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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics, Co. Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do 443-742, Korea

Date of Testing:
06/02/13 - 06/13/13
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1306030937-R2.A3L

FCC ID: A3LSCHR960

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SCH-R960

Equipment Class	Band & Mode	Tx Frequency	Measured Conducted Power [dBm]	SAR			
				1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Extremity (W/kg)
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	24.53	0.16	0.50	0.50	
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	24.76	0.25	0.99	0.99	
PCE	LTE Band 12	701.5 - 713.5 MHz	23.22	< 0.1	0.18	0.18	
PCE	LTE Band 17	706.5 - 713.5 MHz	23.25	< 0.1	0.18	0.18	
PCE	LTE Band 5 (Cell)	826.5 - 846.5 MHz	22.96	0.30	0.22	0.22	
PCE	LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	23.34	0.14	0.43	0.43	
PCE	LTE Band 2 (PCS)	1852.5 - 1907.5 MHz	22.94	0.14	0.54	0.54	
PCE	LTE Band 25 (PCS)	1852.5 - 1912.5 MHz	22.89	0.21	0.51	0.51	
DTS	2.4 GHz WLAN	2412 - 2462 MHz	16.76	< 0.1	0.33	0.33	
DTS	Bluetooth LE	2402 - 2480 MHz	1.55	N/A			
DTS	5.8 GHz WLAN	5745 - 5825 MHz	9.76	< 0.1	< 0.1	< 0.1	
NII	5.2 GHz WLAN	5180 - 5240 MHz	10.05	< 0.1	0.10		0.15
NII	5.3 GHz WLAN	5260 - 5320 MHz	9.88	< 0.1	< 0.1		0.15
NII	5.5 GHz WLAN	5500 - 5700 MHz	10.00	< 0.1	< 0.1		0.12
DSS	Bluetooth	2402 - 2480 MHz	8.64	N/A	0.14	N/A	
Simultaneous SAR per KDB 690783 D01v01r02:				0.62	1.55	1.54	N/A

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

This revised Test Report (S/N: 0Y1306030937-R2.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it 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
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 12	Data	701.5 - 713.5 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 5 (Cell)	Data	826.5 - 846.5 MHz
LTE Band 4 (AWS)	Data	1712.5 - 1752.5 MHz
LTE Band 2 (PCS)	Data	1852.5 - 1907.5 MHz
LTE Band 25 (PCS)	Data	1852.5 - 1912.5 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 D01v05.

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	**25.0**
	Nominal	**24.5**
PCS CDMA/EVDO	Maximum	**25.0**
	Nominal	**24.5**

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 17	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 5 (Cell.)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 4 (AWS)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 2 (PCS)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 25 (PCS)	Maximum	**23.5**
	Nominal	**23.0**

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Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**17.0**
	Nominal	**16.5**
IEEE 802.11g (2.4 GHz)	Maximum	**14.0**
	Nominal	**13.5**
IEEE 802.11n (2.4 GHz)	Maximum	**13.0**
	Nominal	**12.5**
IEEE 802.11a (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11n (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11ac (5 GHz)	Maximum	**10.0**
	Nominal	**9.5**
Bluetooth	Maximum	**9.0**
	Nominal	**8.5**
Bluetooth LE	Maximum	**2.0**
	Nominal	**1.5**

1.3 DUT Antenna Locations

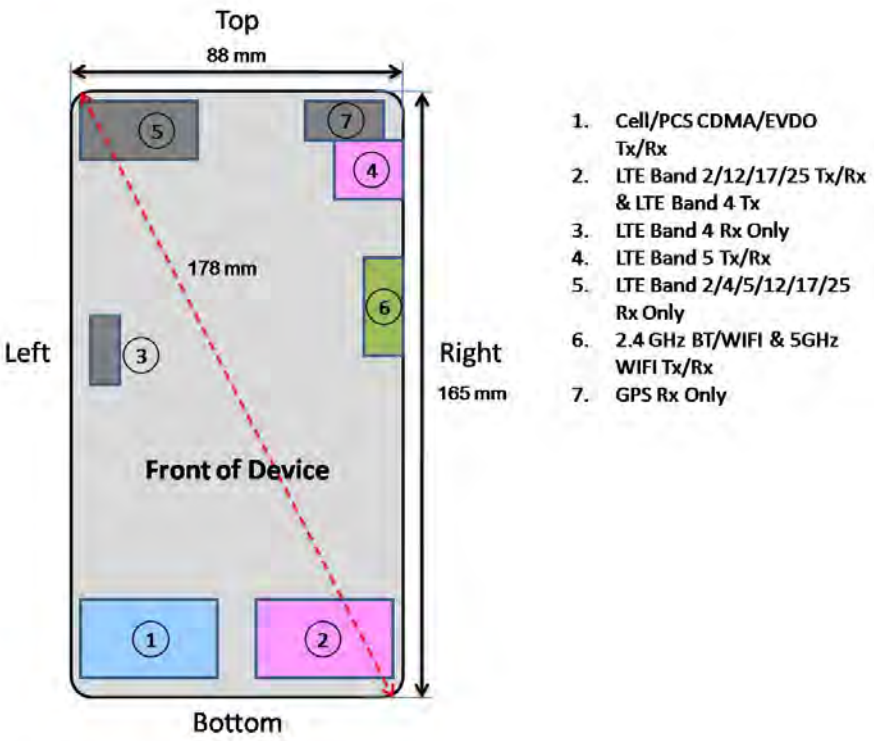

Figure 1-1
DUT Antenna Locations

Note:
1. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.
2. Because the diagonal distance of this device is > 160 mm, it is considered a “phablet”

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Table 1-1
Mobile Sides for SAR Testing

Sides for SAR Testing							
Mode	Exposure Condition	Back	Front	Top	Bottom	Right	Left
Cell. EVDO	Hotspot	Yes	Yes	No	Yes	No	Yes
PCS EVDO	Hotspot	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Hotspot	Yes	Yes	No	Yes	Yes	No
LTE Band 17	Hotspot	Yes	Yes	No	Yes	Yes	No
LTE Band 5 (Cell)	Hotspot	Yes	Yes	Yes	No	Yes	No
LTE Band 4 (AWS)	Hotspot	Yes	Yes	No	Yes	Yes	No
LTE Band 2 (PCS)	Hotspot	Yes	Yes	No	Yes	Yes	No
LTE Band 25 (PCS)	Hotspot	Yes	Yes	No	Yes	Yes	No
2.4 GHz WLAN	Hotspot	Yes	Yes	No	No	Yes	No
5 GHz DTS WLAN	Hotspot	Yes	Yes	No	No	Yes	No
5 GHZ NII WLAN	Extremity	Yes	Yes	No	No	Yes	No

Note: Particular DUT edges were not required to be evaluated for Wireless Router and/or Extremity SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB 648474 D04 Handset SAR v01r01 and FCC KDB Publication 941225 D06v01 and guidance, page 2.

1.4 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the standard battery. The SAR tests were performed with the standard battery (model: B700BU).

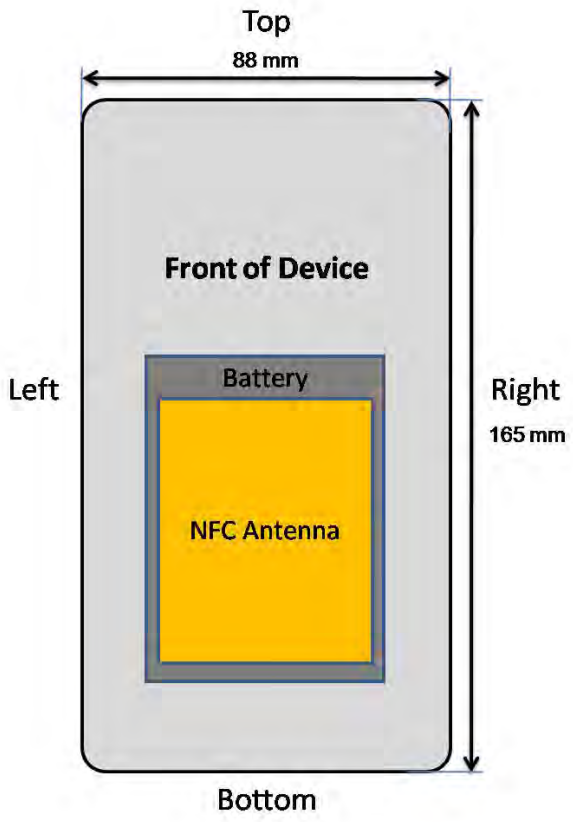

Figure 1-2
NFC Antenna Locations

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1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D05v01, 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 D01v05 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Note
		IEEE 1528, Supp C	Supplement C	FCC KDB 941225 D06 edges/sides	
1	1X CDMA 850/1900 Voice + LTE B12/17/5/4/2/25 Data	√	√	N/A	SVLTE
2	1X CDMA 850/1900 Voice + LTE B12/17/5/4/2/25 Data + 2.4 GHz WIFI	√	√	√	Voice and LTE + WIFI Hotspot
3	1X CDMA 850/1900 Voice + LTE B12/17/5/4/2/25 Data + 2.4 GHz Bluetooth	N/A	√	N/A	
4	1X CDMA 850/1900 Voice + LTE B12/17/5/4/2/25 Data + 5 GHz WIFI	√	√	√	Voice and LTE + 5.8 GHz WIFI Hotspot
5	1X CDMA 850/1900 Voice + 2.4 GHz WIFI	√	√	N/A	1X voice and WiFi Data
6	1X CDMA 850/1900 Voice + 2.4 GHz Bluetooth	N/A	√	N/A	
7	1X CDMA 850/190 Voice + 5 GHz WIFI	√	√	N/A	1X voice and WiFi Data
8	1X/EVDO 850/1900 Data + 2.4 GHz WIFI	√	√	√	EVDO + WIFI Hotspot
9	1X/EVDO 850/1900 Data + 2.4 GHz Bluetooth	N/A	√	N/A	
10	1X/EVDO 850/1900 Data + 5 GHz WIFI	√	√	√	EVDO + 5.8 GHz WIFI Hotspot
11	LTE B12/17/5/4/2/25 Data + 2.4 GHz WIFI	√	√	√	LTE + WIFI Hotspot
12	LTE B12/17/5/4/2/25 Data + 2.4 GHz Bluetooth	N/A	√	N/A	
13	LTE B12/17/5/4/2/25 Data + 5 GHz WIFI	√	√	√	LTE + 5.8 GHz WIFI Hotspot
14	1X CDMA 850/1900 Voice + EVDO	N/A	N/A	N/A	Not available by HW
15	EVDO data + LTE Data	N/A	N/A	N/A	Not available by SW

Notes:

1. CDMA and EVDO share the same antenna path and cannot transmit simultaneously. (Non-SVDO)
2. 2.4 GHz WLAN, 2.4 GHz Bluetooth, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously.
3. For 5 GHz Hotspot, S/W only support the 5.8 GHz Band, therefore al other bands were not evaluated for hotspot conditions. This cannot be changed by any S/W modification by any party after it is manufactured.

Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no new simultaneous transmission scenarios involving WIFI direct.

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1.6 SAR Test Exclusions Applied

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using 5 GHz NII WIFI, only 2.4 GHz WIFI and 5 GHz DTS WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v01.

Per FCC KDB Publication 648474 D03-D04, this device is considered a "phablet" since its diagonal distance, 178 mm, is greater than 160 mm. Therefore hand SAR tests are required. Because wireless router operations are not supported for 5 GHz NII WIFI, hand SAR was evaluated for 5 GHz NII WIFI. However, hand SAR was not evaluated for 2.4 GHz WIFI and 5 GHz DTS WIFI since Hotspot SAR for 2.4 GHz WIFI and 5 GHz DTS WIFI were < 1.2 W/kg."

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
e) No new 5 GHz channels

Per FCC KDB 447498 D01v05, 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 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 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

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 D05v02.

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 and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D03-D04 (Phablet Procedures)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)

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1.9 Device Serial Numbers

Several samples were used with identical hardware 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	Extremity Serial Number
Cell. CDMA/EVDO	#24	#24	#24	-
PCS CDMA/EVDO	#23	#23	#23	-
LTE Band 12	#28	#28	#28	-
LTE Band 17	#28	#28	#28	-
LTE Band 5 (Cell)	#27	#27	#27	-
LTE Band 4 (AWS)	#25	#25	#25	-
LTE Band 2 (PCS)	#26	#26	#26	-
LTE Band 25 (PCS)	#30	#30	#30	-
2.4 GHz WLAN	#30	#30	#30	-
2.4 GHz Bluetooth	-	#30	-	-
5 GHz DTS WLAN	#25	#25	#25	-
5 GHz NII WLAN	#25	#25	-	#25

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2 LTE INFORMATION

LTE Information			
FCC ID	**A3LSCHR960**		
Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	LTE Band 12 (701.5 - 713.5 MHz)		
	LTE Band 17 (706.5 - 713.5 MHz)		
	LTE Band 5 (Cell) (826.5 - 846.5 MHz)		
	LTE Band 4 (AWS) (1712.5 - 1752.5 MHz)		
	LTE Band 2 (PCS) (1852.5 - 1907.5 MHz)		
	LTE Band 25 (PCS) (1852.5 - 1912.5 MHz)		
Channel Bandwidths	LTE Band 12: 5 MHz, 10 MHz		
	LTE Band 17: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 5 MHz, 10 MHz		
	LTE Band 2 (PCS): 5 MHz, 10 MHz		
	LTE Band 25 (PCS): 5 MHz, 10 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 12: 5 MHz	701.5 (23025)	707.5 (23085)	713.5 (23145)
LTE Band 12: 10 MHz	704 (23050)	707.5 (23085)	711 (23120)
LTE Band 17: 5 MHz	706.5 (23075)	707.5 (23085)	708.5 (23095)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	1732.5 (20175)	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)	1732.5 (20175)	1750 (20350)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)	1880 (18900)	1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)	1880 (18900)	1905 (19150)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)	1882.5 (26365)	1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)	1882.5 (26365)	1910 (26640)
UE Category	3		
Modulations Supported in UL	QPSK, 16QAM		
LTE Voice available?	NO		
Hotspot with LTE+WIFI	YES		
Hotspot with LTE+WIFI active with 1XVoice sessions?	YES		
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		

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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]

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure:

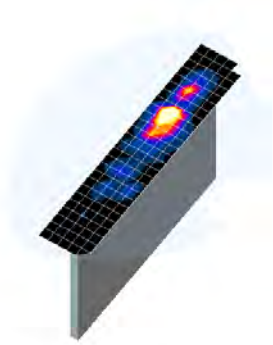

Figure 4-1
Sample SAR Area Scan

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 D01v01 (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.
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 D01v01 (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 D01v01

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

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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].

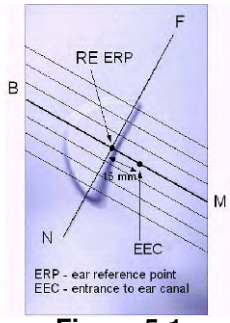

Figure 5-1
Close-Up Side view of ERP

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

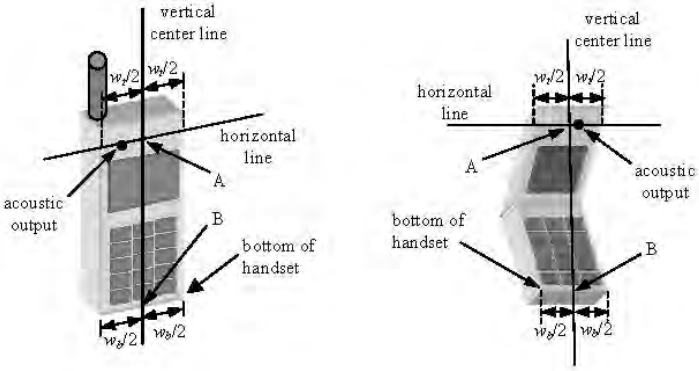

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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).

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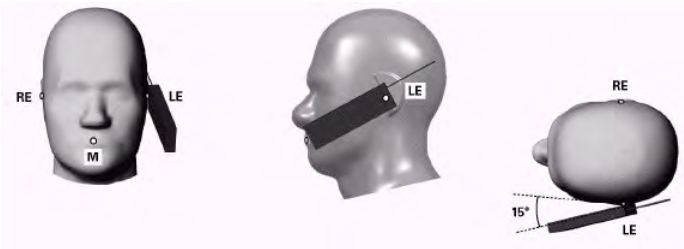

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

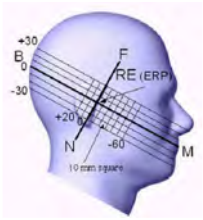

Figure 6-3
Side view w/ relevant markings

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 D04_v01. 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 D04v01, 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 D01v05 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.

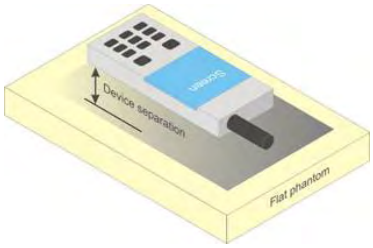

Figure 6-5
Sample Body-Worn Diagram

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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.

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC minitablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04 v01r01DR04 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

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 D06 v01 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 D01v05 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.

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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.

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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 D01v05, 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 D01 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

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

8.3 SAR Measurement Conditions for CDMA2000

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

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.

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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 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 8.3.4 for EVDO Rev. A configuration parameters.

8.3.3 Body SAR Measurements

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

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

8.3.4 Handsets with EVDO

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

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8.3.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 per KDB Publication 941225 D01 procedures for "1x Ev-Do data Devices". SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

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 1⁄4 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 LTE

LTE modes were tested according to FCC KDB 941225 D05v02 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.

8.4.1 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.

8.4.2 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.

8.4.3 A-MPR

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

8.4.4 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.

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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 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.

8.5.1 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.

8.5.2 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.

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9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	22H	824.7	24.46	24.51	24.43	24.41	24.49	24.46
	384	22H	836.52	24.41	24.53	24.51	24.37	24.52	24.51
	777	22H	848.31	24.35	24.45	24.37	24.35	24.42	24.39
PCS	25	24E	1851.25	24.83	24.59	24.77	24.63	24.61	24.60
	600	24E	1880	24.75	24.66	24.71	24.76	24.60	24.59
	1175	24E	1908.75	24.87	24.70	24.90	24.68	24.75	24.69

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

Per KDB Publication 941225 D01v02:

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 1⁄4 dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0
4. CDMA 1x-RTT SAR was additionally required to be evaluated for Hotspot exposure conditions to support simultaneous transmission capabilities.
5. Head SAR was additionally evaluated with EVDO Rev. A to determine compliance for held-to-ear VoIP operations.

Figure 9-1
Power Measurement Setup

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9.2 LTE Conducted Powers

9.2.1 LTE Band 12

Table 9-1
LTE Band 12 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]
Mid	707.5	23095	10	QPSK	1	0	23.09	0	0
	707.5	23095	10	QPSK	1	25	23.07	0	0
	707.5	23095	10	QPSK	1	49	**23.22**	0	0
	707.5	23095	10	QPSK	25	0	22.13	1	0-1
	707.5	23095	10	QPSK	25	12	22.07	1	0-1
	707.5	23095	10	QPSK	25	25	**22.14**	1	0-1
	707.5	23095	10	QPSK	50	0	22.02	1	0-1
	707.5	23095	10	16QAM	1	0	21.88	1	0-1
	707.5	23095	10	16QAM	1	25	21.83	1	0-1
	707.5	23095	10	16QAM	1	49	21.98	1	0-1
	707.5	23095	10	16QAM	25	0	21.00	2	0-2
	707.5	23095	10	16QAM	25	12	20.99	2	0-2
	707.5	23095	10	16QAM	25	25	21.07	2	0-2
	707.5	23095	10	16QAM	50	0	20.90	2	0-2

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-2
LTE Band 12 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	701.5	23035	5	QPSK	1	0	23.13	0	0
	701.5	23035	5	QPSK	1	12	23.05	0	0
	701.5	23035	5	QPSK	1	24	23.32	0	0
	701.5	23035	5	QPSK	12	0	22.10	1	0-1
	701.5	23035	5	QPSK	12	6	22.06	1	0-1
	701.5	23035	5	QPSK	12	13	22.20	1	0-1
	701.5	23035	5	QPSK	25	0	21.91	1	0-1
	701.5	23035	5	16-QAM	1	0	21.88	1	0-1
	701.5	23035	5	16-QAM	1	12	21.83	1	0-1
	701.5	23035	5	16-QAM	1	24	22.08	1	0-1
	701.5	23035	5	16-QAM	12	0	21.18	2	0-2
	701.5	23035	5	16-QAM	12	6	21.14	2	0-2
	701.5	23035	5	16-QAM	12	13	21.28	2	0-2
	701.5	23035	5	16-QAM	25	0	20.88	2	0-2
Mid	707.5	23095	5	QPSK	1	0	23.43	0	0
	707.5	23095	5	QPSK	1	12	23.25	0	0
	707.5	23095	5	QPSK	1	24	23.32	0	0
	707.5	23095	5	QPSK	12	0	22.26	1	0-1
	707.5	23095	5	QPSK	12	6	22.05	1	0-1
	707.5	23095	5	QPSK	12	13	22.12	1	0-1
	707.5	23095	5	QPSK	25	0	22.08	1	0-1
	707.5	23095	5	16-QAM	1	0	22.28	1	0-1
	707.5	23095	5	16-QAM	1	12	22.11	1	0-1
	707.5	23095	5	16-QAM	1	24	22.23	1	0-1
	707.5	23095	5	16-QAM	12	0	21.15	2	0-2
	707.5	23095	5	16-QAM	12	6	21.00	2	0-2
	707.5	23095	5	16-QAM	12	13	21.10	2	0-2
	707.5	23095	5	16-QAM	25	0	20.90	2	0-2
High	713.5	23155	5	QPSK	1	0	23.28	0	0
	713.5	23155	5	QPSK	1	12	23.02	0	0
	713.5	23155	5	QPSK	1	24	23.37	0	0
	713.5	23155	5	QPSK	12	0	22.32	1	0-1
	713.5	23155	5	QPSK	12	6	22.22	1	0-1
	713.5	23155	5	QPSK	12	13	22.33	1	0-1
	713.5	23155	5	QPSK	25	0	22.11	1	0-1
	713.5	23155	5	16-QAM	1	0	22.22	1	0-1
	713.5	23155	5	16-QAM	1	12	22.02	1	0-1
	713.5	23155	5	16-QAM	1	24	22.28	1	0-1
	713.5	23155	5	16-QAM	12	0	21.28	2	0-2
	713.5	23155	5	16-QAM	12	6	21.20	2	0-2
	713.5	23155	5	16-QAM	12	13	21.34	2	0-2
	713.5	23155	5	16-QAM	25	0	20.97	2	0-2

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9.2.2 LTE Band 17

Table 9-3
LTE Band 17 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]
Mid	710.0	23790	10	QPSK	1	0	23.11	0	0
	710.0	23790	10	QPSK	1	25	23.13	0	0
	710.0	23790	10	QPSK	1	49	**23.25**	0	0
	710.0	23790	10	QPSK	25	0	**21.92**	1	0-1
	710.0	23790	10	QPSK	25	12	21.77	1	0-1
	710.0	23790	10	QPSK	25	25	21.90	1	0-1
	710.0	23790	10	QPSK	50	0	21.74	1	0-1
	710.0	23790	10	16QAM	1	0	21.85	1	0-1
	710.0	23790	10	16QAM	1	25	21.84	1	0-1
	710.0	23790	10	16QAM	1	49	21.96	1	0-1
	710.0	23790	10	16QAM	25	0	20.86	2	0-2
	710.0	23790	10	16QAM	25	12	20.74	2	0-2
	710.0	23790	10	16QAM	25	25	20.81	2	0-2
	710.0	23790	10	16QAM	50	0	20.66	2	0-2

Note: LTE Band 17 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-4
LTE Band 17 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]
Mid	710.0	23790	5	QPSK	1	0	23.13	0	0
	710.0	23790	5	QPSK	1	12	23.12	0	0
	710.0	23790	5	QPSK	1	24	23.20	0	0
	710.0	23790	5	QPSK	12	0	22.06	1	0-1
	710.0	23790	5	QPSK	12	6	22.00	1	0-1
	710.0	23790	5	QPSK	12	13	22.06	1	0-1
	710.0	23790	5	QPSK	25	0	21.83	1	0-1
	710.0	23790	5	16-QAM	1	0	21.97	1	0-1
	710.0	23790	5	16-QAM	1	12	21.99	1	0-1
	710.0	23790	5	16-QAM	1	24	22.03	1	0-1
	710.0	23790	5	16-QAM	12	0	20.92	2	0-2
	710.0	23790	5	16-QAM	12	6	20.90	2	0-2
	710.0	23790	5	16-QAM	12	13	20.99	2	0-2
	710.0	23790	5	16-QAM	25	0	20.70	2	0-2

Note: LTE Band 17 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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9.2.3 LTE Band 5 (Cell)

Table 9-5
LTE Band 5 (Cell) 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]
Mid	836.5	20525	10	QPSK	1	0	**22.96**	0	0
	836.5	20525	10	QPSK	1	25	22.62	0	0
	836.5	20525	10	QPSK	1	49	22.92	0	0
	836.5	20525	10	QPSK	25	0	**21.81**	1	0-1
	836.5	20525	10	QPSK	25	12	21.63	1	0-1
	836.5	20525	10	QPSK	25	25	21.75	1	0-1
	836.5	20525	10	QPSK	50	0	21.64	1	0-1
	836.5	20525	10	16QAM	1	0	22.26	1	0-1
	836.5	20525	10	16QAM	1	25	21.94	1	0-1
	836.5	20525	10	16QAM	1	49	22.24	1	0-1
	836.5	20525	10	16QAM	25	0	20.81	2	0-2
	836.5	20525	10	16QAM	25	12	20.67	2	0-2
	836.5	20525	10	16QAM	25	25	20.70	2	0-2
	836.5	20525	10	16QAM	50	0	20.65	2	0-2

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	826.5	20425	5	QPSK	1	0	22.91	0	0
	826.5	20425	5	QPSK	1	12	22.55	0	0
	826.5	20425	5	QPSK	1	24	23.12	0	0
	826.5	20425	5	QPSK	12	0	21.50	1	0-1
	826.5	20425	5	QPSK	12	6	21.52	1	0-1
	826.5	20425	5	QPSK	12	13	21.62	1	0-1
	826.5	20425	5	QPSK	25	0	21.52	1	0-1
	826.5	20425	5	16-QAM	1	0	21.78	1	0-1
	826.5	20425	5	16-QAM	1	12	21.54	1	0-1
	826.5	20425	5	16-QAM	1	24	22.00	1	0-1
	826.5	20425	5	16-QAM	12	0	20.52	2	0-2
	826.5	20425	5	16-QAM	12	6	20.56	2	0-2
	826.5	20425	5	16-QAM	12	13	20.66	2	0-2
	826.5	20425	5	16-QAM	25	0	20.52	2	0-2
Mid	836.5	20525	5	QPSK	1	0	23.11	0	0
	836.5	20525	5	QPSK	1	12	22.64	0	0
	836.5	20525	5	QPSK	1	24	22.79	0	0
	836.5	20525	5	QPSK	12	0	21.93	1	0-1
	836.5	20525	5	QPSK	12	6	21.67	1	0-1
	836.5	20525	5	QPSK	12	13	21.71	1	0-1
	836.5	20525	5	QPSK	25	0	21.54	1	0-1
	836.5	20525	5	16-QAM	1	0	21.76	1	0-1
	836.5	20525	5	16-QAM	1	12	21.50	1	0-1
	836.5	20525	5	16-QAM	1	24	21.55	1	0-1
	836.5	20525	5	16-QAM	12	0	21.02	2	0-2
	836.5	20525	5	16-QAM	12	6	20.70	2	0-2
	836.5	20525	5	16-QAM	12	13	20.77	2	0-2
	836.5	20525	5	16-QAM	25	0	20.56	2	0-2
High	846.5	20625	5	QPSK	1	0	23.25	0	0
	846.5	20625	5	QPSK	1	12	22.70	0	0
	846.5	20625	5	QPSK	1	24	22.94	0	0
	846.5	20625	5	QPSK	12	0	21.93	1	0-1
	846.5	20625	5	QPSK	12	6	21.59	1	0-1
	846.5	20625	5	QPSK	12	13	21.84	1	0-1
	846.5	20625	5	QPSK	25	0	21.76	1	0-1
	846.5	20625	5	16-QAM	1	0	22.14	1	0-1
	846.5	20625	5	16-QAM	1	12	21.61	1	0-1
	846.5	20625	5	16-QAM	1	24	21.83	1	0-1
	846.5	20625	5	16-QAM	12	0	20.89	2	0-2
	846.5	20625	5	16-QAM	12	6	20.60	2	0-2
	846.5	20625	5	16-QAM	12	13	20.81	2	0-2
	846.5	20625	5	16-QAM	25	0	20.60	2	0-2

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9.2.4 LTE Band 4 (AWS)

Table 9-7
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1715	20000	10	QPSK	1	0	23.30	0	0
	1715	20000	10	QPSK	1	25	23.15	0	0
	1715	20000	10	QPSK	1	49	23.20	0	0
	1715	20000	10	QPSK	25	0	22.11	1	0-1
	1715	20000	10	QPSK	25	12	22.04	1	0-1
	1715	20000	10	QPSK	25	25	22.07	1	0-1
	1715	20000	10	QPSK	50	0	21.92	1	0-1
	1715	20000	10	16QAM	1	0	22.02	1	0-1
	1715	20000	10	16QAM	1	25	21.97	1	0-1
	1715	20000	10	16QAM	1	49	21.99	1	0-1
	1715	20000	10	16QAM	25	0	21.12	2	0-2
	1715	20000	10	16QAM	25	12	21.10	2	0-2
	1715	20000	10	16QAM	25	25	21.13	2	0-2
	1715	20000	10	16QAM	50	0	20.91	2	0-2
Mid	1732.5	20175	10	QPSK	1	0	23.13	0	0
	1732.5	20175	10	QPSK	1	25	23.06	0	0
	1732.5	20175	10	QPSK	1	49	23.08	0	0
	1732.5	20175	10	QPSK	25	0	22.04	1	0-1
	1732.5	20175	10	QPSK	25	12	22.08	1	0-1
	1732.5	20175	10	QPSK	25	25	22.13	1	0-1
	1732.5	20175	10	QPSK	50	0	21.89	1	0-1
	1732.5	20175	10	16QAM	1	0	21.97	1	0-1
	1732.5	20175	10	16QAM	1	25	21.69	1	0-1
	1732.5	20175	10	16QAM	1	49	21.90	1	0-1
	1732.5	20175	10	16QAM	25	0	21.23	2	0-2
	1732.5	20175	10	16QAM	25	12	21.16	2	0-2
	1732.5	20175	10	16QAM	25	25	21.35	2	0-2
	1732.5	20175	10	16QAM	50	0	20.94	2	0-2
High	1750	20350	10	QPSK	1	0	23.16	0	0
	1750	20350	10	QPSK	1	25	**23.34**	0	0
	1750	20350	10	QPSK	1	49	23.31	0	0
	1750	20350	10	QPSK	25	0	22.11	1	0-1
	1750	20350	10	QPSK	25	12	22.13	1	0-1
	1750	20350	10	QPSK	25	25	**22.31**	1	0-1
	1750	20350	10	QPSK	50	0	22.00	1	0-1
	1750	20350	10	16QAM	1	0	22.49	1	0-1
	1750	20350	10	16QAM	1	25	22.27	1	0-1
	1750	20350	10	16QAM	1	49	22.45	1	0-1
	1750	20350	10	16QAM	25	0	21.20	2	0-2
	1750	20350	10	16QAM	25	12	21.12	2	0-2
	1750	20350	10	16QAM	25	25	21.35	2	0-2
	1750	20350	10	16QAM	50	0	20.99	2	0-2

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Table 9-8
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1712.5	19975	5	QPSK	1	0	23.28	0	0
	1712.5	19975	5	QPSK	1	12	23.24	0	0
	1712.5	19975	5	QPSK	1	24	23.20	0	0
	1712.5	19975	5	QPSK	12	0	22.36	1	0-1
	1712.5	19975	5	QPSK	12	6	22.30	1	0-1
	1712.5	19975	5	QPSK	12	13	22.26	1	0-1
	1712.5	19975	5	QPSK	25	0	22.17	1	0-1
	1712.5	19975	5	16-QAM	1	0	22.28	1	0-1
	1712.5	19975	5	16-QAM	1	12	22.06	1	0-1
	1712.5	19975	5	16-QAM	1	24	21.93	1	0-1
	1712.5	19975	5	16-QAM	12	0	21.35	2	0-2
	1712.5	19975	5	16-QAM	12	6	21.36	2	0-2
	1712.5	19975	5	16-QAM	12	13	21.17	2	0-2
	1712.5	19975	5	16-QAM	25	0	21.05	2	0-2
Mid	1732.5	20175	5	QPSK	1	0	23.20	0	0
	1732.5	20175	5	QPSK	1	12	23.22	0	0
	1732.5	20175	5	QPSK	1	24	23.18	0	0
	1732.5	20175	5	QPSK	12	0	22.15	1	0-1
	1732.5	20175	5	QPSK	12	6	22.18	1	0-1
	1732.5	20175	5	QPSK	12	13	22.23	1	0-1
	1732.5	20175	5	QPSK	25	0	22.05	1	0-1
	1732.5	20175	5	16-QAM	1	0	22.39	1	0-1
	1732.5	20175	5	16-QAM	1	12	22.27	1	0-1
	1732.5	20175	5	16-QAM	1	24	22.25	1	0-1
	1732.5	20175	5	16-QAM	12	0	21.20	2	0-2
	1732.5	20175	5	16-QAM	12	6	21.27	2	0-2
	1732.5	20175	5	16-QAM	12	13	21.17	2	0-2
	1732.5	20175	5	16-QAM	25	0	21.02	2	0-2
High	1752.5	20375	5	QPSK	1	0	23.27	0	0
	1752.5	20375	5	QPSK	1	12	23.40	0	0
	1752.5	20375	5	QPSK	1	24	23.49	0	0
	1752.5	20375	5	QPSK	12	0	22.39	1	0-1
	1752.5	20375	5	QPSK	12	6	22.45	1	0-1
	1752.5	20375	5	QPSK	12	13	22.47	1	0-1
	1752.5	20375	5	QPSK	25	0	22.32	1	0-1
	1752.5	20375	5	16-QAM	1	0	22.49	1	0-1
	1752.5	20375	5	16-QAM	1	12	22.18	1	0-1
	1752.5	20375	5	16-QAM	1	24	22.17	1	0-1
	1752.5	20375	5	16-QAM	12	0	21.35	2	0-2
	1752.5	20375	5	16-QAM	12	6	21.47	2	0-2
	1752.5	20375	5	16-QAM	12	13	21.47	2	0-2
	1752.5	20375	5	16-QAM	25	0	21.48	2	0-2

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9.2.5 LTE Band 2 (PCS)

Table 9-9
LTE Band 2 (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	18650	10	QPSK	1	0	22.50	0	0
	1855	18650	10	QPSK	1	25	22.82	0	0
	1855	18650	10	QPSK	1	49	**22.94**	0	0
	1855	18650	10	QPSK	25	0	21.50	1	0-1
	1855	18650	10	QPSK	25	12	21.76	1	0-1
	1855	18650	10	QPSK	25	25	**21.86**	1	0-1
	1855	18650	10	QPSK	50	0	21.50	1	0-1
	1855	18650	10	16QAM	1	0	21.83	1	0-1
	1855	18650	10	16QAM	1	25	22.00	1	0-1
	1855	18650	10	16QAM	1	49	21.67	1	0-1
	1855	18650	10	16QAM	25	0	20.78	2	0-2
	1855	18650	10	16QAM	25	12	20.91	2	0-2
	1855	18650	10	16QAM	25	25	20.55	2	0-2
	1855	18650	10	16QAM	50	0	21.00	2	0-2
Mid	1880.0	18900	10	QPSK	1	0	22.50	0	0
	1880.0	18900	10	QPSK	1	25	22.82	0	0
	1880.0	18900	10	QPSK	1	49	22.79	0	0
	1880.0	18900	10	QPSK	25	0	21.62	1	0-1
	1880.0	18900	10	QPSK	25	12	21.66	1	0-1
	1880.0	18900	10	QPSK	25	25	21.85	1	0-1
	1880.0	18900	10	QPSK	50	0	21.53	1	0-1
	1880.0	18900	10	16QAM	1	0	21.88	1	0-1
	1880.0	18900	10	16QAM	1	25	21.77	1	0-1
	1880.0	18900	10	16QAM	1	49	21.90	1	0-1
	1880.0	18900	10	16QAM	25	0	20.81	2	0-2
	1880.0	18900	10	16QAM	25	12	20.78	2	0-2
	1880.0	18900	10	16QAM	25	25	20.71	2	0-2
	1880.0	18900	10	16QAM	50	0	20.62	2	0-2
High	1905	19150	10	QPSK	1	0	22.75	0	0
	1905	19150	10	QPSK	1	25	22.70	0	0
	1905	19150	10	QPSK	1	49	22.53	0	0
	1905	19150	10	QPSK	25	0	21.67	1	0-1
	1905	19150	10	QPSK	25	12	21.58	1	0-1
	1905	19150	10	QPSK	25	25	21.57	1	0-1
	1905	19150	10	QPSK	50	0	21.53	1	0-1
	1905	19150	10	16QAM	1	0	21.90	1	0-1
	1905	19150	10	16QAM	1	25	21.54	1	0-1
	1905	19150	10	16QAM	1	49	21.78	1	0-1
	1905	19150	10	16QAM	25	0	20.58	2	0-2
	1905	19150	10	16QAM	25	12	20.95	2	0-2
	1905	19150	10	16QAM	25	25	20.79	2	0-2
	1905	19150	10	16QAM	50	0	20.96	2	0-2

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Table 9-10
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1852.5	18625	5	QPSK	1	0	22.68	0	0
	1852.5	18625	5	QPSK	1	12	22.87	0	0
	1852.5	18625	5	QPSK	1	24	22.50	0	0
	1852.5	18625	5	QPSK	12	0	21.67	1	0-1
	1852.5	18625	5	QPSK	12	6	21.71	1	0-1
	1852.5	18625	5	QPSK	12	13	21.79	1	0-1
	1852.5	18625	5	QPSK	25	0	21.62	1	0-1
	1852.5	18625	5	16-QAM	1	0	21.79	1	0-1
	1852.5	18625	5	16-QAM	1	12	21.94	1	0-1
	1852.5	18625	5	16-QAM	1	24	21.97	1	0-1
	1852.5	18625	5	16-QAM	12	0	20.60	2	0-2
	1852.5	18625	5	16-QAM	12	6	20.69	2	0-2
	1852.5	18625	5	16-QAM	12	13	20.76	2	0-2
	1852.5	18625	5	16-QAM	25	0	20.53	2	0-2
Mid	1880.0	18900	5	QPSK	1	0	22.85	0	0
	1880.0	18900	5	QPSK	1	12	22.73	0	0
	1880.0	18900	5	QPSK	1	24	22.82	0	0
	1880.0	18900	5	QPSK	12	0	21.75	1	0-1
	1880.0	18900	5	QPSK	12	6	21.78	1	0-1
	1880.0	18900	5	QPSK	12	13	21.83	1	0-1
	1880.0	18900	5	QPSK	25	0	21.75	1	0-1
	1880.0	18900	5	16-QAM	1	0	21.69	1	0-1
	1880.0	18900	5	16-QAM	1	12	21.59	1	0-1
	1880.0	18900	5	16-QAM	1	24	21.69	1	0-1
	1880.0	18900	5	16-QAM	12	0	20.75	2	0-2
	1880.0	18900	5	16-QAM	12	6	20.75	2	0-2
	1880.0	18900	5	16-QAM	12	13	20.90	2	0-2
	1880.0	18900	5	16-QAM	25	0	20.72	2	0-2
High	1907.5	19175	5	QPSK	1	0	22.93	0	0
	1907.5	19175	5	QPSK	1	12	22.93	0	0
	1907.5	19175	5	QPSK	1	24	22.78	0	0
	1907.5	19175	5	QPSK	12	0	21.78	1	0-1
	1907.5	19175	5	QPSK	12	6	21.80	1	0-1
	1907.5	19175	5	QPSK	12	13	21.78	1	0-1
	1907.5	19175	5	QPSK	25	0	21.66	1	0-1
	1907.5	19175	5	16-QAM	1	0	21.75	1	0-1
	1907.5	19175	5	16-QAM	1	12	21.69	1	0-1
	1907.5	19175	5	16-QAM	1	24	21.59	1	0-1
	1907.5	19175	5	16-QAM	12	0	20.72	2	0-2
	1907.5	19175	5	16-QAM	12	6	20.80	2	0-2
	1907.5	19175	5	16-QAM	12	13	20.76	2	0-2
	1907.5	19175	5	16-QAM	25	0	20.63	2	0-2

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9.2.6 LTE Band 25 (PCS)

Table 9-11
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	22.69	0	0
	1855	26090	10	QPSK	1	25	22.64	0	0
	1855	26090	10	QPSK	1	49	22.62	0	0
	1855	26090	10	QPSK	25	0	21.76	1	0-1
	1855	26090	10	QPSK	25	12	21.58	1	0-1
	1855	26090	10	QPSK	25	25	21.79	1	0-1
	1855	26090	10	QPSK	50	0	21.71	1	0-1
	1855	26090	10	16QAM	1	0	21.98	1	0-1
	1855	26090	10	16QAM	1	25	21.74	1	0-1
	1855	26090	10	16QAM	1	49	21.94	1	0-1
	1855	26090	10	16QAM	25	0	20.75	2	0-2
	1855	26090	10	16QAM	25	12	20.74	2	0-2
	1855	26090	10	16QAM	25	25	20.76	2	0-2
	1855	26090	10	16QAM	50	0	20.66	2	0-2
Mid	1882.5	26365	10	QPSK	1	0	22.79	0	0
	1882.5	26365	10	QPSK	1	25	**22.89**	0	0
	1882.5	26365	10	QPSK	1	49	22.88	0	0
	1882.5	26365	10	QPSK	25	0	21.85	1	0-1
	1882.5	26365	10	QPSK	25	12	21.84	1	0-1
	1882.5	26365	10	QPSK	25	25	**21.91**	1	0-1
	1882.5	26365	10	QPSK	50	0	21.70	1	0-1
	1882.5	26365	10	16QAM	1	0	21.67	1	0-1
	1882.5	26365	10	16QAM	1	25	21.76	1	0-1
	1882.5	26365	10	16QAM	1	49	21.87	1	0-1
	1882.5	26365	10	16QAM	25	0	20.93	2	0-2
	1882.5	26365	10	16QAM	25	12	20.79	2	0-2
	1882.5	26365	10	16QAM	25	25	20.71	2	0-2
	1882.5	26365	10	16QAM	50	0	20.58	2	0-2
High	1910	26640	10	QPSK	1	0	22.84	0	0
	1910	26640	10	QPSK	1	25	22.75	0	0
	1910	26640	10	QPSK	1	49	22.70	0	0
	1910	26640	10	QPSK	25	0	21.81	1	0-1
	1910	26640	10	QPSK	25	12	21.85	1	0-1
	1910	26640	10	QPSK	25	25	21.90	1	0-1
	1910	26640	10	QPSK	50	0	21.50	1	0-1
	1910	26640	10	16QAM	1	0	22.00	1	0-1
	1910	26640	10	16QAM	1	25	21.84	1	0-1
	1910	26640	10	16QAM	1	49	21.60	1	0-1
	1910	26640	10	16QAM	25	0	20.66	2	0-2
	1910	26640	10	16QAM	25	12	20.74	2	0-2
	1910	26640	10	16QAM	25	25	20.57	2	0-2
	1910	26640	10	16QAM	50	0	20.55	2	0-2

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Table 9-12
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	22.66	0	0
	1852.5	26065	5	QPSK	1	12	22.69	0	0
	1852.5	26065	5	QPSK	1	24	22.72	0	0
	1852.5	26065	5	QPSK	12	0	21.74	1	0-1
	1852.5	26065	5	QPSK	12	6	21.80	1	0-1
	1852.5	26065	5	QPSK	12	13	21.77	1	0-1
	1852.5	26065	5	QPSK	25	0	21.75	1	0-1
	1852.5	26065	5	16-QAM	1	0	21.65	1	0-1
	1852.5	26065	5	16-QAM	1	12	21.70	1	0-1
	1852.5	26065	5	16-QAM	1	24	21.71	1	0-1
	1852.5	26065	5	16-QAM	12	0	20.70	2	0-2
	1852.5	26065	5	16-QAM	12	6	20.77	2	0-2
	1852.5	26065	5	16-QAM	12	13	20.73	2	0-2
	1852.5	26065	5	16-QAM	25	0	20.62	2	0-2
Mid	1882.5	26365	5	QPSK	1	0	22.72	0	0
	1882.5	26365	5	QPSK	1	12	22.70	0	0
	1882.5	26365	5	QPSK	1	24	22.66	0	0
	1882.5	26365	5	QPSK	12	0	21.71	1	0-1
	1882.5	26365	5	QPSK	12	6	21.70	1	0-1
	1882.5	26365	5	QPSK	12	13	21.72	1	0-1
	1882.5	26365	5	QPSK	25	0	21.68	1	0-1
	1882.5	26365	5	16-QAM	1	0	21.71	1	0-1
	1882.5	26365	5	16-QAM	1	12	21.70	1	0-1
	1882.5	26365	5	16-QAM	1	24	21.71	1	0-1
	1882.5	26365	5	16-QAM	12	0	20.71	2	0-2
	1882.5	26365	5	16-QAM	12	6	20.67	2	0-2
	1882.5	26365	5	16-QAM	12	13	20.68	2	0-2
	1882.5	26365	5	16-QAM	25	0	20.62	2	0-2
High	1912.5	26665	5	QPSK	1	0	22.64	0	0
	1912.5	26665	5	QPSK	1	12	22.63	0	0
	1912.5	26665	5	QPSK	1	24	22.50	0	0
	1912.5	26665	5	QPSK	12	0	21.69	1	0-1
	1912.5	26665	5	QPSK	12	6	21.73	1	0-1
	1912.5	26665	5	QPSK	12	13	21.56	1	0-1
	1912.5	26665	5	QPSK	25	0	21.57	1	0-1
	1912.5	26665	5	16-QAM	1	0	21.54	1	0-1
	1912.5	26665	5	16-QAM	1	12	21.63	1	0-1
	1912.5	26665	5	16-QAM	1	24	21.64	1	0-1
	1912.5	26665	5	16-QAM	12	0	20.74	2	0-2
	1912.5	26665	5	16-QAM	12	6	20.78	2	0-2
	1912.5	26665	5	16-QAM	12	13	20.76	2	0-2
	1912.5	26665	5	16-QAM	25	0	20.57	2	0-2

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9.3 WLAN Conducted Powers

Table 9-13
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*	16.27	16.33	16.28	16.26
802.11b	2437	6*	16.35	16.38	16.26	16.50
802.11b	2462	11*	**16.76**	16.78	16.92	17.00

Table 9-14
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	13.70	13.68	13.73	13.77	13.65	13.74	13.77	13.65
802.11g	2437	6	13.34	13.43	13.22	13.44	13.31	13.46	13.34	13.30
802.11g	2462	11	13.46	13.25	13.15	13.25	13.06	13.74	13.46	13.22

Table 9-15
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	12.99	12.97	12.83	12.93	12.82	12.82	12.84	12.73
802.11n	2437	6	12.49	12.61	12.40	12.60	12.58	12.46	12.68	12.61
802.11n	2462	11	12.27	12.31	12.42	12.41	12.47	12.45	12.54	12.28

Table 9-16
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*	9.52	9.37	9.34	9.38	9.46	9.50	9.36	9.94
802.11a	5200	40	9.51	9.73	9.54	9.80	9.54	9.86	10.10	9.42
802.11a	5220	44	9.73	9.60	9.54	9.48	10.12	9.99	9.26	10.13
802.11a	5240	48*	**10.05**	10.20	10.25	10.19	9.96	10.12	10.02	10.26
802.11a	5260	52*	9.32	9.42	9.29	9.40	9.00	9.71	9.17	9.36
802.11a	5280	56	9.47	9.54	9.28	9.34	9.69	9.46	9.42	9.14
802.11a	5300	60	9.51	9.70	9.69	9.72	9.60	9.44	9.35	9.74
802.11a	5320	64*	**9.88**	10.00	9.53	9.98	9.82	9.96	9.74	9.81
802.11a	5500	100	9.98	10.01	10.12	10.02	10.05	10.01	10.13	9.87
802.11a	5520	104*	9.82	9.79	9.53	10.11	9.61	9.79	9.87	9.98
802.11a	5540	108	9.83	9.57	9.89	9.89	9.79	9.61	9.82	9.66
802.11a	5560	112	9.63	9.52	9.57	9.63	9.48	9.58	9.56	10.11
802.11a	5580	116*	**10.00**	10.19	9.94	10.11	10.23	9.85	9.98	10.12
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	9.75	9.87	9.76	9.83	9.71	9.89	9.60	9.75
802.11a	5680	136*	9.80	9.77	9.86	9.89	9.44	9.80	9.71	10.16
802.11a	5700	140	9.70	9.72	9.99	9.82	10.13	9.99	10.01	9.88
802.11a	5745	149*	9.61	9.53	9.60	9.54	9.29	9.46	9.29	9.03
802.11a	5765	153	9.49	9.50	9.85	9.37	9.63	9.53	9.29	9.21
802.11a	5785	157*	**9.76**	9.70	9.58	9.72	9.60	9.65	9.67	9.50
802.11a	5805	161*	9.38	9.61	9.29	9.43	9.53	9.36	9.45	9.44
802.11a	5825	165	8.53	8.80	8.72	8.87	8.53	8.94	9.24	8.80

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.

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Table 9-17
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	19.5	26	39	52	58.5	65
802.11n	5180	36	9.66	9.52	9.28	9.39	9.58	9.58	9.70	9.68
802.11n	5200	40	9.27	9.80	9.56	9.57	9.42	10.00	9.67	9.78
802.11n	5220	44	9.36	9.53	9.66	9.55	9.69	9.50	9.74	9.63
802.11n	5240	48	10.29	10.10	10.15	10.20	10.25	10.28	10.23	10.28
802.11n	5260	52	9.36	9.37	9.24	9.60	9.38	9.27	9.14	9.38
802.11n	5280	56	9.86	10.00	9.65	9.57	9.40	9.68	9.88	9.93
802.11n	5300	60	9.63	9.64	9.51	9.75	9.73	9.58	9.81	10.01
802.11n	5320	64	9.84	9.75	9.85	10.12	9.99	10.06	9.83	9.96
802.11n	5500	100	10.05	10.20	10.24	10.07	9.99	10.03	10.12	10.22
802.11n	5520	104	10.09	9.88	10.23	10.24	10.08	9.92	10.14	9.87
802.11n	5540	108	9.94	9.94	10.00	9.91	10.21	10.16	9.73	9.79
802.11n	5560	112	9.99	10.10	9.81	9.73	9.81	9.70	9.80	9.80
802.11n	5580	116	10.18	10.21	10.12	9.95	10.22	10.19	9.90	10.21
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	9.78	9.88	10.20	9.69	9.86	9.88	9.69	9.86
802.11n	5680	136	9.65	9.68	9.96	10.24	9.85	9.76	9.88	9.91
802.11n	5700	140	9.93	9.99	10.21	9.96	9.62	9.84	9.76	10.02
802.11n	5745	149	9.51	9.59	9.61	9.60	9.43	9.28	9.64	9.89
802.11n	5765	153	9.88	9.44	9.61	9.89	9.81	9.40	9.88	9.35
802.11n	5785	157	9.74	9.86	9.70	9.67	9.80	9.66	9.87	9.60
802.11n	5805	161	9.51	9.61	9.44	9.59	9.44	9.31	9.66	9.34
802.11n	5825	165	8.45	8.83	9.19	8.93	8.69	8.74	8.94	8.85

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.

Table 9-18
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	9.86	10.04	10.06	9.69	9.88	9.62	9.83	10.24
802.11n	5230	46	10.29	10.25	10.27	10.25	10.18	10.06	10.23	10.06
802.11n	5270	54	10.07	9.69	9.63	9.55	9.62	9.70	9.42	9.58
802.11n	5310	62	10.05	10.04	10.12	9.99	10.00	10.05	10.07	10.02
802.11n	5510	102	9.67	9.60	9.37	9.29	10.20	10.14	9.60	9.41
802.11n	5550	110	9.40	9.46	10.01	9.26	9.31	9.42	9.15	9.55
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	9.35	9.27	9.57	10.00	9.94	9.44	9.75	9.15
802.11n	5755	151	9.35	9.40	9.41	8.93	8.41	8.66	9.48	9.76
802.11n	5795	159	9.44	8.86	9.04	9.94	9.12	9.33	9.75	8.73

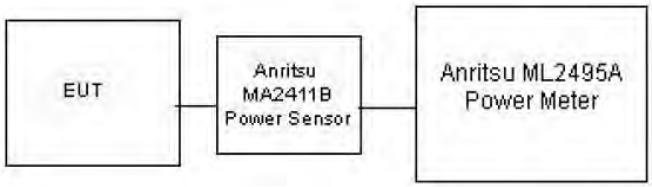

Figure 9-2
Power Measurement Setup for Bandwidths < 50 MHz

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Table 9-19
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	**9.82**	9.66	9.62	9.62	9.52	9.46	9.21	9.52	9.67	9.66
802.11ac	5290	58	**9.42**	9.40	9.34	9.08	9.03	9.17	9.23	9.37	9.65	9.56
802.11ac	5530	106	**9.25**	9.10	9.58	9.75	9.28	9.59	9.32	9.39	9.13	9.53
802.11ac	5775	155	**8.96**	9.17	9.29	9.05	9.08	9.55	9.17	8.80	9.37	9.73

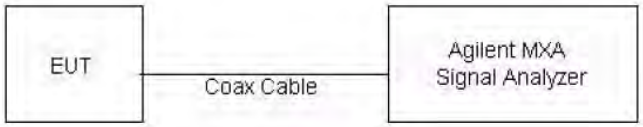

Figure 9-3
Power Measurement Setup for Bandwidths > 50 MHz

Table 9-20
Bluetooth RF Conducted Powers

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Peak Conducted Power		Avg Conducted Power	
			[dBm]	[mW]	[dBm]	[mW]
2402	1.0	0	8.88	7.718	**8.64**	**7.304**
2441	1.0	39	8.75	7.504	8.52	7.113
2480	1.0	78	8.89	7.750	8.63	7.287
2402	2.0	0	9.88	9.727	7.13	5.160
2441	2.0	39	9.75	9.438	7.01	5.021
2480	2.0	78	9.90	9.763	7.12	5.156
2402	3.0	0	10.12	10.285	7.19	5.230
2441	3.0	39	10.00	9.998	7.07	5.089
2480	3.0	78	10.13	10.306	7.18	5.226

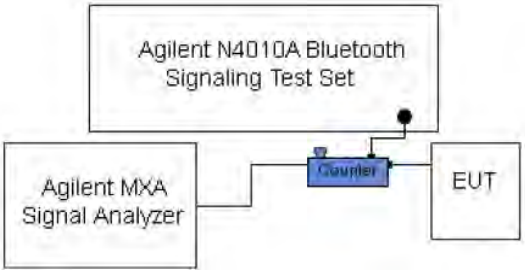

Figure 9-4
Power Measurement Setup

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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.

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head 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
06/06/2013	750H	22.2	695	0.857	41.973	0.886	42.193	-3.27%	-0.52%
			710	0.868	41.633	0.887	42.113	-2.14%	-1.14%
			725	0.877	41.354	0.888	42.033	-1.24%	-1.62%
			740	0.893	41.040	0.889	41.953	0.45%	-2.18%
			755	0.910	40.668	0.891	41.876	2.13%	-2.88%
06/05/2013	835H	22.3	820	0.925	42.622	0.898	41.571	3.01%	2.53%
			835	0.938	42.440	0.900	41.500	4.22%	2.27%
			850	0.951	42.225	0.916	41.500	3.82%	1.75%
06/10/2013	835H	23.7	820	0.911	41.992	0.898	41.571	1.45%	1.01%
			835	0.923	41.834	0.900	41.500	2.56%	0.80%
			850	0.939	41.671	0.916	41.500	2.51%	0.41%
06/06/2013	1750H	22.0	1710	1.379	39.839	1.348	40.136	2.30%	-0.74%
			1750	1.401	39.495	1.370	40.100	2.26%	-1.51%
			1790	1.447	39.257	1.394	40.020	3.80%	-1.91%
06/05/2013	1900H	23.6	1850	1.394	40.118	1.400	40.000	-0.43%	0.30%
			1880	1.422	39.987	1.400	40.000	1.57%	-0.03%
			1910	1.451	39.863	1.400	40.000	3.64%	-0.34%
06/02/2013	2450H	22.7	2401	1.697	39.117	1.758	39.298	-3.47%	-0.46%
			2450	1.748	39.074	1.800	39.200	-2.89%	-0.32%
			2499	1.795	38.721	1.852	39.135	-3.08%	-1.06%
06/10/2013	5200H-5800H	24.5	5200	4.549	37.028	4.660	36.000	-2.38%	2.86%
			5220	4.568	36.999	4.680	35.980	-2.39%	2.83%
			5240	4.606	36.953	4.700	35.960	-2.00%	2.76%
			5280	4.661	36.870	4.740	35.920	-1.67%	2.64%
			5300	4.690	36.844	4.760	35.900	-1.47%	2.63%
			5320	4.715	36.807	4.780	35.880	-1.36%	2.58%
			5500	4.951	36.499	4.965	35.650	-0.28%	2.38%
			5520	4.966	36.485	4.986	35.620	-0.40%	2.43%
			5540	5.002	36.434	5.007	35.590	-0.10%	2.37%
			5580	5.047	36.367	5.049	35.530	-0.04%	2.36%
			5600	5.073	36.345	5.070	35.500	0.06%	2.38%
			5765	5.245	36.000	5.235	35.335	0.19%	1.88%
			5785	5.262	35.935	5.255	35.315	0.13%	1.76%
			5800	5.280	35.902	5.270	35.300	0.19%	1.71%

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Table 10-2
Measured Body 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
06/05/2013	750B	22.1	695	0.938	57.244	0.959	55.745	-2.19%	2.69%
			710	0.952	57.058	0.960	55.687	-0.83%	2.46%
			725	0.965	56.911	0.961	55.629	0.42%	2.30%
			740	0.979	56.808	0.963	55.570	1.66%	2.23%
			755	0.993	56.696	0.964	55.512	3.01%	2.13%
06/07/2013	835B	22.7	820	0.993	56.150	0.969	55.258	2.48%	1.61%
			835	1.008	55.957	0.970	55.200	3.92%	1.37%
			850	1.017	55.809	0.988	55.154	2.94%	1.19%
06/10/2013	835B	23.5	820	0.972	54.455	0.969	55.258	0.31%	-1.45%
			835	0.974	53.945	0.970	55.200	0.41%	-2.27%
			850	0.966	53.981	0.988	55.154	-2.23%	-2.13%
06/04/2013	1750B	23.0	1710	1.389	52.905	1.460	53.540	-4.86%	-1.19%
			1750	1.434	52.619	1.490	53.430	-3.76%	-1.52%
			1790	1.486	52.605	1.510	53.330	-1.59%	-1.36%
06/05/2013	1900B	23.4	1850	1.529	51.742	1.520	53.300	0.59%	-2.92%
			1880	1.564	51.581	1.520	53.300	2.89%	-3.23%
			1910	1.595	51.502	1.520	53.300	4.93%	-3.37%
06/11/2013	1900B	23.6	1850	1.493	51.566	1.520	53.300	-1.78%	-3.25%
			1880	1.527	51.466	1.520	53.300	0.46%	-3.44%
			1910	1.559	51.347	1.520	53.300	2.57%	-3.66%
06/05/2013	2450B	22.6	2401	1.898	51.840	1.903	52.765	-0.26%	-1.75%
			2450	1.961	51.673	1.950	52.700	0.56%	-1.95%
			2499	2.024	51.476	2.019	52.638	0.25%	-2.21%
06/11/2013	2450B	23.9	2401	1.937	51.139	1.903	52.765	1.79%	-3.08%
			2450	2.001	50.950	1.950	52.700	2.62%	-3.32%
			2499	2.064	50.776	2.019	52.638	2.23%	-3.54%
06/06/2013	5200B-5800B	22.2	5200	5.266	47.021	5.299	49.014	-0.62%	-4.07%
			5220	5.296	46.853	5.323	48.987	-0.51%	-4.36%
			5240	5.323	46.839	5.346	48.933	-0.43%	-4.28%
			5280	5.384	46.820	5.393	48.879	-0.17%	-4.21%
			5300	5.408	46.823	5.416	48.851	-0.15%	-4.15%
			5320	5.416	46.783	5.439	48.607	-0.42%	-3.75%
			5500	5.634	46.428	5.650	48.580	-0.28%	-4.43%
			5520	5.681	46.388	5.673	48.553	0.14%	-4.46%
			5540	5.714	46.354	5.696	48.526	0.32%	-4.48%
			5580	5.749	46.330	5.743	48.471	0.10%	-4.42%
			5600	5.790	46.285	5.766	48.444	0.42%	-4.46%
			5765	6.000	45.958	5.959	48.220	0.69%	-4.69%
			5785	6.032	45.952	5.982	48.242	0.84%	-4.75%
			5800	6.058	45.944	6.000	48.200	0.97%	-4.68%
06/13/2013	5200B-5800B	23.4	5200	5.370	47.223	5.299	49.014	1.34%	-3.65%
			5220	5.405	47.163	5.323	48.987	1.54%	-3.72%
			5240	5.432	47.128	5.346	48.933	1.61%	-3.69%
			5280	5.498	47.027	5.393	48.879	1.95%	-3.79%
			5300	5.524	47.002	5.416	48.851	1.99%	-3.78%
			5320	5.559	47.006	5.439	48.607	2.21%	-3.29%
			5500	5.830	46.700	5.650	48.580	3.19%	-3.87%
			5520	5.861	46.660	5.673	48.553	3.31%	-3.90%
			5540	5.891	46.636	5.696	48.526	3.42%	-3.89%
			5580	5.955	46.593	5.743	48.471	3.69%	-3.87%
			5600	5.975	46.549	5.766	48.444	3.62%	-3.91%
			5765	6.176	46.329	5.959	48.220	3.64%	-3.92%
			5785	6.204	46.300	5.982	48.242	3.71%	-4.03%
			5800	6.224	46.284	6.000	48.200	3.73%	-3.98%

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.

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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 10-3
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)	$Deviation_{1g}$ (%)
C	750	HEAD	06/06/2013	23.6	22.2	0.100	1054	3022	0.791	8.500	7.910	-6.94%
D	835	HEAD	06/05/2013	24.3	23.2	0.100	4d132	3288	0.999	9.660	9.990	3.42%
D	835	HEAD	06/10/2013	24.2	23.7	0.100	4d132	3288	0.970	9.660	9.700	0.41%
B	1750	HEAD	06/06/2013	23.1	22.0	0.100	1008	3287	3.770	36.800	37.700	2.45%
G	1900	HEAD	06/05/2013	23.3	23.2	0.100	5d148	3209	3.860	39.700	38.600	-2.77%
G	2450	HEAD	06/02/2013	24.5	24.3	0.050	882	3209	2.430	51.700	48.600	-6.00%
A	5200	HEAD	06/10/2013	24.3	24.5	0.100	1057	3589	7.110	75.900	71.100	-6.32%
A	5300	HEAD	06/10/2013	24.3	24.5	0.100	1057	3589	7.630	76.900	76.300	-0.78%
A	5500	HEAD	06/10/2013	24.1	24.4	0.100	1057	3589	7.430	80.100	74.300	-7.24%
A	5600	HEAD	06/10/2013	24.2	24.4	0.100	1057	3589	8.100	80.400	81.000	0.75%
A	5800	HEAD	06/10/2013	24.2	24.3	0.100	1057	3589	7.530	76.100	75.300	-1.05%
C	750	BODY	06/05/2013	23.3	22.1	0.100	1054	3022	0.890	8.720	8.900	2.06%
G	835	BODY	06/07/2013	24.3	22.7	0.100	4d132	3209	0.955	9.360	9.550	2.03%
G	835	BODY	06/10/2013	24.5	23.5	0.100	4d132	3209	0.929	9.360	9.290	-0.75%
B	1750	BODY	06/04/2013	23.7	23.0	0.100	1008	3287	3.830	38.200	38.300	0.26%
E	1900	BODY	06/05/2013	23.8	23.4	0.100	5d148	3920	4.260	40.800	42.600	4.41%
E	1900	BODY	06/11/2013	24.4	23.5	0.100	5d148	3920	4.240	40.800	42.400	3.92%
G	2450	BODY	06/05/2013	24.2	22.6	0.100	797	3209	5.220	49.600	52.200	5.24%
C	2450	BODY	06/11/2013	23.7	23.5	0.040	719	3022	2.170	51.600	54.250	5.14%
A	5200	BODY	06/13/2013	23.7	22.9	0.100	1057	3589	7.190	75.500	71.900	-4.77%
A	5300	BODY	06/13/2013	23.7	22.9	0.100	1057	3589	7.860	75.300	78.600	4.38%
A	5500	BODY	06/13/2013	23.6	22.9	0.100	1057	3589	7.950	80.800	79.500	-1.61%
A	5600	BODY	06/13/2013	23.6	22.8	0.100	1057	3589	8.730	80.300	87.300	8.72%
A	5800	BODY	06/13/2013	23.5	22.8	0.100	1057	3589	7.560	75.100	75.600	0.67%

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Table 10-4
System Verification Results – Extremity SAR

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_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
A	5200	BODY	06/06/2013	24.2	22.8	0.100	1057	3589	2.000	21.100	20.000	-5.21%
A	5300	BODY	06/06/2013	24.2	22.8	0.100	1057	3589	2.150	21.100	21.500	1.90%
A	5500	BODY	06/06/2013	24.2	22.8	0.100	1057	3589	2.150	22.400	21.500	-4.02%
A	5600	BODY	06/06/2013	24.3	22.9	0.100	1057	3589	2.370	22.300	23.700	6.28%
A	5800	BODY	06/06/2013	24.3	22.9	0.100	1057	3589	2.020	20.700	20.200	-2.42%

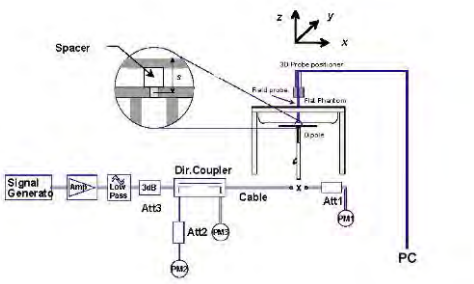

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
Cell. 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)	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.53	0.07	Right	Cheek	#24	1:1	0.119	1.114	0.133	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.53	0.10	Right	Tilt	#24	1:1	0.076	1.114	0.085	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.53	0.04	Left	Cheek	#24	1:1	0.147	1.114	0.164	A1
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.53	0.21	Left	Tilt	#24	1:1	0.084	1.114	0.094	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.51	0.02	Right	Cheek	#24	1:1	0.128	1.119	0.143	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.51	0.09	Right	Tilt	#24	1:1	0.077	1.119	0.086	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.51	0.09	Left	Cheek	#24	1:1	0.143	1.119	0.160	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.51	0.07	Left	Tilt	#24	1:1	0.089	1.119	0.100	
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
PCS 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	25.0	24.66	0.03	Right	Cheek	#23	1:1	0.160	1.081	0.173	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.66	0.07	Right	Tilt	#23	1:1	0.190	1.081	0.205	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.66	0.11	Left	Cheek	#23	1:1	0.230	1.081	0.249	A2
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.66	0.05	Left	Tilt	#23	1:1	0.192	1.081	0.208	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.59	0.02	Right	Cheek	#23	1:1	0.098	1.099	0.108	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.59	0.05	Right	Tilt	#23	1:1	0.162	1.099	0.178	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.59	-0.06	Left	Cheek	#23	1:1	0.168	1.099	0.185	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.59	0.03	Left	Tilt	#23	1:1	0.165	1.099	0.181	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-3
LTE Band 12 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)	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.08	0	Right	Cheek	QPSK	1	49	#28	1:1	0.030	1.067	0.032	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.14	1	Right	Cheek	QPSK	25	25	#28	1:1	0.018	1.086	0.020	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.12	0	Right	Tilt	QPSK	1	49	#28	1:1	0.013	1.067	0.014	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.15	1	Right	Tilt	QPSK	25	25	#28	1:1	0.009	1.086	0.010	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.15	0	Left	Cheek	QPSK	1	49	#28	1:1	0.030	1.067	0.032	A3
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.14	1	Left	Cheek	QPSK	25	25	#28	1:1	0.018	1.086	0.020	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.13	0	Left	Tilt	QPSK	1	49	#28	1:1	0.014	1.067	0.015	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.14	1	Left	Tilt	QPSK	25	25	#28	1:1	0.008	1.086	0.009	
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
LTE Band 17 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)	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.07	0	Right	Cheek	QPSK	1	49	#28	1:1	0.053	1.059	0.056	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.09	1	Right	Cheek	QPSK	25	0	#28	1:1	0.031	1.143	0.035	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.05	0	Right	Tilt	QPSK	1	49	#28	1:1	0.054	1.059	0.057	A4
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.16	1	Right	Tilt	QPSK	25	0	#28	1:1	0.031	1.143	0.035	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	-0.15	0	Left	Cheek	QPSK	1	49	#28	1:1	0.043	1.059	0.046	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.14	1	Left	Cheek	QPSK	25	0	#28	1:1	0.024	1.143	0.027	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.13	0	Left	Tilt	QPSK	1	49	#28	1:1	0.021	1.059	0.022	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.15	1	Left	Tilt	QPSK	25	0	#28	1:1	0.011	1.143	0.013	
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
LTE Band 5 (Cell) 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)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	-0.04	0	Right	Cheek	QPSK	1	0	#27	1:1	0.150	1.132	0.170	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	-0.13	1	Right	Cheek	QPSK	25	0	#27	1:1	0.104	1.172	0.122	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	-0.05	0	Right	Tilt	QPSK	1	0	#27	1:1	0.107	1.132	0.121	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	0.01	1	Right	Tilt	QPSK	25	0	#27	1:1	0.077	1.172	0.090	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.04	0	Left	Cheek	QPSK	1	0	#27	1:1	0.261	1.132	0.295	A5
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	0.13	1	Left	Cheek	QPSK	25	0	#27	1:1	0.184	1.172	0.216	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.08	0	Left	Tilt	QPSK	1	0	#27	1:1	0.186	1.132	0.211	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	0.03	1	Left	Tilt	QPSK	25	0	#27	1:1	0.130	1.172	0.152	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-6
LTE Band 4 (AWS) 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)	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	0.04	0	Right	Cheek	QPSK	1	25	#25	1:1	0.138	1.038	0.143	A6
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	-0.12	1	Right	Cheek	QPSK	25	25	#25	1:1	0.119	1.045	0.124	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.20	0	Right	Tilt	QPSK	1	25	#25	1:1	0.092	1.038	0.095	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	0.19	1	Right	Tilt	QPSK	25	25	#25	1:1	0.083	1.045	0.087	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.15	0	Left	Cheek	QPSK	1	25	#25	1:1	0.085	1.038	0.088	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	0.07	1	Left	Cheek	QPSK	25	25	#25	1:1	0.079	1.045	0.083	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	0.03	0	Left	Tilt	QPSK	1	25	#25	1:1	0.102	1.038	0.106	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	-0.13	1	Left	Tilt	QPSK	25	25	#25	1:1	0.085	1.045	0.089	
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
LTE Band 2 (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)	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.03	0	Right	Cheek	QPSK	1	49	#26	1:1	0.121	1.138	0.138	A7
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.05	1	Right	Cheek	QPSK	25	25	#26	1:1	0.086	1.159	0.100	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.11	0	Right	Tilt	QPSK	1	49	#26	1:1	0.087	1.138	0.099	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.05	1	Right	Tilt	QPSK	25	25	#26	1:1	0.067	1.159	0.078	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.01	0	Left	Cheek	QPSK	1	49	#26	1:1	0.073	1.138	0.083	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.08	1	Left	Cheek	QPSK	25	25	#26	1:1	0.052	1.159	0.060	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.02	0	Left	Tilt	QPSK	1	49	#26	1:1	0.083	1.138	0.094	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.06	1	Left	Tilt	QPSK	25	25	#26	1:1	0.061	1.159	0.071	
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 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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	-0.01	0	Right	Cheek	QPSK	1	25	#30	1:1	0.180	1.151	0.207	A8
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.11	1	Right	Cheek	QPSK	25	25	#30	1:1	0.126	1.146	0.144	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	0.16	0	Right	Tilt	QPSK	1	25	#30	1:1	0.111	1.151	0.128	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.12	1	Right	Tilt	QPSK	25	25	#30	1:1	0.076	1.146	0.087	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	0.04	0	Left	Cheek	QPSK	1	25	#30	1:1	0.091	1.151	0.105	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.03	1	Left	Cheek	QPSK	25	25	#30	1:1	0.062	1.146	0.071	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	0.12	0	Left	Tilt	QPSK	1	25	#30	1:1	0.112	1.151	0.129	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.05	1	Left	Tilt	QPSK	25	25	#30	1:1	0.073	1.146	0.084	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-9
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)	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.17	Right	Cheek	#30	1	1:1	0.031	1.057	0.033	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.14	Right	Tilt	#30	1	1:1	0.032	1.057	0.034	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	-0.05	Left	Cheek	#30	1	1:1	0.074	1.057	0.078	A9
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.15	Left	Tilt	#30	1	1:1	0.039	1.057	0.041	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.16	Right	Cheek	#25	6	1:1	0.000	1.186	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.11	Right	Tilt	#25	6	1:1	0.000	1.186	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	-0.14	Left	Cheek	#25	6	1:1	0.020	1.186	0.024	A11
5775	155	IEEE 802.11ac	OFDM	10.0	8.96	0.13	Left	Cheek	#25	29.3	1:1	0.017	1.271	0.022	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.11	Left	Tilt	#25	6	1:1	0.015	1.186	0.018	
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
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	0.18	Right	Cheek	#25	6	1:1	0.000	1.109	0.000	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	0.15	Right	Tilt	#25	6	1:1	0.012	1.109	0.013	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	0.15	Left	Cheek	#25	6	1:1	0.021	1.109	0.023	
5210	42	IEEE 802.11ac	OFDM	10.0	9.82	0.16	Left	Cheek	#25	29.3	1:1	0.007	1.042	0.007	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	0.11	Left	Tilt	#25	6	1:1	0.018	1.109	0.020	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.18	Right	Cheek	#25	6	1:1	0.010	1.153	0.012	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.09	Right	Tilt	#25	6	1:1	0.014	1.153	0.016	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.13	Left	Cheek	#25	6	1:1	0.021	1.153	0.024	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.06	Left	Tilt	#25	6	1:1	0.021	1.153	0.024	
5290	58	IEEE 802.11ac	OFDM	10.0	9.42	0.12	Left	Tilt	#25	29.3	1:1	0.013	1.143	0.015	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	-0.16	Right	Cheek	#25	6	1:1	0.001	1.122	0.001	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	0.12	Right	Tilt	#25	6	1:1	0.010	1.122	0.011	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	0.13	Left	Cheek	#25	6	1:1	0.034	1.122	0.038	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	0.15	Left	Tilt	#25	6	1:1	0.037	1.122	0.042	A10
5530	106	IEEE 802.11ac	OFDM	10.0	9.25	0.14	Left	Tilt	#25	29.3	1:1	0.025	1.189	0.030	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

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11.2 Standalone Body-Worn SAR Data

Table 11-11
Body-Worn SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.37	0.00	10 mm	#24	1:1	back	0.429	1.156	0.496	A12
1851.25	25	PCS CDMA	TDSO / SO32	25.0	24.63	-0.01	10 mm	#23	1:1	back	0.754	1.089	0.821	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.01	10 mm	#23	1:1	back	0.924	1.057	0.977	A13
1908.75	1175	PCS CDMA	TDSO / SO32	25.0	24.68	0.01	10 mm	#23	1:1	back	0.918	1.076	0.988	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.01	10 mm	#23	1:1	back	0.874	1.057	0.924	
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: Blue entry represents repeatability measurements.

Table 11-12
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.01	0	#28	QPSK	1	49	10 mm	back	1:1	0.165	1.067	0.176	A14
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.05	1	#28	QPSK	25	25	10 mm	back	1:1	0.155	1.086	0.168	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.06	0	#28	QPSK	1	49	10 mm	back	1:1	0.173	1.059	0.183	A15
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.05	1	#28	QPSK	25	0	10 mm	back	1:1	0.143	1.143	0.163	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.03	0	#27	QPSK	1	0	10 mm	back	1:1	0.191	1.132	0.216	A16
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	0.06	1	#27	QPSK	25	0	10 mm	back	1:1	0.137	1.172	0.161	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.08	0	#25	QPSK	1	25	10 mm	back	1:1	0.415	1.038	0.431	A17
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	0.01	1	#25	QPSK	25	25	10 mm	back	1:1	0.338	1.045	0.353	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	-0.05	0	#26	QPSK	1	49	10 mm	back	1:1	0.473	1.138	0.538	A18
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	-0.05	1	#26	QPSK	25	25	10 mm	back	1:1	0.339	1.159	0.393	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	-0.02	0	#30	QPSK	1	25	10 mm	back	1:1	0.445	1.151	0.512	A19
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	-0.05	1	#30	QPSK	25	25	10 mm	back	1:1	0.323	1.146	0.370	
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 11-13
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.00	10 mm	#30	1	back	1:1	0.311	1.057	0.329	A20
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.12	10 mm	#25	6	back	1:1	0.010	1.186	0.012	
5775	155	IEEE 802.11ac	OFDM	10.0	8.96	0.18	10 mm	#25	29.3	back	1:1	0.011	1.271	0.014	A23
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 11-14
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	-0.13	10 mm	#25	6	back	1:1	0.086	1.109	**0.095**	A22
5210	42	IEEE 802.11ac	OFDM	10.0	9.82	0.14	10 mm	#25	29.3	back	1:1	0.023	1.042	0.024	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	-0.12	10 mm	#25	6	back	1:1	0.039	1.153	0.045	
5290	58	IEEE 802.11ac	OFDM	10.0	9.42	-0.11	10 mm	#25	29.3	back	1:1	0.029	1.143	0.033	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	-0.09	10 mm	#25	6	back	1:1	0.014	1.122	0.016	
5530	106	IEEE 802.11ac	OFDM	10.0	9.25	0.15	10 mm	#25	29.3	back	1:1	0.014	1.189	0.017	
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
Bluetooth 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2402	0	Bluetooth	FHSS	9.0	8.64	-0.16	10 mm	#30	1	back	1:1	0.124	1.086	0.135	A21
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Body 1.6 W/kg (mW/g) averaged over 1 gram**								

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11.3 Standalone Wireless Router SAR Data

Table 11-16
CDMA Hotspot SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.37	0.00	10 mm	#24	1:1	back	0.429	1.156	0.496	A12
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.37	-0.01	10 mm	#24	1:1	front	0.213	1.156	0.246	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.37	-0.01	10 mm	#24	1:1	bottom	0.296	1.156	0.342	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.37	0.03	10 mm	#24	1:1	left	0.143	1.156	0.165	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.52	-0.02	10 mm	#24	1:1	back	0.412	1.117	0.460	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.52	0.00	10 mm	#24	1:1	front	0.219	1.117	0.245	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.52	0.04	10 mm	#24	1:1	bottom	0.298	1.117	0.333	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.52	0.02	10 mm	#24	1:1	left	0.134	1.117	0.150	
1851.25	25	PCS CDMA	TDSO / SO32	25.0	24.63	-0.01	10 mm	#23	1:1	back	0.754	1.089	0.821	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.01	10 mm	#23	1:1	back	0.924	1.057	0.977	A13
1908.75	1175	PCS CDMA	TDSO / SO32	25.0	24.68	0.01	10 mm	#23	1:1	back	0.918	1.076	0.988	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.00	10 mm	#23	1:1	front	0.547	1.057	0.578	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	-0.07	10 mm	#23	1:1	bottom	0.567	1.057	0.599	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.00	10 mm	#23	1:1	left	0.289	1.057	0.305	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	24.61	0.01	10 mm	#23	1:1	back	0.711	1.094	0.778	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.60	0.03	10 mm	#23	1:1	back	0.841	1.096	0.922	
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.0	24.75	0.00	10 mm	#23	1:1	back	0.826	1.059	0.875	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.60	-0.09	10 mm	#23	1:1	front	0.479	1.096	0.525	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.60	-0.03	10 mm	#23	1:1	bottom	0.528	1.096	0.579	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.60	0.00	10 mm	#23	1:1	left	0.293	1.096	0.321	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.76	0.01	10 mm	#23	1:1	back	0.874	1.057	0.924	
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: Blue entry represents repeatability measurements.

Table 11-17
LTE Band 12 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.01	0	#28	QPSK	1	49	10 mm	back	1:1	0.165	1.067	0.176	A14
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.05	1	#28	QPSK	25	25	10 mm	back	1:1	0.155	1.086	0.168	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.02	0	#28	QPSK	1	49	10 mm	front	1:1	0.125	1.067	0.133	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.02	1	#28	QPSK	25	25	10 mm	front	1:1	0.093	1.086	0.101	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	-0.07	0	#28	QPSK	1	49	10 mm	bottom	1:1	0.092	1.067	0.098	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.01	1	#28	QPSK	25	25	10 mm	bottom	1:1	0.068	1.086	0.074	
707.50	23085	Mid	LTE Band 12	10	23.5	23.22	0.02	0	#28	QPSK	1	49	10 mm	right	1:1	0.141	1.067	0.150	
707.50	23085	Mid	LTE Band 12	10	22.5	22.14	0.01	1	#28	QPSK	25	25	10 mm	right	1:1	0.101	1.086	0.110	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-18
LTE Band 17 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.06	0	#28	QPSK	1	49	10 mm	back	1:1	0.173	1.059	0.183	A15
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.05	1	#28	QPSK	25	0	10 mm	back	1:1	0.143	1.143	0.163	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	0.06	0	#28	QPSK	1	49	10 mm	front	1:1	0.099	1.059	0.105	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.08	1	#28	QPSK	25	0	10 mm	front	1:1	0.072	1.143	0.082	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	-0.02	0	#28	QPSK	1	49	10 mm	bottom	1:1	0.076	1.059	0.080	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	0.01	1	#28	QPSK	25	0	10 mm	bottom	1:1	0.056	1.143	0.064	
710.00	23790	Mid	LTE Band 17	10	23.5	23.25	-0.02	0	#28	QPSK	1	49	10 mm	right	1:1	0.115	1.059	0.122	
710.00	23790	Mid	LTE Band 17	10	22.5	21.92	-0.01	1	#28	QPSK	25	0	10 mm	right	1:1	0.089	1.143	0.102	
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 11-19
LTE Band 5 (Cell) 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.03	0	#27	QPSK	1	0	10 mm	back	1:1	0.191	1.132	0.216	A16
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	0.06	1	#27	QPSK	25	0	10 mm	back	1:1	0.137	1.172	0.161	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.02	0	#27	QPSK	1	0	10 mm	front	1:1	0.074	1.132	0.084	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	-0.02	1	#27	QPSK	25	0	10 mm	front	1:1	0.052	1.172	0.061	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	-0.04	0	#27	QPSK	1	0	10 mm	top	1:1	0.129	1.132	0.146	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	-0.12	1	#27	QPSK	25	0	10 mm	top	1:1	0.089	1.172	0.104	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.96	0.01	0	#27	QPSK	1	0	10 mm	right	1:1	0.055	1.132	0.062	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.81	-0.04	1	#27	QPSK	25	0	10 mm	right	1:1	0.040	1.172	0.047	
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 11-20
LTE Band 4 (AWS) 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.08	0	#25	QPSK	1	25	10 mm	back	1:1	0.415	1.038	0.431	A17
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	0.01	1	#25	QPSK	25	25	10 mm	back	1:1	0.338	1.045	0.353	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	0.17	0	#25	QPSK	1	25	10 mm	front	1:1	0.372	1.038	0.386	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	0.18	1	#25	QPSK	25	25	10 mm	front	1:1	0.280	1.045	0.293	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.07	0	#25	QPSK	1	25	10 mm	bottom	1:1	0.237	1.038	0.246	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	-0.01	1	#25	QPSK	25	25	10 mm	bottom	1:1	0.194	1.045	0.203	
1750.00	20350	High	LTE Band 4 (AWS)	10	23.5	23.34	-0.07	0	#25	QPSK	1	25	10 mm	right	1:1	0.190	1.038	0.197	
1750.00	20350	High	LTE Band 4 (AWS)	10	22.5	22.31	-0.05	1	#25	QPSK	25	25	10 mm	right	1:1	0.149	1.045	0.156	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-21
LTE Band 2 (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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	-0.05	0	#26	QPSK	1	49	10 mm	back	1:1	0.473	1.138	0.538	A18
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	-0.05	1	#26	QPSK	25	25	10 mm	back	1:1	0.339	1.159	0.393	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.01	0	#26	QPSK	1	49	10 mm	front	1:1	0.350	1.138	0.398	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.05	1	#26	QPSK	25	25	10 mm	front	1:1	0.255	1.159	0.296	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	-0.03	0	#26	QPSK	1	49	10 mm	bottom	1:1	0.249	1.138	0.283	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	0.00	1	#26	QPSK	25	25	10 mm	bottom	1:1	0.178	1.159	0.206	
1855.00	18650	Low	LTE Band 2 (PCS)	10	23.5	22.94	0.07	0	#26	QPSK	1	49	10 mm	right	1:1	0.201	1.138	0.229	
1855.00	18650	Low	LTE Band 2 (PCS)	10	22.5	21.86	-0.02	1	#26	QPSK	25	25	10 mm	right	1:1	0.144	1.159	0.167	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-22
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	-0.02	0	#30	QPSK	1	25	10 mm	back	1:1	0.445	1.151	0.512	A19
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	-0.05	1	#30	QPSK	25	25	10 mm	back	1:1	0.323	1.146	0.370	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	-0.02	0	#30	QPSK	1	25	10 mm	front	1:1	0.445	1.151	0.512	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.02	1	#30	QPSK	25	25	10 mm	front	1:1	0.323	1.146	0.370	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	-0.01	0	#30	QPSK	1	25	10 mm	bottom	1:1	0.225	1.151	0.259	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	0.05	1	#30	QPSK	25	25	10 mm	bottom	1:1	0.152	1.146	0.174	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	23.5	22.89	0.03	0	#30	QPSK	1	25	10 mm	right	1:1	0.186	1.151	0.214	
1882.50	26365	Mid	LTE Band 25 (PCS)	10	22.5	21.91	-0.06	1	#30	QPSK	25	25	10 mm	right	1:1	0.151	1.146	0.173	
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 11-23
WLAN Hotspot 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.00	10 mm	#30	1	back	1:1	0.311	1.057	0.329	A20
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.02	10 mm	#30	1	front	1:1	0.043	1.057	0.045	
2462	11	IEEE 802.11b	DSSS	17.0	16.76	0.01	10 mm	#30	1	right	1:1	0.088	1.057	0.093	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.12	10 mm	#25	6	back	1:1	0.010	1.186	0.012	
5775	155	IEEE 802.11ac	OFDM	10.0	8.96	0.18	10 mm	#25	29.3	back	1:1	0.011	1.271	0.014	A23
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.15	10 mm	#25	6	front	1:1	0.000	1.186	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	9.76	0.12	10 mm	#25	6	right	1:1	0.000	1.186	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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11.4 Standalone Hand SAR Data

Table 11-24
NII Hand 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 (10g)	Scaling Factor	Scaled SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	0.12	0 mm	#25	6	back	1:1	0.132	1.109	0.146	A24
5210	42	IEEE 802.11ac	OFDM	10.0	9.82	-0.21	0 mm	#25	29.3	back	1:1	0.101	1.042	0.105	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	-0.12	0 mm	#25	6	front	1:1	0.005	1.109	0.006	
5240	48	IEEE 802.11a	OFDM	10.5	10.05	-0.15	0 mm	#25	6	right	1:1	0.031	1.109	0.034	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.00	0 mm	#25	6	back	1:1	0.113	1.153	0.130	
5290	58	IEEE 802.11ac	OFDM	10.0	9.42	-0.13	0 mm	#25	29.3	back	1:1	0.129	1.143	0.147	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	-0.08	0 mm	#25	6	front	1:1	0.006	1.153	0.007	
5320	64	IEEE 802.11a	OFDM	10.5	9.88	0.04	0 mm	#25	6	right	1:1	0.026	1.153	0.030	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	-0.12	0 mm	#25	6	back	1:1	0.105	1.122	0.118	
5530	106	IEEE 802.11ac	OFDM	10.0	9.25	-0.17	0 mm	#25	29.3	back	1:1	0.085	1.189	0.101	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	0.13	0 mm	#25	6	front	1:1	0.014	1.122	0.016	
5580	116	IEEE 802.11a	OFDM	10.5	10.00	0.17	0 mm	#25	6	right	1:1	0.014	1.122	0.016	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Hand 4.0 W/kg (mW/g) averaged over 10 grams								

11.5 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 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery with NFC operations was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. 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.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. 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.
7. Per FCC KDB Publication 648474 D04v01, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn accessory SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01 v01, variability SAR tests were performed when the measured 1 gram SAR results for a frequency band were greater than 0.8 W/kg or when the measured 10 gram SAR results for a frequency band were greater than 2.0 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).

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CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v02.
2. 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.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01 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 1⁄4 dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. CDMA 1x-RTT Hotspot SAR was additionally evaluated for Hotspot exposure to support simultaneous capabilities.
6. Per FCC KDB Publication 447498 D01v05, when 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 required for such test configuration(s). Since the maximum output power variation across the required test channels is < ½ dB, the middle 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 D05v02r01. The general test procedures used for testing can be found in Section 8.4.4.
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.

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. This device only supports hotspot for 2.4 GHz and 5.8 GHz Bands, therefore all other bands were not evaluated for hotspot conditions.
5. WIFI transmission was verified using an uncalibrated spectrum analyzer.
6. 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 and the reported 10g averaged SAR is <2.0 W/kg, SAR testing on other default channels was not required.

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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 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 D01v05 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 D01v05 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 1g SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth LE	2441	2.00	10	**0.042**

Note:
1. Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.
2. Tested Bluetooth SAR value represents the worst case and was used to evaluate potential simultaneous combinations.

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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 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.133	0.033	0.166
	Right Tilt	0.085	0.034	0.119
	Left Cheek	0.164	0.078	**0.242**
	Left Tilt	0.094	0.041	0.135

Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.143	0.033	0.176
	Right Tilt	0.086	0.034	0.120
	Left Cheek	0.160	0.078	**0.238**
	Left Tilt	0.100	0.041	0.141

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.173	0.033	0.206
	Right Tilt	0.205	0.034	0.239
	Left Cheek	0.249	0.078	**0.327**
	Left Tilt	0.208	0.041	0.249

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.108	0.033	0.141
	Right Tilt	0.178	0.034	0.212
	Left Cheek	0.185	0.078	**0.263**
	Left Tilt	0.181	0.041	0.222

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.032	0.033	0.065
	Right Tilt	0.014	0.034	0.048
	Left Cheek	0.032	0.078	**0.110**
	Left Tilt	0.015	0.041	0.056

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.056	0.033	0.089
	Right Tilt	0.057	0.034	0.091
	Left Cheek	0.046	0.078	**0.124**
	Left Tilt	0.022	0.041	0.063

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.170	0.033	0.203
	Right Tilt	0.121	0.034	0.155
	Left Cheek	0.295	0.078	**0.373**
	Left Tilt	0.211	0.041	0.252

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.143	0.033	**0.176**
	Right Tilt	0.095	0.034	0.129
	Left Cheek	0.088	0.078	0.166
	Left Tilt	0.106	0.041	0.147

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.138	0.033	0.171
	Right Tilt	0.099	0.034	0.133
	Left Cheek	0.083	0.078	**0.161**
	Left Tilt	0.094	0.041	0.135

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	0.207	0.033	**0.240**
	Right Tilt	0.128	0.034	0.162
	Left Cheek	0.105	0.078	0.183
	Left Tilt	0.129	0.041	0.170

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

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.133	0.012	0.145
	Right Tilt	0.085	0.016	0.101
	Left Cheek	0.164	0.038	**0.202**
	Left Tilt	0.094	0.042	0.136

Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.143	0.012	0.155
	Right Tilt	0.086	0.016	0.102
	Left Cheek	0.160	0.038	**0.198**
	Left Tilt	0.100	0.042	0.142

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.173	0.012	0.185
	Right Tilt	0.205	0.016	0.221
	Left Cheek	0.249	0.038	**0.287**
	Left Tilt	0.208	0.042	0.250

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.108	0.012	0.120
	Right Tilt	0.178	0.016	0.194
	Left Cheek	0.185	0.038	**0.223**
	Left Tilt	0.181	0.042	0.223

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.032	0.012	0.044
	Right Tilt	0.014	0.016	0.030
	Left Cheek	0.032	0.038	**0.070**
	Left Tilt	0.015	0.042	0.057

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.056	0.012	0.068
	Right Tilt	0.057	0.016	0.073
	Left Cheek	0.046	0.038	**0.084**
	Left Tilt	0.022	0.042	0.064

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.170	0.012	0.182
	Right Tilt	0.121	0.016	0.137
	Left Cheek	0.295	0.038	**0.333**
	Left Tilt	0.211	0.042	0.253

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.143	0.012	0.155
	Right Tilt	0.095	0.016	0.111
	Left Cheek	0.088	0.038	**0.126**
	Left Tilt	0.106	0.042	0.148

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.138	0.012	0.150
	Right Tilt	0.099	0.016	0.115
	Left Cheek	0.083	0.038	**0.121**
	Left Tilt	0.094	0.042	0.136

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.207	0.012	0.219
	Right Tilt	0.128	0.016	0.144
	Left Cheek	0.105	0.038	**0.143**
	Left Tilt	0.129	0.042	0.171

Note: The worst case 5 GHz SAR value was used to evaluate potential combinations.

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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	CDMA/LTE SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.496	0.329	0.825
Back Side	PCS CDMA	0.988	0.329	**1.317**
Back Side	LTE Band 12	0.176	0.329	0.505
Back Side	LTE Band 17	0.183	0.329	0.512
Back Side	LTE Band 5 (Cell)	0.216	0.329	0.545
Back Side	LTE Band 4 (AWS)	0.431	0.329	0.760
Back Side	LTE Band 2 (PCS)	0.538	0.329	0.867
Back Side	LTE Band 25 (PCS)	0.512	0.329	0.841

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

Configuration	Mode	CDMA/LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.496	0.135	0.631
Back Side	PCS CDMA	0.988	0.135	**1.123**
Back Side	LTE Band 12	0.176	0.135	0.311
Back Side	LTE Band 17	0.183	0.135	0.318
Back Side	LTE Band 5 (Cell)	0.216	0.135	0.351
Back Side	LTE Band 4 (AWS)	0.431	0.135	0.566
Back Side	LTE Band 2 (PCS)	0.538	0.135	0.673
Back Side	LTE Band 25 (PCS)	0.512	0.135	0.647

Table 12-6
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 10 mm)

Configuration	Mode	CDMA/LTE SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.496	0.095	0.591
Back Side	PCS CDMA	0.988	0.095	**1.083**
Back Side	LTE Band 12	0.176	0.095	0.271
Back Side	LTE Band 17	0.183	0.095	0.278
Back Side	LTE Band 5 (Cell)	0.216	0.095	0.311
Back Side	LTE Band 4 (AWS)	0.431	0.095	0.526
Back Side	LTE Band 2 (PCS)	0.538	0.095	0.633
Back Side	LTE Band 25 (PCS)	0.512	0.095	0.607

Note: The worst case 5 GHz SAR value was used to evaluate potential combinations.

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12.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01, 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 10 mm)

Simult Tx	Configuration	Cell. EVDO SAR W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.460	0.329	**0.789**
	Front	0.245	0.045	0.290
	Top	-	-	0.000
	Bottom	0.333	-	0.333
	Right	-	0.093	0.093
	Left	0.150	-	0.150

Simult Tx	Configuration	PCS EVDO SAR W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.922	0.329	**1.251**
	Front	0.525	0.045	0.570
	Top	-	-	0.000
	Bottom	0.579	-	0.579
	Right	-	0.093	0.093
	Left	0.321	-	0.321

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.176	0.329	**0.505**
	Front	0.133	0.045	0.178
	Top	-	-	0.000
	Bottom	0.098	-	0.098
	Right	0.150	0.093	0.243
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.183	0.329	**0.512**
	Front	0.105	0.045	0.150
	Top	-	-	0.000
	Bottom	0.080	-	0.080
	Right	0.122	0.093	0.215
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.216	0.329	**0.545**
	Front	0.084	0.045	0.129
	Top	0.146	-	0.146
	Bottom	-	-	0.000
	Right	0.062	0.093	0.155
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.329	**0.760**
	Front	0.386	0.045	0.431
	Top	-	-	0.000
	Bottom	0.246	-	0.246
	Right	0.197	0.093	0.290
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.538	0.329	**0.867**
	Front	0.398	0.045	0.443
	Top	-	-	0.000
	Bottom	0.283	-	0.283
	Right	0.229	0.093	0.322
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.512	0.329	**0.841**
	Front	0.512	0.045	0.557
	Top	-	-	0.000
	Bottom	0.259	-	0.259
	Right	0.214	0.093	0.307
	Left	-	-	0.000

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Table 12-8
Simultaneous Transmission Scenario (5.8 GHz Hotspot at 10 mm)

Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.460	0.014	**0.474**
	Front	0.245	0.000	0.245
	Top	-	-	0.000
	Bottom	0.333	-	0.333
	Right	-	0.000	0.000
	Left	0.150	-	0.150

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.922	0.014	**0.936**
	Front	0.525	0.000	0.525
	Top	-	-	0.000
	Bottom	0.579	-	0.579
	Right	-	0.000	0.000
	Left	0.321	-	0.321

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.176	0.014	**0.190**
	Front	0.133	0.000	0.133
	Top	-	-	0.000
	Bottom	0.098	-	0.098
	Right	0.150	0.000	0.150
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.183	0.014	**0.197**
	Front	0.105	0.000	0.105
	Top	-	-	0.000
	Bottom	0.080	-	0.080
	Right	0.122	0.000	0.122
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.216	0.014	**0.230**
	Front	0.084	0.000	0.084
	Top	0.146	-	0.146
	Bottom	-	-	0.000
	Right	0.062	0.000	0.062
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.014	**0.445**
	Front	0.386	0.000	0.386
	Top	-	-	0.000
	Bottom	0.246	-	0.246
	Right	0.197	0.000	0.197
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.538	0.014	**0.552**
	Front	0.398	0.000	0.398
	Top	-	-	0.000
	Bottom	0.283	-	0.283
	Right	0.229	0.000	0.229
	Left	-	-	0.000

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.512	0.014	**0.526**
	Front	0.512	0.000	0.512
	Top	-	-	0.000
	Bottom	0.259	-	0.259
	Right	0.214	0.000	0.214
	Left	-	-	0.000

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12.6 SVLTE Simultaneous Scenario Analysis

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.032	0.033	0.165	0.198
	Right Tilt	0.085	0.014	0.034	0.099	0.133
	Left Cheek	0.164	0.032	0.078	0.196	**0.274**
	Left Tilt	0.094	0.015	0.041	0.109	0.150

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.056	0.033	0.189	0.222
	Right Tilt	0.085	0.057	0.034	0.142	0.176
	Left Cheek	0.164	0.046	0.078	0.210	**0.288**
	Left Tilt	0.094	0.022	0.041	0.116	0.157

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.170	0.033	0.303	0.336
	Right Tilt	0.085	0.121	0.034	0.206	0.240
	Left Cheek	0.164	0.295	0.078	0.459	**0.537**
	Left Tilt	0.094	0.211	0.041	0.305	0.346

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.143	0.033	0.276	0.309
	Right Tilt	0.085	0.095	0.034	0.180	0.214
	Left Cheek	0.164	0.088	0.078	0.252	**0.330**
	Left Tilt	0.094	0.106	0.041	0.200	0.241

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.138	0.033	0.271	0.304
	Right Tilt	0.085	0.099	0.034	0.184	0.218
	Left Cheek	0.164	0.083	0.078	0.247	**0.325**
	Left Tilt	0.094	0.094	0.041	0.188	0.229

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.207	0.033	0.340	**0.373**
	Right Tilt	0.085	0.128	0.034	0.213	0.247
	Left Cheek	0.164	0.105	0.078	0.269	0.347
	Left Tilt	0.094	0.129	0.041	0.223	0.264

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.032	0.033	0.205	0.238
	Right Tilt	0.205	0.014	0.034	0.219	0.253
	Left Cheek	0.249	0.032	0.078	0.281	**0.359**
	Left Tilt	0.208	0.015	0.041	0.223	0.264

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.056	0.033	0.229	0.262
	Right Tilt	0.205	0.057	0.034	0.262	0.296
	Left Cheek	0.249	0.046	0.078	0.295	**0.373**
	Left Tilt	0.208	0.022	0.041	0.230	0.271

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.170	0.033	0.343	0.376
	Right Tilt	0.205	0.121	0.034	0.326	0.360
	Left Cheek	0.249	0.295	0.078	0.544	**0.622**
	Left Tilt	0.208	0.211	0.041	0.419	0.460

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.143	0.033	0.316	0.349
	Right Tilt	0.205	0.095	0.034	0.300	0.334
	Left Cheek	0.249	0.088	0.078	0.337	**0.415**
	Left Tilt	0.208	0.106	0.041	0.314	0.355

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.138	0.033	0.311	0.344
	Right Tilt	0.205	0.099	0.034	0.304	0.338
	Left Cheek	0.249	0.083	0.078	0.332	**0.410**
	Left Tilt	0.208	0.094	0.041	0.302	0.343

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.207	0.033	0.380	0.413
	Right Tilt	0.205	0.128	0.034	0.333	0.367
	Left Cheek	0.249	0.105	0.078	0.354	**0.432**
	Left Tilt	0.208	0.129	0.041	0.337	0.378

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Table 12-10
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.032	0.012	0.165	0.177
	Right Tilt	0.085	0.014	0.016	0.099	0.115
	Left Cheek	0.164	0.032	0.038	0.196	**0.234**
	Left Tilt	0.094	0.015	0.042	0.109	0.151

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.056	0.012	0.189	0.201
	Right Tilt	0.085	0.057	0.016	0.142	0.158
	Left Cheek	0.164	0.046	0.038	0.210	**0.248**
	Left Tilt	0.094	0.022	0.042	0.116	0.158

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.170	0.012	0.303	0.315
	Right Tilt	0.085	0.121	0.016	0.206	0.222
	Left Cheek	0.164	0.295	0.038	0.459	**0.497**
	Left Tilt	0.094	0.211	0.042	0.305	0.347

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.143	0.012	0.276	0.288
	Right Tilt	0.085	0.095	0.016	0.180	0.196
	Left Cheek	0.164	0.088	0.038	0.252	**0.290**
	Left Tilt	0.094	0.106	0.042	0.200	0.242

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.138	0.012	0.271	0.283
	Right Tilt	0.085	0.099	0.016	0.184	0.200
	Left Cheek	0.164	0.083	0.038	0.247	**0.285**
	Left Tilt	0.094	0.094	0.042	0.188	0.230

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.133	0.207	0.012	0.340	**0.352**
	Right Tilt	0.085	0.128	0.016	0.213	0.229
	Left Cheek	0.164	0.105	0.038	0.269	0.307
	Left Tilt	0.094	0.129	0.042	0.223	0.265

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.032	0.012	0.205	0.217
	Right Tilt	0.205	0.014	0.016	0.219	0.235
	Left Cheek	0.249	0.032	0.038	0.281	**0.319**
	Left Tilt	0.208	0.015	0.042	0.223	0.265

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.056	0.012	0.229	0.241
	Right Tilt	0.205	0.057	0.016	0.262	0.278
	Left Cheek	0.249	0.046	0.038	0.295	**0.333**
	Left Tilt	0.208	0.022	0.042	0.230	0.272

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.170	0.012	0.343	0.355
	Right Tilt	0.205	0.121	0.016	0.326	0.342
	Left Cheek	0.249	0.295	0.038	0.544	**0.582**
	Left Tilt	0.208	0.211	0.042	0.419	0.461

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.143	0.012	0.316	0.328
	Right Tilt	0.205	0.095	0.016	0.300	0.316
	Left Cheek	0.249	0.088	0.038	0.337	**0.375**
	Left Tilt	0.208	0.106	0.042	0.314	0.356

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.138	0.012	0.311	0.323
	Right Tilt	0.205	0.099	0.016	0.304	0.320
	Left Cheek	0.249	0.083	0.038	0.332	**0.370**
	Left Tilt	0.208	0.094	0.042	0.302	0.344

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.173	0.207	0.012	0.380	**0.392**
	Right Tilt	0.205	0.128	0.016	0.333	0.349
	Left Cheek	0.249	0.105	0.038	0.354	**0.392**
	Left Tilt	0.208	0.129	0.042	0.337	0.379

Note: The worst case 5 GHz SAR value was used to evaluate potential combinations.

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Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 10mm)

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.176	0.329	0.672	1.001	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.176	0.329	1.164	**1.493**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.183	0.329	0.679	1.008	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.183	0.329	1.171	**1.500**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.216	0.329	0.712	1.041	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.216	0.329	1.204	**1.533**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.431	0.329	0.927	1.256	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.431	0.329	**1.419**	see note	0.02	0.01	0.01

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.538	0.329	1.034	1.363	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.538	0.329	**1.526**	see note	0.03	0.01	0.01

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.512	0.329	1.008	1.337	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.512	0.329	**1.500**	see note	0.02	0.01	0.01

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05. See Section 12.7 for detailed SPLS ratio analysis.

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

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.176	0.135	0.672	0.807	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.176	0.135	1.164	**1.299**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.183	0.135	0.679	0.814	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.183	0.135	1.171	**1.306**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.216	0.135	0.712	0.847	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.216	0.135	1.204	**1.339**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.431	0.135	0.927	1.062	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.431	0.135	1.419	**1.554**	N/A	N/A	N/A

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.538	0.135	1.034	1.169	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.538	0.135	**1.526**	see note	0.03	0.01	0.00

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
		1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back Side	Cell. CDMA	0.496	0.512	0.135	1.008	1.143	N/A	N/A	N/A
Back Side	PCS CDMA	0.988	0.512	0.135	**1.500**	see note	0.02	0.01	0.00

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05. See Section 12.7 for detailed SPLS ratio analysis.

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Table 12-13
Simultaneous Transmission Scenario 5 GHz WLAN (Body-Worn at 10mm)

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.176	0.014	0.672	0.686
Back Side	PCS CDMA	0.988	0.176	0.014	1.164	**1.178**

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.183	0.014	0.679	0.693
Back Side	PCS CDMA	0.988	0.183	0.014	1.171	**1.185**

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.216	0.014	0.712	0.726
Back Side	PCS CDMA	0.988	0.216	0.014	1.204	**1.218**

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.431	0.014	0.927	0.941
Back Side	PCS CDMA	0.988	0.431	0.014	1.419	**1.433**

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.538	0.014	1.034	1.048
Back Side	PCS CDMA	0.988	0.538	0.014	1.526	**1.540**

Configuration	Mode	CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	5.8 GHz WLAN Sar (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Back Side	Cell. CDMA	0.496	0.512	0.014	1.008	1.022
Back Side	PCS CDMA	0.988	0.512	0.014	1.500	**1.514**

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Table 12-14
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 10mm)

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.176	0.329	0.505	**1.001**	N/A	N/A	N/A
	Front	0.246	0.133	0.045	0.178	0.424	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.342	0.098	-	0.098	0.440	N/A	N/A	N/A
	Right	-	0.150	0.093	0.243	0.243	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.183	0.329	0.512	**1.008**	N/A	N/A	N/A
	Front	0.246	0.105	0.045	0.150	0.396	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.342	0.080	-	0.080	0.422	N/A	N/A	N/A
	Right	-	0.122	0.093	0.215	0.215	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.216	0.329	0.545	**1.041**	N/A	N/A	N/A
	Front	0.246	0.084	0.045	0.129	0.375	N/A	N/A	N/A
	Top	-	0.146	-	0.146	0.146	N/A	N/A	N/A
	Bottom	0.342	-	-	0.000	0.342	N/A	N/A	N/A
	Right	-	0.062	0.093	0.155	0.155	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.431	0.329	0.760	**1.256**	N/A	N/A	N/A
	Front	0.246	0.386	0.045	0.431	0.677	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.342	0.246	-	0.246	0.588	N/A	N/A	N/A
	Right	-	0.197	0.093	0.290	0.290	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

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Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.538	0.329	0.867	**1.363**	N/A	N/A	N/A
	Front	0.246	0.398	0.045	0.443	0.689	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.342	0.283	-	0.283	0.625	N/A	N/A	N/A
	Right	-	0.229	0.093	0.322	0.322	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.496	0.512	0.329	0.841	**1.337**	N/A	N/A	N/A
	Front	0.246	0.512	0.045	0.557	0.803	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.342	0.259	-	0.259	0.601	N/A	N/A	N/A
	Right	-	0.214	0.093	0.307	0.307	N/A	N/A	N/A
	Left	0.165	-	-	0.000	0.165	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.176	0.329	0.505	**1.493**	N/A	N/A	N/A
	Front	0.578	0.133	0.045	0.178	0.756	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.599	0.098	-	0.098	0.697	N/A	N/A	N/A
	Right	-	0.150	0.093	0.243	0.243	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.183	0.329	0.512	**1.500**	N/A	N/A	N/A
	Front	0.578	0.105	0.045	0.150	0.728	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.599	0.080	-	0.080	0.679	N/A	N/A	N/A
	Right	-	0.122	0.093	0.215	0.215	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

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Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.216	0.329	0.545	**1.533**	N/A	N/A	N/A
	Front	0.578	0.084	0.045	0.129	0.707	N/A	N/A	N/A
	Top	-	0.146	-	0.146	0.146	N/A	N/A	N/A
	Bottom	0.599	-	-	0.000	0.599	N/A	N/A	N/A
	Right	-	0.062	0.093	0.155	0.155	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.431	0.329	0.760	see note	0.02	0.01	0.01
	Front	0.578	0.386	0.045	0.431	**1.009**	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.599	0.246	-	0.246	0.845	N/A	N/A	N/A
	Right	-	0.197	0.093	0.290	0.290	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.538	0.329	0.867	see note	0.03	0.01	0.01
	Front	0.578	0.398	0.045	0.443	**1.021**	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.599	0.283	-	0.283	0.882	N/A	N/A	N/A
	Right	-	0.229	0.093	0.322	0.322	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	Tx Antenna	1	2	3	2+3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.988	0.512	0.329	0.841	see note	0.02	0.01	0.01
	Front	0.578	0.512	0.045	0.557	**1.135**	N/A	N/A	N/A
	Top	-	-	-	0.000	0.000	N/A	N/A	N/A
	Bottom	0.599	0.259	-	0.259	0.858	N/A	N/A	N/A
	Right	-	0.214	0.093	0.307	0.307	N/A	N/A	N/A
	Left	0.305	-	-	0.000	0.305	N/A	N/A	N/A

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05. See Section 12.7 for detailed SPLS ratio analysis.

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Table 12-15
Simultaneous Transmission Scenario 5.8 GHz WLAN (Hotspot at 10mm)

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.176	0.014	0.190	**0.686**
	Front	0.246	0.133	0.000	0.133	0.379
	Top	-	-	-	0.000	0.000
	Bottom	0.342	0.098	-	0.098	0.440
	Right	-	0.150	0.000	0.150	0.150
	Left	0.165	-	-	0.000	0.165

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.183	0.014	0.197	**0.693**
	Front	0.246	0.105	0.000	0.105	0.351
	Top	-	-	-	0.000	0.000
	Bottom	0.342	0.080	-	0.080	0.422
	Right	-	0.122	0.000	0.122	0.122
	Left	0.165	-	-	0.000	0.165

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.216	0.014	0.230	**0.726**
	Front	0.246	0.084	0.000	0.084	0.330
	Top	-	0.146	-	0.146	0.146
	Bottom	0.342	-	-	0.000	0.342
	Right	-	0.062	0.000	0.062	0.062
	Left	0.165	-	-	0.000	0.165

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.431	0.014	0.445	**0.941**
	Front	0.246	0.386	0.000	0.386	0.632
	Top	-	-	-	0.000	0.000
	Bottom	0.342	0.246	-	0.246	0.588
	Right	-	0.197	0.000	0.197	0.197
	Left	0.165	-	-	0.000	0.165

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Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.538	0.014	0.552	**1.048**
	Front	0.246	0.398	0.000	0.398	0.644
	Top	-	-	-	0.000	0.000
	Bottom	0.342	0.283	-	0.283	0.625
	Right	-	0.229	0.000	0.229	0.229
	Left	0.165	-	-	0.000	0.165

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.496	0.512	0.014	0.526	**1.022**
	Front	0.246	0.512	0.000	0.512	0.758
	Top	-	-	-	0.000	0.000
	Bottom	0.342	0.259	-	0.259	0.601
	Right	-	0.214	0.000	0.214	0.214
	Left	0.165	-	-	0.000	0.165

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 12 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.176	0.014	0.190	**1.178**
	Front	0.578	0.133	0.000	0.133	0.711
	Top	-	-	-	0.000	0.000
	Bottom	0.599	0.098	-	0.098	0.697
	Right	-	0.150	0.000	0.150	0.150
	Left	0.305	-	-	0.000	0.305

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 17 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.183	0.014	0.197	**1.185**
	Front	0.578	0.105	0.000	0.105	0.683
	Top	-	-	-	0.000	0.000
	Bottom	0.599	0.080	-	0.080	0.679
	Right	-	0.122	0.000	0.122	0.122
	Left	0.305	-	-	0.000	0.305

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Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 5 (Cell) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.216	0.014	0.230	**1.218**
	Front	0.578	0.084	0.000	0.084	0.662
	Top	-	0.146	-	0.146	0.146
	Bottom	0.599	-	-	0.000	0.599
	Right	-	0.062	0.000	0.062	0.062
	Left	0.305	-	-	0.000	0.305

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 4 (AWS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.431	0.014	0.445	**1.433**
	Front	0.578	0.386	0.000	0.386	0.964
	Top	-	-	-	0.000	0.000
	Bottom	0.599	0.246	-	0.246	0.845
	Right	-	0.197	0.000	0.197	0.197
	Left	0.305	-	-	0.000	0.305

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 2 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.538	0.014	0.552	**1.540**
	Front	0.578	0.398	0.000	0.398	0.976
	Top	-	-	-	0.000	0.000
	Bottom	0.599	0.283	-	0.283	0.882
	Right	-	0.229	0.000	0.229	0.229
	Left	0.305	-	-	0.000	0.305

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	LTE Band 25 (PCS) SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
	Tx Antenna	1	2	3	2+3	1+2+3
Body SAR	Back	0.988	0.512	0.014	0.526	**1.514**
	Front	0.578	0.512	0.000	0.512	1.090
	Top	-	-	-	0.000	0.000
	Bottom	0.599	0.259	-	0.259	0.858
	Right	-	0.214	0.000	0.214	0.214
	Left	0.305	-	-	0.000	0.305

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12.7 SPLSR Evaluation Analysis

Per FCC KDB Publication 447498 D01v05, when the sum of the standalone transmitters is more than 1.6 W/kg, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤ 0.04, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

$$\text{Distance}_{Tx1\text{-}Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

$$\text{SPLS Ratio} = (SAR_1 + SAR_2)^{1.5}/R_i$$

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with LTE Band 4.

Figure 12-1
Peak SAR Location Plot of PCS CDMA and LTE Band 4

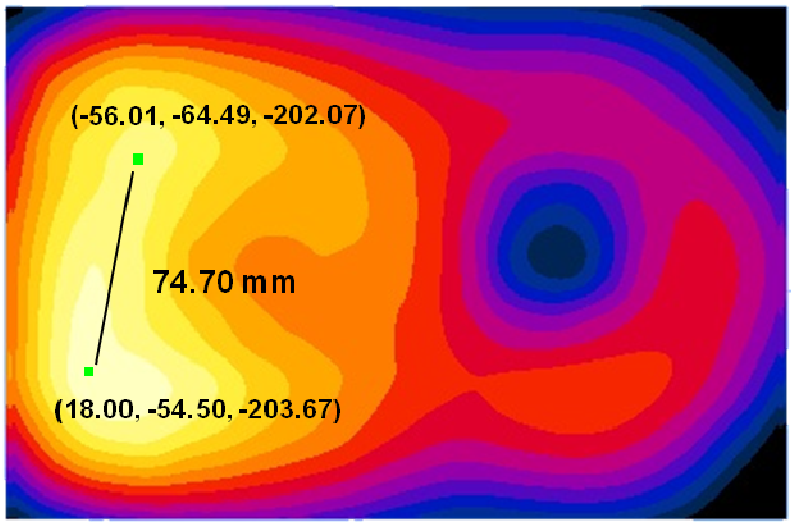

Table 12-16
Peak SAR Locations for Body Back Side PCS CDMA and LTE Band 4

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	18.00	-54.50	-203.67
LTE Band 4	-56.01	-64.49	-202.07

Table 12-17
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	$D_{a\text{-}b}$	$(a+b)^{1.5}/D_{a\text{-}b}$
PCS CDMA	LTE Band 4	0.988	0.431	1.419	74.7	0.02

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with 2.4 GHz WLAN.

Figure 12-2
Peak SAR Location Plot of PCS CDMA and 2.4 GHz WLAN

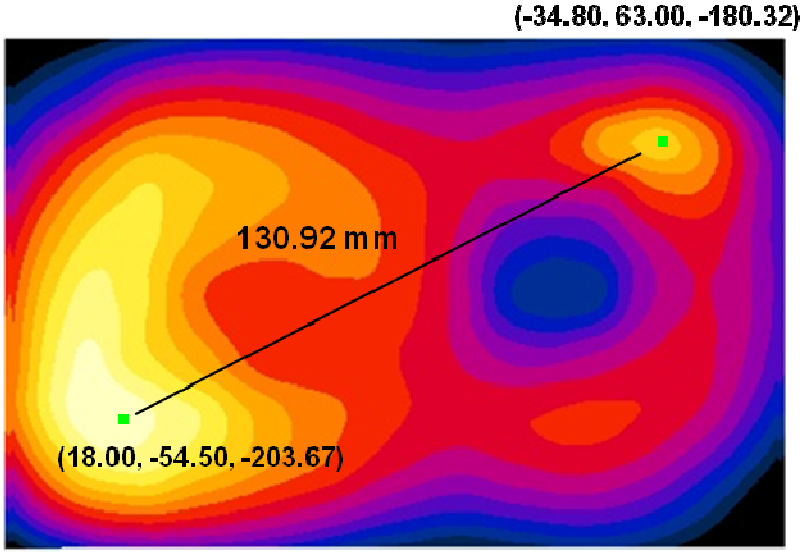

Table 12-18
Peak SAR Locations for Body Back Side PCS CDMA and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	18.00	-54.50	-203.67
2.4 GHz WLAN	-34.80	63.00	-180.32

Table 12-19
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	2.4 GHz WLAN	0.988	0.329	1.317	130.92	0.01

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with LTE Band 4 potentially operating with 2.4 GHz WLAN.

Figure 12-3
Peak SAR Location Plot of LTE Band 4 and 2.4 GHz WLAN

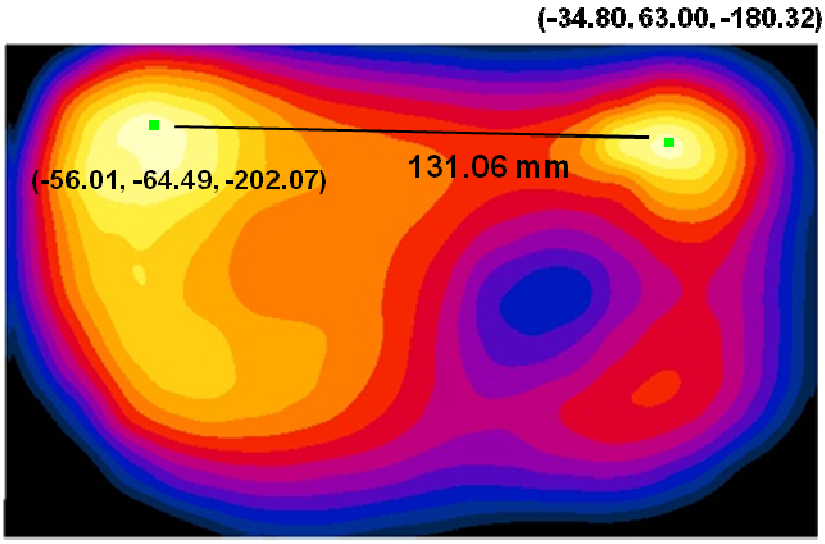

Table 12-20
Peak SAR Locations for Body Back Side LTE Band 4 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
LTE Band 4	-56.01	-64.49	-202.07
2.4 GHz WLAN	-34.80	63.00	-180.32

Table 12-21
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 4	2.4 GHz WLAN	0.431	0.329	0.76	131.06	0.01

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with LTE Band 2.

Figure 12-4
Peak SAR Location Plot of PCS CDMA and LTE Band 2

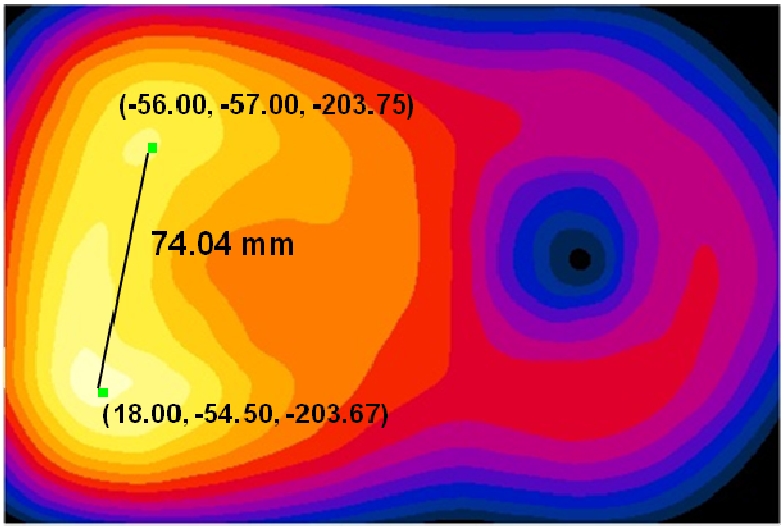

Table 12-22
Peak SAR Locations for Body Back Side PCS CDMA and LTE Band 2

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	18.00	-54.50	-203.67
LTE Band 2	-56.00	-57.00	-203.75

Table 12-23
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	LTE Band 2	0.988	0.538	1.526	74.04	0.03

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with LTE Band 2 potentially operating with 2.4 GHz WLAN.

Figure 12-5
Peak SAR Location Plot of LTE Band 2 and 2.4 GHz WLAN

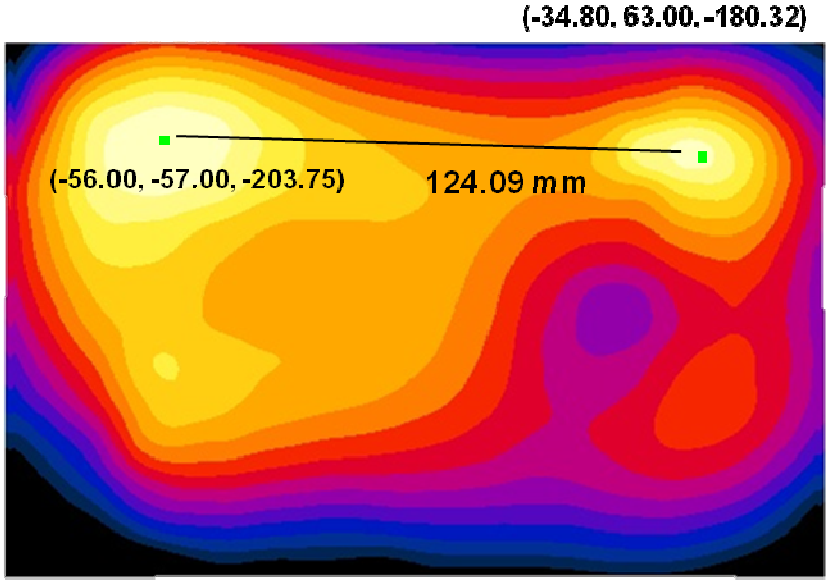

Table 12-24
Peak SAR Locations for Body Back Side LTE Band 2 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
LTE Band 2	-56.00	-57.00	-203.75
2.4 GHz WLAN	-34.80	63.00	-180.32

Table 12-25
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 2	2.4 GHz WLAN	0.538	0.329	0.867	124.09	0.01

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with LTE Band 25.

Figure 12-6
Peak SAR Location Plot of PCS CDMA and LTE Band 25

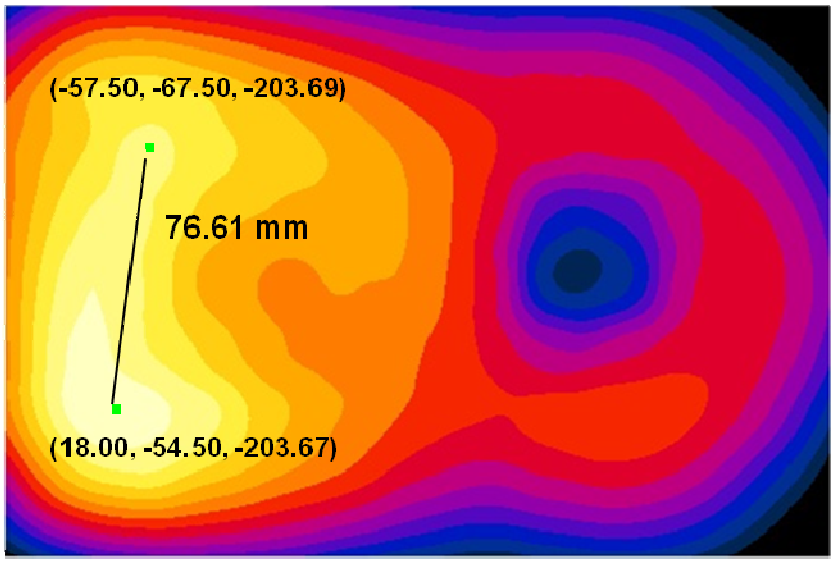

Table 12-26
Peak SAR Locations for Body Back Side PCS CDMA and LTE Band 25

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	18.00	-54.50	-203.67
LTE Band 25	-57.50	-67.50	-203.69

Table 12-27
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	LTE Band 25	0.988	0.512	1.5	76.61	0.02

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with LTE Band 25 potentially operating with 2.4 GHz WLAN.

Figure 12-7
Peak SAR Location Plot of LTE Band 25 and 2.4 GHz WLAN

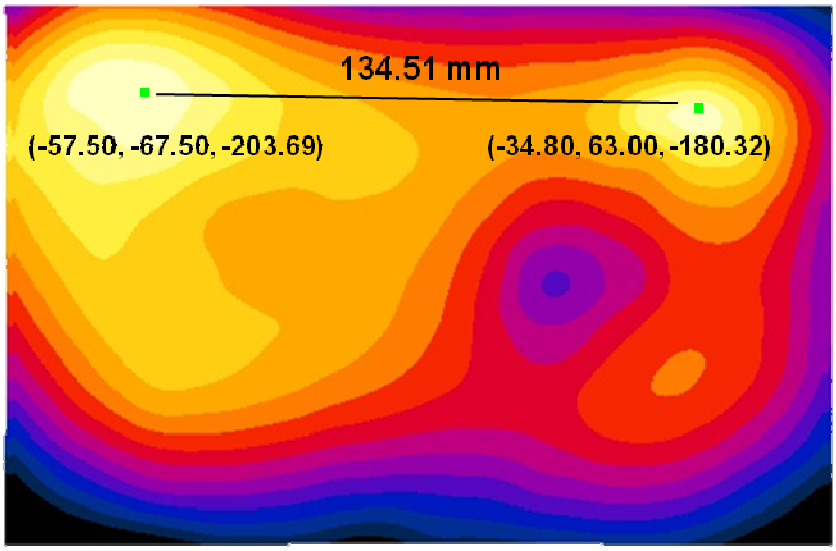

Table 12-28
Peak SAR Locations for Body Back Side LTE Band 25 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
LTE Band 25	-57.50	-67.50	-203.69
2.4 GHz WLAN	-34.80	63.00	-180.32

Table 12-29
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 25	2.4 GHz WLAN	0.512	0.329	0.841	134.51	0.01

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with LTE Band 2 potentially operating with 2.4 GHz Bluetooth.

Figure 12-8
Peak SAR Location Plot of LTE Band 2 and 2.4 GHz Bluetooth

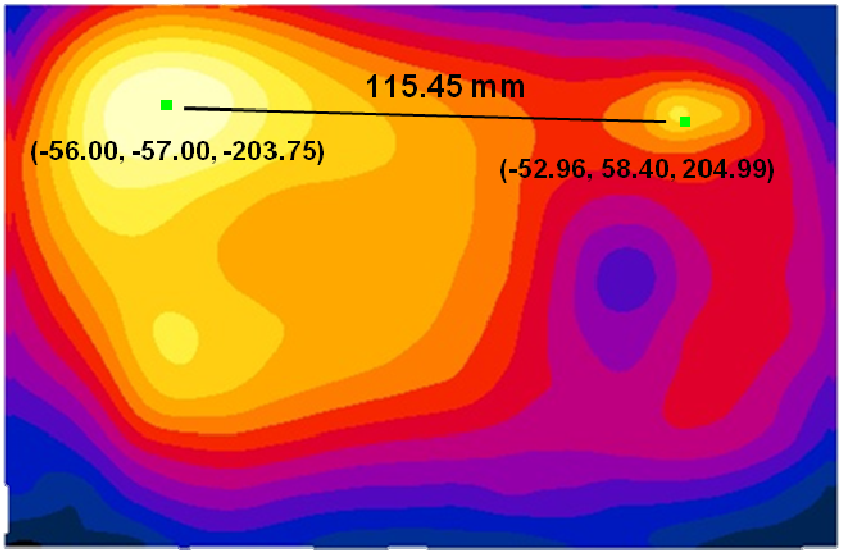

Table 12-30
Peak SAR Locations for Body Back Side LTE Band 2 and 2.4 GHz Bluetooth

Mode/Band	x (mm)	y (mm)	z (mm)
LTE Band 2	-56.00	-57.00	-203.75
2.4 GHz Bluetooth	-52.96	58.40	-204.99

Table 12-31
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 2	2.4 GHz Bluetooth	0.538	0.135	0.673	115.45	0.00

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with 2.4 GHz Bluetooth.

Figure 12-9
Peak SAR Location Plot of PCS CDMA and 2.4 GHz Bluetooth

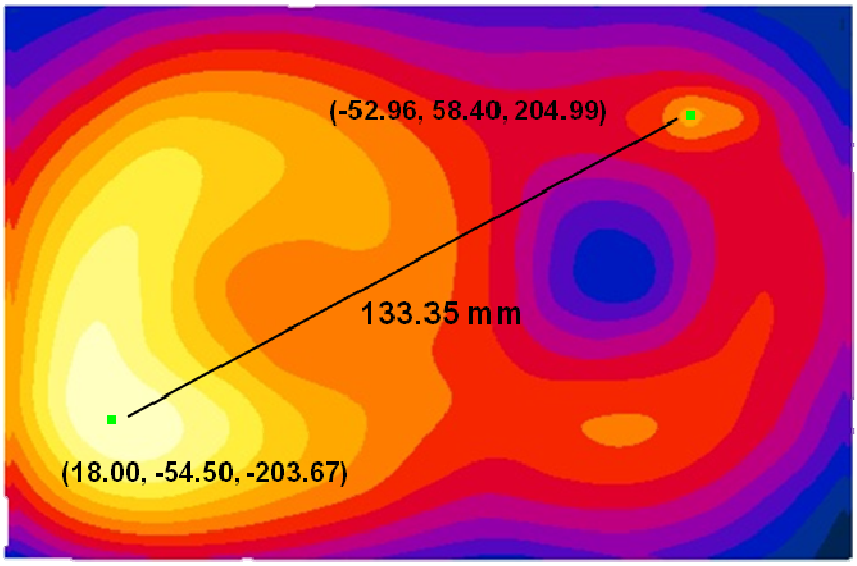

Table 12-32
Peak SAR Locations for Body Back Side PCS CDMA and 2.4 GHz Bluetooth

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	18.00	-54.50	-203.67
2.4 GHz Bluetooth	-52.96	58.40	-204.99

Table 12-33
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	2.4 GHz Bluetooth	0.988	0.135	1.123	133.35	0.01

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The following is the SAR sum to peak location ratio analysis for the Body Back Side configuration at a separation distance of 1.0 cm with LTE Band 25 potentially operating with 2.4 GHz Bluetooth.

Figure 12-10
Peak SAR Location Plot of LTE Band 25 and 2.4 GHz Bluetooth

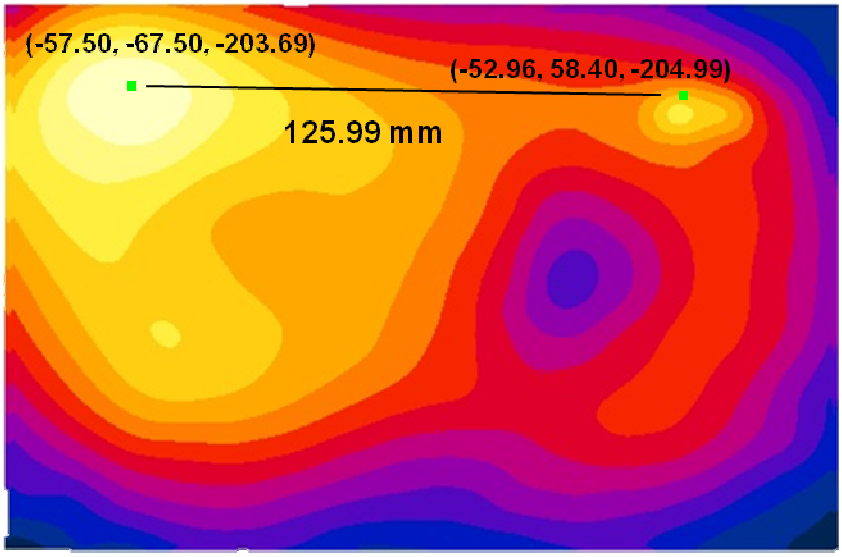

Table 12-34
Peak SAR Locations for Body Back Side LTE Band 25 and 2.4 GHz Bluetooth

Mode/Band	x (mm)	y (mm)	z (mm)
LTE Band 25	-57.50	-67.50	-203.69
2.4 GHz Bluetooth	-52.96	58.40	-204.99

Table 12-35
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 25	2.4 GHz Bluetooth	0.512	0.135	0.647	125.99	0.00

12.8 Simultaneous Transmission Conclusion

The above numerical summed SAR results and SPLSR 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 D01v05.

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, 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 performed 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)	
1900	1880.00	600	PCS CDMA	TDSO / SO32	back	10 mm	0.924	0.874	1.06	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram							

13.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
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	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	85070C	Dielectric Probe Kit	2/14/2013	Annual	2/14/2014	MY44300633
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	5/9/2013	Biennial	5/9/2015	GB43304447
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
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	5318
Anritsu	MA2481A	Power Sensor	2/14/2013	Annual	2/14/2014	5821
Anritsu	MA2411B	Pulse Power Sensor	12/5/2012	Annual	12/5/2013	1126066
Anritsu	MA2411B	Pulse Power Sensor	12/4/2012	Annual	12/4/2013	1207364
Anritsu	MT8820C	Radio Communication Tester	11/6/2012	Annual	11/6/2013	6200901190
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	8/22/2012	Annual	8/22/2013	1231535
Anritsu	MA24106A	USB Power Sensor	8/22/2012	Annual	8/22/2013	1231538
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4353	Long Stem Thermometer	9/25/2012	Biennial	9/25/2014	122539615
Control Company	36934-158	Wall-Mounted Thermometer	1/4/2012	Biennial	1/4/2014	122014497
Fisher Scientific	15-078J	Long Stem Thermometer	10/30/2012	Biennial	10/30/2014	122626059
Fisher Scientific	15-077-960	Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Intelligent Weighing	PD-3000	Electronic Balance	6/29/2012	Annual	6/29/2013	120405017
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
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	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	2/8/2013	Annual	2/8/2014	101699
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Biennial	10/7/2013	103962
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	9/26/2012	Annual	9/26/2013	108798
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
Rohde & Schwarz	SME06	Signal Generator	10/11/2012	Annual	10/11/2013	832026
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
SPEAG	D750V3	750 MHz Dipole	3/18/2013	Annual	3/18/2014	1054
SPEAG	D835V2	835 MHz SAR Dipole	1/7/2013	Annual	1/7/2014	4d132
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2013	Annual	5/14/2014	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/6/2013	Annual	2/6/2014	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2012	Annual	8/23/2013	719
SPEAG	D2450V2	2450 MHz SAR Dipole	1/8/2013	Annual	1/8/2014	797
SPEAG	D2450V2	2450 MHz SAR Dipole	2/11/2013	Annual	2/11/2014	882
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/11/2013	Annual	1/11/2014	1057
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/6/2013	Annual	2/6/2014	649
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/17/2013	Annual	1/17/2014	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/24/2012	Annual	8/24/2013	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/19/2012	Annual	9/19/2013	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/13/2012	Annual	11/13/2013	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2013	Annual	3/8/2014	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/14/2013	Annual	5/14/2014	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	12/11/2012	Annual	12/11/2013	1091
SPEAG	ES3DV2	SAR Probe	8/28/2012	Annual	8/28/2013	3022
SPEAG	ES3DV3	SAR Probe	3/15/2013	Annual	3/15/2014	3209
SPEAG	ES3DV3	SAR Probe	11/15/2012	Annual	11/15/2013	3287
SPEAG	ES3DV3	SAR Probe	9/20/2012	Annual	9/20/2013	3288
SPEAG	EX3DV4	SAR Probe	1/17/2013	Annual	1/17/2014	3589
SPEAG	EX3DV4	SAR Probe	2/27/2013	Annual	2/27/2014	3920
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
VWR	23226-658	Long Stem Thermometer	3/30/2012	Biennial	3/30/2014	122179874
VWR	62344-925	Mini-Thermometer	10/24/2011	Biennial	10/24/2013	111886443
VWR	36934-158	Wall-Mounted Thermometer	9/30/2011	Biennial	9/30/2013	111859332

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.

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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

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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

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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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[31] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D02

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

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

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APPENDIX A: SAR TEST DATA

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PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #24

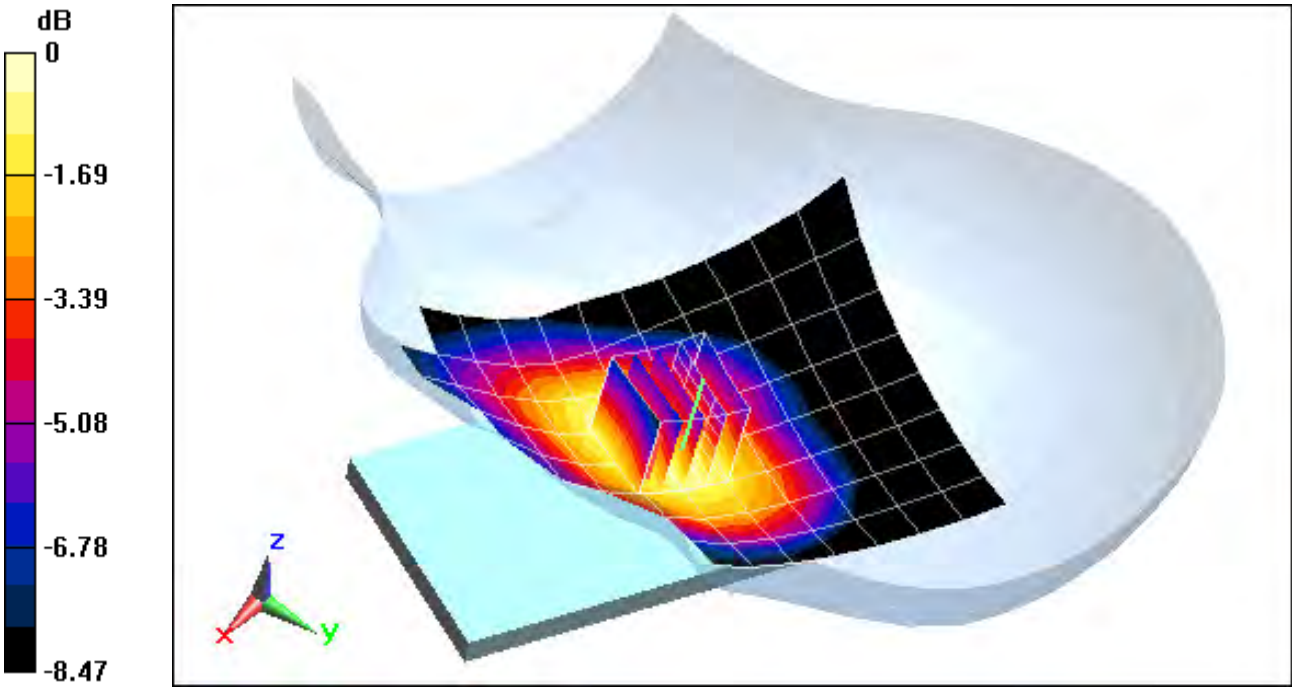
Communication System: CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.939 S/m; ε_r = 42.418; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-05-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°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: Cell. CDMA, Left Head, Cheek, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.633 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.147 W/kg



0 dB = 0.153 W/kg = -8.15 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #23

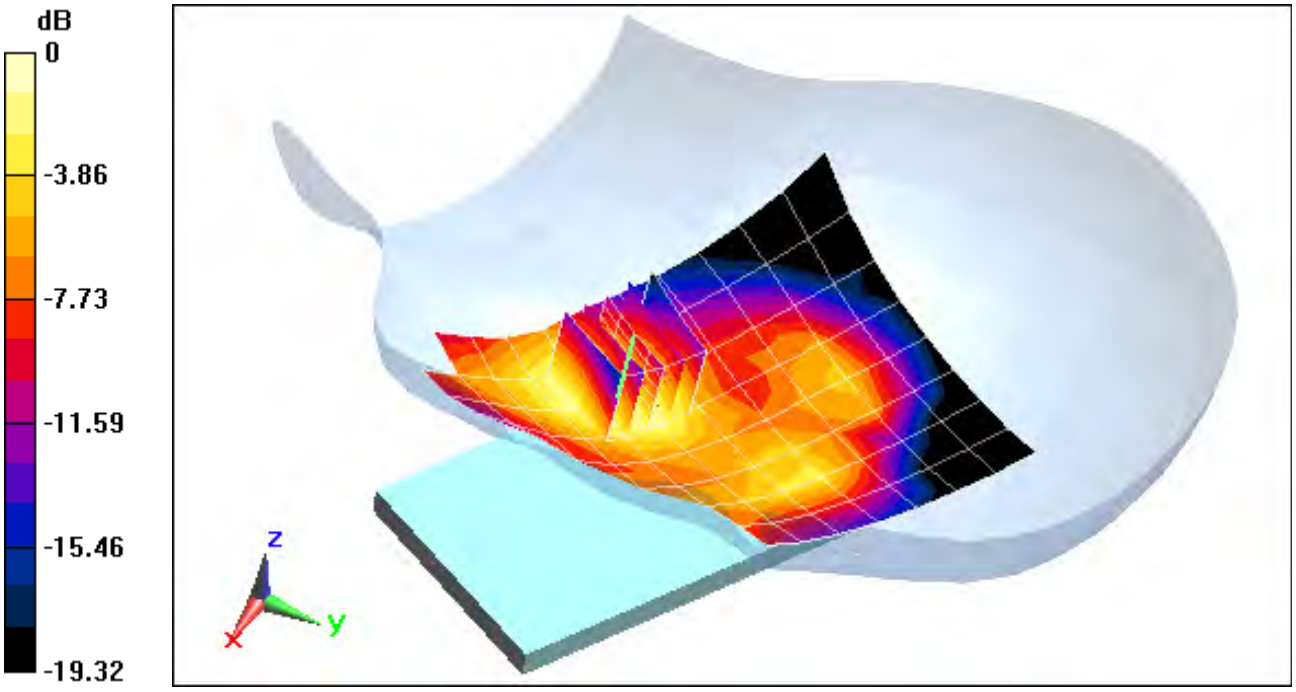
Communication System: CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used:
f = 1880 MHz; σ = 1.422 S/m; ε_r = 39.987; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 23.2°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 CDMA, Left Head, Cheek, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.521 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.230 W/kg



0 dB = 0.251 W/kg = -6.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #28

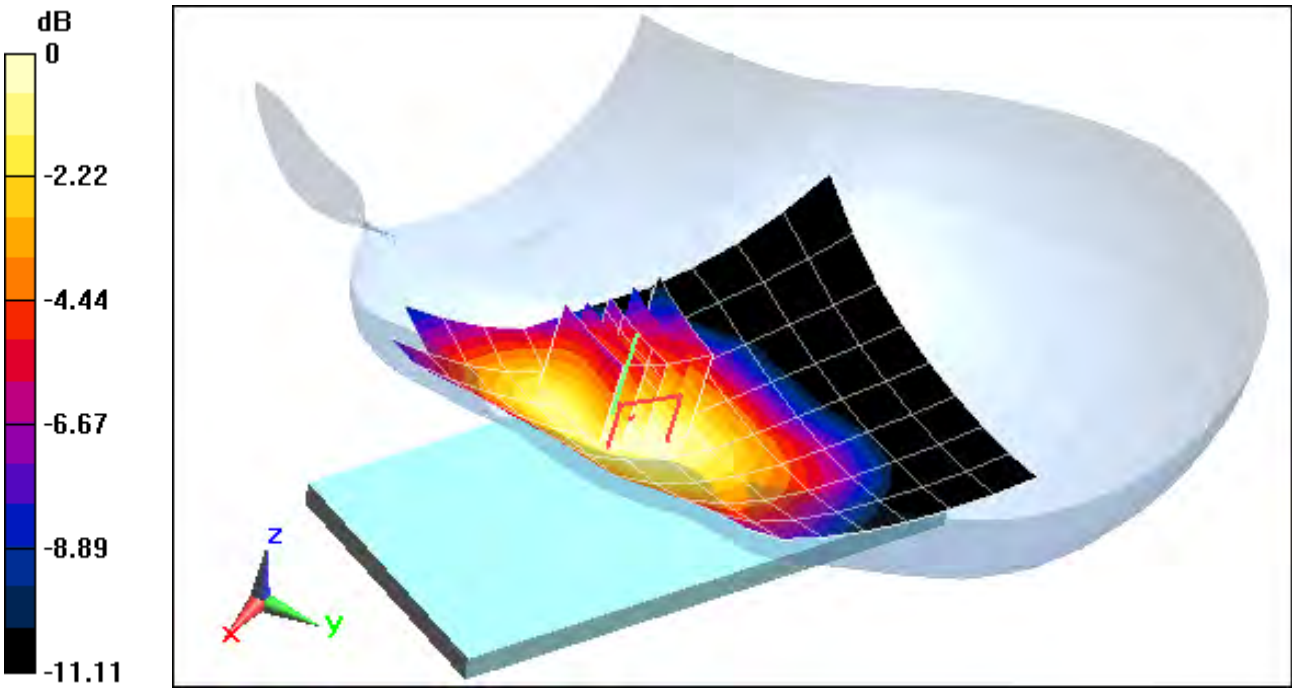
Communication System: LTE RF; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.866 S/m; ε_r = 41.69; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-06-2013; Ambient Temp: 23.6°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.3, 6.3, 6.3); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.296 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.0380 W/kg
SAR(1 g) = 0.030 W/kg



0 dB = 0.0316 W/kg = -15.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #28

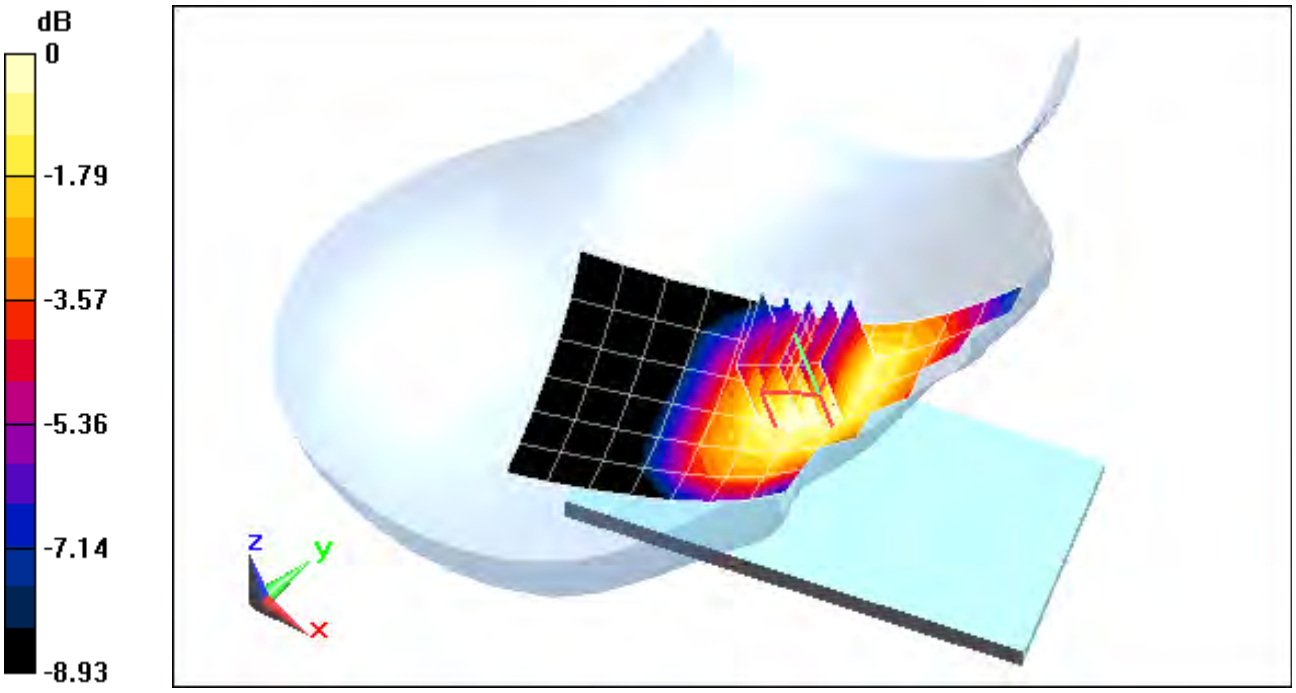
Communication System: LTE BAND 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used:
f = 710 MHz; σ = 0.868 S/m; ε_r = 41.633; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-06-2013; Ambient Temp: 23.6°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.3, 6.3, 6.3); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 17, Right Head, Tilt, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 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 = 8.359 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.0660 W/kg
SAR(1 g) = 0.054 W/kg



0 dB = 0.0565 W/kg = -12.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #27

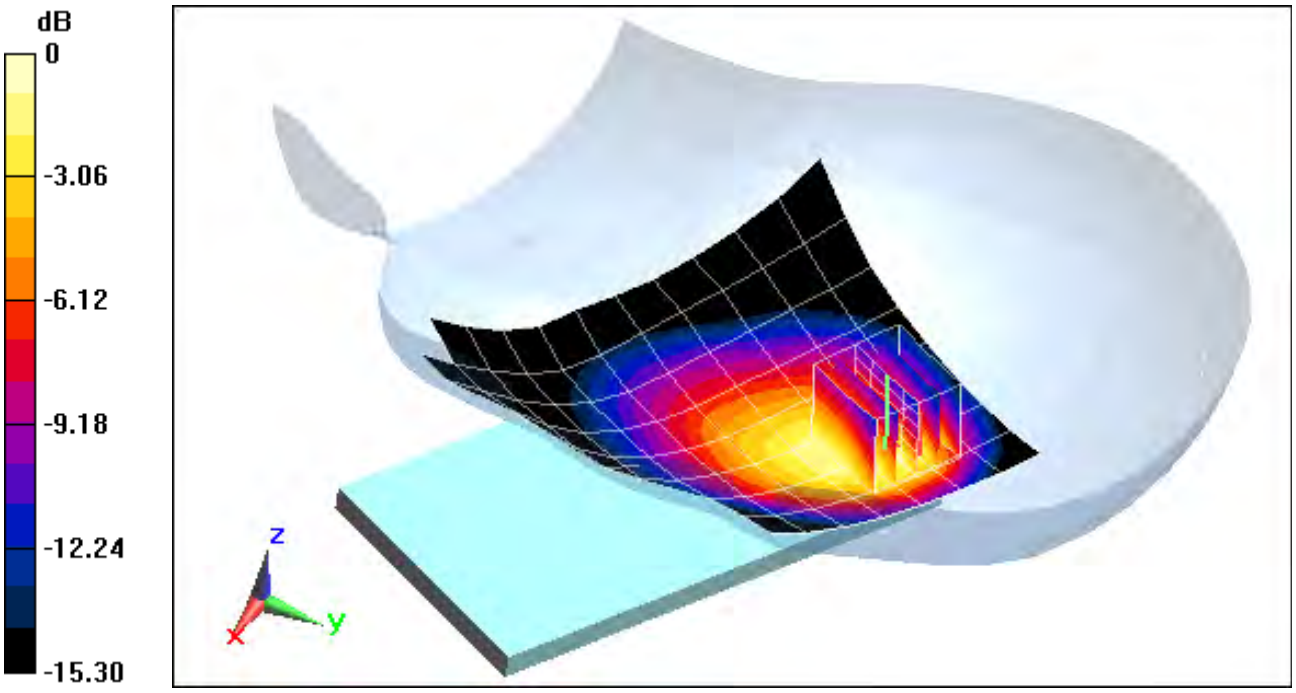
Communication System: LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.925 S/m; ε_r = 41.818; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-10-2013; Ambient Temp: 24.2°C; Tissue Temp: 23.7°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: LTE Band 5 (Cell.), Left Head, Cheek, Mid.ch,
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.409 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.464 W/kg
SAR(1 g) = 0.261 W/kg



0 dB = 0.274 W/kg = -5.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

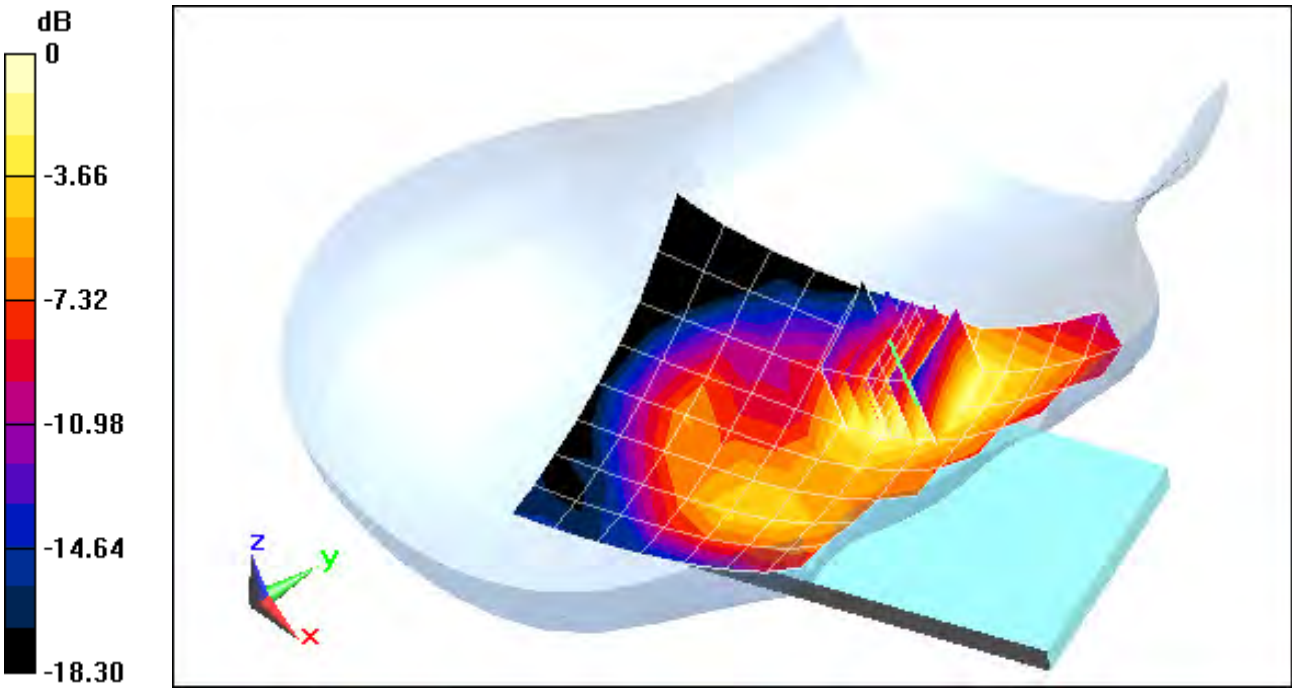
Communication System: LTE RF; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head, Medium parameters used:
f = 1750 MHz; σ = 1.401 S/m; ε_r = 39.495; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-06-2013; Ambient Temp: 23.1°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3287; ConvF(5.16, 5.16, 5.16); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Right Head, Cheek, High.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.885 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.138 W/kg



0 dB = 0.147 W/kg = -8.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #26

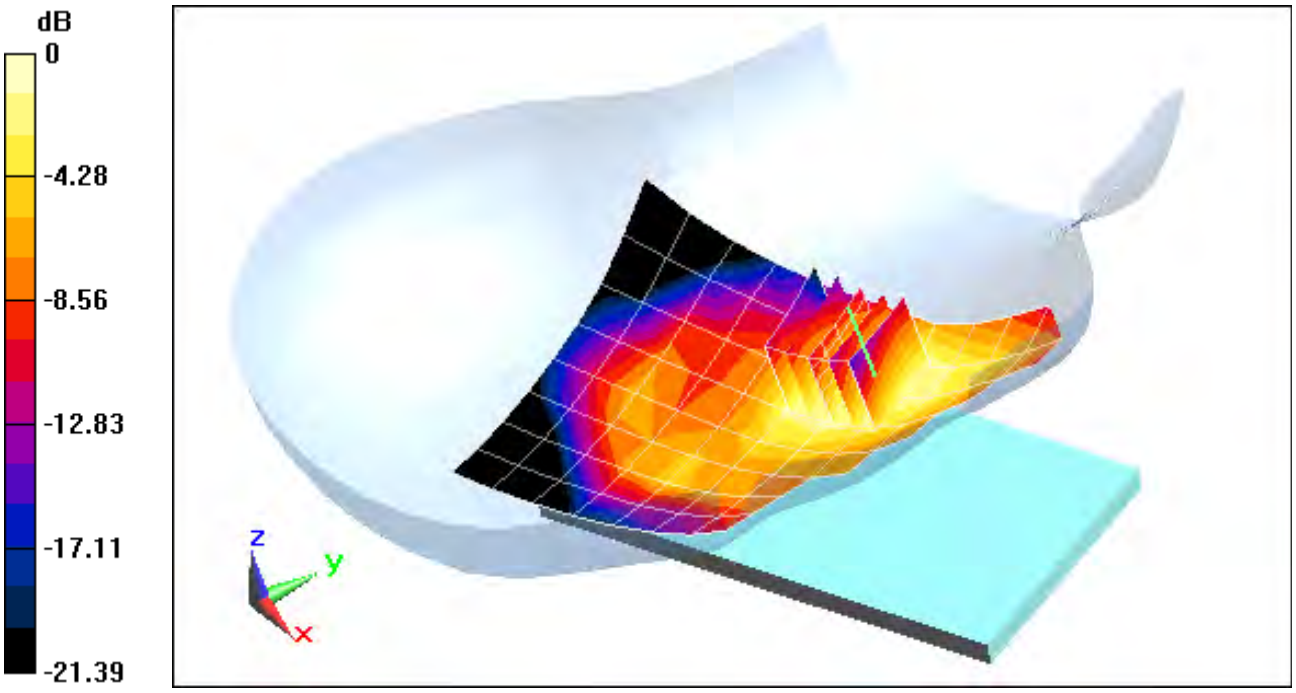
Communication System: LTE Band 2 (PCS); Frequency: 1855 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1855 MHz; σ = 1.399 S/m; ε_r = 40.096; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 23.2°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 2 (PCS), Right Head, Cheek, Low.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.010 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.175 W/kg
SAR(1 g) = 0.121 W/kg



0 dB = 0.125 W/kg = -9.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #30

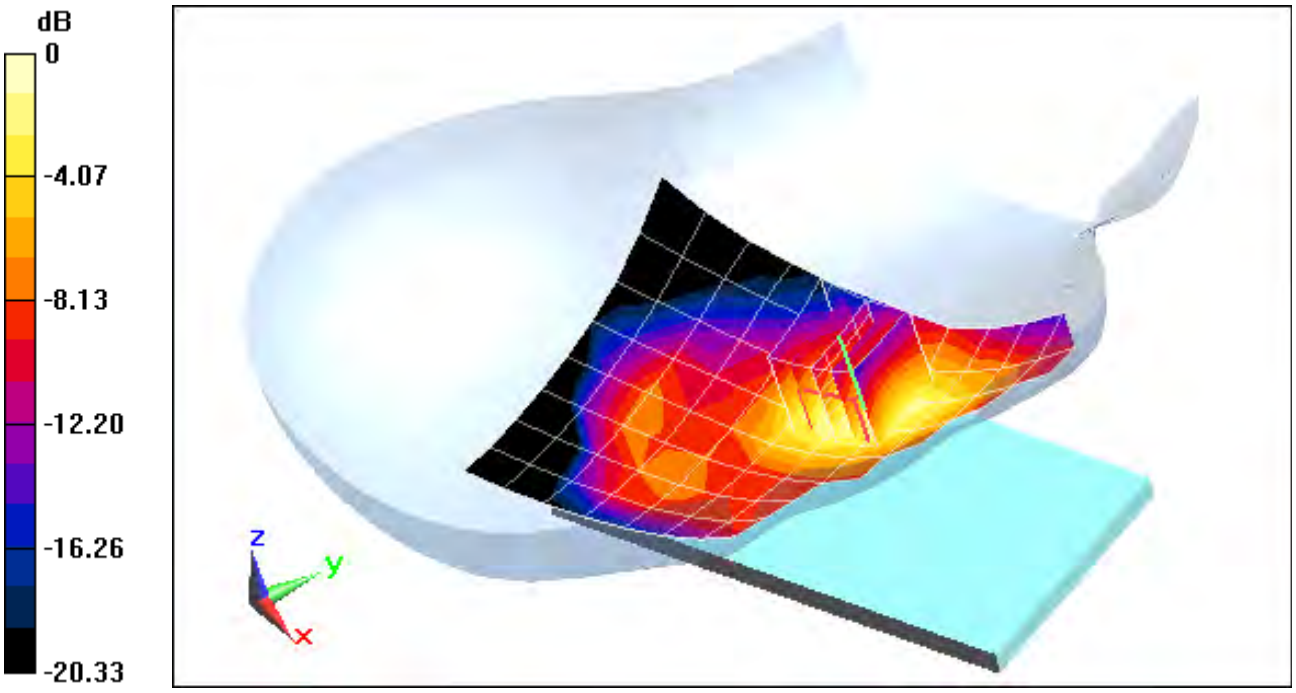
Communication System: LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.424 S/m; ε_r = 39.977; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 23.2°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), Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.350 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.180 W/kg



0 dB = 0.198 W/kg = -7.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #30

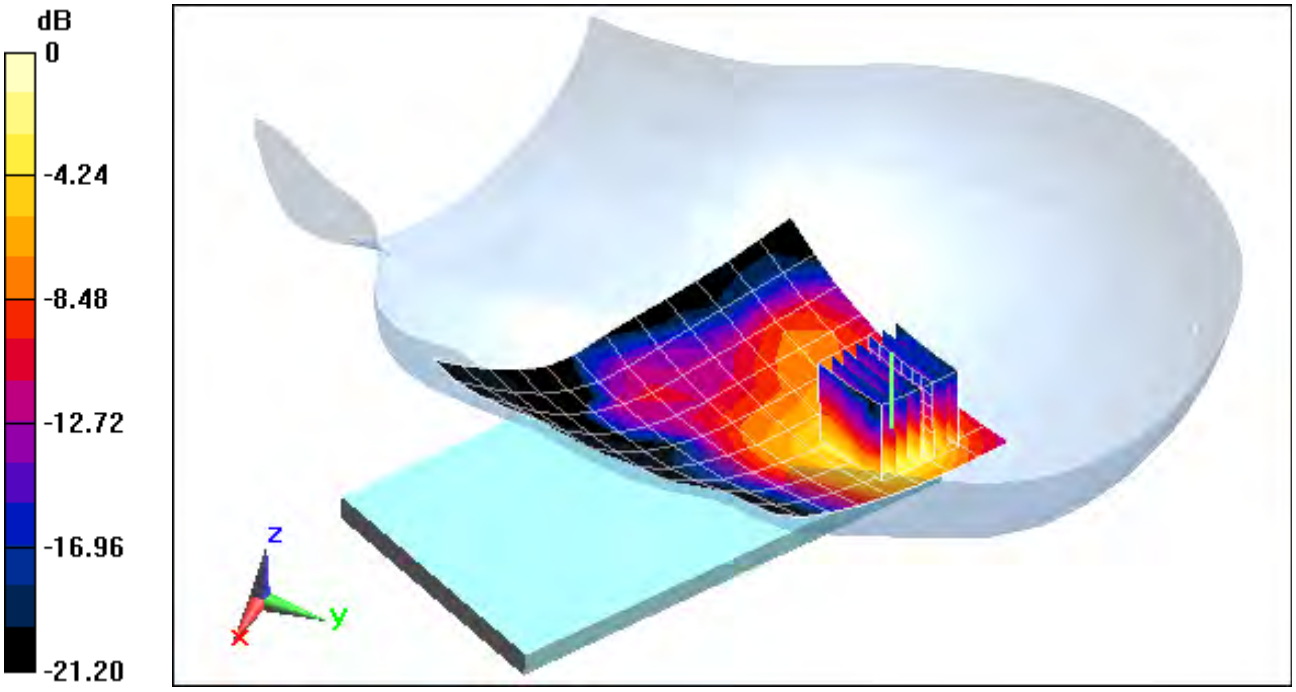
Communication System: IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.76 S/m; ε_r = 38.988; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-02-2013; Ambient Temp: 24.5°C; Tissue Temp: 24.3°C

Probe: ES3DV3 - SN3209; ConvF(4.57, 4.57, 4.57); Calibrated: 3/15/2013;
Sensor-Surface: 3mm (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: IEEE 802.11b, Left Head, Cheek, Ch 11, 1 Mbps

Area Scan (10x13x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.961 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.074 W/kg



0 dB = 0.0925 W/kg = -10.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

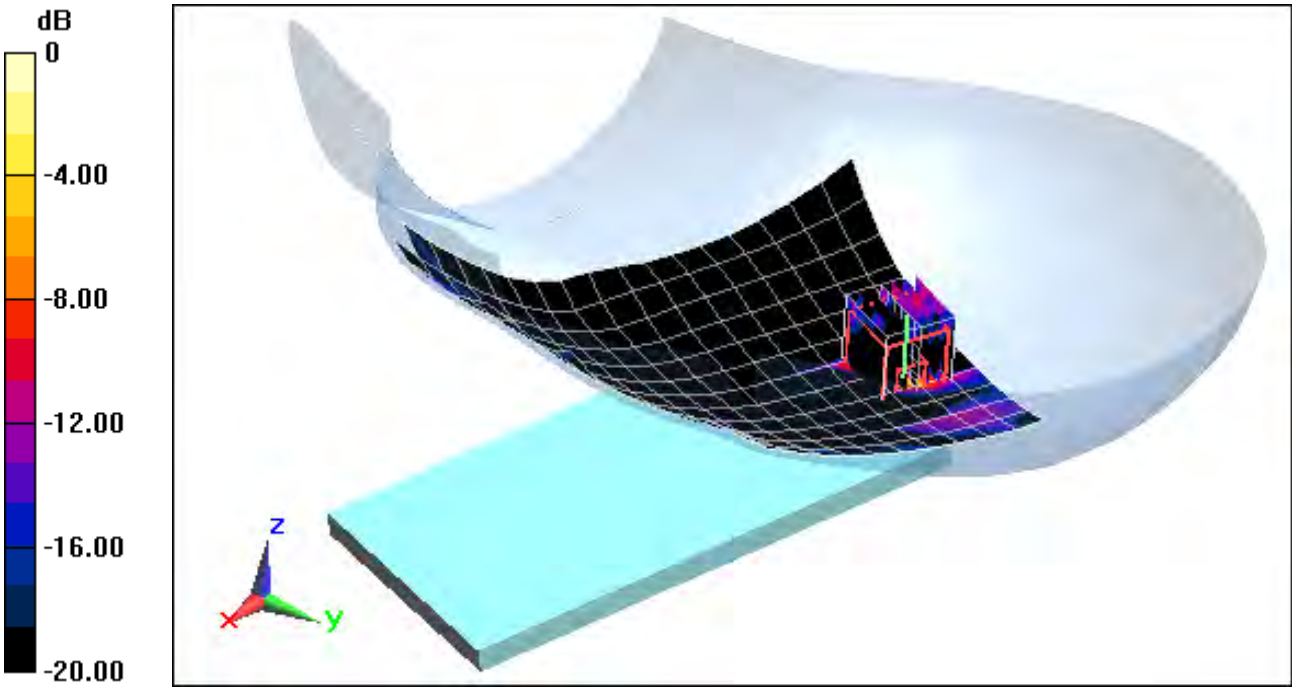
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5580 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5580 MHz; σ = 5.047 S/m; ε_r = 36.367; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-10-2013; Ambient Temp: 24.2°C; Tissue Temp: 24.4°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 Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.5-5.7 GHz Left Head, Tilt, Ch 116, 6 Mbps

Area Scan (13x20x1): 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 = 1.482 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.561 W/kg
SAR(1 g) = 0.037 W/kg



0 dB = 0.137 W/kg = -8.63 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

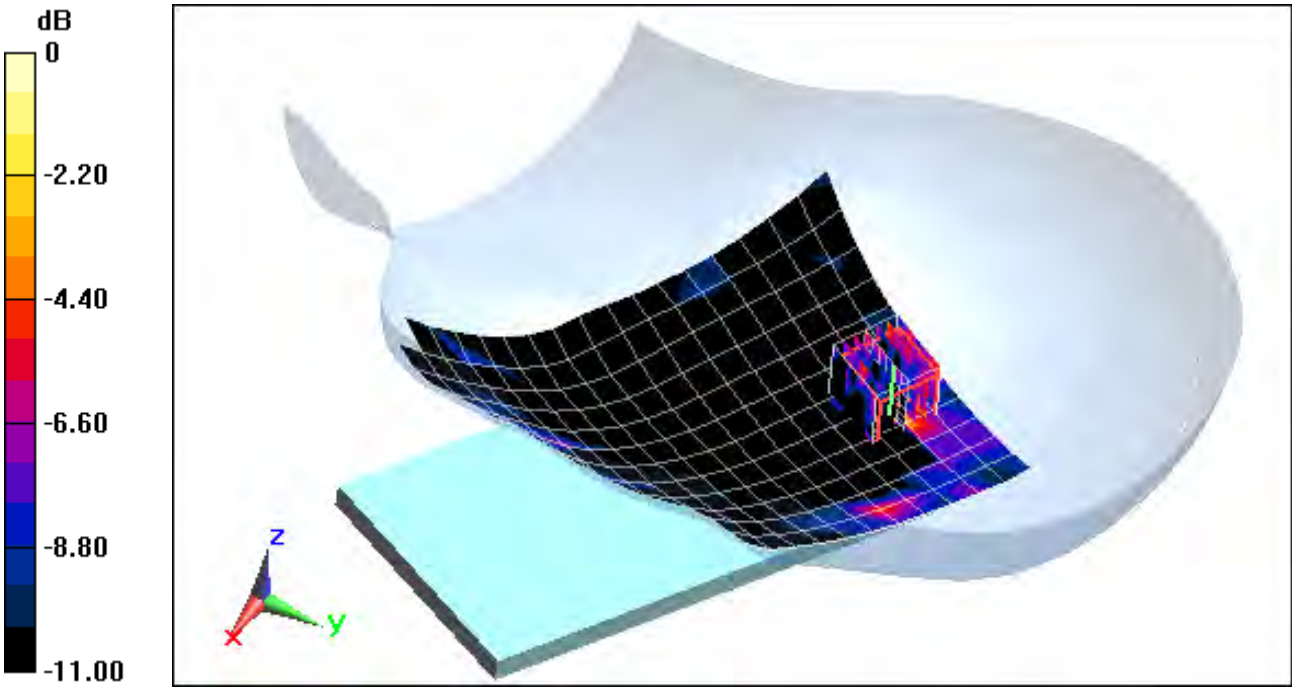
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5785 MHz; σ = 5.262 S/m; ε_r = 35.935; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-10-2013; Ambient Temp: 24.2°C; Tissue Temp: 24.3°C

Probe: EX3DV4 - SN3589; ConvF(3.85, 3.85, 3.85); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz Left Head, Cheek, Ch 157, 6 Mbps

Area Scan (13x20x1): 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 = 1.994 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.400 W/kg
SAR(1 g) = 0.020 W/kg



0 dB = 0.0702 W/kg = -11.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #24

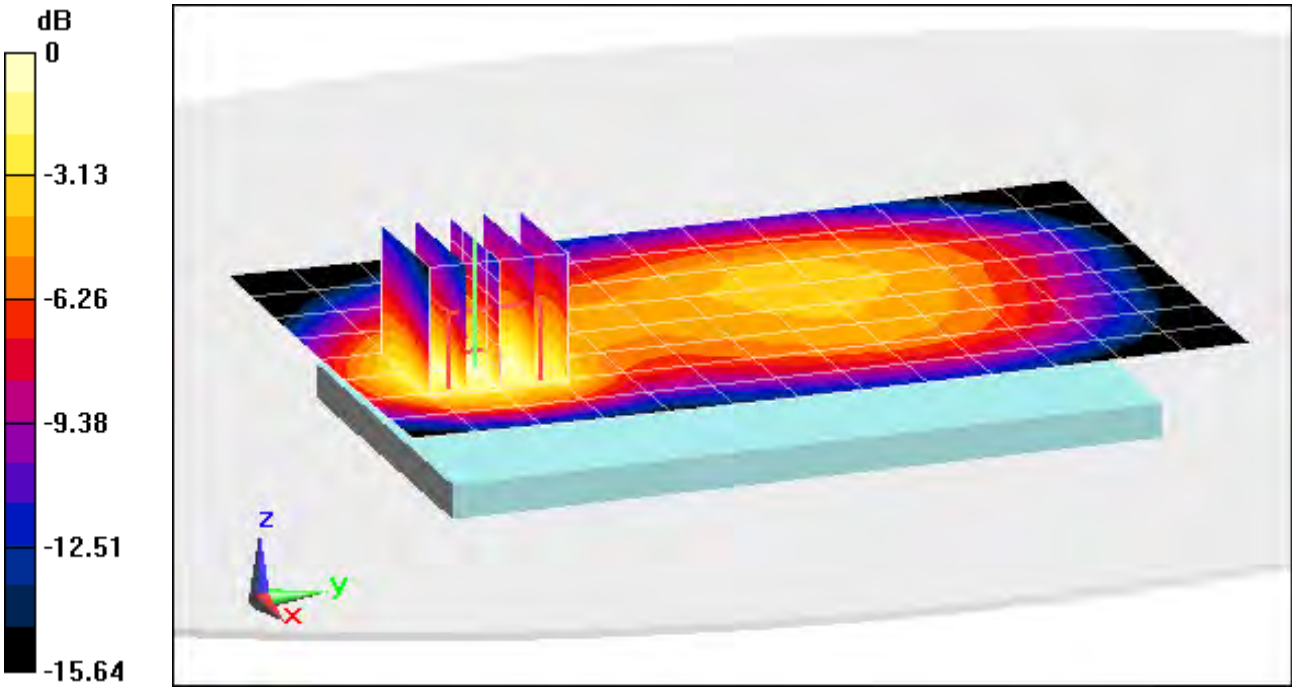
Communication System: CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.973 S/m; ε_r = 53.949; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.5°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, Body SAR, Back side, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.296 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.763 W/kg
SAR(1 g) = 0.429 W/kg



0 dB = 0.472 W/kg = -3.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #23

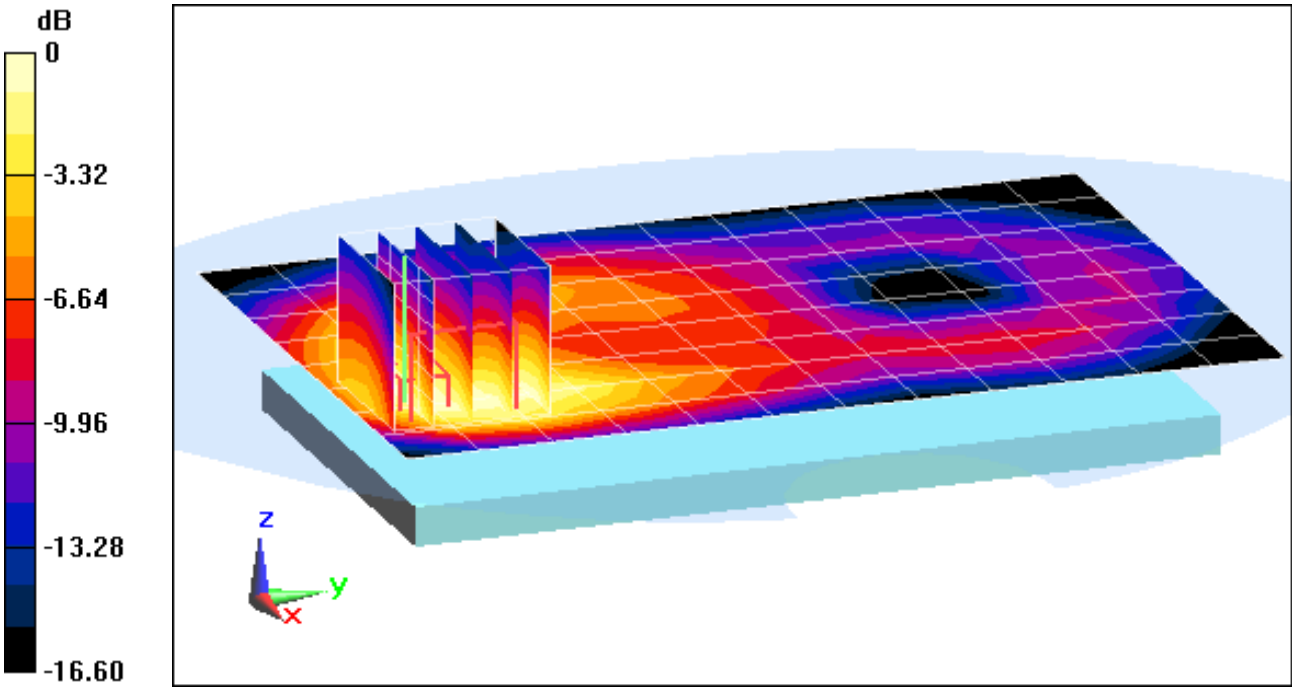
Communication System: CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.527 S/m; ε_r = 51.466; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-11-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.5°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)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.784 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.924 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #28

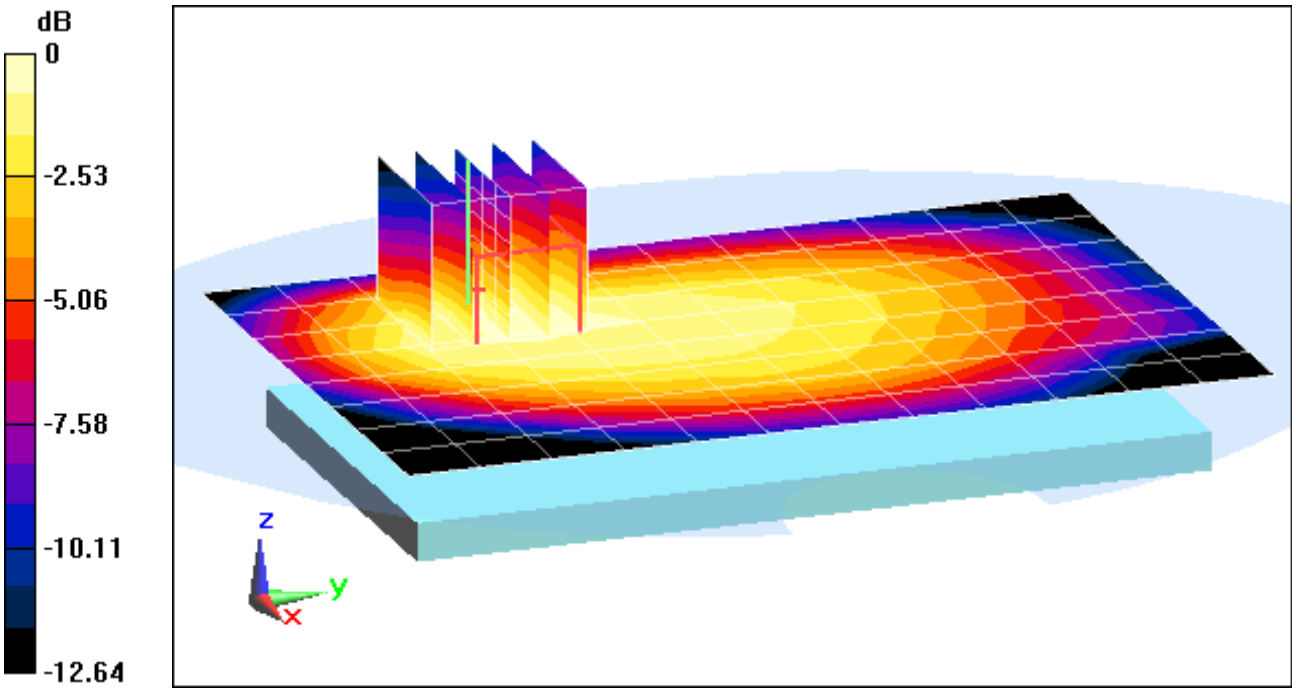
Communication System: LTE RF; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.95 S/m; ε_r = 57.089; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(6.07, 6.07, 6.07); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (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 12, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.820 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.165 W/kg



0 dB = 0.182 W/kg = -7.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #28

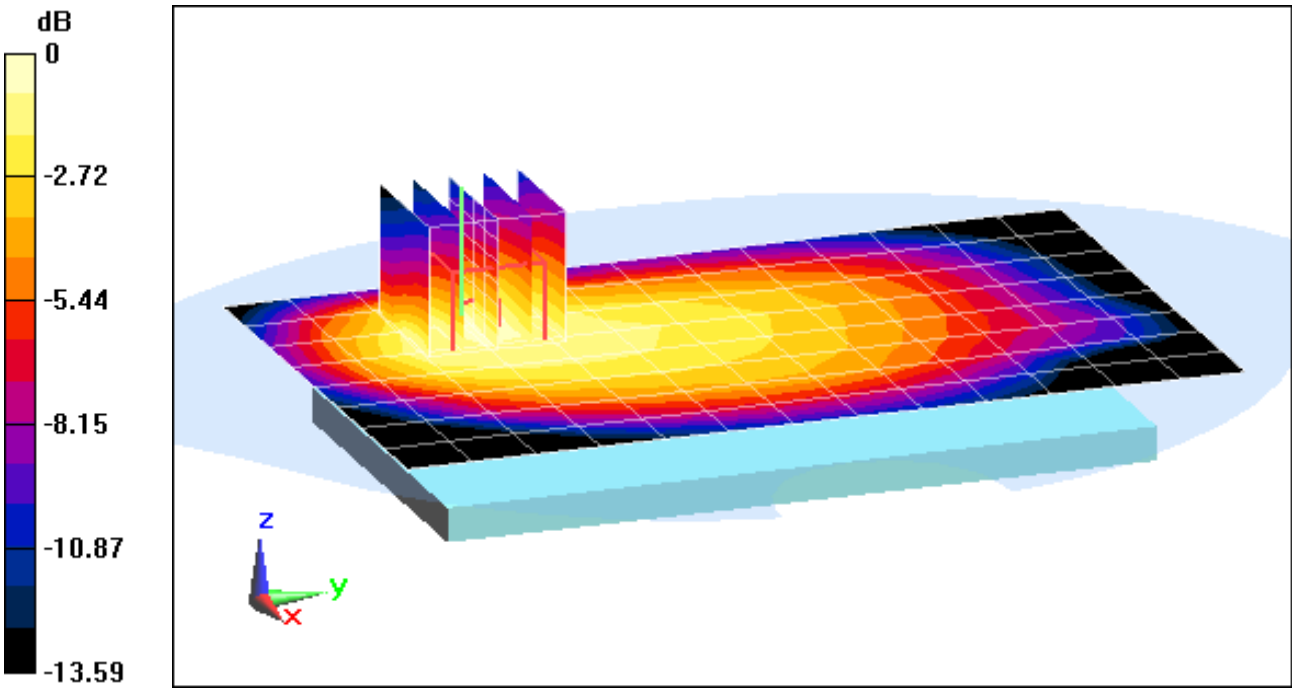
Communication System: LTE BAND 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used:
f = 710 MHz; σ = 0.952 S/m; ε_r = 57.058; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(6.07, 6.07, 6.07); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (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 17, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.559 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.292 W/kg
SAR(1 g) = 0.173 W/kg



0 dB = 0.192 W/kg = -7.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #27

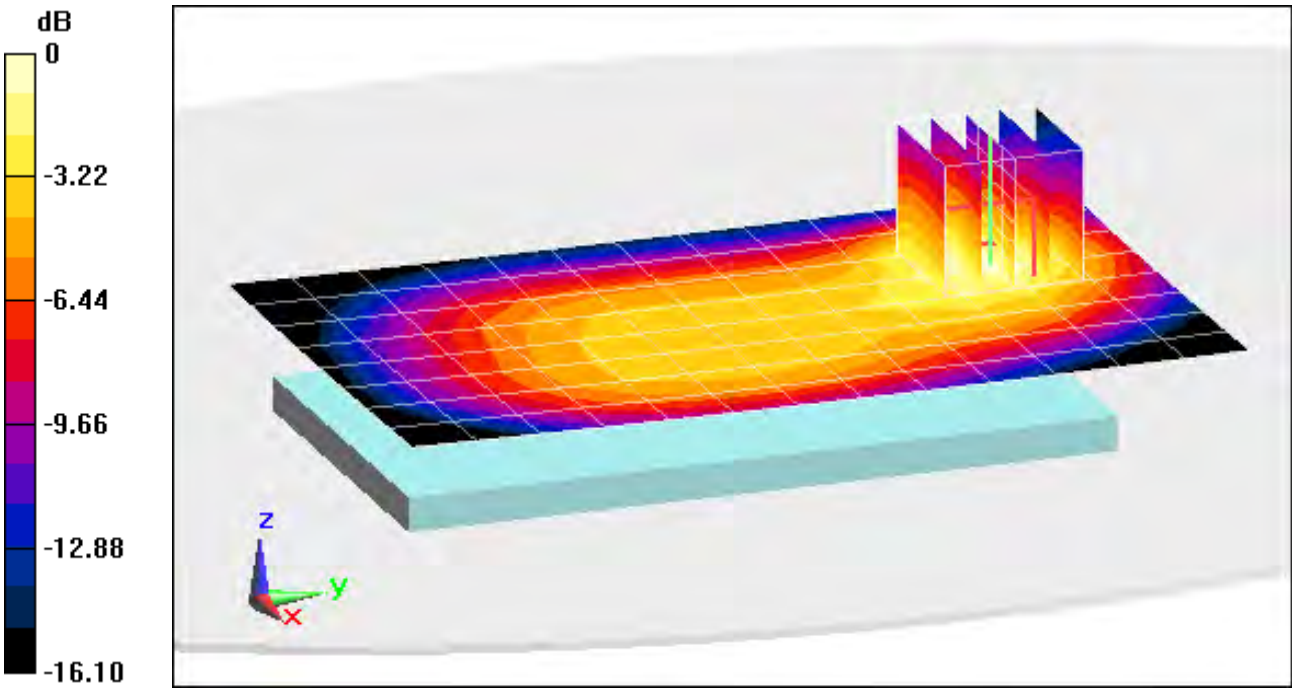
Communication System: LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.009 S/m; ε_r = 55.942; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-07-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.7°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 5 (Cell.), Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.553 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.191 W/kg



0 dB = 0.207 W/kg = -6.84 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

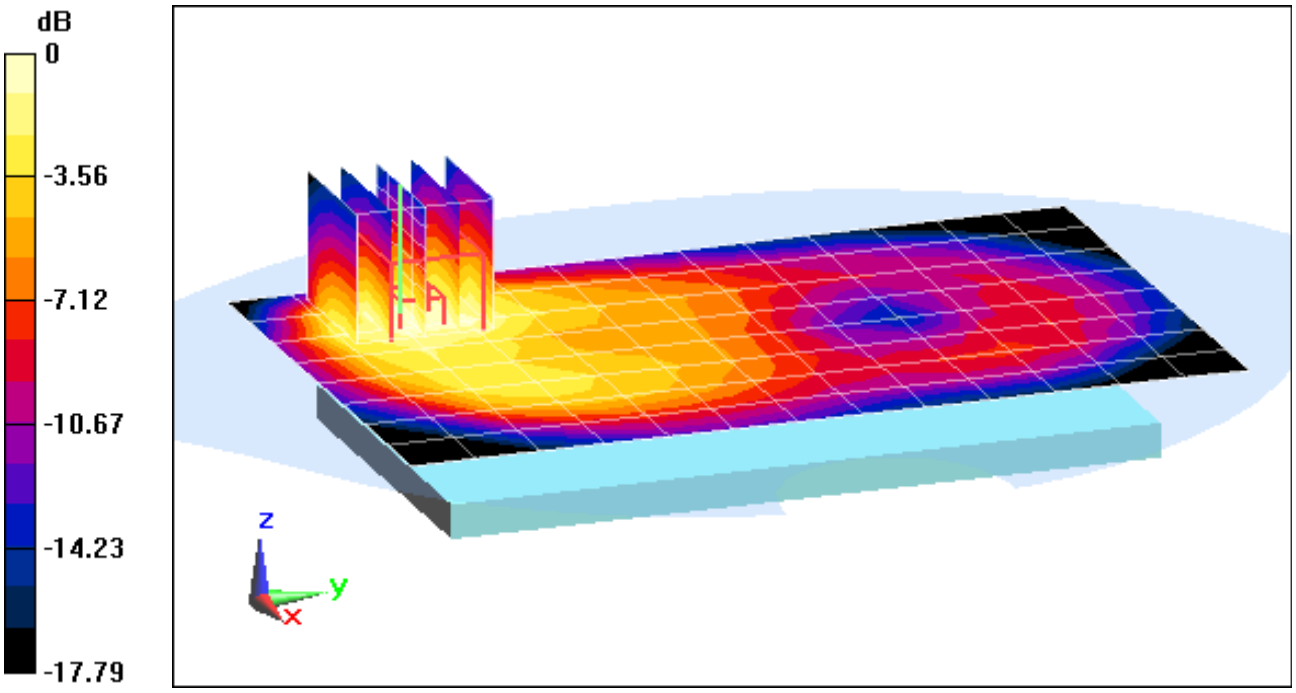
Communication System: LTE RF; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.434 S/m; ε_r = 52.619; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2013; Ambient Temp: 23.7°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.86, 4.86, 4.86); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Body SAR, Back side, High.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.693 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.709 W/kg
SAR(1 g) = 0.415 W/kg



0 dB = 0.431 W/kg = -3.66 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #26

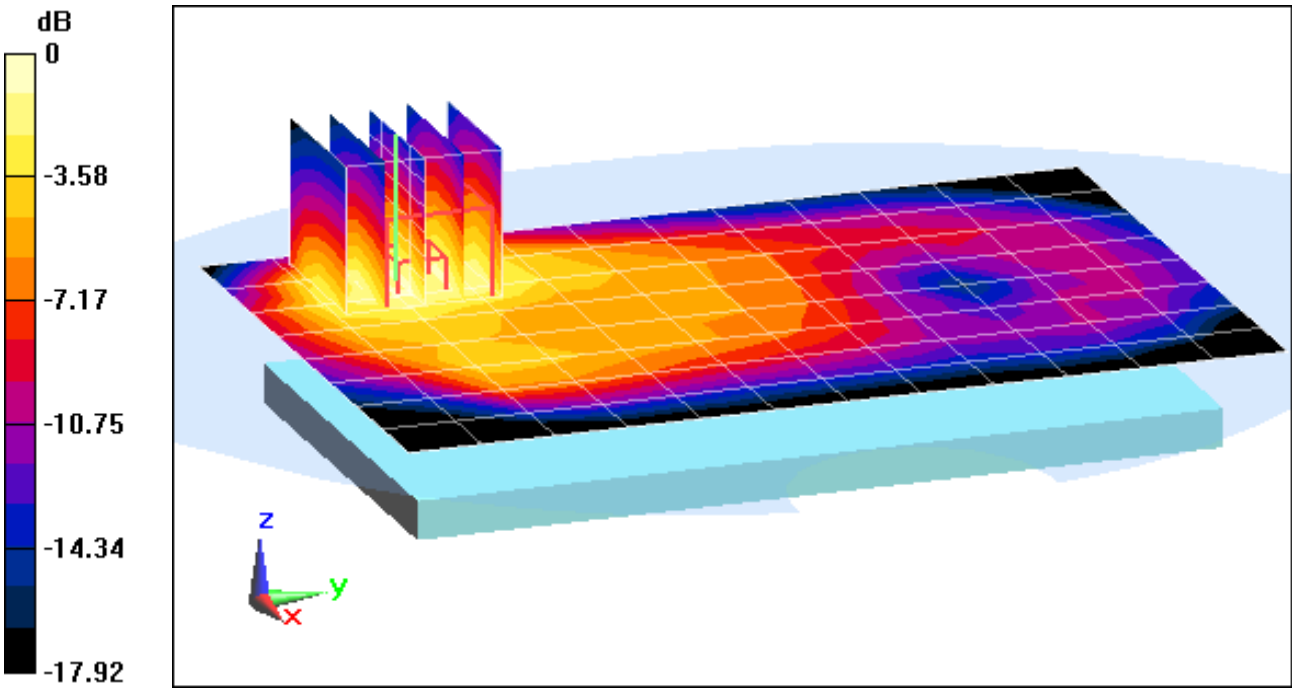
Communication System: LTE Band 2 (PCS); Frequency: 1855 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1855 MHz; σ = 1.499 S/m; ε_r = 51.549; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-11-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.5°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)

Mode: LTE Band 2 (PCS), Body SAR, Back side, Low.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.568 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.801 W/kg
SAR(1 g) = 0.473 W/kh



0 dB = 0.512 W/kg = -2.91 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #30

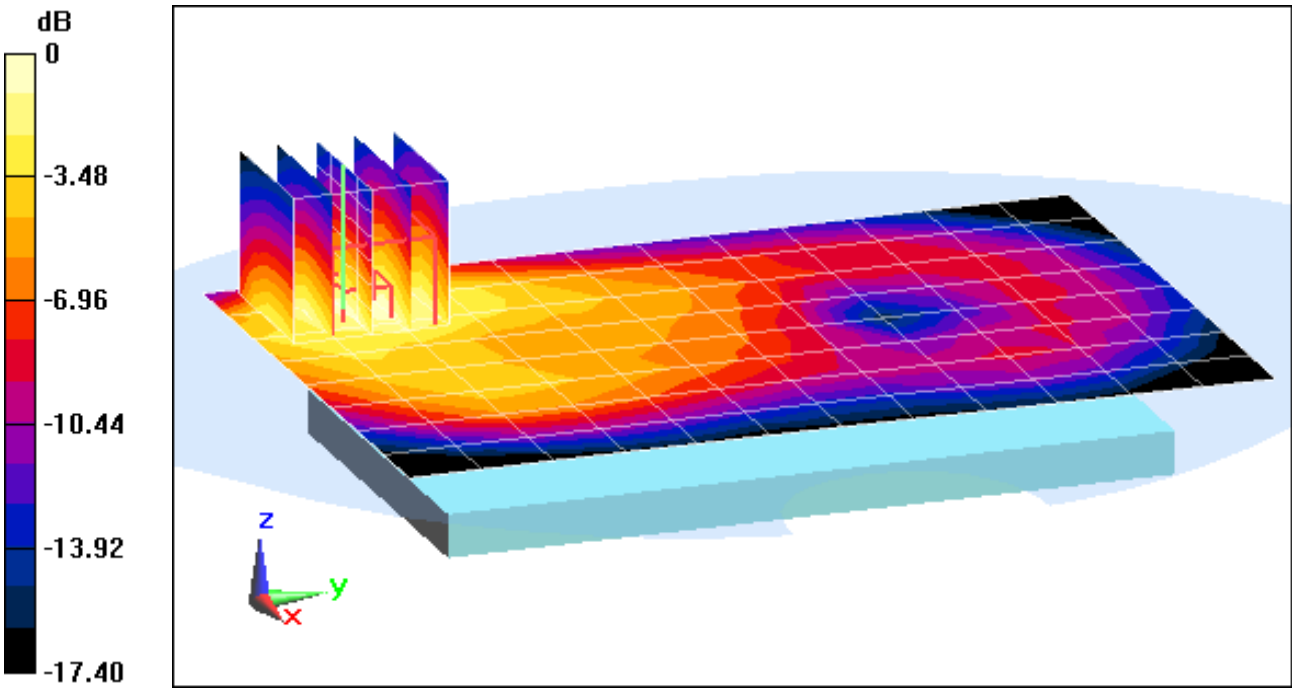
Communication System: LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.567 S/m; ε_r = 51.574; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 23.8°C; Tissue Temp: 23.4°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 V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.408 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.746 W/kg
SAR(1 g) = 0.445 W/kg



0 dB = 0.487 W/kg = -3.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #30

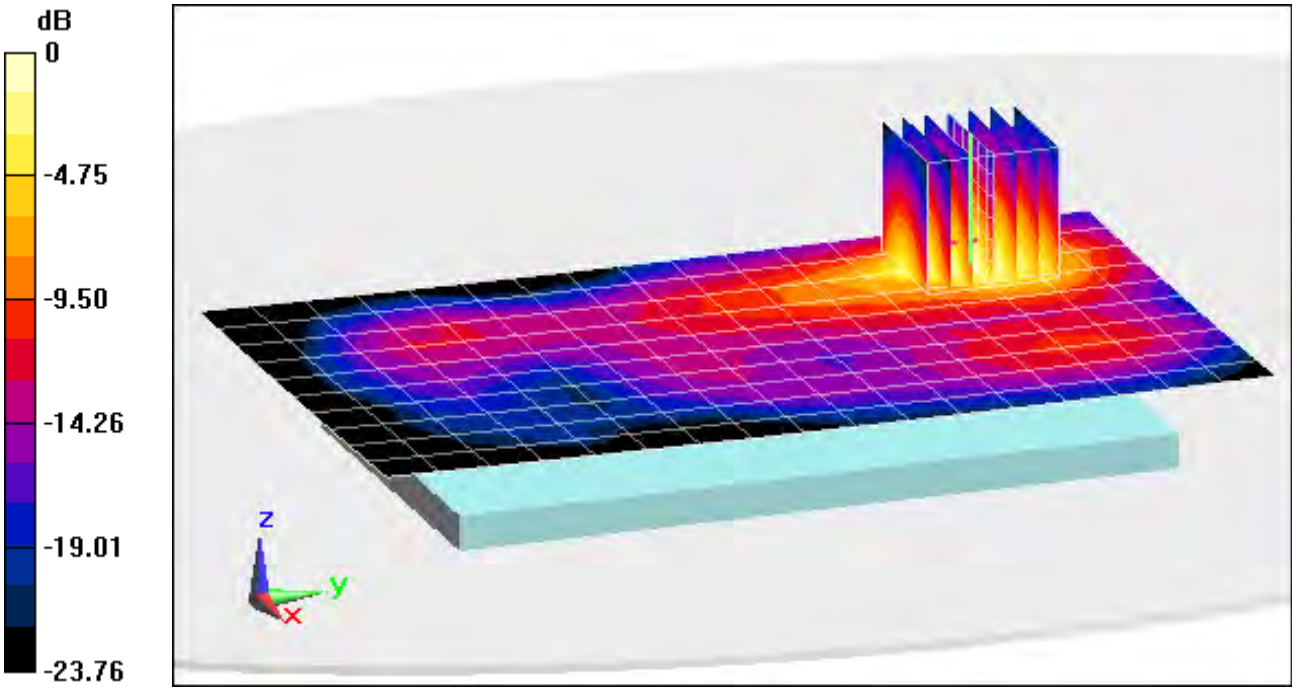
Communication System: IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.976 S/m; ε_r = 51.625; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3209; ConvF(4.34, 4.34, 4.34); Calibrated: 3/15/2013;
Sensor-Surface: 3mm (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: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Back Side

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.672 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.651 W/kg
SAR(1 g) = 0.311 W/kg



0 dB = 0.409 W/kg = -3.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #30

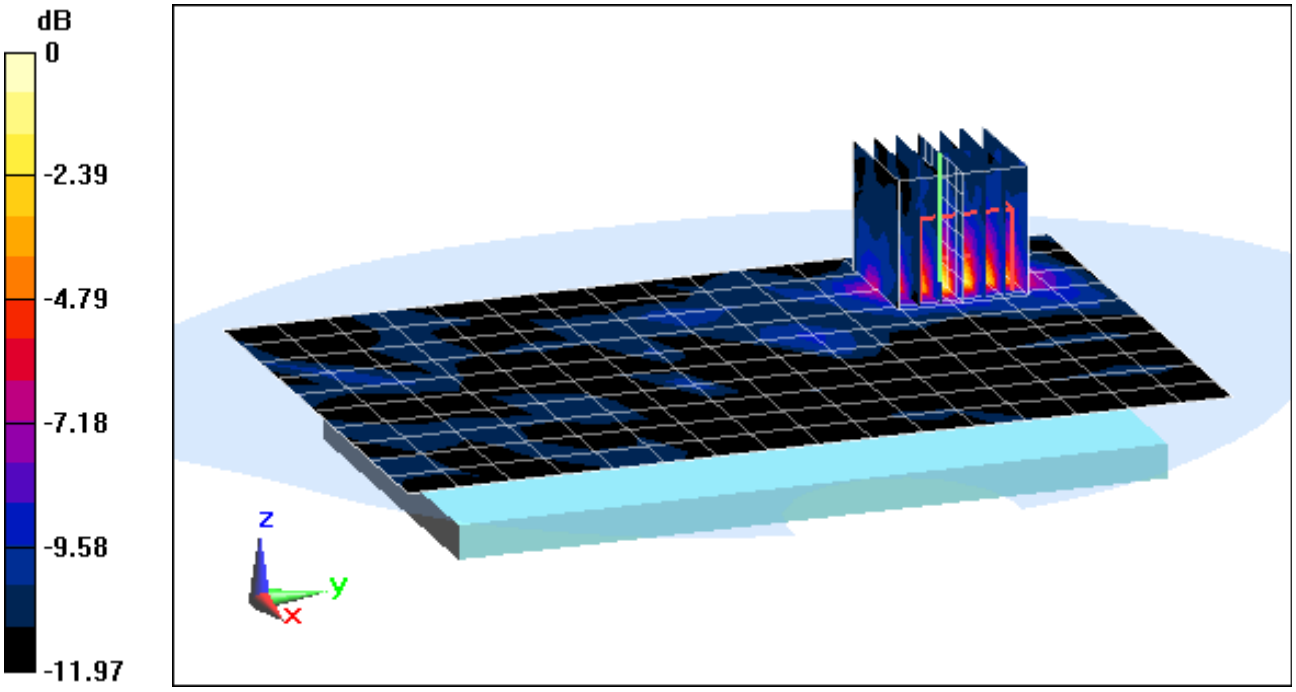
Communication System: Bluetooth; Frequency: 2402 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2402 MHz; σ = 1.938 S/m; ε_r = 51.135; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-11-2013; Ambient Temp: 23.7°C; Tissue Temp: 23.5°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-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: Bluetooth, Body SAR, Ch 0, 1 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.929 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.395 W/kg
SAR(1 g) = 0.124 W/kg



0 dB = 0.178 W/kg = -7.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

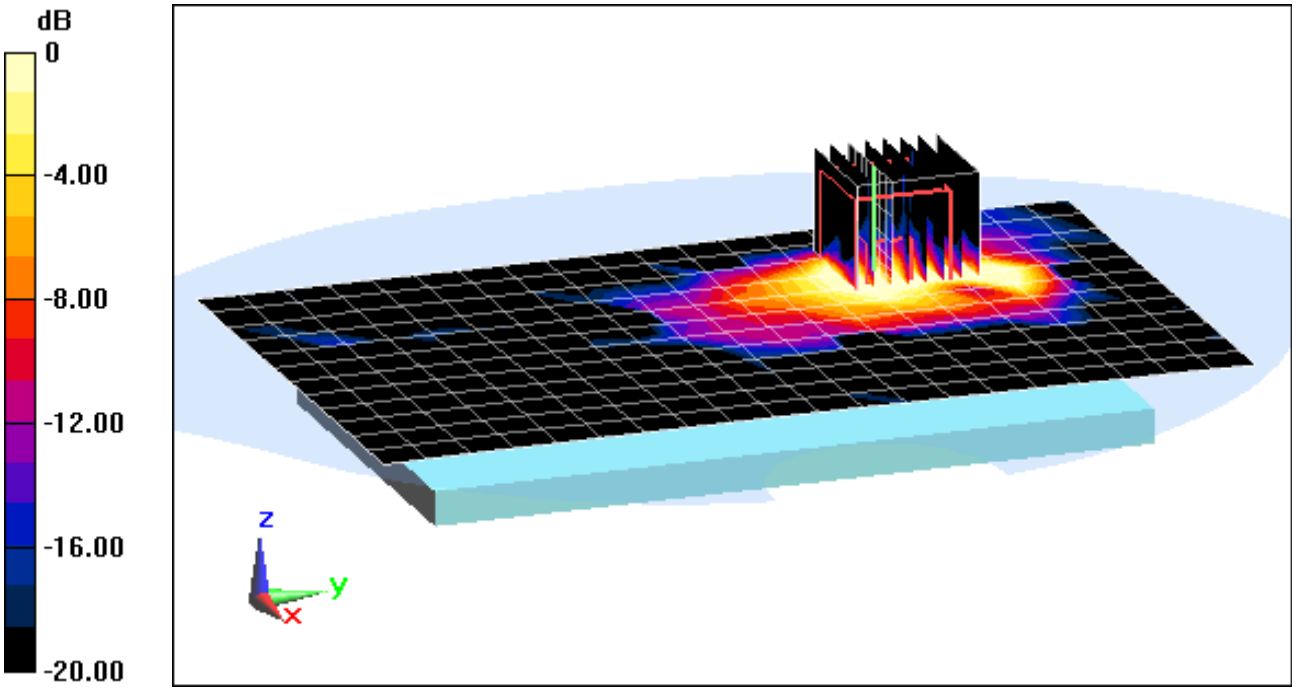
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5240 MHz; σ = 5.432 S/m; ε_r = 47.128; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.7°C; Tissue Temp: 22.9°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)

Mode: IEEE 802.11a, 5.2 GHz, Body SAR, Ch 48, 6 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.143 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.493 W/kg
SAR(1 g) = 0.086 W/kg



0 dB = 0.239 W/kg = -6.22 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

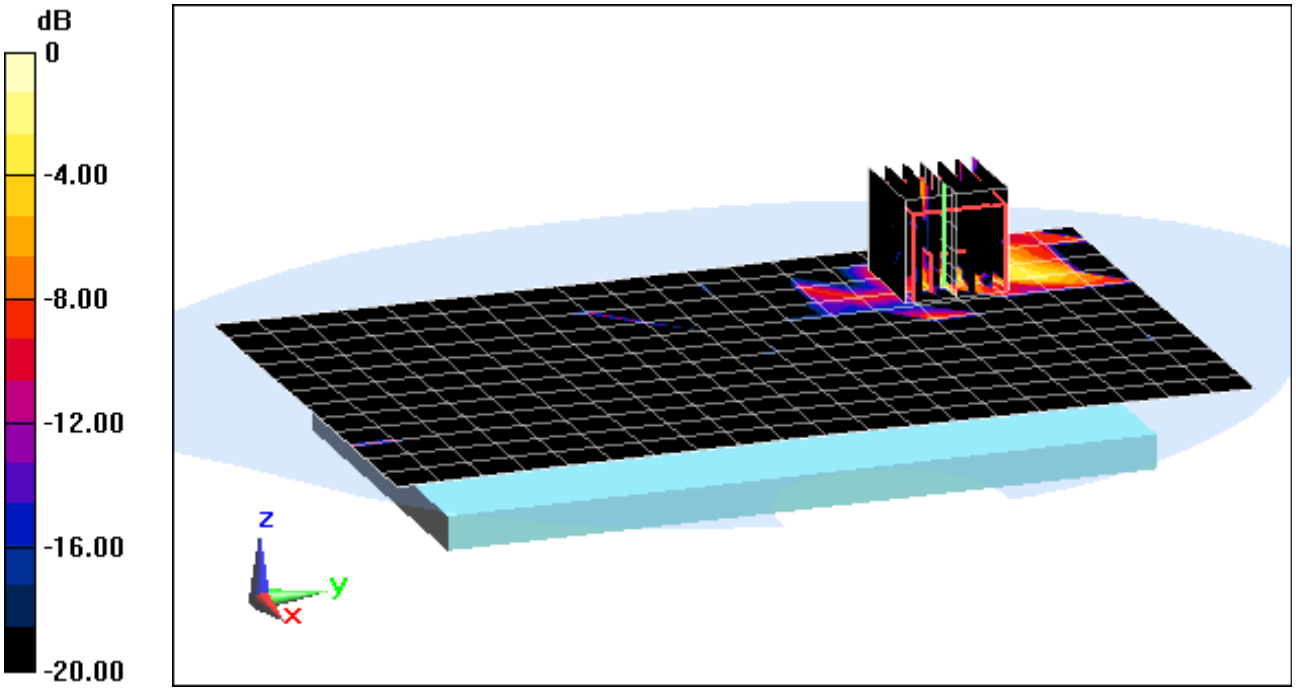
Communication System: IEEE 802.11ac 5.2-5.8 GHz Band; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used (interpolated):
f = 5775 MHz; σ = 6.19 S/m; ε_r = 46.314; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.5°C; Tissue Temp: 22.8°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 802.11ac, 5.8 GHz, Body SAR, Ch 155, 29.3 Mbps, Back Side

Area Scan (13x21x1): 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 = 1.000 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.229 W/kg
SAR(1 g) = 0.011 W/kg



0 dB = 0.0370 W/kg = -14.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHR960; Type: Portable Handset; Serial: #25

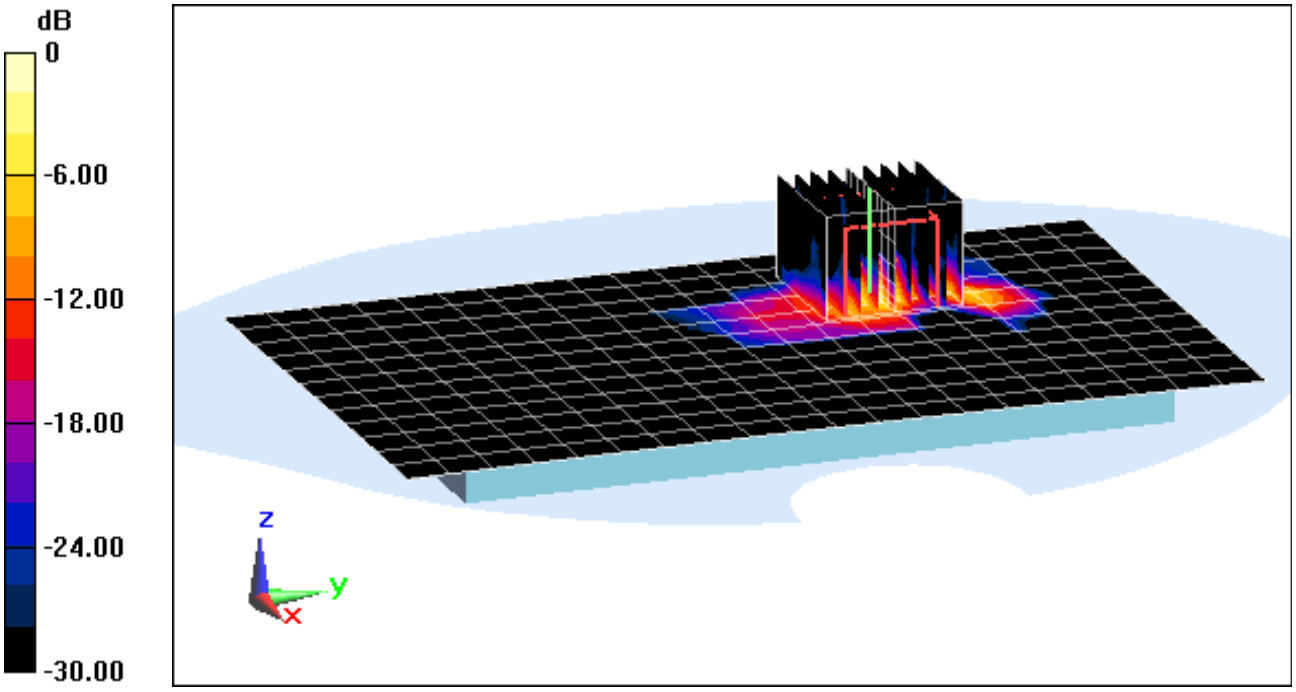
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5240 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5240 MHz; σ = 5.323 S/m; ε_r = 46.839; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.8°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)

Mode: IEEE 802.11a, 5.2 GHz, Hand SAR, Ch 48, 6 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 10.878 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(10 g) = 0.132 W/kg



0 dB = 1.75 W/kg = 2.43 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

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PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

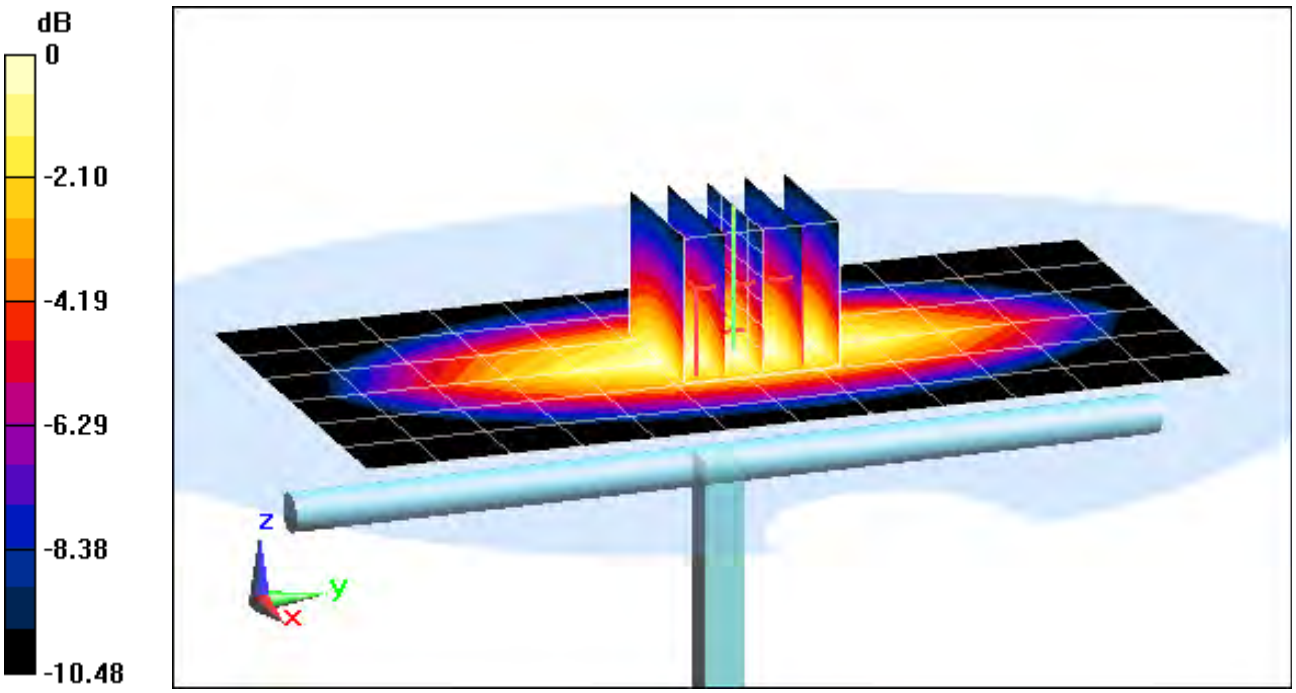
Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.904 S/m; ε_r = 40.792; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-06-2013; Ambient Temp: 23.6°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(6.3, 6.3, 6.3); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.791 W/kg
Deviation = -6.94%



0 dB = 0.857 W/kg = -0.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

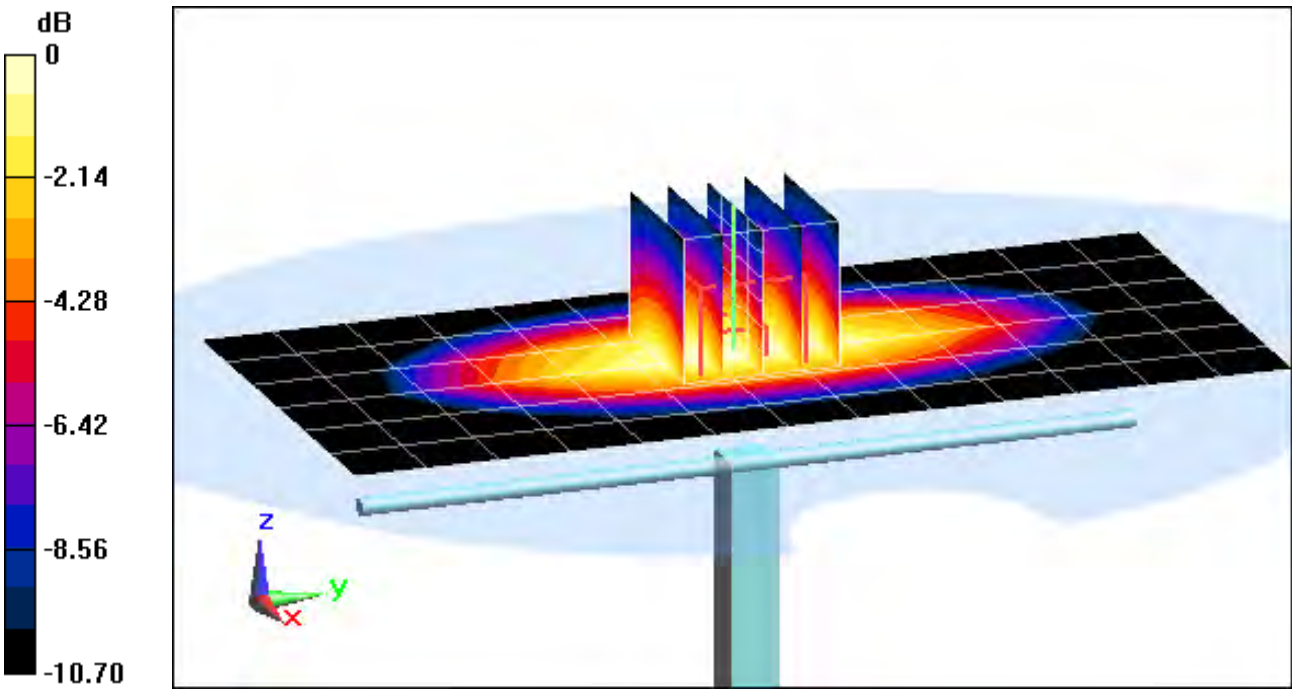
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used:
f = 835 MHz; σ = 0.938 S/m; ε_r = 42.44; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-05-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°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 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.999 W/kg
Deviation = 3.42%



0 dB = 1.08 W/kg = 0.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

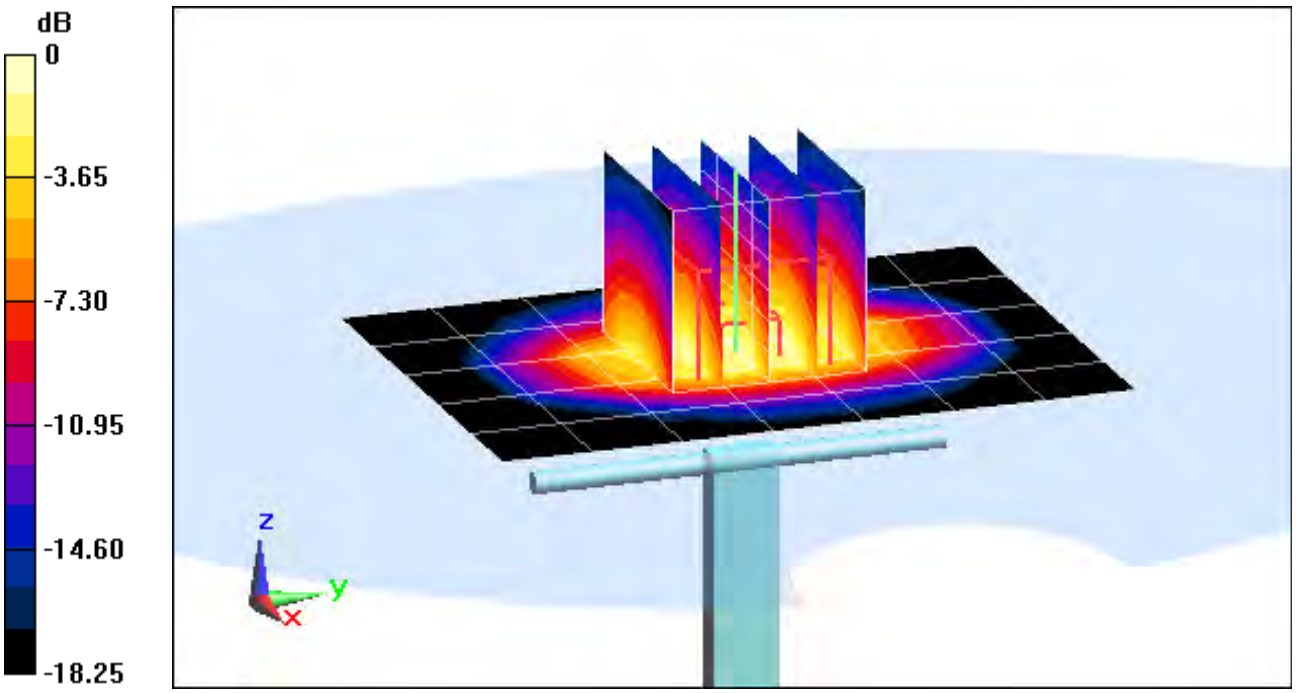
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head, Medium parameters used:
f = 1750 MHz; σ = 1.401 S/m; ε_r = 39.495; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 23.1°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3287; ConvF(5.16, 5.16, 5.16); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.03 W/kg
SAR(1 g) = 3.77 W/kg
Deviation = 2.45%



0 dB = 4.22 W/kg = 6.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

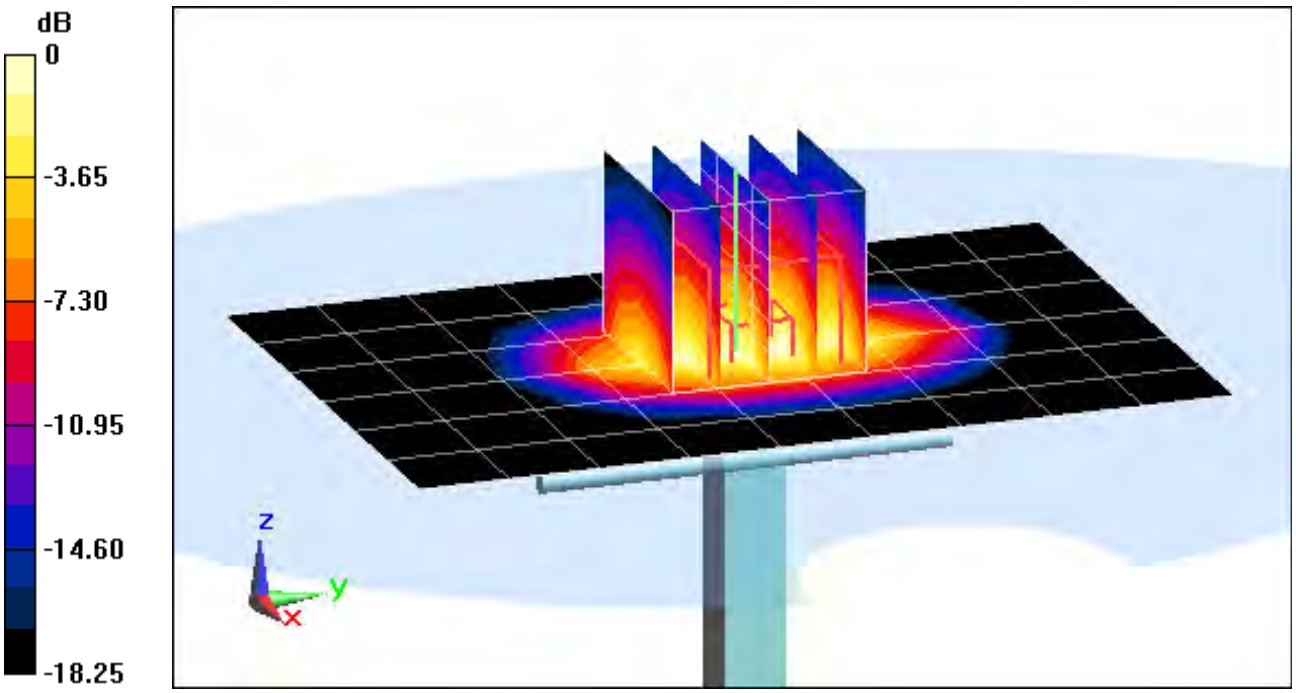
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.441 S/m; ε_r = 39.904; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 23.2°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) = 7.19 W/kg
SAR(1 g) = 3.86 W/kg
Deviation = -2.77%



0 dB = 4.30 W/kg = 6.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 882

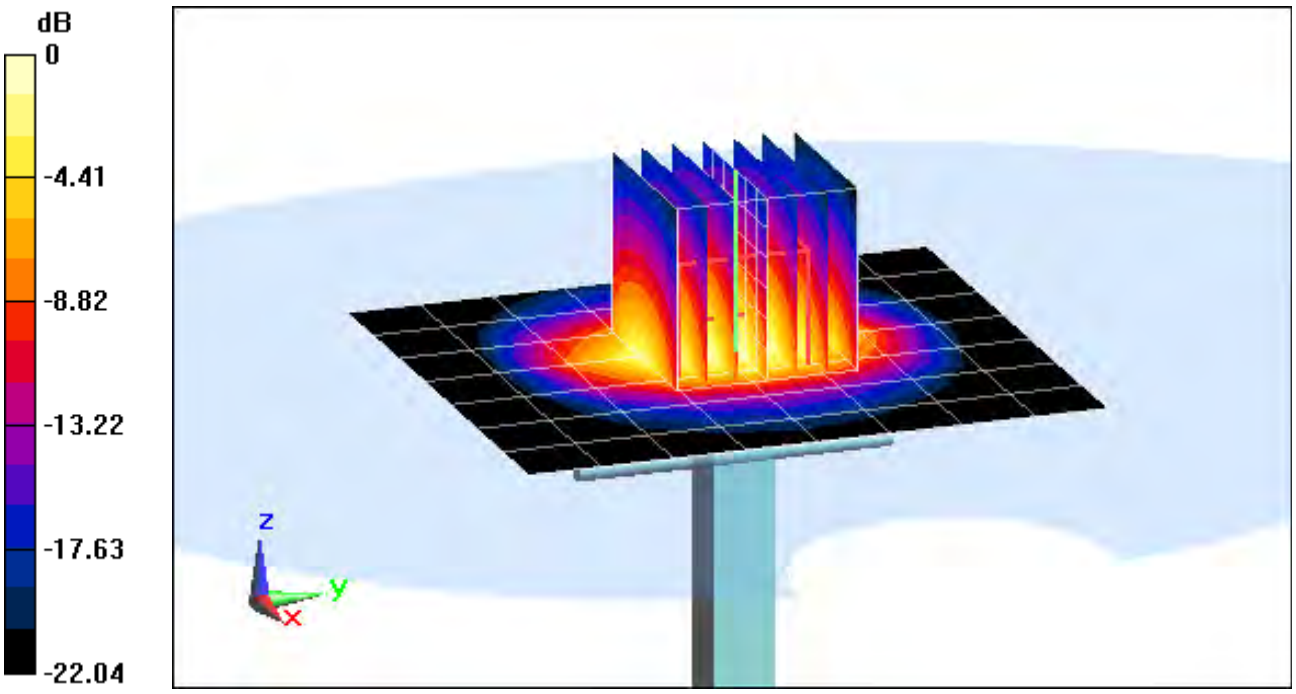
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used:
f = 2450 MHz; σ = 1.748 S/m; ε_r = 39.074; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-02-2013; Ambient Temp: 24.5°C; Tissue Temp: 24.3°C

Probe: ES3DV3 - SN3209; ConvF(4.57, 4.57, 4.57); Calibrated: 3/15/2013;
Sensor-Surface: 3mm (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)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 4.91 W/kg
SAR(1 g) = 2.43 W/kg
Deviation = -6.00%



0 dB = 3.14 W/kg = 4.97 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

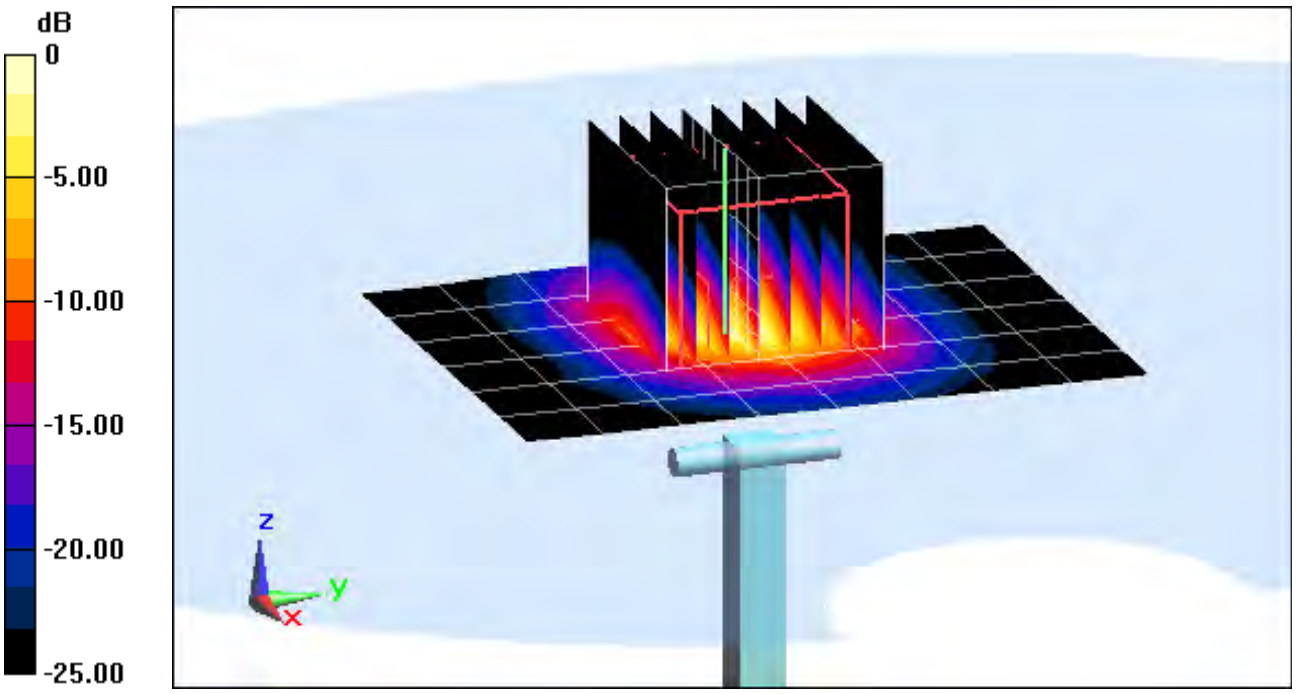
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5200 MHz; σ = 4.549 S/m; ε_r = 37.028; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.3°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN3589; ConvF(4.48, 4.48, 4.48); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
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 (8x8x7)/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) = 33.5 W/kg
SAR(1 g) = 7.11 W/kg
Deviation = -6.32%



0 dB = 17.6 W/kg = 12.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

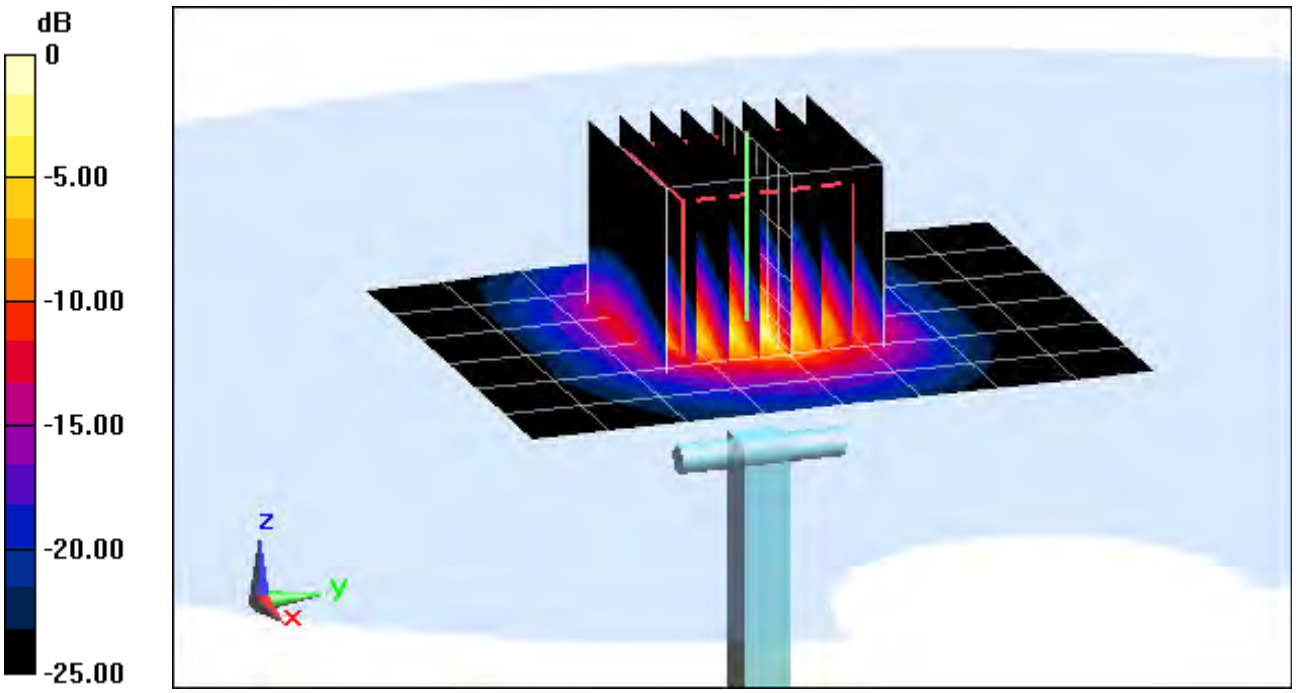
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5300 MHz; σ = 4.69 S/m; ε_r = 36.844; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.3°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN3589; ConvF(4.27, 4.27, 4.27); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
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 (8x8x7)/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) = 30.4 W/kg
SAR(1 g) = 7.63 W/kg
Deviation = -0.78%



0 dB = 18.3 W/kg = 12.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

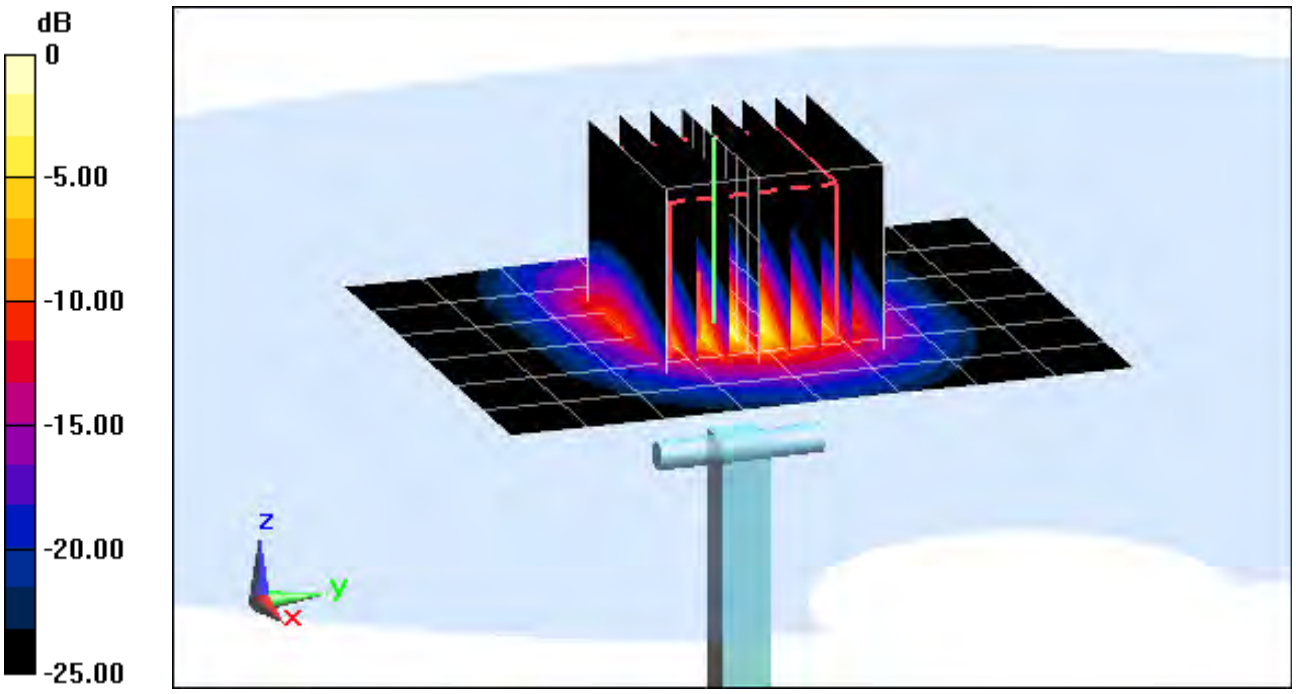
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5500 MHz; σ = 4.951 S/m; ε_r = 36.499; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.1°C; Tissue Temp: 24.4°C

Probe: EX3DV4 - SN3589; ConvF(4.14, 4.14, 4.14); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x9x1): 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 = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 29.1 W/kg
SAR(1 g) = 7.43 W/kg
Deviation = -7.24%



0 dB = 18.1 W/kg = 12.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

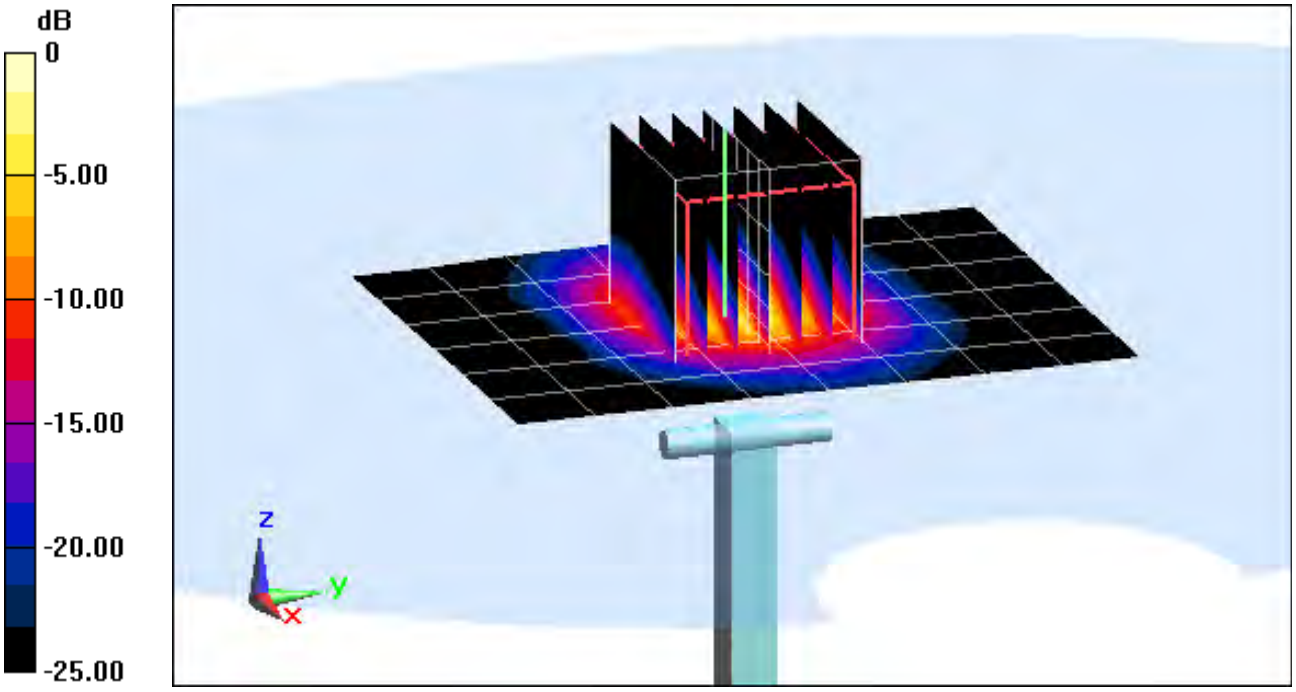
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5600 MHz; σ = 5.073 S/m; ε_r = 36.345; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.2°C; Tissue Temp: 24.4°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 Main; Type: SAM 4.0; Serial: TP-1114
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 (7x7x7)/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) = 37.8 W/kg
SAR(1 g) = 8.10 W/kg
Deviation = 0.75%



0 dB = 22.1 W/kg = 13.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

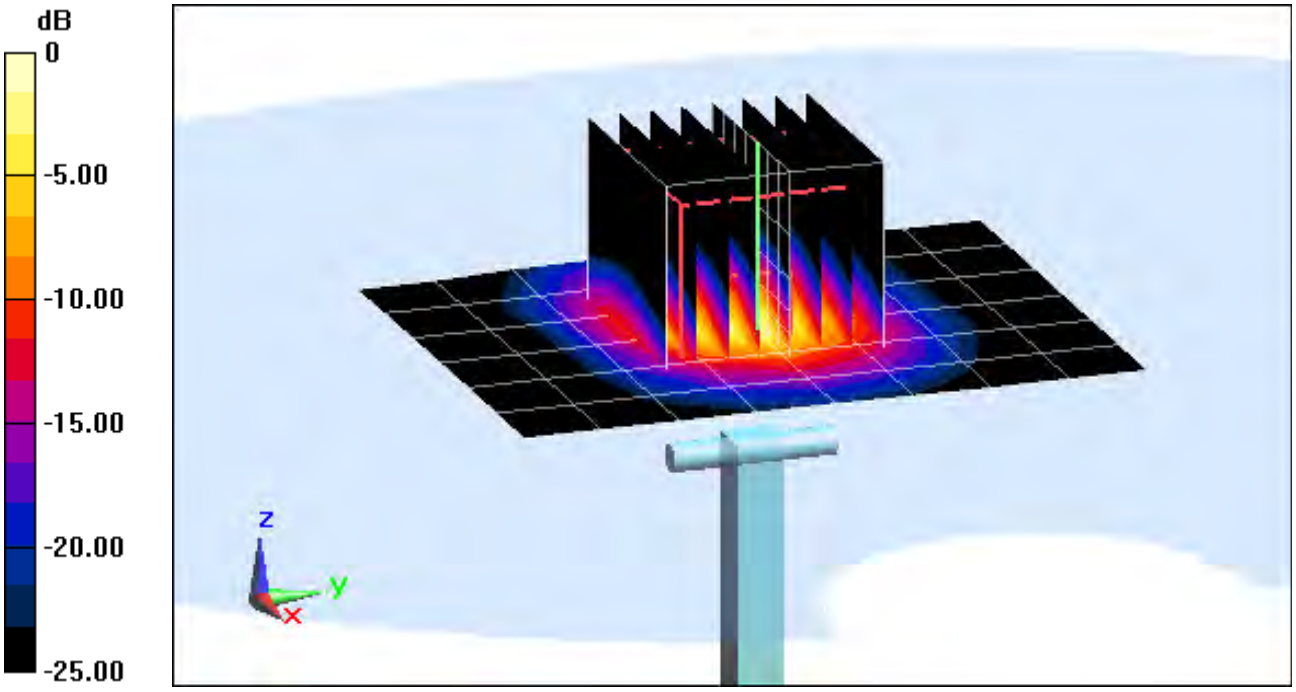
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5800 MHz; σ = 5.28 S/m; ε_r = 35.902; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2013; Ambient Temp: 24.2°C; Tissue Temp: 24.3°C

Probe: EX3DV4 - SN3589; ConvF(3.85, 3.85, 3.85); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
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 (8x8x7)/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) = 38.1 W/kg
SAR(1 g) = 7.53 W/kg
Deviation = -1.05%



0 dB = 18.4 W/kg = 12.65 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

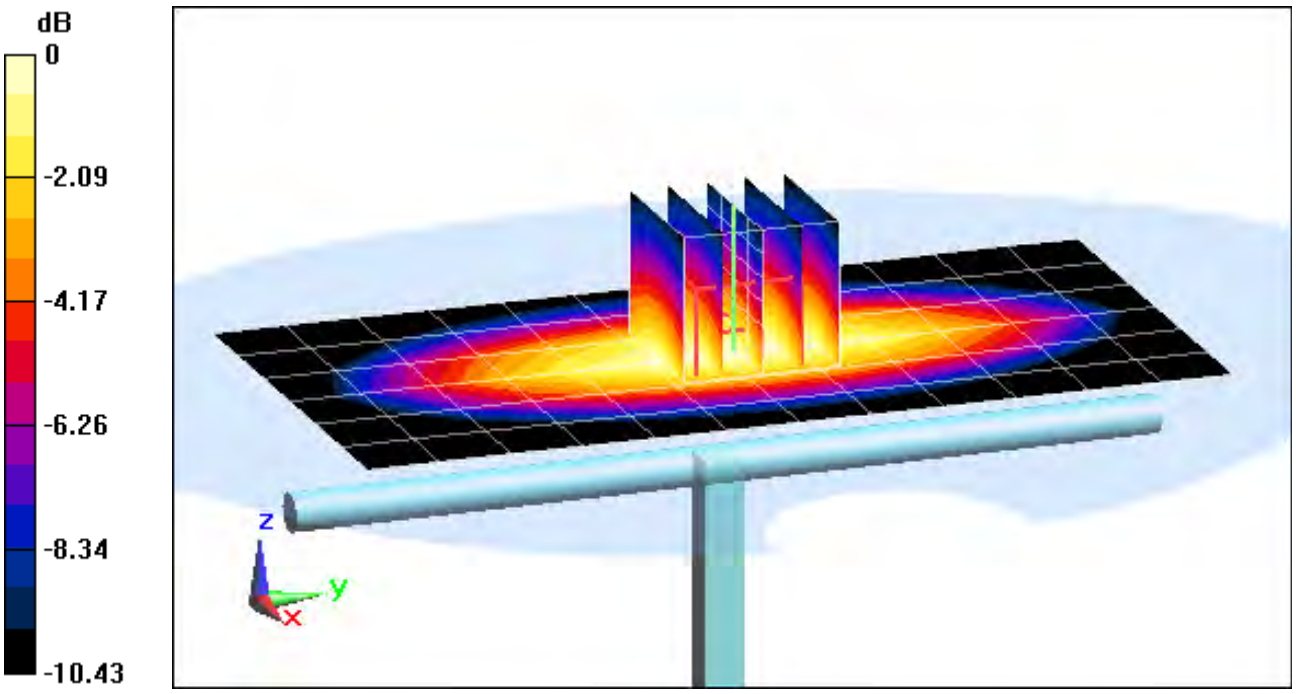
Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.988 S/m; ε_r = 56.733; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-05-2013; Ambient Temp: 23.3°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(6.07, 6.07, 6.07); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (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)

750 MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.890 W/kg
Deviation = 2.06%



0 dB = 0.965 W/kg = -0.15 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

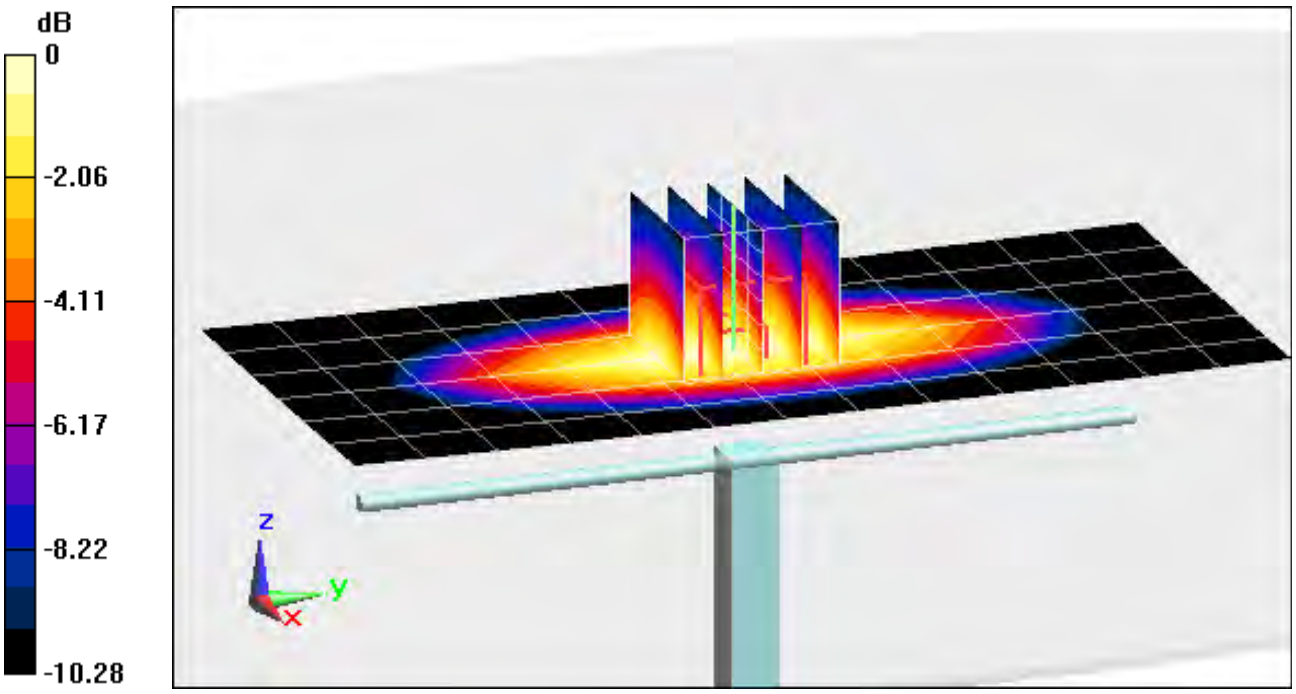
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used:
f = 835 MHz; σ = 1.008 S/m; ε_r = 55.957; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-07-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.7°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) = 1.38 W/kg
SAR(1 g) = 0.955 W/kg
Deviation = 2.03%



0 dB = 1.03 W/kg = 0.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

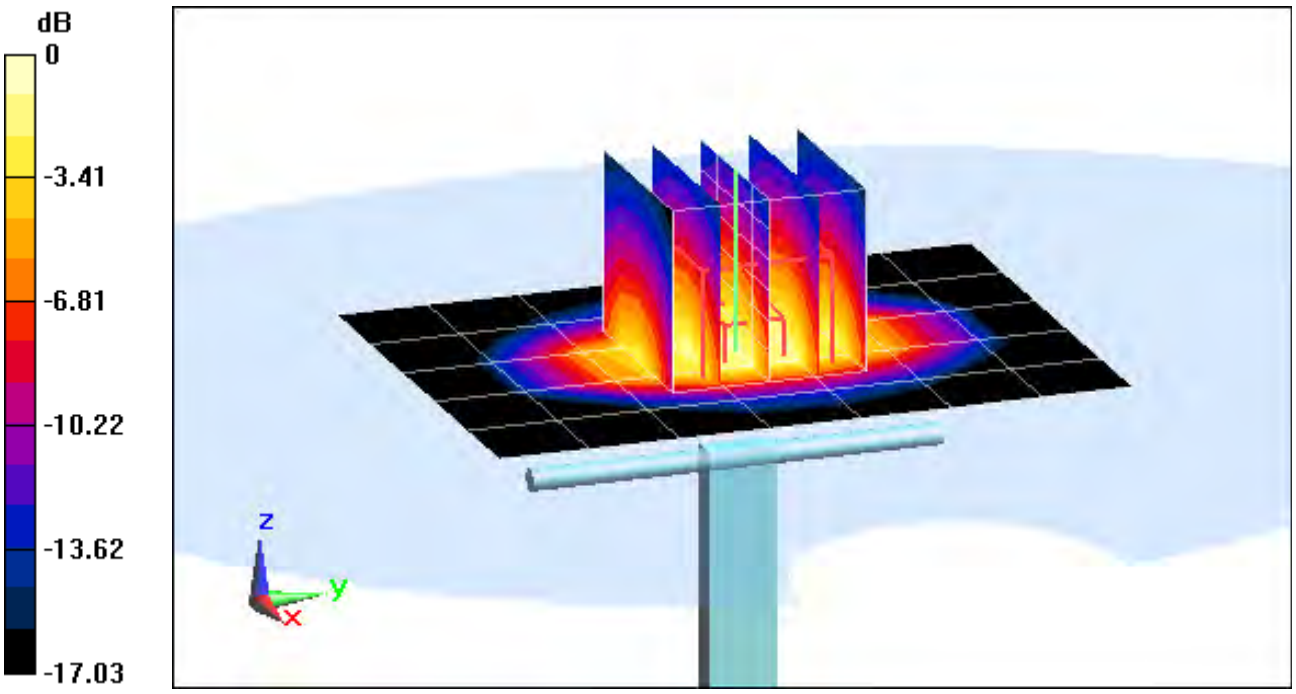
Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.434 S/m; ε_r = 52.619; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-04-2013; Ambient Temp: 23.7°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.86, 4.86, 4.86); Calibrated: 11/15/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM with CRP; Type: SAM 4.0; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.75 W/kg
SAR(1 g) = 3.83 W/kg
Deviation = 0.26%



0 dB = 4.29 W/kg = 6.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

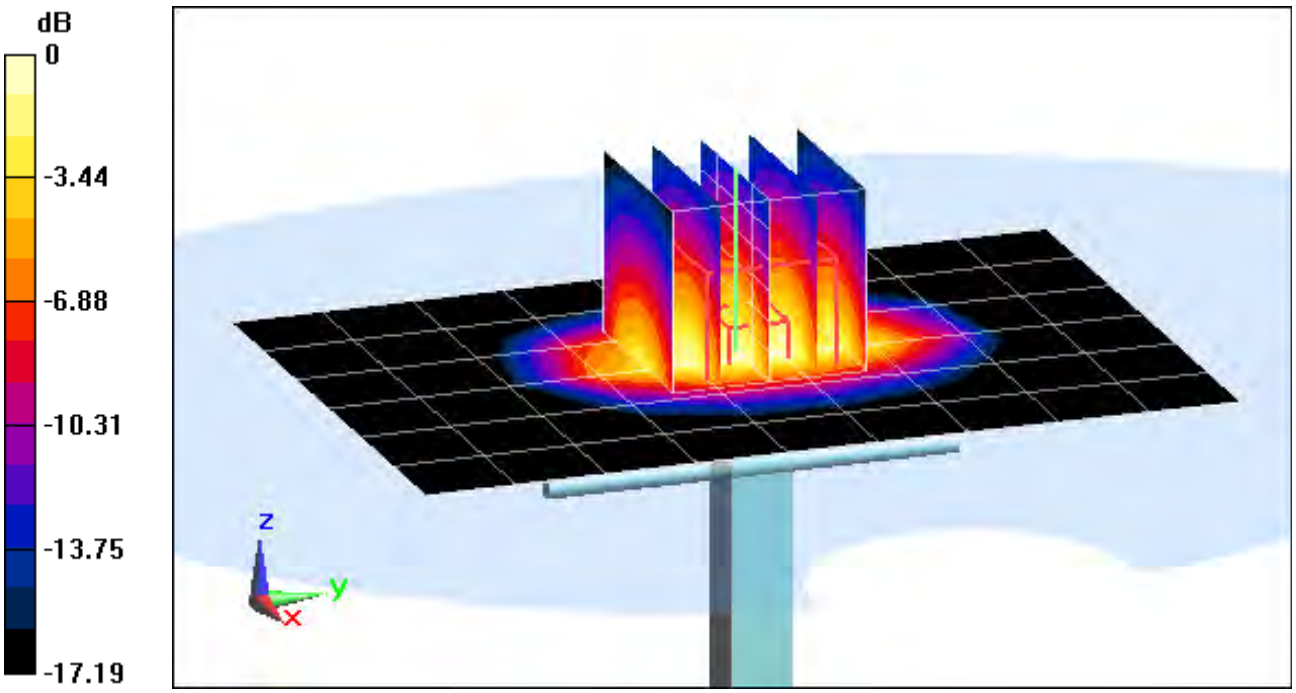
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.585 S/m; ε_r = 51.528; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 23.8°C; Tissue Temp: 23.4°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 V5.0 Right; Type: QD000P40CD; Serial: 1647
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) = 7.60 W/kg
SAR(1 g) = 4.26 W/kg
Deviation = 4.41%



0 dB = 4.76 W/kg = 6.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

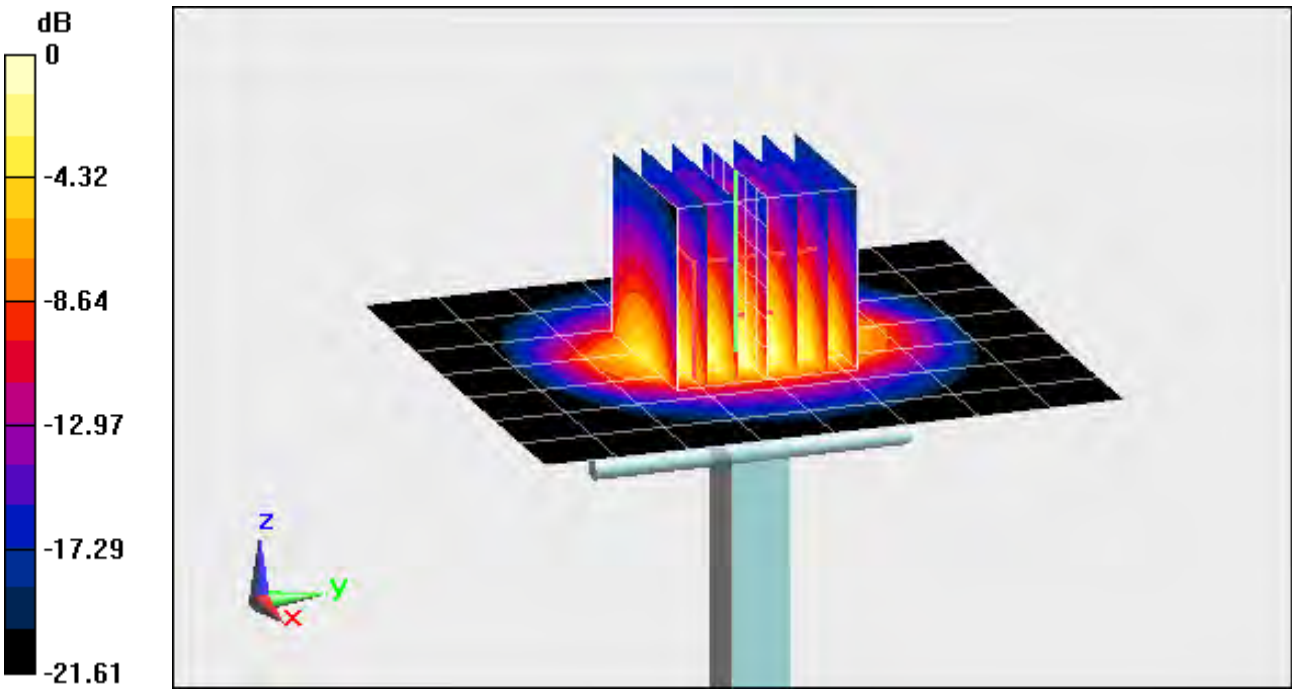
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 1.961 S/m; ε_r = 51.673; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3209; ConvF(4.34, 4.34, 4.34); Calibrated: 3/15/2013;
Sensor-Surface: 3mm (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)

2450 MHz System Verification

Area Scan (8x9x1): 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) = 10.6 W/kg
SAR(1 g) = 5.22 W/kg
Deviation = 5.24%



0 dB = 6.75 W/kg = 8.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

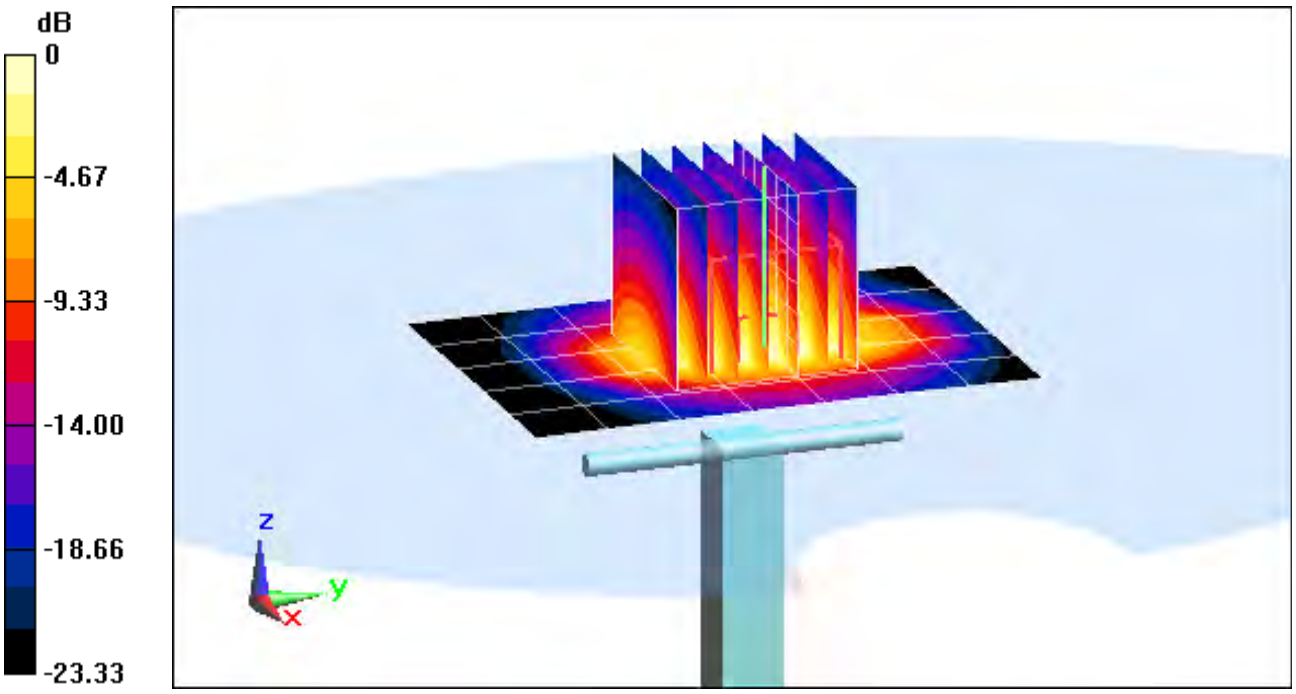
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.001 S/m; ε_r = 50.95; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-11-2013; Ambient Temp: 23.7°C; Tissue Temp: 23.5°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-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 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 = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 4.58 W/kg
SAR(1 g) = 2.17 W/kg
Deviation = 5.14%



0 dB = 2.78 W/kg = 4.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

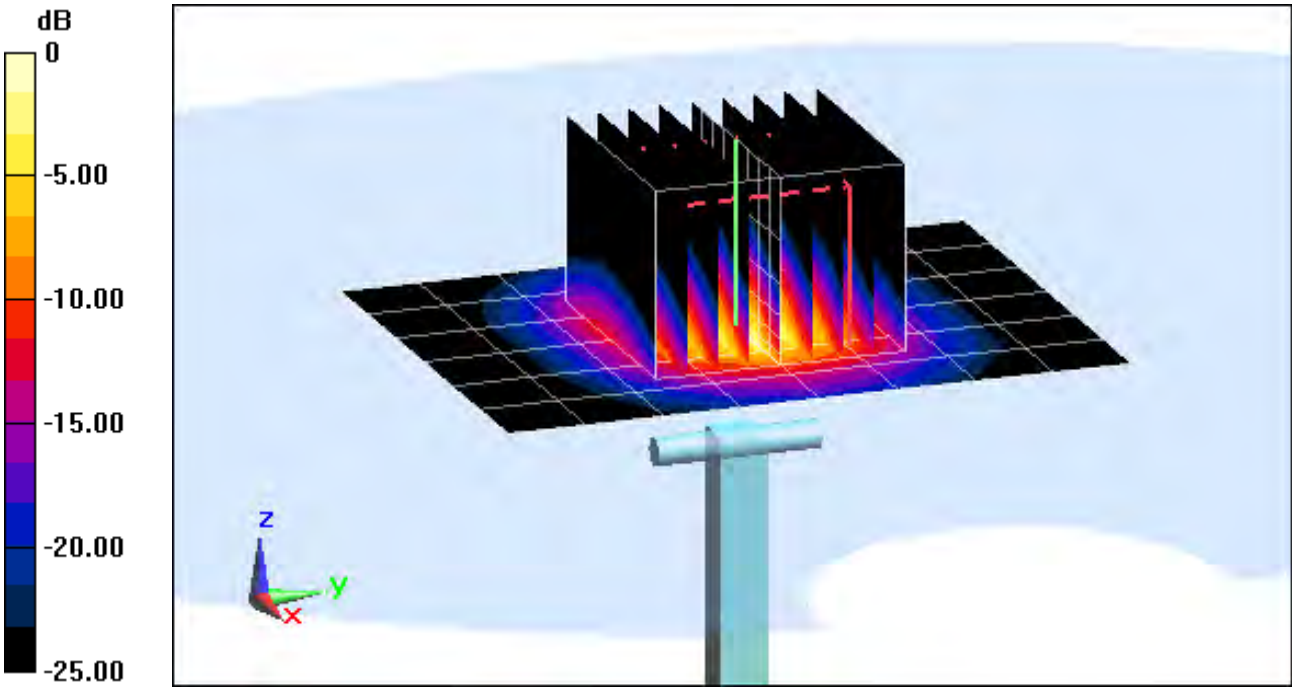
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.37 S/m; ε_r = 47.223; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.7°C; Tissue Temp: 22.9°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) = 29.3 W/kg
SAR(1 g) = 7.19 W/kg
Deviation = -4.77%



0 dB = 17.4 W/kg = 12.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

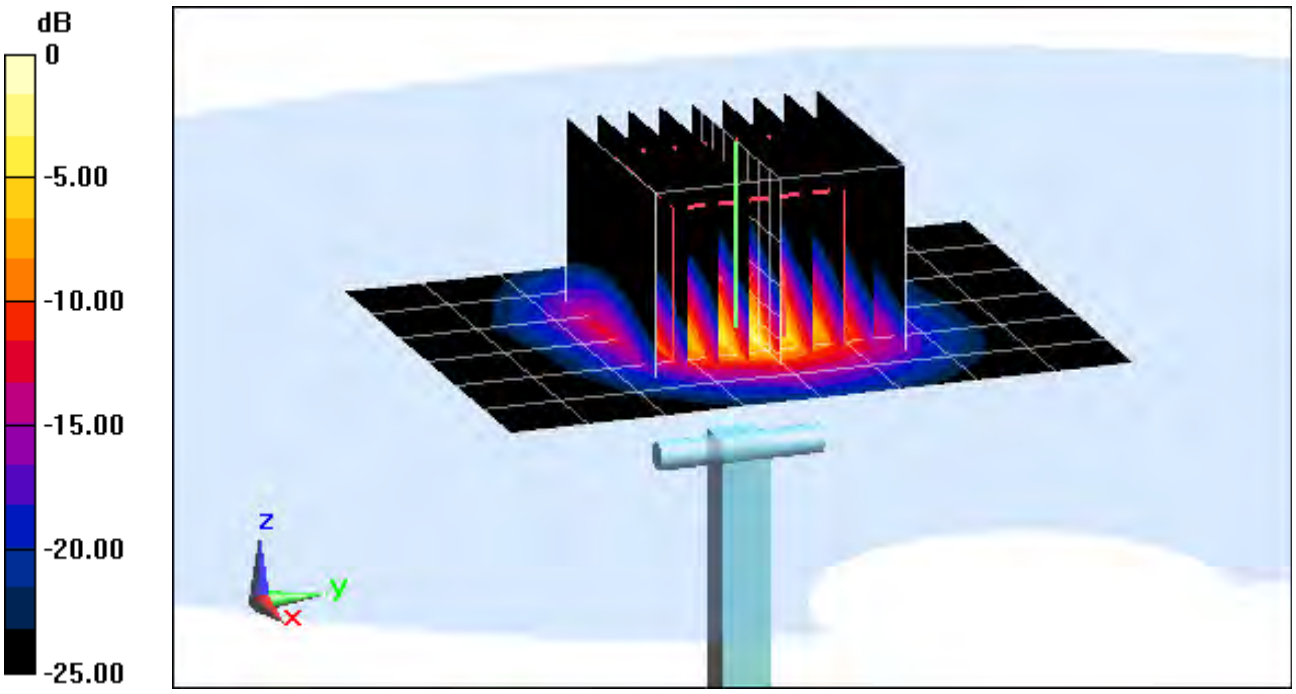
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.524 S/m; ε_r = 47.002; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.7°C; Tissue Temp: 22.9°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) = 33.0 W/kg
SAR(1 g) = 7.86 W/kg
Deviation = 4.38%



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

PCTEST ENGINEERING LABORATORY, INC.

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

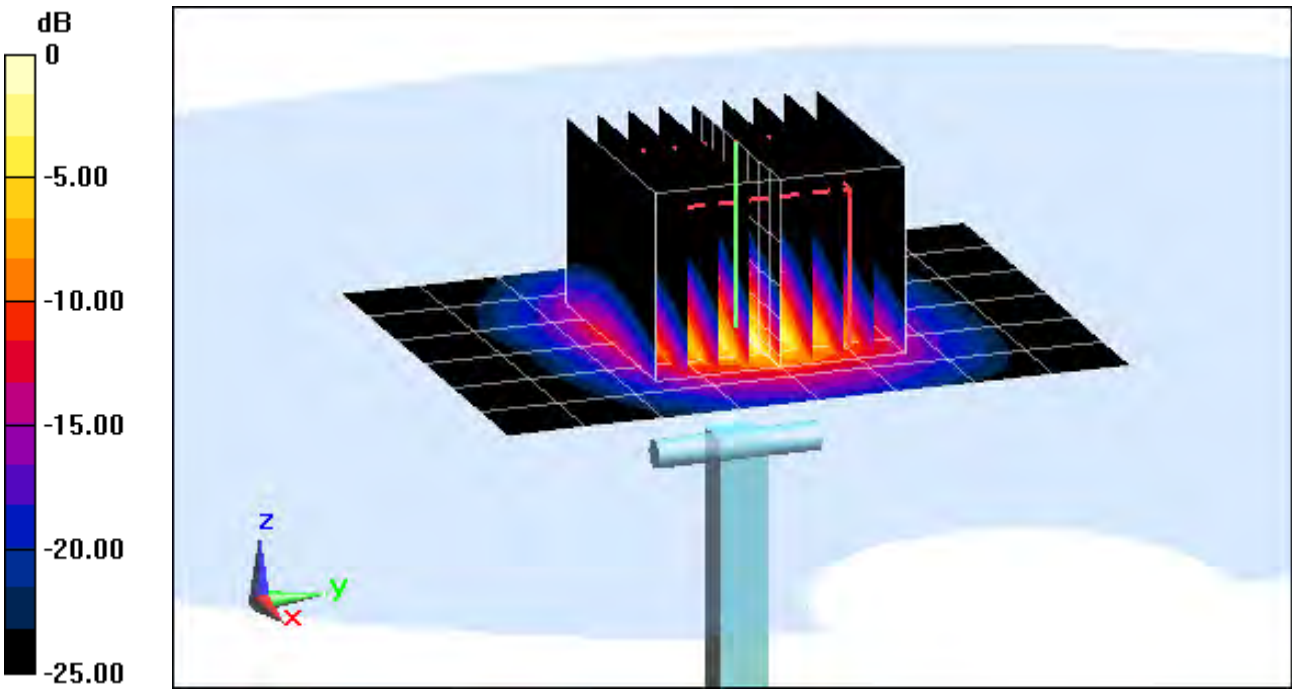
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.83 S/m; ε_r = 46.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(3.52, 3.52, 3.52); 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)

5500 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) = 34.7 W/kg
SAR(1 g) = 7.95 W/kg
Deviation = -1.61%



0 dB = 19.6 W/kg = 12.92 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

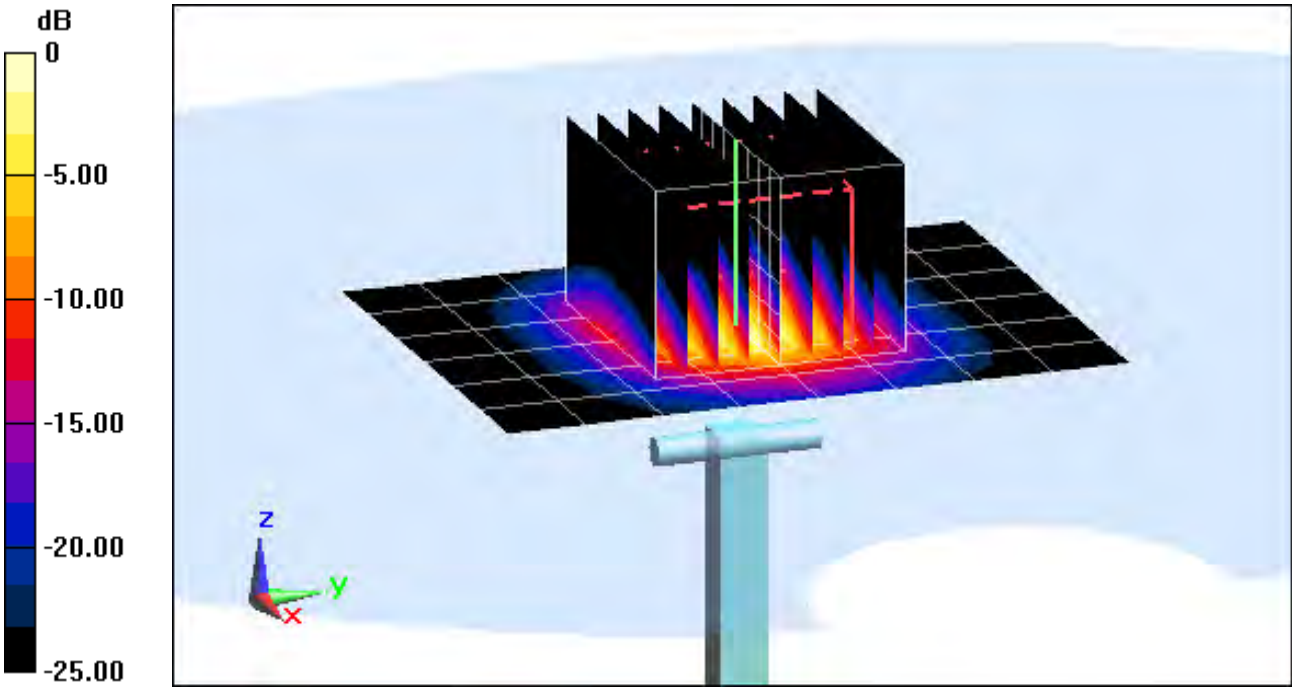
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.975 S/m; ε_r = 46.549; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.6°C; Tissue Temp: 22.8°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 (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) = 38.9 W/kg
SAR(1 g) = 8.73 W/kg
Deviation = 8.72%



0 dB = 20.7 W/kg = 13.16 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

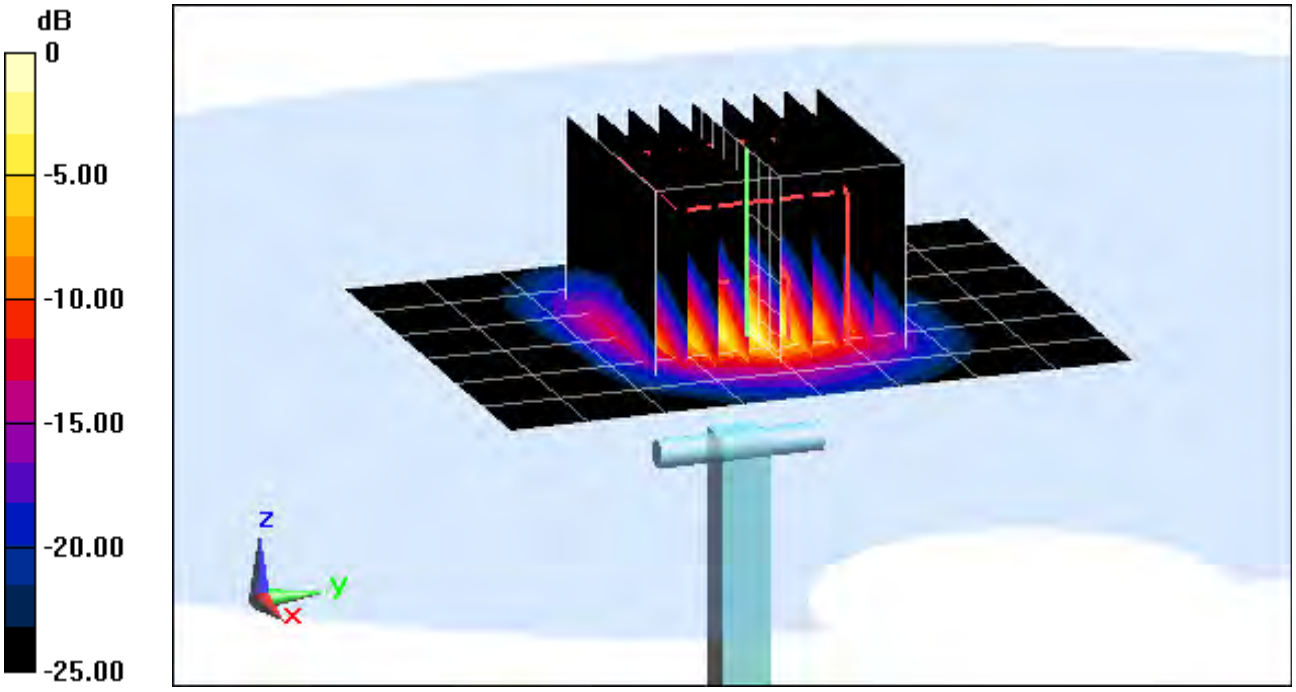
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.224 S/m; ε_r = 46.284; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-13-2013; Ambient Temp: 23.5°C; Tissue Temp: 22.8°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) = 40.3 W/kg
SAR(1 g) = 7.56 W/kg
Deviation = 0.67%



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

PCTEST ENGINEERING LABORATORY, INC.

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

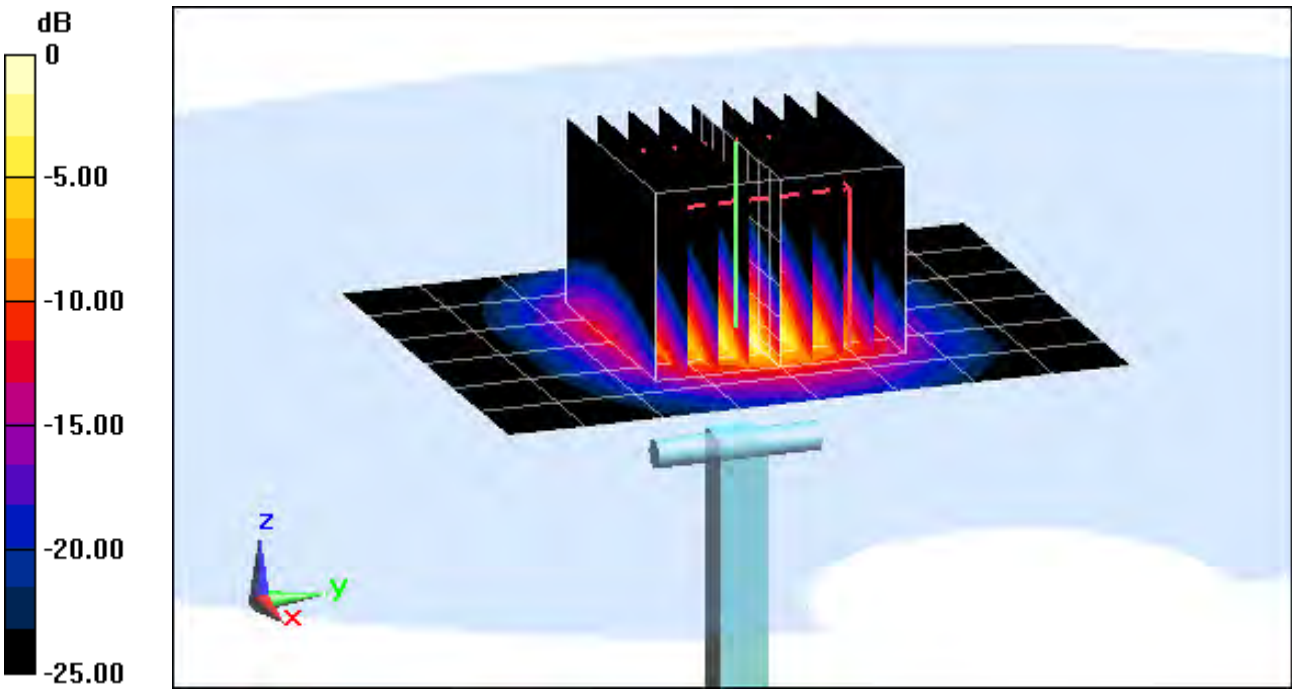
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.266 S/m; ε_r = 47.021; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.8°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) = 28.7 W/kg
SAR(10 g) = 2.00 W/kg
Deviation = -5.21%



0 dB = 17.1 W/kg = 12.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

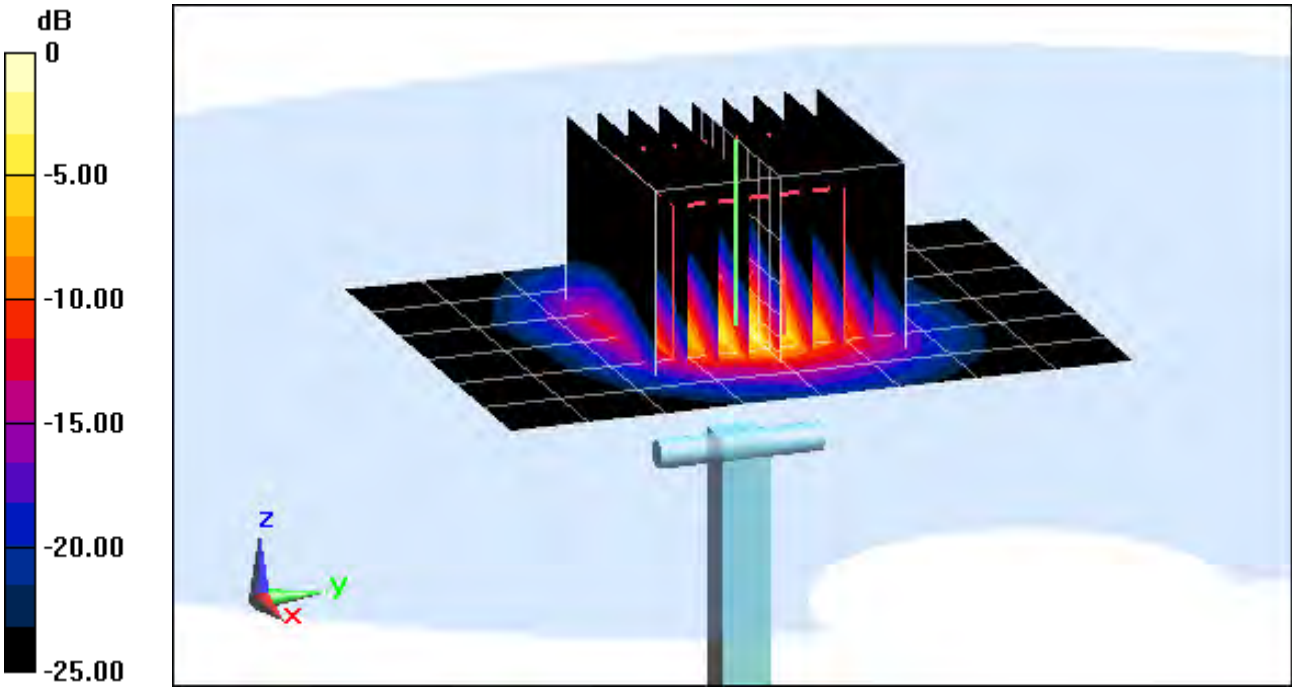
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.408 S/m; ε_r = 46.823; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.8°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) = 32.3 W/kg
SAR(10 g) = 2.15 W/kg
Deviation = 1.90%



0 dB = 18.4 W/kg = 12.65 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

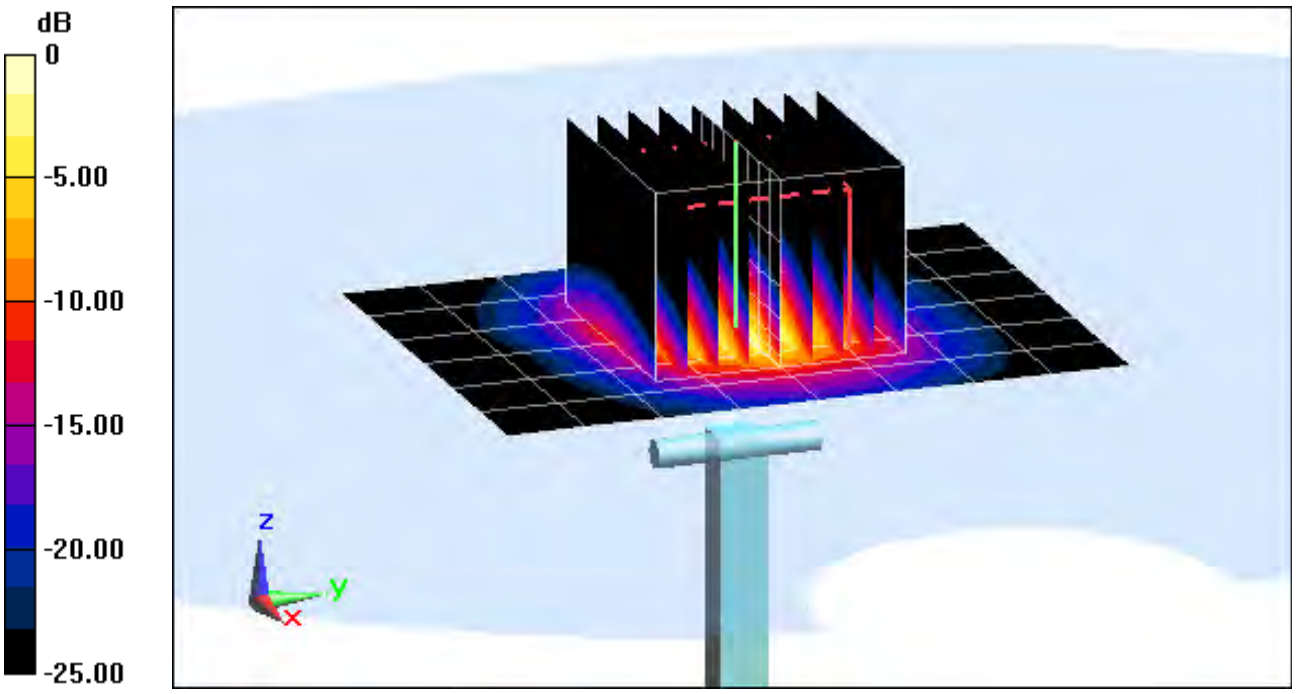
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.634 S/m; ε_r = 46.428; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3589; ConvF(3.52, 3.52, 3.52); 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)

5500 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) = 33.5 W/kg
SAR(10 g) = 2.15 W/kg
Deviation = -4.02%



0 dB = 19.0 W/kg = 12.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

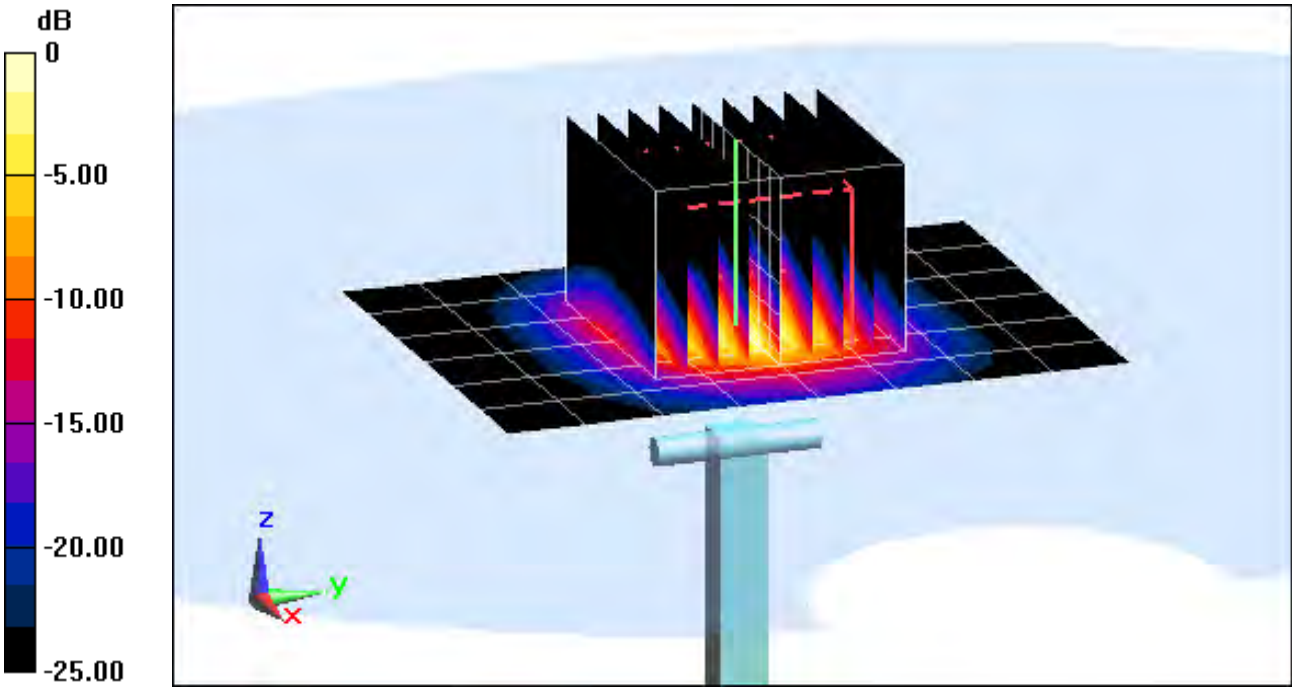
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.79 S/m; ε_r = 46.285; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.9°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 (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) = 37.7 W/kg
SAR(10 g) = 2.37 W/kg
Deviation = 6.28%



0 dB = 20.0 W/kg = 13.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

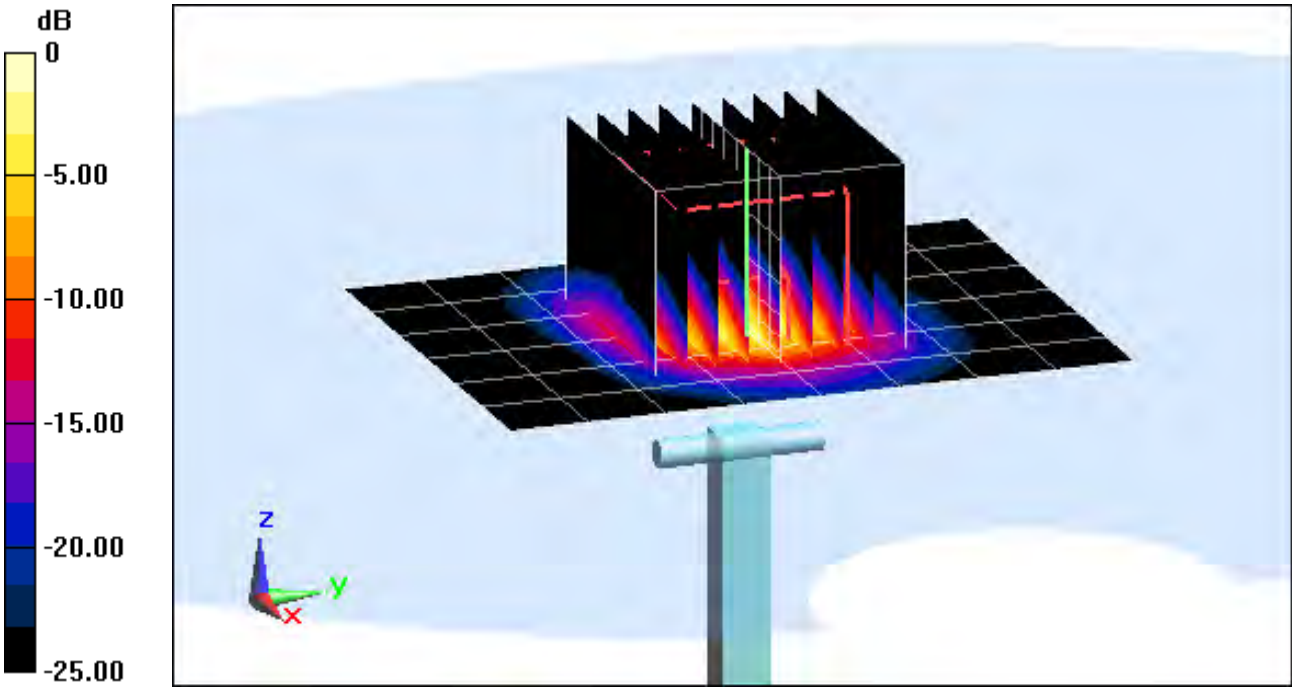
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.058 S/m; ε_r = 45.944; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-06-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.9°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) = 39.3 W/kg
SAR(10 g) = 2.02 W/kg
Deviation = -2.42%



0 dB = 18.2 W/kg = 12.60 dBW/kg