SAR EVALUATION REPORT

Applicant Name:
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FCC ID: **A3LSMG900T**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-G900T, SM-G900W8

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.25	0.35	0.50
PCE	UMTS 850	826.40 - 846.60 MHz	0.26	0.33	0.41
PCE	UMTS 1750	1712.4 - 1752.5 MHz	0.78	0.77	1.06
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.45	0.38	0.51
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.86	0.73	0.73
PCE	LTE Band 17	706.5 - 713.5 MHz	< 0.1	0.14	0.14
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.19	0.46	0.46
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.80	0.84	1.01
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.79	0.53	0.73
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.40	0.26	0.26
DTS	5.8 GHz WLAN	5745 - 5825 MHz	0.38	0.48	0.68
NII	5.2 GHz WLAN	5180 - 5240 MHz	0.14	0.11	
NII	5.3 GHz WLAN	5260 - 5320 MHz	0.18	0.23	
NII	5.5 GHz WLAN	5500 - 5700 MHz	0.56	0.64	
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r02:			1.48		

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 1.9 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
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.5 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 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
ANT+	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device requires power reduction for SAR compliance. It always applies power reduction in voice or VOIP held to ear scenarios on the WIFI transmitter, and does not impact any other transmitter in the device. Therefore, WIFI Head SAR was evaluated at reduced power according to the head SAR test positions described in IEEE 1528.

1.3 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.

1.3.1 Maximum Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**33.0**	**33.0**	**31.5**	**30.0**	**29.0**	**26.5**	**26.0**	**25.0**	**23.0**
	Nominal	**32.5**	**32.5**	**31.0**	**29.5**	**28.5**	**26.0**	**25.5**	**24.5**	**22.5**
GSM/GPRS/EDGE 1900	Maximum	**30.0**	**30.0**	**28.0**	**26.0**	**25.0**	**26.5**	**25.5**	**23.5**	**22.5**
	Nominal	**29.5**	**29.5**	**27.5**	**25.5**	**24.5**	**26.0**	**25.0**	**23.0**	**22.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*	*3GPP DC-HSPA Rel 8*
UMTS Band 5 (850 MHz)	Maximum	**24.0**	**23.5**	**23.5**	**23.5**
	Nominal	**23.5**	**23.0**	**23.0**	**23.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.0**	**23.5**	**23.5**	**23.5**
	Nominal	**23.5**	**23.0**	**23.0**	**23.0**
UMTS Band 2 (1900 MHz)	Maximum	**23.5**	**23.0**	**23.0**	**23.0**
	Nominal	**23.0**	**22.5**	**22.5**	**22.5**

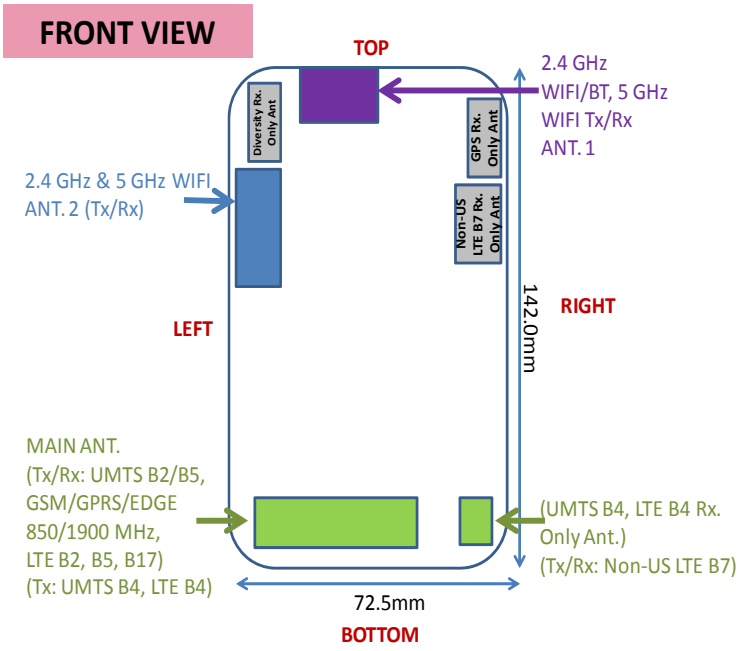
Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 5 (Cell)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 4 (AWS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 2 (PCS)	Maximum	**24.0**
	Nominal	**23.5**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**17.5**
	Nominal	**17.0**
IEEE 802.11g (2.4 GHz)	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11n (2.4 GHz)	Maximum	**14.0**
	Nominal	**13.5**
IEEE 802.11a (5 GHz)	Maximum	**14.0**
	Nominal	**13.5**
IEEE 802.11n (5 GHz 20 MHz Bandwidth)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (5 GHz 40MHz Bandwidth)	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11ac (5 GHz 80MHz Bandwidth)	Maximum	**11.5**
	Nominal	**11.0**
Bluetooth	Maximum	**10.0**
	Nominal	**9.5**
Bluetooth LE	Maximum	**8.5**
	Nominal	**8.0**

1.3.2 Reduced Power – Held-to-Ear

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11g (2.4 GHz)	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11n (2.4 GHz)	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11a (5 GHz)	Maximum	**9.5**
	Nominal	**9.0**
IEEE 802.11n (5 GHz)	Maximum	**9.5**
	Nominal	**9.0**
IEEE 802.11ac (5 GHz)	Maximum	**9.5**
	Nominal	**9.0**

1.4 DUT Antenna Locations



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

Figure 1-1
DUT Antenna Locations

Table 1-1
Mobile Hotspot Sides for SAR Testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 17	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN - Antenna 1 & MIMO	Yes	Yes	Yes	No	No	Yes
5.8 GHz WLAN - Antenna 1 & MIMO	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN - Antenna 2	yes	Yes	No	No	No	Yes
5.8 GHz WLAN - Antenna 2	Yes	Yes	No	No	No	Yes

Note: Particular DUT edges were not required to be evaluated for Wireless Router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v01 guidance, page 2. When the wireless router mode is enabled, all 5 GHz NII bands are disabled. Therefore 5 GHz NII WIFI is not considered in this section.

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the specialized battery. The SAR tests were performed with the specialized battery (model: **EBBG900BBU**).

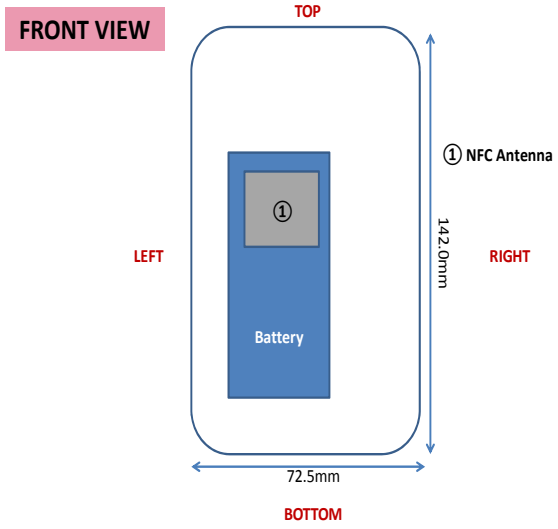


Figure 1-2
NFC Antenna Locations

1.6 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.

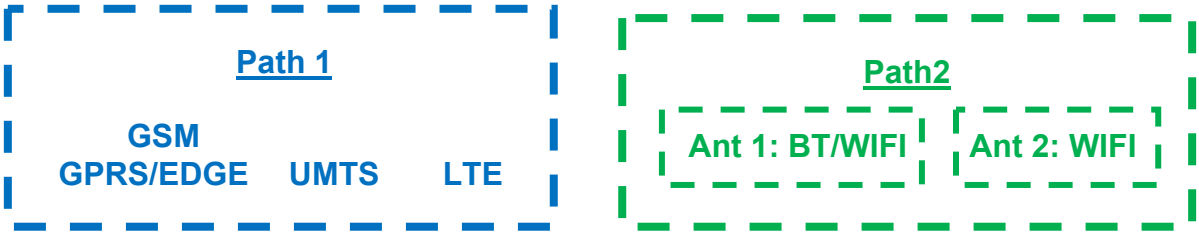


Figure 1-3
Simultaneous Transmission Paths

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 Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	
2	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	
3	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
4	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	
5	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	
6	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	
7	LTE + 2.4 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
8	LTE + 5.8 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
9	LTE + 2.4 GHz Bluetooth	N/A	Yes*	N/A	*-Pre-installed VOIP applications are considered.
10	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	
11	GPRS/EDGE + 5.8 GHz WI-FI	N/A	N/A	Yes	
12	GPRS/EDGE + 5.2-5.7 GHz WI-FI	N/A	N/A	N/A	Not Supported by S/W
13	UMTS Data + 5.2-5.7 GHz WI-FI	N/A	N/A	N/A	Not Supported by S/W
14	LTE + 5.2-5.7 GHz WI-FI	N/A	N/A	N/A	Not Supported by S/W

Notes:

1. 2.4 GHz WLAN, 2.4 GHz Bluetooth, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously.
2. GSM/GPRS, UMTS, and LTE share the same antenna and cannot transmit simultaneously.
3. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
4. 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 simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
5. This device supports 2x2 MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.
6. 5 GHz Hotspot is only supported for the 5.8 GHz Band, therefore all other 5 GHz NII Bands were not evaluated for hotspot conditions.

1.7 Wireless Charging Cover

This DUT may be used with a standard battery cover or with an optional wireless charging battery cover. Per FCC KDB Publication 648474 D04, SAR was measured using the standard battery cover and then repeated with the wireless charging battery cover for the highest reported SAR for each wireless technology, frequency band, operating mode, and exposure condition. No additional tests with wireless charging cover were required since all reported SAR values were less than 1.2 W/kg.

1.8 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.

This device supports 40 MHz Bandwidth for IEEE 802.11n for 5 GHz WIFI only.

This device supports IEEE 802.11ac with the following features:

a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 2 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 (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth SAR was not required; [(10/10)* √2.441] = 1.6< 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)

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

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v02.

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.

1.9 Guidance Applied

- 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 (Wireless Charging Cover)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)
- October 2013 TCB Workshop Notes (GPRS)

1.10 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.

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	Head Serial Number	Body-Worn Serial	Hotspot Serial Number
GSM/GPRS/EDGE 850	20FA1	20F82	20F82
UMTS 850	20F93	20F53	20F53
UMTS 1750	20F53	20F53	20F53
GSM/GPRS/EDGE 1900	20F84	20F84	20F84
UMTS 1900	20F84	20F84	20F84
LTE Band 17	20F80	20F85	20F85
LTE Band 5 (Cell)	20F53	20FA1	20FA1
LTE Band 4 (AWS)	20F83	20F83	20F83
LTE Band 2 (PCS)	20F84	20F84	20F84
2.4 GHz WLAN - Antenna 1,2 & MIMO	00F05	00F05	00F05
5 GHz DTS WLAN - Antenna 1,2 & MIMO	F1186	14524	14524
5 GHz NII WLAN - Antenna 1,2 & MIMO	F1186	14524	-

2 LTE INFORMATION

LTE Information			
FCC ID	**A3LSMG900T**		
Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	LTE Band 17 (706.5 - 713.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
Channel Bandwidths	LTE Band 17: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 17: 5 MHz	706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
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): 1.4 MHz	1710.7 (19957)	1732.5 (20175)	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	1732.5 (20175)	1753.5 (20385)
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 4 (AWS): 15 MHz	1717.5 (20025)	1732.5 (20175)	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)	1732.5 (20175)	1745 (20300)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)	1880 (18900)	1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)	1880 (18900)	1908.5 (19185)
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 2 (PCS): 15 MHz	1857.5 (18675)	1880 (18900)	1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)	1880 (18900)	1900 (19100)
UE Category	4		
Modulations Supported in UL	QPSK, 16QAM		
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES		
A-MPR (Additional MPR) disabled for SAR Testing?	YES		

3 INTRODUCTION

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

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01 and IEEE 1528-2013:

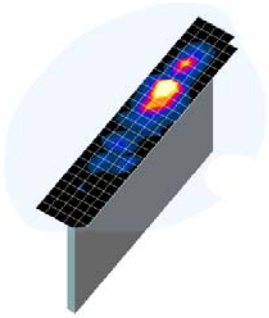

Figure 4-1
Sample SAR Area Scan

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) and IEEE 1528-2013.
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) and IEEE 1528-2013. 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. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. 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

*Also compliant to IEEE 1528-2013 Table 6

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), also called the Reference Pivoting Line, is not perpendicular to the reference plane (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].

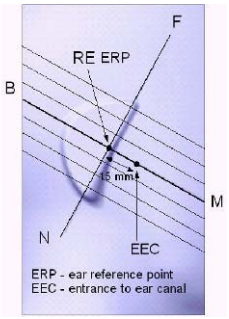

Figure 5-1
Close-Up Side view of ERP

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 acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 5-3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

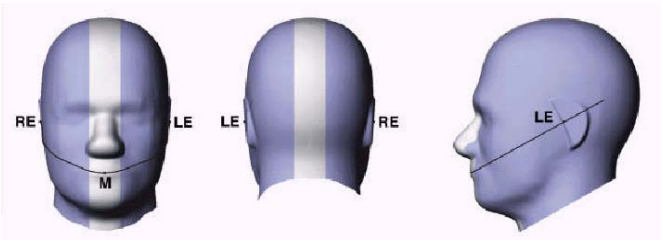

Figure 5-2
Front, back and side view of SAM Twin Phantom

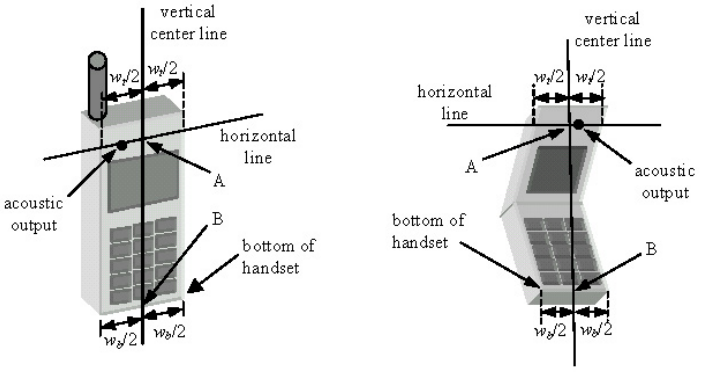

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

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

6.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

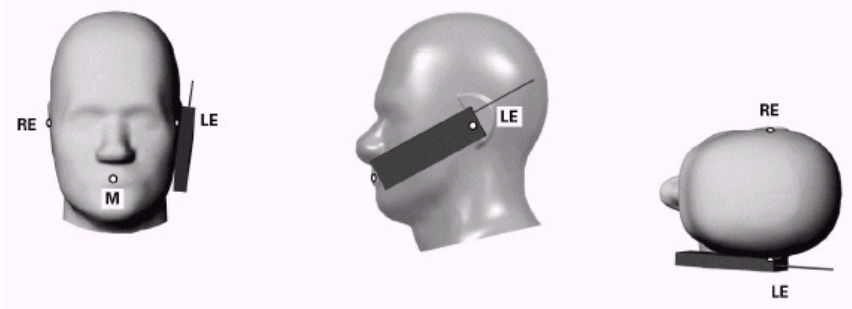

Figure 6-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the 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. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

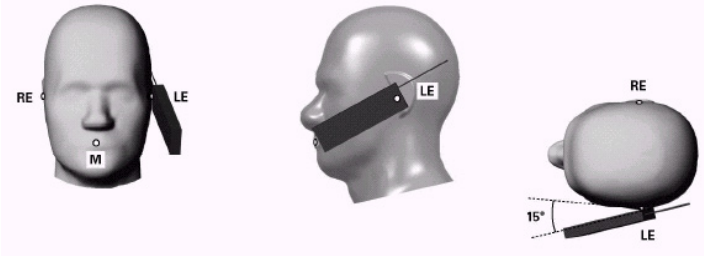

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

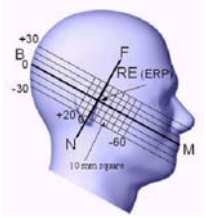

Figure 6-3
Side view w/ relevant markings

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

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01. 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.

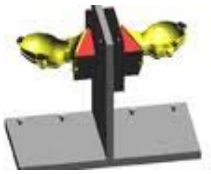

Figure 6-4 Twin SAM Chin20

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.

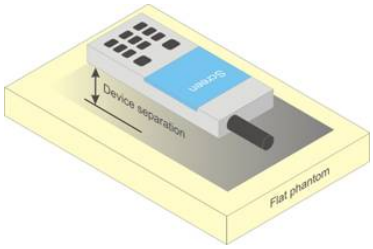

Figure 6-5
Sample Body-Worn Diagram

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

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 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.

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

Table 7-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 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 UMTS

8.3.1 Output Power Verification

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

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

8.3.2 Head SAR Measurements for Handsets

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

3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

8.3.3 Body SAR Measurements

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

8.3.4 SAR Measurements for Handsets with Rel 5 HSDPA

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

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

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

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{hs} = 30/15$) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{hs} = 24/15$) with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

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

8.3.5 SAR Measurements for Handsets with Rel 6 HSUPA

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

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

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

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

8.3.6 SAR Measurement Conditions for DC-HSDPA

SAR test exclusion for DC-HSDPA devices is determined by power measurements according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to qualify for SAR test exclusion. DC-HSDPA uplink maximum output power measurements using the four Rel. 5 HSDPA subtests in Table C.10.1.4 of TS 234.121-1 is required.

When the maximum average output power of each RF channel with DC-HSDPA active is ≤ ¼ dB higher than that measured using 12.2 kbps RMC, or the maximum reported SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit, SAR evaluation for DC-HSDPA is not required.

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. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

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.
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 [24]

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 higher than 0.25 dB or more 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.

8.5.3 MIMO SAR considerations

Per KDB 248227, SAR for MIMO was measured with both transmitting simultaneously and was evaluated independently of SISO operation. For 2.4 GHz MIMO, 802.11n was evaluated. For 5 GHz MIMO, 20 MHz BW 802.11n was evaluated. Additional evaluations for 40 MHz bandwidth 802.11n and 802.11ac were not required since the maximum allowed output power was not higher than 802.11n 20 MHz Bandwidth.

9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

		Maximum Burst-Averaged Output Power								
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	32.55	32.61	31.15	29.51	**28.37**	26.49	25.90	23.81	22.70
	190	32.57	32.62	31.45	29.75	**28.94**	26.50	25.99	23.95	22.85
	251	32.56	32.59	31.34	29.55	**28.55**	26.40	25.96	24.02	22.69
GSM 1900	512	29.75	29.73	27.77	25.99	**24.78**	25.67	24.97	23.45	22.33
	661	29.58	29.61	27.89	25.96	**24.57**	25.25	25.15	23.38	22.07
	810	29.55	29.57	27.58	25.93	**24.60**	25.37	24.85	23.18	22.19
		Calculated Maximum Frame-Averaged Output Power								
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	23.52	23.58	25.13	25.25	**25.36**	17.46	19.88	19.55	19.69
	190	23.54	23.59	25.43	25.49	**25.93**	17.47	19.97	19.69	19.84
	251	23.53	23.56	25.32	25.29	**25.54**	17.37	19.94	19.76	19.68
GSM 1900	512	20.72	20.70	21.75	21.73	**21.77**	16.64	18.95	19.19	19.32
	661	20.55	20.58	21.87	21.70	**21.56**	16.22	19.13	19.12	19.06
	810	20.52	20.54	21.56	21.67	**21.59**	16.34	18.83	18.92	19.18
GSM 850	**Frame Avg.Targets:**	23.47	23.97	24.98	25.24	**25.49**	16.97	19.48	20.24	19.49
GSM 1900		20.47	20.97	21.48	21.24	**21.49**	16.97	18.98	18.74	18.99

Note:

- Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- Justification for reduced test configurations per KDB Publication 941225 D03v01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
- GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
- EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: B
GPRS Multislot class: 12 (Max 4 Tx uplink slots)
EDGE Multislot class: 12 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1862	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.24	23.42	23.42	23.15	23.07	23.10	23.24	23.00	22.85	-
99		12.2 kbps AMR	23.22	23.34	23.33	23.09	22.89	22.95	23.22	23.03	22.82	-
6	HSDPA	Subtest 1	22.12	22.31	22.26	22.16	22.27	22.42	22.18	21.96	21.74	0
6		Subtest 2	22.11	22.41	22.28	22.15	22.32	22.47	22.21	21.98	21.65	0
6		Subtest 3	21.65	21.77	21.75	21.64	21.84	21.93	21.72	21.46	21.15	0.5
6		Subtest 4	21.55	21.78	21.73	21.74	21.83	21.97	21.71	21.46	21.17	0.5
6	HSUPA	Subtest 1	21.51	22.24	22.24	21.61	22.25	22.43	22.01	21.26	21.17	0
6		Subtest 2	20.63	21.24	21.08	21.22	21.11	21.23	21.24	20.93	20.43	2
6		Subtest 3	21.00	21.18	21.18	20.81	21.26	21.45	21.05	20.66	20.59	1
6		Subtest 4	21.57	21.35	21.25	21.12	21.35	21.44	21.26	20.92	21.03	2
6		Subtest 5	21.58	22.13	21.96	21.73	21.50	21.59	22.08	21.75	21.18	0
8	DC-HSDPA	Subtest 1	22.72	22.92	22.80	22.14	22.36	22.55	22.74	22.34	21.97	0
8		Subtest 2	22.75	22.94	22.84	22.19	22.34	22.57	22.78	22.42	22.06	0
8		Subtest 3	22.21	22.42	22.42	21.64	21.84	22.06	22.26	21.85	21.57	0.5
8		Subtest 4	22.12	22.43	22.42	21.75	21.82	22.06	22.21	21.83	21.56	0.5

UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- Measured maximum output powers for DC-HSDPA were not greater than 1/4 dB higher than the WCDMA 12.2 kbps RMC maximum output, as a result, SAR is not required for DC-HSDPA
- The DUT supports UE category 24 for HSDPA

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.

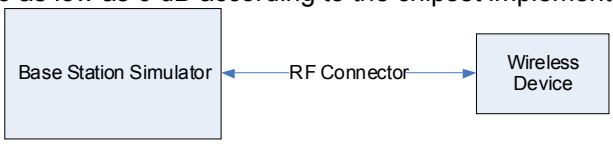

Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

9.3.1 LTE Band 17

Table 9-1
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	**23.45**	0	0
	710.0	23790	10	QPSK	1	25	23.43	0	0
	710.0	23790	10	QPSK	1	49	23.36	0	0
	710.0	23790	10	QPSK	25	0	**22.54**	1	0-1
	710.0	23790	10	QPSK	25	12	22.53	1	0-1
	710.0	23790	10	QPSK	25	25	22.43	1	0-1
	710.0	23790	10	QPSK	50	0	22.50	1	0-1
	710.0	23790	10	16QAM	1	0	22.75	1	0-1
	710.0	23790	10	16QAM	1	25	22.80	1	0-1
	710.0	23790	10	16QAM	1	49	22.70	1	0-1
	710.0	23790	10	16QAM	25	0	21.54	2	0-2
	710.0	23790	10	16QAM	25	12	21.51	2	0-2
	710.0	23790	10	16QAM	25	25	21.46	2	0-2
	710.0	23790	10	16QAM	50	0	21.45	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 9-2
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	23.60	0	0
	710.0	23790	5	QPSK	1	12	23.56	0	0
	710.0	23790	5	QPSK	1	24	23.65	0	0
	710.0	23790	5	QPSK	12	0	22.47	1	0-1
	710.0	23790	5	QPSK	12	6	22.50	1	0-1
	710.0	23790	5	QPSK	12	13	22.56	1	0-1
	710.0	23790	5	QPSK	25	0	22.62	1	0-1
	710.0	23790	5	16-QAM	1	0	22.60	1	0-1
	710.0	23790	5	16-QAM	1	12	22.67	1	0-1
	710.0	23790	5	16-QAM	1	24	22.47	1	0-1
	710.0	23790	5	16-QAM	12	0	21.47	2	0-2
	710.0	23790	5	16-QAM	12	6	21.43	2	0-2
	710.0	23790	5	16-QAM	12	13	21.49	2	0-2
	710.0	23790	5	16-QAM	25	0	21.50	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.

9.3.2 LTE Band 5 (Cell)

Table 9-3
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	23.22	0	0
	836.5	20525	10	QPSK	1	25	**23.33**	0	0
	836.5	20525	10	QPSK	1	49	23.27	0	0
	836.5	20525	10	QPSK	25	0	22.20	1	0-1
	836.5	20525	10	QPSK	25	12	22.26	1	0-1
	836.5	20525	10	QPSK	25	25	**22.29**	1	0-1
	836.5	20525	10	QPSK	50	0	22.14	1	0-1
	836.5	20525	10	16QAM	1	0	22.12	1	0-1
	836.5	20525	10	16QAM	1	25	22.22	1	0-1
	836.5	20525	10	16QAM	1	49	22.33	1	0-1
	836.5	20525	10	16QAM	25	0	21.14	2	0-2
	836.5	20525	10	16QAM	25	12	21.09	2	0-2
	836.5	20525	10	16QAM	25	25	21.17	2	0-2
	836.5	20525	10	16QAM	50	0	21.18	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 9-4
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	23.22	0	0
	826.5	20425	5	QPSK	1	12	23.23	0	0
	826.5	20425	5	QPSK	1	24	23.37	0	0
	826.5	20425	5	QPSK	12	0	22.10	1	0-1
	826.5	20425	5	QPSK	12	6	22.16	1	0-1
	826.5	20425	5	QPSK	12	13	22.29	1	0-1
	826.5	20425	5	QPSK	25	0	22.24	1	0-1
	826.5	20425	5	16-QAM	1	0	22.12	1	0-1
	826.5	20425	5	16-QAM	1	12	22.22	1	0-1
	826.5	20425	5	16-QAM	1	24	22.33	1	0-1
	826.5	20425	5	16-QAM	12	0	21.14	2	0-2
	826.5	20425	5	16-QAM	12	6	21.09	2	0-2
	826.5	20425	5	16-QAM	12	13	21.27	2	0-2
	826.5	20425	5	16-QAM	25	0	21.18	2	0-2
Mid	836.5	20525	5	QPSK	1	0	23.22	0	0
	836.5	20525	5	QPSK	1	12	23.23	0	0
	836.5	20525	5	QPSK	1	24	23.27	0	0
	836.5	20525	5	QPSK	12	0	22.10	1	0-1
	836.5	20525	5	QPSK	12	6	22.16	1	0-1
	836.5	20525	5	QPSK	12	13	22.19	1	0-1
	836.5	20525	5	QPSK	25	0	22.24	1	0-1
	836.5	20525	5	16-QAM	1	0	22.22	1	0-1
	836.5	20525	5	16-QAM	1	12	22.12	1	0-1
	836.5	20525	5	16-QAM	1	24	22.33	1	0-1
	836.5	20525	5	16-QAM	12	0	21.14	2	0-2
	836.5	20525	5	16-QAM	12	6	21.09	2	0-2
	836.5	20525	5	16-QAM	12	13	21.17	2	0-2
	836.5	20525	5	16-QAM	25	0	21.08	2	0-2
High	846.5	20625	5	QPSK	1	0	23.22	0	0
	846.5	20625	5	QPSK	1	12	23.13	0	0
	846.5	20625	5	QPSK	1	24	23.27	0	0
	846.5	20625	5	QPSK	12	0	22.06	1	0-1
	846.5	20625	5	QPSK	12	6	22.16	1	0-1
	846.5	20625	5	QPSK	12	13	22.19	1	0-1
	846.5	20625	5	QPSK	25	0	22.34	1	0-1
	846.5	20625	5	16-QAM	1	0	22.12	1	0-1
	846.5	20625	5	16-QAM	1	12	22.12	1	0-1
	846.5	20625	5	16-QAM	1	24	22.33	1	0-1
	846.5	20625	5	16-QAM	12	0	21.14	2	0-2
	846.5	20625	5	16-QAM	12	6	21.09	2	0-2
	846.5	20625	5	16-QAM	12	13	21.07	2	0-2
	846.5	20625	5	16-QAM	25	0	21.18	2	0-2

Table 9-5
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	825.5	20415	3	QPSK	1	0	23.28	0	0
	825.5	20415	3	QPSK	1	7	23.19	0	0
	825.5	20415	3	QPSK	1	14	23.41	0	0
	825.5	20415	3	QPSK	8	0	22.02	1	0-1
	825.5	20415	3	QPSK	8	4	22.12	1	0-1
	825.5	20415	3	QPSK	8	7	22.29	1	0-1
	825.5	20415	3	QPSK	15	0	22.30	1	0-1
	825.5	20415	3	16-QAM	1	0	22.06	1	0-1
	825.5	20415	3	16-QAM	1	7	22.14	1	0-1
	825.5	20415	3	16-QAM	1	14	22.41	1	0-1
	825.5	20415	3	16-QAM	8	0	21.14	2	0-2
	825.5	20415	3	16-QAM	8	4	21.13	2	0-2
	825.5	20415	3	16-QAM	8	7	21.23	2	0-2
	825.5	20415	3	16-QAM	15	0	21.08	2	0-2
Mid	836.5	20525	3	QPSK	1	0	23.18	0	0
	836.5	20525	3	QPSK	1	7	23.27	0	0
	836.5	20525	3	QPSK	1	14	23.25	0	0
	836.5	20525	3	QPSK	8	0	22.12	1	0-1
	836.5	20525	3	QPSK	8	4	22.12	1	0-1
	836.5	20525	3	QPSK	8	7	22.09	1	0-1
	836.5	20525	3	QPSK	15	0	22.18	1	0-1
	836.5	20525	3	16-QAM	1	0	22.32	1	0-1
	836.5	20525	3	16-QAM	1	7	22.22	1	0-1
	836.5	20525	3	16-QAM	1	14	22.41	1	0-1
	836.5	20525	3	16-QAM	8	0	21.18	2	0-2
	836.5	20525	3	16-QAM	8	4	21.17	2	0-2
	836.5	20525	3	16-QAM	8	7	21.23	2	0-2
	836.5	20525	3	16-QAM	15	0	21.00	2	0-2
High	847.5	20635	3	QPSK	1	0	23.24	0	0
	847.5	20635	3	QPSK	1	7	23.23	0	0
	847.5	20635	3	QPSK	1	14	23.21	0	0
	847.5	20635	3	QPSK	8	0	22.06	1	0-1
	847.5	20635	3	QPSK	8	4	22.10	1	0-1
	847.5	20635	3	QPSK	8	7	22.09	1	0-1
	847.5	20635	3	QPSK	15	0	22.30	1	0-1
	847.5	20635	3	16-QAM	1	0	22.18	1	0-1
	847.5	20635	3	16-QAM	1	7	22.20	1	0-1
	847.5	20635	3	16-QAM	1	14	22.23	1	0-1
	847.5	20635	3	16-QAM	8	0	21.24	2	0-2
	847.5	20635	3	16-QAM	8	4	21.05	2	0-2
	847.5	20635	3	16-QAM	8	7	21.01	2	0-2
	847.5	20635	3	16-QAM	15	0	21.22	2	0-2

Table 9-6
LTE Band 5 (Cell) Conducted Powers – 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	824.7	20407	1.4	QPSK	1	0	23.36	0	0
	824.7	20407	1.4	QPSK	1	2	23.46	0	0
	824.7	20407	1.4	QPSK	1	5	23.40	0	0
	824.7	20407	1.4	QPSK	3	0	23.42	0	0
	824.7	20407	1.4	QPSK	3	2	23.39	0	0
	824.7	20407	1.4	QPSK	3	3	23.50	0	0
	824.7	20407	1.4	QPSK	6	0	22.45	1	0-1
	824.7	20407	1.4	16-QAM	1	0	22.31	1	0-1
	824.7	20407	1.4	16-QAM	1	2	22.43	1	0-1
	824.7	20407	1.4	16-QAM	1	5	22.23	1	0-1
	824.7	20407	1.4	16-QAM	3	0	22.30	1	0-1
	824.7	20407	1.4	16-QAM	3	2	22.36	1	0-1
	824.7	20407	1.4	16-QAM	3	3	22.46	1	0-1
	824.7	20407	1.4	16-QAM	6	0	21.34	2	0-2
Mid	836.5	20525	1.4	QPSK	1	0	23.36	0	0
	836.5	20525	1.4	QPSK	1	2	23.46	0	0
	836.5	20525	1.4	QPSK	1	5	23.51	0	0
	836.5	20525	1.4	QPSK	3	0	23.37	0	0
	836.5	20525	1.4	QPSK	3	2	23.45	0	0
	836.5	20525	1.4	QPSK	3	3	23.38	0	0
	836.5	20525	1.4	QPSK	6	0	22.40	1	0-1
	836.5	20525	1.4	16-QAM	1	0	22.46	1	0-1
	836.5	20525	1.4	16-QAM	1	2	22.22	1	0-1
	836.5	20525	1.4	16-QAM	1	5	22.38	1	0-1
	836.5	20525	1.4	16-QAM	3	0	22.38	1	0-1
	836.5	20525	1.4	16-QAM	3	2	22.36	1	0-1
	836.5	20525	1.4	16-QAM	3	3	22.48	1	0-1
	836.5	20525	1.4	16-QAM	6	0	21.60	2	0-2
High	848.3	20643	1.4	QPSK	1	0	23.40	0	0
	848.3	20643	1.4	QPSK	1	2	23.39	0	0
	848.3	20643	1.4	QPSK	1	5	23.30	0	0
	848.3	20643	1.4	QPSK	3	0	23.41	0	0
	848.3	20643	1.4	QPSK	3	2	23.36	0	0
	848.3	20643	1.4	QPSK	3	3	23.42	0	0
	848.3	20643	1.4	QPSK	6	0	22.39	1	0-1
	848.3	20643	1.4	16-QAM	1	0	22.39	1	0-1
	848.3	20643	1.4	16-QAM	1	2	22.63	1	0-1
	848.3	20643	1.4	16-QAM	1	5	22.50	1	0-1
	848.3	20643	1.4	16-QAM	3	0	22.40	1	0-1
	848.3	20643	1.4	16-QAM	3	2	22.30	1	0-1
	848.3	20643	1.4	16-QAM	3	3	22.63	1	0-1
	848.3	20643	1.4	16-QAM	6	0	21.53	2	0-2

9.3.3 LTE Band 4 (AWS)

Table 9-7
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Mid	1732.5	20175	20	QPSK	1	0	23.22	0	0
	1732.5	20175	20	QPSK	1	50	**23.35**	0	0
	1732.5	20175	20	QPSK	1	99	23.15	0	0
	1732.5	20175	20	QPSK	50	0	**22.45**	1	0-1
	1732.5	20175	20	QPSK	50	25	22.15	1	0-1
	1732.5	20175	20	QPSK	50	50	22.23	1	0-1
	1732.5	20175	20	QPSK	100	0	**22.20**	1	0-1
	1732.5	20175	20	16QAM	1	0	22.25	1	0-1
	1732.5	20175	20	16QAM	1	50	22.40	1	0-1
	1732.5	20175	20	16QAM	1	99	22.20	1	0-1
	1732.5	20175	20	16QAM	50	0	21.18	2	0-2
	1732.5	20175	20	16QAM	50	25	21.21	2	0-2
	1732.5	20175	20	16QAM	50	50	21.27	2	0-2
	1732.5	20175	20	16QAM	100	0	21.13	2	0-2

Note: LTE Band 4 (AWS) at 20 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 9-8
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1717.5	20025	15	QPSK	1	0	23.12	0	0
	1717.5	20025	15	QPSK	1	36	23.15	0	0
	1717.5	20025	15	QPSK	1	74	23.05	0	0
	1717.5	20025	15	QPSK	36	0	22.15	1	0-1
	1717.5	20025	15	QPSK	36	18	22.15	1	0-1
	1717.5	20025	15	QPSK	36	37	22.23	1	0-1
	1717.5	20025	15	QPSK	75	0	22.20	1	0-1
	1717.5	20025	15	16QAM	1	0	22.25	1	0-1
	1717.5	20025	15	16QAM	1	36	22.80	1	0-1
	1717.5	20025	15	16QAM	1	74	22.60	1	0-1
	1717.5	20025	15	16QAM	36	0	21.58	2	0-2
	1717.5	20025	15	16QAM	36	18	21.22	2	0-2
	1717.5	20025	15	16QAM	36	37	21.17	2	0-2
	1717.5	20025	15	16QAM	75	0	21.13	2	0-2
Mid	1732.5	20175	15	QPSK	1	0	23.02	0	0
	1732.5	20175	15	QPSK	1	36	23.15	0	0
	1732.5	20175	15	QPSK	1	74	23.05	0	0
	1732.5	20175	15	QPSK	36	0	22.25	1	0-1
	1732.5	20175	15	QPSK	36	18	22.15	1	0-1
	1732.5	20175	15	QPSK	36	37	22.13	1	0-1
	1732.5	20175	15	QPSK	75	0	22.20	1	0-1
	1732.5	20175	15	16QAM	1	0	22.15	1	0-1
	1732.5	20175	15	16QAM	1	36	22.70	1	0-1
	1732.5	20175	15	16QAM	1	74	22.70	1	0-1
	1732.5	20175	15	16QAM	36	0	21.48	2	0-2
	1732.5	20175	15	16QAM	36	18	21.00	2	0-2
	1732.5	20175	15	16QAM	36	37	21.17	2	0-2
	1732.5	20175	15	16QAM	75	0	21.03	2	0-2
High	1747.5	20325	15	QPSK	1	0	23.05	0	0
	1747.5	20325	15	QPSK	1	36	23.15	0	0
	1747.5	20325	15	QPSK	1	74	23.05	0	0
	1747.5	20325	15	QPSK	36	0	22.35	1	0-1
	1747.5	20325	15	QPSK	36	18	22.05	1	0-1
	1747.5	20325	15	QPSK	36	37	22.03	1	0-1
	1747.5	20325	15	QPSK	75	0	22.20	1	0-1
	1747.5	20325	15	16QAM	1	0	22.25	1	0-1
	1747.5	20325	15	16QAM	1	36	22.70	1	0-1
	1747.5	20325	15	16QAM	1	74	22.70	1	0-1
	1747.5	20325	15	16QAM	36	0	21.48	2	0-2
	1747.5	20325	15	16QAM	36	18	21.01	2	0-2
	1747.5	20325	15	16QAM	36	37	21.07	2	0-2
	1747.5	20325	15	16QAM	75	0	21.03	2	0-2

Table 9-9
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	23.22	0	0
	1715	20000	10	QPSK	1	25	23.25	0	0
	1715	20000	10	QPSK	1	49	23.15	0	0
	1715	20000	10	QPSK	25	0	22.15	1	0-1
	1715	20000	10	QPSK	25	12	22.15	1	0-1
	1715	20000	10	QPSK	25	25	22.23	1	0-1
	1715	20000	10	QPSK	50	0	22.30	1	0-1
	1715	20000	10	16QAM	1	0	22.25	1	0-1
	1715	20000	10	16QAM	1	25	22.80	1	0-1
	1715	20000	10	16QAM	1	49	22.70	1	0-1
	1715	20000	10	16QAM	25	0	21.48	2	0-2
	1715	20000	10	16QAM	25	12	21.32	2	0-2
	1715	20000	10	16QAM	25	25	21.17	2	0-2
	1715	20000	10	16QAM	50	0	21.03	2	0-2
Mid	1732.5	20175	10	QPSK	1	0	23.00	0	0
	1732.5	20175	10	QPSK	1	25	23.25	0	0
	1732.5	20175	10	QPSK	1	49	23.05	0	0
	1732.5	20175	10	QPSK	25	0	22.15	1	0-1
	1732.5	20175	10	QPSK	25	12	22.25	1	0-1
	1732.5	20175	10	QPSK	25	25	22.03	1	0-1
	1732.5	20175	10	QPSK	50	0	22.20	1	0-1
	1732.5	20175	10	16QAM	1	0	22.15	1	0-1
	1732.5	20175	10	16QAM	1	25	22.60	1	0-1
	1732.5	20175	10	16QAM	1	49	22.70	1	0-1
	1732.5	20175	10	16QAM	25	0	21.38	2	0-2
	1732.5	20175	10	16QAM	25	12	21.11	2	0-2
	1732.5	20175	10	16QAM	25	25	21.17	2	0-2
	1732.5	20175	10	16QAM	50	0	21.13	2	0-2
High	1750	20350	10	QPSK	1	0	23.05	0	0
	1750	20350	10	QPSK	1	25	23.25	0	0
	1750	20350	10	QPSK	1	49	23.15	0	0
	1750	20350	10	QPSK	25	0	22.45	1	0-1
	1750	20350	10	QPSK	25	12	22.15	1	0-1
	1750	20350	10	QPSK	25	25	22.03	1	0-1
	1750	20350	10	QPSK	50	0	22.30	1	0-1
	1750	20350	10	16QAM	1	0	22.15	1	0-1
	1750	20350	10	16QAM	1	25	22.60	1	0-1
	1750	20350	10	16QAM	1	49	22.60	1	0-1
	1750	20350	10	16QAM	25	0	21.58	2	0-2
	1750	20350	10	16QAM	25	12	21.01	2	0-2
	1750	20350	10	16QAM	25	25	21.17	2	0-2
	1750	20350	10	16QAM	50	0	21.10	2	0-2

Table 9-10
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	23.22	0	0
	1712.5	19975	5	QPSK	1	12	23.35	0	0
	1712.5	19975	5	QPSK	1	24	23.15	0	0
	1712.5	19975	5	QPSK	12	0	22.05	1	0-1
	1712.5	19975	5	QPSK	12	6	22.05	1	0-1
	1712.5	19975	5	QPSK	12	13	22.33	1	0-1
	1712.5	19975	5	QPSK	25	0	22.30	1	0-1
	1712.5	19975	5	16-QAM	1	0	22.15	1	0-1
	1712.5	19975	5	16-QAM	1	12	22.70	1	0-1
	1712.5	19975	5	16-QAM	1	24	22.60	1	0-1
	1712.5	19975	5	16-QAM	12	0	21.48	2	0-2
	1712.5	19975	5	16-QAM	12	6	21.22	2	0-2
	1712.5	19975	5	16-QAM	12	13	21.07	2	0-2
	1712.5	19975	5	16-QAM	25	0	21.03	2	0-2
Mid	1732.5	20175	5	QPSK	1	0	23.02	0	0
	1732.5	20175	5	QPSK	1	12	23.15	0	0
	1732.5	20175	5	QPSK	1	24	23.05	0	0
	1732.5	20175	5	QPSK	12	0	22.25	1	0-1
	1732.5	20175	5	QPSK	12	6	22.35	1	0-1
	1732.5	20175	5	QPSK	12	13	22.09	1	0-1
	1732.5	20175	5	QPSK	25	0	22.30	1	0-1
	1732.5	20175	5	16-QAM	1	0	22.25	1	0-1
	1732.5	20175	5	16-QAM	1	12	22.70	1	0-1
	1732.5	20175	5	16-QAM	1	24	22.60	1	0-1
	1732.5	20175	5	16-QAM	12	0	21.05	2	0-2
	1732.5	20175	5	16-QAM	12	6	21.00	2	0-2
	1732.5	20175	5	16-QAM	12	13	21.07	2	0-2
	1732.5	20175	5	16-QAM	25	0	21.13	2	0-2
High	1752.5	20375	5	QPSK	1	0	23.12	0	0
	1752.5	20375	5	QPSK	1	12	23.25	0	0
	1752.5	20375	5	QPSK	1	24	23.15	0	0
	1752.5	20375	5	QPSK	12	0	22.35	1	0-1
	1752.5	20375	5	QPSK	12	6	22.25	1	0-1
	1752.5	20375	5	QPSK	12	13	22.03	1	0-1
	1752.5	20375	5	QPSK	25	0	22.20	1	0-1
	1752.5	20375	5	16-QAM	1	0	22.25	1	0-1
	1752.5	20375	5	16-QAM	1	12	22.70	1	0-1
	1752.5	20375	5	16-QAM	1	24	22.50	1	0-1
	1752.5	20375	5	16-QAM	12	0	21.48	2	0-2
	1752.5	20375	5	16-QAM	12	6	21.01	2	0-2
	1752.5	20375	5	16-QAM	12	13	21.07	2	0-2
	1752.5	20375	5	16-QAM	25	0	21.13	2	0-2

Table 9-11
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1711.5	19965	3	QPSK	1	0	23.41	0	0
	1711.5	19965	3	QPSK	1	7	23.62	0	0
	1711.5	19965	3	QPSK	1	14	23.70	0	0
	1711.5	19965	3	QPSK	8	0	22.60	1	0-1
	1711.5	19965	3	QPSK	8	4	22.30	1	0-1
	1711.5	19965	3	QPSK	8	7	22.62	1	0-1
	1711.5	19965	3	QPSK	15	0	22.35	1	0-1
	1711.5	19965	3	16-QAM	1	0	22.10	1	0-1
	1711.5	19965	3	16-QAM	1	7	22.68	1	0-1
	1711.5	19965	3	16-QAM	1	14	22.53	1	0-1
	1711.5	19965	3	16-QAM	8	0	21.56	2	0-2
	1711.5	19965	3	16-QAM	8	4	21.39	2	0-2
	1711.5	19965	3	16-QAM	8	7	21.08	2	0-2
	1711.5	19965	3	16-QAM	15	0	21.20	2	0-2
Mid	1732.5	20175	3	QPSK	1	0	23.30	0	0
	1732.5	20175	3	QPSK	1	7	23.29	0	0
	1732.5	20175	3	QPSK	1	14	23.10	0	0
	1732.5	20175	3	QPSK	8	0	22.23	1	0-1
	1732.5	20175	3	QPSK	8	4	22.39	1	0-1
	1732.5	20175	3	QPSK	8	7	22.46	1	0-1
	1732.5	20175	3	QPSK	15	0	22.60	1	0-1
	1732.5	20175	3	16-QAM	1	0	22.80	1	0-1
	1732.5	20175	3	16-QAM	1	7	22.63	1	0-1
	1732.5	20175	3	16-QAM	1	14	22.30	1	0-1
	1732.5	20175	3	16-QAM	8	0	21.60	2	0-2
	1732.5	20175	3	16-QAM	8	4	21.49	2	0-2
	1732.5	20175	3	16-QAM	8	7	21.39	2	0-2
	1732.5	20175	3	16-QAM	15	0	21.30	2	0-2
High	1753.5	20385	3	QPSK	1	0	23.46	0	0
	1753.5	20385	3	QPSK	1	7	23.60	0	0
	1753.5	20385	3	QPSK	1	14	23.39	0	0
	1753.5	20385	3	QPSK	8	0	22.60	1	0-1
	1753.5	20385	3	QPSK	8	4	22.74	1	0-1
	1753.5	20385	3	QPSK	8	7	22.80	1	0-1
	1753.5	20385	3	QPSK	15	0	22.59	1	0-1
	1753.5	20385	3	16-QAM	1	0	22.68	1	0-1
	1753.5	20385	3	16-QAM	1	7	22.63	1	0-1
	1753.5	20385	3	16-QAM	1	14	22.46	1	0-1
	1753.5	20385	3	16-QAM	8	0	21.39	2	0-2
	1753.5	20385	3	16-QAM	8	4	21.42	2	0-2
	1753.5	20385	3	16-QAM	8	7	21.32	2	0-2
	1753.5	20385	3	16-QAM	15	0	21.56	2	0-2

Table 9-12
LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1710.7	19957	1.4	QPSK	1	0	23.41	0	0
	1710.7	19957	1.4	QPSK	1	2	23.62	0	0
	1710.7	19957	1.4	QPSK	1	5	23.70	0	0
	1710.7	19957	1.4	QPSK	3	0	23.50	0	0
	1710.7	19957	1.4	QPSK	3	2	23.70	0	0
	1710.7	19957	1.4	QPSK	3	3	23.60	0	0
	1710.7	19957	1.4	QPSK	6	0	22.35	1	0-1
	1710.7	19957	1.4	16-QAM	1	0	22.10	1	0-1
	1710.7	19957	1.4	16-QAM	1	2	22.68	1	0-1
	1710.7	19957	1.4	16-QAM	1	5	22.53	1	0-1
	1710.7	19957	1.4	16-QAM	3	0	22.56	1	0-1
	1710.7	19957	1.4	16-QAM	3	2	22.39	1	0-1
	1710.7	19957	1.4	16-QAM	3	3	22.08	1	0-1
	1710.7	19957	1.4	16-QAM	6	0	21.20	2	0-2
Mid	1732.5	20175	1.4	QPSK	1	0	23.30	0	0
	1732.5	20175	1.4	QPSK	1	2	23.29	0	0
	1732.5	20175	1.4	QPSK	1	5	23.10	0	0
	1732.5	20175	1.4	QPSK	3	0	23.23	0	0
	1732.5	20175	1.4	QPSK	3	2	23.39	0	0
	1732.5	20175	1.4	QPSK	3	3	23.46	0	0
	1732.5	20175	1.4	QPSK	6	0	22.60	1	0-1
	1732.5	20175	1.4	16-QAM	1	0	22.80	1	0-1
	1732.5	20175	1.4	16-QAM	1	2	22.63	1	0-1
	1732.5	20175	1.4	16-QAM	1	5	22.30	1	0-1
	1732.5	20175	1.4	16-QAM	3	0	22.90	1	0-1
	1732.5	20175	1.4	16-QAM	3	2	22.60	1	0-1
	1732.5	20175	1.4	16-QAM	3	3	22.53	1	0-1
	1732.5	20175	1.4	16-QAM	6	0	21.30	2	0-2
High	1754.3	20393	1.4	QPSK	1	0	23.46	0	0
	1754.3	20393	1.4	QPSK	1	2	23.60	0	0
	1754.3	20393	1.4	QPSK	1	5	23.39	0	0
	1754.3	20393	1.4	QPSK	3	0	23.60	0	0
	1754.3	20393	1.4	QPSK	3	2	23.76	0	0
	1754.3	20393	1.4	QPSK	3	3	23.82	0	0
	1754.3	20393	1.4	QPSK	6	0	22.59	1	0-1
	1754.3	20393	1.4	16-QAM	1	0	22.68	1	0-1
	1754.3	20393	1.4	16-QAM	1	2	22.63	1	0-1
	1754.3	20393	1.4	16-QAM	1	5	22.46	1	0-1
	1754.3	20393	1.4	16-QAM	3	0	22.39	1	0-1
	1754.3	20393	1.4	16-QAM	3	2	22.46	1	0-1
	1754.3	20393	1.4	16-QAM	3	3	22.39	1	0-1
	1754.3	20393	1.4	16-QAM	6	0	21.56	2	0-2

9.3.4 LTE Band 2 (PCS)

Table 9-13
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1860	18700	20	QPSK	1	0	23.51	0	0
	1860	18700	20	QPSK	1	50	**23.86**	0	0
	1860	18700	20	QPSK	1	99	23.75	0	0
	1860	18700	20	QPSK	50	0	**22.96**	1	0-1
	1860	18700	20	QPSK	50	25	22.89	1	0-1
	1860	18700	20	QPSK	50	50	22.74	1	0-1
	1860	18700	20	QPSK	100	0	22.88	1	0-1
	1860	18700	20	16QAM	1	0	22.97	1	0-1
	1860	18700	20	16QAM	1	50	22.92	1	0-1
	1860	18700	20	16QAM	1	99	22.81	1	0-1
	1860	18700	20	16QAM	50	0	21.87	2	0-2
	1860	18700	20	16QAM	50	25	21.82	2	0-2
	1860	18700	20	16QAM	50	50	21.72	2	0-2
	1860	18700	20	16QAM	100	0	21.77	2	0-2
Mid	1880.0	18900	20	QPSK	1	0	23.71	0	0
	1880.0	18900	20	QPSK	1	50	23.70	0	0
	1880.0	18900	20	QPSK	1	99	23.74	0	0
	1880.0	18900	20	QPSK	50	0	22.65	1	0-1
	1880.0	18900	20	QPSK	50	25	22.62	1	0-1
	1880.0	18900	20	QPSK	50	50	22.65	1	0-1
	1880.0	18900	20	QPSK	100	0	22.63	1	0-1
	1880.0	18900	20	16QAM	1	0	22.80	1	0-1
	1880.0	18900	20	16QAM	1	50	22.77	1	0-1
	1880.0	18900	20	16QAM	1	99	22.84	1	0-1
	1880.0	18900	20	16QAM	50	0	21.56	2	0-2
	1880.0	18900	20	16QAM	50	25	21.44	2	0-2
	1880.0	18900	20	16QAM	50	50	21.46	2	0-2
	1880.0	18900	20	16QAM	100	0	21.49	2	0-2
High	1900	19100	20	QPSK	1	0	23.70	0	0
	1900	19100	20	QPSK	1	50	23.30	0	0
	1900	19100	20	QPSK	1	99	23.70	0	0
	1900	19100	20	QPSK	50	0	22.86	1	0-1
	1900	19100	20	QPSK	50	25	22.50	1	0-1
	1900	19100	20	QPSK	50	50	22.00	1	0-1
	1900	19100	20	QPSK	100	0	22.30	1	0-1
	1900	19100	20	16QAM	1	0	22.70	1	0-1
	1900	19100	20	16QAM	1	50	22.73	1	0-1
	1900	19100	20	16QAM	1	99	22.23	1	0-1
	1900	19100	20	16QAM	50	0	21.73	2	0-2
	1900	19100	20	16QAM	50	25	21.55	2	0-2
	1900	19100	20	16QAM	50	50	21.13	2	0-2
	1900	19100	20	16QAM	100	0	21.37	2	0-2

Table 9-14
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1857.5	18675	15	QPSK	1	0	23.41	0	0
	1857.5	18675	15	QPSK	1	36	23.96	0	0
	1857.5	18675	15	QPSK	1	74	23.75	0	0
	1857.5	18675	15	QPSK	36	0	22.94	1	0-1
	1857.5	18675	15	QPSK	36	18	22.99	1	0-1
	1857.5	18675	15	QPSK	36	37	22.74	1	0-1
	1857.5	18675	15	QPSK	75	0	22.98	1	0-1
	1857.5	18675	15	16QAM	1	0	22.97	1	0-1
	1857.5	18675	15	16QAM	1	36	22.82	1	0-1
	1857.5	18675	15	16QAM	1	74	22.91	1	0-1
	1857.5	18675	15	16QAM	36	0	21.97	2	0-2
	1857.5	18675	15	16QAM	36	18	21.92	2	0-2
	1857.5	18675	15	16QAM	36	37	21.72	2	0-2
	1857.5	18675	15	16QAM	75	0	21.77	2	0-2
Mid	1880.0	18900	15	QPSK	1	0	23.61	0	0
	1880.0	18900	15	QPSK	1	36	23.80	0	0
	1880.0	18900	15	QPSK	1	74	23.84	0	0
	1880.0	18900	15	QPSK	36	0	22.55	1	0-1
	1880.0	18900	15	QPSK	36	18	22.52	1	0-1
	1880.0	18900	15	QPSK	36	37	22.65	1	0-1
	1880.0	18900	15	QPSK	75	0	22.73	1	0-1
	1880.0	18900	15	16QAM	1	0	22.70	1	0-1
	1880.0	18900	15	16QAM	1	36	22.87	1	0-1
	1880.0	18900	15	16QAM	1	74	22.94	1	0-1
	1880.0	18900	15	16QAM	36	0	21.56	2	0-2
	1880.0	18900	15	16QAM	36	18	21.54	2	0-2
	1880.0	18900	15	16QAM	36	37	21.46	2	0-2
	1880.0	18900	15	16QAM	75	0	21.59	2	0-2
High	1902.5	19125	15	QPSK	1	0	23.60	0	0
	1902.5	19125	15	QPSK	1	36	23.30	0	0
	1902.5	19125	15	QPSK	1	74	23.70	0	0
	1902.5	19125	15	QPSK	36	0	22.96	1	0-1
	1902.5	19125	15	QPSK	36	18	22.50	1	0-1
	1902.5	19125	15	QPSK	36	37	22.15	1	0-1
	1902.5	19125	15	QPSK	75	0	22.40	1	0-1
	1902.5	19125	15	16QAM	1	0	22.70	1	0-1
	1902.5	19125	15	16QAM	1	36	22.73	1	0-1
	1902.5	19125	15	16QAM	1	74	22.33	1	0-1
	1902.5	19125	15	16QAM	36	0	21.63	2	0-2
	1902.5	19125	15	16QAM	36	18	21.55	2	0-2
	1902.5	19125	15	16QAM	36	37	21.23	2	0-2
	1902.5	19125	15	16QAM	75	0	21.37	2	0-2

Table 9-15
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	23.61	0	0
	1855	18650	10	QPSK	1	25	23.76	0	0
	1855	18650	10	QPSK	1	49	23.85	0	0
	1855	18650	10	QPSK	25	0	22.86	1	0-1
	1855	18650	10	QPSK	25	12	22.89	1	0-1
	1855	18650	10	QPSK	25	25	22.64	1	0-1
	1855	18650	10	QPSK	50	0	22.98	1	0-1
	1855	18650	10	16QAM	1	0	22.87	1	0-1
	1855	18650	10	16QAM	1	25	22.92	1	0-1
	1855	18650	10	16QAM	1	49	22.91	1	0-1
	1855	18650	10	16QAM	25	0	21.87	2	0-2
	1855	18650	10	16QAM	25	12	21.92	2	0-2
	1855	18650	10	16QAM	25	25	21.82	2	0-2
	1855	18650	10	16QAM	50	0	21.77	2	0-2
Mid	1880.0	18900	10	QPSK	1	0	23.71	0	0
	1880.0	18900	10	QPSK	1	25	23.70	0	0
	1880.0	18900	10	QPSK	1	49	23.84	0	0
	1880.0	18900	10	QPSK	25	0	22.55	1	0-1
	1880.0	18900	10	QPSK	25	12	22.52	1	0-1
	1880.0	18900	10	QPSK	25	25	22.55	1	0-1
	1880.0	18900	10	QPSK	50	0	22.63	1	0-1
	1880.0	18900	10	16QAM	1	0	22.80	1	0-1
	1880.0	18900	10	16QAM	1	25	22.67	1	0-1
	1880.0	18900	10	16QAM	1	49	22.84	1	0-1
	1880.0	18900	10	16QAM	25	0	21.56	2	0-2
	1880.0	18900	10	16QAM	25	12	21.44	2	0-2
	1880.0	18900	10	16QAM	25	25	21.46	2	0-2
	1880.0	18900	10	16QAM	50	0	21.39	2	0-2
High	1905	19150	10	QPSK	1	0	23.70	0	0
	1905	19150	10	QPSK	1	25	23.40	0	0
	1905	19150	10	QPSK	1	49	23.70	0	0
	1905	19150	10	QPSK	25	0	22.96	1	0-1
	1905	19150	10	QPSK	25	12	22.60	1	0-1
	1905	19150	10	QPSK	25	25	22.10	1	0-1
	1905	19150	10	QPSK	50	0	22.40	1	0-1
	1905	19150	10	16QAM	1	0	22.60	1	0-1
	1905	19150	10	16QAM	1	25	22.83	1	0-1
	1905	19150	10	16QAM	1	49	22.23	1	0-1
	1905	19150	10	16QAM	25	0	21.83	2	0-2
	1905	19150	10	16QAM	25	12	21.65	2	0-2
	1905	19150	10	16QAM	25	25	21.13	2	0-2
	1905	19150	10	16QAM	50	0	21.47	2	0-2

Table 9-16
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	23.71	0	0
	1852.5	18625	5	QPSK	1	12	23.86	0	0
	1852.5	18625	5	QPSK	1	24	23.85	0	0
	1852.5	18625	5	QPSK	12	0	22.76	1	0-1
	1852.5	18625	5	QPSK	12	6	22.79	1	0-1
	1852.5	18625	5	QPSK	12	13	22.54	1	0-1
	1852.5	18625	5	QPSK	25	0	22.98	1	0-1
	1852.5	18625	5	16-QAM	1	0	22.87	1	0-1
	1852.5	18625	5	16-QAM	1	12	22.82	1	0-1
	1852.5	18625	5	16-QAM	1	24	22.81	1	0-1
	1852.5	18625	5	16-QAM	12	0	21.87	2	0-2
	1852.5	18625	5	16-QAM	12	6	21.82	2	0-2
	1852.5	18625	5	16-QAM	12	13	21.82	2	0-2
	1852.5	18625	5	16-QAM	25	0	21.67	2	0-2
Mid	1880.0	18900	5	QPSK	1	0	23.81	0	0
	1880.0	18900	5	QPSK	1	12	23.70	0	0
	1880.0	18900	5	QPSK	1	24	23.84	0	0
	1880.0	18900	5	QPSK	12	0	22.55	1	0-1
	1880.0	18900	5	QPSK	12	6	22.42	1	0-1
	1880.0	18900	5	QPSK	12	13	22.65	1	0-1
	1880.0	18900	5	QPSK	25	0	22.73	1	0-1
	1880.0	18900	5	16-QAM	1	0	22.90	1	0-1
	1880.0	18900	5	16-QAM	1	12	22.67	1	0-1
	1880.0	18900	5	16-QAM	1	24	22.94	1	0-1
	1880.0	18900	5	16-QAM	12	0	21.56	2	0-2
	1880.0	18900	5	16-QAM	12	6	21.54	2	0-2
	1880.0	18900	5	16-QAM	12	13	21.56	2	0-2
	1880.0	18900	5	16-QAM	25	0	21.29	2	0-2
High	1907.5	19175	5	QPSK	1	0	23.60	0	0
	1907.5	19175	5	QPSK	1	12	23.40	0	0
	1907.5	19175	5	QPSK	1	24	23.80	0	0
	1907.5	19175	5	QPSK	12	0	22.96	1	0-1
	1907.5	19175	5	QPSK	12	6	22.60	1	0-1
	1907.5	19175	5	QPSK	12	13	22.20	1	0-1
	1907.5	19175	5	QPSK	25	0	22.30	1	0-1
	1907.5	19175	5	16-QAM	1	0	22.60	1	0-1
	1907.5	19175	5	16-QAM	1	12	22.93	1	0-1
	1907.5	19175	5	16-QAM	1	24	22.23	1	0-1
	1907.5	19175	5	16-QAM	12	0	21.83	2	0-2
	1907.5	19175	5	16-QAM	12	6	21.65	2	0-2
	1907.5	19175	5	16-QAM	12	13	21.23	2	0-2
	1907.5	19175	5	16-QAM	25	0	21.47	2	0-2

Table 9-17
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1851.5	18615	3	QPSK	1	0	23.61	0	0
	1851.5	18615	3	QPSK	1	7	23.86	0	0
	1851.5	18615	3	QPSK	1	14	23.85	0	0
	1851.5	18615	3	QPSK	8	0	22.86	1	0-1
	1851.5	18615	3	QPSK	8	4	22.99	1	0-1
	1851.5	18615	3	QPSK	8	7	22.84	1	0-1
	1851.5	18615	3	QPSK	15	0	22.98	1	0-1
	1851.5	18615	3	16-QAM	1	0	22.87	1	0-1
	1851.5	18615	3	16-QAM	1	7	22.82	1	0-1
	1851.5	18615	3	16-QAM	1	14	22.91	1	0-1
	1851.5	18615	3	16-QAM	8	0	21.97	2	0-2
	1851.5	18615	3	16-QAM	8	4	21.92	2	0-2
	1851.5	18615	3	16-QAM	8	7	21.62	2	0-2
	1851.5	18615	3	16-QAM	15	0	21.87	2	0-2
Mid	1880.0	18900	3	QPSK	1	0	23.71	0	0
	1880.0	18900	3	QPSK	1	7	23.60	0	0
	1880.0	18900	3	QPSK	1	14	23.64	0	0
	1880.0	18900	3	QPSK	8	0	22.55	1	0-1
	1880.0	18900	3	QPSK	8	4	22.52	1	0-1
	1880.0	18900	3	QPSK	8	7	22.65	1	0-1
	1880.0	18900	3	QPSK	15	0	22.53	1	0-1
	1880.0	18900	3	16-QAM	1	0	22.80	1	0-1
	1880.0	18900	3	16-QAM	1	7	22.87	1	0-1
	1880.0	18900	3	16-QAM	1	14	22.94	1	0-1
	1880.0	18900	3	16-QAM	8	0	21.46	2	0-2
	1880.0	18900	3	16-QAM	8	4	21.54	2	0-2
	1880.0	18900	3	16-QAM	8	7	21.46	2	0-2
	1880.0	18900	3	16-QAM	15	0	21.49	2	0-2
High	1908.5	19185	3	QPSK	1	0	23.60	0	0
	1908.5	19185	3	QPSK	1	7	23.40	0	0
	1908.5	19185	3	QPSK	1	14	23.60	0	0
	1908.5	19185	3	QPSK	8	0	22.96	1	0-1
	1908.5	19185	3	QPSK	8	4	22.60	1	0-1
	1908.5	19185	3	QPSK	8	7	22.10	1	0-1
	1908.5	19185	3	QPSK	15	0	22.40	1	0-1
	1908.5	19185	3	16-QAM	1	0	22.80	1	0-1
	1908.5	19185	3	16-QAM	1	7	22.73	1	0-1
	1908.5	19185	3	16-QAM	1	14	22.23	1	0-1
	1908.5	19185	3	16-QAM	8	0	21.73	2	0-2
	1908.5	19185	3	16-QAM	8	4	21.65	2	0-2
	1908.5	19185	3	16-QAM	8	7	21.13	2	0-2
	1908.5	19185	3	16-QAM	15	0	21.27	2	0-2

Table 9-18
LTE Band 2 (PCS) Conducted Powers – 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1850.7	18607	1.4	QPSK	1	0	23.50	0	0
	1850.7	18607	1.4	QPSK	1	2	23.75	0	0
	1850.7	18607	1.4	QPSK	1	5	23.80	0	0
	1850.7	18607	1.4	QPSK	3	0	23.60	0	0
	1850.7	18607	1.4	QPSK	3	2	23.80	0	0
	1850.7	18607	1.4	QPSK	3	3	23.76	0	0
	1850.7	18607	1.4	QPSK	6	0	22.80	1	0-1
	1850.7	18607	1.4	16-QAM	1	0	22.79	1	0-1
	1850.7	18607	1.4	16-QAM	1	2	22.76	1	0-1
	1850.7	18607	1.4	16-QAM	1	5	22.90	1	0-1
	1850.7	18607	1.4	16-QAM	3	0	22.60	1	0-1
	1850.7	18607	1.4	16-QAM	3	2	22.70	1	0-1
	1850.7	18607	1.4	16-QAM	3	3	22.51	1	0-1
	1850.7	18607	1.4	16-QAM	6	0	21.50	2	0-2
Mid	1880.0	18900	1.4	QPSK	1	0	23.60	0	0
	1880.0	18900	1.4	QPSK	1	2	23.50	0	0
	1880.0	18900	1.4	QPSK	1	5	23.61	0	0
	1880.0	18900	1.4	QPSK	3	0	23.53	0	0
	1880.0	18900	1.4	QPSK	3	2	23.57	0	0
	1880.0	18900	1.4	QPSK	3	3	23.60	0	0
	1880.0	18900	1.4	QPSK	6	0	22.50	1	0-1
	1880.0	18900	1.4	16-QAM	1	0	22.75	1	0-1
	1880.0	18900	1.4	16-QAM	1	2	22.88	1	0-1
	1880.0	18900	1.4	16-QAM	1	5	22.96	1	0-1
	1880.0	18900	1.4	16-QAM	3	0	22.40	1	0-1
	1880.0	18900	1.4	16-QAM	3	2	22.30	1	0-1
	1880.0	18900	1.4	16-QAM	3	3	22.63	1	0-1
	1880.0	18900	1.4	16-QAM	6	0	21.30	2	0-2
High	1909.3	19193	1.4	QPSK	1	0	23.60	0	0
	1909.3	19193	1.4	QPSK	1	2	23.45	0	0
	1909.3	19193	1.4	QPSK	1	5	23.50	0	0
	1909.3	19193	1.4	QPSK	3	0	23.50	0	0
	1909.3	19193	1.4	QPSK	3	2	23.60	0	0
	1909.3	19193	1.4	QPSK	3	3	23.45	0	0
	1909.3	19193	1.4	QPSK	6	0	22.38	1	0-1
	1909.3	19193	1.4	16-QAM	1	0	22.76	1	0-1
	1909.3	19193	1.4	16-QAM	1	2	22.70	1	0-1
	1909.3	19193	1.4	16-QAM	1	5	22.23	1	0-1
	1909.3	19193	1.4	16-QAM	3	0	22.30	1	0-1
	1909.3	19193	1.4	16-QAM	3	2	22.39	1	0-1
	1909.3	19193	1.4	16-QAM	3	3	22.42	1	0-1
	1909.3	19193	1.4	16-QAM	6	0	21.40	2	0-2

9.4 Antenna 1 WLAN Conducted Powers

9.4.1 Maximum Conducted Powers

Table 9-19
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	16.57	16.54	16.74	16.62
802.11b	2437	6*	**17.05**	17.02	17.22	17.10
802.11b	2462	11*	16.81	16.78	16.98	16.86

Table 9-20
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	14.09	13.97	14.10	13.92	14.22	14.25	14.21	14.24
802.11g	2437	6	13.90	13.78	13.91	13.73	14.03	14.06	14.02	14.05
802.11g	2462	11	13.54	13.42	13.55	13.37	13.67	13.70	13.66	13.69

Table 9-21
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	13.14	13.34	13.17	13.39	13.34	13.42	13.45	13.24
802.11n	2437	6	12.95	13.15	12.98	13.20	13.15	13.23	13.26	13.05
802.11n	2462	11	12.81	13.01	12.84	13.06	13.01	13.09	13.12	12.91

Table 9-22
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	13.02	12.76	12.89	12.84	13.11	13.18	13.24	13.17
802.11a	5200	40	13.08	12.82	12.95	12.90	13.17	13.24	13.30	13.23
802.11a	5220	44	**13.12**	12.86	12.99	12.94	13.21	13.28	13.34	13.27
802.11a	5240	48*	12.93	12.67	12.80	12.75	13.02	13.09	13.15	13.08
802.11a	5260	52*	12.85	12.78	13.04	12.99	12.67	12.54	12.68	12.65
802.11a	5280	56	**12.97**	12.90	13.16	13.11	12.79	12.66	12.80	12.77
802.11a	5300	60	12.57	12.50	12.76	12.71	12.39	12.26	12.40	12.37
802.11a	5320	64*	12.54	12.47	12.73	12.68	12.36	12.23	12.37	12.34
802.11a	5500	100	13.33	12.62	13.26	13.19	13.11	13.37	13.32	13.26
802.11a	5520	104*	13.36	12.65	13.29	13.22	13.14	13.40	13.35	13.29
802.11a	5540	108	**13.41**	12.70	13.34	13.27	13.19	13.45	13.40	13.34
802.11a	5560	112	13.27	12.56	13.20	13.13	13.05	13.31	13.26	13.20
802.11a	5580	116*	**13.40**	12.69	13.33	13.26	13.18	13.44	13.39	13.33
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	**13.19**	12.48	13.12	13.05	12.97	13.23	13.18	13.12
802.11a	5680	136*	13.01	12.30	12.94	12.87	12.79	13.05	13.00	12.94
802.11a	5700	140	13.06	12.35	12.99	12.92	12.84	13.10	13.05	12.99
802.11a	5745	149*	**13.31**	13.12	13.33	13.25	12.81	12.63	12.79	12.56
802.11a	5765	153	**13.21**	13.02	13.23	13.15	12.71	12.53	12.69	12.46
802.11a	5785	157*	13.15	12.96	13.17	13.09	12.65	12.47	12.63	12.40
802.11a	5805	161	**13.20**	13.01	13.22	13.14	12.70	12.52	12.68	12.45
802.11a	5825	165*	12.98	12.79	13.00	12.92	12.48	12.30	12.46	12.23

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

Table 9-23
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	12.89	13.27	12.81	12.92	13.24	13.35	13.21	13.28
802.11n	5200	40	12.83	13.31	12.75	12.86	13.18	13.32	13.15	13.22
802.11n	5220	44	12.92	13.30	12.84	12.95	13.27	13.34	13.24	13.31
802.11n	5240	48	12.72	13.20	12.64	12.75	13.07	13.27	13.04	13.11
802.11n	5260	52	13.09	12.57	12.75	13.21	13.14	12.92	13.02	13.14
802.11n	5280	56	13.02	12.50	12.68	13.20	13.07	12.85	12.95	13.07
802.11n	5300	60	12.91	12.39	12.57	13.19	12.96	12.74	12.84	12.96
802.11n	5320	64	13.21	12.69	12.87	13.17	13.21	13.04	13.14	13.21
802.11n	5500	100	13.14	13.28	13.21	13.39	13.33	12.97	13.02	13.07
802.11n	5520	104	13.08	13.22	13.15	13.33	13.27	12.91	12.96	13.01
802.11n	5540	108	13.25	13.39	13.32	13.48	13.44	13.08	13.13	13.18
802.11n	5560	112	13.29	13.43	13.36	13.44	13.48	13.12	13.17	13.22
802.11n	5580	116	13.21	13.35	13.28	13.46	13.40	13.04	13.09	13.14
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	12.82	12.96	12.89	13.07	13.01	12.65	12.70	12.75
802.11n	5680	136	13.04	13.18	13.11	13.29	13.23	12.87	12.92	12.97
802.11n	5700	140	12.81	12.95	12.88	13.06	13.00	12.64	12.69	12.74
802.11n	5745	149	12.74	12.95	13.14	13.21	13.15	13.01	12.94	13.08
802.11n	5765	153	12.56	12.77	12.96	13.03	12.97	12.83	12.76	12.90
802.11n	5785	157	12.72	12.93	13.12	13.19	13.13	12.99	12.92	13.06
802.11n	5805	161	12.52	12.73	12.92	12.99	12.93	12.79	12.72	12.86
802.11n	5825	165	12.74	12.95	13.14	13.21	13.15	13.01	12.94	13.08

Table 9-24
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	11.42	12.05	12.24	12.28	11.93	12.12	12.38	12.24
802.11n	5230	46	11.26	11.89	12.08	12.12	11.77	11.96	12.22	12.08
802.11n	5270	54	11.29	11.85	12.09	12.35	12.14	12.36	12.04	12.12
802.11n	5310	62	11.36	11.92	12.16	12.42	12.21	12.43	12.11	12.19
802.11n	5510	102	11.45	11.48	11.65	11.84	11.67	11.95	11.72	11.62
802.11n	5550	110	11.69	11.72	11.89	12.08	11.91	12.19	11.96	11.86
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	11.51	11.54	11.71	11.90	11.73	12.01	11.78	11.68
802.11n	5755	151	11.43	11.23	11.42	11.48	11.52	11.46	11.32	11.47
802.11n	5795	159	11.29	11.09	11.28	11.34	11.38	11.32	11.18	11.33

Table 9-25
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	**10.71**	10.76	10.69	10.77	10.94	10.92	10.87	10.91	10.88	10.79
802.11ac	5290	58	**10.77**	10.81	10.72	10.60	10.98	10.87	10.91	10.82	10.87	10.97
802.11ac	5530	106	**11.15**	11.18	11.11	11.38	11.17	11.32	11.34	11.21	11.25	11.37
802.11ac	5775	155	**11.25**	11.14	10.94	11.09	11.32	10.92	11.10	11.17	10.89	10.52

9.4.2 Reduced Conducted Powers – Held-to-Ear

Table 9-26
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	**11.94**	12.03	12.09	12.08
802.11b	2437	6*	11.23	11.39	11.31	11.33
802.11b	2462	11*	11.27	11.36	11.39	11.48

Table 9-27
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	11.42	11.55	11.52	11.41	11.46	11.44	11.40	11.38
802.11g	2437	6	11.87	11.92	11.93	11.87	11.98	11.93	11.92	11.94
802.11g	2462	11	11.89	11.71	11.75	11.79	11.82	11.82	11.81	11.81

Table 9-28
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	11.25	11.25	11.30	11.18	11.24	11.24	11.32	11.31
802.11n	2437	6	11.90	11.89	11.90	11.85	11.90	11.79	11.92	11.79
802.11n	2462	11	11.66	11.78	11.78	11.64	11.81	11.70	11.75	11.70

Table 9-29
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	**9.25**	9.23	8.90	8.92	9.25	8.91	9.31	8.91
802.11a	5200	40	9.10	8.98	9.24	9.21	9.17	8.94	8.96	9.24
802.11a	5220	44	9.24	8.96	9.05	9.28	9.01	9.22	9.14	9.31
802.11a	5240	48*	9.00	9.08	9.07	9.06	8.97	8.73	9.14	9.02
802.11a	5260	52*	**9.33**	9.33	9.28	9.48	9.22	9.27	9.45	9.19
802.11a	5280	56	9.11	9.41	9.25	9.48	9.29	9.45	9.42	9.13
802.11a	5300	60	9.24	9.37	9.41	9.49	9.39	9.43	9.31	9.27
802.11a	5320	64*	9.30	9.25	9.30	9.21	9.33	9.46	9.34	9.29
802.11a	5500	100	**9.45**	9.35	9.24	9.27	9.34	9.33	9.23	9.45
802.11a	5520	104*	9.31	9.39	9.39	9.38	9.46	9.20	9.21	9.26
802.11a	5540	108	9.40	9.33	9.35	9.46	9.26	9.33	9.35	9.43
802.11a	5560	112	9.35	9.37	9.32	9.42	9.41	9.10	9.15	9.47
802.11a	5580	116*	**9.46**	9.47	9.44	9.41	9.42	9.38	9.17	9.24
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	9.36	9.47	9.43	9.40	9.46	9.45	9.34	9.46
802.11a	5680	136*	**9.39**	9.39	9.42	9.34	9.27	9.41	9.18	9.31
802.11a	5700	140	9.32	9.33	9.45	9.49	9.35	9.40	9.20	9.42
802.11a	5745	149*	**9.12**	8.89	9.32	9.30	9.26	8.94	9.09	9.13
802.11a	5765	153	9.08	8.69	8.81	8.91	9.14	9.11	8.81	8.85
802.11a	5785	157*	**9.28**	9.23	9.14	8.82	8.88	9.07	8.90	9.22
802.11a	5805	161	**9.19**	8.98	8.98	9.09	9.20	8.96	9.25	8.87
802.11a	5825	165*	8.64	8.98	8.99	8.63	8.60	8.92	9.01	8.83

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

Table 9-30
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	9.33	9.04	9.28	9.45	9.16	9.40	9.18	9.41
802.11n	5200	40	9.49	9.28	9.10	9.21	9.35	9.23	9.35	9.22
802.11n	5220	44	9.26	9.00	9.20	9.30	8.91	8.96	8.99	9.29
802.11n	5240	48	9.37	9.47	9.20	9.40	9.43	9.15	9.32	9.31
802.11n	5260	52	9.40	9.46	9.22	9.41	9.21	9.14	9.43	9.31
802.11n	5280	56	9.23	9.25	9.34	8.90	9.08	8.93	9.42	9.01
802.11n	5300	60	9.14	9.13	9.04	9.28	9.29	9.15	9.48	9.12
802.11n	5320	64	9.20	9.34	9.18	9.21	9.32	9.40	9.15	9.40
802.11n	5500	100	8.23	8.71	8.22	8.65	8.48	8.36	8.63	8.52
802.11n	5520	104	8.33	8.47	8.79	8.61	8.48	8.41	8.75	8.40
802.11n	5540	108	8.38	8.46	8.42	8.26	8.74	8.57	8.56	8.59
802.11n	5560	112	8.64	8.17	8.18	8.18	8.60	8.51	8.65	8.25
802.11n	5580	116	8.73	8.72	8.53	8.32	8.34	8.78	8.32	8.48
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	8.29	8.59	8.52	8.40	8.46	8.41	8.65	8.24
802.11n	5680	136	8.47	8.45	8.35	8.73	8.34	8.78	8.46	8.31
802.11n	5700	140	8.43	8.80	8.67	8.48	8.42	8.43	8.81	8.83
802.11n	5745	149	9.44	9.11	9.33	9.11	9.40	9.43	9.45	9.24
802.11n	5765	153	9.19	9.16	9.33	9.07	9.27	9.15	9.33	8.91
802.11n	5785	157	9.33	9.02	8.99	8.86	8.88	9.35	9.08	9.07
802.11n	5805	161	8.92	9.19	8.79	9.02	9.11	9.11	8.93	9.01
802.11n	5825	165	8.72	9.11	8.91	8.99	9.09	9.12	9.01	8.83

Table 9-31
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	9.12	8.69	8.58	8.33	9.01	8.72	8.62	8.92
802.11n	5230	46	8.82	8.77	9.20	9.14	8.73	8.99	9.27	9.24
802.11n	5270	54	9.25	8.55	8.99	8.65	8.92	9.16	8.74	8.48
802.11n	5310	62	8.43	9.05	8.56	8.66	8.76	8.37	9.12	8.37
802.11n	5510	102	8.27	9.16	8.98	8.83	8.71	8.97	8.40	8.73
802.11n	5550	110	8.56	8.38	8.26	8.14	8.12	8.54	8.26	8.14
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	8.14	8.44	8.22	8.09	8.87	8.71	8.85	8.70
802.11n	5755	151	8.38	7.98	8.37	8.72	8.15	8.42	8.12	8.75
802.11n	5795	159	8.29	8.91	8.49	8.28	8.43	8.91	8.78	8.37

Table 9-32
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	**9.30**	9.13	9.30	9.14	9.27	9.05	9.02	9.27	9.14	9.11
802.11ac	5290	58	**8.77**	8.91	8.94	8.99	8.79	8.94	8.88	8.84	8.98	8.88
802.11ac	5530	106	**9.16**	9.34	9.26	9.15	9.24	9.26	9.30	9.24	9.17	9.32
802.11ac	5775	155	**9.01**	9.01	9.04	9.09	8.99	8.87	9.12	9.01	8.88	8.91

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

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

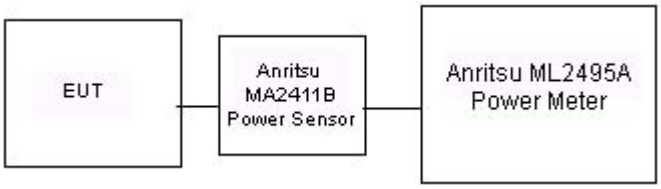

Figure 9-3
Power Measurement Setup for Bandwidths < 50 MHz

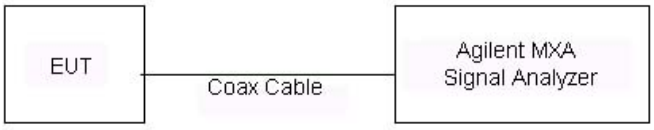

Figure 9-4
Power Measurement Setup for Bandwidths > 50 MHz

9.5 Antenna 2 WLAN Conducted Powers

9.5.1 Maximum Conducted Powers

Table 9-33
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	**17.07**	17.24	17.29	17.17
802.11b	2437	6*	16.54	16.71	16.76	16.64
802.11b	2462	11*	16.49	16.66	16.71	16.59

Table 9-34
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	13.82	13.62	13.57	13.61	13.94	14.04	14.12	14.11
802.11g	2437	6	13.64	13.44	13.39	13.43	13.76	13.86	13.94	13.93
802.11g	2462	11	13.37	13.17	13.12	13.16	13.49	13.59	13.67	13.66

Table 9-35
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	12.93	12.97	12.82	12.94	13.07	13.12	13.09	13.14
802.11n	2437	6	12.85	12.89	12.74	12.86	12.99	13.04	13.01	13.06
802.11n	2462	11	12.64	12.68	12.53	12.65	12.78	12.83	12.80	12.85

Table 9-36
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	**13.94**	13.87	13.97	13.37	13.72	13.92	13.34	13.48
802.11a	5200	40	13.84	13.77	13.87	13.27	13.62	13.82	13.24	13.38
802.11a	5220	44	13.86	13.79	13.89	13.29	13.64	13.84	13.26	13.40
802.11a	5240	48*	13.74	13.67	13.77	13.17	13.52	13.72	13.14	13.28
802.11a	5260	52*	**13.21**	12.91	12.98	12.92	13.42	13.35	13.10	13.44
802.11a	5280	56	13.02	12.72	12.79	12.73	13.23	13.16	12.91	13.25
802.11a	5300	60	13.11	12.81	12.88	12.82	13.32	13.25	13.00	13.34
802.11a	5320	64*	12.99	12.69	12.76	12.70	13.20	13.13	12.88	13.22
802.11a	5500	100	**13.26**	12.98	13.22	13.16	13.44	13.40	13.04	12.94
802.11a	5520	104*	13.17	12.89	13.13	13.07	13.35	13.31	12.95	12.85
802.11a	5540	108	13.04	12.76	13.00	12.94	13.22	13.18	12.82	12.72
802.11a	5560	112	13.21	12.93	13.17	13.11	13.39	13.35	12.99	12.89
802.11a	5580	116*	12.91	12.63	12.87	12.81	13.09	13.05	12.69	12.59
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	13.01	12.73	12.97	12.91	13.19	13.15	12.79	12.69
802.11a	5680	136*	12.81	12.53	12.77	12.71	12.99	12.95	12.59	12.49
802.11a	5700	140	12.61	12.33	12.57	12.51	12.79	12.75	12.39	12.29
802.11a	5745	149*	13.37	13.09	12.91	12.95	13.35	13.17	13.24	13.37
802.11a	5765	153	**13.44**	13.16	12.98	13.02	13.42	13.24	13.31	13.44
802.11a	5785	157*	13.31	13.03	12.85	12.89	13.29	13.11	13.18	13.31
802.11a	5805	161	13.11	12.83	12.65	12.69	13.09	12.91	12.98	13.11
802.11a	5825	165*	13.25	12.97	12.79	12.83	13.23	13.05	13.12	13.25

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

Table 9-37
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	12.78	12.95	13.02	13.11	13.04	13.07	12.99	13.12
802.11n	5200	40	12.96	13.13	13.20	13.29	13.22	13.25	13.17	13.30
802.11n	5220	44	12.72	12.89	12.96	13.05	12.98	13.01	12.93	13.06
802.11n	5240	48	12.84	13.01	13.08	13.17	13.10	13.13	13.05	13.18
802.11n	5260	52	13.15	13.02	13.25	13.37	13.34	13.17	13.27	13.25
802.11n	5280	56	13.04	12.91	13.14	13.26	13.23	13.06	13.16	13.14
802.11n	5300	60	13.12	12.99	13.22	13.34	13.31	13.14	13.24	13.22
802.11n	5320	64	12.89	12.76	12.99	13.11	13.08	12.91	13.01	12.99
802.11n	5500	100	13.01	13.18	13.27	13.24	13.28	13.32	13.29	13.32
802.11n	5520	104	13.18	13.35	13.44	13.41	13.45	13.44	13.46	13.42
802.11n	5540	108	13.01	13.18	13.27	13.24	13.28	13.32	13.29	13.32
802.11n	5560	112	13.09	13.26	13.35	13.32	13.36	13.40	13.37	13.40
802.11n	5580	116	13.04	13.21	13.30	13.27	13.31	13.35	13.32	13.35
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	12.82	12.99	13.08	13.05	13.09	13.13	13.10	13.13
802.11n	5680	136	12.68	12.85	12.94	12.91	12.95	12.99	12.96	12.99
802.11n	5700	140	12.60	12.77	12.86	12.83	12.87	12.91	12.88	12.91
802.11n	5745	149	13.08	13.12	13.27	13.29	13.25	13.21	13.30	13.24
802.11n	5765	153	13.11	13.15	13.30	13.32	13.28	13.24	13.33	13.27
802.11n	5785	157	13.21	13.25	13.40	13.42	13.38	13.34	13.43	13.37
802.11n	5805	161	13.25	13.29	13.44	13.46	13.42	13.38	13.47	13.41
802.11n	5825	165	13.16	13.20	13.35	13.37	13.33	13.29	13.38	13.32

Table 9-38
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	12.25	12.38	12.41	12.25	12.34	12.43	12.32	12.29
802.11n	5230	46	12.17	12.30	12.33	12.17	12.26	12.35	12.24	12.21
802.11n	5270	54	11.54	11.52	11.61	11.79	11.35	11.62	11.55	11.67
802.11n	5310	62	11.41	11.39	11.48	11.66	11.22	11.49	11.42	11.54
802.11n	5510	102	11.67	11.85	11.58	11.79	11.82	11.98	11.67	11.54
802.11n	5550	110	11.61	11.79	11.52	11.73	11.76	11.92	11.61	11.48
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	11.32	11.50	11.23	11.44	11.47	11.63	11.32	11.19
802.11n	5755	151	11.74	11.84	11.81	12.02	12.05	11.98	11.90	11.84
802.11n	5795	159	11.77	11.87	11.84	12.05	12.08	12.01	11.93	11.87

Table 9-39
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	**10.78**	10.61	10.64	10.59	10.86	10.79	10.81	10.95	11.01	10.98
802.11ac	5290	58	**10.94**	10.75	10.74	10.93	11.05	11.01	11.12	11.07	10.95	11.18
802.11ac	5530	106	**10.98**	10.84	10.97	10.75	11.14	11.04	11.16	11.07	11.12	11.14
802.11ac	5775	155	**11.26**	11.23	11.14	11.24	11.37	11.24	11.42	11.38	11.27	11.35

9.5.2 Reduced Conducted Powers – Held-to-Ear

Table 9-40
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	**11.74**	11.67	11.75	11.70
802.11b	2437	6*	11.50	11.43	11.35	11.44
802.11b	2462	11*	11.39	11.35	11.32	11.27

Table 9-41
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	11.66	11.78	11.61	11.76	11.75	11.73	11.59	11.78
802.11g	2437	6	11.63	11.62	11.80	11.77	11.69	11.76	11.75	11.76
802.11g	2462	11	11.38	11.51	11.49	11.43	11.44	11.50	11.47	11.45

Table 9-42
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	11.83	11.97	11.93	11.92	11.81	11.97	11.91	11.81
802.11n	2437	6	11.73	11.70	11.69	11.79	11.82	11.78	11.83	11.69
802.11n	2462	11	11.69	11.79	11.75	11.77	11.85	11.75	11.70	11.71

Table 9-43
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	8.61	8.67	8.66	8.65	8.67	8.60	8.61	8.71
802.11a	5200	40	8.55	8.62	8.66	8.59	8.58	8.68	8.56	8.66
802.11a	5220	44	**8.83**	8.88	8.74	8.78	8.80	8.81	8.71	8.72
802.11a	5240	48*	8.65	8.77	8.78	8.79	8.80	8.79	8.80	8.72
802.11a	5260	52*	**8.79**	8.50	8.62	8.49	8.65	8.58	8.49	8.51
802.11a	5280	56	8.75	8.77	8.79	8.76	8.66	8.75	8.69	8.84
802.11a	5300	60	8.69	8.67	8.53	8.61	8.55	8.57	8.61	8.57
802.11a	5320	64*	8.43	8.49	8.41	8.52	8.43	8.47	8.40	8.47
802.11a	5500	100	8.70	8.88	8.85	8.77	8.76	8.90	8.80	8.87
802.11a	5520	104*	8.72	8.78	8.65	8.79	8.68	8.80	8.74	8.66
802.11a	5540	108	8.77	8.82	8.89	8.76	8.76	8.80	8.86	8.89
802.11a	5560	112	8.86	8.80	8.83	8.93	8.95	8.97	8.78	8.87
802.11a	5580	116*	8.86	8.90	8.93	8.93	9.00	8.86	8.88	8.86
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	8.80	8.74	8.77	8.84	8.82	8.75	8.78	8.76
802.11a	5680	136*	**8.90**	8.83	8.81	8.92	8.83	8.94	8.84	8.93
802.11a	5700	140	8.67	8.68	8.65	8.55	8.54	8.70	8.57	8.56
802.11a	5745	149*	9.15	9.12	9.13	9.18	9.09	9.15	9.19	9.03
802.11a	5765	153	**9.19**	9.18	9.26	9.12	9.25	9.18	9.11	9.17
802.11a	5785	157*	9.03	9.09	9.00	9.03	9.18	9.09	9.08	9.09
802.11a	5805	161	9.00	8.99	9.00	9.10	9.01	9.01	9.12	9.12
802.11a	5825	165*	8.99	9.24	9.10	9.22	9.20	9.21	9.13	9.08

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

Table 9-44
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	8.41	8.39	8.39	8.50	8.50	8.43	8.46	8.57
802.11n	5200	40	8.60	8.59	8.43	8.51	8.59	8.43	8.50	8.43
802.11n	5220	44	8.63	8.66	8.65	8.62	8.65	8.59	8.66	8.57
802.11n	5240	48	8.44	8.33	8.49	8.52	8.33	8.46	8.47	8.35
802.11n	5260	52	8.30	8.38	8.24	8.37	8.24	8.43	8.26	8.27
802.11n	5280	56	8.42	8.44	8.43	8.53	8.53	8.57	8.53	8.45
802.11n	5300	60	8.57	8.49	8.58	8.58	8.67	8.60	8.57	8.53
802.11n	5320	64	8.70	8.54	8.55	8.63	8.63	8.70	8.62	8.55
802.11n	5500	100	8.60	8.75	8.65	8.73	8.65	8.58	8.62	8.60
802.11n	5520	104	8.58	8.71	8.68	8.56	8.60	8.67	8.68	8.54
802.11n	5540	108	8.51	8.49	8.58	8.61	8.55	8.53	8.64	8.56
802.11n	5560	112	8.86	8.73	8.77	8.77	8.73	8.82	8.83	8.83
802.11n	5580	116	8.86	8.79	8.88	8.81	8.74	8.80	8.74	8.78
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	8.92	8.78	8.84	8.75	8.87	8.90	8.94	8.93
802.11n	5680	136	8.89	8.82	8.72	8.90	8.78	8.73	8.74	8.86
802.11n	5700	140	8.81	8.84	8.82	8.69	8.69	8.79	8.70	8.68
802.11n	5745	149	8.97	9.11	8.98	9.14	9.08	9.08	9.06	9.00
802.11n	5765	153	8.97	8.98	9.05	8.90	9.08	8.91	9.04	9.03
802.11n	5785	157	9.00	8.89	8.97	8.97	8.83	8.86	8.96	8.96
802.11n	5805	161	8.86	8.98	8.94	8.94	9.00	8.86	9.00	8.85
802.11n	5825	165	8.89	8.88	8.94	8.92	8.98	8.90	9.06	8.92

Table 9-45
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	8.49	8.52	8.57	8.63	8.60	8.59	8.65	8.63
802.11n	5230	46	8.42	8.41	8.38	8.48	8.38	8.50	8.40	8.47
802.11n	5270	54	8.43	8.39	8.35	8.38	8.37	8.35	8.31	8.42
802.11n	5310	62	8.40	8.41	8.45	8.34	8.41	8.42	8.34	8.43
802.11n	5510	102	8.94	8.90	8.84	8.91	8.94	8.89	8.98	8.96
802.11n	5550	110	8.83	8.83	8.87	8.73	8.81	8.80	8.75	8.77
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	8.96	8.90	9.02	8.98	8.96	9.00	8.84	8.86
802.11n	5755	151	9.16	9.24	9.14	9.14	9.24	9.26	9.27	9.27
802.11n	5795	159	9.09	9.17	9.07	9.11	9.04	9.08	8.99	8.98

Table 9-46
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	**8.12**	8.17	8.28	8.30	8.18	8.19	8.23	8.21	8.14	8.27
802.11ac	5290	58	**8.33**	8.43	8.29	8.31	8.31	8.34	8.29	8.36	8.26	8.36
802.11ac	5530	106	**8.52**	8.46	8.56	8.60	8.49	8.41	8.54	8.43	8.50	8.51
802.11ac	5775	155	**8.85**	8.96	8.96	8.98	8.91	8.88	9.01	8.82	8.89	8.92

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

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

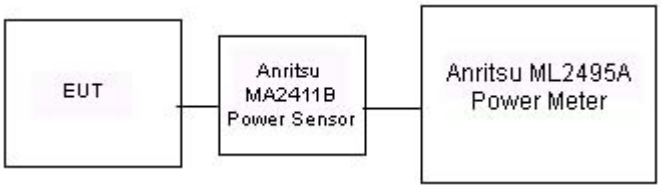

Figure 9-5
Power Measurement Setup for Bandwidths < 50 MHz

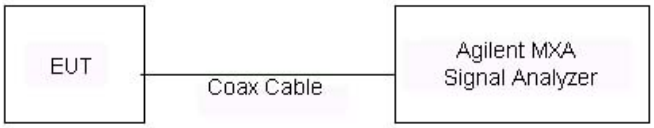

Figure 9-6
Power Measurement Setup for Bandwidths > 50 MHz

9.6 MIMO WLAN Conducted Powers

9.6.1 Maximum Conducted Powers

Table 9-47
IEEE 802.11n Average RF Power MIMO

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			13
802.11n	2412	1*	**13.87**
802.11n	2437	6*	13.64
802.11n	2462	11*	13.48

Table 9-48
IEEE 802.11n Average RF Power – 20 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			13
802.11n	5180	36*	**12.63**
802.11n	5200	40	12.60
802.11n	5220	44	12.62
802.11n	5240	48*	12.55
802.11n	5260	52*	12.75
802.11n	5280	56	12.76
802.11n	5300	60	**12.77**
802.11n	5320	64*	12.63
802.11n	5500	100	**12.30**
802.11n	5520	104*	12.28
802.11n	5540	108	12.25
802.11n	5560	112	12.24
802.11n	5580	116*	12.18
802.11n	5600	120	N/A
802.11n	5620	124	N/A
802.11n	5640	128	N/A
802.11n	5660	132	12.08
802.11n	5680	136*	12.12
802.11n	5700	140	12.06
802.11n	5745	149*	13.44
802.11n	5765	153	**13.47**
802.11n	5785	157*	13.44
802.11n	5805	161	13.43
802.11n	5825	165*	13.41

Table 9-49
IEEE 802.11n Average RF Power – 40 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			27
802.11n	5190	38	11.63
802.11n	5230	46	11.79
802.11n	5270	54	11.58
802.11n	5310	62	11.73
802.11n	5510	102	12.33
802.11n	5550	110	12.41
802.11n	5590	118	N/A
802.11n	5630	126	N/A
802.11n	5670	134	12.14
802.11n	5755	151	12.44
802.11n	5795	159	12.28

Table 9-50
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			58.5
802.11ac	5210	42	11.23
802.11ac	5290	58	11.27
802.11ac	5530	106	10.89
802.11ac	5775	155	10.76

9.6.2 Reduced Conducted Powers – Held-to-Ear

Table 9-51
IEEE 802.11n Average RF Power MIMO

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			13
802.11n	2412	1*	**11.85**
802.11n	2437	6*	11.70
802.11n	2462	11*	11.34

Table 9-52
IEEE 802.11n Average RF Power – 20 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			13
802.11n	5180	36*	8.27
802.11n	5200	40	8.31
802.11n	5220	44	8.22
802.11n	5240	48*	**8.33**
802.11n	5260	52*	8.25
802.11n	5280	56	8.24
802.11n	5300	60	**8.30**
802.11n	5320	64*	8.23
802.11n	5500	100	**9.48**
802.11n	5520	104*	9.44
802.11n	5540	108	9.37
802.11n	5560	112	9.34
802.11n	5580	116*	9.44
802.11n	5600	120	N/A
802.11n	5620	124	N/A
802.11n	5640	128	N/A
802.11n	5660	132	9.35
802.11n	5680	136*	9.41
802.11n	5700	140	9.42
802.11n	5745	149*	7.64
802.11n	5765	153	**7.74**
802.11n	5785	157*	7.66
802.11n	5805	161	7.56
802.11n	5825	165*	7.58

Table 9-53
IEEE 802.11n Average RF Power – 40 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			27
802.11n	5190	38	8.24
802.11n	5230	46	8.27
802.11n	5270	54	8.34
802.11n	5310	62	8.32
802.11n	5510	102	9.47
802.11n	5550	110	9.36
802.11n	5590	118	N/A
802.11n	5630	126	N/A
802.11n	5670	134	9.38
802.11n	5755	151	8.22
802.11n	5795	159	8.26

Table 9-54
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth MIMO

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]
			Data Rate [Mbps]
			58.5
802.11ac	5210	42	9.46
802.11ac	5290	58	9.39
802.11ac	5530	106	9.40
802.11ac	5775	155	9.31

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

- Per KDB 662911 D01v02r01, the individual spectra for each 2x2 MIMO WIFI Antenna were summed mathematically in linear power units for the MIMO output power measurements.
- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11n were selected for SAR evaluation.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11n were selected for SAR evaluation.
- 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.

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
02/13/2014	750H	23.7	710	0.872	41.681	0.890	42.149	-2.02%	-1.11%
			725	0.886	41.478	0.891	42.071	-0.56%	-1.41%
			740	0.899	41.300	0.893	41.994	0.67%	-1.65%
			755	0.914	41.116	0.894	41.916	2.24%	-1.91%
02/10/2014	835H	22.9	820	0.911	41.909	0.899	41.578	1.33%	0.80%
			835	0.925	41.704	0.900	41.500	2.78%	0.49%
			850	0.939	41.522	0.916	41.500	2.51%	0.05%
02/10/2014	835H	22.9	820	0.917	42.790	0.899	41.578	2.00%	2.92%
			835	0.932	42.598	0.900	41.500	3.56%	2.65%
			850	0.944	42.413	0.916	41.500	3.06%	2.20%
02/13/2014	1750H	22.8	1710	1.329	39.071	1.348	40.142	-1.41%	-2.67%
			1750	1.369	38.850	1.371	40.079	-0.15%	-3.07%
			1790	1.406	38.673	1.394	40.016	0.86%	-3.36%
02/12/2014	1900H	23.0	1850	1.348	39.260	1.400	40.000	-3.71%	-1.85%
			1880	1.378	39.128	1.400	40.000	-1.57%	-2.18%
			1910	1.411	39.022	1.400	40.000	0.79%	-2.45%
02/14/2014	2450H	23.0	2401	1.779	40.217	1.756	39.287	1.31%	2.37%
			2450	1.840	40.077	1.800	39.200	2.22%	2.24%
			2499	1.891	39.887	1.853	39.138	2.05%	1.91%
02/06/2014	5200H-5800H	23.1	5180	4.533	37.666	4.635	36.009	-2.20%	4.60%
			5200	4.566	37.509	4.655	35.986	-1.91%	4.23%
			5220	4.623	37.545	4.676	35.963	-1.13%	4.40%
			5240	4.668	37.613	4.696	35.940	-0.60%	4.65%
			5260	4.663	37.698	4.717	35.917	-1.14%	4.96%
			5280	4.656	37.637	4.737	35.894	-1.71%	4.86%
			5300	4.651	37.509	4.758	35.871	-2.25%	4.57%
			5500	4.925	37.305	4.963	35.643	-0.77%	4.66%
			5520	4.924	37.347	4.983	35.620	-1.18%	4.85%
			5540	4.911	37.289	5.004	35.597	-1.86%	4.75%
			5580	4.954	37.020	5.045	35.551	-1.80%	4.13%
			5600	5.017	37.024	5.065	35.529	-0.95%	4.21%
			5745	5.200	36.954	5.214	35.363	-0.27%	4.50%
			5765	5.199	37.033	5.234	35.340	-0.67%	4.79%
			5785	5.182	36.998	5.255	35.317	-1.39%	4.76%
			5800	5.176	36.885	5.270	35.300	-1.78%	4.49%
			5805	5.175	36.876	5.275	35.294	-1.90%	4.48%
02/17/2014	5500H	22.3	5500	4.912	36.692	4.963	35.643	-1.03%	2.94%
			5540	4.942	36.646	5.004	35.597	-1.24%	2.95%
			5580	4.984	36.558	5.045	35.551	-1.21%	2.83%

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
02/11/2014	750B	21.2	710	0.942	56.049	0.960	55.687	-1.88%	0.65%
			725	0.952	56.005	0.961	55.629	-0.94%	0.68%
			740	0.970	55.884	0.963	55.570	0.73%	0.57%
			755	0.985	55.578	0.964	55.512	2.18%	0.12%
02/10/2014	835B	22.6	820	1.010	55.259	0.969	55.258	4.23%	0.00%
			835	1.004	53.949	0.970	55.200	3.51%	-2.27%
			850	1.016	53.745	0.988	55.154	2.83%	-2.55%
02/12/2014	1750B	23.5	1710	1.433	52.231	1.463	53.537	-2.05%	-2.44%
			1750	1.477	52.006	1.488	53.432	-0.74%	-2.67%
			1790	1.519	51.875	1.514	53.326	0.33%	-2.72%
02/13/2014	1750B	22.3	1710	1.481	52.610	1.463	53.537	1.23%	-1.73%
			1750	1.524	52.407	1.488	53.432	2.42%	-1.92%
			1790	1.573	52.322	1.514	53.326	3.90%	-1.88%
02/10/2014	1900B	22.2	1850	1.525	51.969	1.520	53.300	0.33%	-2.50%
			1880	1.561	51.837	1.520	53.300	2.70%	-2.74%
			1910	1.595	51.735	1.520	53.300	4.93%	-2.94%
02/13/2014	1900B	23.0	1850	1.489	52.697	1.520	53.300	-2.04%	-1.13%
			1880	1.523	52.598	1.520	53.300	0.20%	-1.32%
			1910	1.558	52.505	1.520	53.300	2.50%	-1.49%
02/12/2014	2450B	24.0	2401	1.872	51.518	1.903	52.765	-1.63%	-2.36%
			2450	1.937	51.331	1.950	52.700	-0.67%	-2.60%
			2499	1.998	51.123	2.019	52.638	-1.04%	-2.88%
02/03/2014	5200B-5800B	22.6	5180	5.172	47.680	5.276	49.041	-1.97%	-2.78%
			5200	5.168	47.598	5.299	49.014	-2.47%	-2.89%
			5220	5.189	47.462	5.323	48.987	-2.52%	-3.11%
			5260	5.259	47.183	5.369	48.933	-2.05%	-3.58%
			5280	5.313	47.205	5.393	48.906	-1.48%	-3.48%
			5300	5.352	47.314	5.416	48.879	-1.18%	-3.20%
			5500	5.579	46.639	5.650	48.607	-1.26%	-4.05%
			5520	5.640	46.533	5.673	48.580	-0.58%	-4.21%
			5540	5.696	46.550	5.696	48.553	0.00%	-4.13%
			5580	5.764	46.751	5.743	48.499	0.37%	-3.60%
			5600	5.749	46.646	5.766	48.471	-0.29%	-3.77%
			5660	5.868	46.242	5.837	48.390	0.53%	-4.44%
			5745	5.965	46.140	5.936	48.275	0.49%	-4.42%
			5765	5.986	45.986	5.959	48.248	0.45%	-4.69%
			5785	6.049	45.975	5.982	48.220	1.12%	-4.66%
			5800	6.097	46.032	6.000	48.200	1.62%	-4.50%
			5805	6.109	46.051	6.006	48.193	1.71%	-4.44%
02/09/2014	5800B	22.5	5745	6.102	46.334	5.936	48.275	2.80%	-4.02%
			5765	6.128	46.297	5.959	48.248	2.84%	-4.04%
			5800	6.172	46.231	6.000	48.200	2.87%	-4.09%
			5805	6.177	46.187	6.006	48.193	2.85%	-4.16%
			5825	6.213	46.133	6.029	48.166	3.05%	-4.22%

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 KDB 865664 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

10.2 Test System Verification

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

Table 10-3
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)	$Deviation_{1g}$ (%)
D	750	HEAD	02/13/2014	24.5	23.7	0.100	1003	3287	0.809	8.370	8.090	-3.35%
J	835	HEAD	02/10/2014	24.5	23.9	0.100	4d119	3332	0.988	9.680	9.880	2.07%
H	835	HEAD	02/10/2014	23.9	23.1	0.100	4d119	3589	0.965	9.680	9.650	-0.31%
D	1750	HEAD	02/13/2014	24.1	23.0	0.100	1051	3287	3.580	36.500	35.800	-1.92%
D	1900	HEAD	02/12/2014	23.0	23.0	0.100	5d149	3287	3.870	40.400	38.700	-4.21%
K	2450	HEAD	02/14/2014	23.9	23.2	0.100	719	3287	5.420	53.200	54.200	1.88%
E	5200	HEAD	02/06/2014	24.5	23.5	0.100	1120	3914	7.840	76.000	78.400	3.16%
E	5300	HEAD	02/06/2014	24.1	23.5	0.100	1120	3914	7.960	78.700	79.600	1.14%
E	5500	HEAD	02/06/2014	23.9	23.5	0.100	1120	3914	7.910	80.100	79.100	-1.25%
E	5500	HEAD	02/17/2014	24.3	23.0	0.040	1057	3914	3.160	84.300	79.000	-6.29%
E	5600	HEAD	02/06/2014	24.0	23.4	0.100	1120	3914	7.970	79.900	79.700	-0.25%
E	5800	HEAD	02/06/2014	24.1	23.5	0.100	1120	3914	7.400	74.900	74.000	-1.20%
C	750	BODY	02/11/2014	22.3	21.2	0.100	1054	3263	0.880	8.720	8.800	0.92%
G	835	BODY	02/10/2014	23.7	21.6	0.100	4d119	3209	1.010	9.540	10.100	5.87%
K	1750	BODY	02/12/2014	24.0	23.5	0.100	1051	3333	3.660	37.800	36.600	-3.17%
B	1750	BODY	02/13/2014	24.1	22.3	0.100	1008	3288	3.700	38.200	37.000	-3.14%
D	1900	BODY	02/10/2014	23.3	22.2	0.100	5d149	3022	4.020	40.500	40.200	-0.74%
G	1900	BODY	02/13/2014	23.5	23.0	0.100	5d149	3209	3.890	40.500	38.900	-3.95%
H	2450	BODY	02/12/2014	24.5	24.0	0.100	719	3318	5.410	51.700	54.100	4.64%
E	5200	BODY	02/03/2014	24.5	22.6	0.040	1120	3914	3.110	76.600	77.750	1.50%
E	5300	BODY	02/03/2014	24.4	22.6	0.040	1120	3914	3.260	76.800	81.500	6.12%
E	5500	BODY	02/03/2014	24.3	22.6	0.040	1120	3914	3.270	79.800	81.750	2.44%
E	5600	BODY	02/03/2014	24.5	22.5	0.040	1120	3914	3.380	80.700	84.500	4.71%
E	5800	BODY	02/03/2014	24.5	22.7	0.040	1120	3914	3.050	75.500	76.250	0.99%
E	5800	BODY	02/09/2014	24.5	23.3	0.100	1120	3914	6.940	75.500	69.400	-8.08%

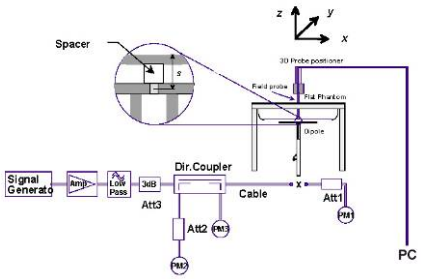

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.57	0.08	Right	Cheek	Standard	20FA1	1:8.3	0.093	1.104	0.103	
836.60	190	GSM 850	GSM	33.0	32.57	0.16	Right	Tilt	Standard	20FA1	1:8.3	0.081	1.104	0.089	
836.60	190	GSM 850	GSM	33.0	32.57	0.03	Left	Cheek	Standard	20FA1	1:8.3	0.224	1.104	0.247	A1
836.60	190	GSM 850	GSM	33.0	32.57	0.03	Left	Cheek	Wireless Charging	20FA1	1:8.3	0.116	1.104	0.128	
836.60	190	GSM 850	GSM	33.0	32.57	0.06	Left	Tilt	Standard	20FA1	1:8.3	0.091	1.104	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
UMTS 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.0	23.42	0.11	Right	Cheek	Standard	20F93	1:1	0.162	1.143	0.185	
836.60	4183	UMTS 850	RMC	24.0	23.42	0.09	Right	Tilt	Standard	20F93	1:1	0.129	1.143	0.147	
836.60	4183	UMTS 850	RMC	24.0	23.42	0.02	Left	Cheek	Standard	20F93	1:1	0.224	1.143	0.256	A2
836.60	4183	UMTS 850	RMC	24.0	23.42	0.17	Left	Cheek	Wireless Charging	20F93	1:1	0.106	1.143	0.121	
836.60	4183	UMTS 850	RMC	24.0	23.42	0.08	Left	Tilt	Standard	20F93	1:1	0.123	1.143	0.141	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-3
UMTS 1750 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	-0.04	Right	Cheek	Standard	20F53	1:1	0.266	1.239	0.330	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.05	Right	Tilt	Standard	20F53	1:1	0.235	1.239	0.291	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.05	Left	Cheek	Standard	20F53	1:1	0.633	1.239	0.784	A3
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.03	Left	Cheek	Wireless Charging	20F53	1:1	0.616	1.239	0.763	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	-0.15	Left	Tilt	Standard	20F53	1:1	0.239	1.239	0.296	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-4
GSM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.0	29.58	0.11	Right	Cheek	Standard	20F84	1:8.3	0.207	1.102	0.228	
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.14	Right	Tilt	Standard	20F84	1:8.3	0.147	1.102	0.162	
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.14	Left	Cheek	Standard	20F84	1:8.3	0.344	1.102	0.379	
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.15	Left	Cheek	Wireless Charging	20F84	1:8.3	0.408	1.102	0.450	A4
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.11	Left	Tilt	Standard	20F84	1:8.3	0.138	1.102	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							

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	0.01	Right	Cheek	Standard	20F84	1:1	0.460	1.122	0.516	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.03	Right	Tilt	Standard	20F84	1:1	0.286	1.122	0.321	
1852.40	9262	UMTS 1900	RMC	23.5	23.24	-0.04	Left	Cheek	Standard	20F84	1:1	0.699	1.062	0.742	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.08	Left	Cheek	Standard	20F84	1:1	0.765	1.122	**0.858**	A5
1907.60	9538	UMTS 1900	RMC	23.5	22.85	0.11	Left	Cheek	Standard	20F84	1:1	0.735	1.161	0.853	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.09	Left	Cheek	Wireless Charging	20F84	1:1	0.554	1.122	0.622	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	0.06	Left	Tilt	Standard	20F84	1:1	0.254	1.122	0.285	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-6
LTE Band 17 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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	Standard	24.0	23.45	0.19	0	Right	Cheek	QPSK	1	0	20F80	1:1	0.049	1.135	0.056	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.03	1	Right	Cheek	QPSK	25	0	20F80	1:1	0.034	1.112	0.038	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	0.02	0	Right	Tilt	QPSK	1	0	20F80	1:1	0.030	1.135	0.034	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.03	1	Right	Tilt	QPSK	25	0	20F80	1:1	0.019	1.112	0.021	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	0.14	0	Left	Cheek	QPSK	1	0	20F80	1:1	0.058	1.135	0.066	A6
710.00	23790	Mid	LTE Band 17	10	Wireless Charging	24.0	23.45	0.02	0	Left	Cheek	QPSK	1	0	20F80	1:1	0.047	1.135	0.053	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.04	1	Left	Cheek	QPSK	25	0	20F80	1:1	0.043	1.112	0.048	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	0.03	0	Left	Tilt	QPSK	1	0	20F80	1:1	0.031	1.135	0.035	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.18	1	Left	Tilt	QPSK	25	0	20F80	1:1	0.023	1.112	0.026	
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 5 (Cell) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	0.18	0	Right	Cheek	QPSK	1	25	20F53	1:1	0.108	1.167	0.126	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.20	1	Right	Cheek	QPSK	25	25	20F53	1:1	0.091	1.178	0.107	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	0.15	0	Right	Tilt	QPSK	1	25	20F53	1:1	0.085	1.167	0.099	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.17	1	Right	Tilt	QPSK	25	25	20F53	1:1	0.073	1.178	0.086	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	0.08	0	Left	Cheek	QPSK	1	25	20F53	1:1	0.159	1.167	0.186	A7
836.50	20525	Mid	LTE Band 5 (Cell)	10	Wireless Charging	24.0	23.33	0.08	0	Left	Cheek	QPSK	1	25	20F53	1:1	0.109	1.167	0.127	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.06	1	Left	Cheek	QPSK	25	25	20F53	1:1	0.134	1.178	0.158	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	0.05	0	Left	Tilt	QPSK	1	25	20F53	1:1	0.086	1.167	0.100	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.02	1	Left	Tilt	QPSK	25	25	20F53	1:1	0.077	1.178	0.091	
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 4 (AWS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	-0.12	0	Right	Cheek	QPSK	1	50	20F83	1:1	0.293	1.161	0.340	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	0.16	1	Right	Cheek	QPSK	50	0	20F83	1:1	0.240	1.135	0.272	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.02	0	Right	Tilt	QPSK	1	50	20F83	1:1	0.222	1.161	0.258	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	0.00	1	Right	Tilt	QPSK	50	0	20F83	1:1	0.191	1.135	0.217	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.03	0	Left	Cheek	QPSK	1	50	20F83	1:1	0.688	1.161	0.799	A8
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Wireless Charging	24.0	23.35	0.00	0	Left	Cheek	QPSK	1	50	20F83	1:1	0.642	1.161	0.745	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	-0.07	1	Left	Cheek	QPSK	50	0	20F83	1:1	0.557	1.135	0.632	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.06	0	Left	Tilt	QPSK	1	50	20F83	1:1	0.252	1.161	0.293	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	0.01	1	Left	Tilt	QPSK	50	0	20F83	1:1	0.195	1.135	0.221	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-9
LTE Band 2 (PCS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.03	0	Right	Cheek	QPSK	1	50	20F84	1:1	0.344	1.033	0.355	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	-0.02	1	Right	Cheek	QPSK	50	0	20F84	1:1	0.305	1.009	0.308	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.09	0	Right	Tilt	QPSK	1	50	20F84	1:1	0.202	1.033	0.209	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.02	1	Right	Tilt	QPSK	50	0	20F84	1:1	0.189	1.009	0.191	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.09	0	Left	Cheek	QPSK	1	50	20F84	1:1	0.766	1.033	0.791	A9
1860.00	18700	Low	LTE Band 2 (PCS)	20	Wireless Charging	24.0	23.86	0.00	0	Left	Cheek	QPSK	1	50	20F84	1:1	0.732	1.033	0.756	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.01	1	Left	Cheek	QPSK	50	0	20F84	1:1	0.601	1.009	0.606	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	0.02	0	Left	Tilt	QPSK	1	50	20F84	1:1	0.222	1.033	0.229	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.02	1	Left	Tilt	QPSK	50	0	20F84	1:1	0.176	1.009	0.178	
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
DTS Head SAR Antenna 1

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	12.5	11.94	0.02	Right	Cheek	Standard	00F05	1	1:1	0.354	1.138	**0.403**	A10
2412	1	IEEE 802.11b	DSSS	12.5	11.94	0.17	Right	Cheek	Wireless Charging	00F05	1	1:1	0.347	1.138	0.395	
2412	1	IEEE 802.11b	DSSS	12.5	11.94	0.20	Right	Tilt	Standard	00F05	1	1:1	0.272	1.138	0.310	
2412	1	IEEE 802.11b	DSSS	12.5	11.94	0.10	Left	Cheek	Standard	00F05	1	1:1	0.231	1.138	0.263	
2412	1	IEEE 802.11b	DSSS	12.5	11.94	-0.02	Left	Tilt	Standard	00F05	1	1:1	0.195	1.138	0.222	
5785	157	IEEE 802.11a	OFDM	9.5	9.28	-0.03	Right	Cheek	Standard	F1186	6	1:1	0.293	1.052	0.308	
5745	149	IEEE 802.11a	OFDM	9.5	9.12	-0.06	Right	Tilt	Standard	F1186	6	1:1	0.352	1.091	0.384	
5785	157	IEEE 802.11a	OFDM	9.5	9.28	0.05	Right	Tilt	Standard	F1186	6	1:1	0.359	1.052	0.378	A11
5805	161	IEEE 802.11a	OFDM	9.5	9.19	0.03	Right	Tilt	Standard	F1186	6	1:1	0.333	1.074	0.358	
5775	155	IEEE 802.11ac	OFDM	9.5	9.01	0.08	Right	Tilt	Standard	F1186	29.3	1:1	0.199	1.119	0.223	
5785	157	IEEE 802.11a	OFDM	9.5	9.28	0.14	Left	Cheek	Standard	F1186	6	1:1	0.339	1.052	0.357	
5785	157	IEEE 802.11a	OFDM	9.5	9.28	-0.05	Left	Tilt	Standard	F1186	6	1:1	0.343	1.052	0.361	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-11
NII Head SAR Antenna 1

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5180	36	IEEE 802.11a	OFDM	9.5	9.25	0.21	Right	Cheek	Standard	F1186	6	1:1	0.099	1.059	0.105	
5180	36	IEEE 802.11a	OFDM	9.5	9.25	0.16	Right	Tilt	Standard	F1186	6	1:1	0.111	1.059	0.118	
5210	42	IEEE 802.11ac	OFDM	9.5	9.30	-0.01	Right	Tilt	Standard	F1186	29.3	1:1	0.068	1.047	0.071	
5180	36	IEEE 802.11a	OFDM	9.5	9.25	0.17	Left	Cheek	Standard	F1186	6	1:1	0.094	1.059	0.100	
5180	36	IEEE 802.11a	OFDM	9.5	9.25	0.04	Left	Tilt	Standard	F1186	6	1:1	0.104	1.059	0.110	
5260	52	IEEE 802.11a	OFDM	9.5	9.33	0.03	Right	Cheek	Standard	F1186	6	1:1	0.149	1.040	0.155	
5260	52	IEEE 802.11a	OFDM	9.5	9.33	0.17	Right	Tilt	Standard	F1186	6	1:1	0.175	1.040	0.182	
5290	58	IEEE 802.11ac	OFDM	9.5	8.77	0.04	Right	Tilt	Standard	F1186	29.3	1:1	0.111	1.183	0.131	
5260	52	IEEE 802.11a	OFDM	9.5	9.33	0.21	Left	Cheek	Standard	F1186	6	1:1	0.136	1.040	0.141	
5260	52	IEEE 802.11a	OFDM	9.5	9.33	0.03	Left	Tilt	Standard	F1186	6	1:1	0.156	1.040	0.162	
5580	116	IEEE 802.11a	OFDM	9.5	9.46	-0.03	Right	Cheek	Standard	F1186	6	1:1	0.232	1.009	0.234	
5500	100	IEEE 802.11a	OFDM	9.5	9.45	0.00	Right	Tilt	Standard	F1186	6	1:1	0.389	1.012	0.394	
5580	116	IEEE 802.11a	OFDM	9.5	9.46	-0.05	Right	Tilt	Standard	F1186	6	1:1	0.323	1.009	0.326	
5680	136	IEEE 802.11a	OFDM	9.5	9.39	-0.03	Right	Tilt	Standard	F1186	6	1:1	0.381	1.026	0.391	
5530	106	IEEE 802.11ac	OFDM	9.5	9.16	-0.01	Right	Tilt	Standard	F1186	29.3	1:1	0.213	1.081	0.230	
5500	100	IEEE 802.11a	OFDM	9.5	9.45	-0.15	Right	Tilt	Wireless Charging	F1186	6	1:1	0.554	1.012	**0.561**	A12
5580	116	IEEE 802.11a	OFDM	9.5	9.46	-0.04	Left	Cheek	Standard	F1186	6	1:1	0.303	1.009	0.306	
5580	116	IEEE 802.11a	OFDM	9.5	9.46	0.19	Left	Tilt	Standard	F1186	6	1:1	0.334	1.009	0.337	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Head** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-12
DTS Head SAR Antenna 2

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	12.5	11.74	0.04	Right	Cheek	Standard	00F05	1	1:1	0.110	1.191	0.131	
2412	1	IEEE 802.11b	DSSS	12.5	11.74	0.17	Right	Tilt	Standard	00F05	1	1:1	0.025	1.191	0.030	
2412	1	IEEE 802.11b	DSSS	12.5	11.74	0.03	Left	Cheek	Standard	00F05	1	1:1	0.046	1.191	0.055	
2412	1	IEEE 802.11b	DSSS	12.5	11.74	0.04	Left	Tilt	Standard	00F05	1	1:1	0.020	1.191	0.024	
5765	153	IEEE 802.11a	OFDM	9.5	9.19	0.03	Right	Cheek	Standard	F1186	6	1:1	0.034	1.074	0.037	
5765	153	IEEE 802.11a	OFDM	9.5	9.19	-0.04	Right	Tilt	Standard	F1186	6	1:1	0.041	1.074	0.044	
5775	155	IEEE 802.11ac	OFDM	9.5	8.85	-0.02	Right	Tilt	Standard	F1186	29.3	1:1	0.020	1.161	0.023	
5765	153	IEEE 802.11a	OFDM	9.5	9.19	0.03	Left	Cheek	Standard	F1186	6	1:1	0.011	1.074	0.012	
5765	153	IEEE 802.11a	OFDM	9.5	9.19	0.03	Left	Tilt	Standard	F1186	6	1:1	0.004	1.074	0.004	
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 11-13
NII Head SAR Antenna 2

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5220	44	IEEE 802.11a	OFDM	9.5	8.83	-0.11	Right	Cheek	Standard	F1186	6	1:1	0.121	1.167	0.141	
5210	42	IEEE 802.11ac	OFDM	9.5	8.12	0.20	Right	Cheek	Standard	F1186	29.3	1:1	0.076	1.374	0.104	
5220	44	IEEE 802.11a	OFDM	9.5	8.83	0.11	Right	Tilt	Standard	F1186	6	1:1	0.016	1.167	0.019	
5220	44	IEEE 802.11a	OFDM	9.5	8.83	0.11	Left	Cheek	Standard	F1186	6	1:1	0.017	1.167	0.020	
5220	44	IEEE 802.11a	OFDM	9.5	8.83	0.04	Left	Tilt	Standard	F1186	6	1:1	0.005	1.167	0.006	
5260	52	IEEE 802.11a	OFDM	9.5	8.79	0.14	Right	Cheek	Standard	F1186	6	1:1	0.102	1.178	0.120	
5290	58	IEEE 802.11ac	OFDM	9.5	8.33	0.06	Right	Cheek	Standard	F1186	29.3	1:1	0.066	1.309	0.086	
5260	52	IEEE 802.11a	OFDM	9.5	8.79	-0.17	Right	Tilt	Standard	F1186	6	1:1	0.010	1.178	0.012	
5260	52	IEEE 802.11a	OFDM	9.5	8.79	0.03	Left	Cheek	Standard	F1186	6	1:1	0.010	1.178	0.012	
5260	52	IEEE 802.11a	OFDM	9.5	8.79	0.14	Left	Tilt	Standard	F1186	6	1:1	0.006	1.178	0.007	
5680	136	IEEE 802.11a	OFDM	9.5	8.90	-0.05	Right	Cheek	Standard	F1186	6	1:1	0.039	1.148	0.045	
5530	106	IEEE 802.11ac	OFDM	9.5	8.52	-0.04	Right	Cheek	Standard	F1186	29.3	1:1	0.021	1.253	0.026	
5680	136	IEEE 802.11a	OFDM	9.5	8.90	-0.12	Right	Tilt	Standard	F1186	6	1:1	0.008	1.148	0.009	
5680	136	IEEE 802.11a	OFDM	9.5	8.90	0.11	Left	Cheek	Standard	F1186	6	1:1	0.000	1.148	0.000	
5680	136	IEEE 802.11a	OFDM	9.5	8.90	0.09	Left	Tilt	Standard	F1186	6	1:1	0.001	1.148	0.001	
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 11-14
DTS Head SAR MIMO

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11n	OFDM	12.5	11.85	0.14	Right	Cheek	Standard	00F05	13	1:1	0.205	1.161	0.238	
2412	1	IEEE 802.11n	OFDM	12.5	11.85	0.03	Right	Cheek	Wireless Charging	00F05	13	1:1	0.120	1.161	0.139	
2412	1	IEEE 802.11n	OFDM	12.5	11.85	0.15	Right	Tilt	Standard	00F05	13	1:1	0.171	1.161	0.199	
2412	1	IEEE 802.11n	OFDM	12.5	11.85	0.03	Left	Cheek	Standard	00F05	13	1:1	0.156	1.161	0.181	
2412	1	IEEE 802.11n	OFDM	12.5	11.85	0.03	Left	Tilt	Standard	00F05	13	1:1	0.129	1.161	0.150	
5765	153	IEEE 802.11n	OFDM	9.5	7.74	-0.17	Right	Cheek	Standard	F1186	13	1:1	0.006	1.500	0.009	
5765	153	IEEE 802.11n	OFDM	9.5	7.74	0.11	Right	Tilt	Standard	F1186	13	1:1	0.051	1.500	0.077	
5765	153	IEEE 802.11n	OFDM	9.5	7.74	0.05	Left	Cheek	Standard	F1186	13	1:1	0.053	1.500	0.080	
5765	153	IEEE 802.11n	OFDM	9.5	7.74	0.08	Left	Tilt	Standard	F1186	13	1:1	0.054	1.500	0.081	

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 11-15
NII Head SAR MIMO

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Cover Type	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 802.11n	OFDM	9.5	8.33	0.05	Right	Cheek	Standard	F1186	13	1:1	0.033	1.309	0.043	
5240	48	IEEE 802.11n	OFDM	9.5	8.33	0.12	Right	Tilt	Standard	F1186	13	1:1	0.018	1.309	0.024	
5240	48	IEEE 802.11n	OFDM	9.5	8.33	0.04	Left	Cheek	Standard	F1186	13	1:1	0.018	1.309	0.024	
5240	48	IEEE 802.11n	OFDM	9.5	8.33	0.03	Left	Tilt	Standard	F1186	13	1:1	0.016	1.309	0.021	
5300	60	IEEE 802.11n	OFDM	9.5	8.30	0.10	Right	Cheek	Standard	F1186	13	1:1	0.023	1.318	0.030	
5300	60	IEEE 802.11n	OFDM	9.5	8.30	-0.03	Right	Tilt	Standard	F1186	13	1:1	0.025	1.318	0.033	
5300	60	IEEE 802.11n	OFDM	9.5	8.30	0.03	Left	Cheek	Standard	F1186	13	1:1	0.022	1.318	0.029	
5300	60	IEEE 802.11n	OFDM	9.5	8.30	0.02	Left	Tilt	Standard	F1186	13	1:1	0.022	1.318	0.029	
5500	100	IEEE 802.11n	OFDM	9.5	9.48	0.03	Right	Cheek	Standard	F1186	13	1:1	0.016	1.005	0.016	
5500	100	IEEE 802.11n	OFDM	9.5	9.48	0.05	Right	Tilt	Standard	F1186	13	1:1	0.070	1.005	0.070	
5500	100	IEEE 802.11n	OFDM	9.5	9.48	0.03	Right	Tilt	Wireless Charging	F1186	13	1:1	0.048	1.005	0.048	
5500	100	IEEE 802.11n	OFDM	9.5	9.48	0.01	Left	Cheek	Standard	F1186	13	1:1	0.054	1.005	0.054	
5500	100	IEEE 802.11n	OFDM	9.5	9.48	0.10	Left	Tilt	Standard	F1186	13	1:1	0.058	1.005	0.058	

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

11.2 Standalone Body-Worn SAR Data

Table 11-16
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.57	0.00	10 mm	Standard	20F82	1	1:8.3	back	0.314	1.104	0.347	A13
836.60	190	GSM 850	GSM	33.0	32.57	0.01	10 mm	Wireless Charging	20F82	1	1:8.3	back	0.195	1.104	0.215	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.03	10 mm	Standard	20F53	N/A	1:1	back	0.289	1.143	0.330	A15
836.60	4183	UMTS 850	RMC	24.0	23.42	0.03	10 mm	Wireless Charging	20F53	N/A	1:1	back	0.222	1.143	0.254	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.01	10 mm	Standard	20F53	N/A	1:1	back	0.623	1.239	0.772	A17
1732.40	1412	UMTS 1750	RMC	24.0	23.07	-0.12	10 mm	Wireless Charging	20F53	N/A	1:1	back	0.502	1.239	0.622	
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.06	10 mm	Standard	20F84	1	1:8.3	back	0.347	1.102	0.382	A19
1880.00	661	GSM 1900	GSM	30.0	29.58	-0.10	10 mm	Wireless Charging	20F84	1	1:8.3	back	0.254	1.102	0.280	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.07	10 mm	Standard	20F84	N/A	1:1	back	0.650	1.122	0.729	A21
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.06	10 mm	Wireless Charging	20F84	N/A	1:1	back	0.524	1.122	0.588	
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 11-17
LTE Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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	Standard	24.0	23.45	0.01	0	20F85	QPSK	1	0	10 mm	back	1:1	0.124	1.135	0.141	A22
710.00	23790	Mid	LTE Band 17	10	Wireless Charging	24.0	23.45	0.04	0	20F85	QPSK	1	0	10 mm	back	1:1	0.087	1.135	0.099	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.08	1	20F85	QPSK	25	0	10 mm	back	1:1	0.083	1.112	0.092	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	0.07	0	20FA1	QPSK	1	25	10 mm	back	1:1	0.397	1.167	0.463	A23
836.50	20525	Mid	LTE Band 5 (Cell)	10	Wireless Charging	24.0	23.33	0.02	0	20FA1	QPSK	1	25	10 mm	back	1:1	0.206	1.167	0.240	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	-0.02	1	20FA1	QPSK	25	25	10 mm	back	1:1	0.264	1.178	0.311	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.03	0	20F83	QPSK	1	50	10 mm	back	1:1	0.721	1.161	**0.837**	A24
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Wireless Charging	24.0	23.35	0.03	0	20F83	QPSK	1	50	10 mm	back	1:1	0.551	1.161	0.640	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	-0.02	1	20F83	QPSK	50	0	10 mm	back	1:1	0.561	1.135	0.637	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.20	-0.02	1	20F83	QPSK	100	0	10 mm	back	1:1	0.559	1.202	0.672	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.05	0	20F84	QPSK	1	50	10 mm	back	1:1	0.511	1.033	0.528	A26
1860.00	18700	Low	LTE Band 2 (PCS)	20	Wireless Charging	24.0	23.86	-0.04	0	20F84	QPSK	1	50	10 mm	back	1:1	0.464	1.033	0.479	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	-0.11	1	20F84	QPSK	50	0	10 mm	back	1:1	0.420	1.009	0.424	
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 11-18
DTS Body-Worn SAR Antenna 1

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	17.5	17.05	-0.08	10 mm	Standard	00F05	1	back	1:1	0.235	1.109	0.261	A28
2437	6	IEEE 802.11b	DSSS	17.5	17.05	0.16	10 mm	Wireless Charging	00F05	1	back	1:1	0.103	1.109	0.114	
5745	149	IEEE 802.11a	OFDM	14.0	13.31	-0.10	10 mm	Standard	14524	6	back	1:1	0.409	1.172	**0.479**	A29
5765	153	IEEE 802.11a	OFDM	14.0	13.21	-0.03	10 mm	Standard	14524	6	back	1:1	0.383	1.199	0.459	
5805	161	IEEE 802.11a	OFDM	14.0	13.20	0.12	10 mm	Standard	14524	6	back	1:1	0.392	1.202	0.471	
5775	155	IEEE 802.11ac	OFDM	11.5	11.25	-0.03	10 mm	Standard	14524	29.3	back	1:1	0.167	1.059	0.177	
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
NII Body-Worn SAR Antenna 1

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5220	44	IEEE 802.11a	OFDM	14.0	13.12	-0.01	10 mm	Standard	14524	6	back	1:1	0.049	1.225	0.060	
5210	42	IEEE 802.11ac	OFDM	11.5	10.71	-0.09	10 mm	Standard	14524	29.3	back	1:1	0.037	1.199	0.044	
5280	56	IEEE 802.11a	OFDM	14.0	12.97	0.04	10 mm	Standard	14524	6	back	1:1	0.141	1.268	0.179	
5290	58	IEEE 802.11ac	OFDM	11.5	10.77	-0.03	10 mm	Standard	14524	29.3	back	1:1	0.071	1.183	0.084	
5540	108	IEEE 802.11a	OFDM	14.0	13.41	-0.01	10 mm	Standard	14524	6	back	1:1	0.558	1.146	**0.639**	A31
5580	116	IEEE 802.11a	OFDM	14.0	13.40	0.12	10 mm	Standard	14524	6	back	1:1	0.491	1.148	0.564	
5660	132	IEEE 802.11a	OFDM	14.0	13.19	-0.12	10 mm	Standard	14524	6	back	1:1	0.383	1.205	0.462	
5530	106	IEEE 802.11ac	OFDM	11.5	11.15	0.15	10 mm	Standard	14524	29.3	back	1:1	0.237	1.084	0.257	
5540	108	IEEE 802.11a	OFDM	14.0	13.41	-0.12	10 mm	Wireless Charging	14524	6	back	1:1	0.436	1.146	0.500	
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
DTS Body-Worn SAR Antenna 2

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	17.07	0.04	10 mm	Standard	00F05	1	back	1:1	0.087	1.104	0.096	
5765	153	IEEE 802.11a	OFDM	14.0	13.44	0.10	10 mm	Standard	14524	6	back	1:1	0.287	1.138	0.327	
5775	155	IEEE 802.11ac	OFDM	11.5	11.26	0.03	10 mm	Standard	14524	29.3	back	1:1	0.128	1.057	0.135	
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 11-21
NII Body-Worn SAR Antenna 2

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5180	36	IEEE 802.11a	OFDM	14.0	13.94	-0.12	10 mm	Standard	14524	6	back	1:1	0.104	1.014	0.105	
5210	42	IEEE 802.11ac	OFDM	11.5	10.78	0.18	10 mm	Standard	14524	29.3	back	1:1	0.056	1.180	0.066	
5260	52	IEEE 802.11a	OFDM	14.0	13.21	-0.04	10 mm	Standard	14524	6	back	1:1	0.195	1.199	0.234	
5290	58	IEEE 802.11ac	OFDM	11.5	10.94	0.08	10 mm	Standard	14524	29.3	back	1:1	0.074	1.138	0.084	
5500	100	IEEE 802.11a	OFDM	14.0	13.26	0.03	10 mm	Standard	14524	6	back	1:1	0.296	1.186	0.351	
5530	106	IEEE 802.11ac	OFDM	11.5	10.98	-0.03	10 mm	Standard	14524	29.3	back	1:1	0.099	1.127	0.112	
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
DTS Body-Worn SAR MIMO

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.11	10 mm	Standard	00F05	13	back	1:1	0.066	1.030	0.068	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.10	10 mm	Wireless Charging	00F05	13	back	1:1	0.053	1.030	0.055	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.16	10 mm	Standard	14524	13	back	1:1	0.220	1.007	0.222	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.00	10 mm	Wireless Charging	14524	13	back	1:1	0.121	1.007	0.122	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-23
NII Body-Worn SAR MIMO

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)	
5180	36	IEEE 802.11n	OFDM	13.5	12.63	0.07	10 mm	14524	13	back	1:1	0.065	1.222	0.079	
5300	60	IEEE 802.11n	OFDM	13.5	12.77	0.09	10 mm	14524	13	back	1:1	0.060	1.183	0.071	
5500	100	IEEE 802.11n	OFDM	13.5	12.30	0.06	10 mm	14524	13	back	1:1	0.075	1.318	0.099	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

11.3 Standalone Wireless Router SAR Data

Table 11-24
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	29.0	28.94	0.20	10 mm	Standard	20F82	4	1:2.076	back	0.398	1.014	0.404	
836.60	190	GSM 850	GPRS	29.0	28.94	0.02	10 mm	Standard	20F82	4	1:2.076	front	0.327	1.014	0.332	
836.60	190	GSM 850	GPRS	29.0	28.94	0.04	10 mm	Standard	20F82	4	1:2.076	bottom	0.356	1.014	0.361	
836.60	190	GSM 850	GPRS	29.0	28.94	-0.02	10 mm	Standard	20F82	4	1:2.076	right	0.322	1.014	0.327	
836.60	190	GSM 850	GPRS	29.0	28.94	0.11	10 mm	Standard	20F82	4	1:2.076	left	0.488	1.014	0.495	A14
836.60	190	GSM 850	GPRS	29.0	28.94	-0.15	10 mm	Wireless Charging	20F82	4	1:2.076	left	0.432	1.014	0.438	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.03	10 mm	Standard	20F53	N/A	1:1	back	0.289	1.143	0.330	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.02	10 mm	Standard	20F53	N/A	1:1	front	0.284	1.143	0.325	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.04	10 mm	Standard	20F53	N/A	1:1	bottom	0.191	1.143	0.218	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.06	10 mm	Standard	20F53	N/A	1:1	right	0.199	1.143	0.227	
836.60	4183	UMTS 850	RMC	24.0	23.42	0.02	10 mm	Standard	20F53	N/A	1:1	left	0.353	1.143	0.403	
836.60	4183	UMTS 850	RMC	24.0	23.42	-0.04	10 mm	Wireless Charging	20F53	N/A	1:1	left	0.355	1.143	0.406	A16
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.01	10 mm	Standard	20F53	N/A	1:1	back	0.623	1.239	0.772	
1712.40	1312	UMTS 1750	RMC	24.0	23.15	0.02	10 mm	Standard	20F53	N/A	1:1	front	0.748	1.216	0.910	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.02	10 mm	Standard	20F53	N/A	1:1	front	0.783	1.239	0.970	
1752.50	1862	UMTS 1750	RMC	24.0	23.10	0.12	10 mm	Standard	20F53	N/A	1:1	front	0.811	1.230	0.998	
1752.50	1862	UMTS 1750	RMC	24.0	23.10	0.01	10 mm	Wireless Charging	20F53	N/A	1:1	front	0.863	1.230	**1.061**	A18
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.03	10 mm	Standard	20F53	N/A	1:1	bottom	0.229	1.239	0.284	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.15	10 mm	Standard	20F53	N/A	1:1	right	0.077	1.239	0.095	
1732.40	1412	UMTS 1750	RMC	24.0	23.07	0.03	10 mm	Standard	20F53	N/A	1:1	left	0.363	1.239	0.450	
1880.00	661	GSM 1900	GPRS	25.0	24.57	0.01	10 mm	Standard	20F84	4	1:2.076	back	0.403	1.104	0.445	
1880.00	661	GSM 1900	GPRS	25.0	24.57	-0.06	10 mm	Standard	20F84	4	1:2.076	front	0.457	1.104	0.505	A20
1880.00	661	GSM 1900	GPRS	25.0	24.57	0.00	10 mm	Wireless Charging	20F84	4	1:2.076	front	0.407	1.104	0.449	
1880.00	661	GSM 1900	GPRS	25.0	24.57	0.03	10 mm	Standard	20F84	4	1:2.076	bottom	0.193	1.104	0.213	
1880.00	661	GSM 1900	GPRS	25.0	24.57	0.15	10 mm	Standard	20F84	4	1:2.076	right	0.040	1.104	0.044	
1880.00	661	GSM 1900	GPRS	25.0	24.57	0.05	10 mm	Standard	20F84	4	1:2.076	left	0.312	1.104	0.344	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.07	10 mm	Standard	20F84	N/A	1:1	back	0.650	1.122	0.729	A21
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.06	10 mm	Wireless Charging	20F84	N/A	1:1	back	0.524	1.122	0.588	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.09	10 mm	Standard	20F84	N/A	1:1	front	0.473	1.122	0.531	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	0.01	10 mm	Standard	20F84	N/A	1:1	bottom	0.262	1.122	0.294	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.13	10 mm	Standard	20F84	N/A	1:1	right	0.053	1.122	0.059	
1880.00	9400	UMTS 1900	RMC	23.5	23.00	-0.11	10 mm	Standard	20F84	N/A	1:1	left	0.388	1.122	0.435	
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 11-25
LTE Band 17 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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	Standard	24.0	23.45	0.01	0	20F85	QPSK	1	0	10 mm	back	1:1	0.124	1.135	0.141	A22
710.00	23790	Mid	LTE Band 17	10	Wireless Charging	24.0	23.45	0.04	0	20F85	QPSK	1	0	10 mm	back	1:1	0.087	1.135	0.099	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.08	1	20F85	QPSK	25	0	10 mm	back	1:1	0.083	1.112	0.092	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	-0.02	0	20F85	QPSK	1	0	10 mm	front	1:1	0.104	1.135	0.118	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	-0.05	1	20F85	QPSK	25	0	10 mm	front	1:1	0.066	1.112	0.073	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	-0.04	0	20F85	QPSK	1	0	10 mm	bottom	1:1	0.080	1.135	0.091	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	-0.11	1	20F85	QPSK	25	0	10 mm	bottom	1:1	0.051	1.112	0.057	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	0.02	0	20F85	QPSK	1	0	10 mm	right	1:1	0.028	1.135	0.032	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	-0.02	1	20F85	QPSK	25	0	10 mm	right	1:1	0.016	1.112	0.018	
710.00	23790	Mid	LTE Band 17	10	Standard	24.0	23.45	-0.03	0	20F85	QPSK	1	0	10 mm	left	1:1	0.068	1.135	0.077	
710.00	23790	Mid	LTE Band 17	10	Standard	23.0	22.54	0.10	1	20F85	QPSK	25	0	10 mm	left	1:1	0.043	1.112	0.048	
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 11-26
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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	Standard	24.0	23.33	0.07	0	20FA1	QPSK	1	25	10 mm	back	1:1	0.397	1.167	0.463	A23
836.50	20525	Mid	LTE Band 5 (Cell)	10	Wireless Charging	24.0	23.33	0.02	0	20FA1	QPSK	1	25	10 mm	back	1:1	0.206	1.167	0.240	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	-0.02	1	20FA1	QPSK	25	25	10 mm	back	1:1	0.264	1.178	0.311	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	-0.08	0	20FA1	QPSK	1	25	10 mm	front	1:1	0.286	1.167	0.334	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.11	1	20FA1	QPSK	25	25	10 mm	front	1:1	0.207	1.178	0.244	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	-0.06	0	20FA1	QPSK	1	25	10 mm	bottom	1:1	0.222	1.167	0.259	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.01	1	20FA1	QPSK	25	25	10 mm	bottom	1:1	0.157	1.178	0.185	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	-0.07	0	20FA1	QPSK	1	25	10 mm	right	1:1	0.169	1.167	0.197	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	-0.04	1	20FA1	QPSK	25	25	10 mm	right	1:1	0.113	1.178	0.133	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	24.0	23.33	-0.16	0	20FA1	QPSK	1	25	10 mm	left	1:1	0.376	1.167	0.439	
836.50	20525	Mid	LTE Band 5 (Cell)	10	Standard	23.0	22.29	0.04	1	20FA1	QPSK	25	25	10 mm	left	1:1	0.262	1.178	0.309	
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 11-27
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.03	0	20F83	QPSK	1	50	10 mm	back	1:1	0.721	1.161	0.837	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	-0.02	1	20F83	QPSK	50	0	10 mm	back	1:1	0.561	1.135	0.637	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.20	-0.02	1	20F83	QPSK	100	0	10 mm	back	1:1	0.559	1.202	0.672	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.02	0	20F83	QPSK	1	50	10 mm	front	1:1	0.807	1.161	0.937	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Wireless Charging	24.0	23.35	-0.02	0	20F83	QPSK	1	50	10 mm	front	1:1	0.867	1.161	1.007	A25
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	0.03	1	20F83	QPSK	50	0	10 mm	front	1:1	0.645	1.135	0.732	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.20	-0.02	1	20F83	QPSK	100	0	10 mm	front	1:1	0.678	1.202	0.815	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.00	0	20F83	QPSK	1	50	10 mm	bottom	1:1	0.295	1.161	0.342	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	-0.09	1	20F83	QPSK	50	0	10 mm	bottom	1:1	0.248	1.135	0.281	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.02	0	20F83	QPSK	1	50	10 mm	right	1:1	0.086	1.161	0.100	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	0.11	1	20F83	QPSK	50	0	10 mm	right	1:1	0.068	1.135	0.077	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	24.0	23.35	0.00	0	20F83	QPSK	1	50	10 mm	left	1:1	0.456	1.161	0.529	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Standard	23.0	22.45	-0.07	1	20F83	QPSK	50	0	10 mm	left	1:1	0.362	1.135	0.411	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	Wireless Charging	24.0	23.35	0.01	0	20F83	QPSK	1	50	10 mm	front	1:1	0.830	1.161	0.964	
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 indicates variability measurement.

Table 11-28
LTE Band 2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Cover Type	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)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.05	0	20F84	QPSK	1	50	10 mm	back	1:1	0.511	1.033	0.528	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	-0.11	1	20F84	QPSK	50	0	10 mm	back	1:1	0.420	1.009	0.424	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.01	0	20F84	QPSK	1	50	10 mm	front	1:1	0.709	1.033	0.732	A27
1860.00	18700	Low	LTE Band 2 (PCS)	20	Wireless Charging	24.0	23.86	0.02	0	20F84	QPSK	1	50	10 mm	front	1:1	0.600	1.033	0.620	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.00	1	20F84	QPSK	50	0	10 mm	front	1:1	0.591	1.009	0.596	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.07	0	20F84	QPSK	1	50	10 mm	bottom	1:1	0.282	1.033	0.291	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.00	1	20F84	QPSK	50	0	10 mm	bottom	1:1	0.228	1.009	0.230	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.12	0	20F84	QPSK	1	50	10 mm	right	1:1	0.057	1.033	0.059	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	0.15	1	20F84	QPSK	50	0	10 mm	right	1:1	0.046	1.009	0.046	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	24.0	23.86	-0.01	0	20F84	QPSK	1	50	10 mm	left	1:1	0.507	1.033	0.524	
1860.00	18700	Low	LTE Band 2 (PCS)	20	Standard	23.0	22.96	-0.01	1	20F84	QPSK	50	0	10 mm	left	1:1	0.415	1.009	0.419	
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 11-29
WLAN Hotspot SAR Antenna 1

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	17.5	17.05	-0.08	10 mm	Standard	00F05	1	back	1:1	0.235	1.109	0.261	A28
2437	6	IEEE 802.11b	DSSS	17.5	17.05	0.16	10 mm	Wireless Charging	00F05	1	back	1:1	0.103	1.109	0.114	
2437	6	IEEE 802.11b	DSSS	17.5	17.05	0.06	10 mm	Standard	00F05	1	front	1:1	0.193	1.109	0.214	
2437	6	IEEE 802.11b	DSSS	17.5	17.05	0.04	10 mm	Standard	00F05	1	top	1:1	0.114	1.109	0.126	
2437	6	IEEE 802.11b	DSSS	17.5	17.05	0.04	10 mm	Standard	00F05	1	left	1:1	0.111	1.109	0.123	
5745	149	IEEE 802.11a	OFDM	14.0	13.31	-0.10	10 mm	Standard	14524	6	back	1:1	0.409	1.172	0.479	
5765	153	IEEE 802.11a	OFDM	14.0	13.21	-0.03	10 mm	Standard	14524	6	back	1:1	0.383	1.199	0.459	
5805	161	IEEE 802.11a	OFDM	14.0	13.20	0.12	10 mm	Standard	14524	6	back	1:1	0.392	1.202	0.471	
5745	149	IEEE 802.11a	OFDM	14.0	13.31	0.04	10 mm	Standard	14524	6	front	1:1	0.163	1.172	0.191	
5745	149	IEEE 802.11a	OFDM	14.0	13.31	0.13	10 mm	Standard	14524	6	top	1:1	0.559	1.172	0.655	
5765	153	IEEE 802.11a	OFDM	14.0	13.21	0.19	10 mm	Standard	14524	6	top	1:1	0.545	1.199	0.653	
5805	161	IEEE 802.11a	OFDM	14.0	13.20	0.05	10 mm	Standard	14524	6	top	1:1	0.569	1.202	**0.684**	A30
5775	155	IEEE 802.11ac	OFDM	11.5	11.25	0.04	10 mm	Standard	14524	29.3	top	1:1	0.312	1.059	0.330	
5805	161	IEEE 802.11a	OFDM	14.0	13.20	0.20	10 mm	Wireless Charging	14524	6	top	1:1	0.495	1.202	0.595	
5745	149	IEEE 802.11a	OFDM	14.0	13.31	0.16	10 mm	Standard	14524	6	left	1:1	0.033	1.172	0.039	
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 11-30
WLAN Hotspot SAR Antenna 2

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	17.07	0.04	10 mm	Standard	00F05	1	back	1:1	0.087	1.104	0.096	
2412	1	IEEE 802.11b	DSSS	17.5	17.07	0.09	10 mm	Standard	00F05	1	front	1:1	0.053	1.104	0.059	
2412	1	IEEE 802.11b	DSSS	17.5	17.07	0.05	10 mm	Standard	00F05	1	left	1:1	0.077	1.104	0.085	
5765	153	IEEE 802.11a	OFDM	14.0	13.44	0.10	10 mm	Standard	14524	6	back	1:1	0.287	1.138	0.327	
5775	155	IEEE 802.11ac	OFDM	11.5	11.26	0.03	10 mm	Standard	14524	29.3	back	1:1	0.128	1.057	0.135	
5765	153	IEEE 802.11a	OFDM	14.0	13.44	0.04	10 mm	Standard	14524	6	front	1:1	0.078	1.138	0.089	
5765	153	IEEE 802.11a	OFDM	14.0	13.44	0.02	10 mm	Standard	14524	6	left	1:1	0.173	1.138	0.197	
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 11-31
WLAN Hotspot SAR MIMO

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Cover Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.11	10 mm	Standard	00F05	13	back	1:1	0.066	1.030	0.068	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.10	10 mm	Wireless Charging	00F05	13	back	1:1	0.053	1.030	0.055	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.04	10 mm	Standard	00F05	13	front	1:1	0.056	1.030	0.058	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.04	10 mm	Standard	00F05	13	top	1:1	0.037	1.030	0.038	
2412	1	IEEE 802.11n	OFDM	14.0	13.87	0.15	10 mm	Standard	00F05	13	left	1:1	0.029	1.030	0.030	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.16	10 mm	Standard	14524	13	back	1:1	0.220	1.007	0.222	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.00	10 mm	Wireless Charging	14524	13	back	1:1	0.121	1.007	0.122	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	-0.01	10 mm	Standard	14524	13	front	1:1	0.032	1.007	0.032	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.06	10 mm	Standard	14524	13	top	1:1	0.097	1.007	0.098	
5765	153	IEEE 802.11n	OFDM	13.5	13.47	0.03	10 mm	Standard	14524	13	left	1:1	0.060	1.007	0.060	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram								

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements. A specialized battery 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 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 SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
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).
10. This DUT may be used with a wireless charging cover. Per FCC KDB Publication 648474 D04, SAR was measured using the standard battery cover and then repeated with the wireless charging cover for the highest reported SAR for each wireless technology, frequency band, operating mode, and exposure condition. No other additional testing with the wireless charging battery cover was required since all reported SAR was less than 1.2 W/kg.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D03v01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 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. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

WLAN Notes:

1. Justification for reduced test configurations for SISO 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 SISO 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 SISO 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 SISO 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 SISO IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
4. When Hotspot is enabled, all 5 GHz NII bands are disabled. Therefore no 5 GHz NII WIFI Wireless Router SAR Data was required.
5. WIFI transmission was verified using an uncalibrated spectrum analyzer.
6. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is >1.6 W/kg or the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other default channels were evaluated.
7. Per KDB 248227, SAR for MIMO was measured with both transmitting simultaneously and was evaluated independently of SISO operation. For 2.4 GHz MIMO, 802.11n was evaluated. For 5 GHz MIMO, 20 MHz BW 802.11n was evaluated. Additional evaluations for 40 MHz bandwidth 802.11n and 802.11ac were not required since the maximum allowed output power was not higher than 802.11n 20 MHz Bandwidth..
8. For SAR compliance, this device uses power reduction when the device is in a held-to-ear RF exposure condition with WIFI data modes. Therefore, WIFI Head SAR was evaluated at reduced power levels.

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 and IEEE 1528-2013 Section 6.3.4.1.2, 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 SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	10.00	10	**0.208**

Note: 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.

12.3 Head SAR Simultaneous Transmission Analysis

Table 12-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 1 (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.403	0.506	Head SAR	Right Cheek	0.185	0.403	**0.588**
	Right Tilt	0.089	0.310	0.399		Right Tilt	0.147	0.310	0.457
	Left Cheek	0.247	0.263	**0.510**		Left Cheek	0.256	0.263	0.519
	Left Tilt	0.100	0.222	0.322		Left Tilt	0.141	0.222	0.363
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.403	0.733	Head SAR	Right Cheek	0.228	0.403	0.631
	Right Tilt	0.291	0.310	0.601		Right Tilt	0.162	0.310	0.472
	Left Cheek	0.784	0.263	**1.047**		Left Cheek	0.450	0.263	**0.713**
	Left Tilt	0.296	0.222	0.518		Left Tilt	0.152	0.222	0.374

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.403	0.919	Head SAR	Right Cheek	0.056	0.403	**0.459**
	Right Tilt	0.321	0.310	0.631		Right Tilt	0.034	0.310	0.344
	Left Cheek	0.858	0.263	**1.121**		Left Cheek	0.066	0.263	0.329
	Left Tilt	0.285	0.222	0.507		Left Tilt	0.035	0.222	0.257
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.403	**0.529**	Head SAR	Right Cheek	0.340	0.403	0.743
	Right Tilt	0.099	0.310	0.409		Right Tilt	0.258	0.310	0.568
	Left Cheek	0.186	0.263	0.449		Left Cheek	0.799	0.263	**1.062**
	Left Tilt	0.100	0.222	0.322		Left Tilt	0.293	0.222	0.515

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	0.355	0.403	0.758
	Right Tilt	0.209	0.310	0.519
	Left Cheek	0.791	0.263	**1.054**
	Left Tilt	0.229	0.222	0.451

Table 12-3
Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 1 (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.308	0.411	Head SAR	Right Cheek	0.185	0.308	0.493
	Right Tilt	0.089	0.561	**0.650**		Right Tilt	0.147	0.561	**0.708**
	Left Cheek	0.247	0.357	0.604		Left Cheek	0.256	0.357	0.613
	Left Tilt	0.100	0.361	0.461		Left Tilt	0.141	0.361	0.502
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.308	0.638	Head SAR	Right Cheek	0.228	0.308	0.536
	Right Tilt	0.291	0.561	0.852		Right Tilt	0.162	0.561	0.723
	Left Cheek	0.784	0.357	**1.141**		Left Cheek	0.450	0.357	**0.807**
	Left Tilt	0.296	0.361	0.657		Left Tilt	0.152	0.361	0.513
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.308	0.824	Head SAR	Right Cheek	0.056	0.308	0.364
	Right Tilt	0.321	0.561	0.882		Right Tilt	0.034	0.561	**0.595**
	Left Cheek	0.858	0.357	**1.215**		Left Cheek	0.066	0.357	0.423
	Left Tilt	0.285	0.361	0.646		Left Tilt	0.035	0.361	0.396
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.308	0.434	Head SAR	Right Cheek	0.340	0.308	0.648
	Right Tilt	0.099	0.561	**0.660**		Right Tilt	0.258	0.561	0.819
	Left Cheek	0.186	0.357	0.543		Left Cheek	0.799	0.357	**1.156**
	Left Tilt	0.100	0.361	0.461		Left Tilt	0.293	0.361	0.654

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.355	0.308	0.663
	Right Tilt	0.209	0.561	0.770
	Left Cheek	0.791	0.357	**1.148**
	Left Tilt	0.229	0.361	0.590

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.131	0.234	Head SAR	Right Cheek	0.185	0.131	**0.316**
	Right Tilt	0.089	0.030	0.119		Right Tilt	0.147	0.030	0.177
	Left Cheek	0.247	0.055	**0.302**		Left Cheek	0.256	0.055	**0.311**
	Left Tilt	0.100	0.024	0.124		Left Tilt	0.141	0.024	0.165
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.131	0.461	Head SAR	Right Cheek	0.228	0.131	0.359
	Right Tilt	0.291	0.030	0.321		Right Tilt	0.162	0.030	0.192
	Left Cheek	0.784	0.055	**0.839**		Left Cheek	0.450	0.055	**0.505**
	Left Tilt	0.296	0.024	0.320		Left Tilt	0.152	0.024	0.176
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.131	0.647	Head SAR	Right Cheek	0.056	0.131	**0.187**
	Right Tilt	0.321	0.030	0.351		Right Tilt	0.034	0.030	0.064
	Left Cheek	0.858	0.055	**0.913**		Left Cheek	0.066	0.055	0.121
	Left Tilt	0.285	0.024	0.309		Left Tilt	0.035	0.024	0.059
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.131	**0.257**	Head SAR	Right Cheek	0.340	0.131	0.471
	Right Tilt	0.099	0.030	0.129		Right Tilt	0.258	0.030	0.288
	Left Cheek	0.186	0.055	0.241		Left Cheek	0.799	0.055	**0.854**
	Left Tilt	0.100	0.024	0.124		Left Tilt	0.293	0.024	0.317

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	0.355	0.131	0.486
	Right Tilt	0.209	0.030	0.239
	Left Cheek	0.791	0.055	**0.846**
	Left Tilt	0.229	0.024	0.253

Table 12-5
Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 2 (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.141	0.244	Head SAR	Right Cheek	0.185	0.141	**0.326**
	Right Tilt	0.089	0.044	0.133		Right Tilt	0.147	0.044	0.191
	Left Cheek	0.247	0.020	**0.267**		Left Cheek	0.256	0.020	0.276
	Left Tilt	0.100	0.007	0.107		Left Tilt	0.141	0.007	0.148
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.141	0.471	Head SAR	Right Cheek	0.228	0.141	0.369
	Right Tilt	0.291	0.044	0.335		Right Tilt	0.162	0.044	0.206
	Left Cheek	0.784	0.020	**0.804**		Left Cheek	0.450	0.020	**0.470**
	Left Tilt	0.296	0.007	0.303		Left Tilt	0.152	0.007	0.159
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.141	0.657	Head SAR	Right Cheek	0.056	0.141	**0.197**
	Right Tilt	0.321	0.044	0.365		Right Tilt	0.034	0.044	0.078
	Left Cheek	0.858	0.020	**0.878**		Left Cheek	0.066	0.020	0.086
	Left Tilt	0.285	0.007	0.292		Left Tilt	0.035	0.007	0.042

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.141	**0.267**	Head SAR	Right Cheek	0.340	0.141	0.481
	Right Tilt	0.099	0.044	0.143		Right Tilt	0.258	0.044	0.302
	Left Cheek	0.186	0.020	0.206		Left Cheek	0.799	0.020	**0.819**
	Left Tilt	0.100	0.007	0.107		Left Tilt	0.293	0.007	0.300

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.355	0.141	0.496
	Right Tilt	0.209	0.044	0.253
	Left Cheek	0.791	0.020	**0.811**
	Left Tilt	0.229	0.007	0.236

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-6
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.238	0.341	Head SAR	Right Cheek	0.185	0.238	0.423
	Right Tilt	0.089	0.199	0.288		Right Tilt	0.147	0.199	0.346
	Left Cheek	0.247	0.181	**0.428**		Left Cheek	0.256	0.181	**0.437**
	Left Tilt	0.100	0.150	0.250		Left Tilt	0.141	0.150	0.291
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.238	0.568	Head SAR	Right Cheek	0.228	0.238	0.466
	Right Tilt	0.291	0.199	0.490		Right Tilt	0.162	0.199	0.361
	Left Cheek	0.784	0.181	**0.965**		Left Cheek	0.450	0.181	**0.631**
	Left Tilt	0.296	0.150	0.446		Left Tilt	0.152	0.150	0.302
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.238	0.754	Head SAR	Right Cheek	0.056	0.238	**0.294**
	Right Tilt	0.321	0.199	0.520		Right Tilt	0.034	0.199	0.233
	Left Cheek	0.858	0.181	**1.039**		Left Cheek	0.066	0.181	0.247
	Left Tilt	0.285	0.150	0.435		Left Tilt	0.035	0.150	0.185
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.238	0.364	Head SAR	Right Cheek	0.340	0.238	0.578
	Right Tilt	0.099	0.199	0.298		Right Tilt	0.258	0.199	0.457
	Left Cheek	0.186	0.181	**0.367**		Left Cheek	0.799	0.181	**0.980**
	Left Tilt	0.100	0.150	0.250		Left Tilt	0.293	0.150	0.443

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	0.355	0.238	0.593
	Right Tilt	0.209	0.199	0.408
	Left Cheek	0.791	0.181	**0.972**
	Left Tilt	0.229	0.150	0.379

Table 12-7
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.103	0.043	0.146
	Right Tilt	0.089	0.077	0.166
	Left Cheek	0.247	0.080	**0.327**
	Left Tilt	0.100	0.081	0.181

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.185	0.043	0.228
	Right Tilt	0.147	0.077	0.224
	Left Cheek	0.256	0.080	**0.336**
	Left Tilt	0.141	0.081	0.222

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.330	0.043	0.373
	Right Tilt	0.291	0.077	0.368
	Left Cheek	0.784	0.080	**0.864**
	Left Tilt	0.296	0.081	0.377

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.228	0.043	0.271
	Right Tilt	0.162	0.077	0.239
	Left Cheek	0.450	0.080	**0.530**
	Left Tilt	0.152	0.081	0.233

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.516	0.043	0.559
	Right Tilt	0.321	0.077	0.398
	Left Cheek	0.858	0.080	**0.938**
	Left Tilt	0.285	0.081	0.366

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	0.043	0.099
	Right Tilt	0.034	0.077	0.111
	Left Cheek	0.066	0.080	**0.146**
	Left Tilt	0.035	0.081	0.116

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.126	0.043	0.169
	Right Tilt	0.099	0.077	0.176
	Left Cheek	0.186	0.080	**0.266**
	Left Tilt	0.100	0.081	0.181

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.340	0.043	0.383
	Right Tilt	0.258	0.077	0.335
	Left Cheek	0.799	0.080	**0.879**
	Left Tilt	0.293	0.081	0.374

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.355	0.043	0.398
	Right Tilt	0.209	0.077	0.286
	Left Cheek	0.791	0.080	**0.871**
	Left Tilt	0.229	0.081	0.310

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 1 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.261	0.608
Back Side	UMTS 850	0.330	0.261	0.591
Back Side	UMTS 1750	0.772	0.261	1.033
Back Side	GSM 1900	0.382	0.261	0.643
Back Side	UMTS 1900	0.729	0.261	0.990
Back Side	LTE Band 17	0.141	0.261	0.402
Back Side	LTE Band 5 (Cell)	0.463	0.261	0.724
Back Side	LTE Band 4 (AWS)	0.837	0.261	**1.098**
Back Side	LTE Band 2 (PCS)	0.528	0.261	0.789

Table 12-9
Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 1 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.639	0.986
Back Side	UMTS 850	0.330	0.639	0.969
Back Side	UMTS 1750	0.772	0.639	1.411
Back Side	GSM 1900	0.382	0.639	1.021
Back Side	UMTS 1900	0.729	0.639	1.368
Back Side	LTE Band 17	0.141	0.639	0.780
Back Side	LTE Band 5 (Cell)	0.463	0.639	1.102
Back Side	LTE Band 4 (AWS)	0.837	0.639	**1.476**
Back Side	LTE Band 2 (PCS)	0.528	0.639	1.167

The worst case 5 GHz WIFI reported SAR for each body-worn configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-10
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.208	0.555
Back Side	UMTS 850	0.330	0.208	0.538
Back Side	UMTS 1750	0.772	0.208	0.980
Back Side	GSM 1900	0.382	0.208	0.590
Back Side	UMTS 1900	0.729	0.208	0.937
Back Side	LTE Band 17	0.141	0.208	0.349
Back Side	LTE Band 5 (Cell)	0.463	0.208	0.671
Back Side	LTE Band 4 (AWS)	0.837	0.208	**1.045**
Back Side	LTE Band 2 (PCS)	0.528	0.208	0.736

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

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.096	0.443
Back Side	UMTS 850	0.330	0.096	0.426
Back Side	UMTS 1750	0.772	0.096	0.868
Back Side	GSM 1900	0.382	0.096	0.478
Back Side	UMTS 1900	0.729	0.096	0.825
Back Side	LTE Band 17	0.141	0.096	0.237
Back Side	LTE Band 5 (Cell)	0.463	0.096	0.559
Back Side	LTE Band 4 (AWS)	0.837	0.096	**0.933**
Back Side	LTE Band 2 (PCS)	0.528	0.096	0.624

Table 12-12
Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 2 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.351	0.698
Back Side	UMTS 850	0.330	0.351	0.681
Back Side	UMTS 1750	0.772	0.351	1.123
Back Side	GSM 1900	0.382	0.351	0.733
Back Side	UMTS 1900	0.729	0.351	1.080
Back Side	LTE Band 17	0.141	0.351	0.492
Back Side	LTE Band 5 (Cell)	0.463	0.351	0.814
Back Side	LTE Band 4 (AWS)	0.837	0.351	**1.188**
Back Side	LTE Band 2 (PCS)	0.528	0.351	0.879

The worst case 5 GHz WIFI reported SAR for each body-worn configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-13
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.068	0.415
Back Side	UMTS 850	0.330	0.068	0.398
Back Side	UMTS 1750	0.772	0.068	0.840
Back Side	GSM 1900	0.382	0.068	0.450
Back Side	UMTS 1900	0.729	0.068	0.797
Back Side	LTE Band 17	0.141	0.068	0.209
Back Side	LTE Band 5 (Cell)	0.463	0.068	0.531
Back Side	LTE Band 4 (AWS)	0.837	0.068	**0.905**
Back Side	LTE Band 2 (PCS)	0.528	0.068	0.596

Table 12-14
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.347	0.222	0.569
Back Side	UMTS 850	0.330	0.222	0.552
Back Side	UMTS 1750	0.772	0.222	0.994
Back Side	GSM 1900	0.382	0.222	0.604
Back Side	UMTS 1900	0.729	0.222	0.951
Back Side	LTE Band 17	0.141	0.222	0.363
Back Side	LTE Band 5 (Cell)	0.463	0.222	0.685
Back Side	LTE Band 4 (AWS)	0.837	0.222	**1.059**
Back Side	LTE Band 2 (PCS)	0.528	0.222	0.750

The worst case 5 GHz WIFI reported SAR for each body-worn configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

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 12-15
Simultaneous Transmission Scenario (2.4 GHz Hotspot Antenna 1 at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.261	**0.665**	Body SAR	Back	0.330	0.261	**0.591**
	Front	0.332	0.214	0.546		Front	0.325	0.214	0.539
	Top	-	0.126	0.126		Top	-	0.126	0.126
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.123	0.618		Left	0.406	0.123	0.529
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.261	1.033	Body SAR	Back	0.445	0.261	0.706
	Front	1.061	0.214	**1.275**		Front	0.505	0.214	**0.719**
	Top	-	0.126	0.126		Top	-	0.126	0.126
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.123	0.573		Left	0.344	0.123	0.467
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.261	**0.990**	Body SAR	Back	0.141	0.261	**0.402**
	Front	0.531	0.214	0.745		Front	0.118	0.214	0.332
	Top	-	0.126	0.126		Top	-	0.126	0.126
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.123	0.558		Left	0.077	0.123	0.200
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.261	**0.724**	Body SAR	Back	0.837	0.261	1.098
	Front	0.334	0.214	0.548		Front	1.007	0.214	**1.221**
	Top	-	0.126	0.126		Top	-	0.126	0.126
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.123	0.562		Left	0.529	0.123	0.652

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.261	0.789
	Front	0.732	0.214	**0.946**
	Top	-	0.126	0.126
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.123	0.647

Table 12-16
Simultaneous Transmission Scenario (5 GHz Hotspot Antenna 1 at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.479	**0.883**	Body SAR	Back	0.330	0.479	**0.809**
	Front	0.332	0.191	0.523		Front	0.325	0.191	0.516
	Top	-	0.684	0.684		Top	-	0.684	0.684
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.039	0.534		Left	0.406	0.039	0.445

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.479	1.251	Body SAR	Back	0.445	0.479	**0.924**
	Front	1.061	0.191	**1.252**		Front	0.505	0.191	0.696
	Top	-	0.684	0.684		Top	-	0.684	0.684
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.039	0.489		Left	0.344	0.039	0.383
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.479	**1.208**	Body SAR	Back	0.141	0.479	0.620
	Front	0.531	0.191	0.722		Front	0.118	0.191	0.309
	Top	-	0.684	0.684		Top	-	0.684	**0.684**
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.039	0.474		Left	0.077	0.039	0.116
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.479	**0.942**	Body SAR	Back	0.837	0.479	**1.316**
	Front	0.334	0.191	0.525		Front	1.007	0.191	1.198
	Top	-	0.684	0.684		Top	-	0.684	0.684
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.039	0.478		Left	0.529	0.039	0.568

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.479	**1.007**
	Front	0.732	0.191	0.923
	Top	-	0.684	0.684
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.039	0.563

Table 12-17
Simultaneous Transmission Scenario (2.4 GHz Hotspot Antenna 2 at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.096	0.500	Body SAR	Back	0.330	0.096	0.426
	Front	0.332	0.059	0.391		Front	0.325	0.059	0.384
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.085	**0.580**		Left	0.406	0.085	**0.491**
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.096	0.868	Body SAR	Back	0.445	0.096	0.541
	Front	1.061	0.059	**1.120**		Front	0.505	0.059	**0.564**
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.085	0.535		Left	0.344	0.085	0.429
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.096	**0.825**	Body SAR	Back	0.141	0.096	**0.237**
	Front	0.531	0.059	0.590		Front	0.118	0.059	0.177
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.085	0.520		Left	0.077	0.085	0.162

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.096	**0.559**	Body SAR	Back	0.837	0.096	0.933
	Front	0.334	0.059	0.393		Front	1.007	0.059	**1.066**
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.085	0.524		Left	0.529	0.085	0.614

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.096	0.624
	Front	0.732	0.059	**0.791**
	Top	-	-	0.000
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.085	0.609

Table 12-14
Simultaneous Transmission Scenario (5 GHz Hotspot Antenna 2 at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.327	**0.731**	Body SAR	Back	0.330	0.327	**0.657**
	Front	0.332	0.089	0.421		Front	0.325	0.089	0.414
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.197	0.692		Left	0.406	0.197	0.603
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.327	1.099	Body SAR	Back	0.445	0.327	**0.772**
	Front	1.061	0.089	**1.150**		Front	0.505	0.089	0.594
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.197	0.647		Left	0.344	0.197	0.541
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.327	**1.056**	Body SAR	Back	0.141	0.327	**0.468**
	Front	0.531	0.089	0.620		Front	0.118	0.089	0.207
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.197	0.632		Left	0.077	0.197	0.274
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.327	**0.790**	Body SAR	Back	0.837	0.327	**1.164**
	Front	0.334	0.089	0.423		Front	1.007	0.089	1.096
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.197	0.636		Left	0.529	0.197	0.726

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.327	**0.855**
	Front	0.732	0.089	0.821
	Top	-	-	0.000
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.197	0.721

Table 12-19
Simultaneous Transmission Scenario (2.4 GHz Hotspot MIMO at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.068	0.472	Body SAR	Back	0.330	0.068	0.398
	Front	0.332	0.058	0.390		Front	0.325	0.058	0.383
	Top	-	0.038	0.038		Top	-	0.038	0.038
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.030	**0.525**		Left	0.406	0.030	**0.436**
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.068	0.840	Body SAR	Back	0.445	0.068	0.513
	Front	1.061	0.058	**1.119**		Front	0.505	0.058	**0.563**
	Top	-	0.038	0.038		Top	-	0.038	0.038
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.030	0.480		Left	0.344	0.030	0.374
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.068	**0.797**	Body SAR	Back	0.141	0.068	**0.209**
	Front	0.531	0.058	0.589		Front	0.118	0.058	0.176
	Top	-	0.038	0.038		Top	-	0.038	0.038
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.030	0.465		Left	0.077	0.030	0.107
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.068	**0.531**	Body SAR	Back	0.837	0.068	0.905
	Front	0.334	0.058	0.392		Front	1.007	0.058	**1.065**
	Top	-	0.038	0.038		Top	-	0.038	0.038
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.030	0.469		Left	0.529	0.030	0.559

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.068	0.596
	Front	0.732	0.058	**0.790**
	Top	-	0.038	0.038
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.030	0.554

Table 12-20
Simultaneous Transmission Scenario (5 GHz Hotspot MIMO at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.404	0.222	**0.626**	Body SAR	Back	0.330	0.222	**0.552**
	Front	0.332	0.032	0.364		Front	0.325	0.032	**0.357**
	Top	-	0.098	0.098		Top	-	0.098	0.098
	Bottom	0.361	-	0.361		Bottom	0.218	-	0.218
	Right	0.327	-	0.327		Right	0.227	-	0.227
	Left	0.495	0.060	0.555		Left	0.406	0.060	0.466
Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.772	0.222	0.994	Body SAR	Back	0.445	0.222	**0.667**
	Front	1.061	0.032	**1.093**		Front	0.505	0.032	0.537
	Top	-	0.098	0.098		Top	-	0.098	0.098
	Bottom	0.284	-	0.284		Bottom	0.213	-	0.213
	Right	0.095	-	0.095		Right	0.044	-	0.044
	Left	0.450	0.060	0.510		Left	0.344	0.060	0.404

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.222	**0.951**	Body SAR	Back	0.141	0.222	**0.363**
	Front	0.531	0.032	0.563		Front	0.118	0.032	0.150
	Top	-	0.098	0.098		Top	-	0.098	0.098
	Bottom	0.294	-	0.294		Bottom	0.091	-	0.091
	Right	0.059	-	0.059		Right	0.032	-	0.032
	Left	0.435	0.060	0.495		Left	0.077	0.060	0.137

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.463	0.222	**0.685**	Body SAR	Back	0.837	0.222	**1.059**
	Front	0.334	0.032	0.366		Front	1.007	0.032	1.039
	Top	-	0.098	0.098		Top	-	0.098	0.098
	Bottom	0.259	-	0.259		Bottom	0.342	-	0.342
	Right	0.197	-	0.197		Right	0.100	-	0.100
	Left	0.439	0.060	0.499		Left	0.529	0.060	0.589

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.528	0.222	0.750
	Front	0.732	0.032	**0.764**
	Top	-	0.098	0.098
	Bottom	0.291	-	0.291
	Right	0.059	-	0.059
	Left	0.524	0.060	0.584

12.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v05 and IEEE 1528-2013 Section 6.3.4.1.2.

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

Table 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Cover Type	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)	
1750	1732.50	20175	LTE Band 4 (AWS)	QPSK, 1 RB, 50 RB Offset	Wireless Charging	front	10 mm	0.867	0.830	1.04	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.

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/30/2013	Annual	10/30/2014	1833460
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	8753E	(30kHz-6GHz) Network Analyzer	7/23/2013	Annual	7/23/2014	US37390350
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
SPEAG	D1750V2	1750 MHz SAR Dipole	4/30/2013	Annual	4/30/2014	1051
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2013	Annual	5/14/2014	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2013	Annual	7/22/2014	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2013	Annual	8/23/2014	719
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/14/2013	Annual	2/14/2014	1120
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/27/2014	Annual	1/27/2015	1057
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
SPEAG	D750V3	750 MHz Dipole	3/18/2013	Annual	3/18/2014	1054
SPEAG	D750V3	750 MHz Dipole	1/20/2014	Annual	1/20/2015	1003
SPEAG	D835V2	835 MHz SAR Dipole	4/25/2013	Annual	4/25/2014	4d119
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	9/23/2013	Annual	9/23/2014	109892
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2013	Annual	3/8/2014	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/22/2013	Annual	4/22/2014	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/13/2013	Annual	5/13/2014	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/21/2013	Annual	8/21/2014	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2013	Annual	9/17/2014	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/18/2013	Annual	11/18/2014	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2014	Annual	1/22/2015	1272
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/14/2013	Annual	5/14/2014	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/13/2013	Annual	11/13/2014	1091
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
VWR	23226-658	Long Stem Thermometer	3/30/2012	Biennial	3/30/2014	122179874
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	6/6/2013	Annual	6/6/2014	111427
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/4/2013	Annual	10/4/2014	108798
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Agilent	N5182A	MXG Vector Signal Generator	10/28/2013	Annual	10/28/2014	US46240505
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2013	Annual	8/18/2014	1008
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2013	Annual	8/18/2014	1009
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Anritsu	MA2481A	Power Sensor	10/30/2013	Annual	10/30/2014	5605
Anritsu	MA2411B	Pulse Power Sensor	11/14/2013	Annual	11/14/2014	1126066
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
SPEAG	ES3DV3	SAR Probe	3/15/2013	Annual	3/15/2014	3209
SPEAG	ES3DV3	SAR Probe	4/29/2013	Annual	4/29/2014	3318
SPEAG	ES3DV3	SAR Probe	5/16/2013	Annual	5/16/2014	3263
SPEAG	ES3DV2	SAR Probe	8/22/2013	Annual	8/22/2014	3022
SPEAG	ES3DV3	SAR Probe	9/23/2013	Annual	9/23/2014	3288
SPEAG	EX3DV4	SAR Probe	10/23/2013	Annual	10/23/2014	3914
SPEAG	ES3DV3	SAR Probe	11/20/2013	Annual	11/20/2014	3287
SPEAG	ES3DV3	SAR Probe	11/22/2013	Annual	11/22/2014	3333
SPEAG	ES3DV3	SAR Probe	11/25/2013	Annual	11/25/2014	3332
SPEAG	EX3DV4	SAR Probe	1/29/2014	Annual	1/29/2015	3589
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
Rohde & Schwarz	SME06	Signal Generator	10/30/2013	Annual	10/30/2014	832026
Rohde & Schwarz	NRVS	Single Channel Power Meter	10/31/2013	Annual	10/31/2014	835360/0079
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Agilent	85047A	S-Parameter Test Set	N/A	N/A	N/A	2904A00579
Fisher Scientific	15-077-960	Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Gigatronics	8651A	Universal Power Meter	10/30/2013	Annual	10/30/2014	8650319
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349514
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349503
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Annual	8/8/2014	130477877
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43304447

Note:

1. 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.
2. Each equipment item was used solely within its respective calibration period.

15 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

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

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

Applicable for frequencies up to 6 GHz.

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

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

16 CONCLUSION

16.1 Measurement Conclusion

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

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

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

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

[23] FCC SAR Test Procedures for 2G-3G Devices, Mobile Hotspot and UMPC Devices KDB Publications 941225, D01-D07

[24] SAR Measurement procedures for IEEE 802.11a/b/g KDB Publication 248227 D01v01r02

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D02-D04

[26] FCC SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers, FCC KDB Publication 616217 D04

[27] FCC SAR Measurement and Reporting Requirements for 100MHz – 6 GHz, KDB Publications 865664 D01-D02

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

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

[30] 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.

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20FA1

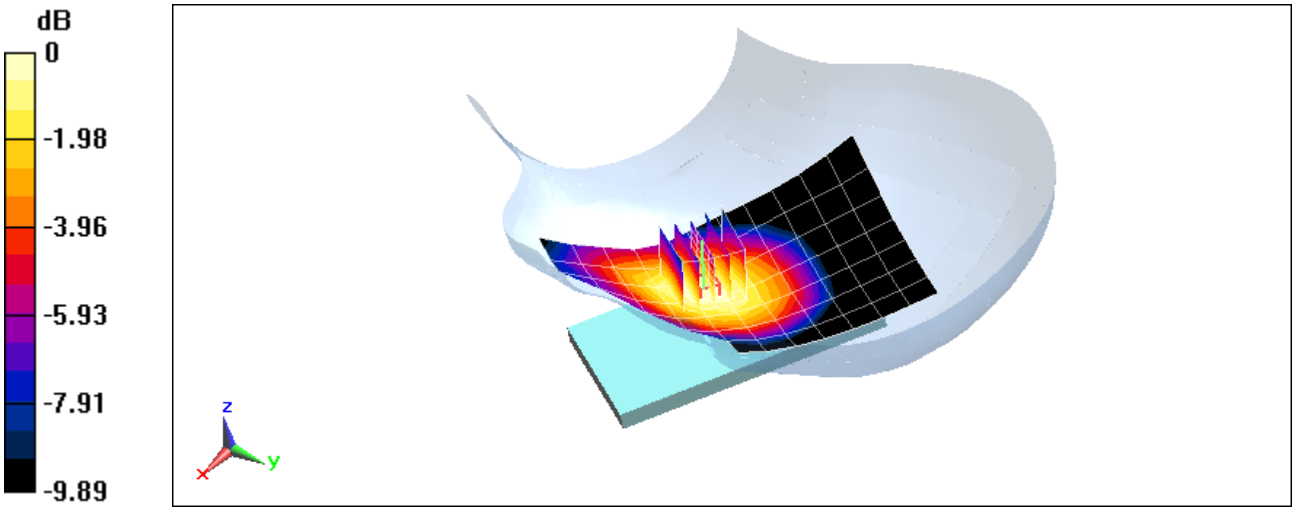
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.926$ S/m; $\varepsilon_r = 41.685$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 02-10-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.9°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 850, Left Head, Cheek, Mid.ch, Standard Battery Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.341 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.292 W/kg
SAR(1 g) = 0.224 W/kg



0 dB = 0.235 W/kg = -6.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F93

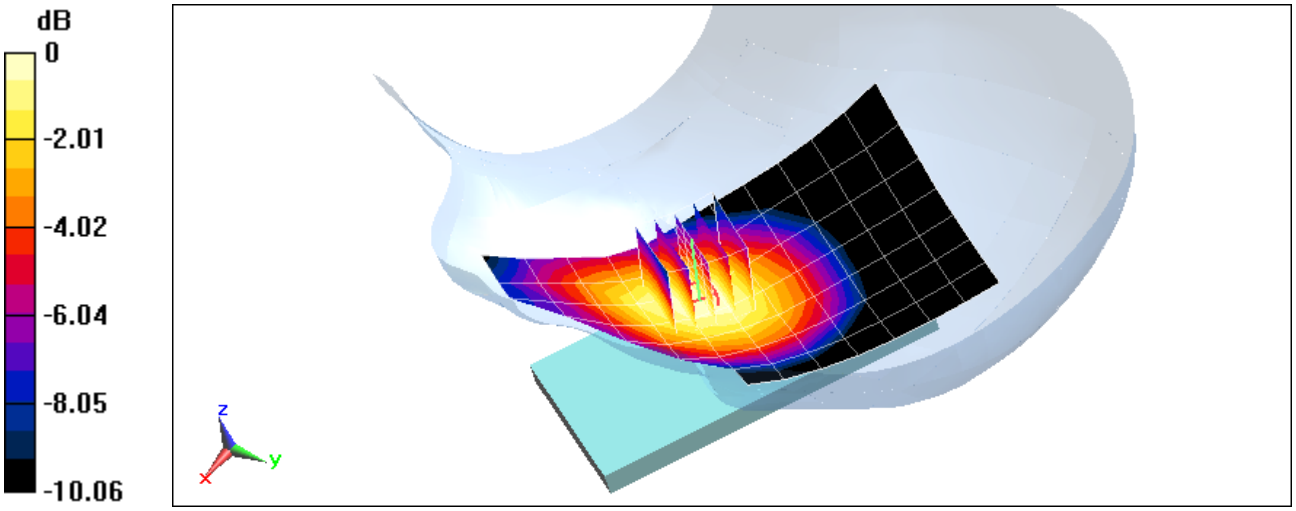
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.926$ S/m; $\varepsilon_r = 41.685$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 02-10-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.9°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Left Head, Cheek, Mid.ch, Standard Battery Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.649 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.295 W/kg
SAR(1 g) = 0.224 W/kg



0 dB = 0.234 W/kg = -6.31 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

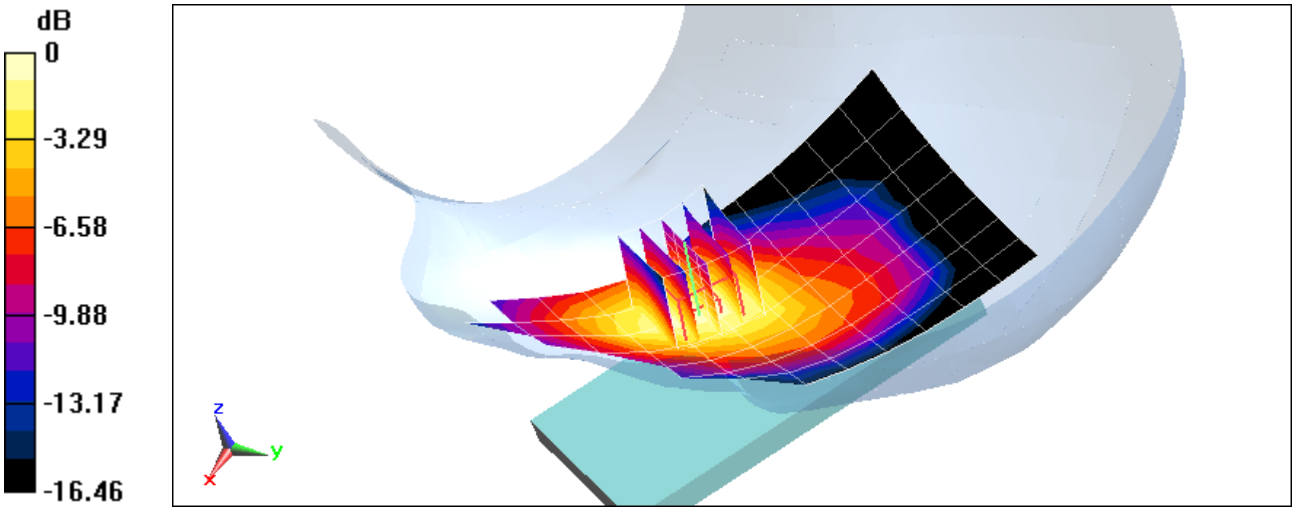
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.351 S/m; ε_r = 38.947; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-13-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1750, Left Head, Cheek, Mid.ch, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.452 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.946 W/kg
SAR(1 g) = 0.633 W/kg



0 dB = 0.686 W/kg = -1.64 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

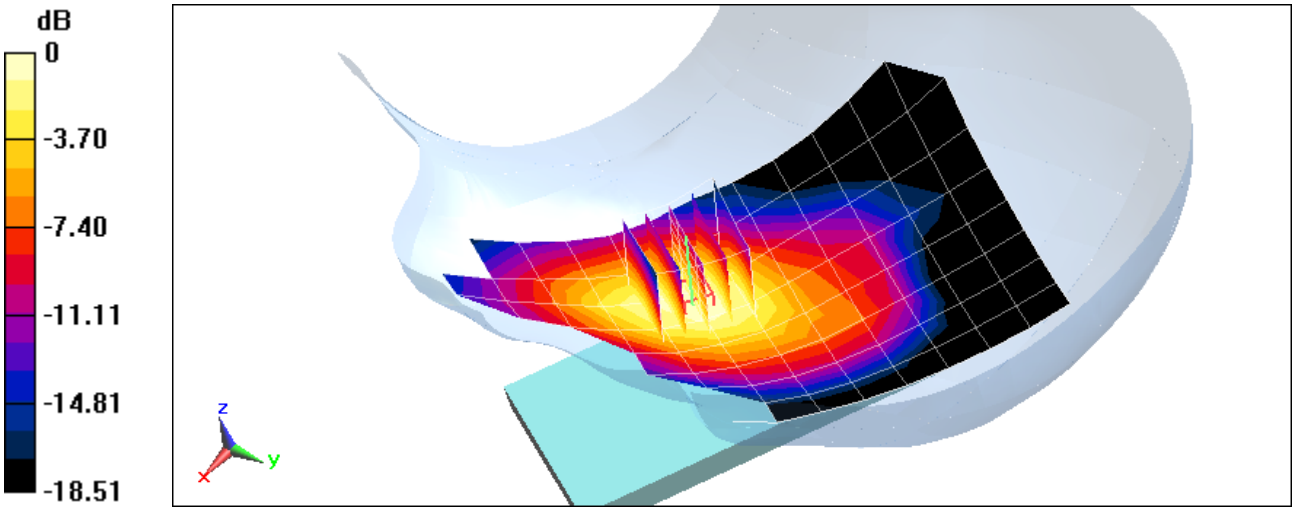
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.128; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-12-2014; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.08, 5.08, 5.08); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 1900, Left Head, Cheek, Mid.ch, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.749 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.621 W/kg
SAR(1 g) = 0.408 W/kg



0 dB = 0.445 W/kg = -3.52 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

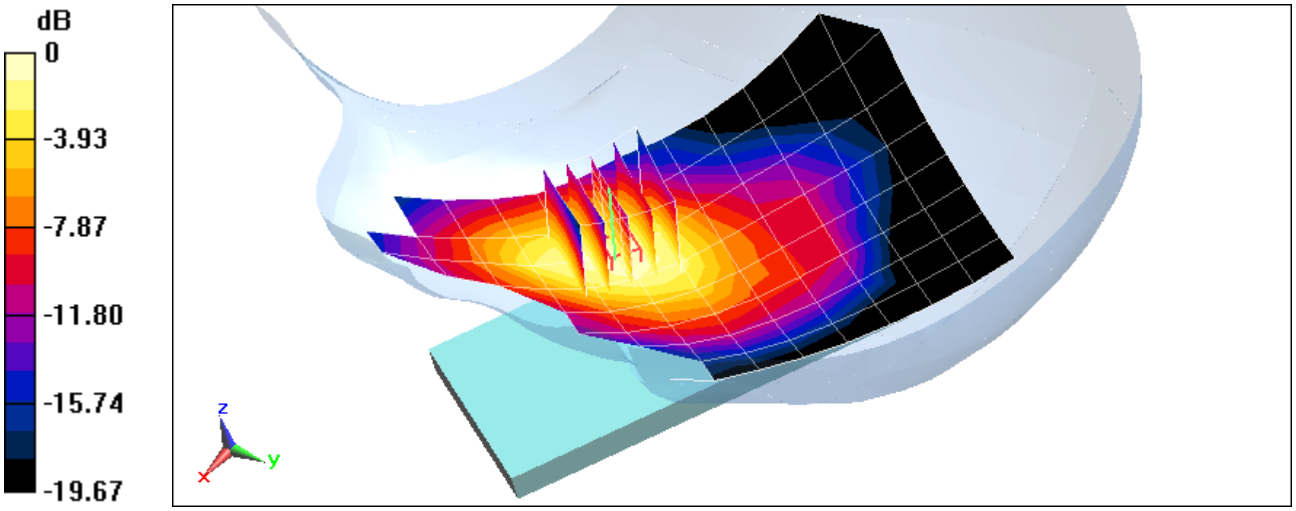
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.128; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-12-2014; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.08, 5.08, 5.08); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Left Head, Cheek, Mid.ch, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.912 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.765 W/kg



0 dB = 0.830 W/kg = -0.81 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F80

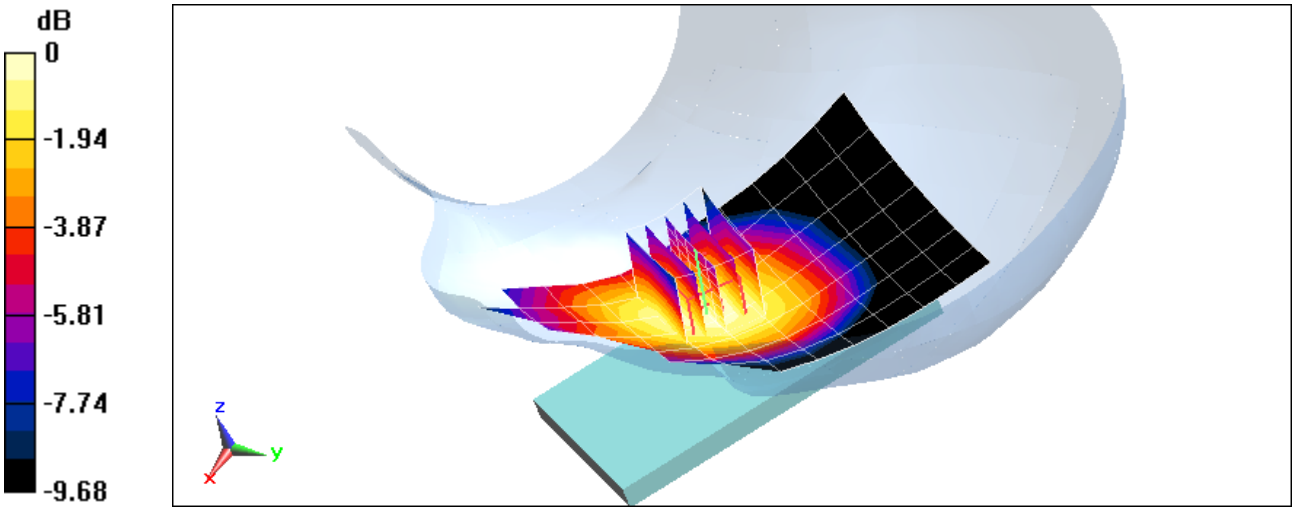
Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used:
f = 710 MHz; σ = 0.872 S/m; ε_r = 41.681; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-13-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.7°C

Probe: ES3DV3 - SN3287; ConvF(6.52, 6.52, 6.52); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 17, Left Head, Cheek, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 0 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.684 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.0730 W/kg
SAR(1 g) = 0.058 W/kg



0 dB = 0.0611 W/kg = -12.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

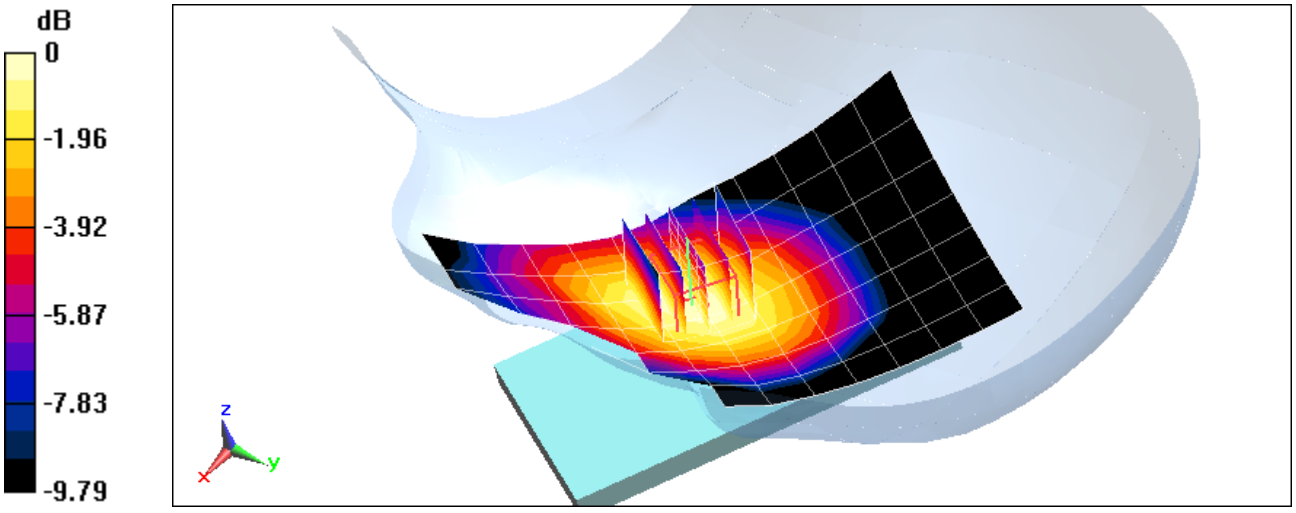
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.5$ MHz; $\sigma = 0.933$ S/m; $\varepsilon_r = 42.58$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 02-10-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49); Calibrated: 1/29/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
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, 25 RB Offset, Standard Battery Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.717 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.203 W/kg
SAR(1 g) = 0.159 W/kg



0 dB = 0.168 W/kg = -7.75 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F83

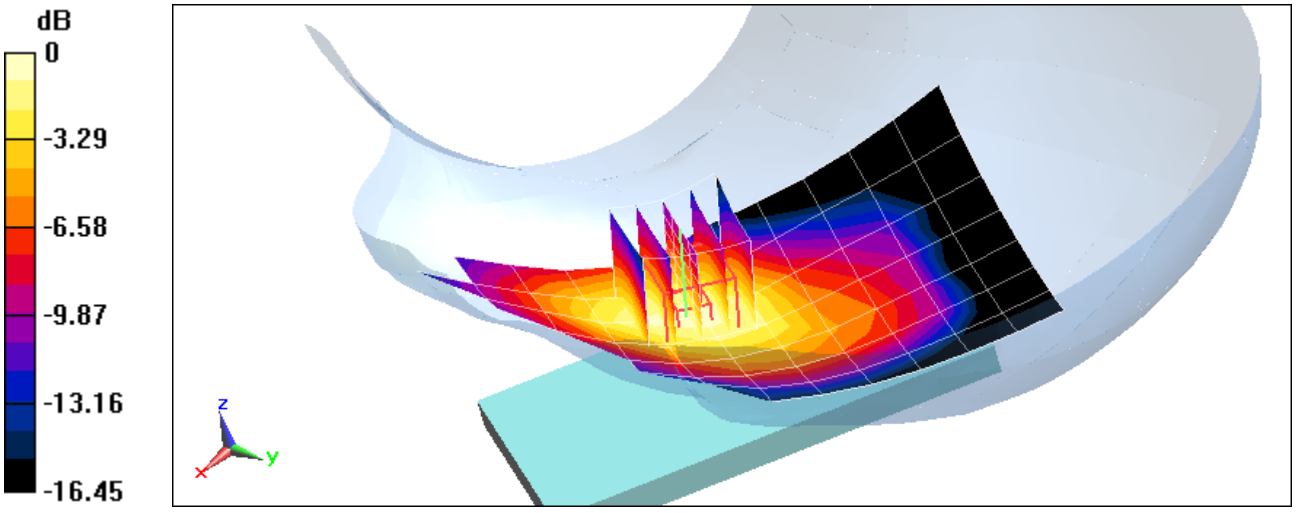
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
$f = 1732.5$ MHz; $\sigma = 1.352$ S/m; $\varepsilon_r = 38.947$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 02-13-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
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 4 (AWS), Left Head, Cheek, Mid.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.244 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.688 W/kg



0 dB = 0.749 W/kg = -1.26 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

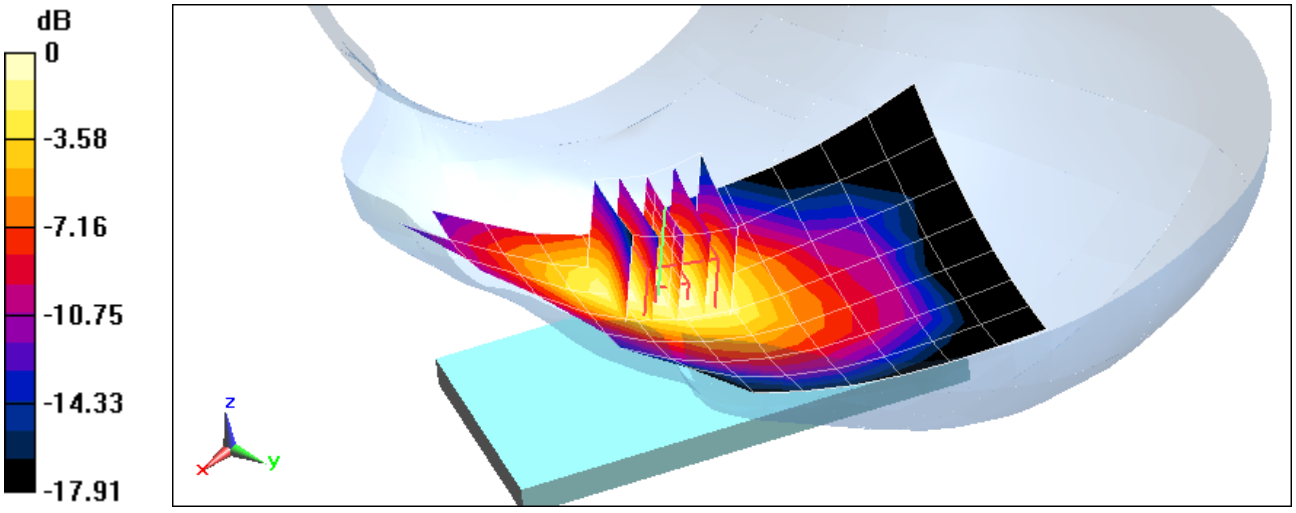
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
$f = 1860$ MHz; $\sigma = 1.358$ S/m; $\varepsilon_r = 39.216$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 02-12-2014; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.08, 5.08, 5.08); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 2 (PCS), Left Head, Cheek, Low.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.891 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.766 W/kg



0 dB = 0.833 W/kg = -0.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 00F05

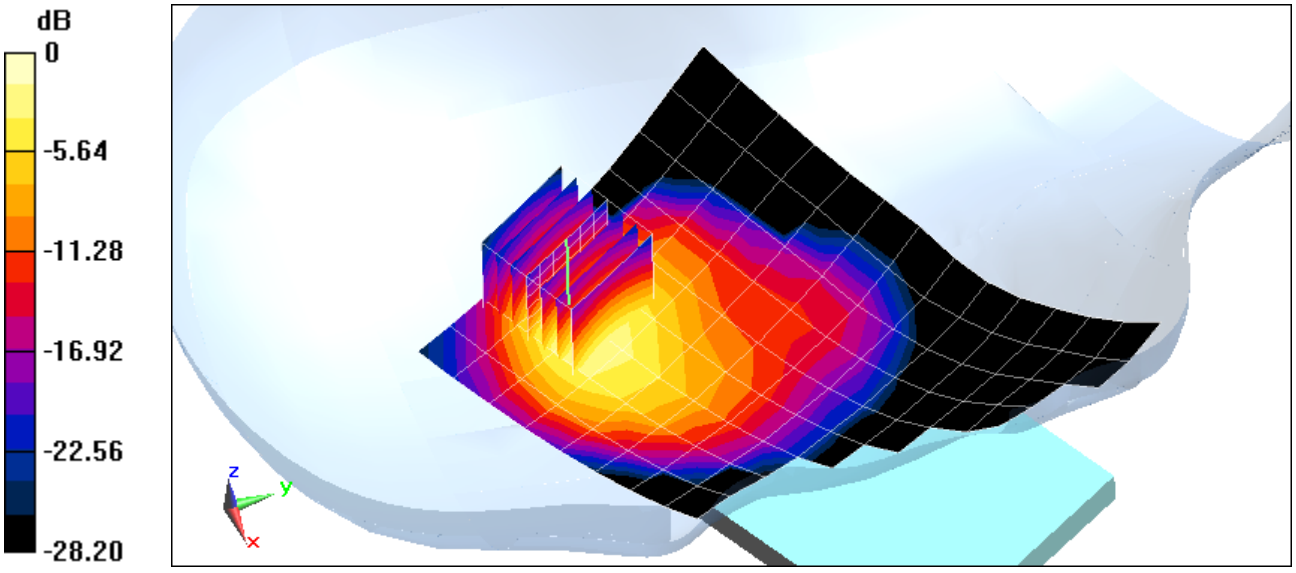
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.793 S/m; ε_r = 40.186; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-14-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Right Head, Cheek, Ch 01, 1 Mbps, Standard Battery Cover, Ant. 1

Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.688 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.776 W/kg
SAR(1 g) = 0.354 W/kg



0 dB = 0.459 W/kg = -3.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: F1186

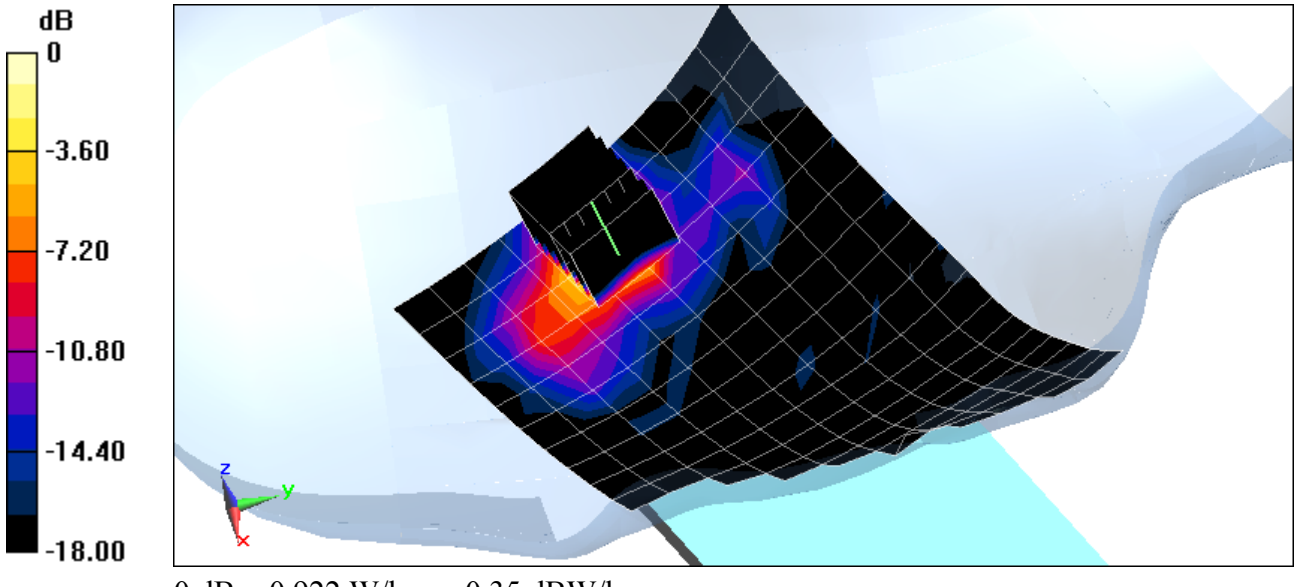
Communication System: UID 0, IEEE 802.11a ; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5785 MHz; σ = 5.182 S/m; ε_r = 36.998; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-06-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(4.52, 4.52, 4.52); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Right Head, Tilt, Ch 157, 6 Mbps, Standard Battery Cover, Ant. 1

Area Scan (11x19x1): 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 = 8.087 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.359 W/kg



0 dB = 0.922 W/kg = -0.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: F1186

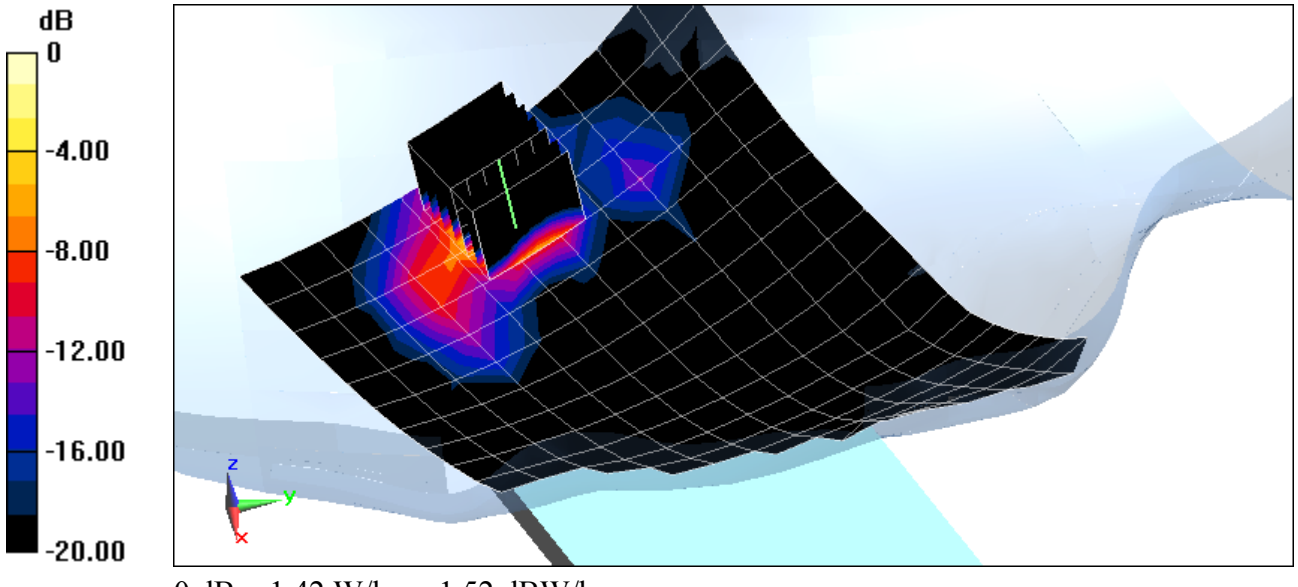
Communication System: UID 0, IEEE 802.11a; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5500 MHz; σ = 4.912 S/m; ε_r = 36.692; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-17-2014; Ambient Temp: 24.3°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3914; ConvF(4.55, 4.55, 4.55); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.5 GHz, Right Head, Tilt, Ch 100, 6 Mbps, Wireless Charging Cover, Ant. 1

Area Scan (12x19x1): 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 = 9.699 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 0.554 W/kg



0 dB = 1.42 W/kg = 1.52 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F82

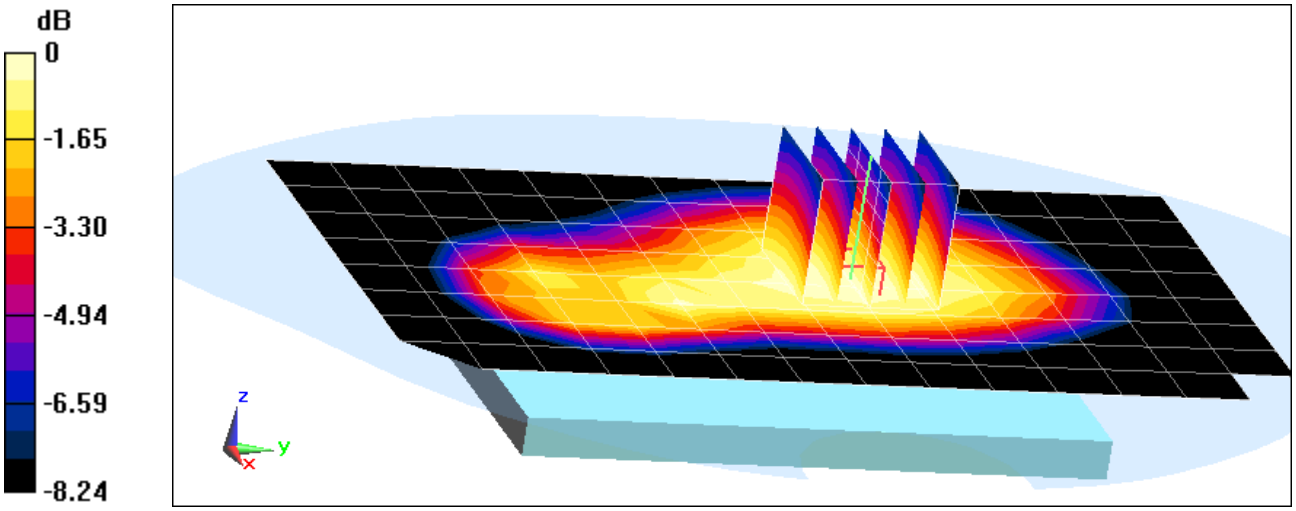
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.005$ S/m; $\varepsilon_r = 53.927$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GSM 850, Body SAR, Back side, Mid.ch, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.328 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.398 W/kg
SAR(1 g) = 0.314 W/kg



0 dB = 0.328 W/kg = -4.84 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F82

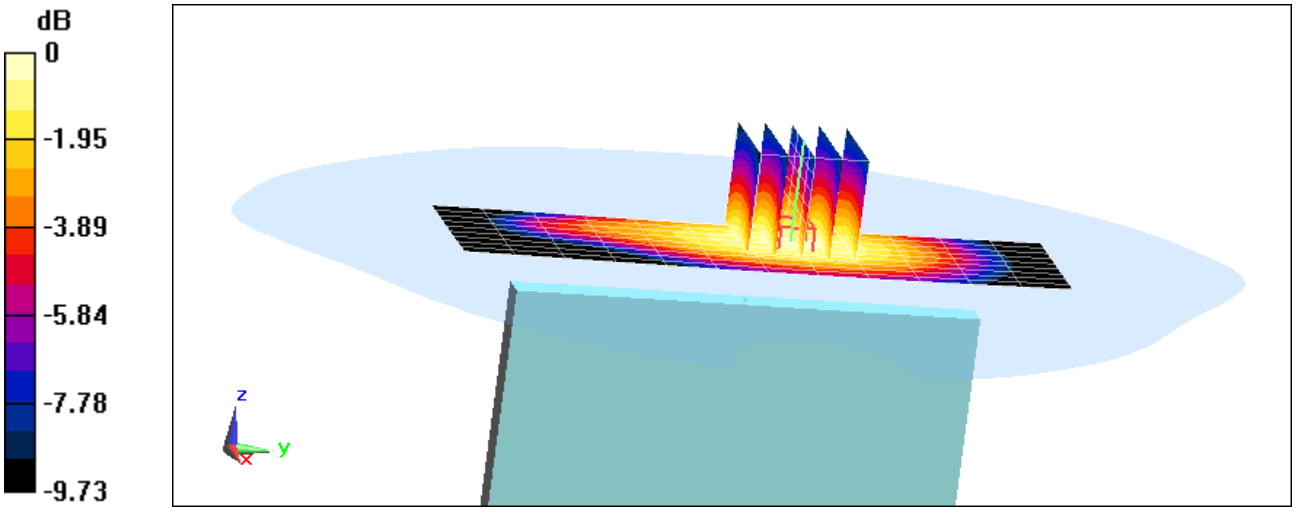
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.076
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.005$ S/m; $\varepsilon_r = 53.927$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 850, Body SAR, Left Edge, Mid.ch, 4 Tx Slots, Standard Battery Cover

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.302 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.673 W/kg
SAR(1 g) = 0.488 W/kg



0 dB = 0.516 W/kg = -2.87 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

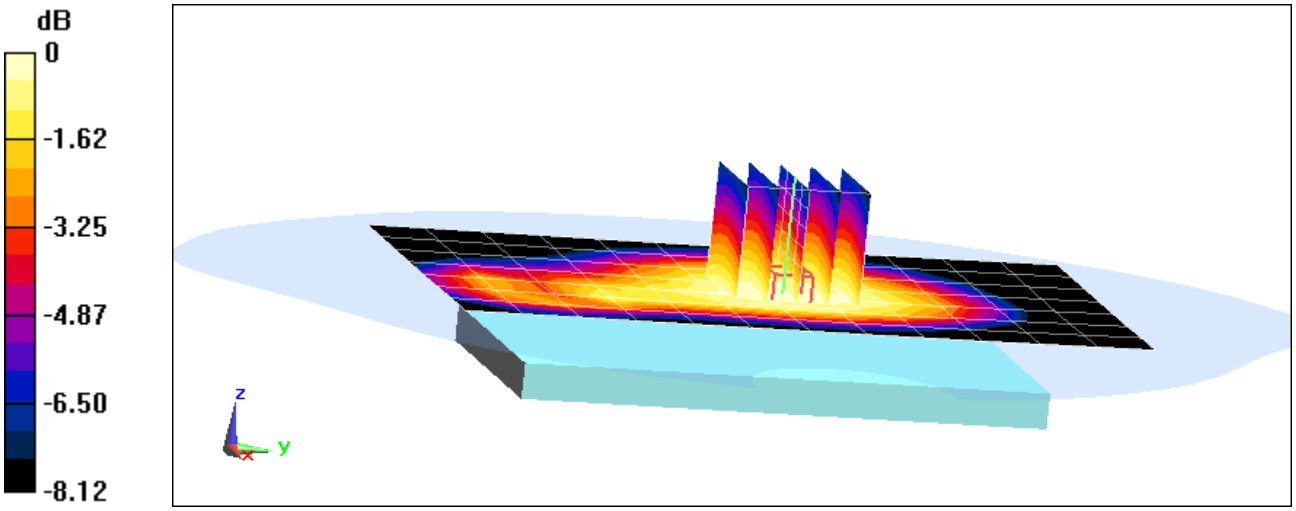
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.005$ S/m; $\varepsilon_r = 53.927$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

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

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.596 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.362 W/kg
SAR(1 g) = 0.289 W/kg



0 dB = 0.303 W/kg = -5.19 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

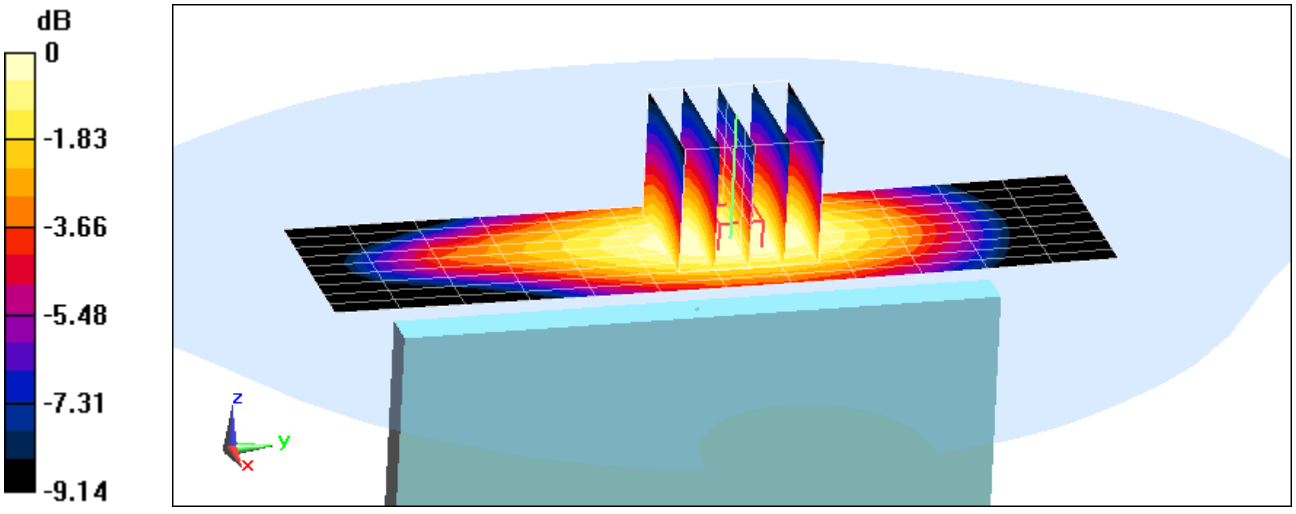
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.005$ S/m; $\varepsilon_r = 53.927$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Body SAR, Left Edge, Mid.ch, Wireless Charging Cover

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.713 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.485 W/kg
SAR(1 g) = 0.355 W/kg



0 dB = 0.381 W/kg = -4.19 dBW/kg

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DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

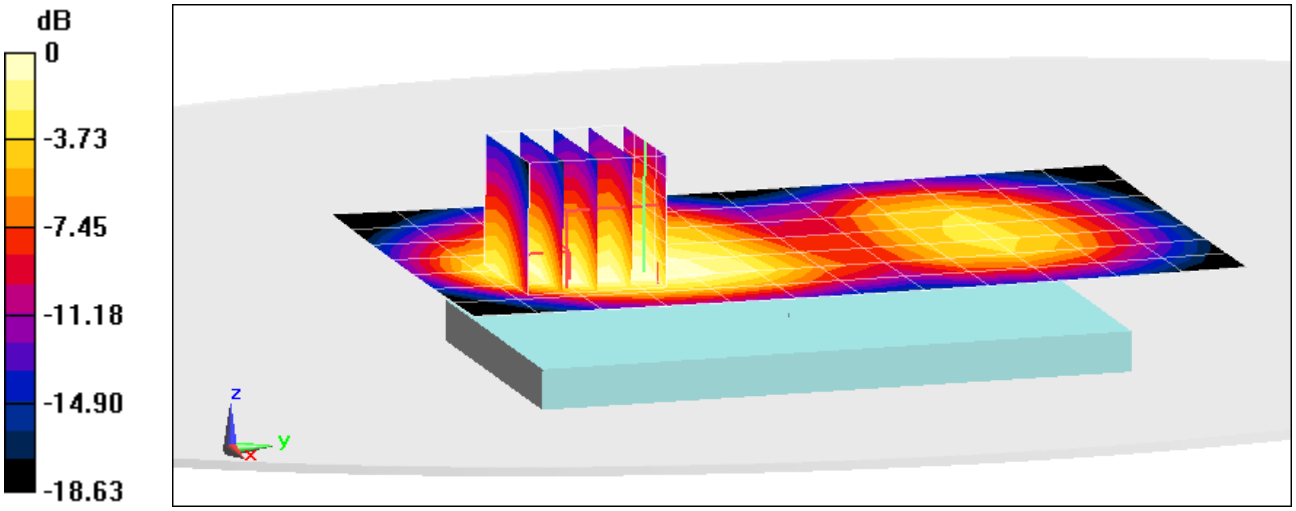
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
$f = 1732.4$ MHz; $\sigma = 1.458$ S/m; $\varepsilon_r = 52.105$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1750, Body SAR, Back side, Mid.ch, Standard Battery Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.338 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.623 W/kg



0 dB = 0.711 W/kg = -1.48 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F53

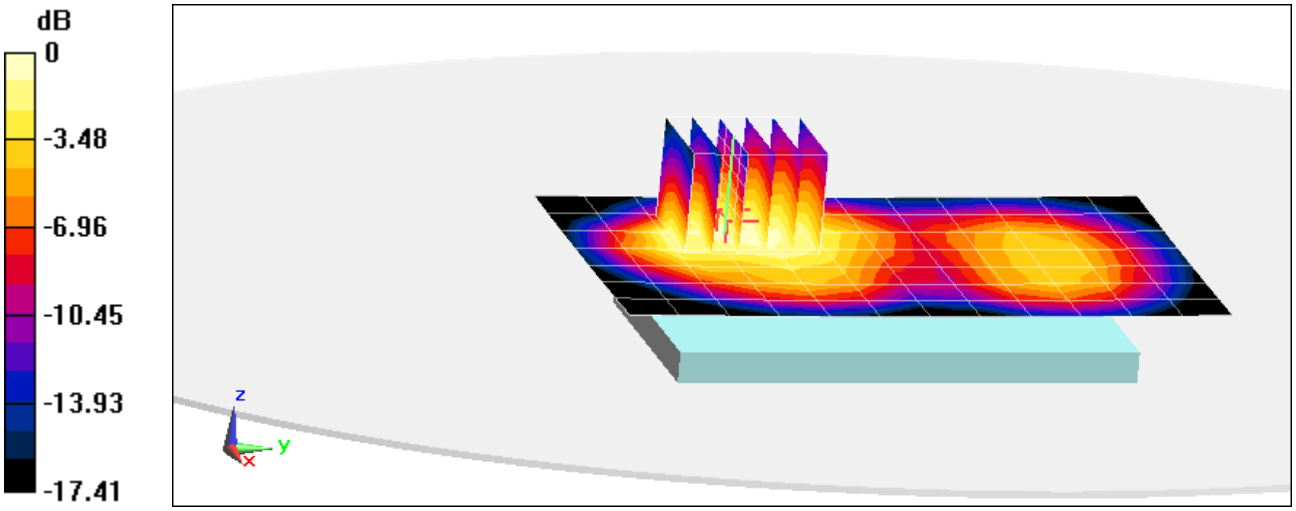
Communication System: UID 0, UMTS; Frequency: 1752.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.5 MHz; σ = 1.48 S/m; ε_r = 51.998; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1750, Body SAR, Front side, High.ch, Wireless Charging Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.726 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.863 W/kg



0 dB = 0.929 W/kg = -0.32 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

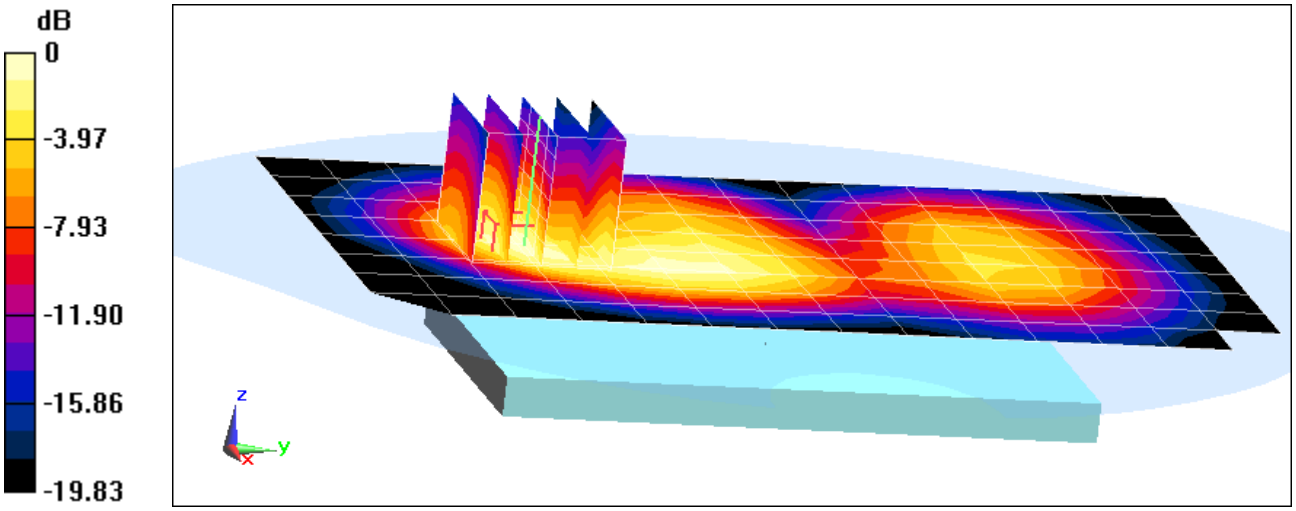
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.561 S/m; ε_r = 51.837; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
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: GSM 1900, Body SAR, Back side, Mid.ch, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.226 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.658 W/kg
SAR(1 g) = 0.347 W/kg



0 dB = 0.376 W/kg = -4.25 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

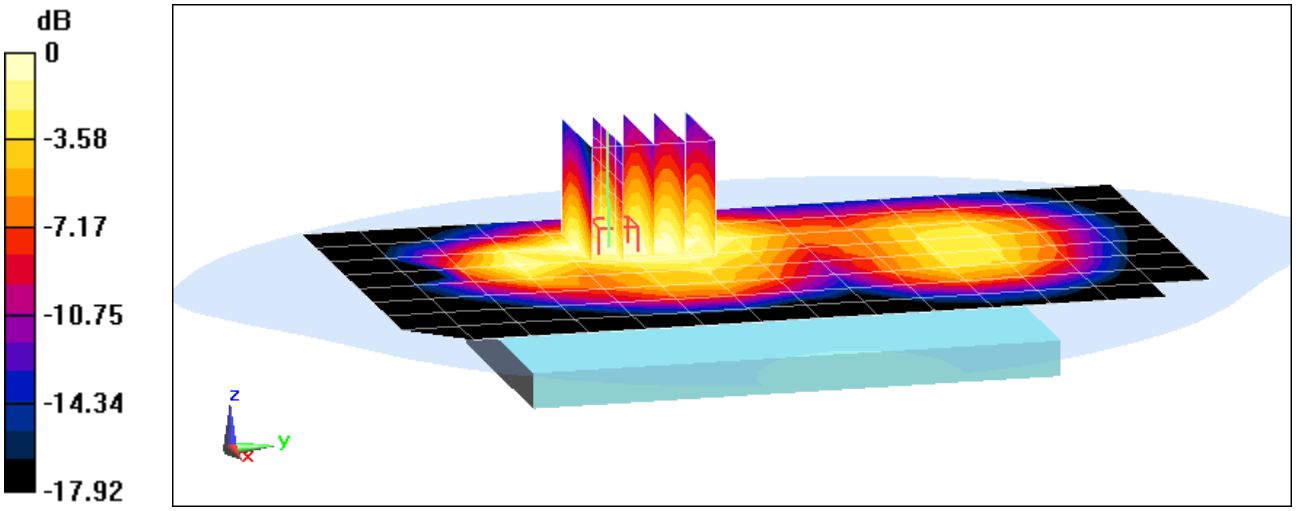
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.076
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.561 S/m; ε_r = 51.837; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Front side, Mid.ch, 4 Tx Slots, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.969 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.689 W/kg
SAR(1 g) = 0.457 W/kg



0 dB = 0.496 W/kg = -3.05 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

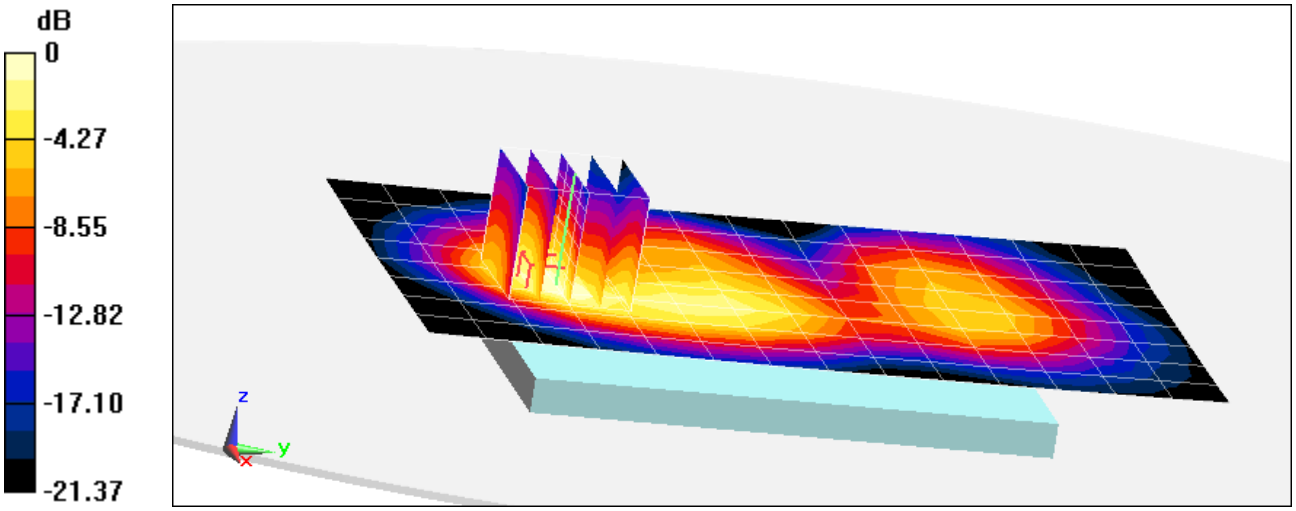
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.523 S/m; ε_r = 52.598; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-13-2014; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(4.77, 4.77, 4.77); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.076 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.650 W/kg



0 dB = 0.712 W/kg = -1.48 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F85

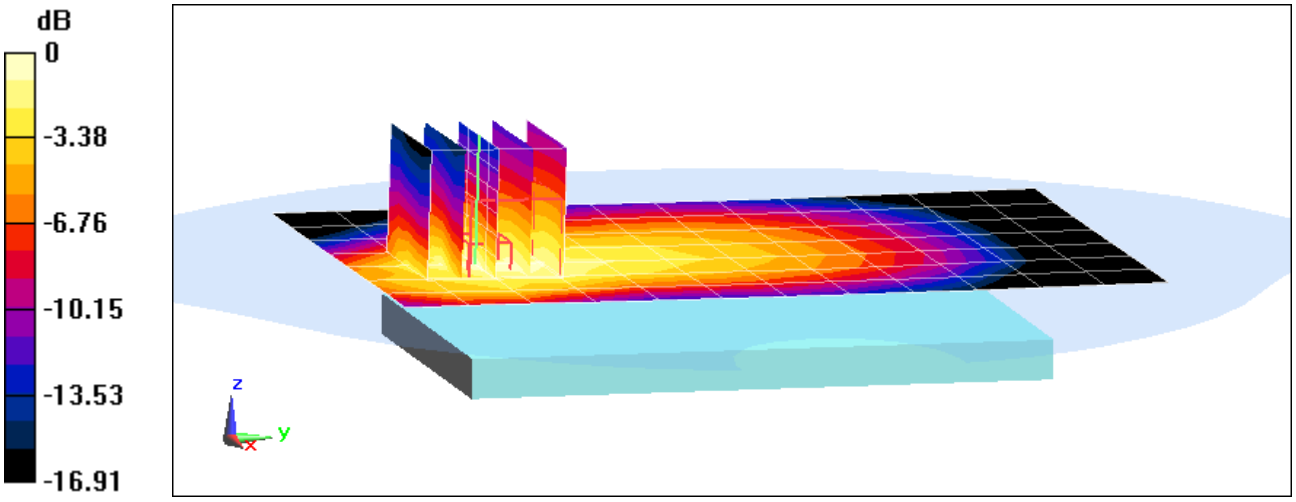
Communication System: UID 0, LTE BAND 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used:
f = 710 MHz; σ = 0.942 S/m; ε_r = 56.049; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-11-2014; Ambient Temp: 22.3°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3263; ConvF(6.37, 6.37, 6.37); Calibrated: 5/16/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/13/2013
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: LTE Band 17, Body SAR, Back side, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 0 RB Offset, Standard Battery Cover

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.484 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.243 W/kg
SAR(1 g) = 0.124 W/kg



0 dB = 0.139 W/kg = -8.57 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20FA1

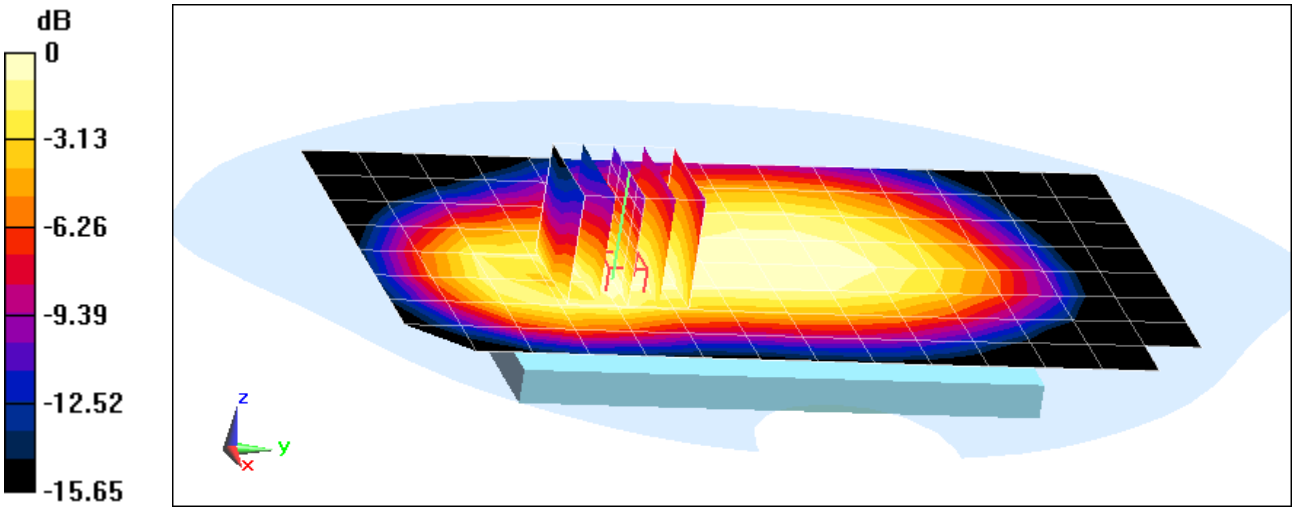
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.5$ MHz; $\sigma = 1.005$ S/m; $\varepsilon_r = 53.929$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
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, QPSK
10 MHz Bandwidth, 1 RB, 25 RB Offset, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.212 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.579 W/kg
SAR(1 g) = 0.397 W/kg



0 dB = 0.428 W/kg = -3.69 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F83

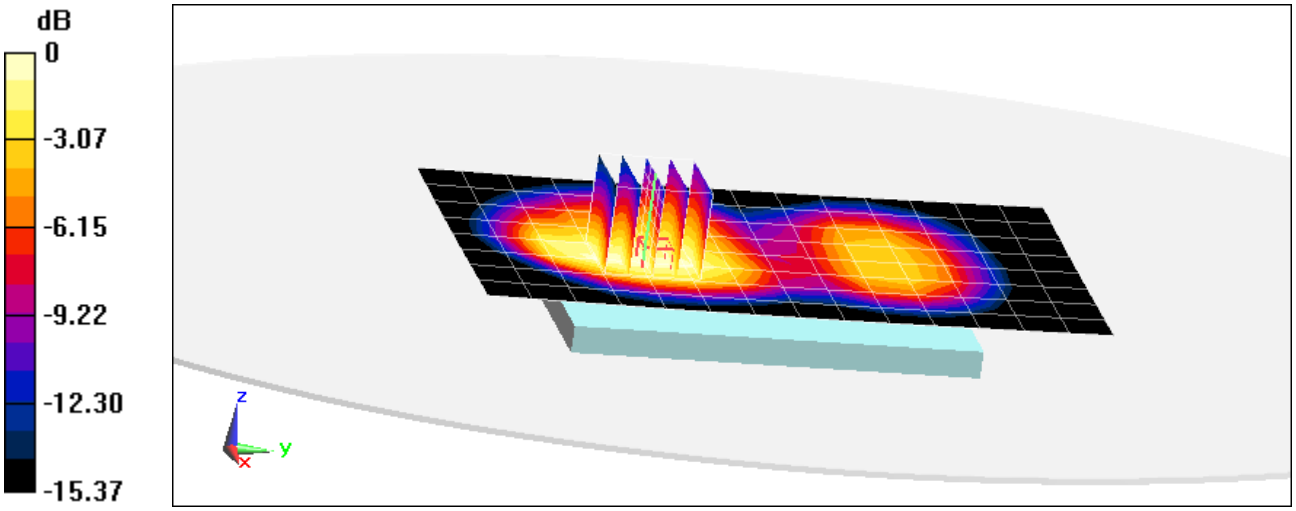
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.458 S/m; ε_r = 52.104; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Standard Battery Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.365 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.721 W/kg



0 dB = 0.777 W/kg = -1.10 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F83

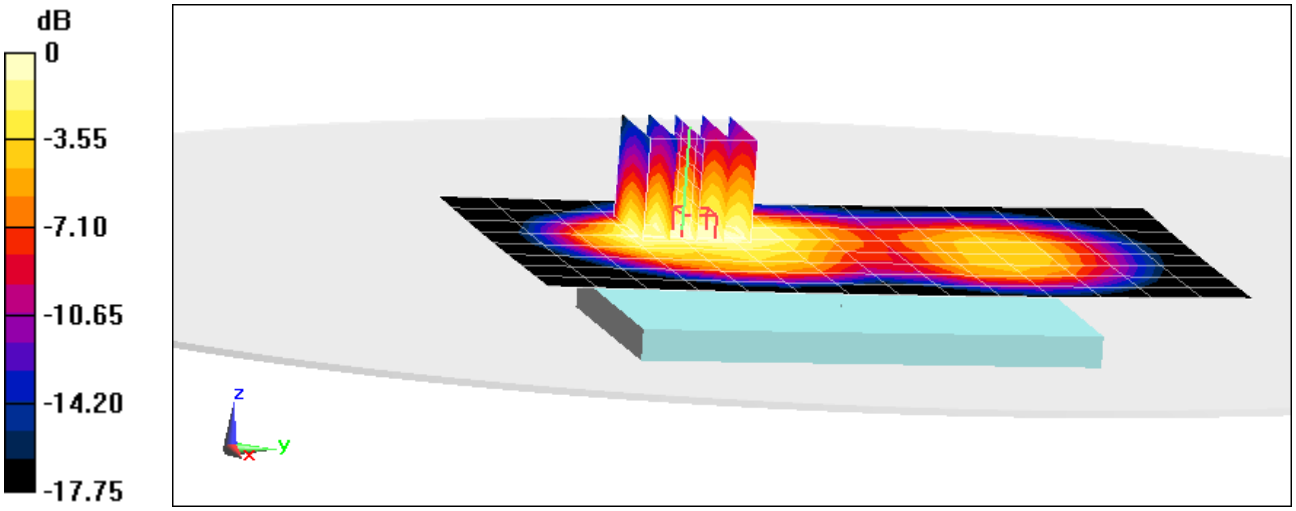
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.458 S/m; ε_r = 52.104; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Body SAR, Front side, Mid.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Wireless Charging Cover

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.608 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.867 W/kg



0 dB = 0.931 W/kg = -0.31 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

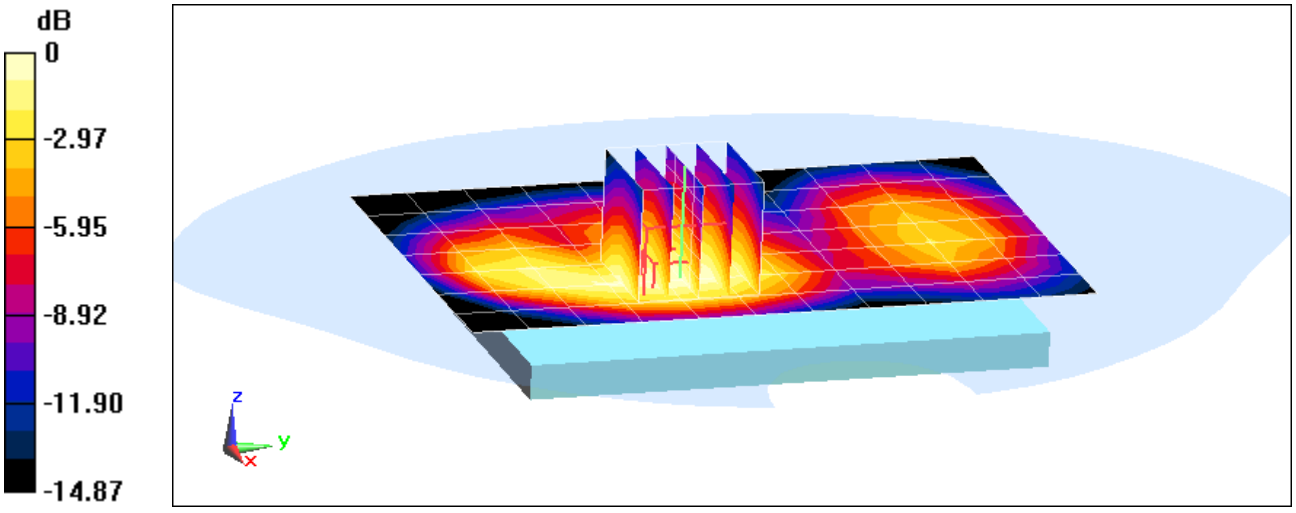
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.537 S/m; ε_r = 51.925; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
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 2 (PCS), Body SAR, Back side, Low.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.335 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.753 W/kg
SAR(1 g) = 0.511 W/kg



0 dB = 0.548 W/kg = -2.61 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 20F84

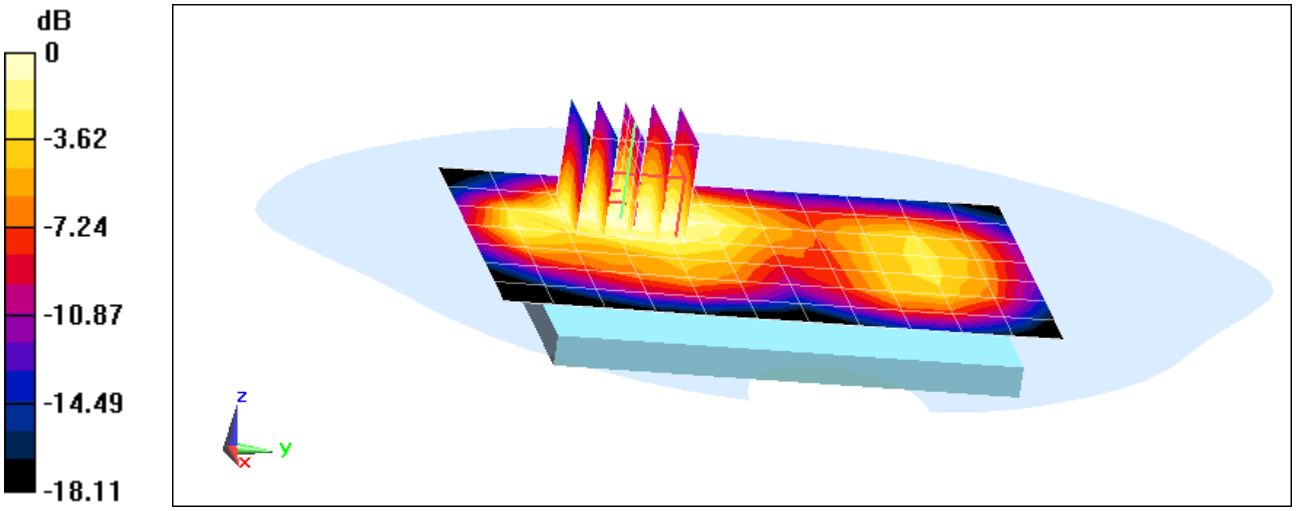
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.537 S/m; ε_r = 51.925; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
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 2 (PCS), Body SAR, Front side, Low.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset, Standard Battery Cover

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.793 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.709 W/kg



0 dB = 0.761 W/kg = -1.19 dBW/kg

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DUT: A3LSMG900T; Type: Portable Handset; Serial: 00F05

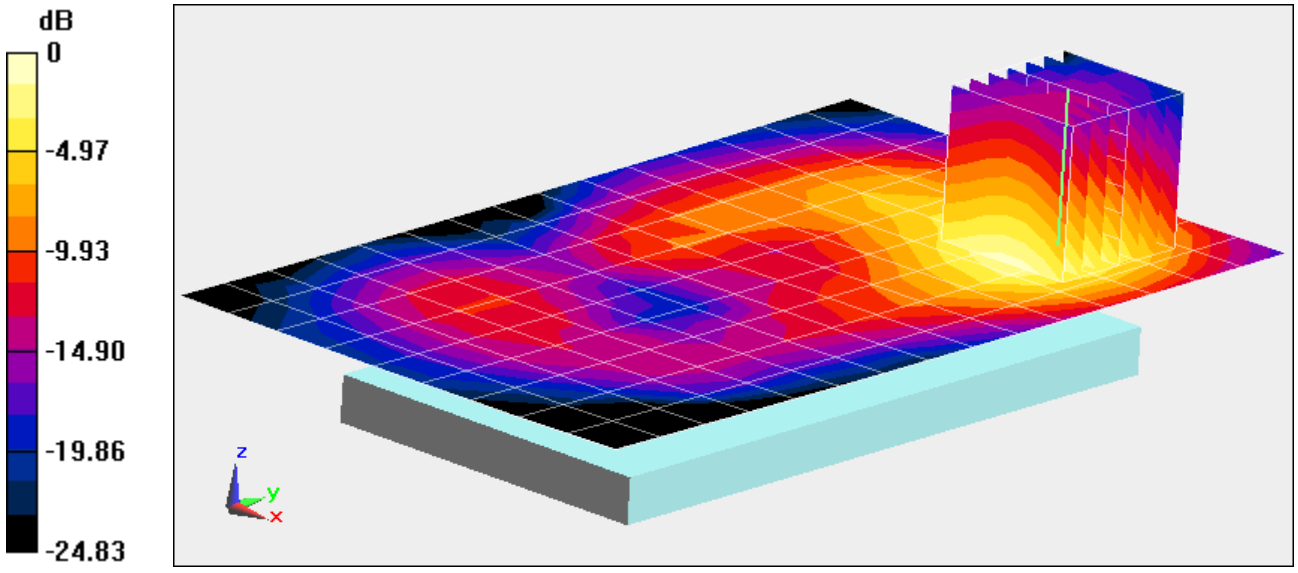
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.92 S/m; ε_r = 51.381; ρ = 1000 kg/m^3
Phantom section: Flat Section, Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.0°C

Probe: ES3DV3 - SN3318; ConvF(4.31, 4.31, 4.31); Calibrated: 4/29/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Back Side, Ch 06, 1 Mbps, Standard Battery Cover, Ant. 1

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.646 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.434 W/kg
SAR(1 g) = 0.235 W/kg



0 dB = 0.289 W/kg = -5.39 dBW/kg

DUT: A3LSMG900T; Type: Portable Handset; Serial: 14524

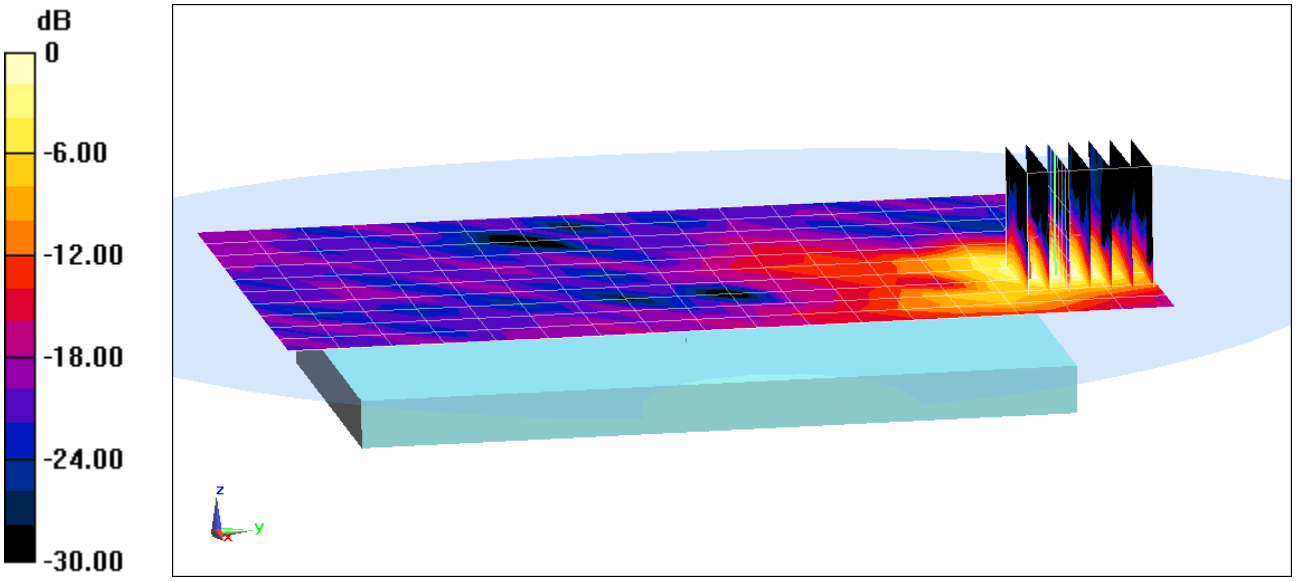
Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5745 MHz; σ = 5.965 S/m; ε_r = 46.14; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3914; ConvF(4.14, 4.14, 4.14); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Back Side, Ch 149, 6 Mbps
Standard Battery Cover, Ant. 1

Area Scan (11x18x1): 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 = 6.092 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 0.409 W/kg



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

DUT: A3LSMG900T; Type: Portable Handset; Serial: 14524

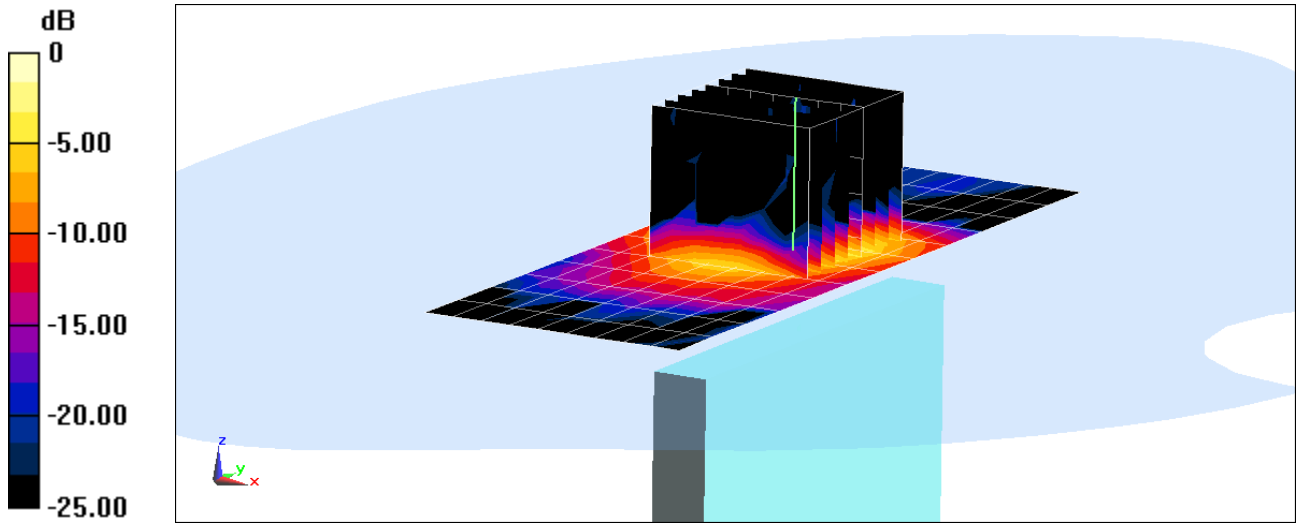
Communication System: UID 0, IEEE 802.11a; 5805 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5805 MHz; σ = 6.177 S/m; εr = 46.187; ρ = 1000 kg/m3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-09-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3914; ConvF(4.14, 4.14, 4.14); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Top Side, Ch 161, 6 Mbps
Standard Battery Cover, Ant. 1

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 9.289 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.57 W/kg
SAR(1 g) = 0.569 W/kg



0 dB = 1.34 W/kg = 1.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG900T; Type: Portable Handset; Serial: 14524

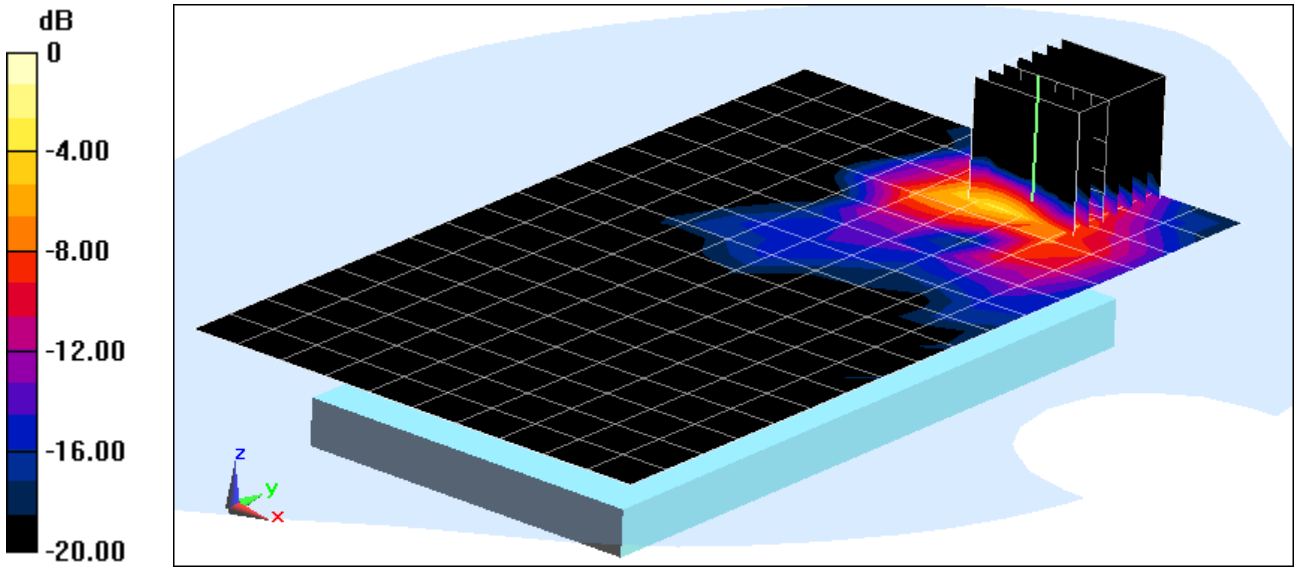
Communication System: UID 0, IEEE 802.11a (0); Frequency: 5540 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5540 MHz; σ = 5.696 S/m; ε_r = 46.55; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3914; ConvF(4.07, 4.07, 4.07); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.5 GHz, Body SAR, Back Side, Ch 108, 6 Mbps
Standard Battery Cover, Ant. 1

Area Scan (11x18x1): 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 = 7.275 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.43 W/kg
SAR(1 g) = 0.558 W/kg



0 dB = 1.39 W/kg = 1.43 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

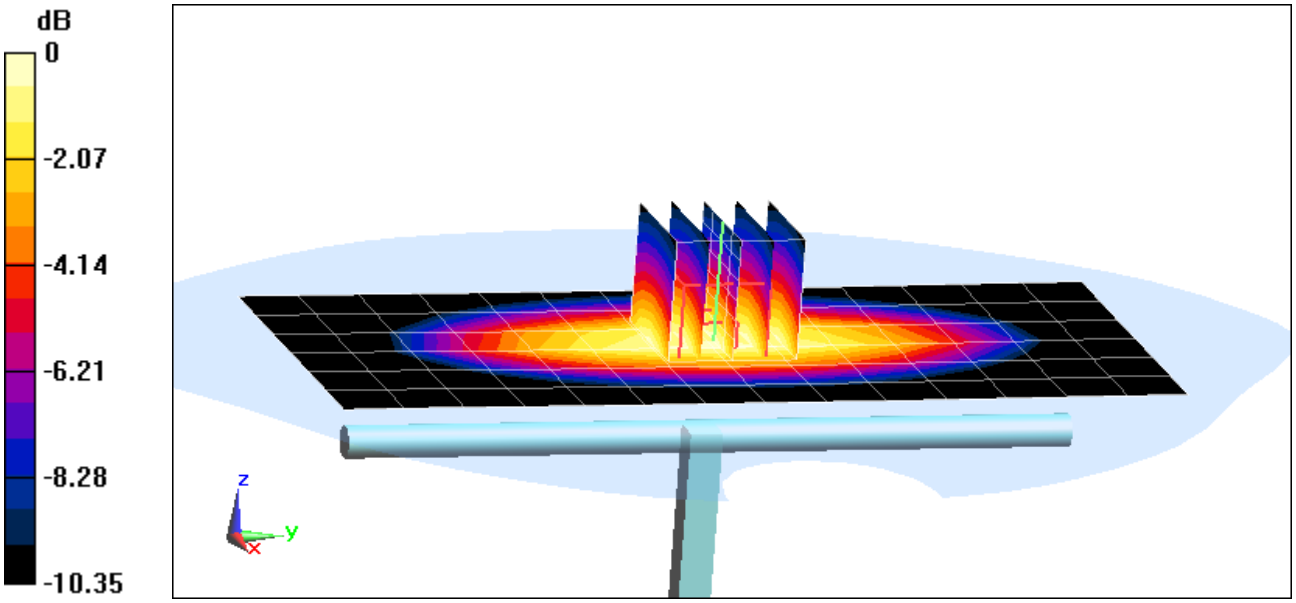
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
$f = 750$ MHz; $\sigma = 0.909$ S/m; $\varepsilon_r = 41.177$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-13-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.7°C

Probe: ES3DV3 - SN3287; ConvF(6.52, 6.52, 6.52); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.809 W/kg
Deviation = -3.35%



0 dB = 0.874 W/kg = -0.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V3; Serial: 4d119

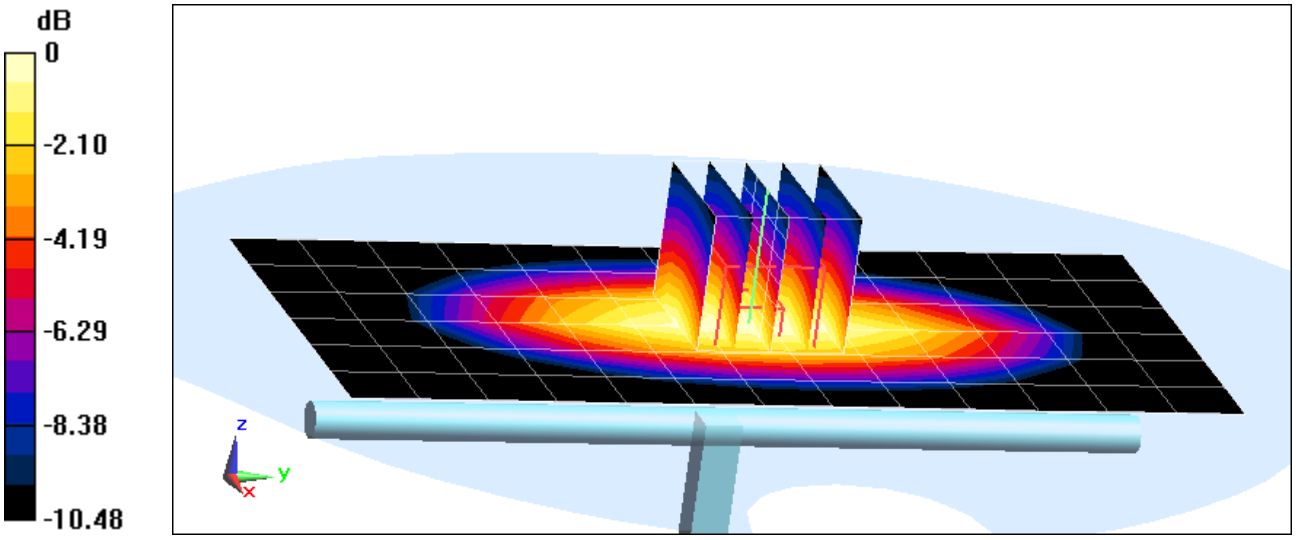
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.925 S/m; ε_r = 41.704; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-10-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.9°C

Probe: ES3DV3 - SN3332; ConvF(6.29, 6.29, 6.29); Calibrated: 11/25/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: SAM v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.988 W/kg
Deviation = 2.07%



0 dB = 1.06 W/kg = 0.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

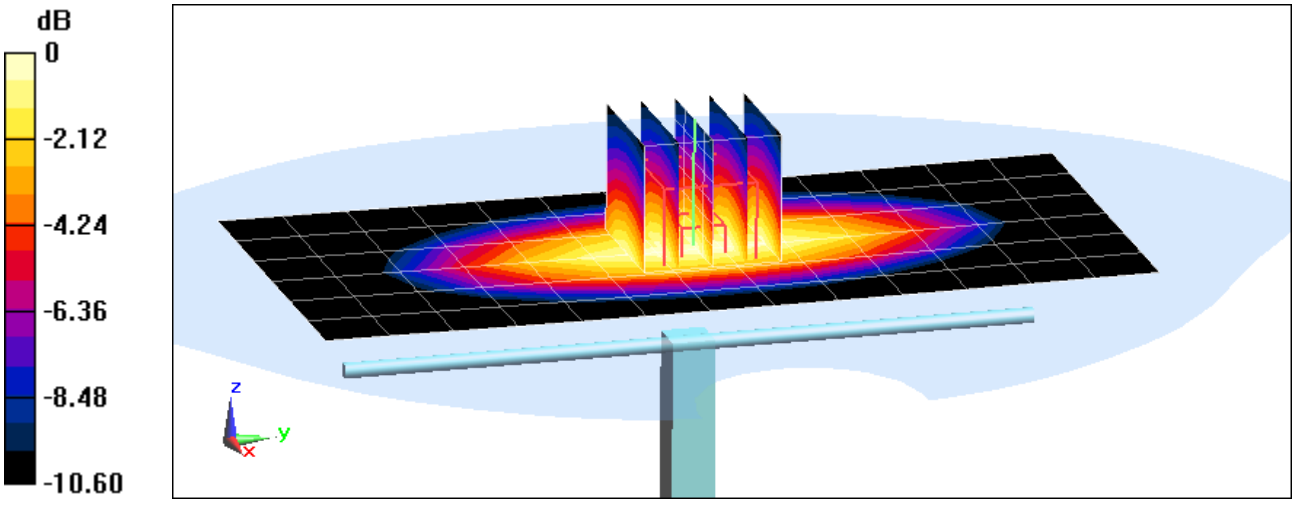
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.932 S/m; ε_r = 42.598; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-10-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49); Calibrated: 1/29/2014;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.965 W/kg
Deviation = -0.31%



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

PCTEST ENGINEERING LABORATORY, INC.

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

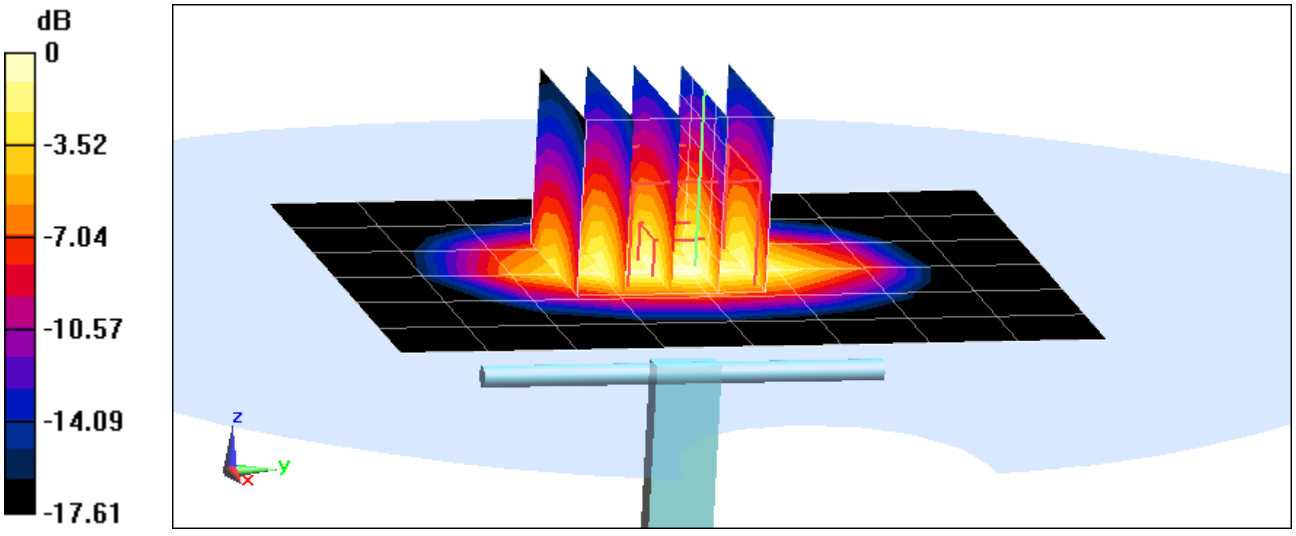
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.369 S/m; ε_r = 38.85; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-13-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (7x9x1): 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) = 6.48 W/kg
SAR(1 g) = 3.58 W/kg
Deviation = -1.92%



0 dB = 3.96 W/kg = 5.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz ; Type: D1900V2; Serial: 5d149

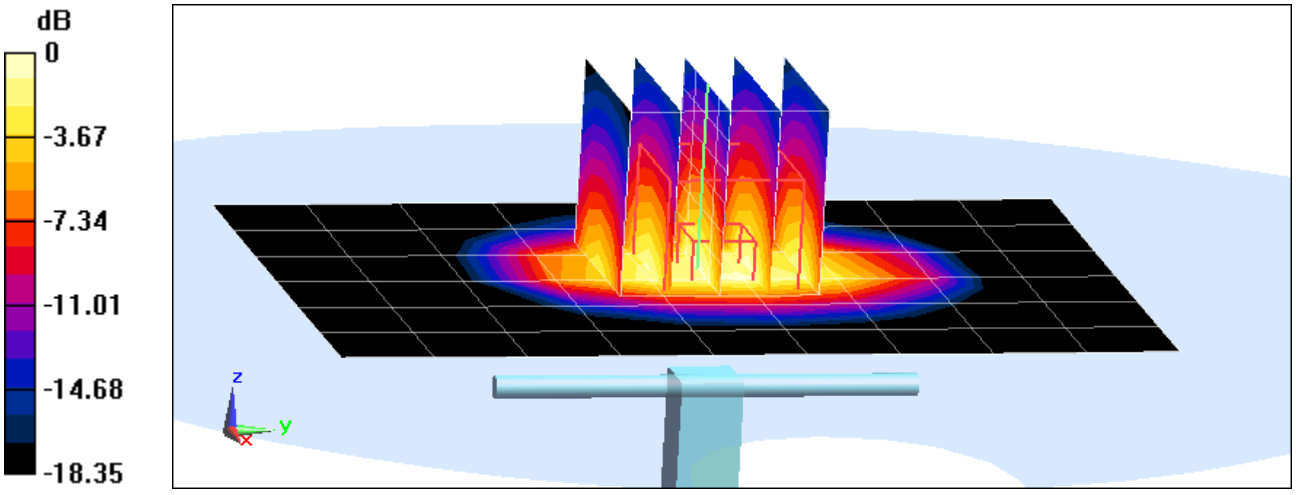
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.4 S/m; ε_r = 39.057; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(5.08, 5.08, 5.08); Calibrated: 11/20/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
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) = 7.14 W/kg
SAR(1 g) = 3.87 W/kg
Deviation = -4.21%



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

PCTEST ENGINEERING LABORATORY, INC.

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

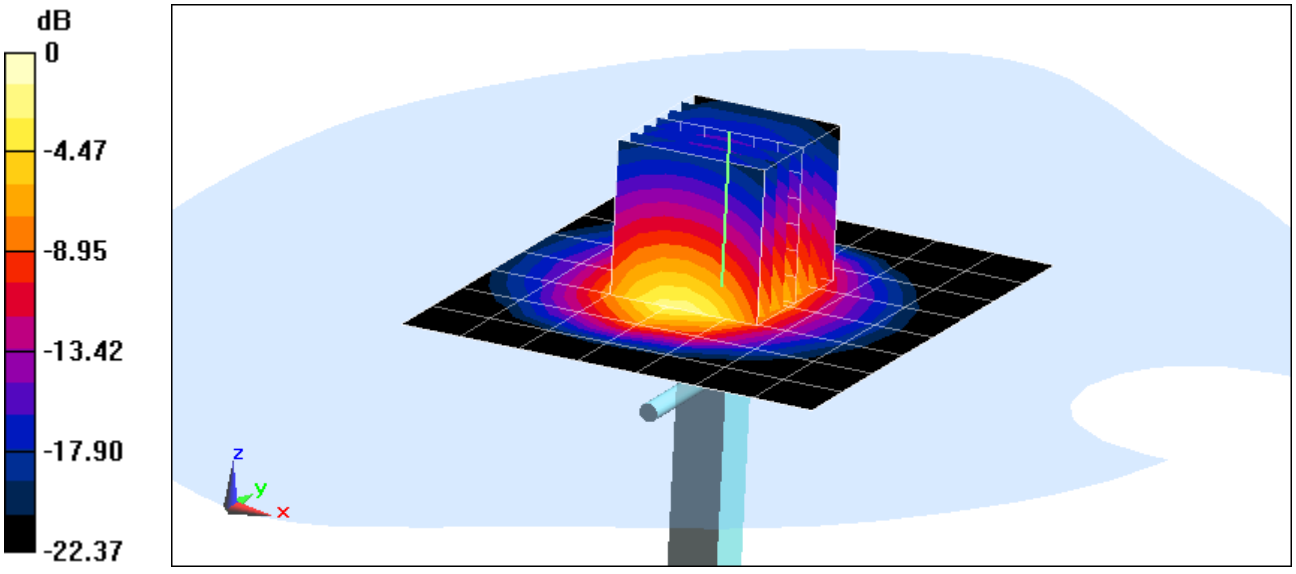
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.84 S/m; ε_r = 40.077; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-14-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
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) = 11.1 W/kg
SAR(1 g) = 5.42 W/kg
Deviation = 1.88%



0 dB = 7.04 W/kg = 8.48 dBW/kg

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

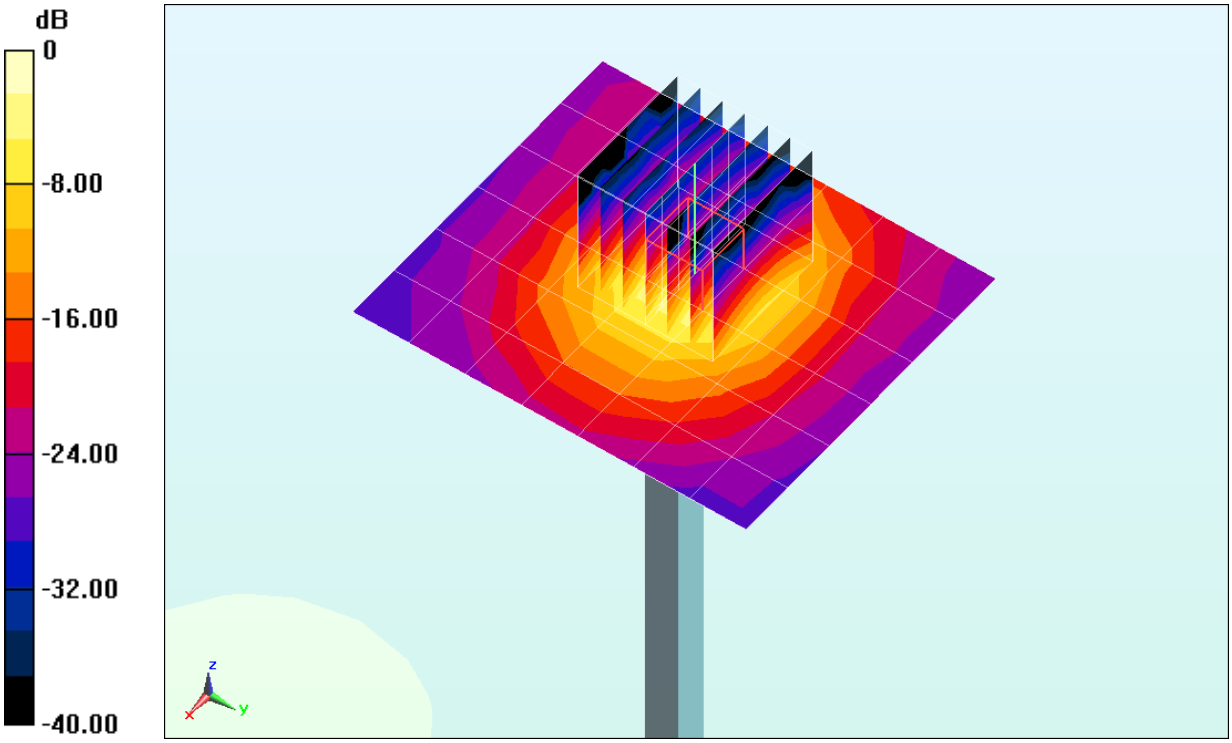
Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5200 MHz; σ = 4.566 S/m; ε_r = 37.509; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(4.99, 4.99, 4.99); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (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) = 32.8 W/kg
SAR(1 g) = 7.84 W/kg
Deviation = 3.16%



0 dB = 19.8 W/kg = 12.97 dBW/kg

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

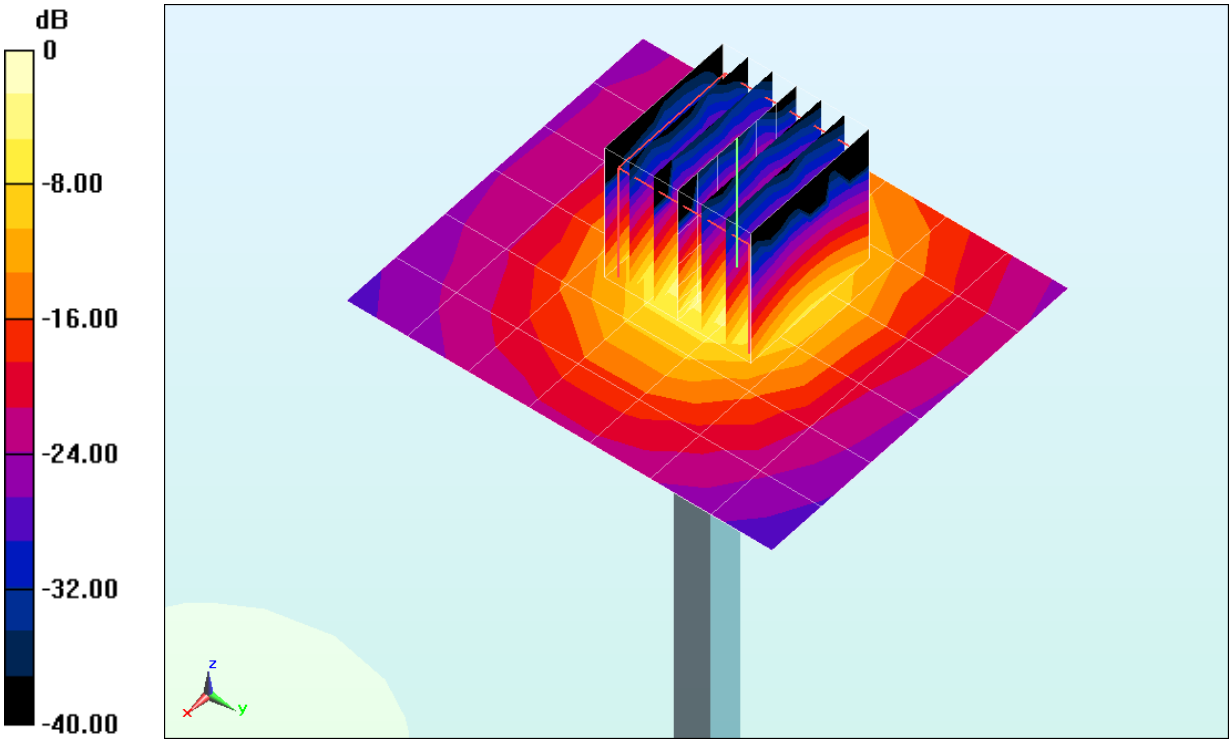
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5300 MHz; σ = 4.651 S/m; ε_r = 37.509; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(4.82, 4.82, 4.82); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (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) = 34.5 W/kg
SAR(1 g) = 7.96 W/kg
Deviation =1.14%



0 dB = 20.4 W/kg = 13.10 dBW/kg

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1120

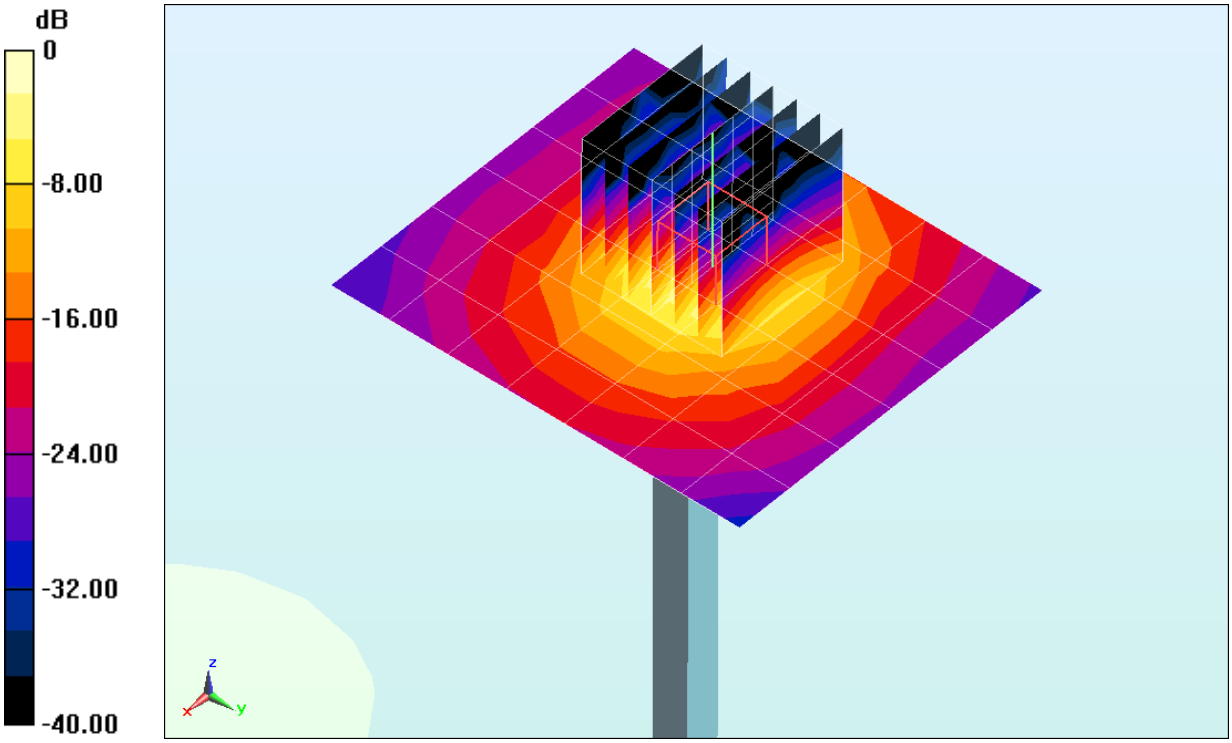
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5500 MHz; σ = 4.925 S/m; ε_r = 37.305; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(4.55, 4.55, 4.55); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x8x1): 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) = 34.0 W/kg
SAR(1 g) = 7.91 W/kg
Deviation = -1.25%



0 dB = 20.3 W/kg = 13.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

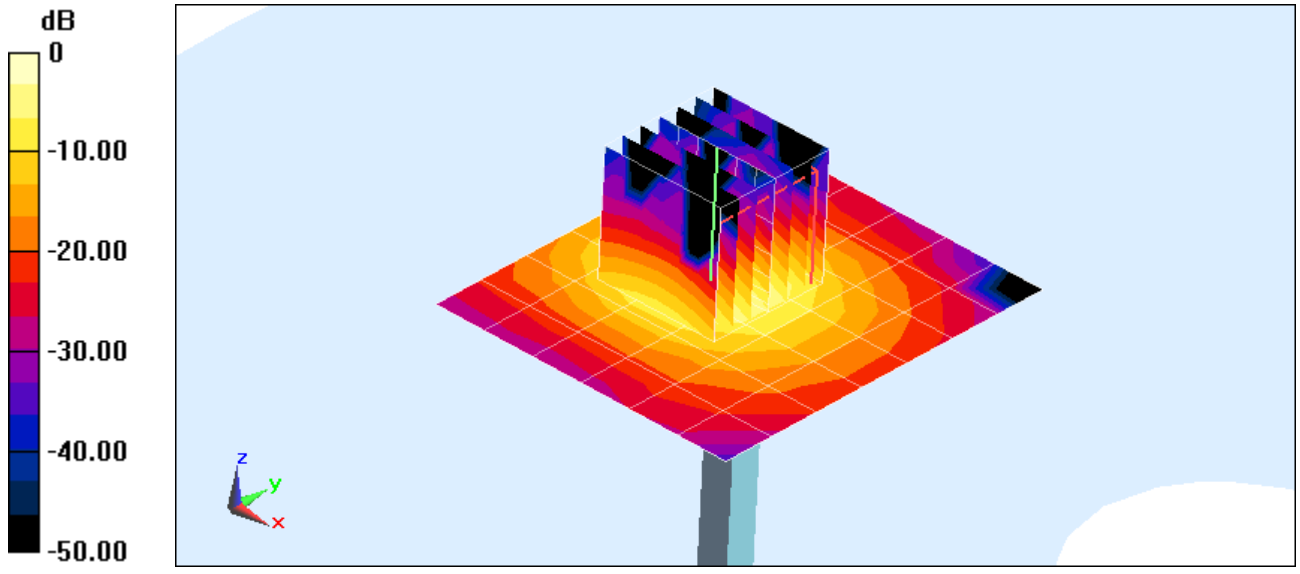
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head Medium parameters used:
f = 5500 MHz; σ = 4.912 S/m; ε_r = 36.692; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-17-2014; Ambient Temp: 24.3°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3914; ConvF(4.55, 4.55, 4.55); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x8x1): 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 = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 14.1 W/kg
SAR(1 g) = 3.16 W/kg
Deviation = -6.29%



0 dB = 8.16 W/kg = 9.12 dBW/kg

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

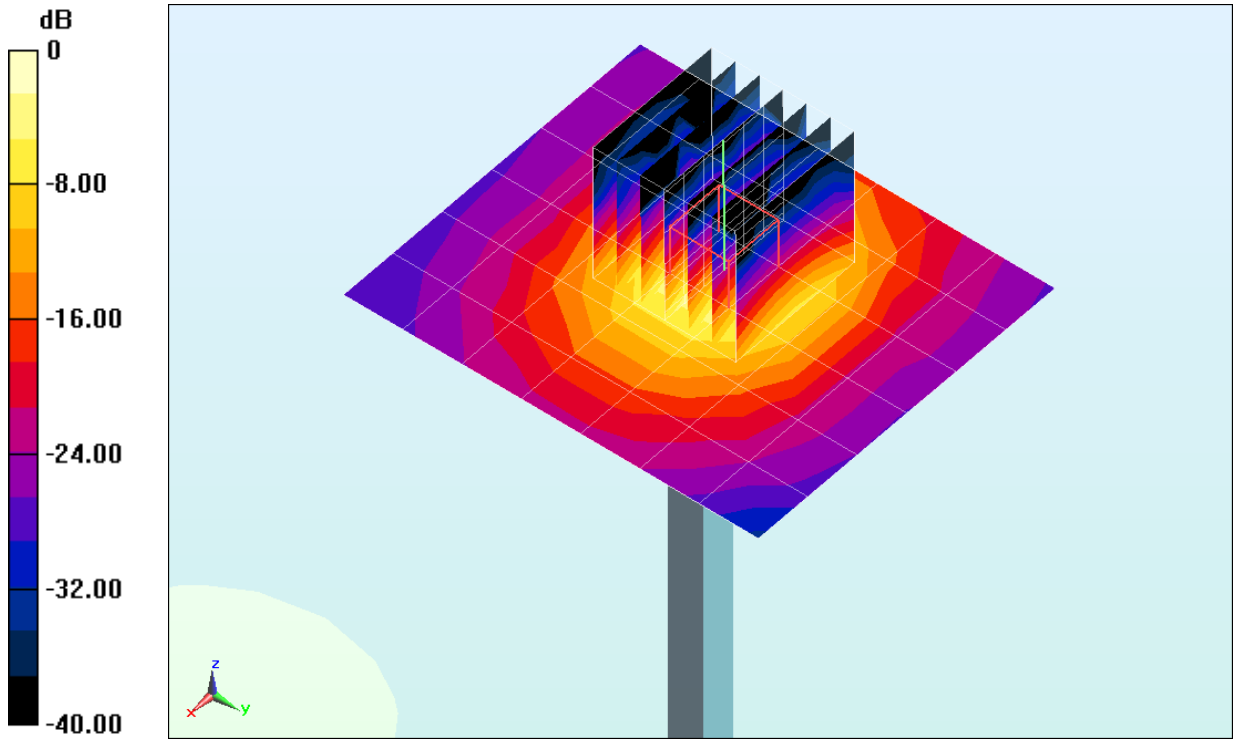
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5600 MHz; σ = 5.017 S/m; ε_r = 37.024; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3914; ConvF(4.37, 4.37, 4.37); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (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) = 36.1 W/kg
SAR(1 g) = 7.97 W/kg
Deviation = -0.25%



0 dB = 20.9 W/kg = 13.20 dBW/kg

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

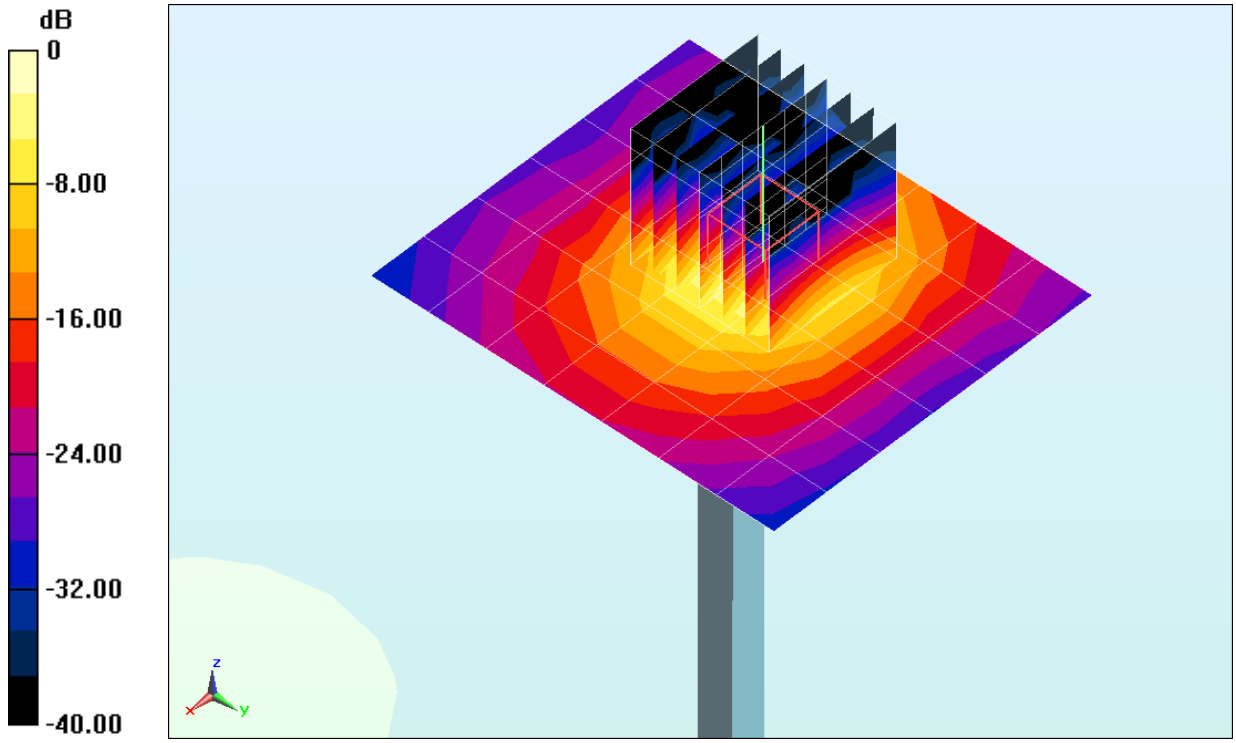
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head; Medium parameters used:
f = 5800 MHz; σ = 5.176 S/m; ε_r = 36.885; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(4.52, 4.52, 4.52); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (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) = 34.8 W/kg
SAR(1 g) = 7.40 W/kg
Deviation = -1.20%



0 dB = 19.5 W/kg = 12.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

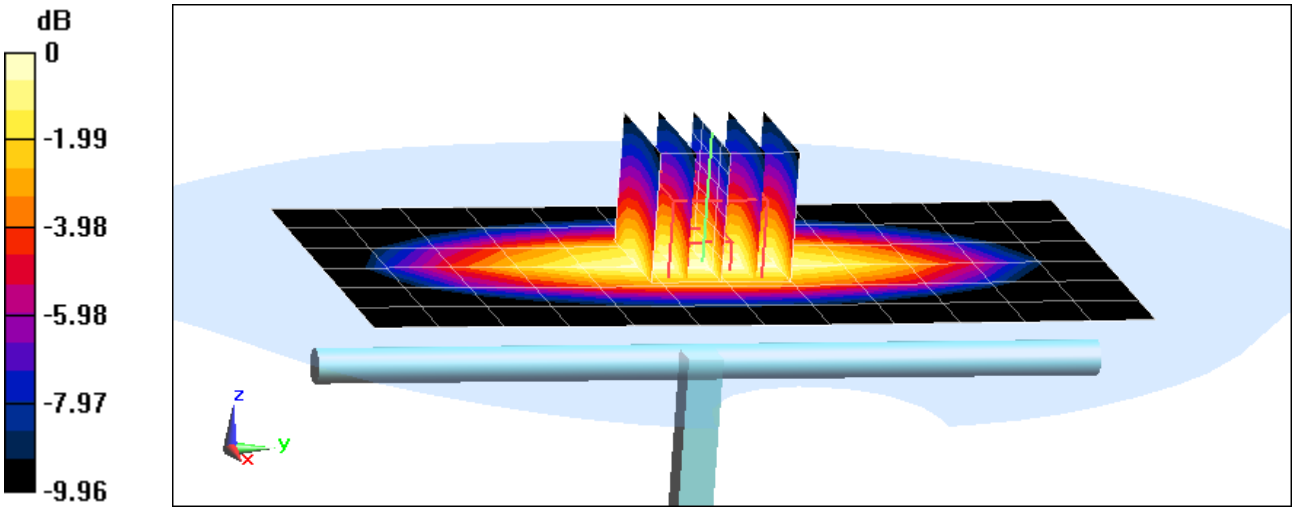
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
$f = 750$ MHz; $\sigma = 0.98$ S/m; $\varepsilon_r = 55.68$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-11-2014; Ambient Temp: 22.3°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3263; ConvF(6.37, 6.37, 6.37); Calibrated: 5/16/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/13/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80);SEMCAD X Version 14.6.10 (7164)

750MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.880 W/kg
Deviation = 0.92%



0 dB = 0.956 W/kg = -0.20 dBW/kg

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

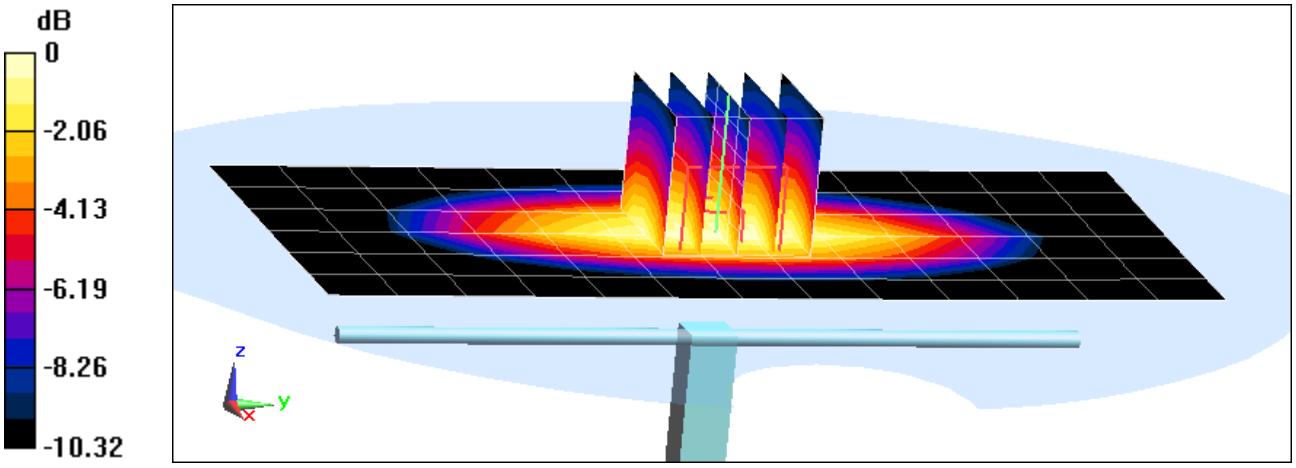
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.004 S/m; ε_r = 53.949; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-10-2014; Ambient Temp: 23.7°C; Tissue Temp: 21.6°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: SAM Front; Type: SAM; Serial: 1686
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) = 1.46 W/kg
SAR(1 g) = 1.01 W/kg
Deviation = 5.87%



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

PCTEST ENGINEERING LABORATORY, INC.

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

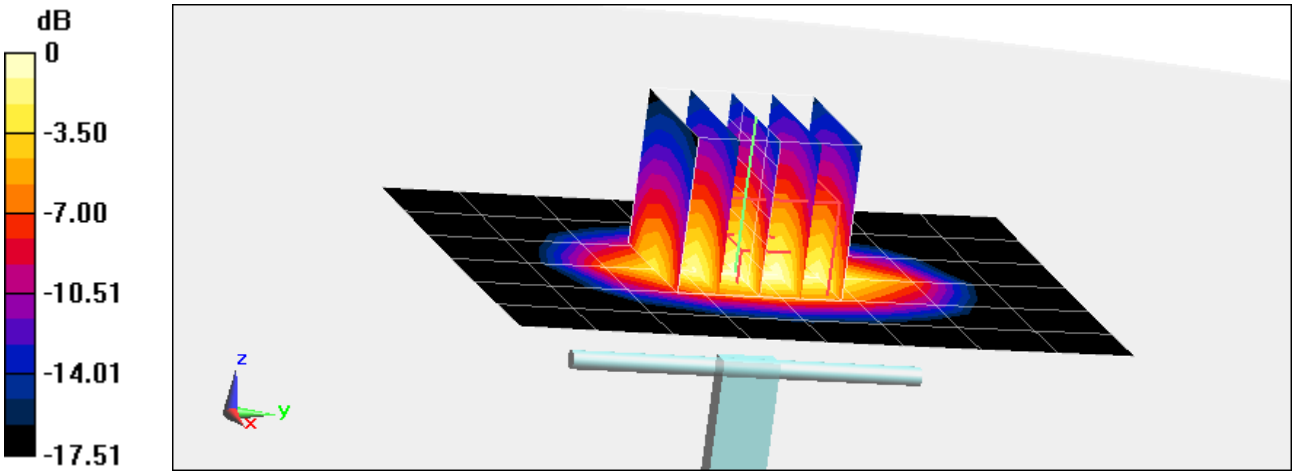
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.477 S/m; ε_r = 52.006; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7);SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (7x9x1): 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) = 6.55 W/kg
SAR(1 g) = 3.66 W/kg
Deviation = -3.17%



0 dB = 4.01 W/kg = 6.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

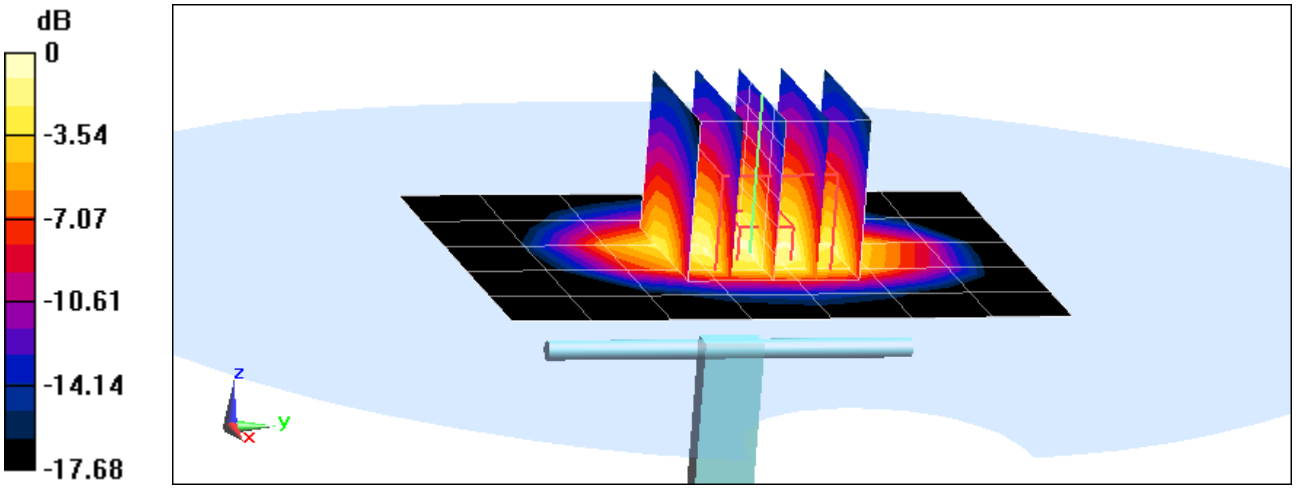
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.524 S/m; ε_r = 52.407; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-13-2014; Ambient Temp: 24.1°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3288; ConvF(5.1, 5.1, 5.1); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM with CRP; Type: SAM; 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) = 6.80 W/kg
SAR(1 g) = 3.70 W/kg
Deviation = -3.14%



0 dB = 4.07 W/kg = 6.10 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

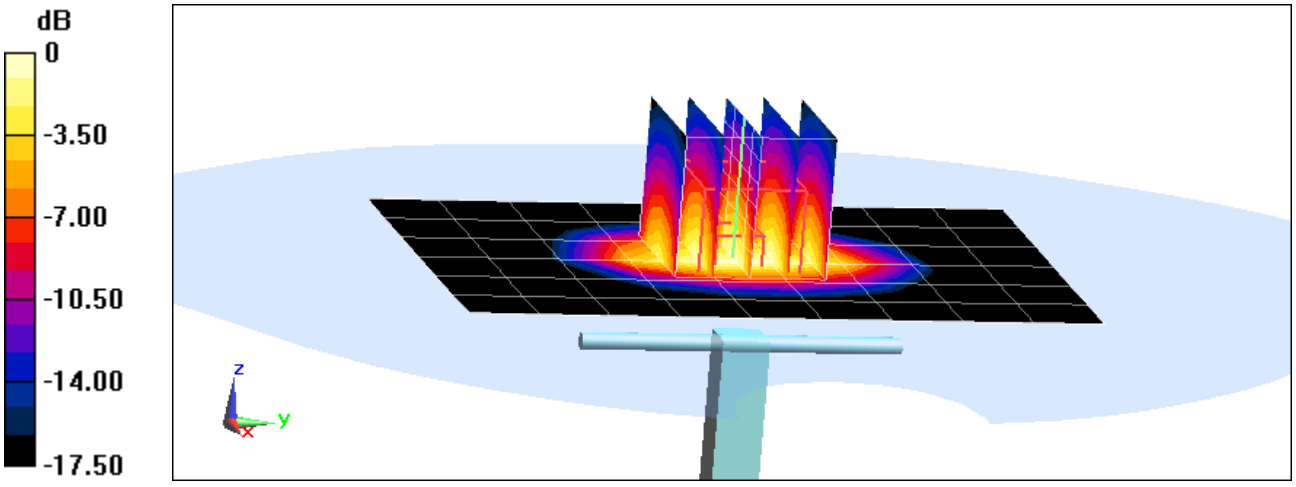
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.584 S/m; ε_r = 51.769; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-10-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.2°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/21/2013
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
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) = 7.28 W/kg
SAR(1 g) = 4.02 W/kg
Deviation = -0.74%



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

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

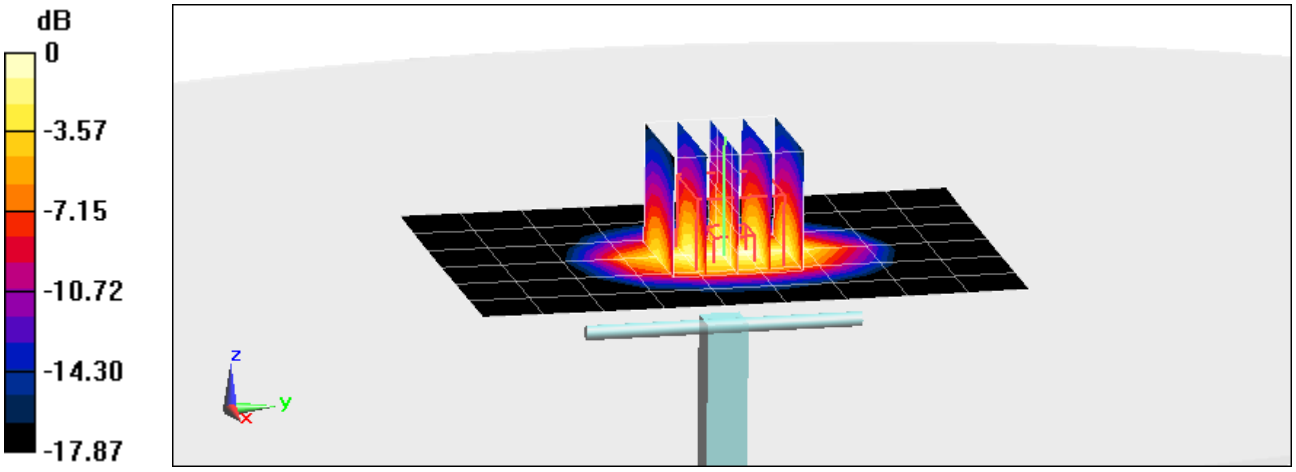
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.546 S/m; ε_r = 52.536; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-13-2014; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(4.77, 4.77, 4.77); 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)

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) = 7.10 W/kg
SAR(1 g) = 3.89 W/kg
Deviation = -3.95%



0 dB = 4.35 W/kg = 6.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

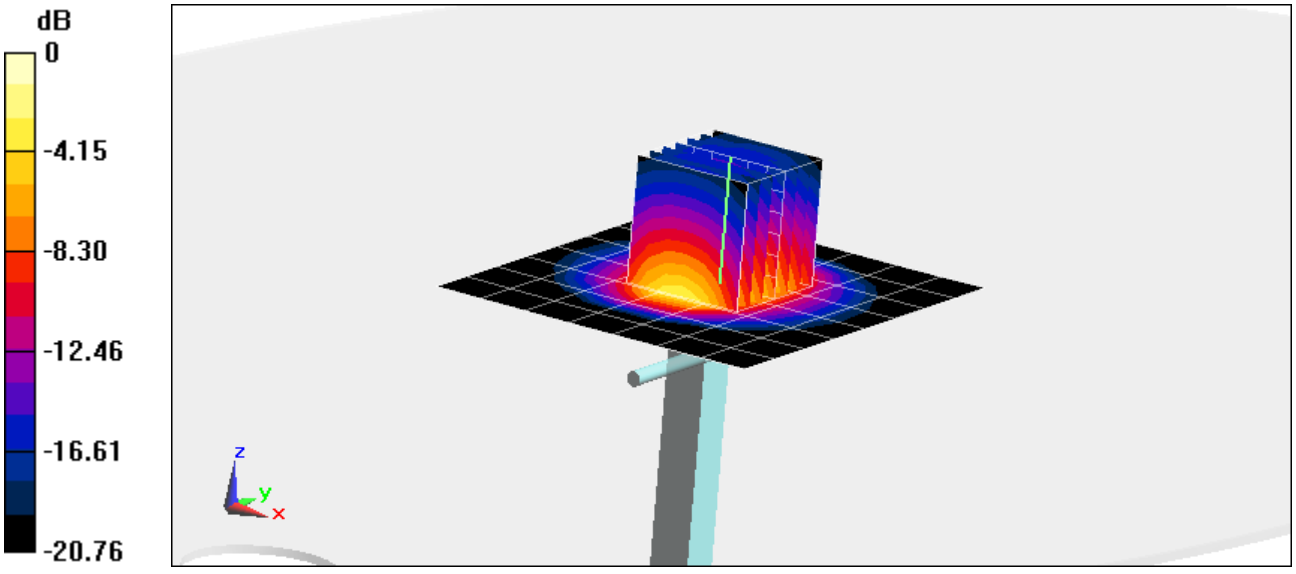
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.937 S/m; ε_r = 51.331; ρ = 1000 kg/m^3
Phantom section: Flat Section, Space = 1.0 cm

Test Date: 02-12-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.0°C

Probe: ES3DV3 - SN3318; ConvF(4.31, 4.31, 4.31); Calibrated: 4/29/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
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) = 11.1 W/kg
SAR(1 g) = 5.41 W/kg
Deviation = 4.64%



0 dB = 7.09 W/kg = 8.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

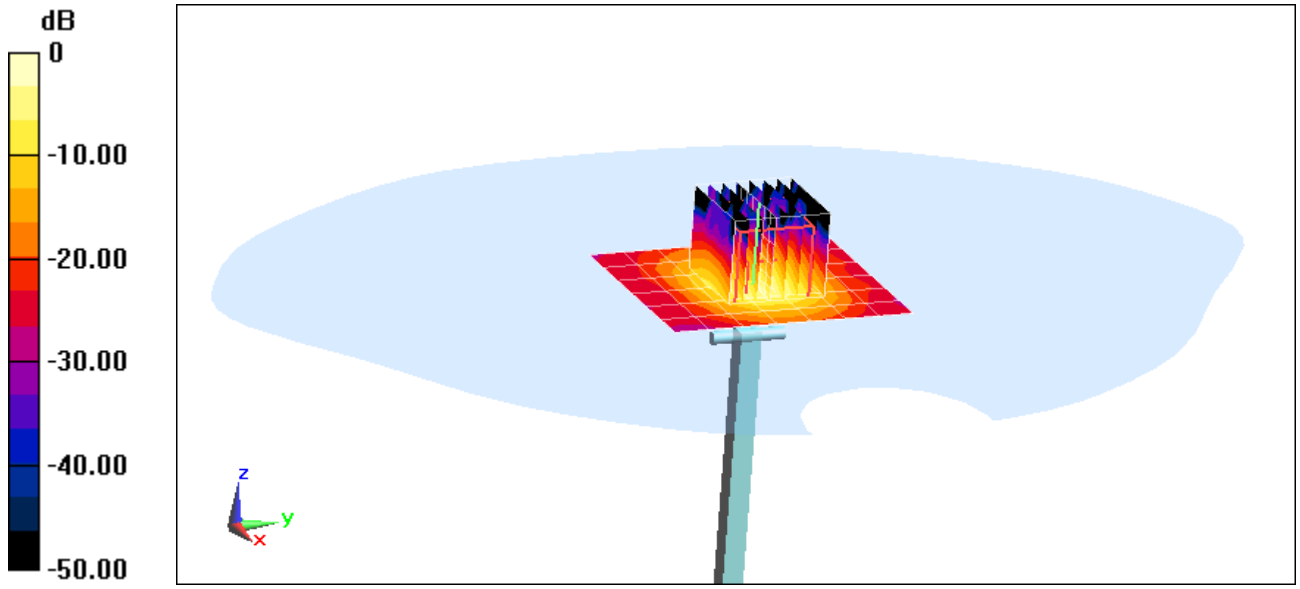
Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.168 S/m; ε_r = 47.598; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3914; ConvF(4.52, 4.52, 4.52); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 3.11 W/kg
Deviation = 1.50%



0 dB = 7.88 W/kg = 8.97 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

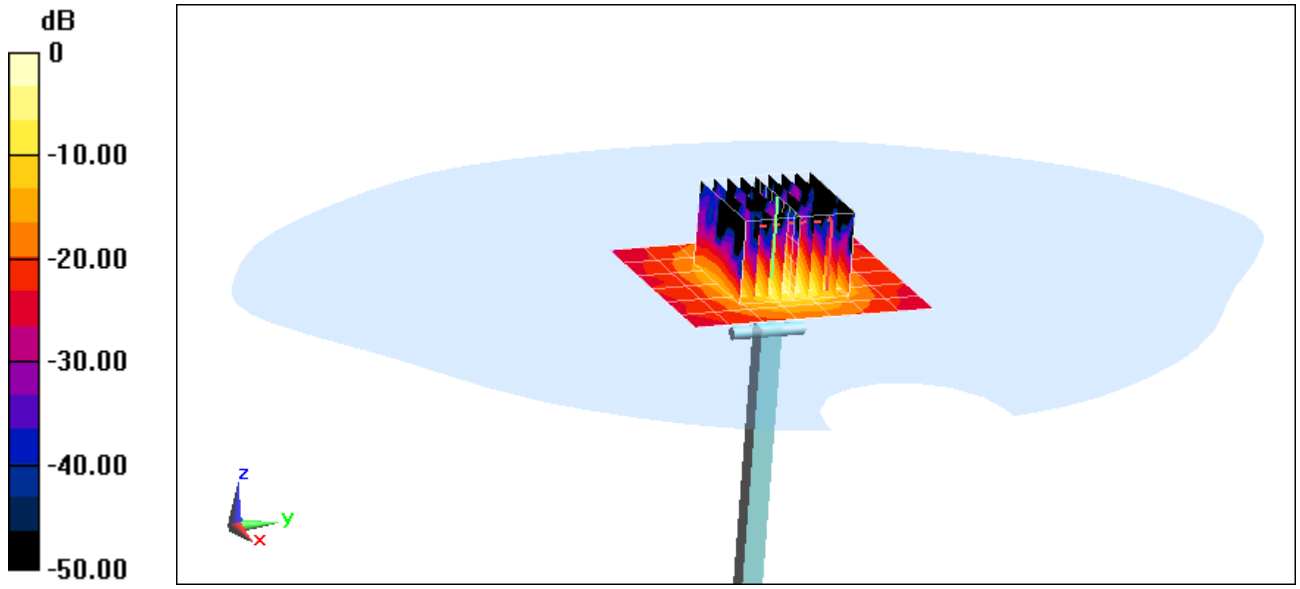
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.352 S/m; ε_r = 47.314; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.4°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 14.4 W/kg
SAR(1 g) = 3.26 W/kg
Deviation = 6.12%



0 dB = 8.34 W/kg = 9.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1120

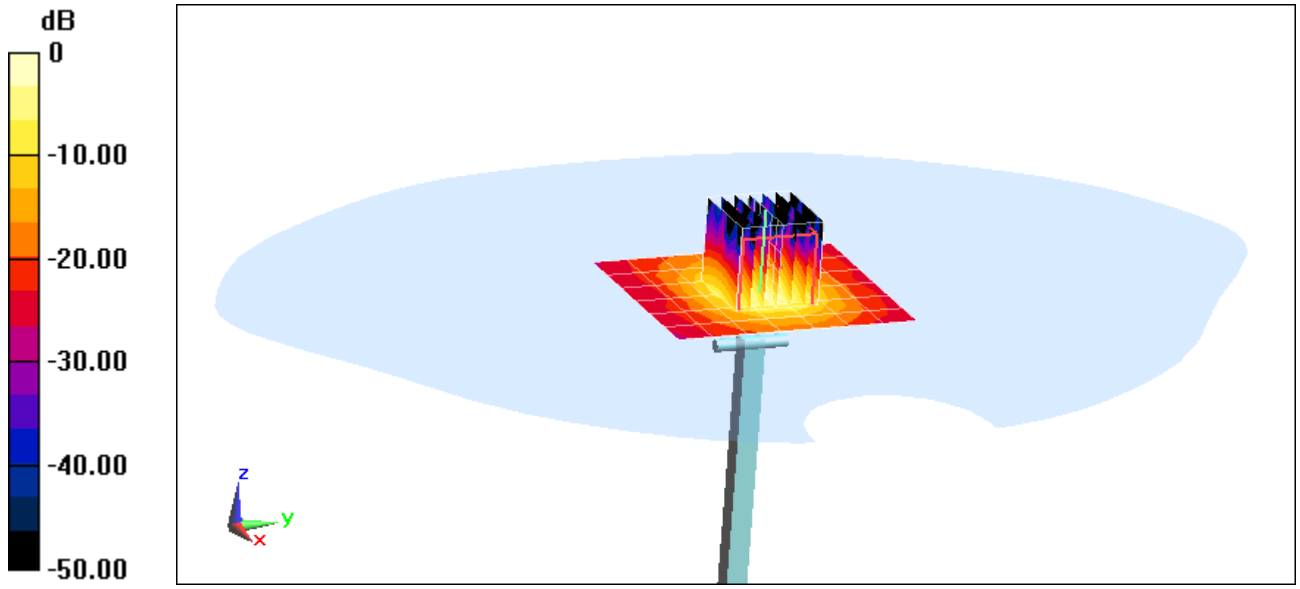
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.579 S/m; ε_r = 46.639; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3914; ConvF(4.07, 4.07, 4.07); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x8x1): 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 = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 15.3 W/kg
SAR(1 g) = 3.27 W/kg
Deviation = 2.44%



0 dB = 8.61 W/kg = 9.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

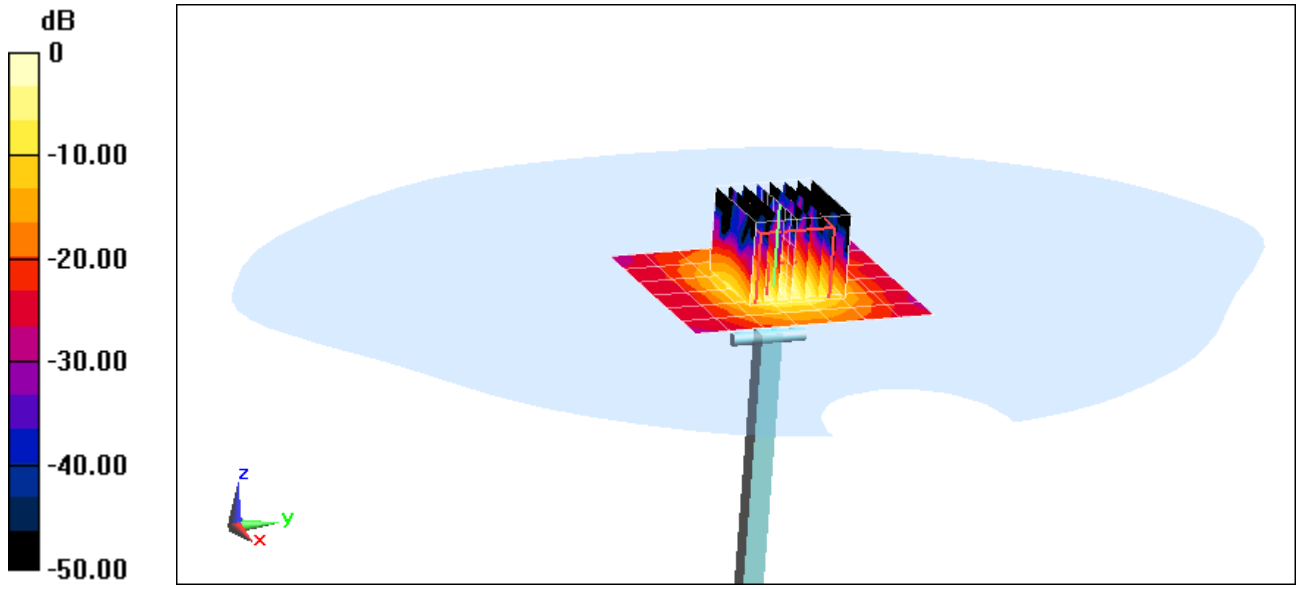
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.749 S/m; ε_r = 46.646; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-03-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(3.97, 3.97, 3.97); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 16.2 W/kg
SAR(1 g) = 3.38 W/kg
Deviation = 4.71%



0 dB = 8.93 W/kg = 9.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

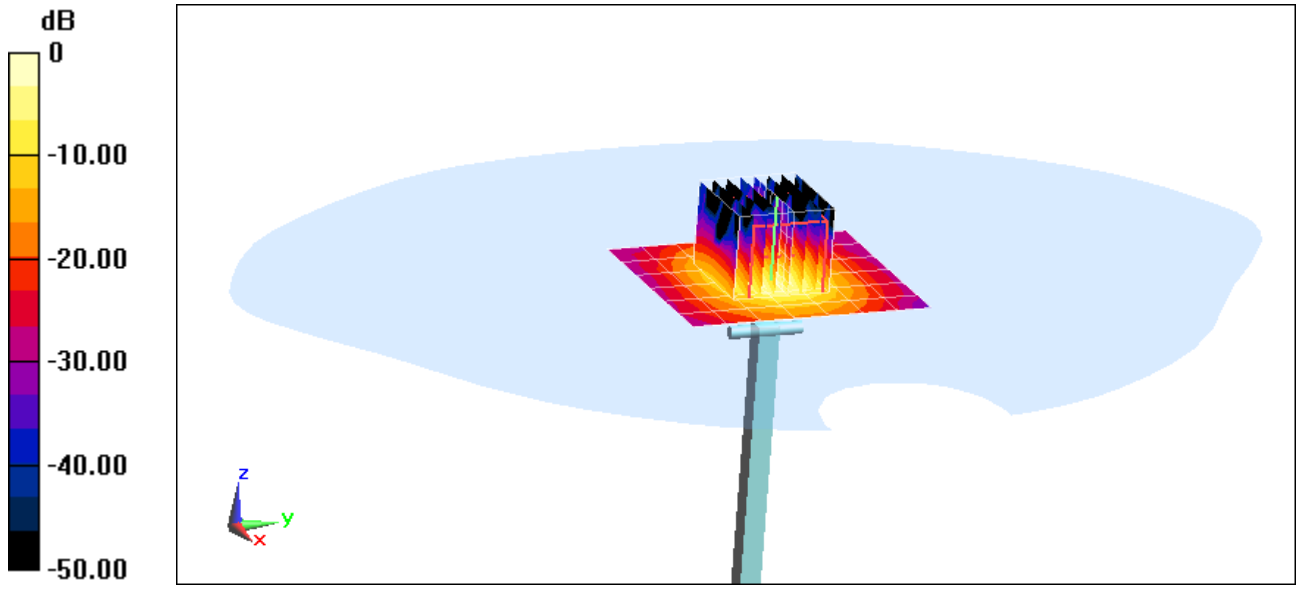
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.172 S/m; ε_r = 46.231; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-09-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3914; ConvF(4.14, 4.14, 4.14); Calibrated: 10/23/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/19/2013
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (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) = 34.4 W/kg
SAR(1 g) = 6.94 W/kg
Deviation = -8.08%



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

APPENDIX C: PROBE CALIBRATION

APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

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

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

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

Table D-I
Composition of the Tissue Equivalent Matter

Frequency (MHz)	750	750	835	835	1750	1750	1900	1900	2450	2450	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)												
Bactericide	See Page 2&3	See Page 2	0.1	0.1					See Page 4		See Page 5	
DGBE					47	31	44.92	29.44		26.7		
HEC			1	1								
NaCl			1.45	0.94	0.4	0.2	0.18	0.39		0.1		
Sucrose			57	44.9								
Polysorbate (Tween) 80												20
Water			40.45	53.06	52.6	68.8	54.9	70.17		73.2		80

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

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

Figure D-1
Composition of 750 MHz Head and Body Tissue Equivalent Matter

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

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MSL750V2)**
Product No.	SL AAM 075 AA (Charge: 130313-1)
Manufacturer	SPEAG

Measurement Method
TSL dielectric parameters measured using calibrated OCP probe.

Setup Validation
Validation results were within ± 2.5% towards the target values of Methanol.

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

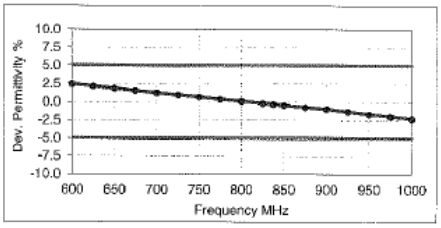
Test Condition

Ambient	Environment temperatur (22 ± 3)°C and humidity < 70%.
TSL Temperature	22°C
Test Date	13-Mar-13
Operator	IEN

Additional Information

TSL Density	1.212 g/cm^3
TSL Heat-capacity	3.006 kJ/(kg*K)

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	57.5	24.64	0.82	56.1	0.95	2.5	-13.6
625	57.2	24.31	0.84	56.0	0.95	2.1	-11.4
650	57.0	23.99	0.87	55.9	0.96	1.8	-9.2
675	56.7	23.69	0.89	55.8	0.96	1.5	-7.1
700	56.4	23.39	0.91	55.7	0.96	1.2	-5.1
725	56.2	23.18	0.93	55.6	0.96	1.0	-2.8
750	55.9	22.97	0.96	55.5	0.96	0.7	-0.5
775	55.7	22.78	0.98	55.4	0.97	0.4	1.7
800	55.4	22.60	1.01	55.3	0.97	0.1	4.0
825	55.2	22.44	1.03	55.2	0.98	-0.2	5.3
838	55.0	22.36	1.04	55.2	0.98	-0.3	5.9
850	54.9	22.28	1.05	55.2	0.99	-0.4	6.6
875	54.7	22.16	1.08	55.1	1.02	-0.7	5.8
900	54.5	22.03	1.10	55.0	1.05	-1.0	5.1
925	54.2	21.93	1.13	55.0	1.06	-1.3	6.2
950	54.0	21.82	1.15	54.9	1.08	-1.7	7.2
975	53.8	21.74	1.18	54.9	1.09	-2.0	8.5
1000	53.6	21.66	1.21	54.8	1.10	-2.3	9.7



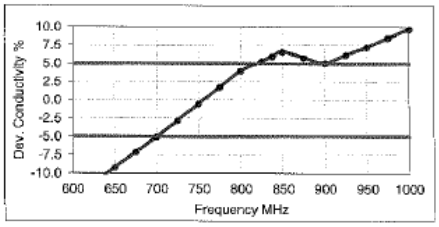


Figure D-2
750MHz Body Tissue Equivalent Matter

Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HSL750V2)**
Product No.	SL AAH 075 AA (Charge: 130312-4)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated OCP probe.

Setup Validation

Validation results were within ± 2.5% towards the target values of Methanol.

Target Parameters

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

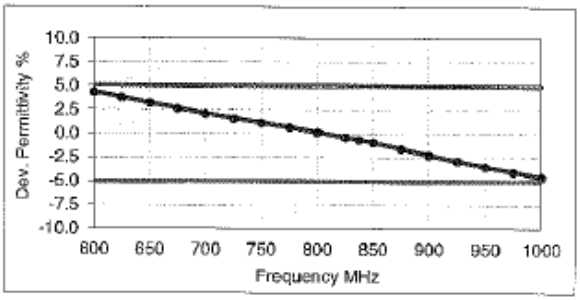
Test Condition

Ambient	Environment temperatur (22 ± 3)°C and humidity < 70%.
TSL Temperature	22°C
Test Date	13-Mar-13
Operator	IEN

Additional Information

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

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	44.6	23.25	0.78	42.7	0.88	4.3	-12.0
625	44.2	23.00	0.80	42.6	0.88	3.8	-9.5
650	43.8	22.76	0.82	42.5	0.89	3.2	-7.1
675	43.4	22.50	0.84	42.3	0.89	2.6	-4.9
700	43.1	22.24	0.87	42.2	0.89	2.1	-2.6
725	42.7	22.06	0.89	42.1	0.89	1.6	-0.2
750	42.4	21.88	0.91	41.9	0.89	1.1	2.2
775	42.1	21.72	0.94	41.8	0.90	0.6	4.6
800	41.7	21.55	0.96	41.7	0.90	0.1	6.9
825	41.4	21.40	0.98	41.6	0.91	-0.4	8.3
838	41.3	21.32	0.99	41.5	0.91	-0.6	9.0
850	41.1	21.24	1.00	41.5	0.92	-0.9	9.6
875	40.8	21.11	1.03	41.5	0.94	-1.6	9.0
900	40.6	20.99	1.05	41.5	0.97	-2.3	8.3
925	40.3	20.87	1.07	41.5	0.98	-2.9	9.4
950	40.0	20.76	1.10	41.4	0.99	-3.5	10.3
975	39.7	20.66	1.12	41.4	1.00	-4.0	11.5
1000	39.5	20.57	1.14	41.3	1.01	-4.5	12.7



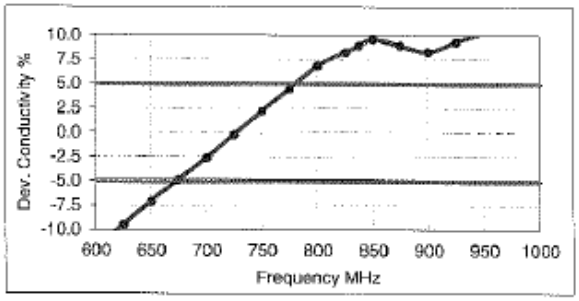


Figure D-3
750MHz Head Tissue Equivalent Matter

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

H2O	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25 – 48% (CAS-No. 112-34-5, EC-No. 203-961-6, EC-index-No. 603-096-00-8) Relevant for safety; Refer to the respective Safety Data Sheet*.
NaCl	Sodium Chloride, <1.0%

Figure D-4
Composition of 2.4 GHz Head Tissue Equivalent Matter

Note: 2.4 GHz head liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HSL2450V2)**
Product No.	SL AAH 245 BA (Charge: 130212-2)
Manufacturer	SPEAG

Measurement Method
TSL dielectric parameters measured using calibrated OCP probe.

Setup Validation
Validation results were within ± 2.5% towards the target values of Methanol.

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

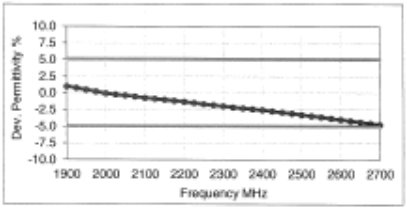
Test Condition

Ambient	Environment temperatur (22 ± 3)°C and humidity < 70%.
TSL Temperature	23°C
Test Date	13-Feb-13
Operator	DI

Additional Information

TSL Density	0.988 g/cm^3
TSL Heat-capacity	3.680 kJ/(kg*K)

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e"	sigma	eps	sigma	Δ-eps	Δ-sigma
1900	40.4	11.94	1.26	40.0	1.40	1.0	-9.9
1925	40.3	12.02	1.29	40.0	1.40	0.7	-8.0
1950	40.2	12.11	1.31	40.0	1.40	0.5	-6.2
1975	40.1	12.20	1.34	40.0	1.40	0.2	-4.2
2000	40.0	12.29	1.37	40.0	1.40	-0.1	-2.3
2025	39.9	12.39	1.40	40.0	1.42	-0.2	-1.9
2050	39.8	12.49	1.42	39.9	1.44	-0.4	-1.4
2075	39.6	12.57	1.45	39.9	1.47	-0.6	-1.1
2100	39.5	12.65	1.48	39.8	1.49	-0.7	-0.7
2125	39.4	12.74	1.51	39.8	1.51	-0.9	-0.4
2150	39.3	12.82	1.53	39.7	1.53	-1.0	0.0
2175	39.2	12.89	1.56	39.7	1.56	-1.2	0.3
2200	39.1	12.97	1.59	39.6	1.58	-1.3	0.6
2225	39.0	13.04	1.61	39.6	1.60	-1.5	0.9
2250	38.9	13.11	1.64	39.6	1.62	-1.7	1.2
2275	38.8	13.20	1.67	39.5	1.64	-1.8	1.6
2300	**38.7**	**13.28**	**1.70**	**39.5**	**1.67**	**-2.0**	**2.0**
2325	38.6	13.35	1.73	39.4	1.69	-2.1	2.3
2350	38.5	13.42	1.75	39.4	1.71	-2.3	2.6
2375	38.4	13.50	1.78	39.3	1.73	-2.4	2.9
2400	38.3	13.58	1.81	39.3	1.76	-2.6	3.3
2425	38.2	13.65	1.84	39.2	1.78	-2.7	3.6
2450	**38.1**	**13.73**	**1.87**	**39.2**	**1.80**	**-2.9**	**4.0**
2475	38.0	13.79	1.90	39.2	1.83	-3.1	3.9
2500	37.9	13.85	1.93	39.1	1.85	-3.3	3.9
2525	37.8	13.94	1.96	39.1	1.88	-3.4	4.0
2550	37.7	14.02	1.99	39.1	1.91	-3.6	4.2
2575	37.6	14.09	2.02	39.0	1.94	-3.8	4.3
2600	**37.5**	**14.17**	**2.05**	**39.0**	**1.96**	**-4.0**	**4.4**
2625	37.4	14.23	2.08	39.0	1.99	-4.2	4.4
2650	37.3	14.29	2.11	38.9	2.02	-4.3	4.4
2675	37.1	14.36	2.14	38.9	2.05	-4.5	4.5
2700	37.0	14.43	2.17	38.9	2.07	-4.8	4.6



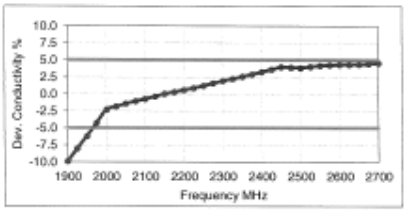


Figure D-5
2.4 GHz Head Tissue Equivalent Matter

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

Water	50 – 65%
Mineral oil	10 – 30%
Emulsifiers	8 – 25%
Sodium salt	0 – 1.5%

Figure D-6
Composition of 5 GHz Head Tissue Equivalent Matter

Note: 5GHz head liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HBBL3500-5800V5)**
Product No.	SL AAH 502 AB (Charge: 120402-2)
Manufacturer	SPEAG

Measurement Method

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

Target Parameters

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

Test Condition

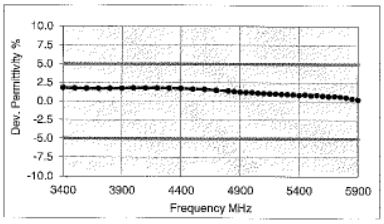
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	4-Apr-12

Additional Information

TSL Density	0.985 g/cm^3
TSL Heat-capacity	3.383 kJ/(kg*K)

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e''	sigma	eps	sigma	Δ-eps	Δ-sigma
3400	38.7	14.96	2.83	38.0	2.81	1.8	0.7
3500	38.6	14.91	2.90	37.9	2.91	1.7	-0.3
3600	38.5	14.92	2.99	37.8	3.02	1.7	-0.9
3700	38.3	14.92	3.07	37.7	3.12	1.7	-1.5
3800	38.2	14.94	3.16	37.6	3.22	1.7	-1.9
3900	38.1	14.95	3.24	37.5	3.32	1.7	-2.4
4000	38.0	15.00	3.34	37.4	3.43	1.8	-2.5
4100	37.9	15.04	3.43	37.2	3.53	1.8	-2.8
4200	37.8	15.08	3.52	37.1	3.63	1.8	-2.9
4300	37.7	15.14	3.62	37.0	3.73	1.8	-3.0
4400	37.5	15.18	3.71	36.9	3.84	1.7	-3.1
4500	37.4	15.20	3.81	36.8	3.94	1.6	-3.3
4600	37.3	15.29	3.91	36.7	4.04	1.6	-3.2
4700	37.1	15.34	4.01	36.6	4.14	1.5	-3.2
4800	37.0	15.39	4.11	36.4	4.25	1.4	-3.2
4850	36.9	15.43	4.16	36.4	4.30	1.3	-3.1
4900	36.8	15.45	4.21	36.3	4.35	1.3	-3.1
4950	36.7	15.47	4.26	36.3	4.40	1.2	-3.1
5000	36.7	15.50	4.31	36.2	4.45	1.2	-3.1
5050	36.6	15.55	4.37	36.2	4.50	1.1	-3.0
5100	36.5	15.60	4.43	36.1	4.55	1.1	-2.8
5150	36.4	15.62	4.48	36.0	4.60	1.0	-2.8
5200	36.4	15.65	4.53	36.0	4.66	1.0	-2.8
5250	36.3	15.67	4.58	35.9	4.71	1.0	-2.8
5300	36.2	15.70	4.63	35.9	4.76	1.0	-2.7
5350	36.1	15.70	4.67	35.8	4.81	0.9	-2.9
5400	36.1	15.74	4.73	35.8	4.86	0.8	-2.7
5450	36.0	15.75	4.77	35.7	4.91	0.9	-2.8
5500	35.9	15.75	4.82	35.6	4.96	0.8	-2.9
5550	35.9	15.80	4.88	35.6	5.01	0.8	-2.7
5600	35.8	15.82	4.93	35.5	5.07	0.7	-2.7
5650	35.7	15.86	4.98	35.5	5.12	0.7	-2.6
5700	35.7	15.88	5.03	35.4	5.17	0.7	-2.6
5750	35.6	15.90	5.08	35.4	5.22	0.6	-2.6
5800	35.5	15.94	5.14	35.3	5.27	0.5	-2.4
5850	35.4	15.98	5.20	35.3	5.34	0.4	-2.5
5900	35.4	16.02	5.26	35.3	5.40	0.2	-2.6



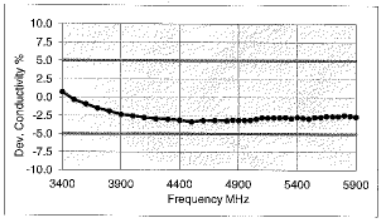


Figure D-7
5GHz Head Tissue Equivalent Matter

APPENDIX E: SAR SYSTEM VALIDATION

Per FCC KDB 865664 D02v01, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB 865664 D01 v01 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table E-I
SAR System Validation Summary

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE TYPE	PROBE CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
							(σ)	(ε_r)	SENSI-TIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
D	750	2/13/2014	3287	ES3DV3	750	Head	0.909	41.18	PASS	PASS	PASS	N/A	N/A	N/A
J	835	1/15/2014	3332	ES3DV3	835	Head	0.900	40.49	PASS	PASS	PASS	GMSK	PASS	N/A
H	835	2/7/2014	3589	EX3DV4	835	Head	0.892	40.40	PASS	PASS	PASS	GMSK	PASS	N/A
D	1750	2/13/2014	3287	ES3DV3	1750	Head	1.329	39.07	PASS	PASS	PASS	N/A	N/A	N/A
D	1900	2/12/2014	3287	ES3DV3	1900	Head	1.400	39.06	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	2/8/2014	3287	ES3DV3	2450	Head	1.832	38.03	PASS	PASS	PASS	OFDM	N/A	PASS
E	5200	12/3/2013	3914	EX3DV4	5200	Head	4.482	34.70	PASS	PASS	PASS	OFDM	N/A	PASS
E	5300	12/3/2013	3914	EX3DV4	5300	Head	4.604	34.60	PASS	PASS	PASS	OFDM	N/A	PASS
E	5500	12/3/2013	3914	EX3DV4	5500	Head	4.821	34.28	PASS	PASS	PASS	OFDM	N/A	PASS
E	5600	12/3/2013	3914	EX3DV4	5600	Head	4.907	34.13	PASS	PASS	PASS	OFDM	N/A	PASS
E	5800	12/3/2013	3914	EX3DV4	5800	Head	5.133	33.89	PASS	PASS	PASS	OFDM	N/A	PASS
C	750	8/14/2013	3263	ES3DV3	750	Body	0.975	54.36	PASS	PASS	PASS	N/A	N/A	N/A
G	835	1/6/2014	3209	ES3DV3	835	Body	0.989	53.83	PASS	PASS	PASS	GMSK	PASS	N/A
K	1750	1/14/2014	3333	ES3DV3	1750	Body	1.510	52.07	PASS	PASS	PASS	N/A	N/A	N/A
B	1750	11/6/2013	3288	ES3DV3	1750	Body	1.534	51.18	PASS	PASS	PASS	N/A	N/A	N/A
D	1900	9/10/2013	3022	ES3DV2	1900	Body	1.516	52.49	PASS	PASS	PASS	GMSK	PASS	N/A
G	1900	1/13/2014	3209	ES3DV3	1900	Body	1.576	51.59	PASS	PASS	PASS	GMSK	PASS	N/A
H	2450	6/21/2013	3318	ES3DV3	2450	Body	2.006	51.66	PASS	PASS	PASS	OFDM	N/A	PASS
E	5200	12/7/2013	3914	EX3DV4	5200	Body	5.330	48.16	PASS	PASS	PASS	OFDM	N/A	PASS
E	5300	12/7/2013	3914	EX3DV4	5300	Body	5.481	47.91	PASS	PASS	PASS	OFDM	N/A	PASS
E	5500	12/7/2013	3914	EX3DV4	5500	Body	5.807	47.39	PASS	PASS	PASS	OFDM	N/A	PASS
E	5600	12/7/2013	3914	EX3DV4	5600	Body	5.933	47.15	PASS	PASS	PASS	OFDM	N/A	PASS
E	5800	12/7/2013	3914	EX3DV4	5800	Body	6.240	46.70	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: While the probes have been calibrated for both a CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664.