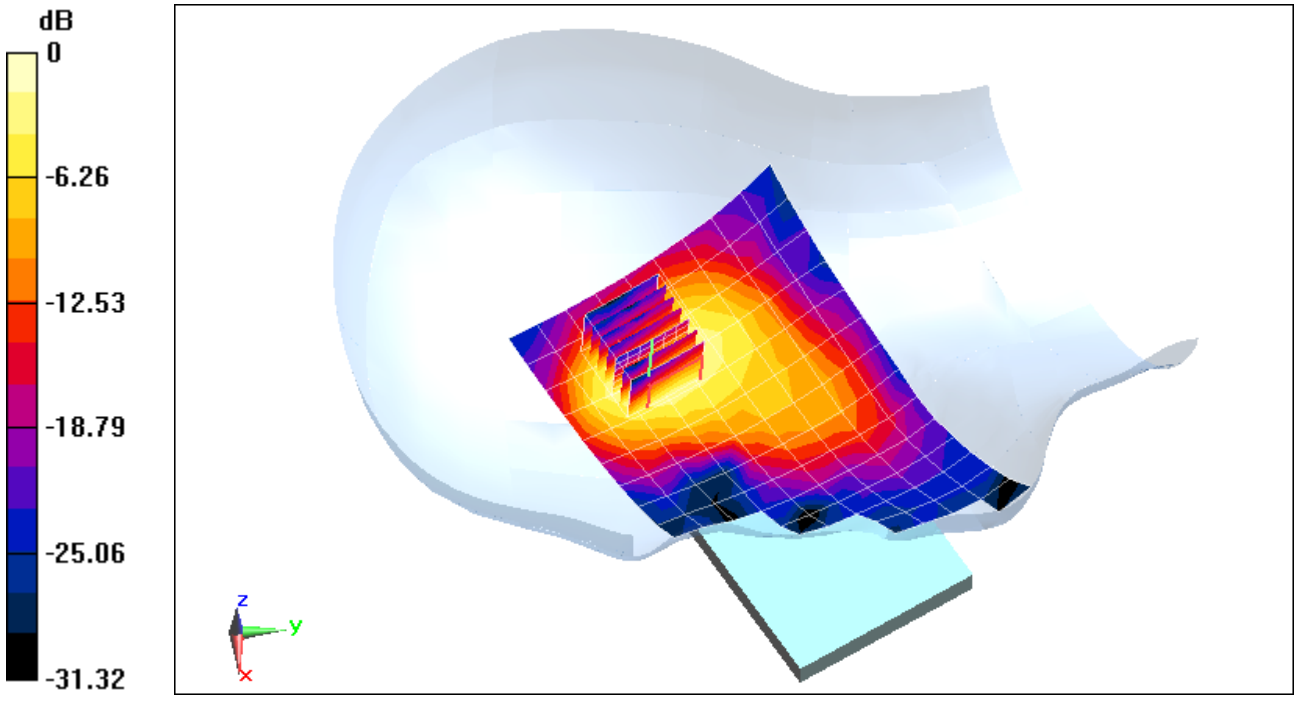
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2437$ MHz; $\sigma = 1.855$ S/m; $\varepsilon_r = 38.334$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-11-2013; Ambient Temp: 24.4°C; Tissue Temp: 24.2°C

Probe: ES3DV2 - SN3022; ConvF(4.23, 4.23, 4.23); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.868 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.530 W/kg
SAR(1 g) = 0.262 W/kg



0 dB = 0.339 W/kg = -4.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 152

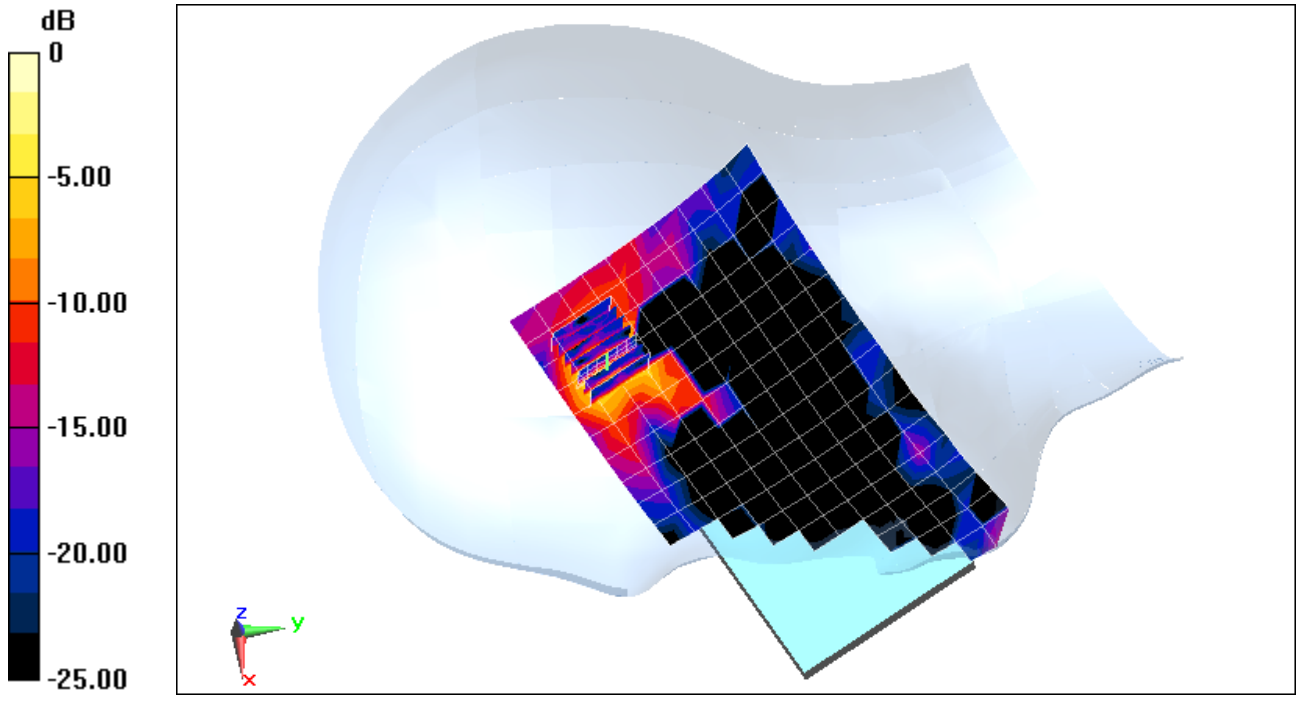
Communication System: IEEE 802.11a; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5260 MHz; σ = 4.525 S/m; ε_r = 34.989; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-08-2013; Ambient Temp: 24.8°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(4.73, 4.73, 4.73); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.3 GHz, Right Head, Cheek, Ch 52, 6 Mbps

Area Scan (11x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 5.813 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.137 W/kg



0 dB = 0.319 W/kg = -4.96 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 152

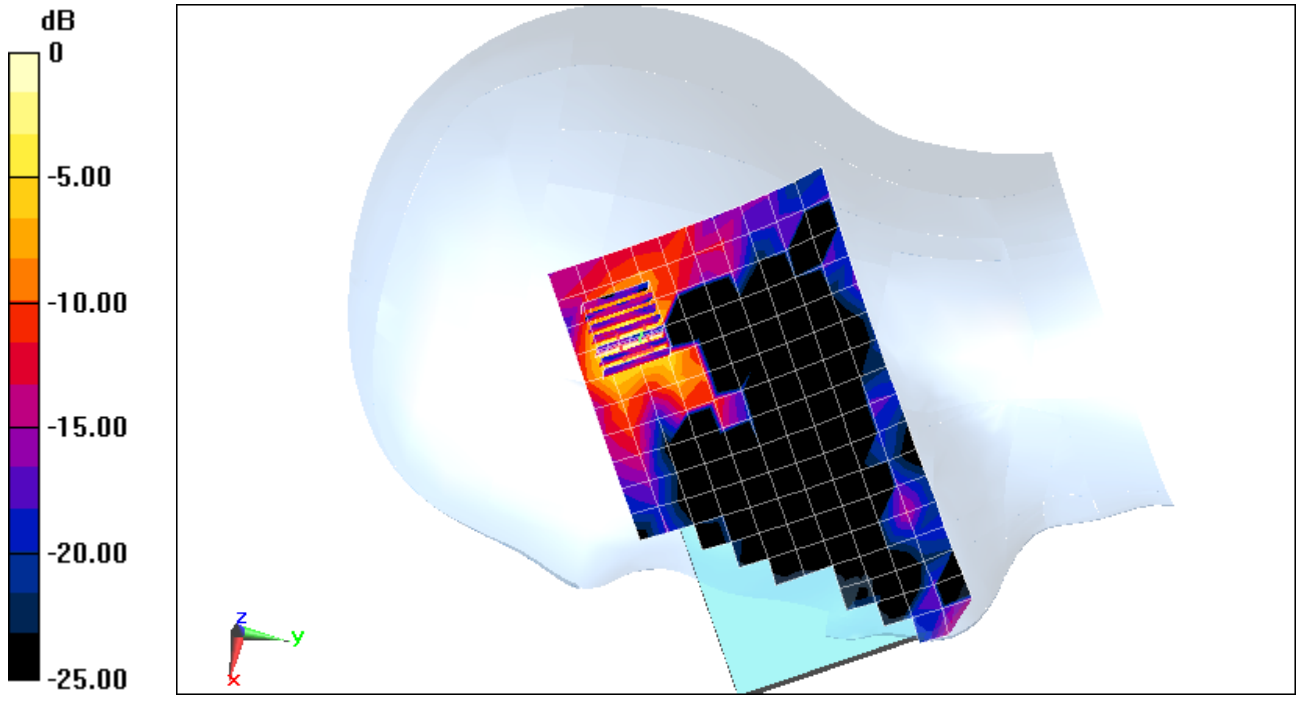
Communication System: IEEE 802.11a; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5745 MHz; σ = 5.019 S/m; ε_r = 34.293; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-08-2013; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3920; ConvF(4.02, 4.02, 4.02); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Right Head, Cheek, Ch 149, 6 Mbps

Area Scan (11x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.776 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.400 W/kg
SAR(1 g) = 0.104 W/kg



0 dB = 0.264 W/kg = -5.78 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

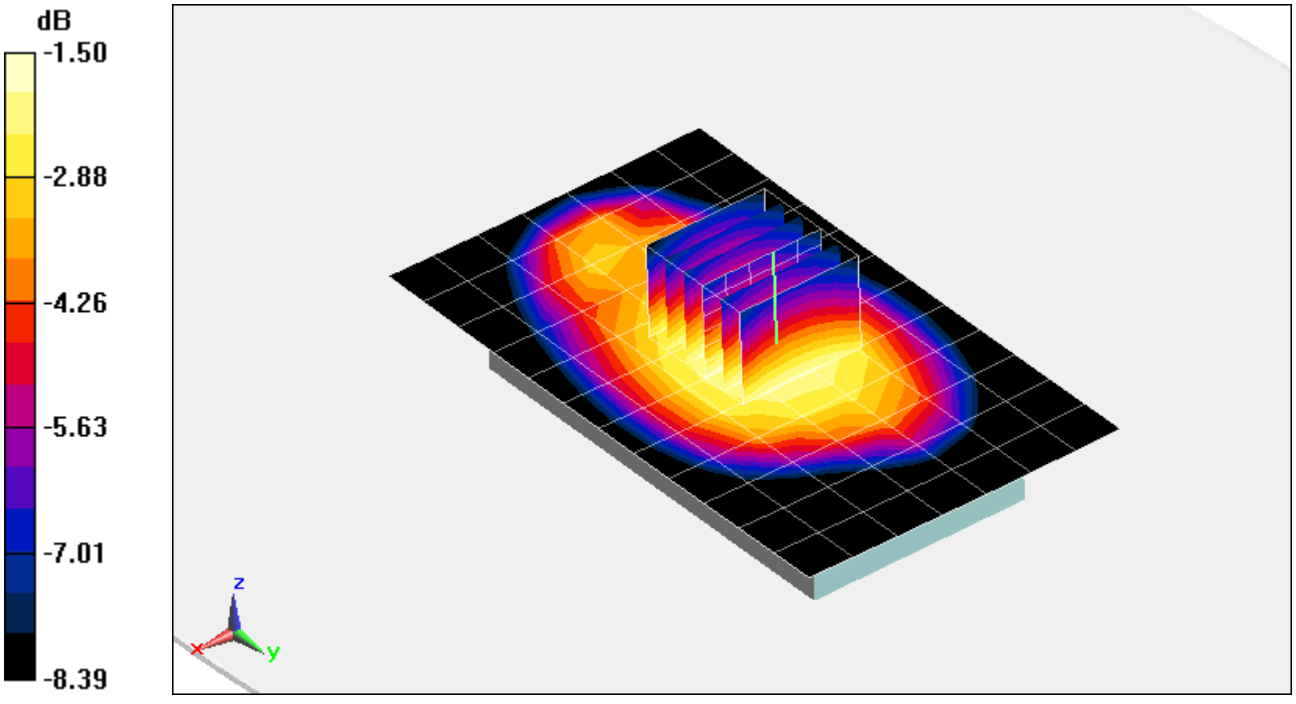
Communication System: CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 820.1$ MHz; $\sigma = 0.983$ S/m; $\varepsilon_r = 54.533$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-19-2013; Ambient Temp: 24.9°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. CDMA BC10 (§90S), Body SAR, Back side, Mid.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.373 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.677 W/kg



0 dB = 0.705 W/kg = -1.52 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

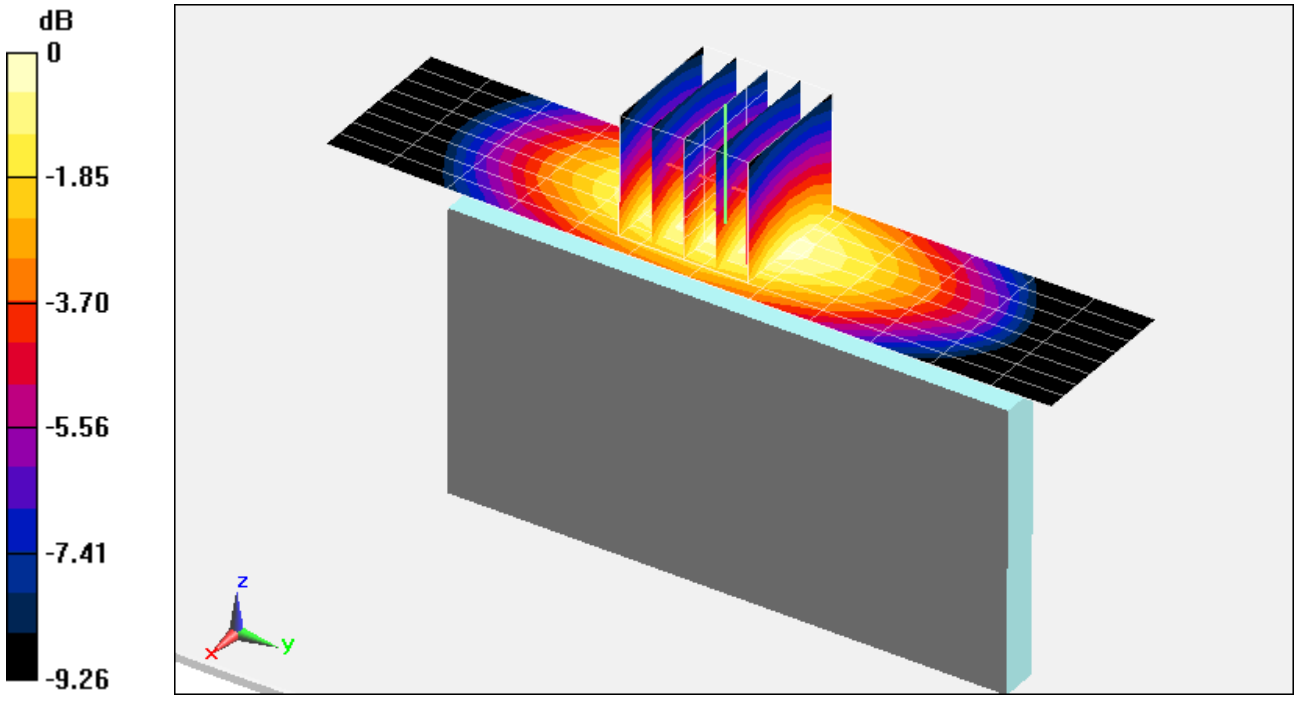
Communication System: CDMA; Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 820.1$ MHz; $\sigma = 0.983$ S/m; $\varepsilon_r = 54.479$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-23-2013; Ambient Temp: 24.1°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO Rev.0 BC10 (§90S), Body SAR, Right Edge, Mid.ch

Area Scan (9x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.033 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.974 W/kg



0 dB = 1.04 W/kg = 0.17 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

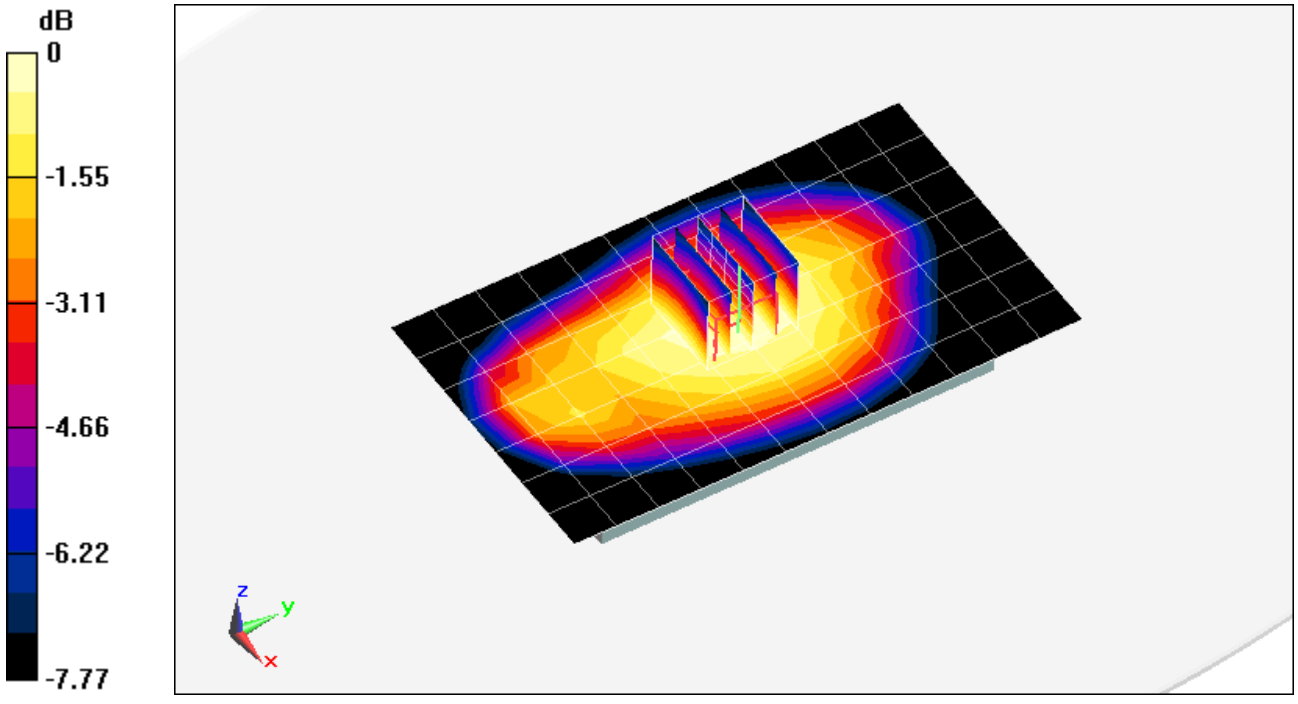
Communication System: CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.999$ S/m; $\varepsilon_r = 54.352$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-19-2013; Ambient Temp: 24.9°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. CDMA BC0 (§22H), Body SAR, Back side, Mid.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.234 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.584 W/kg
SAR(1 g) = 0.467 W/kg



0 dB = 0.488 W/kg = -3.12 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

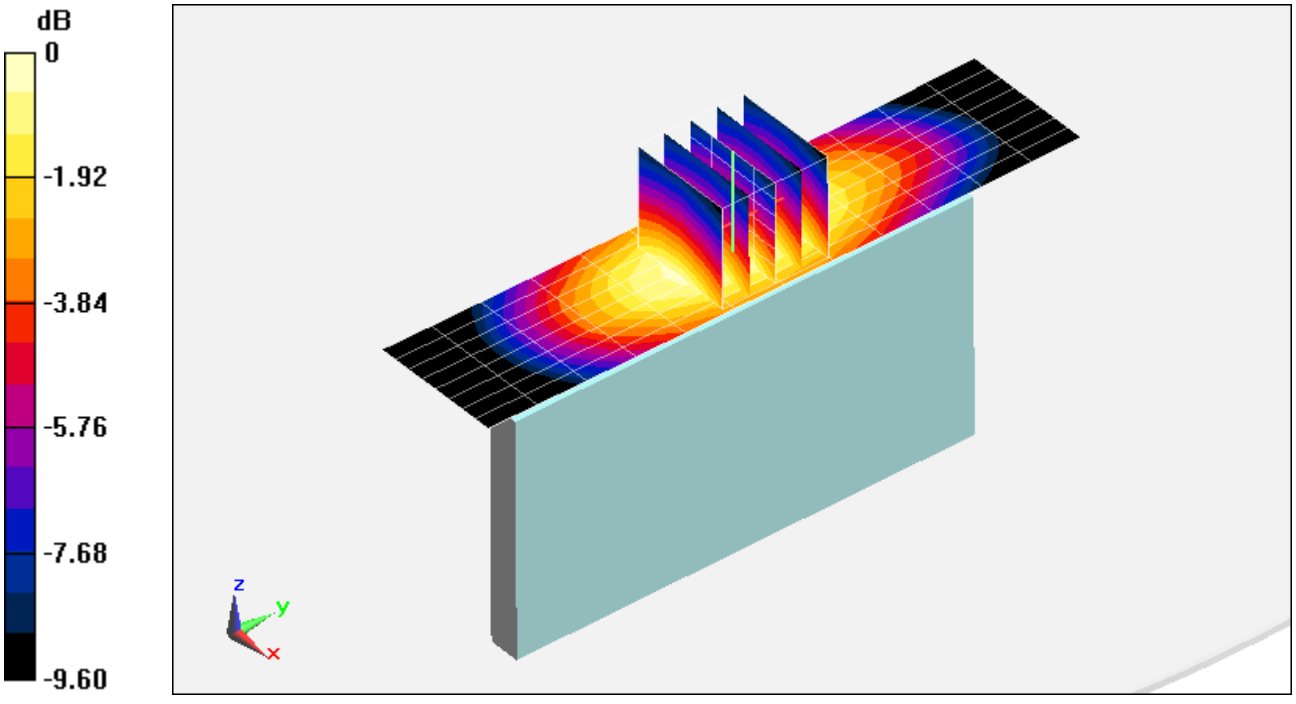
Communication System: CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 0.999$ S/m; $\varepsilon_r = 54.352$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-19-2013; Ambient Temp: 24.9°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO Rev.0 BC0 (§22H), Body SAR, Right Edge, Mid.ch

Area Scan (9x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.456 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.972 W/kg
SAR(1 g) = 0.693 W/kg



0 dB = 0.733 W/kg = -1.35 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

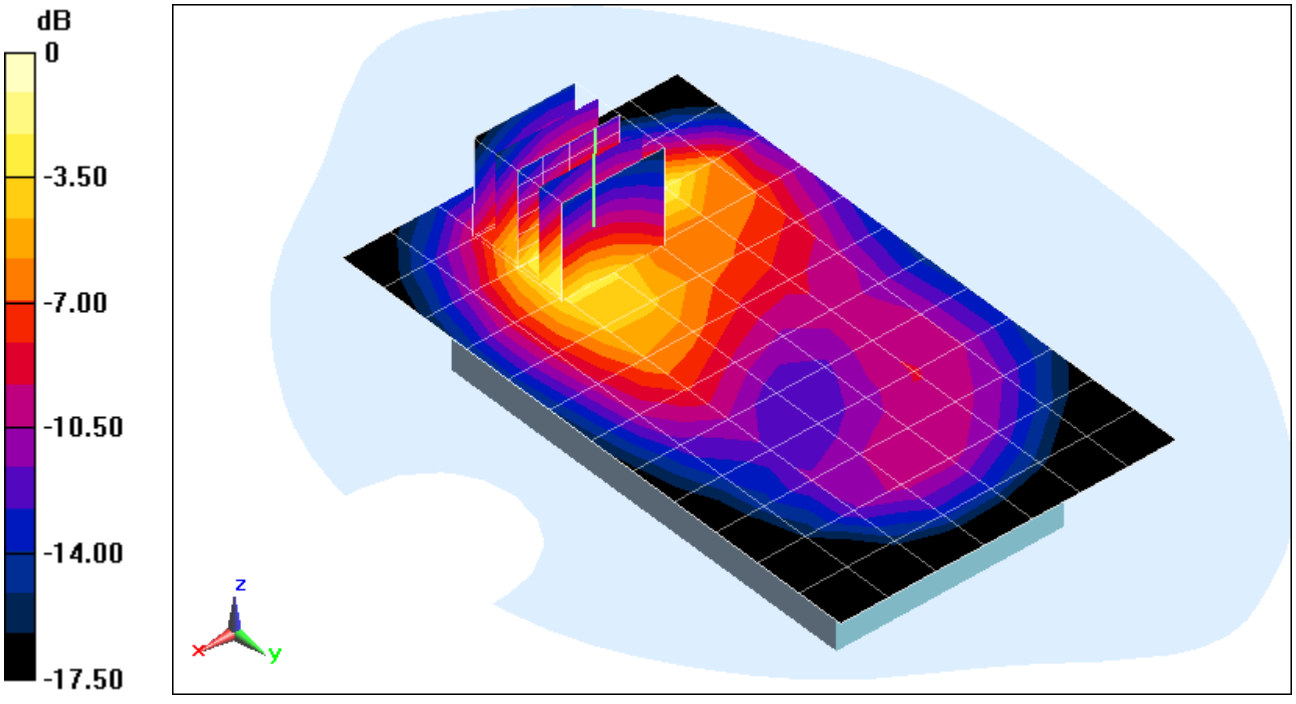
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
$f = 1908.75$ MHz; $\sigma = 1.551$ S/m; $\varepsilon_r = 54.036$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: PCS CDMA, Body SAR, Back side, High.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.215 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 1.02 W/kg



0 dB = 1.15 W/kg = 0.61 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 150

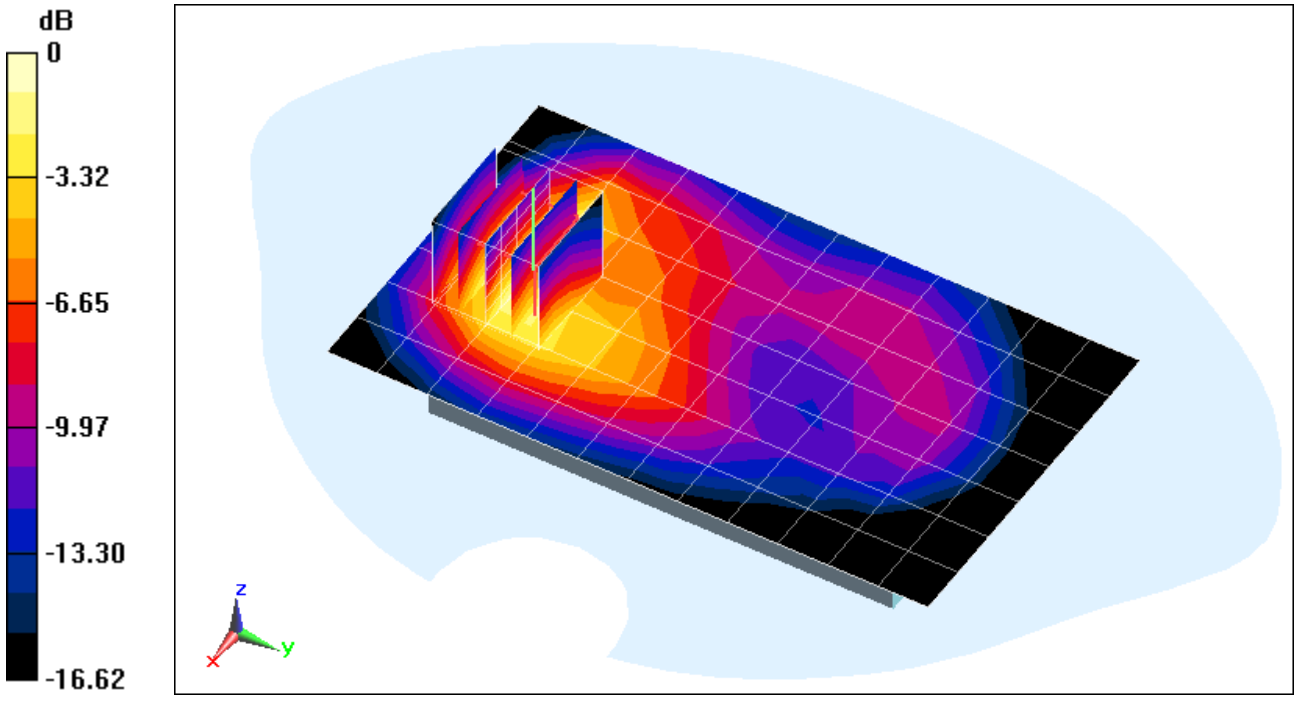
Communication System: PCS CDMA; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; σ = 1.551 S/m; ε_r = 54.036; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO Rev.0, Body SAR, Back side, High.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.047 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 1.06 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

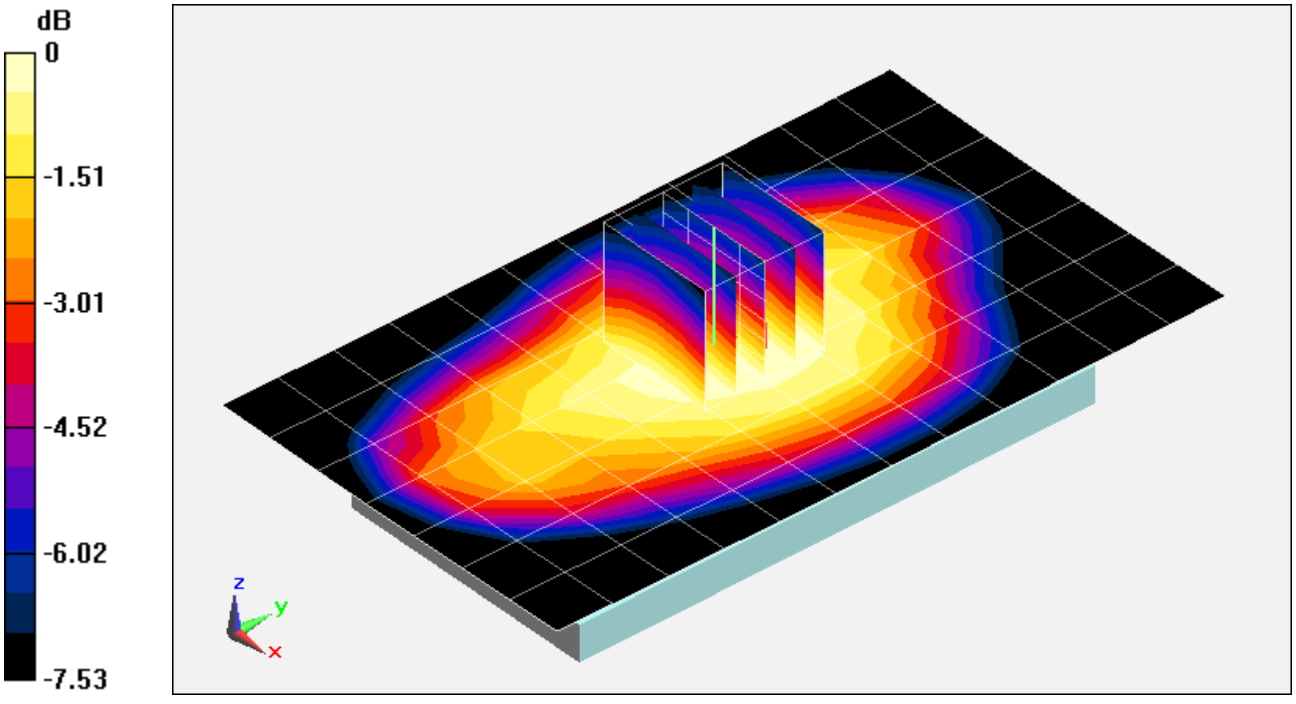
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 824.2 MHz; σ = 1 S/m; ε_r = 55.619; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.136 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.572 W/kg
SAR(1 g) = 0.467 W/kg



0 dB = 0.488 W/kg = -3.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

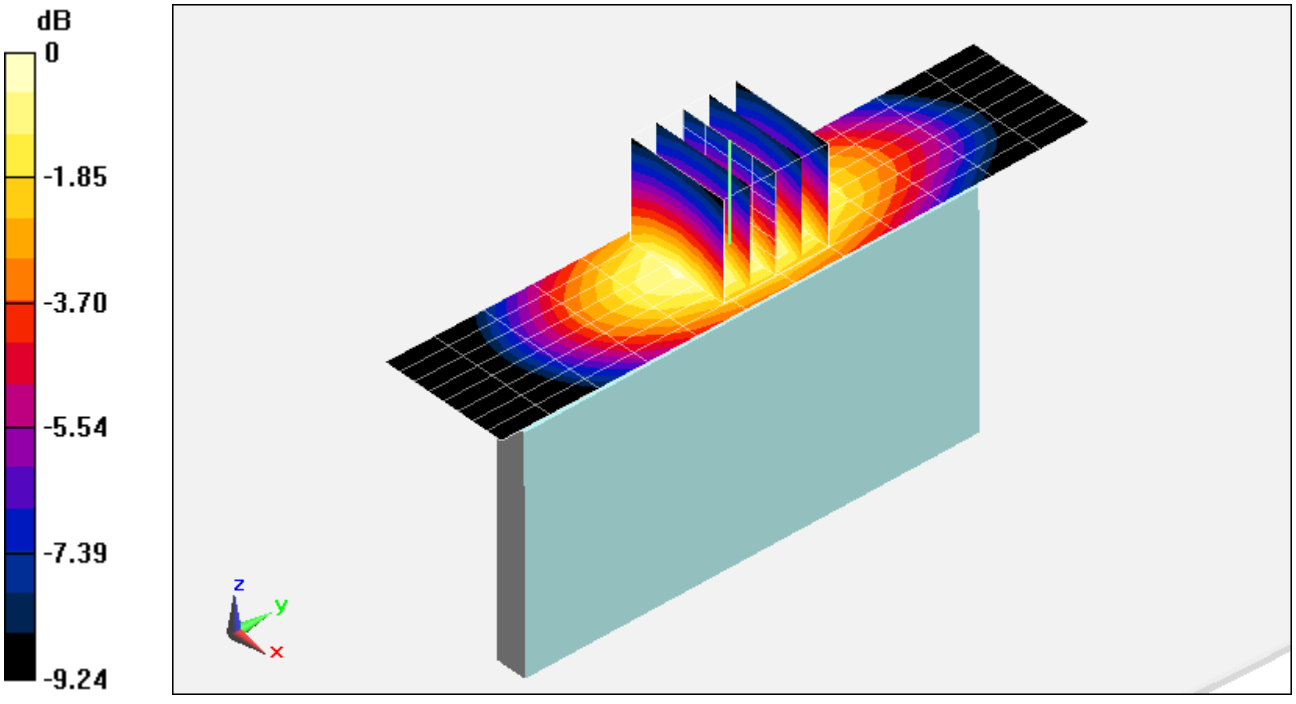
Communication System: GSM850 GPRS; 2 Tx slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
$f = 824.2$ MHz; $\sigma = 1$ S/m; $\varepsilon_r = 55.619$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.333 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.952 W/kg
SAR(1 g) = 0.691 W/kg



0 dB = 0.738 W/kg = -1.32 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

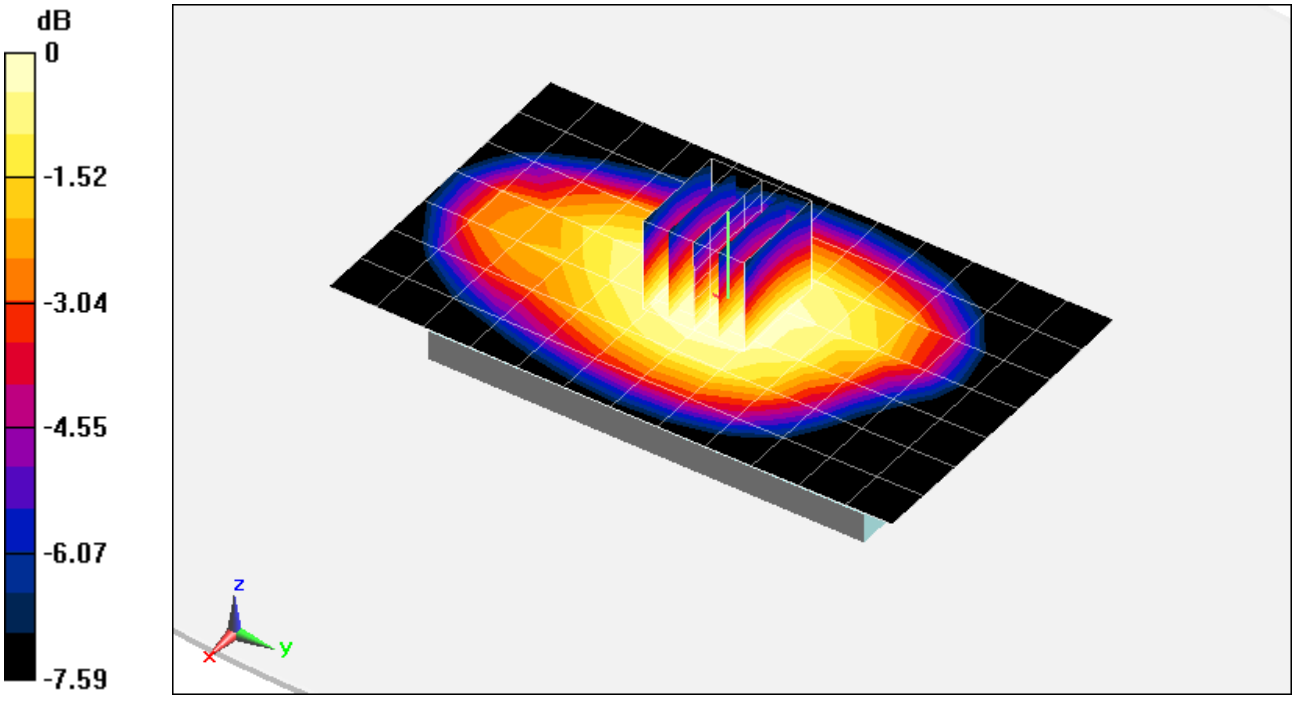
Communication System: UMTS; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.013$ S/m; $\varepsilon_r = 55.505$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.685 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.499 W/kg
SAR(1 g) = 0.404 W/kg



0 dB = 0.422 W/kg = -3.75 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

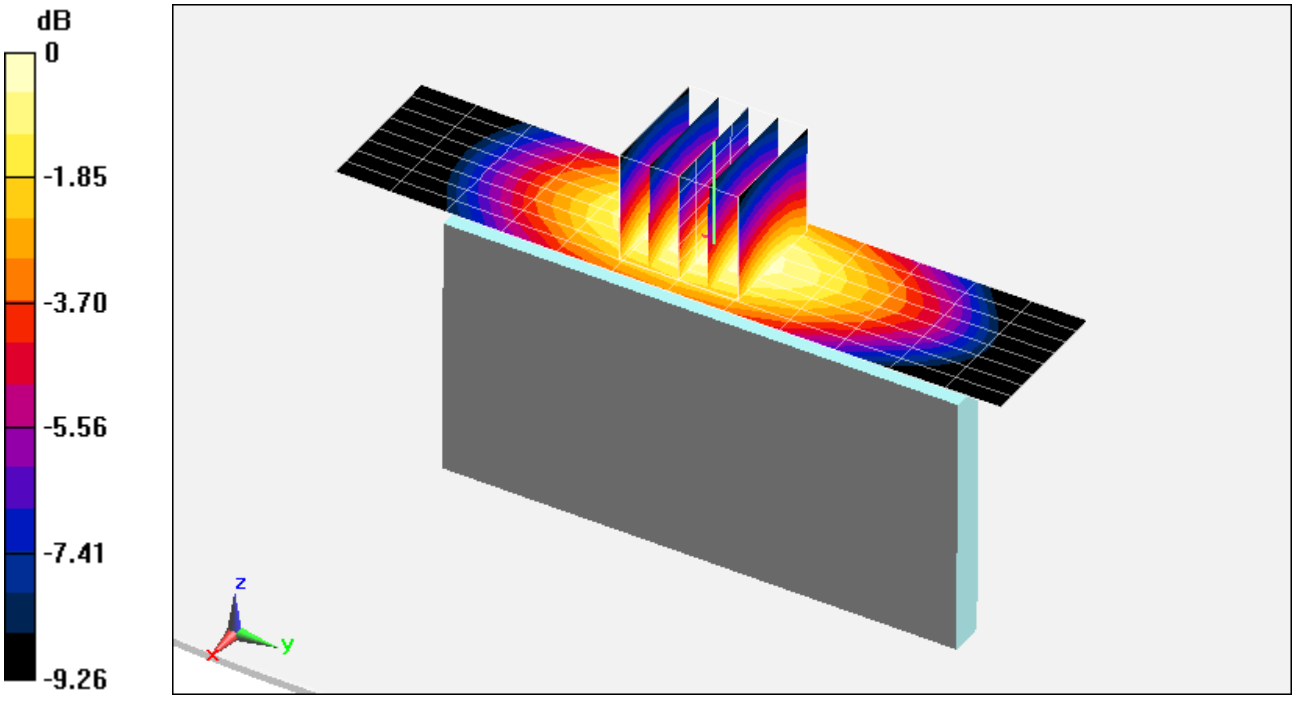
Communication System: UMTS; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.013$ S/m; $\varepsilon_r = 55.505$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.408 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.818 W/kg
SAR(1 g) = 0.592 W/kg



0 dB = 0.632 W/kg = -1.99 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

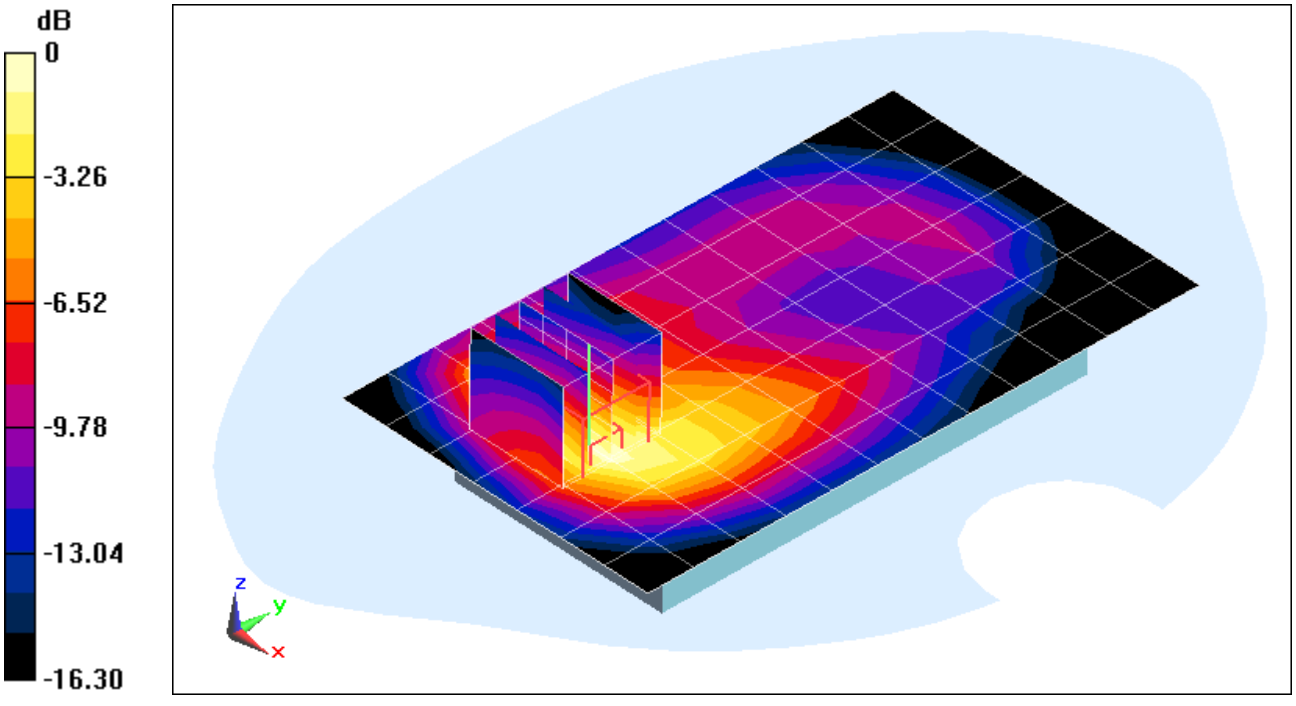
Communication System: GSM1900 GPRS; 1 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.511 S/m; ε_r = 54.125; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 1 Tx Slots

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.025 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.271 W/kg



0 dB = 0.307 W/kg = -5.13 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

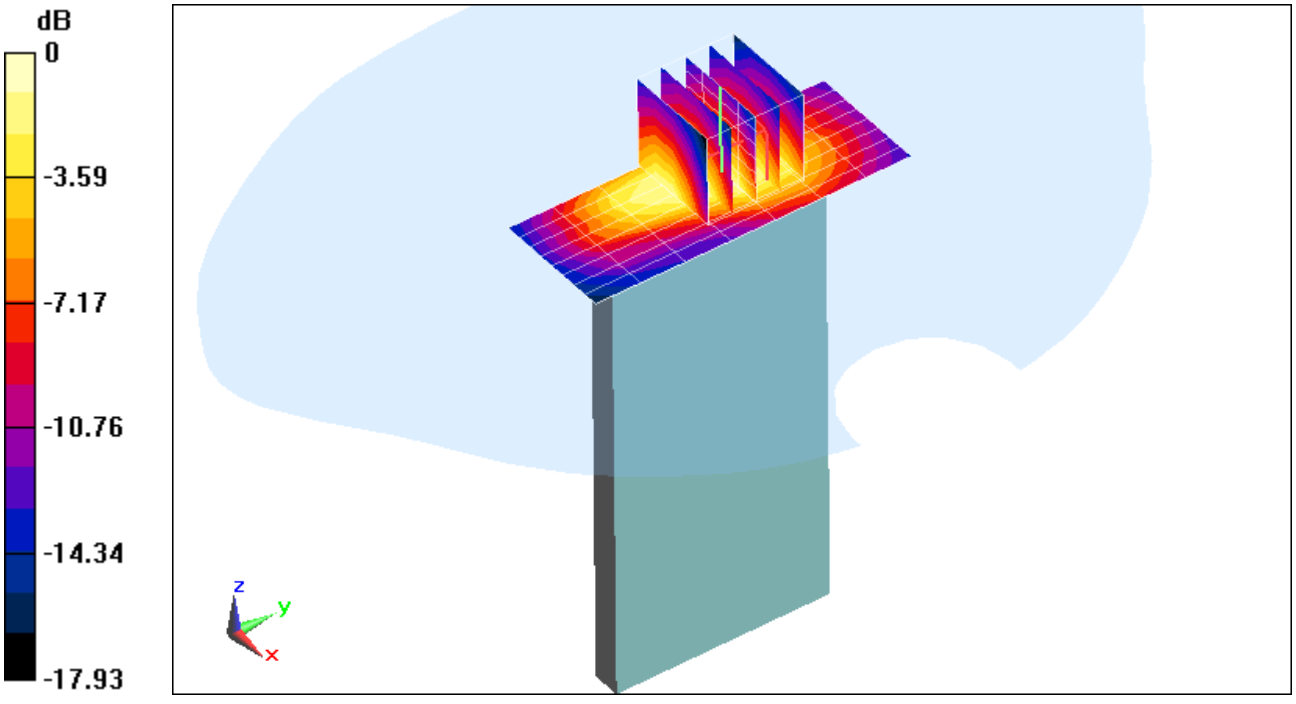
Communication System: GSM1900 GPRS; 1 Tx slots; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.511 S/m; ε_r = 54.125; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Bottom Edge, Mid.ch, 1 Tx Slots

Area Scan (9x8x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.896 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.293 W/kg



0 dB = 0.327 W/kg = -4.85 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 167

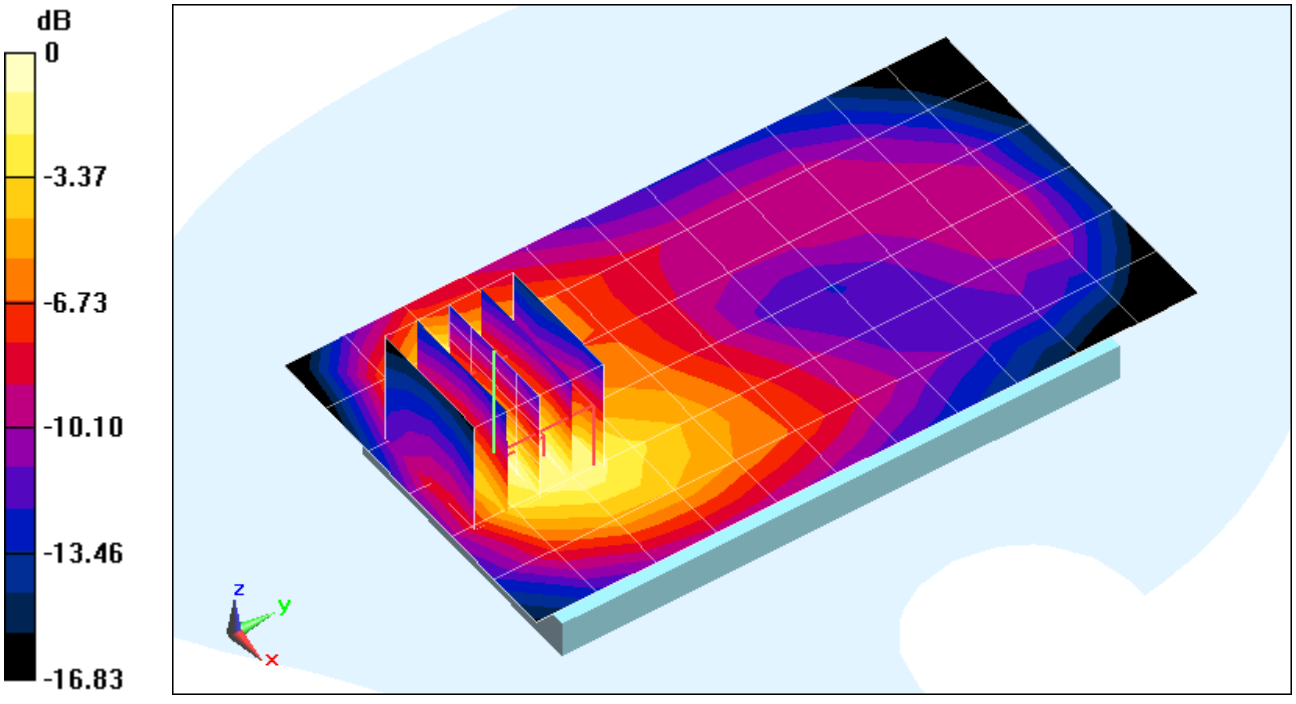
Communication System: UMTS; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.511 S/m; ε_r = 54.125; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.070 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.722 W/kg



0 dB = 0.778 W/kg = -1.09 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

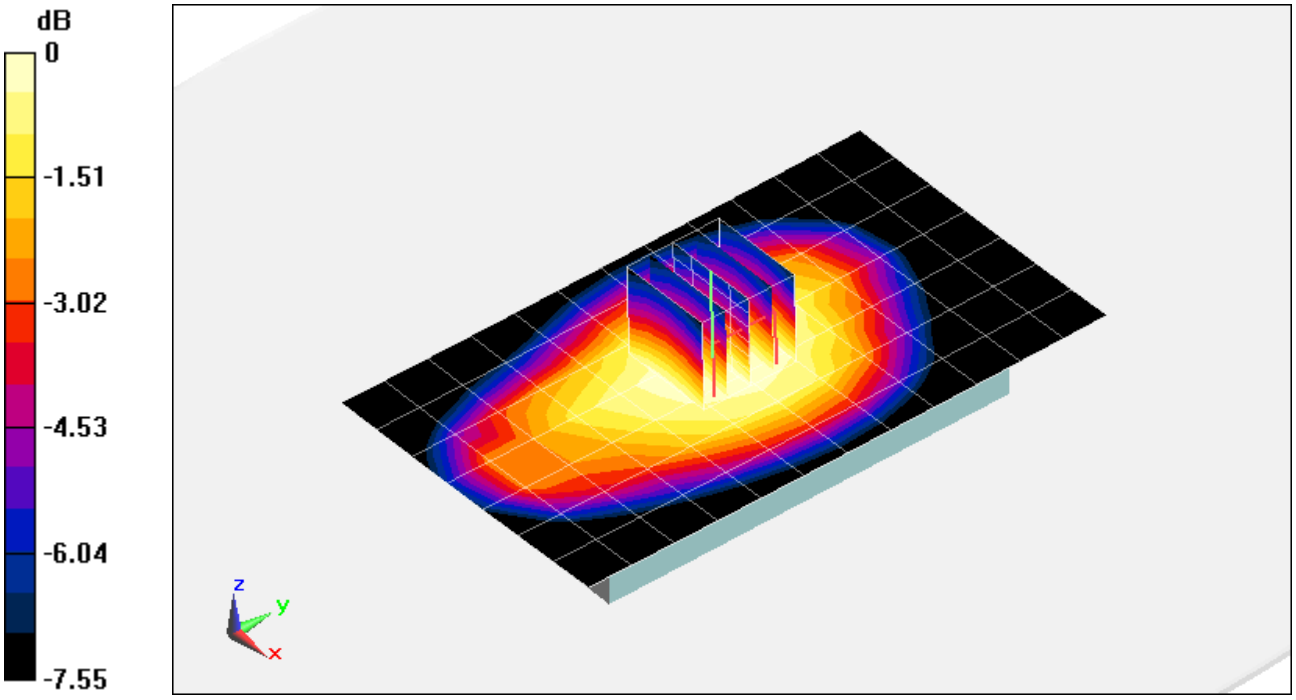
Communication System: LTE Band 26; Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 1.007$ S/m; $\varepsilon_r = 55.552$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 26, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.803 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.445 W/kg



0 dB = 0.465 W/kg = -3.33 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

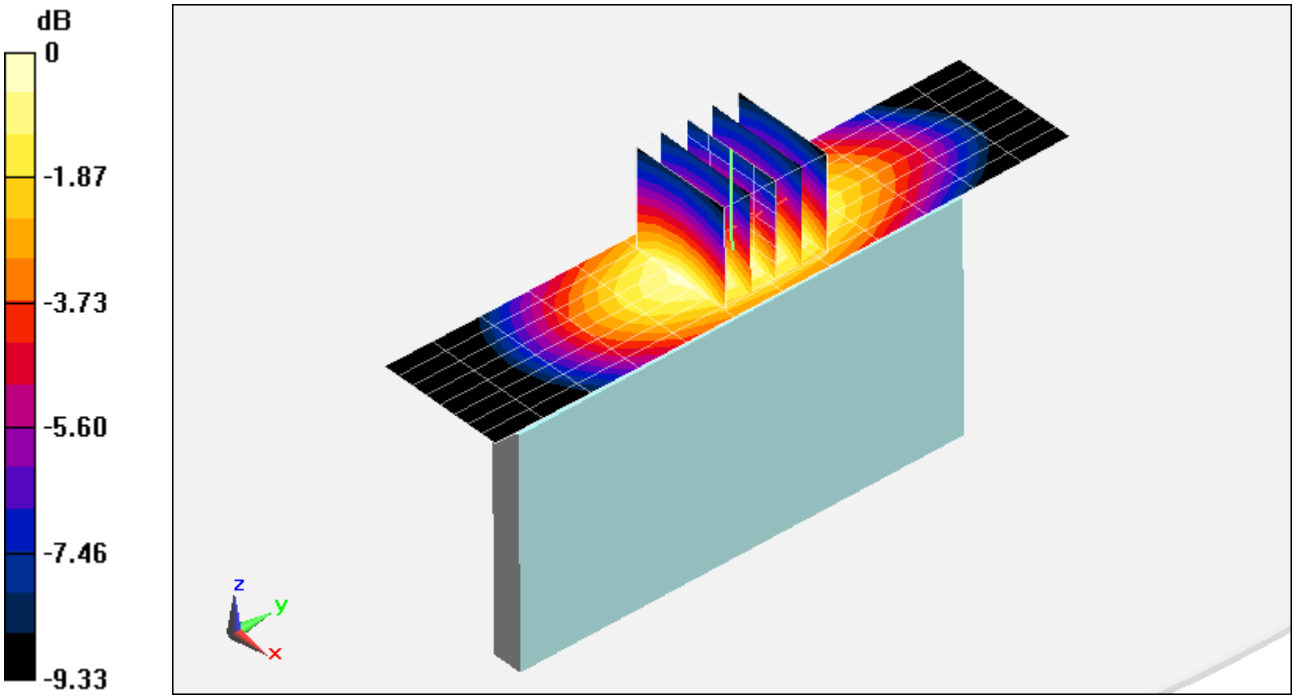
Communication System: LTE Band 26; Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 1.007$ S/m; $\varepsilon_r = 55.552$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 26, Body SAR, Right Edge, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.047 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.728 W/kg
SAR(1 g) = 0.527 W/kg



0 dB = 0.566 W/kg = -2.47 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

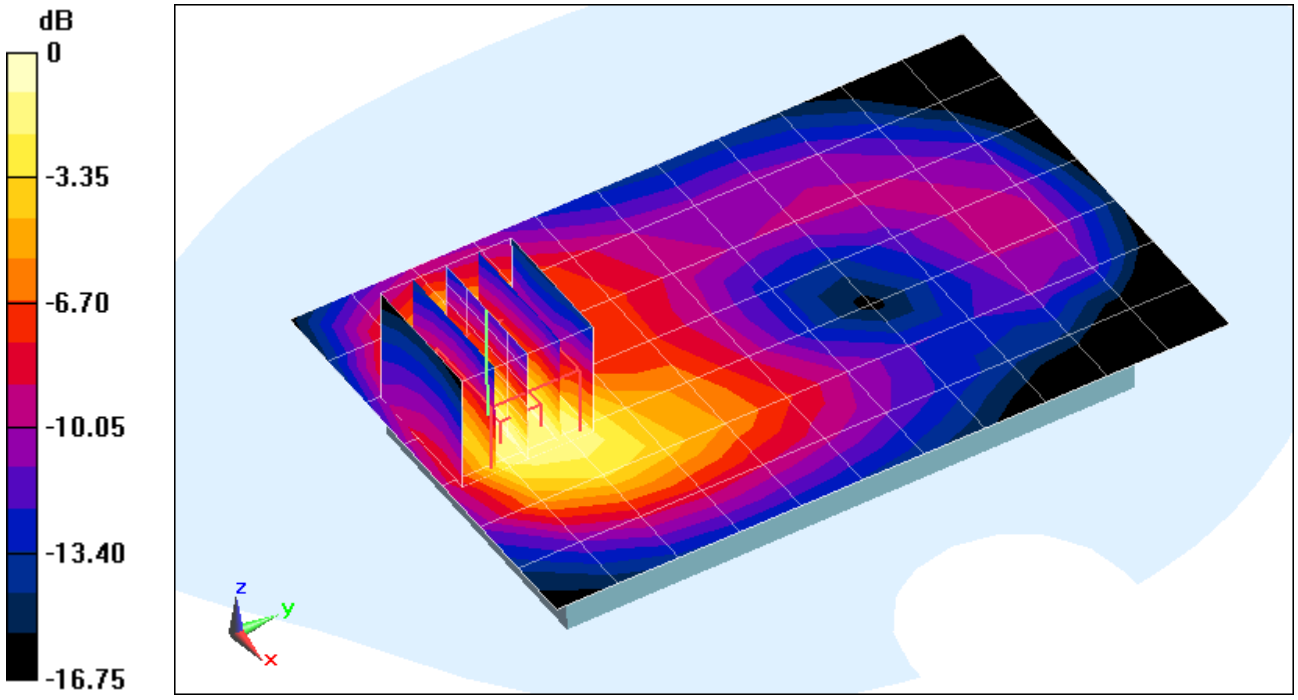
Communication System: LTE BAND 25 (PCS); Frequency: 1910 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.543 S/m; ε_r = 52.667; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 25 (PCS), Body SAR, Back side, High.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.299 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 1.11 W/kg



0 dB = 1.18 W/kg = 0.72 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 161

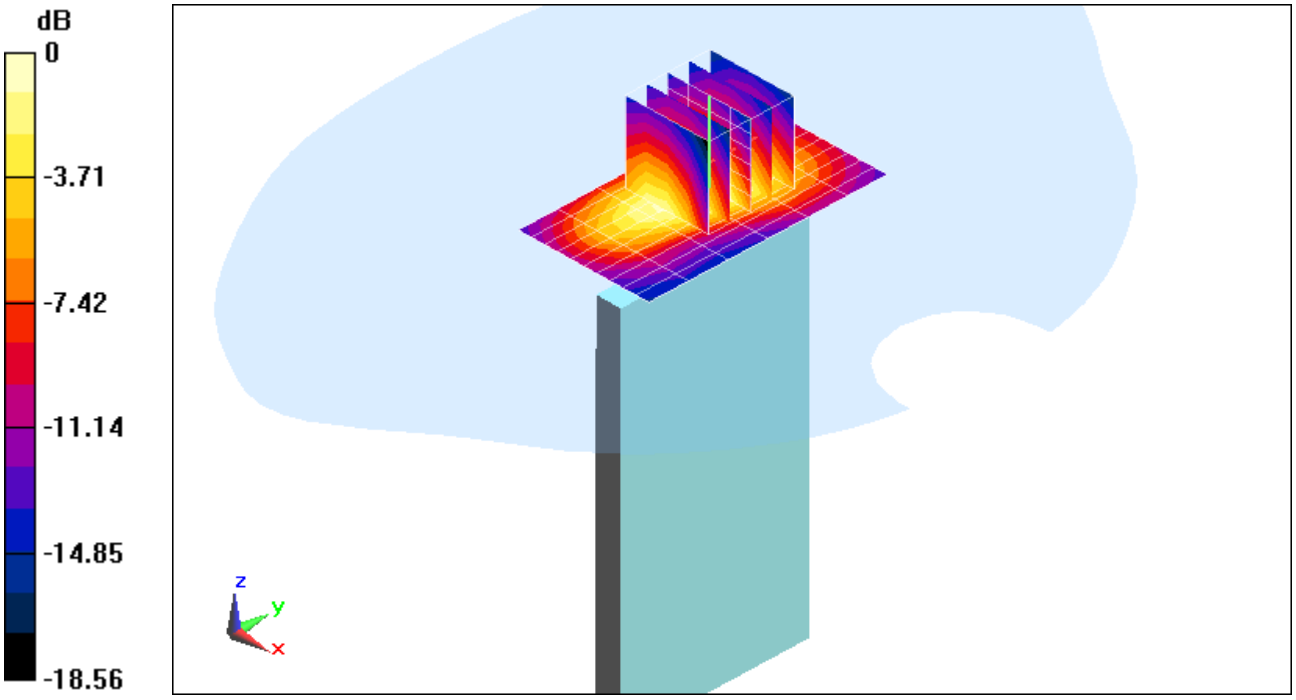
Communication System: LTE BAND 25 (PCS); Frequency: 1910 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.543 S/m; ε_r = 52.667; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2013; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 25 (PCS), Body SAR, Bottom Edge, High.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (11x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.714 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.98 W/kg
SAR(1 g) = 1.19 W/kg



0 dB = 1.33 W/kg = 1.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 151

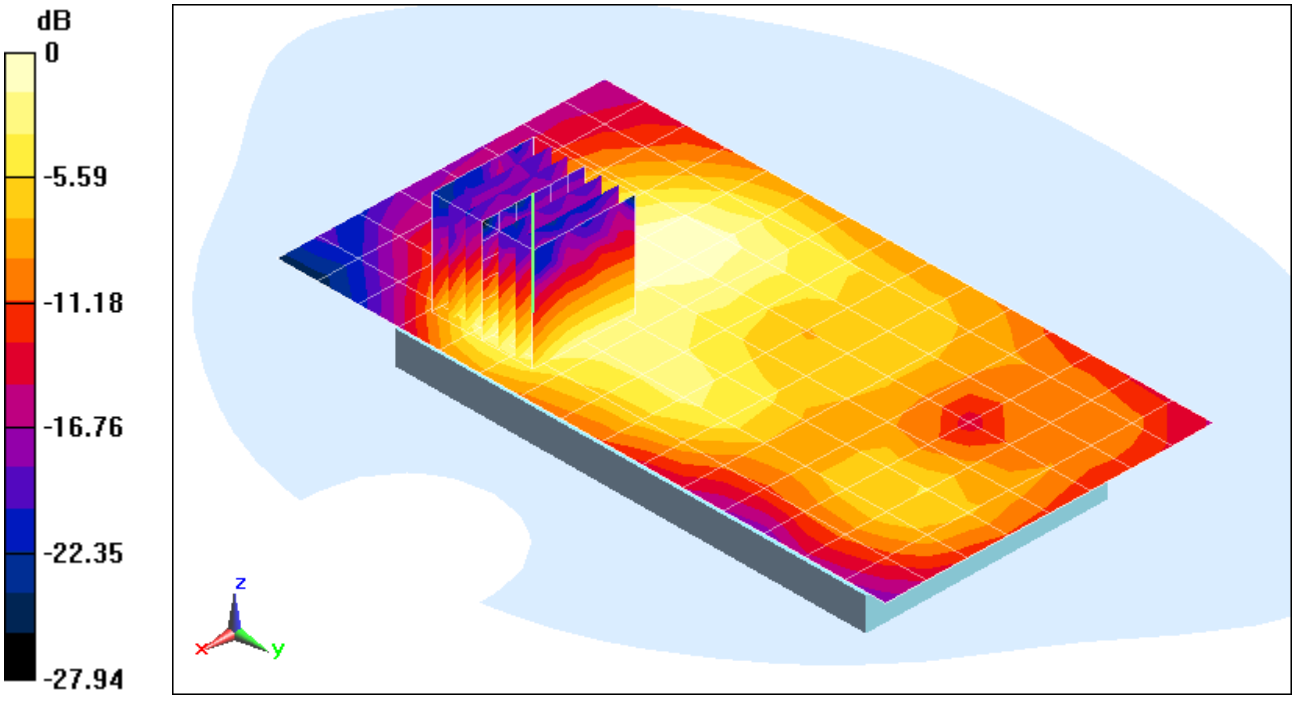
Communication System: LTE Band 41; Frequency: 2549.5 MHz;Duty Cycle: 1:1.59
Medium: 2600 Body Medium parameters used (interpolated):
$f = 2549.5$ MHz; $\sigma = 2.171$ S/m; $\varepsilon_r = 52.26$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-22-2013; Ambient Temp: 23.0°C; Tissue Temp: 22.6°C

Probe: ES3DV2 - SN3022; ConvF(3.8, 3.8, 3.8); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 41, Body SAR, Back side, Low Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.828 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.311 W/kg
SAR(1 g) = 0.133 W/kg



0 dB = 0.171 W/kg = -7.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 151

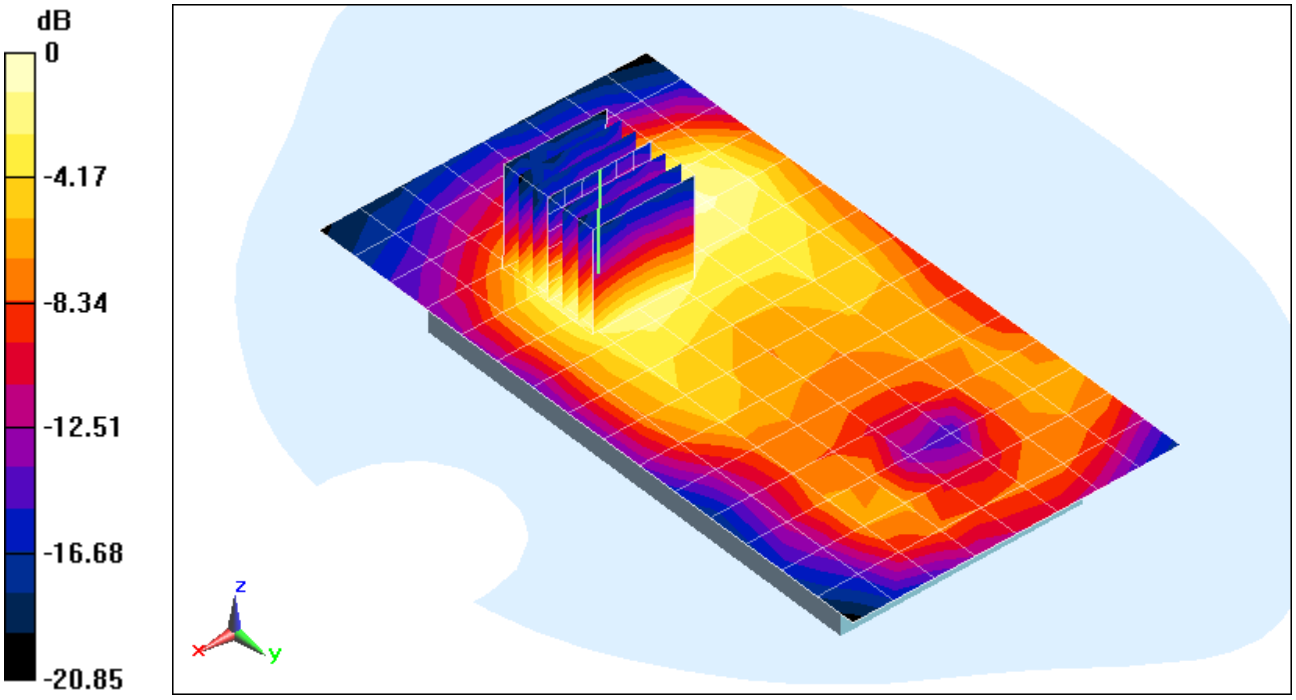
Communication System: LTE Band 41; Frequency: 2549.5 MHz;Duty Cycle: 1:1.59
Medium: 2600 Body Medium parameters used (interpolated):
$f = 2549.5$ MHz; $\sigma = 2.171$ S/m; $\varepsilon_r = 52.26$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-22-2013; Ambient Temp: 23.0°C; Tissue Temp: 22.6°C

Probe: ES3DV2 - SN3022; ConvF(3.8, 3.8, 3.8); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 41, Body SAR, Front side, Low Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.147 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.142 W/kg



0 dB = 0.177 W/kg = -7.52 dBW/kg

DUT: ZNFLS980; Type: Portable Handset; Serial: 152

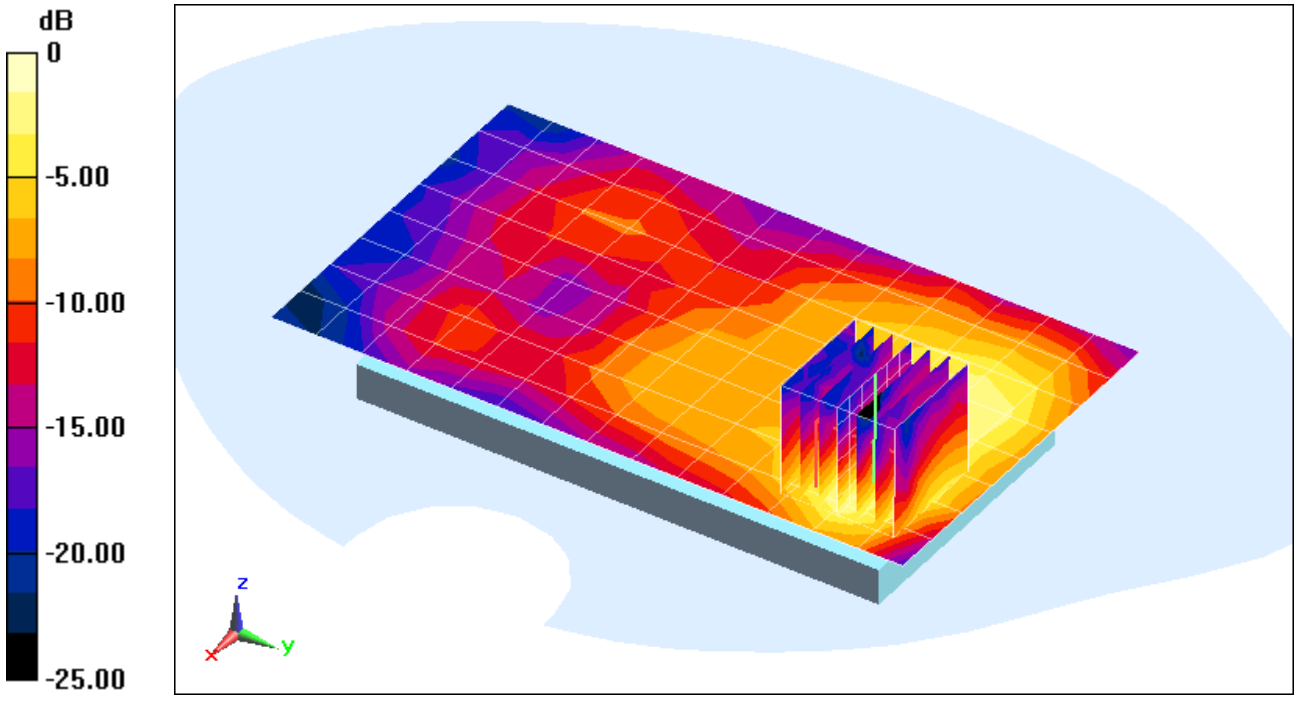
Communication System: IEEE 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
$f = 2437$ MHz; $\sigma = 2.014$ S/m; $\varepsilon_r = 52.718$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-22-2013; Ambient Temp: 23.0°C; Tissue Temp: 22.6°C

Probe: ES3DV2 - SN3022; ConvF(3.97, 3.97, 3.97); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Back Side

Area Scan (9x15x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.127 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.163 W/kg
SAR(1 g) = 0.071 W/kg



0 dB = 0.0939 W/kg = -10.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS980; Type: Portable Handset; Serial: 152

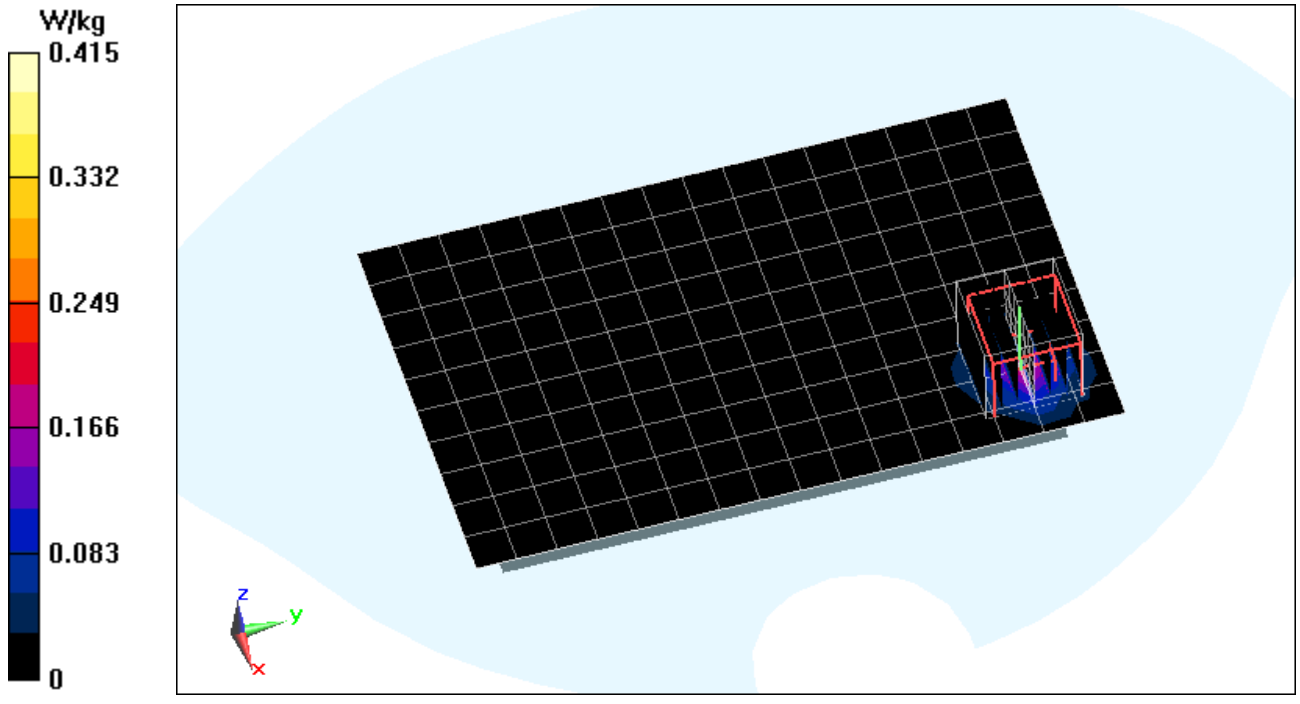
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5260 MHz; σ = 5.331 S/m; ε_r = 46.752; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.3 GHz, Body SAR, Ch 52, 6 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 5.867 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.703 W/kg
SAR(1 g) = 0.163 W/kg



DUT: ZNFLS980; Type: Portable Handset; Serial: 152

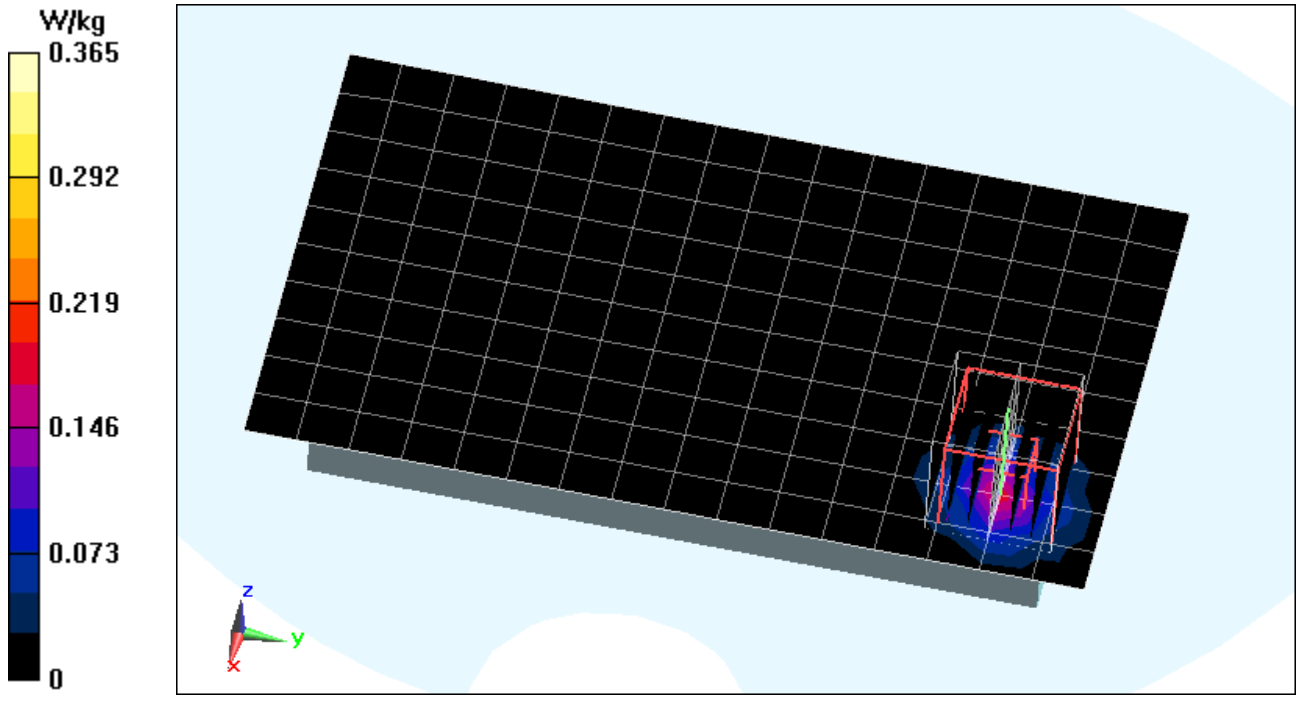
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5745 MHz; σ = 6.139 S/m; ε_r = 46.17; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3589; ConvF(3.66, 3.66, 3.66); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Ch 149, 6 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 5.278 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.135 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

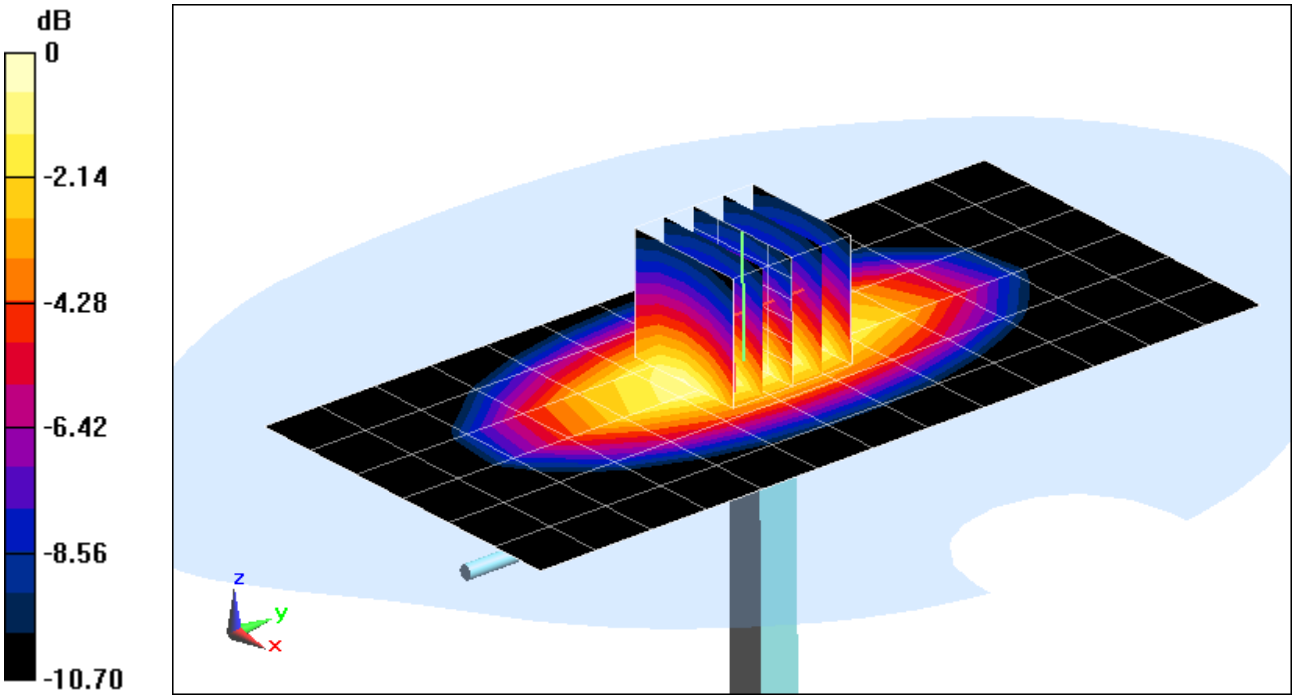
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.917 S/m; ε_r = 40.856; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-18-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN3920; ConvF(9.58, 9.58, 9.58); Calibrated: 2/27/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.971 W/kg
Deviation: 3.41%



0 dB = 1.05 W/kg = 0.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

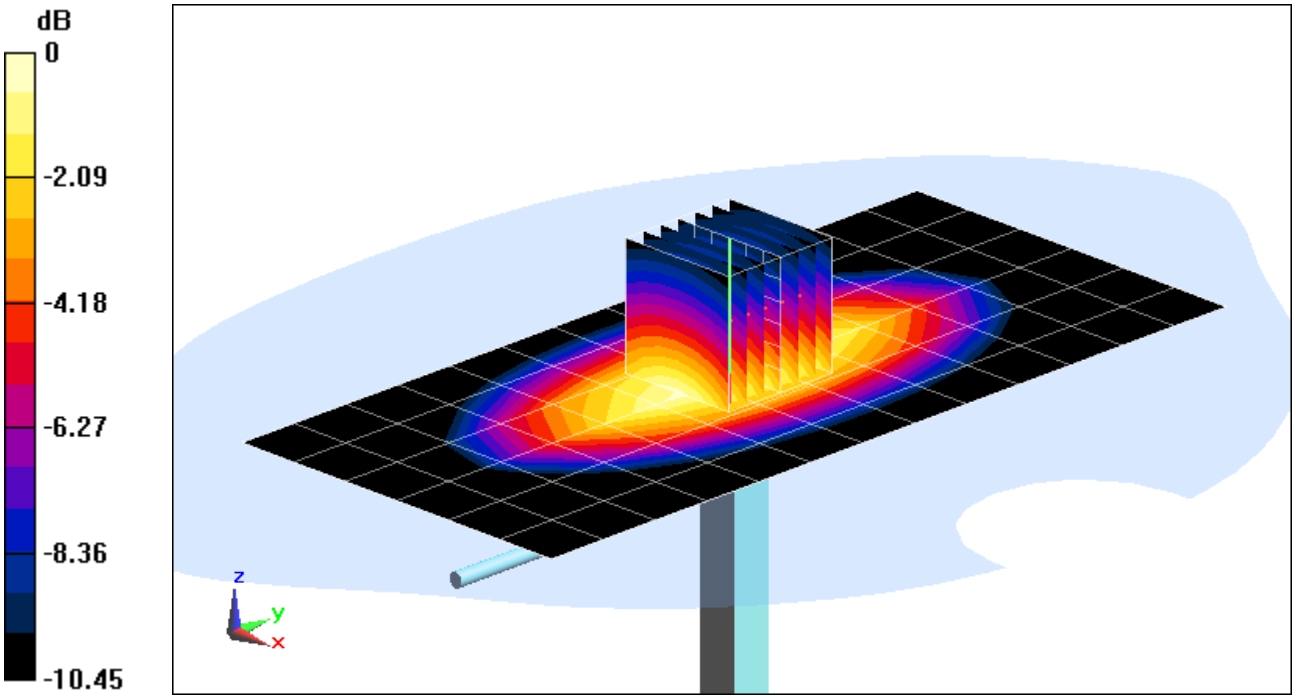
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.918 S/m; ε_r = 40.674; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-23-2013; Ambient Temp: 23.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3288; ConvF(6.41, 6.41, 6.41); Calibrated: 9/20/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/19/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.918 W/kg
Deviation: -2.24%



0 dB = 0.993 W/kg = -0.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

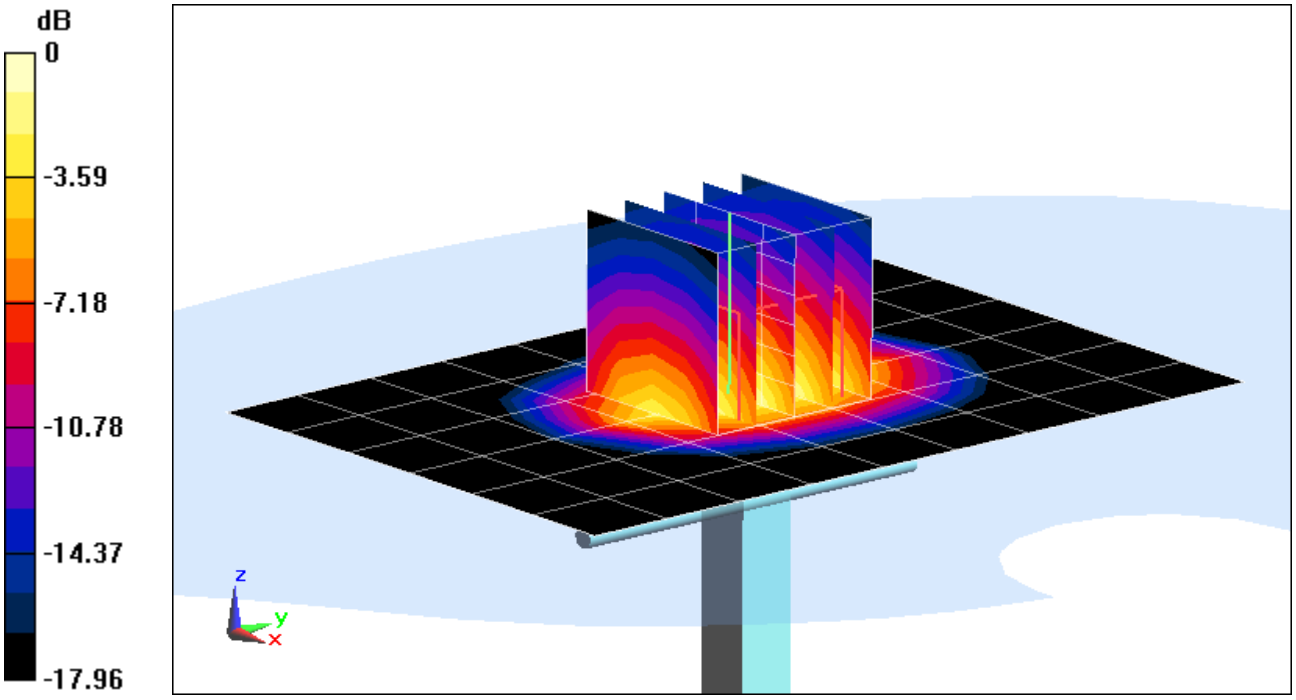
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
$f = 1900$ MHz; $\sigma = 1.418$ S/m; $\varepsilon_r = 40.144$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-17-2013; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.02 W/kg
SAR(1 g) = 3.83 W/kg
Deviation: -3.53%



0 dB = 4.27 W/kg = 6.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

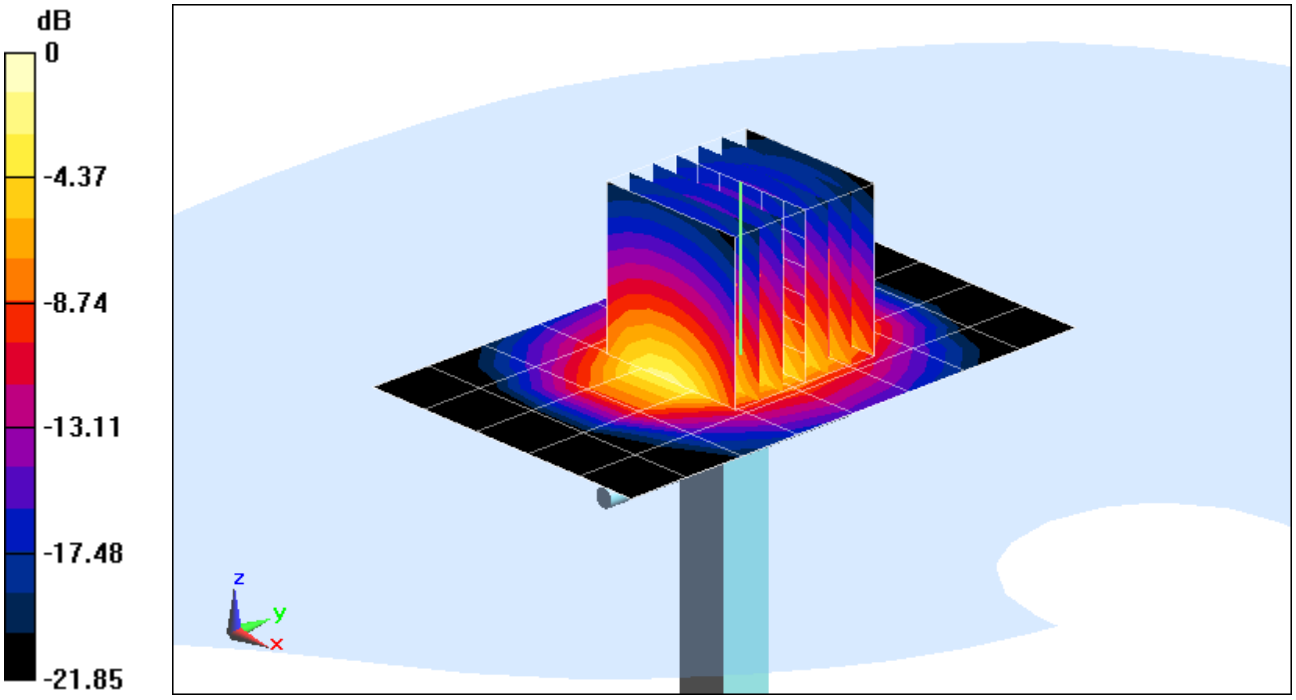
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.87 S/m; ε_r = 38.283; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2013; Ambient Temp: 24.4°C; Tissue Temp: 24.2°C

Probe: ES3DV2 - SN3022; ConvF(4.23, 4.23, 4.23); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 10.7 W/kg
SAR(1 g) = 5.16 W/kg
Deviation: -2.09%



0 dB = 6.69 W/kg = 8.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 2600 MHz; Type: D2600V2; Serial: 1004

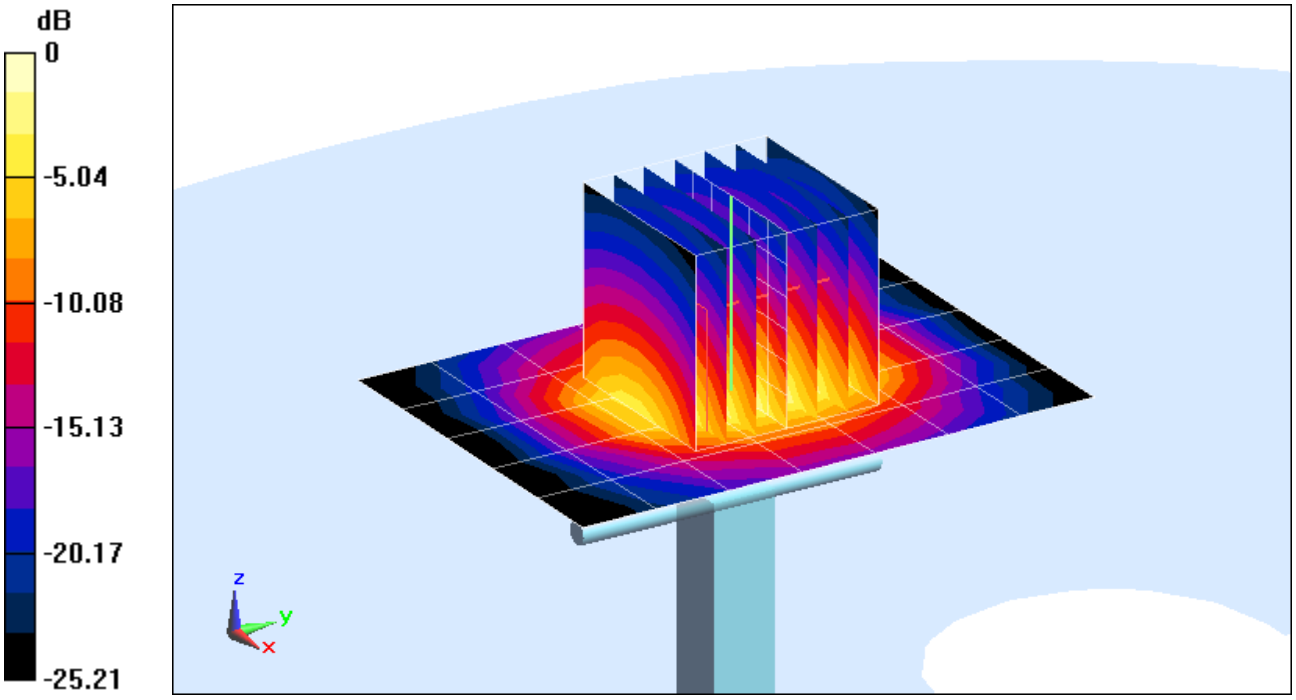
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 2.018 S/m; ε_r = 37.879; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2013; Ambient Temp: 23.0°C; Tissue Temp: 23.5°C

Probe: ES3DV2 - SN3022; ConvF(4.1, 4.1, 4.1); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2600 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 14.3 W/kg
SAR(1 g) = 6.22 W/kg
Deviation: 6.87%



0 dB = 8.26 W/kg = 9.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1120

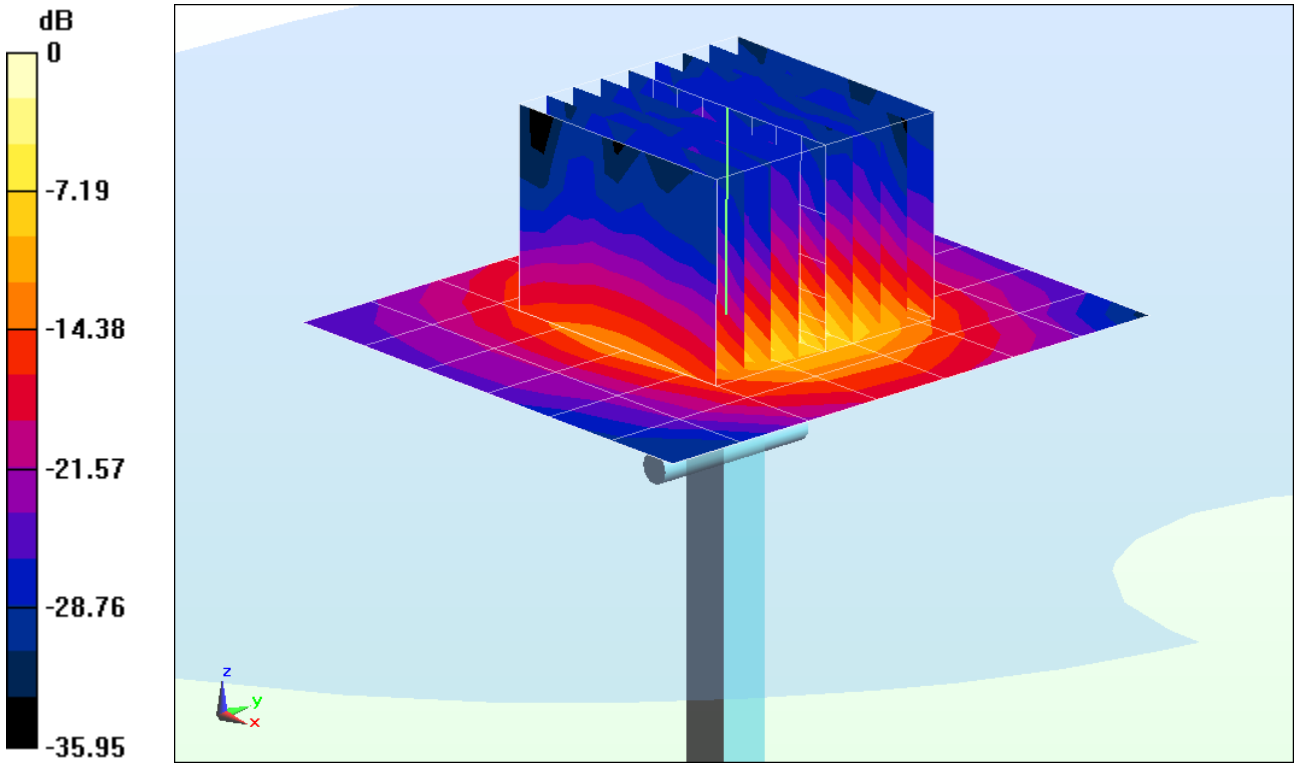
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5200 MHz; σ = 4.468 S/m; ε_r = 35.069; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.7°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(4.87, 4.87, 4.87); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 12.1 W/kg
SAR(1 g) = 3.03 W/kg
Deviation = -0.33%



0 dB = 7.55 W/kg = 8.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1120

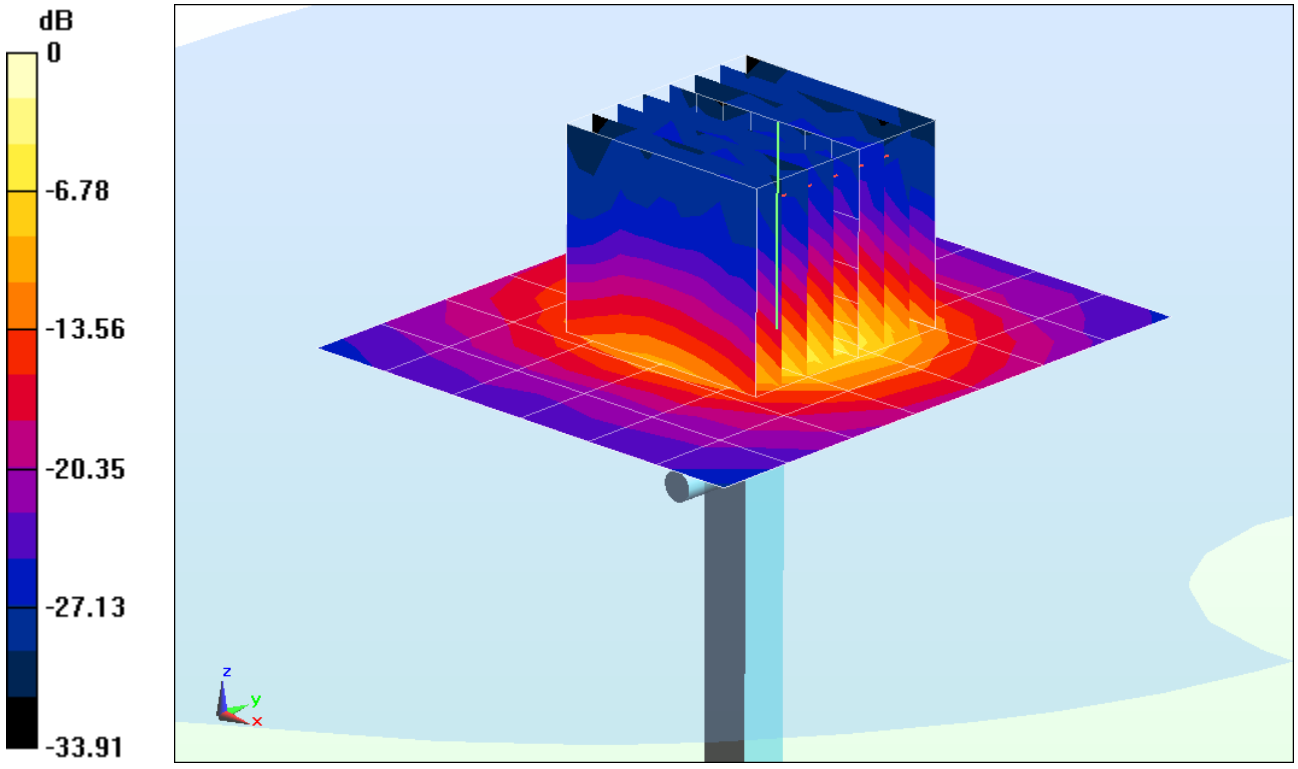
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5300 MHz; σ = 4.565 S/m; ε_r = 34.928; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.8°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(4.73, 4.73, 4.73); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 12.2 W/kg
SAR(1 g) = 2.97 W/kg
Deviation = -5.65%



0 dB = 7.08 W/kg = 8.50 dBW/kg

DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1120

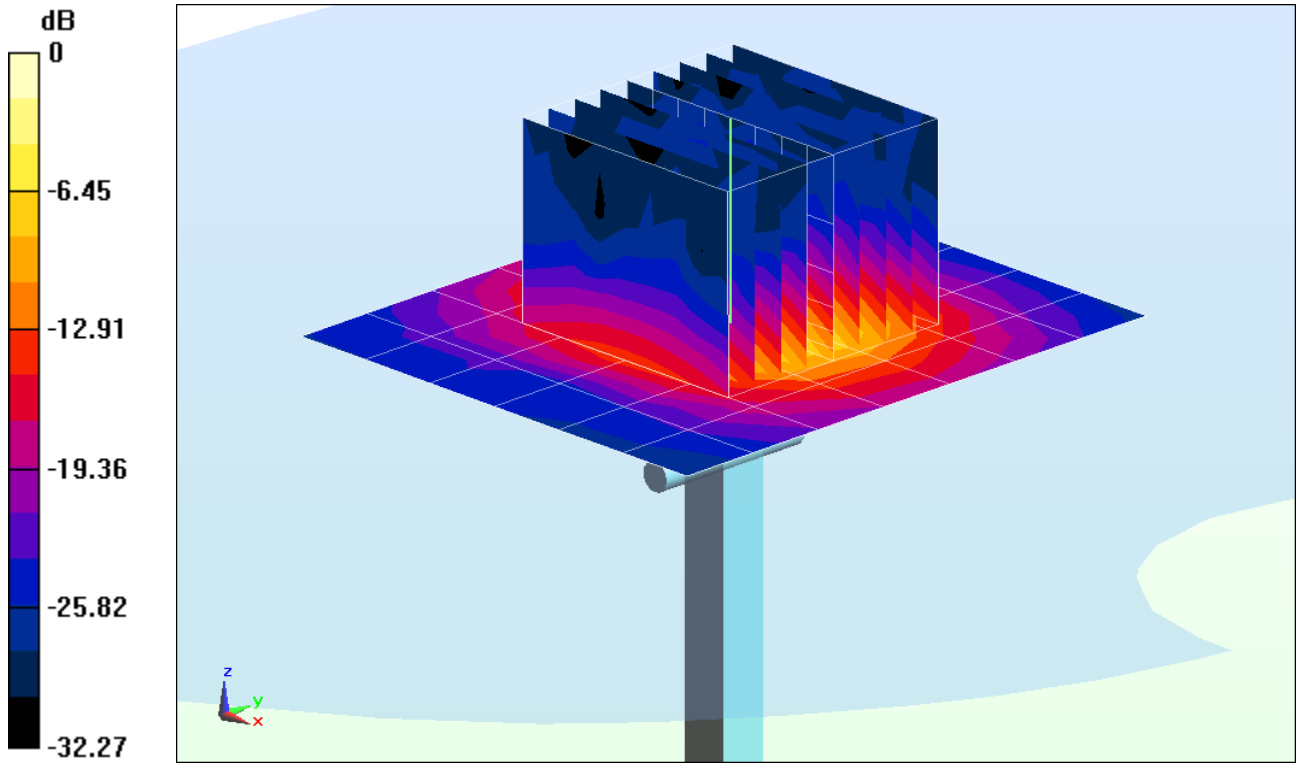
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5600 MHz; σ = 4.868 S/m; ε_r = 34.489; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.6°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3920; ConvF(4.17, 4.17, 4.17); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 3.17 W/kg
Deviation = -0.81%



0 dB = 7.86 W/kg = 8.95 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1120

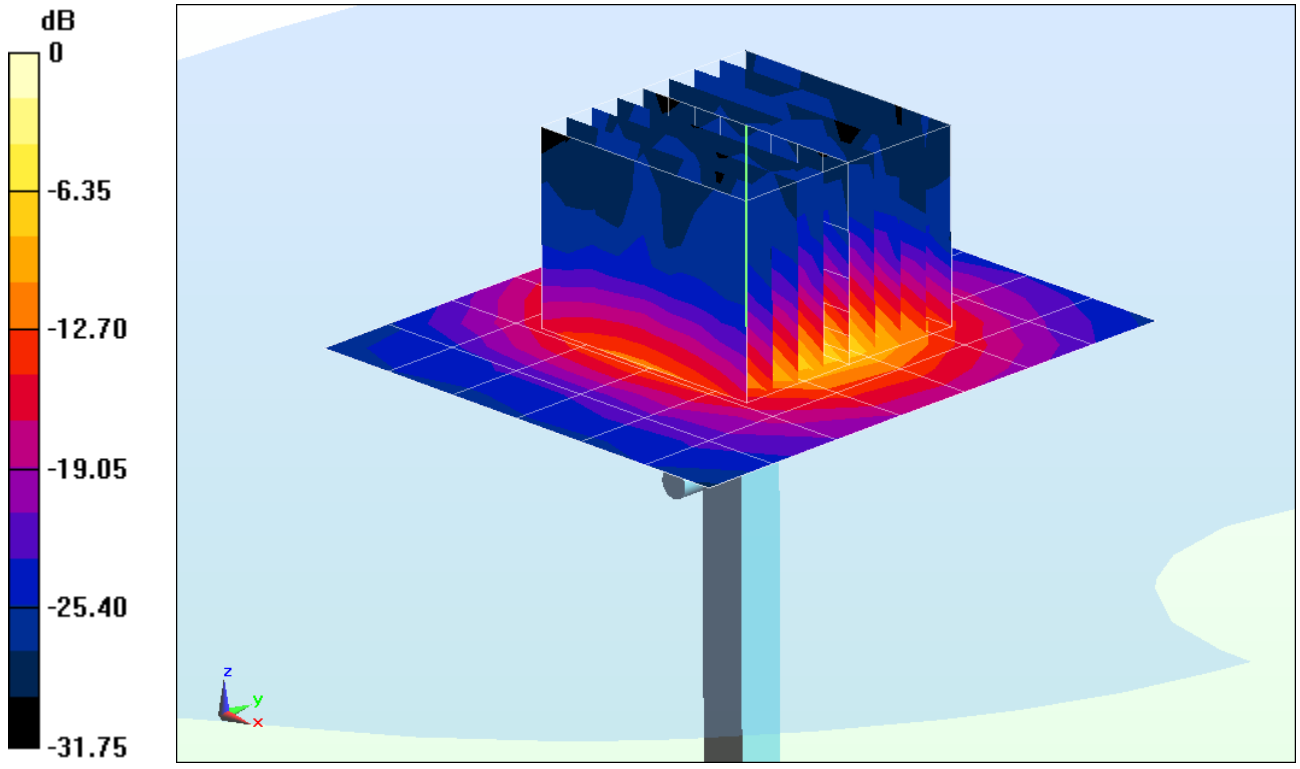
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5800 MHz; σ = 5.075 S/m; ε_r = 34.216; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.9°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3920; ConvF(4.02, 4.02, 4.02); Calibrated: 2/27/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 2.98 W/kg
Deviation = -0.53%



0 dB = 7.63 W/kg = 8.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 835 MHz; Type: D835V2; Serial: 4d132

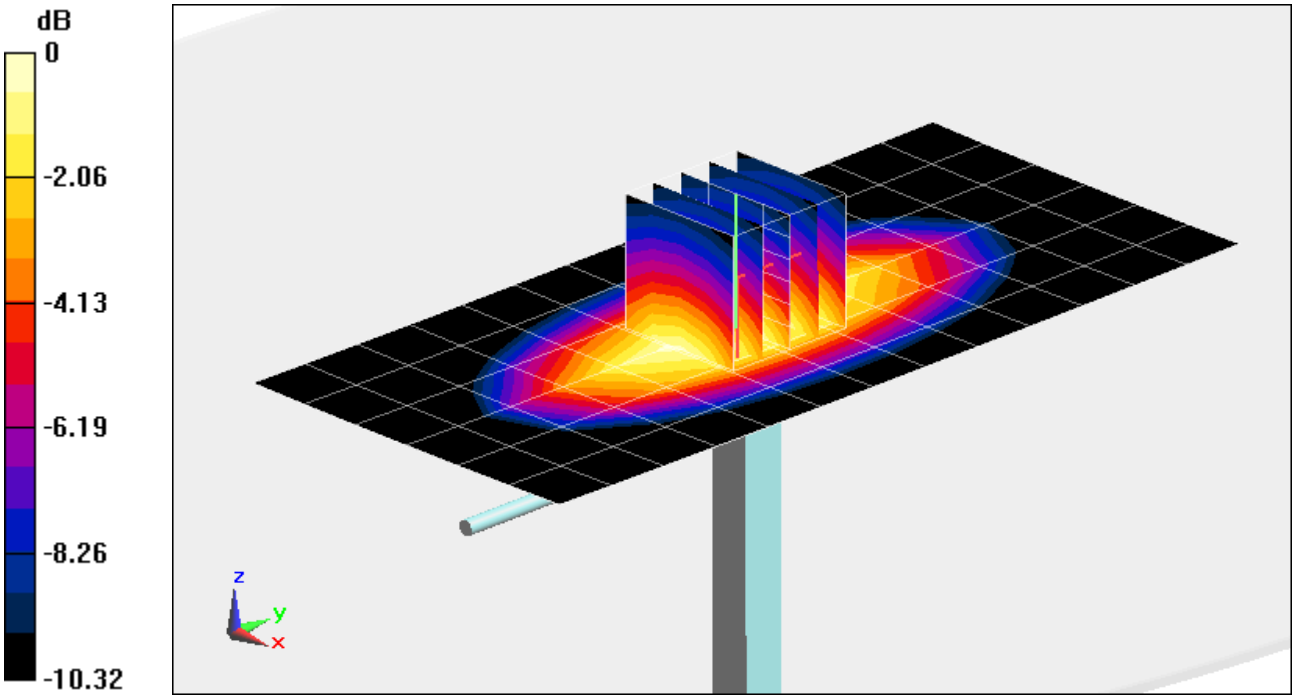
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.011 S/m; ε_r = 55.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-15-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 1 W/kg
Deviation: 6.84%



0 dB = 1.09 W/kg = 0.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

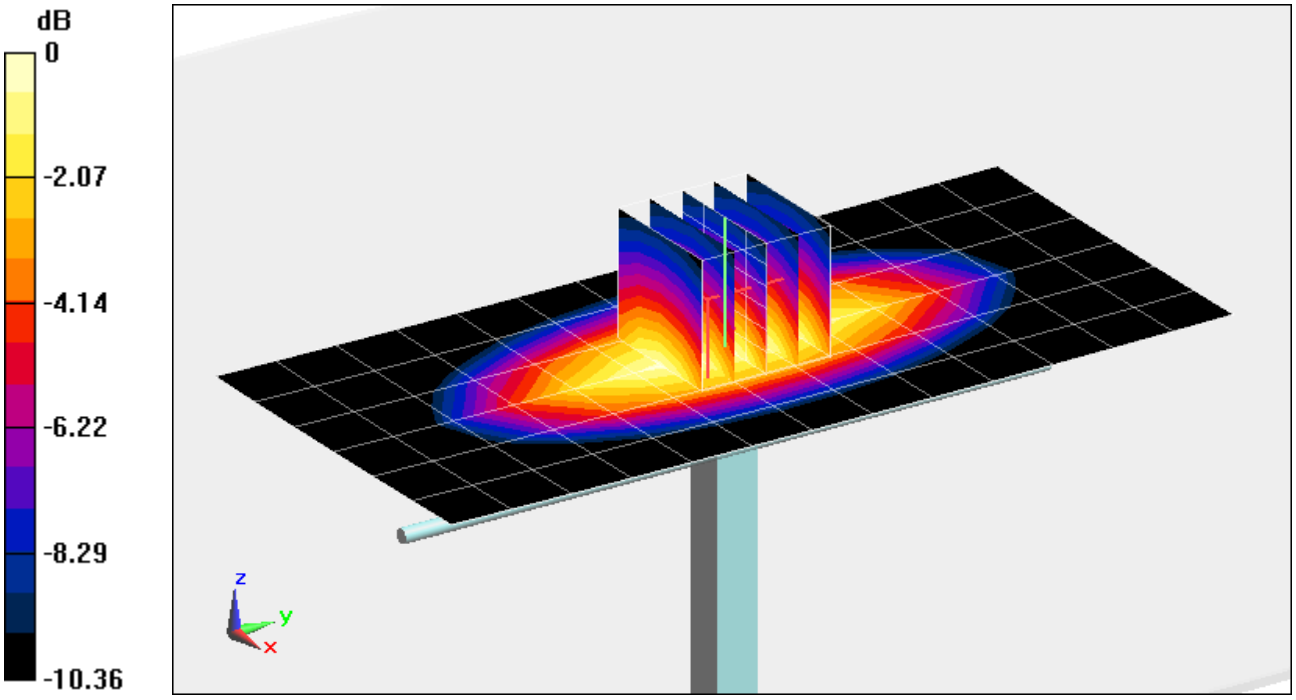
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.999 S/m; ε_r = 54.331; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-23-2013; Ambient Temp: 24.1°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.992 W/kg
Deviation: 3.55%



0 dB = 1.07 W/kg = 0.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

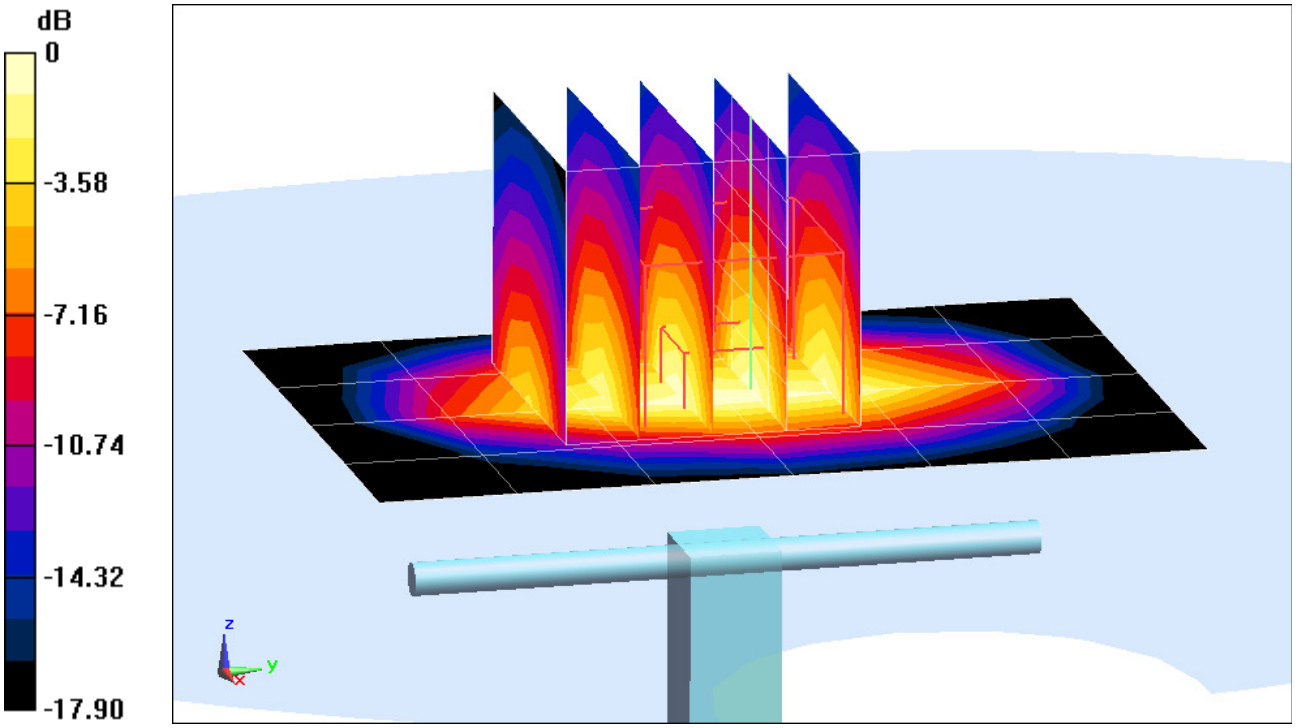
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.539 S/m; ε_r = 54.063; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3287; ConvF(4.69, 4.69, 4.69); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.53 W/kg
SAR(1 g) = 4.25 W/kg
Deviation = 5.46%



0 dB = 4.66 W/kg = 6.68 dBW/kg

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

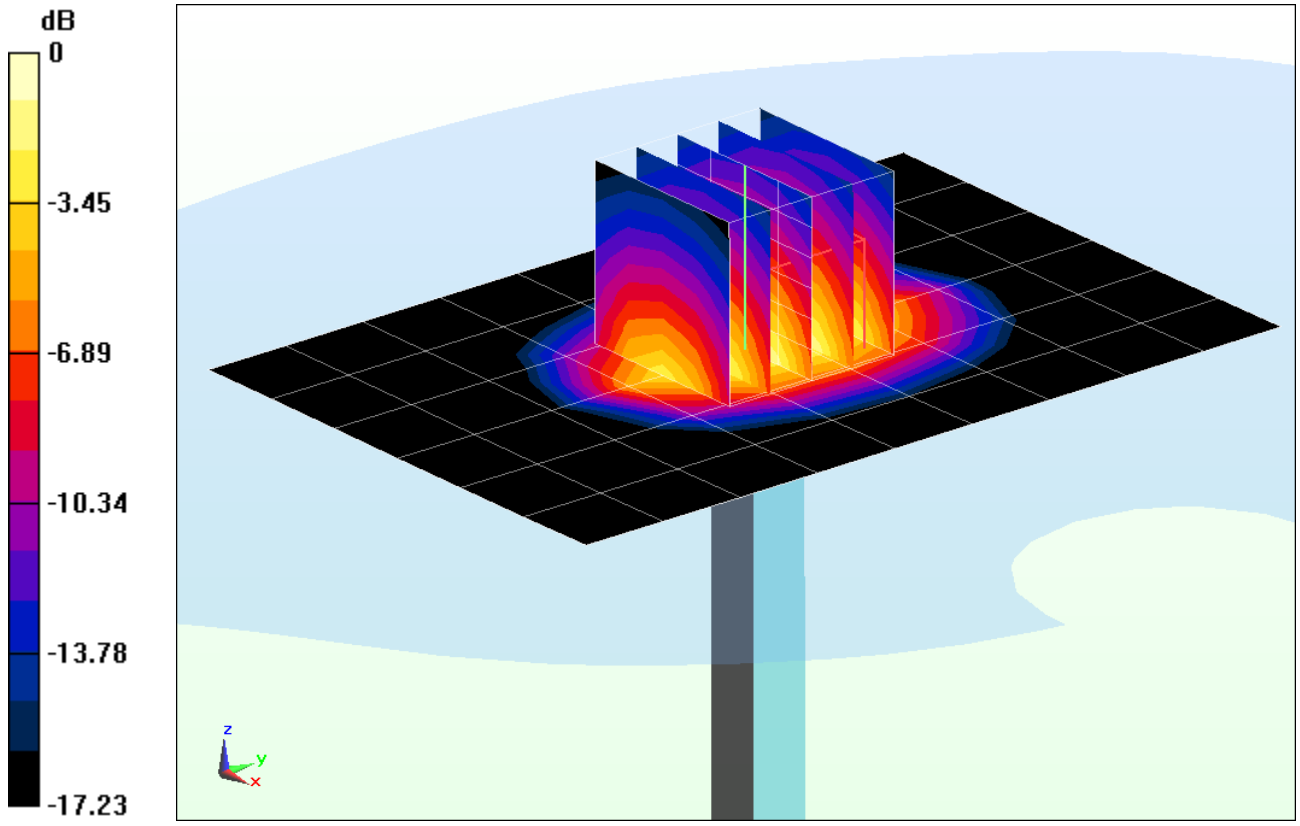
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
$f = 1900$ MHz; $\sigma = 1.517$ S/m; $\varepsilon_r = 53.11$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-25-2013; Ambient Temp: 24.2°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN3920; ConvF(7.38, 7.38, 7.38); Calibrated: 2/27/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 2/6/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.29 W/kg
SAR(1 g) = 4.1 W/kg
Deviation = 0.49%



0 dB = 4.53 W/kg = 6.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

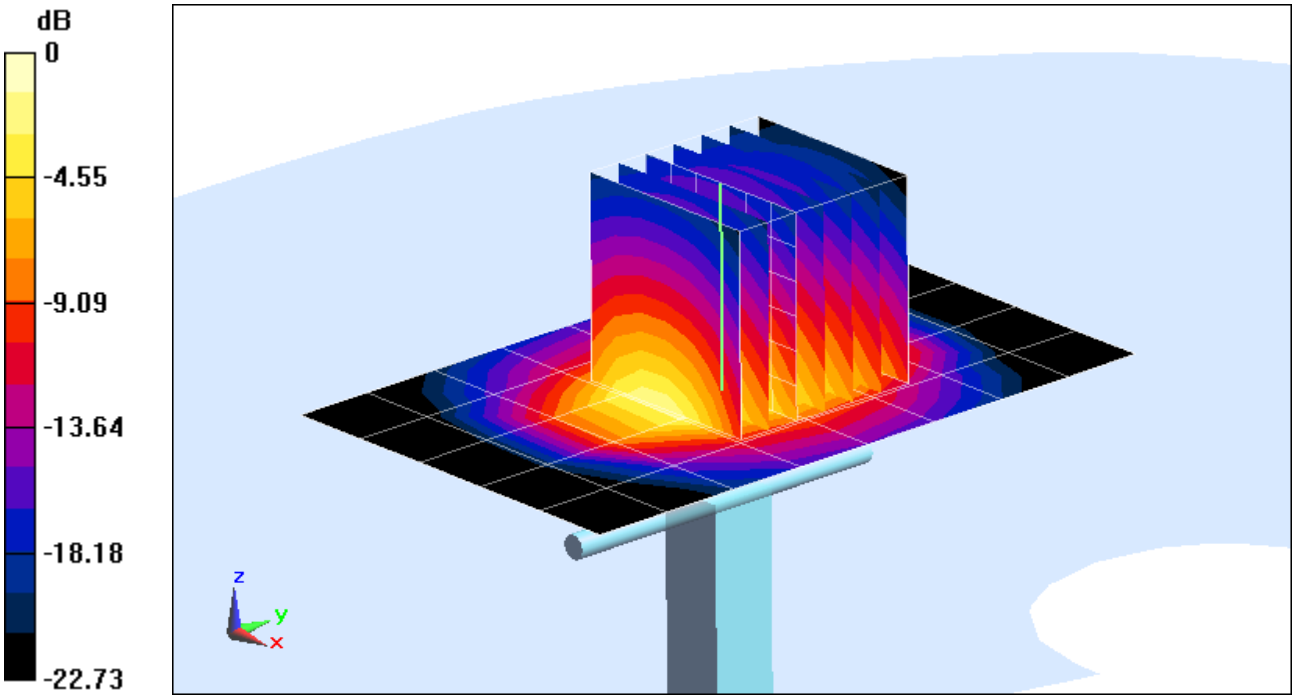
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.031 S/m; ε_r = 52.669; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-22-2013; Ambient Temp: 23.0°C; Tissue Temp: 22.6°C

Probe: ES3DV2 - SN3022; ConvF(3.97, 3.97, 3.97); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 12.0 W/kg
SAR(1 g) = 5.48 W/kg
Deviation: 6.20%



0 dB = 7.03 W/kg = 8.47 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 2600 MHz; Type: D2600V2; Serial: 1004

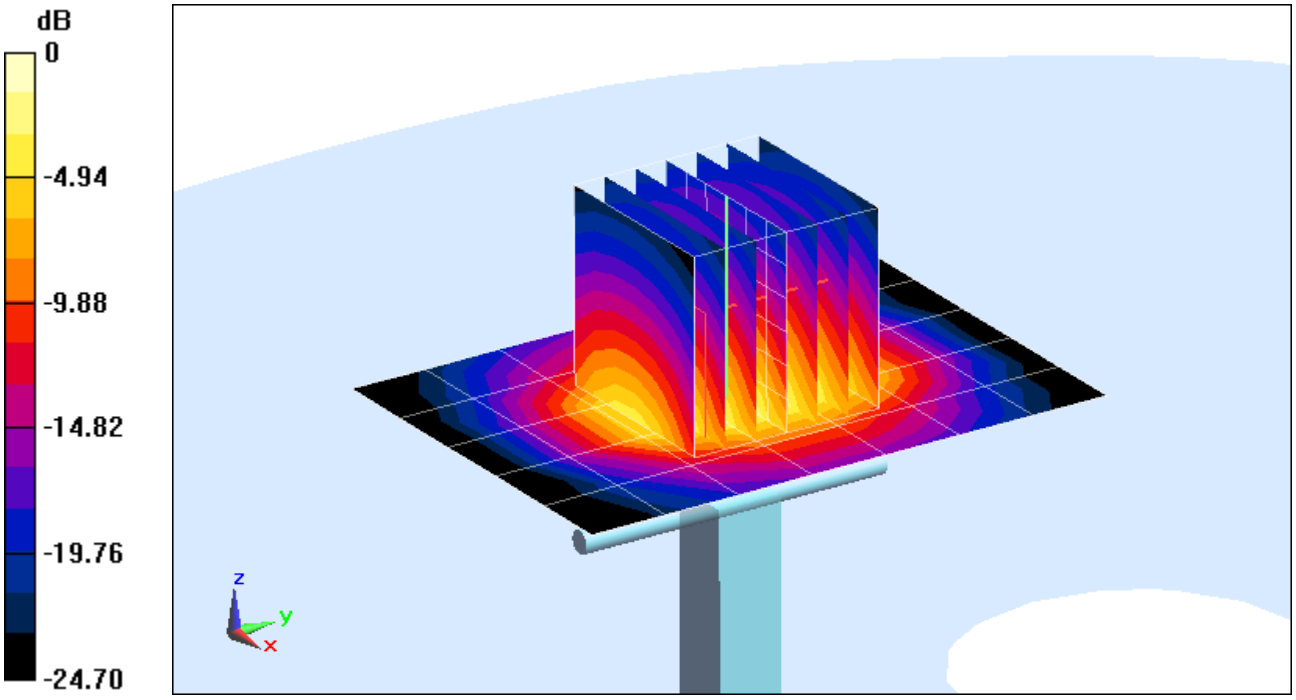
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.239 S/m; ε_r = 52.077; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-22-2013; Ambient Temp: 23.0°C; Tissue Temp: 22.6°C

Probe: ES3DV2 - SN3022; ConvF(3.8, 3.8, 3.8); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2600 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 13.8 W/kg
SAR(1 g) = 5.67 W/kg
Deviation: -1.39%



0 dB = 7.44 W/kg = 8.72 dBW/kg

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

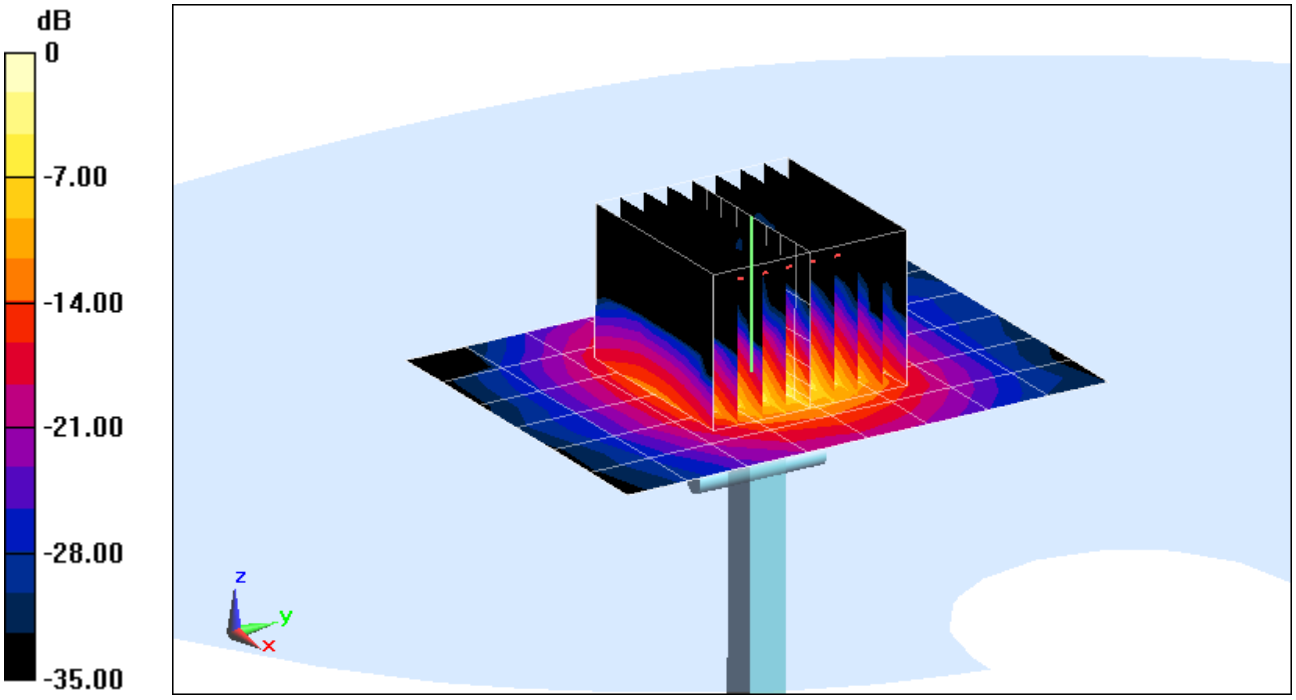
Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.215 S/m; ε_r = 46.814; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.99, 3.99, 3.99); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 28.5 W/kg
SAR(1 g) = 7.16 W/kg
Deviation: -5.17%



0 dB = 17.5 W/kg = 12.43 dBW/kg

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DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1057

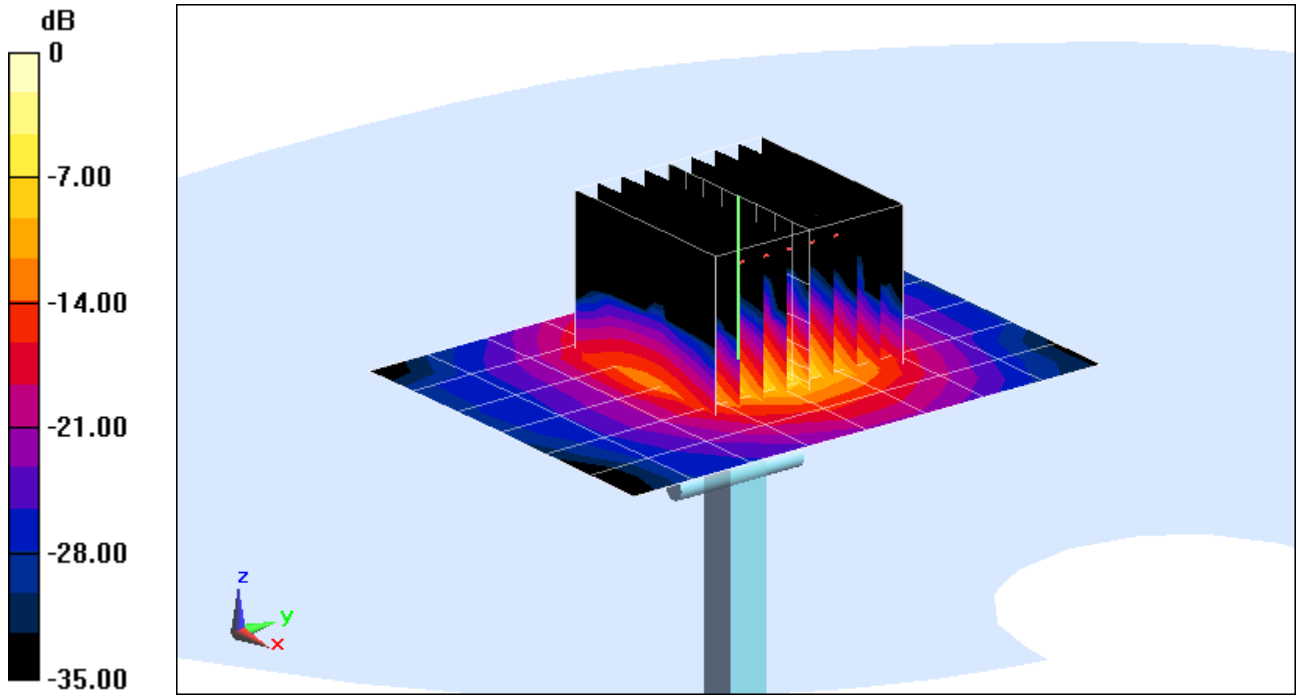
Communication System: CW; Frequency: 5300 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5300 MHz; σ = 5.366 S/m; ε_r = 46.619; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.6 W/kg
SAR(1 g) = 7.87 W/kg
Deviation: 4.52%



0 dB = 18.8 W/kg = 12.74 dBW/kg

DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1057

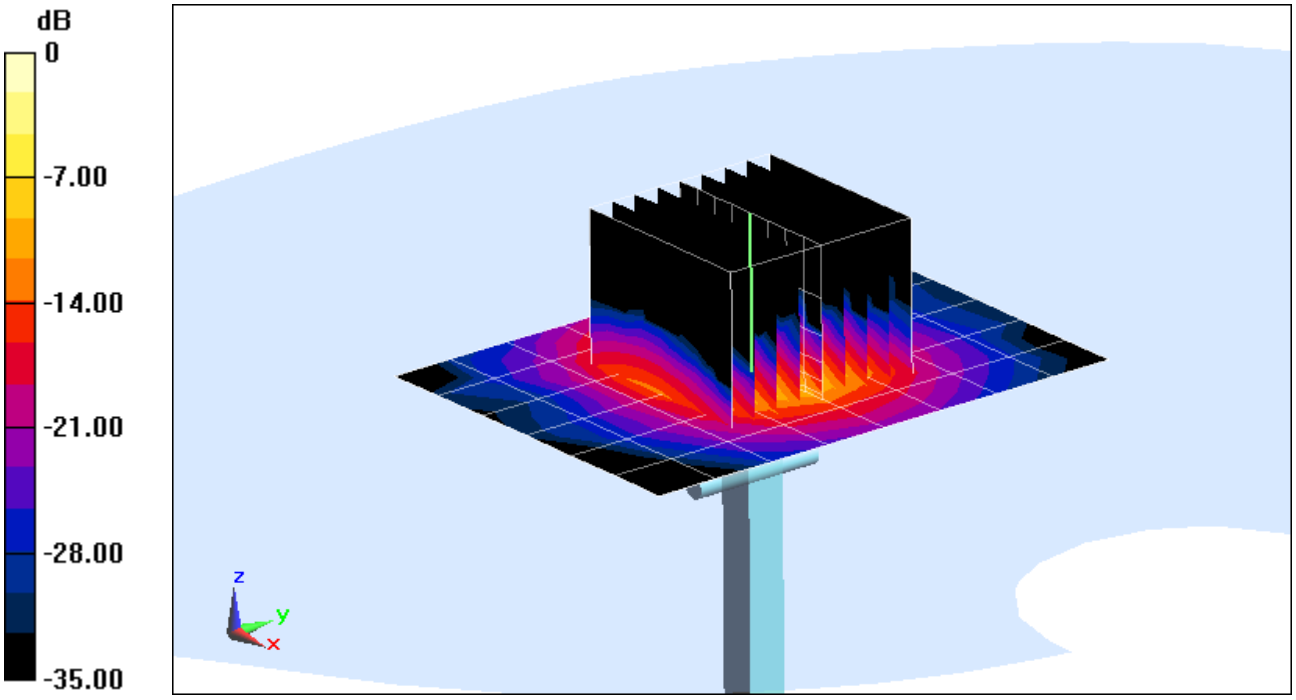
Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.899 S/m; ε_r = 46.249; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3589; ConvF(3.32, 3.32, 3.32); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.89 W/kg
Deviation: -1.74%



0 dB = 21.1 W/kg = 13.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

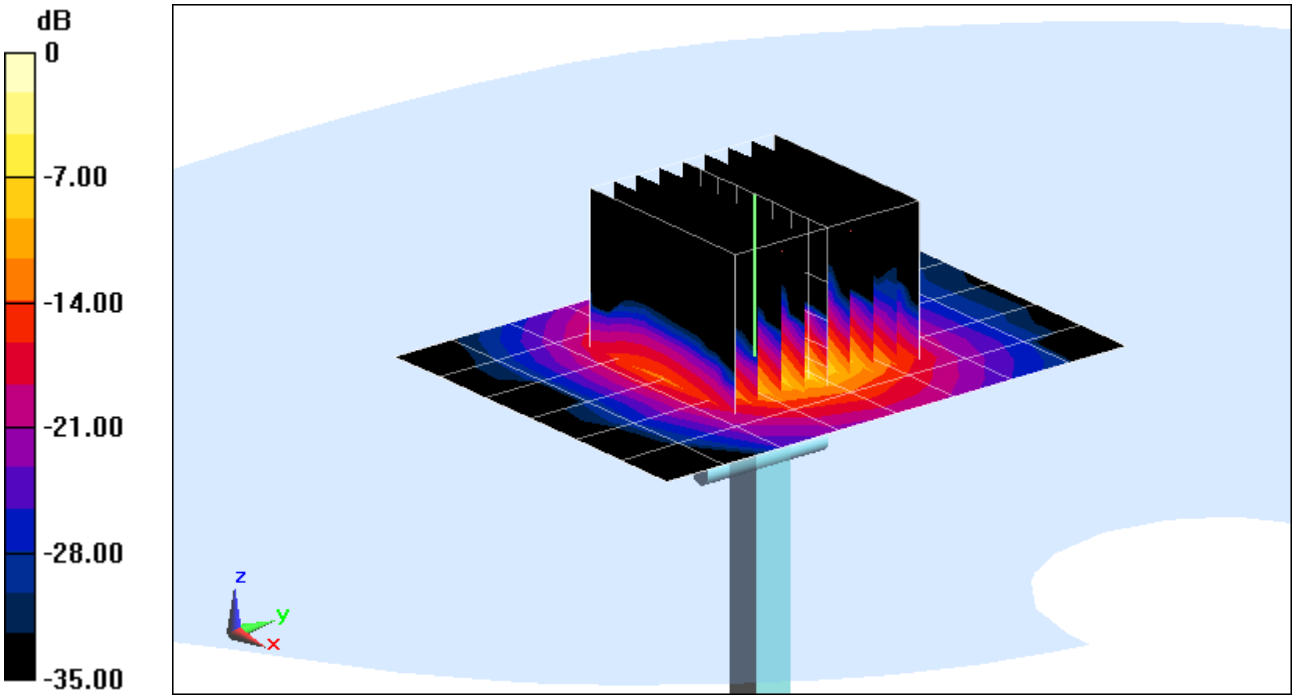
Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.218 S/m; ε_r = 46.037; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3589; ConvF(3.66, 3.66, 3.66); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power: 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 31.7 W/kg
SAR(1 g) = 7.33 W/kg
Deviation: -2.40%



0 dB = 18.7 W/kg = 12.72 dBW/kg