



SAR EVALUATION REPORT

Applicant Name:

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Date of Testing:

12/31/14 – 01/19/15

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

0Y1412292326.A3L

FCC ID:

A3LSMG530AZ

APPLICANT:

SAMSUNG ELECTRONICS, CO. LTD.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SM-G530AZ

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	0.39	0.72	0.69
PCE	UMTS 850	826.40 - 846.60 MHz	0.44	0.67	0.67
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.33	0.74	0.82
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.58	0.76	0.67
PCE	LTE Band 17	706.5 - 713.5 MHz	0.33	0.40	0.59
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.37	0.62	0.62
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.42	0.45	0.49
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.38	0.51	0.76
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.23	0.23	0.23
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r03:			0.74	1.00	1.05

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

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


Randy Ortanez
President



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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
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
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Power Reduction for SAR

The device utilizes power reduction under portable hotspot for SAR compliance. There is power reduction for UMTS Band 2 and LTE Band 2 and Band 4. There is no power reduction for GSM/GPRS/EDGE 850/1900, UMTS Band 5, LTE Bands 17 and 5, and WLAN modes. The reduced powers were confirmed via conducted power measurements at the RF port (See Section 9). A detailed description of the hotspot power reduction is included in the operational description.

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	1 TX Slots	2 TX Slots
GSM/GPRS/EDGE 850	Maximum	33.0	33.0	30.0	27.5	25.5
	Nominal	32.5	32.5	29.5	27.0	25.0
GSM/GPRS/EDGE 1900	Maximum	30.5	30.5	27.5	26.5	25.0
	Nominal	30.0	30.0	27.0	26.0	24.5

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Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
UMTS Band 5 (850 MHz)	Maximum	23.5	23.5	22.5
	Nominal	23.0	23.0	22.0
UMTS Band 2 (1900 MHz)	Maximum	23.5	23.5	22.5
	Nominal	23.0	23.0	22.0

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	23.5
	Nominal	23.0
LTE Band 5 (Cell)	Maximum	23.5
	Nominal	23.0
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
Bluetooth	Maximum	10.0
	Nominal	9.5
Bluetooth LE	Maximum	1.5
	Nominal	1.0

1.3.2 Reduced Power – Hotspot Mode

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
UMTS Band 2 (1900 MHz)	Maximum	20.5	20.5	18.5
	Nominal	20.0	20.0	18.0
Mode / Band		Modulated Average (dBm)		
LTE Band 4 (AWS)	Maximum	21.0		
	Nominal	20.5		
LTE Band 2 (PCS)	Maximum	21.0		
	Nominal	20.5		

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1.4 DUT Antenna Locations

Note:

1. A diagram showing the location of the device antennas can be found in Appendix F. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.
2. The overall dimensions of this device are more than 9x5 cm. Since the overall diagonal dimension of the device is less than 160 mm and the diagonal display is less than 150 mm, it is considered a "handset".

Table 1-1
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
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	Yes	Yes	Yes	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. The distances between the transmit antennas and the edges of the device are included in the filing.

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: **EB-BG530BBU**). A diagram showing the location of the NFC antenna can be found in appendix F.

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 1-1 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 1-1
Simultaneous Transmission Paths

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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 + 2.4 GHz Bluetooth	N/A	Yes	N/A	
3	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	
4	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	
5	LTE + 2.4 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
6	LTE + 2.4 GHz Bluetooth	N/A	Yes*	N/A	*-Pre-installed VOIP applications are considered.
7	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	

1. 2.4 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path 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.

1.7 SAR Test Exclusions Applied

(A) WIFI/BT

Per FCC KDB 447498 D01v05, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; $[(10/15) * \sqrt{2.480}] = 1.0 < 3.0$. 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 D01.

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.

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1.8 Guidance Applied

- IEEE 1528-2003
- FCC KDB Publication 941225 D01, D05, D06 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r02 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r03, D02v01r01 (SAR Measurements up to 6 GHz)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.9 Device Serial Numbers

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

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number
GSM/GPRS/EDGE 850	3012-9	3012-9	3012-9
UMTS 850	3012-9	3012-9	3012-9
GSM/GPRS/EDGE 1900	3012-9	3012-9	3012-9
UMTS 1900 - Max Power	3012-9	3012-9	N/A
UMTS 1900 - Reduced Power	N/A	N/A	3012-3
LTE Band 17	3012-10	3012-10	3012-10
LTE Band 5 (Cell)	3012-2	3012-2	3012-2
LTE Band 4 (AWS) - Max Power	3012-2	3012-2	N/A
LTE Band 4 (AWS) - Reduced Power	3012-4	N/A	3012-4
LTE Band 2 (PCS) - Max Power	3012-10	3012-10	N/A
LTE Band 2 (PCS) - Reduced Power	3012-11	N/A	3012-11
2.4 GHz WLAN	3012-5	3012-5	3012-5

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LTE INFORMATION

LTE Information			
FCC ID	A3LSMG530AZ		
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		

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3

INTRODUCTION

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

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [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/m³)
- E = Total RMS electric field strength (V/m)

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

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

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.

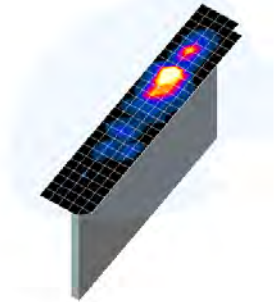


Figure 4-1
Sample SAR Area
Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01*

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

*Also compliant to IEEE 1528-2013 Table 6

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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].

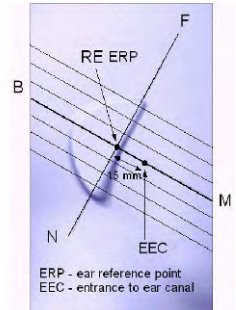


Figure 5-1
Close-Up Side view
of ERP

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 then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



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

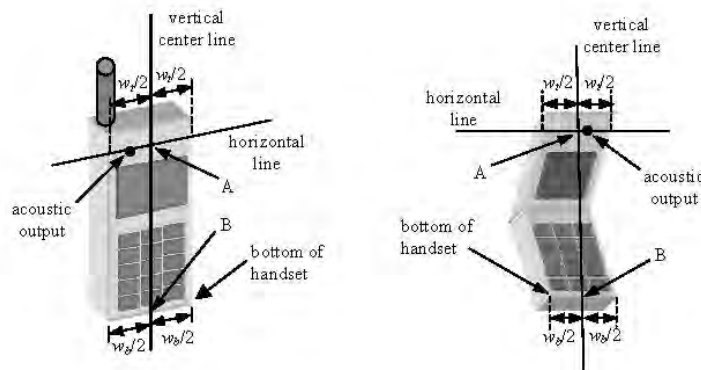


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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6

TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

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

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.

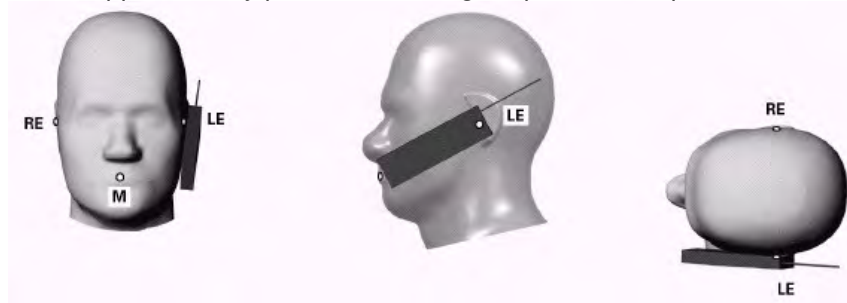


Figure 6-1 Front, Side and Top View of Cheek Position

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 with 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 / 15° 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 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the 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).

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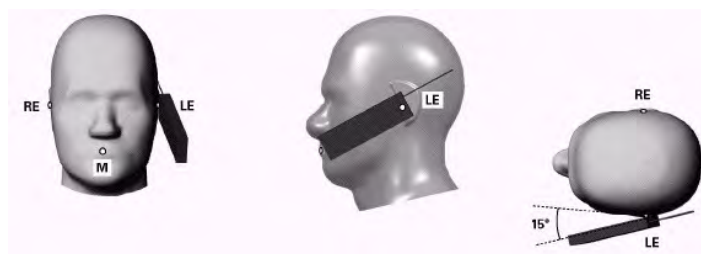


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

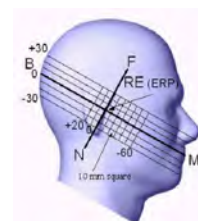


Figure 6-3 Side view w/ relevant markings

6.4 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 6-4). 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 $> 1.2 \text{ W/kg}$, 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.

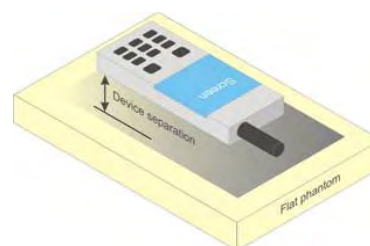


Figure 6-4 Sample Body-Worn Diagram

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.

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6.5 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 ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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.

There is power reduction for UMTS Band 2 and LTE Band 2 and Band 4. There is no power reduction for GSM/GPRS/EDGE 850/1900, UMTS Band 5, LTE Bands 17 and 5, and WLAN modes. The reduced powers were confirmed via conducted power measurements at the RF port (See Section 9). A detailed description of the hotspot power reduction is included in the operational description.

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 447498 D01v05 should be applied to determine SAR test requirements.

Per KDB Publication 447498 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.

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7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

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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". 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

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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 $\leq 75\%$ of the SAR limit. Otherwise, SAR is measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration measured in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that resulted in the highest SAR in 12.2 kbps RMC mode for that RF channel.

The H-set used in FRC for HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HSPDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the applicable H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the FRC for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 2 ms to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors of $\beta_c=9$ and $\beta_d=15$, and power offset parameters of $\Delta_{ACK} = \Delta_{NACK} = 5$ and $\Delta_{CQI}=2$ 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} (Note 1, 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 $\Delta_{CQI} = 8 \Rightarrow A_{HS} = \beta_{HS}/\beta_c = 30/15 \Rightarrow \beta_{HS} = 30/15 * \beta_c$.

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 $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. 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 $\leq 75\%$ 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”

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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_e	β_d	β_d (SF)	β_e/β_d	$\beta_{in}^{(1)}$	β_{ex}	β_{ul}	β_{ul} (SF)	β_{ul} (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽³⁾ 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_{ul} : 47/15 β_{ex} : 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_{HACK} and $\Delta_{CQI} = 8 \Rightarrow A_M = \beta_{ul}/\beta_e = 30/15 \Rightarrow \beta_{ul} = 30/15 * \beta_e$.

Note 2: CM = 1 for $\beta_e/\beta_d = 12/15$, $\beta_{ul}/\beta_e = 24/15$. 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_e/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 $\beta_e = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_e/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 $\beta_e = 14/15$ and $\beta_d = 15/15$.

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_{ul} can not be set directly; it is set by Absolute Grant Value.

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.

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

8.5 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 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.

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

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9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

		Maximum Burst-Averaged Output Power				
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	32.43	32.55	28.90	26.72	24.76
	190	32.31	32.37	29.11	26.80	24.73
	251	32.57	32.54	29.28	26.85	24.82
GSM 1900	512	30.09	30.12	27.04	26.01	24.79
	661	29.81	29.82	26.88	25.95	24.66
	810	29.83	29.86	27.01	26.03	24.87
		Calculated Maximum Frame-Averaged Output Power				
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	23.40	23.52	22.88	17.69	18.74
	190	23.28	23.34	23.09	17.77	18.71
	251	23.54	23.51	23.26	17.82	18.80
GSM 1900	512	21.06	21.09	21.02	16.98	18.77
	661	20.78	20.79	20.86	16.92	18.64
	810	20.80	20.83	20.99	17.00	18.85
GSM 850	Frame	23.47	23.47	23.48	17.97	18.98
GSM 1900	Avg.Targets:	20.97	20.97	20.98	16.97	18.48

Note:

- Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- The 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: 10 (Max 2 Tx uplink slots)
EDGE Multislot class: 10 (Max 2 Tx uplink slots)
DTM Multislot Class: N/A



Figure 9-1
Power Measurement Setup

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9.2 UMTS Conducted Powers

Table 9-1
Maximum Average RF Output Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.56	22.60	22.49	22.45	22.57	22.70	-
99		12.2 kbps AMR	22.50	22.54	22.41	22.41	22.53	22.69	-
6	HSDPA	Subtest 1	22.62	22.50	22.43	22.45	22.60	22.72	0
6		Subtest 2	22.54	22.47	22.41	22.33	22.54	22.74	0
6		Subtest 3	22.46	22.40	22.36	22.20	22.42	22.42	0.5
6		Subtest 4	22.48	22.41	22.34	22.24	22.41	22.49	0.5
6	HSUPA	Subtest 1	20.53	20.60	20.51	20.51	20.55	20.58	0
6		Subtest 2	19.35	19.56	19.43	20.00	19.90	20.13	2
6		Subtest 3	19.80	19.72	19.68	19.96	19.82	20.02	1
6		Subtest 4	20.04	19.98	20.01	20.09	20.29	20.42	2
6		Subtest 5	20.74	20.57	20.53	20.54	20.58	20.61	0

Table 9-2
Reduced Average RF Output Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	19.95	20.13	20.08	-
99		12.2 kbps AMR	20.00	20.03	19.96	-
6	HSDPA	Subtest 1	19.84	19.79	19.80	0
6		Subtest 2	19.78	19.77	19.76	0
6		Subtest 3	19.63	19.60	19.53	0.5
6		Subtest 4	19.69	19.65	19.64	0.5
6	HSUPA	Subtest 1	17.74	17.83	17.89	0
6		Subtest 2	16.60	16.57	16.61	2
6		Subtest 3	16.73	16.67	16.79	1
6		Subtest 4	17.78	17.93	17.95	2
6		Subtest 5	17.70	17.76	17.73	0

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.

This device does not support DC-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

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9.3 LTE Conducted Powers

9.3.1 LTE Band 17

Table 9-3
LTE Band 17 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	710.0	23790	10	QPSK	1	0	23.50	0	0
	710.0	23790	10	QPSK	1	25	23.47	0	0
	710.0	23790	10	QPSK	1	49	23.43	0	0
	710.0	23790	10	QPSK	25	0	22.41	0-1	1
	710.0	23790	10	QPSK	25	12	22.39	0-1	1
	710.0	23790	10	QPSK	25	25	22.33	0-1	1
	710.0	23790	10	QPSK	50	0	22.35	0-1	1
	710.0	23790	10	16QAM	1	0	22.48	0-1	1
	710.0	23790	10	16QAM	1	25	22.34	0-1	1
	710.0	23790	10	16QAM	1	49	22.18	0-1	1
	710.0	23790	10	16QAM	25	0	21.40	0-2	2
	710.0	23790	10	16QAM	25	12	21.43	0-2	2
	710.0	23790	10	16QAM	25	25	21.37	0-2	2
	710.0	23790	10	16QAM	50	0	21.19	0-2	2

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

Table 9-4
LTE Band 17 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	710.0	23790	5	QPSK	1	0	23.34	0	0
	710.0	23790	5	QPSK	1	12	23.37	0	0
	710.0	23790	5	QPSK	1	24	22.97	0	0
	710.0	23790	5	QPSK	12	0	22.37	0-1	1
	710.0	23790	5	QPSK	12	6	22.22	0-1	1
	710.0	23790	5	QPSK	12	13	22.08	0-1	1
	710.0	23790	5	QPSK	25	0	22.28	0-1	1
	710.0	23790	5	16-QAM	1	0	22.30	0-1	1
	710.0	23790	5	16-QAM	1	12	22.32	0-1	1
	710.0	23790	5	16-QAM	1	24	22.33	0-1	1
	710.0	23790	5	16-QAM	12	0	21.34	0-2	2
	710.0	23790	5	16-QAM	12	6	21.34	0-2	2
	710.0	23790	5	16-QAM	12	13	21.12	0-2	2
	710.0	23790	5	16-QAM	25	0	21.35	0-2	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 9-5
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	836.5	20525	10	QPSK	1	0	23.24	0	0
	836.5	20525	10	QPSK	1	25	23.26	0	0
	836.5	20525	10	QPSK	1	49	23.17	0	0
	836.5	20525	10	QPSK	25	0	21.95	0-1	1
	836.5	20525	10	QPSK	25	12	21.89	0-1	1
	836.5	20525	10	QPSK	25	25	21.97	0-1	1
	836.5	20525	10	QPSK	50	0	21.88	0-1	1
	836.5	20525	10	16QAM	1	0	22.06	0-1	1
	836.5	20525	10	16QAM	1	25	21.83	0-1	1
	836.5	20525	10	16QAM	1	49	22.14	0-1	1
	836.5	20525	10	16QAM	25	0	21.12	0-2	2
	836.5	20525	10	16QAM	25	12	20.94	0-2	2
	836.5	20525	10	16QAM	25	25	21.10	0-2	2
	836.5	20525	10	16QAM	50	0	20.96	0-2	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.

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	826.5	20425	5	QPSK	1	0	23.21	0	0
	826.5	20425	5	QPSK	1	12	23.25	0	0
	826.5	20425	5	QPSK	1	24	23.14	0	0
	826.5	20425	5	QPSK	12	0	21.92	0-1	1
	826.5	20425	5	QPSK	12	6	21.86	0-1	1
	826.5	20425	5	QPSK	12	13	21.94	0-1	1
	826.5	20425	5	QPSK	25	0	21.89	0-1	1
	826.5	20425	5	16-QAM	1	0	22.00	0-1	1
	826.5	20425	5	16-QAM	1	12	21.80	0-1	1
	826.5	20425	5	16-QAM	1	24	22.11	0-1	1
	826.5	20425	5	16-QAM	12	0	21.09	0-2	2
	826.5	20425	5	16-QAM	12	6	20.91	0-2	2
	826.5	20425	5	16-QAM	12	13	21.07	0-2	2
	826.5	20425	5	16-QAM	25	0	20.96	0-2	2
	836.5	20525	5	QPSK	1	0	23.16	0	0
	836.5	20525	5	QPSK	1	12	23.18	0	0
Mid	836.5	20525	5	QPSK	1	24	23.09	0	0
	836.5	20525	5	QPSK	12	0	21.87	0-1	1
	836.5	20525	5	QPSK	12	6	21.81	0-1	1
	836.5	20525	5	QPSK	12	13	21.89	0-1	1
	836.5	20525	5	QPSK	25	0	21.80	0-1	1
	836.5	20525	5	16-QAM	1	0	21.98	0-1	1
	836.5	20525	5	16-QAM	1	12	21.87	0-1	1
	836.5	20525	5	16-QAM	1	24	22.10	0-1	1
	836.5	20525	5	16-QAM	12	0	21.04	0-2	2
	836.5	20525	5	16-QAM	12	6	20.86	0-2	2
	836.5	20525	5	16-QAM	12	13	21.02	0-2	2
	836.5	20525	5	16-QAM	25	0	20.88	0-2	2
	846.5	20625	5	QPSK	1	0	23.21	0	0
	846.5	20625	5	QPSK	1	12	23.23	0	0
	846.5	20625	5	QPSK	1	24	23.14	0	0
	846.5	20625	5	QPSK	12	0	21.92	0-1	1
High	846.5	20625	5	QPSK	12	6	21.90	0-1	1
	846.5	20625	5	QPSK	12	13	21.94	0-1	1
	846.5	20625	5	QPSK	25	0	21.85	0-1	1
	846.5	20625	5	16-QAM	1	0	22.09	0-1	1
	846.5	20625	5	16-QAM	1	12	21.80	0-1	1
	846.5	20625	5	16-QAM	1	24	22.11	0-1	1
	846.5	20625	5	16-QAM	12	0	21.16	0-2	2
	846.5	20625	5	16-QAM	12	6	20.91	0-2	2
	846.5	20625	5	16-QAM	12	13	21.07	0-2	2
	846.5	20625	5	16-QAM	25	0	20.93	0-2	2

Table 9-7
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	825.5	20415	3	QPSK	1	0	23.15	0	0
	825.5	20415	3	QPSK	1	7	23.19	0	0
	825.5	20415	3	QPSK	1	14	23.08	0	0
	825.5	20415	3	QPSK	8	0	21.86	0-1	1
	825.5	20415	3	QPSK	8	4	21.84	0-1	1
	825.5	20415	3	QPSK	8	7	21.88	0-1	1
	825.5	20415	3	QPSK	15	0	21.83	0-1	1
	825.5	20415	3	16-QAM	1	0	21.94	0-1	1
	825.5	20415	3	16-QAM	1	7	21.74	0-1	1
	825.5	20415	3	16-QAM	1	14	22.05	0-1	1
	825.5	20415	3	16-QAM	8	0	21.03	0-2	2
	825.5	20415	3	16-QAM	8	4	21.00	0-2	2
	825.5	20415	3	16-QAM	8	7	21.01	0-2	2
	825.5	20415	3	16-QAM	15	0	20.90	0-2	2
	836.5	20525	3	QPSK	1	0	23.10	0	0
	836.5	20525	3	QPSK	1	7	23.12	0	0
Mid	836.5	20525	3	QPSK	1	14	23.03	0	0
	836.5	20525	3	QPSK	8	0	21.81	0-1	1
	836.5	20525	3	QPSK	8	4	21.75	0-1	1
	836.5	20525	3	QPSK	8	7	21.83	0-1	1
	836.5	20525	3	QPSK	15	0	21.74	0-1	1
	836.5	20525	3	16-QAM	1	0	21.92	0-1	1
	836.5	20525	3	16-QAM	1	7	21.88	0-1	1
	836.5	20525	3	16-QAM	1	14	22.04	0-1	1
	836.5	20525	3	16-QAM	8	0	20.94	0-2	2
	836.5	20525	3	16-QAM	8	4	20.80	0-2	2
	836.5	20525	3	16-QAM	8	7	20.96	0-2	2
	836.5	20525	3	16-QAM	15	0	20.82	0-2	2
	847.5	20635	3	QPSK	1	0	23.15	0	0
	847.5	20635	3	QPSK	1	7	23.17	0	0
	847.5	20635	3	QPSK	1	14	23.08	0	0
	847.5	20635	3	QPSK	8	0	21.86	0-1	1
High	847.5	20635	3	QPSK	8	4	21.84	0-1	1
	847.5	20635	3	QPSK	8	7	21.88	0-1	1
	847.5	20635	3	QPSK	15	0	21.79	0-1	1
	847.5	20635	3	16-QAM	1	0	22.03	0-1	1
	847.5	20635	3	16-QAM	1	7	21.80	0-1	1
	847.5	20635	3	16-QAM	1	14	22.05	0-1	1
	847.5	20635	3	16-QAM	8	0	21.40	0-2	2
	847.5	20635	3	16-QAM	8	4	20.85	0-2	2
	847.5	20635	3	16-QAM	8	7	21.09	0-2	2
	847.5	20635	3	16-QAM	15	0	20.66	0-2	2

Table 9-8
LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	824.7	20407	1.4	QPSK	1	0	23.29	0	0
	824.7	20407	1.4	QPSK	1	2	23.33	0	0
	824.7	20407	1.4	QPSK	1	5	23.22	0	0
	824.7	20407	1.4	QPSK	3	0	23.02	0	0
	824.7	20407	1.4	QPSK	3	2	23.02	0	0
	824.7	20407	1.4	QPSK	3	3	23.00	0	0
	824.7	20407	1.4	QPSK	6	0	21.97	0-1	1
	824.7	20407	1.4	16-QAM	1	0	22.08	0-1	1
	824.7	20407	1.4	16-QAM	1	2	21.88	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.19	0-1	1
	824.7	20407	1.4	16-QAM	3	0	21.65	0-1	1
	824.7	20407	1.4	16-QAM	3	2	21.71	0-1	1
	824.7	20407	1.4	16-QAM	3	3	21.57	0-1	1
	824.7	20407	1.4	16-QAM	6	0	21.04	0-2	2
	836.5	20525	1.4	QPSK	1	0	23.24	0	0
	836.5	20525	1.4	QPSK	1	2	23.26	0	0
Mid	836.5	20525	1.4	QPSK	1	5	23.17	0	0
	836.5	20525	1.4	QPSK	3	0	22.50	0	0
	836.5	20525	1.4	QPSK	3	2	22.64	0	0
	836.5	20525	1.4	QPSK	3	3	22.57	0	0
	836.5	20525	1.4	QPSK	6	0	21.88	0-1	1
	836.5	20525	1.4	16-QAM	1	0	22.06	0-1	1
	836.5	20525	1.4	16-QAM	1	2	21.95	0-1	1
	836.5	20525	1.4	16-QAM	1	5	22.18	0-1	1
	836.5	20525	1.4	16-QAM	3	0	21.94	0-1	1
	836.5	20525	1.4	16-QAM	3	2	21.64	0-1	1
	836.5	20525	1.4	16-QAM	3	3	21.78	0-1	1
	836.5	20525	1.4	16-QAM	6	0	20.96	0-2	2
	848.3	20643	1.4	QPSK	1	0	23.29	0	0
	848.3	20643	1.4	QPSK	1	2	23.31	0	0
	848.3	20643	1.4	QPSK	1	5	23.22	0	0
	848.3	20643	1.4	QPSK	3	0	22.50	0	0
High	848.3	20643	1.4	QPSK	3	2	23.05	0	0
	848.3	20643	1.4	QPSK	3	3	23.00	0	0
	848.3	20643	1.4	QPSK	6	0	21.93	0-1	1
	848.3	20643	1.4	16-QAM	1	0	22.17	0-1	1
	848.3	20643	1.4	16-QAM	1	2	21.88	0-1	1
	848.3	20643	1.4	16-QAM	1	5	22.19	0-1	1
	848.3	20643	1.4	16-QAM	3	0	22.50	0-1	1
	848.3	20643	1.4	16-QAM	3	2	22.00	0-1	1
	848.3	20643	1.4	16-QAM	3	3	21.97	0-1	1
	848.3	20643	1.4	16-QAM	6	0	21.01	0-2	2

9.3.3 LTE Band 4 (AWS)

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	23.60	0	0
	1732.5	20175	20	QPSK	1	50	23.48	0	0
	1732.5	20175	20	QPSK	1	99	23.33	0	0
	1732.5	20175	20	QPSK	50	0	22.49	0-1	1
	1732.5	20175	20	QPSK	50	25	22.42	0-1	1
	1732.5	20175	20	QPSK	50	50	22.44	0-1	1
	1732.5	20175	20	QPSK	100	0	22.46	0-1	1
	1732.5	20175	20	16QAM	1	0	22.60	0-1	1
	1732.5	20175	20	16QAM	1	50	22.43	0-1	1
	1732.5	20175	20	16QAM	1	99	22.44	0-1	1
	1732.5	20175	20	16QAM	50	0	21.40	0-2	2
	1732.5	20175	20	16QAM	50	25	21.38	0-2	2
	1732.5	20175	20	16QAM	50	50	21.41	0-2	2
	1732.5	20175	20	16QAM	100	0	21.37	0-2	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.

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Table 9-10
Maximum LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	23.73	0	0
	1717.5	20025	15	QPSK	1	36	23.61	0	0
	1717.5	20025	15	QPSK	1	74	23.46	0	0
	1717.5	20025	15	QPSK	36	0	22.66	0-1	1
	1717.5	20025	15	QPSK	36	18	22.52	0-1	1
	1717.5	20025	15	QPSK	36	37	22.57	0-1	1
	1717.5	20025	15	QPSK	75	0	22.58	0-1	1
	1717.5	20025	15	16QAM	1	0	22.73	0-1	1
	1717.5	20025	15	16QAM	1	36	22.56	0-1	1
	1717.5	20025	15	16QAM	1	74	22.53	0-1	1
	1717.5	20025	15	16QAM	36	0	21.42	0-2	2
	1717.5	20025	15	16QAM	36	18	21.79	0-2	2
	1717.5	20025	15	16QAM	36	37	21.76	0-2	2
	1717.5	20025	15	16QAM	75	0	21.59	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	23.71	0	0
	1732.5	20175	15	QPSK	1	36	23.59	0	0
	1732.5	20175	15	QPSK	1	74	23.37	0	0
	1732.5	20175	15	QPSK	36	0	22.81	0-1	1
	1732.5	20175	15	QPSK	36	18	22.53	0-1	1
	1732.5	20175	15	QPSK	36	37	22.55	0-1	1
	1732.5	20175	15	QPSK	75	0	22.59	0-1	1
	1732.5	20175	15	16QAM	1	0	22.71	0-1	1
	1732.5	20175	15	16QAM	1	36	22.54	0-1	1
	1732.5	20175	15	16QAM	1	74	22.55	0-1	1
	1732.5	20175	15	16QAM	36	0	21.73	0-2	2
	1732.5	20175	15	16QAM	36	18	21.54	0-2	2
	1732.5	20175	15	16QAM	36	37	21.52	0-2	2
	1732.5	20175	15	16QAM	75	0	21.51	0-2	2
High	1747.5	20325	15	QPSK	1	0	23.79	0	0
	1747.5	20325	15	QPSK	1	36	23.68	0	0
	1747.5	20325	15	QPSK	1	74	23.67	0	0
	1747.5	20325	15	QPSK	36	0	22.68	0-1	1
	1747.5	20325	15	QPSK	36	18	22.45	0-1	1
	1747.5	20325	15	QPSK	36	37	22.56	0-1	1
	1747.5	20325	15	QPSK	75	0	22.70	0-1	1
	1747.5	20325	15	16QAM	1	0	22.84	0-1	1
	1747.5	20325	15	16QAM	1	36	22.44	0-1	1
	1747.5	20325	15	16QAM	1	74	22.63	0-1	1
	1747.5	20325	15	16QAM	36	0	21.55	0-2	2
	1747.5	20325	15	16QAM	36	18	21.75	0-2	2
	1747.5	20325	15	16QAM	36	37	21.60	0-2	2
	1747.5	20325	15	16QAM	75	0	21.62	0-2	2

Table 9-11
Maximum LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	23.57	0	0
	1715	20000	10	QPSK	1	25	23.45	0	0
	1715	20000	10	QPSK	1	49	23.30	0	0
	1715	20000	10	QPSK	25	0	22.50	0-1	1
	1715	20000	10	QPSK	25	12	22.39	0-1	1
	1715	20000	10	QPSK	25	25	22.41	0-1	1
	1715	20000	10	QPSK	50	0	22.43	0-1	1
	1715	20000	10	16QAM	1	0	22.57	0-1	1
	1715	20000	10	16QAM	1	25	22.40	0-1	1
	1715	20000	10	16QAM	1	49	22.41	0-1	1
	1715	20000	10	16QAM	25	0	21.37	0-2	2
	1715	20000	10	16QAM	25	12	21.41	0-2	2
	1715	20000	10	16QAM	25	25	21.63	0-2	2
	1715	20000	10	16QAM	50	0	21.34	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	23.55	0	0
	1732.5	20175	10	QPSK	1	25	23.43	0	0
	1732.5	20175	10	QPSK	1	49	23.28	0	0
	1732.5	20175	10	QPSK	25	0	22.65	0-1	1
	1732.5	20175	10	QPSK	25	12	22.37	0-1	1
	1732.5	20175	10	QPSK	25	25	22.39	0-1	1
	1732.5	20175	10	QPSK	50	0	22.43	0-1	1
	1732.5	20175	10	16QAM	1	0	22.55	0-1	1
	1732.5	20175	10	16QAM	1	25	22.38	0-1	1
	1732.5	20175	10	16QAM	1	49	22.39	0-1	1
	1732.5	20175	10	16QAM	25	0	21.35	0-2	2
	1732.5	20175	10	16QAM	25	12	21.38	0-2	2
	1732.5	20175	10	16QAM	25	25	21.36	0-2	2
	1732.5	20175	10	16QAM	50	0	21.35	0-2	2
High	1750	20350	10	QPSK	1	0	23.63	0	0
	1750	20350	10	QPSK	1	25	23.55	0	0
	1750	20350	10	QPSK	1	49	23.51	0	0
	1750	20350	10	QPSK	25	0	22.52	0-1	1
	1750	20350	10	QPSK	25	12	22.45	0-1	1
	1750	20350	10	QPSK	25	25	22.47	0-1	1
	1750	20350	10	QPSK	50	0	22.54	0-1	1
	1750	20350	10	16QAM	1	0	22.69	0-1	1
	1750	20350	10	16QAM	1	25	22.28	0-1	1
	1750	20350	10	16QAM	1	49	22.47	0-1	1
	1750	20350	10	16QAM	25	0	21.43	0-2	2
	1750	20350	10	16QAM	25	12	21.46	0-2	2
	1750	20350	10	16QAM	25	25	21.44	0-2	2
	1750	20350	10	16QAM	50	0	21.41	0-2	2

Table 9-12
Maximum LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	23.66	0	0
	1712.5	19975	5	QPSK	1	12	23.54	0	0
	1712.5	19975	5	QPSK	1	24	23.39	0	0
	1712.5	19975	5	QPSK	12	0	22.59	0-1	1
	1712.5	19975	5	QPSK	12	6	22.45	0-1	1
	1712.5	19975	5	QPSK	12	13	22.50	0-1	1
	1712.5	19975	5	QPSK	25	0	22.51	0-1	1
	1712.5	19975	5	16-QAM	1	0	22.66	0-1	1
	1712.5	19975	5	16-QAM	1	12	22.49	0-1	1
	1712.5	19975	5	16-QAM	1	24	22.46	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.35	0-2	2
	1712.5	19975	5	16-QAM	12	6	21.72	0-2	2
	1712.5	19975	5	16-QAM	12	13	21.69	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.52	0-2	2
	1732.5	20175	5	QPSK	1	0	23.64	0	0
Mid	1732.5	20175	5	QPSK	1	12	23.52	0	0
	1732.5	20175	5	QPSK	1	24	23.30	0	0
	1732.5	20175	5	QPSK	12	0	22.74	0-1	1
	1732.5	20175	5	QPSK	12	6	22.46	0-1	1
	1732.5	20175	5	QPSK	12	13	22.48	0-1	1
	1732.5	20175	5	QPSK	25	0	22.52	0-1	1
	1732.5	20175	5	16-QAM	1	0	22.64	0-1	1
	1732.5	20175	5	16-QAM	1	12	22.47	0-1	1
	1732.5	20175	5	16-QAM	1	24	22.48	0-1	1
	1732.5	20175	5	16-QAM	12	0	21.66	0-2	2
	1732.5	20175	5	16-QAM	12	6	21.47	0-2	2
	1732.5	20175	5	16-QAM	12	13	21.45	0-2	2
	1732.5	20175	5	16-QAM	25	0	21.44	0-2	2
	1752.5	20375	5	QPSK	1	0	23.72	0	0
	1752.5	20375	5	QPSK	1	12	23.61	0	0
	1752.5	20375	5	QPSK	1	24	23.60	0	0
High	1752.5	20375	5	QPSK	12	0	22.61	0-1	1
	1752.5	20375	5	QPSK	12	6	22.38	0-1	1
	1752.5	20375	5	QPSK	12	13	22.49	0-1	1
	1752.5	20375	5	QPSK	25	0	22.63	0-1	1
	1752.5	20375	5	16-QAM	1	0	22.77	0-1	1
	1752.5	20375	5	16-QAM	1	12	22.37	0-1	1
	1752.5	20375	5	16-QAM	1	24	22.56	0-1	1
	1752.5	20375	5	16-QAM	12	0	21.48	0-2	2
	1752.5	20375	5	16-QAM	12	6	21.68	0-2	2
	1752.5	20375	5	16-QAM	12	13	21.53	0-2	2
	1752.5	20375	5	16-QAM	25	0	21.55	0-2	2

Table 9-13
Maximum LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	23.63	0	0
	1711.5	19965	3	QPSK	1	7	23.51	0	0
	1711.5	19965	3	QPSK	1	14	23.36	0	0
	1711.5	19965	3	QPSK	8	0	22.56	0-1	1
	1711.5	19965	3	QPSK	8	4	22.42	0-1	1
	1711.5	19965	3	QPSK	8	7	22.47	0-1	1
	1711.5	19965	3	QPSK	15	0	22.48	0-1	1
	1711.5	19965	3	16-QAM	1	0	22.63	0-1	1
	1711.5	19965	3	16-QAM	1	7	22.46	0-1	1
	1711.5	19965	3	16-QAM	1	14	22.47	0-1	1
	1711.5	19965	3	16-QAM	8	0	21.43	0-2	2
	1711.5	19965	3	16-QAM	8	4	21.69	0-2	2
	1711.5	19965	3	16-QAM	8	7	21.66	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.48	0-2	2
	1732.5	20175	3	QPSK	1	0	23.61	0	0
Mid	1732.5	20175	3	QPSK	1	7	23.49	0	0
	1732.5	20175	3	QPSK	1	14	23.34	0	0
	1732.5	20175	3	QPSK	8	0	22.71	0-1	1
	1732.5	20175	3	QPSK	8	4	22.43	0-1	1
	1732.5	20175	3	QPSK	8	7	22.45	0-1	1
	1732.5	20175	3	QPSK	15	0	22.49	0-1	1
	1732.5	20175	3	16-QAM	1	0	22.61	0-1	1
	1732.5	20175	3	16-QAM	1	7	22.44	0-1	1
	1732.5	20175	3	16-QAM	1	14	22.45	0-1	1
	1732.5	20175	3	16-QAM	8	0	21.26	0-2	2
	1732.5	20175	3	16-QAM	8	4	21.44	0-2	2
	1732.5	20175	3	16-QAM	8	7	21.42	0-2	2
	1732.5	20175	3	16-QAM	15	0	21.41	0-2	2
	1753.5	20385	3	QPSK	1	0	23.69	0	0
	1753.5	20385	3	QPSK	1	7	23.58	0	0
High	1753.5	20385	3	QPSK	1	14	23.57	0	0
	1753.5	20385	3	QPSK	8	0	22.58	0-1	1
	1753.5	20385	3	QPSK	8	4	22.56	0-1	1
	1753.5	20385	3	QPSK	8	7	22.46	0-1	1
	1753.5	20385	3	QPSK	15	0	22.60	0-1	1
	1753.5	20385	3	16-QAM	1	0	22.74	0-1	1
	1753.5	20385	3	16-QAM	1	7	22.34	0-1	1
	1753.5	20385	3	16-QAM	1	14	22.53	0-1	1
	1753.5	20385	3	16-QAM	8	0	21.49	0-2	2
	1753.5	20385	3	16-QAM	8	4	21.65	0-2	2
	1753.5	20385	3	16-QAM	8	7	21.50	0-2	2
	1753.5	20385	3	16-QAM	15	0	21.52	0-2	2

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Table 9-14
Maximum LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	23.61	0	0
	1710.7	19957	1.4	QPSK	1	2	23.49	0	0
	1710.7	19957	1.4	QPSK	1	5	23.34	0	0
	1710.7	19957	1.4	QPSK	3	0	23.01	0	0
	1710.7	19957	1.4	QPSK	3	2	23.12	0	0
	1710.7	19957	1.4	QPSK	3	3	23.06	0	0
	1710.7	19957	1.4	QPSK	6	0	22.47	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	22.61	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	22.44	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.45	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	22.00	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	22.03	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	22.06	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	21.38	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	23.59	0	0
	1732.5	20175	1.4	QPSK	1	2	23.47	0	0
	1732.5	20175	1.4	QPSK	1	5	23.32	0	0
	1732.5	20175	1.4	QPSK	3	0	23.00	0	0
	1732.5	20175	1.4	QPSK	3	2	23.13	0	0
	1732.5	20175	1.4	QPSK	3	3	23.15	0	0
	1732.5	20175	1.4	QPSK	6	0	22.47	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	22.59	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	22.42	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	22.43	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	22.19	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	22.08	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	22.13	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	21.39	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	23.67	0	0
	1754.3	20393	1.4	QPSK	1	2	23.59	0	0
	1754.3	20393	1.4	QPSK	1	5	23.55	0	0
	1754.3	20393	1.4	QPSK	3	0	23.12	0	0
	1754.3	20393	1.4	QPSK	3	2	23.01	0	0
	1754.3	20393	1.4	QPSK	3	3	23.17	0	0
	1754.3	20393	1.4	QPSK	6	0	22.58	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.73	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	22.32	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.51	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	22.36	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	22.10	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.01	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	21.45	0-2	2

Table 9-15
Reduced LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	20.85	0	0
	1732.5	20175	20	QPSK	1	50	20.76	0	0
	1732.5	20175	20	QPSK	1	99	20.82	0	0
	1732.5	20175	20	QPSK	50	0	20.53	0-1	0
	1732.5	20175	20	QPSK	50	25	20.36	0-1	0
	1732.5	20175	20	QPSK	50	50	20.44	0-1	0
	1732.5	20175	20	QPSK	100	0	20.55	0-1	0
	1732.5	20175	20	16QAM	1	0	20.54	0-1	0
	1732.5	20175	20	16QAM	1	50	20.33	0-1	0
	1732.5	20175	20	16QAM	1	99	20.45	0-1	0
	1732.5	20175	20	16QAM	50	0	20.52	0-2	0
	1732.5	20175	20	16QAM	50	25	20.38	0-2	0
	1732.5	20175	20	16QAM	50	50	20.49	0-2	0
	1732.5	20175	20	16QAM	100	0	20.56	0-2	0

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.

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Table 9-16
Reduced LTE Band 4 (AWS) Conducted Powers -15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	20.64	0	0
	1717.5	20025	15	QPSK	1	36	20.67	0	0
	1717.5	20025	15	QPSK	1	74	20.44	0	0
	1717.5	20025	15	QPSK	36	0	20.43	0-1	0
	1717.5	20025	15	QPSK	36	18	20.30	0-1	0
	1717.5	20025	15	QPSK	36	37	20.42	0-1	0
	1717.5	20025	15	QPSK	75	0	20.34	0-1	0
	1717.5	20025	15	16QAM	1	0	20.31	0-1	0
	1717.5	20025	15	16QAM	1	36	20.42	0-1	0
	1717.5	20025	15	16QAM	1	74	20.57	0-1	0
	1717.5	20025	15	16QAM	36	0	20.38	0-2	0
	1717.5	20025	15	16QAM	36	18	20.35	0-2	0
	1717.5	20025	15	16QAM	36	37	20.23	0-2	0
	1717.5	20025	15	16QAM	75	0	20.43	0-2	0
	1732.5	20175	15	QPSK	1	0	20.60	0	0
Mid	1732.5	20175	15	QPSK	1	36	20.32	0	0
	1732.5	20175	15	QPSK	1	74	20.55	0	0
	1732.5	20175	15	QPSK	36	0	20.45	0-1	0
	1732.5	20175	15	QPSK	36	18	20.34	0-1	0
	1732.5	20175	15	QPSK	36	37	20.46	0-1	0
	1732.5	20175	15	QPSK	75	0	20.43	0-1	0
	1732.5	20175	15	16QAM	1	0	20.79	0-1	0
	1732.5	20175	15	16QAM	1	36	20.62	0-1	0
	1732.5	20175	15	16QAM	1	74	20.79	0-1	0
	1732.5	20175	15	16QAM	36	0	20.64	0-2	0
	1732.5	20175	15	16QAM	36	18	20.47	0-2	0
	1732.5	20175	15	16QAM	36	37	20.62	0-2	0
	1732.5	20175	15	16QAM	75	0	20.44	0-2	0
	1747.5	20325	15	QPSK	1	0	20.84	0	0
	1747.5	20325	15	QPSK	1	36	20.64	0	0
High	1747.5	20325	15	QPSK	1	74	20.56	0	0
	1747.5	20325	15	QPSK	36	0	20.38	0-1	0
	1747.5	20325	15	QPSK	36	18	20.36	0-1	0
	1747.5	20325	15	QPSK	36	37	20.35	0-1	0
	1747.5	20325	15	QPSK	75	0	20.46	0-1	0
	1747.5	20325	15	16QAM	1	0	20.74	0-1	0
	1747.5	20325	15	16QAM	1	36	20.95	0-1	0
	1747.5	20325	15	16QAM	1	74	20.98	0-1	0
	1747.5	20325	15	16QAM	36	0	20.37	0-2	0
	1747.5	20325	15	16QAM	36	18	20.25	0-2	0
	1747.5	20325	15	16QAM	36	37	20.29	0-2	0
	1747.5	20325	15	16QAM	75	0	20.38	0-2	0

Table 9-17
Reduced LTE Band 4 (AWS) Conducted Powers -10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	20.70	0	0
	1715	20000	10	QPSK	1	25	20.75	0	0
	1715	20000	10	QPSK	1	49	20.63	0	0
	1715	20000	10	QPSK	25	0	20.47	0-1	0
	1715	20000	10	QPSK	25	12	20.44	0-1	0
	1715	20000	10	QPSK	25	25	20.37	0-1	0
	1715	20000	10	QPSK	50	0	20.36	0-1	0
	1715	20000	10	16QAM	1	0	20.51	0-1	0
	1715	20000	10	16QAM	1	25	20.65	0-1	0
	1715	20000	10	16QAM	1	49	20.60	0-1	0
	1715	20000	10	16QAM	25	0	20.55	0-2	0
	1715	20000	10	16QAM	25	12	20.57	0-2	0
	1715	20000	10	16QAM	25	25	20.39	0-2	0
	1715	20000	10	16QAM	50	0	20.38	0-2	0
	1732.5	20175	10	QPSK	1	0	20.68	0	0
Mid	1732.5	20175	10	QPSK	1	25	20.72	0	0
	1732.5	20175	10	QPSK	1	49	20.97	0	0
	1732.5	20175	10	QPSK	25	0	20.45	0-1	0
	1732.5	20175	10	QPSK	25	12	20.37	0-1	0
	1732.5	20175	10	QPSK	25	25	20.49	0-1	0
	1732.5	20175	10	QPSK	50	0	20.42	0-1	0
	1732.5	20175	10	16QAM	1	0	20.66	0-1	0
	1732.5	20175	10	16QAM	1	25	20.74	0-1	0
	1732.5	20175	10	16QAM	1	49	20.57	0-1	0
	1732.5	20175	10	16QAM	25	0	20.46	0-2	0
	1732.5	20175	10	16QAM	25	12	20.34	0-2	0
	1732.5	20175	10	16QAM	25	25	20.53	0-2	0
	1732.5	20175	10	16QAM	50	0	20.59	0-2	0
	1750	20350	10	QPSK	1	0	20.81	0	0
	1750	20350	10	QPSK	1	25	20.53	0	0
High	1750	20350	10	QPSK	1	49	20.57	0	0
	1750	20350	10	QPSK	25	0	20.44	0-1	0
	1750	20350	10	QPSK	25	12	20.42	0-1	0
	1750	20350	10	QPSK	25	25	20.48	0-1	0
	1750	20350	10	QPSK	50	0	20.52	0-1	0
	1750	20350	10	16QAM	1	0	20.85	0-1	0
	1750	20350	10	16QAM	1	25	20.84	0-1	0
	1750	20350	10	16QAM	1	49	20.65	0-1	0
	1750	20350	10	16QAM	25	0	20.53	0-2	0
	1750	20350	10	16QAM	25	12	20.49	0-2	0
	1750	20350	10	16QAM	25	25	20.56	0-2	0
	1750	20350	10	16QAM	50	0	20.52	0-2	0

Table 9-18
Reduced LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	20.80	0	0
	1712.5	19975	5	QPSK	1	12	20.72	0	0
	1712.5	19975	5	QPSK	1	24	20.63	0	0
	1712.5	19975	5	QPSK	12	0	20.38	0-1	0
	1712.5	19975	5	QPSK	12	6	20.50	0-1	0
	1712.5	19975	5	QPSK	12	13	20.46	0-1	0
	1712.5	19975	5	QPSK	25	0	20.52	0-1	0
	1712.5	19975	5	16-QAM	1	0	20.71	0-1	0
	1712.5	19975	5	16-QAM	1	12	20.67	0-1	0
	1712.5	19975	5	16-QAM	1	24	20.58	0-1	0
	1712.5	19975	5	16-QAM	12	0	20.31	0-2	0
	1712.5	19975	5	16-QAM	12	6	20.44	0-2	0
	1712.5	19975	5	16-QAM	12	13	20.37	0-2	0
	1712.5	19975	5	16-QAM	25	0	20.60	0-2	0
	1732.5	20175	5	QPSK	1	0	20.75	0	0
Mid	1732.5	20175	5	QPSK	1	12	20.89	0	0
	1732.5	20175	5	QPSK	1	24	20.63	0	0
	1732.5	20175	5	QPSK	12	0	20.30	0-1	0
	1732.5	20175	5	QPSK	12	6	20.32	0-1	0
	1732.5	20175	5	QPSK	12	13	20.36	0-1	0
	1732.5	20175	5	QPSK	25	0	20.30	0-1	0
	1732.5	20175	5	16-QAM	1	0	20.29	0-1	0
	1732.5	20175	5	16-QAM	1	12	20.34	0-1	0
	1732.5	20175	5	16-QAM	1	24	20.26	0-1	0
	1732.5	20175	5	16-QAM	12	0	20.32	0-2	0
	1732.5	20175	5	16-QAM	12	6	20.28	0-2	0
	1732.5	20175	5	16-QAM	12	13	20.32	0-2	0
	1732.5	20175	5	16-QAM	25	0	20.43	0-2	0
	1752.5	20375	5	QPSK	1	0	20.68	0	0
	1752.5	20375	5	QPSK	1	12	20.70	0	0
High	1752.5	20375	5	QPSK	1	24	20.39	0	0
	1752.5	20375	5	QPSK	12	0	20.44	0-1	0
	1752.5	20375	5	QPSK	12	6	20.37	0-1	0
	1752.5	20375	5	QPSK	12	13	20.48	0-1	0
	1752.5	20375	5	QPSK	25	0	20.47	0-1	0
	1752.5	20375	5	16-QAM	1	0	20.82	0-1	0
	1752.5	20375	5	16-QAM	1	12	20.65	0-1	0
	1752.5	20375	5	16-QAM	1	24	20.35	0-1	0
	1752.5	20375	5	16-QAM	12	0	20.36	0-2	0
	1752.5	20375	5	16-QAM	12	6	20.52	0-2	0
	1752.5	20375	5	16-QAM	12	13	20.40	0-2	0
	1752.5	20375	5	16-QAM	25	0	20.45	0-2	0

Table 9-19
Reduced LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	20.82	0	0
	1711.5	19965	3	QPSK	1	7	20.79	0	0
	1711.5	19965	3	QPSK	1	14	20.66	0	0
	1711.5	19965	3	QPSK	8	0	20.47	0-1	0
	1711.5	19965	3	QPSK	8	4	20.49	0-1	0
	1711.5	19965	3	QPSK	8	7	20.51	0-1	0
	1711.5	19965	3	QPSK	15	0	20.50	0-1	0
	1711.5	19965	3	16-QAM	1	0	20.33	0-1	0
	1711.5	19965	3	16-QAM	1	7	20.60	0-1	0
	1711.5	19965	3	16-QAM	1	14	20.45	0-1	0
	1711.5	19965	3	16-QAM	8	0	20.35	0-2	0
	1711.5	19965	3	16-QAM	8	4	20.47	0-2	0
	1711.5	19965	3	16-QAM	8	7	20.43	0-2	0
	1711.5	19965	3	16-QAM	15	0	20.40	0-2	0
	1732.5	20175	3	QPSK	1	0	20.69	0	0
Mid	1732.5	20175	3	QPSK	1	7	20.85	0	0
	1732.5	20175	3	QPSK	1	14	20.67	0	0
	1732.5	20175	3	QPSK	8	0	20.46	0-1	0
	1732.5	20175	3	QPSK	8	4	20.34	0-1	0
	1732.5	20175	3	QPSK	8	7	20.30	0-1	0
	1732.5	20175	3	QPSK	15	0	20.38	0-1	0
	1732.5	20175	3	16-QAM	1	0	20.87	0-1	0
	1732.5	20175	3	16-QAM	1	7	20.62	0-1	0
	1732.5	20175	3	16-QAM	1	14	20.35	0-1	0
	1732.5	20175	3	16-QAM	8	0	20.39	0-2	0
	1732.5	20175	3	16-QAM	8	4	20.28	0-2	0
	1732.5	20175	3	16-QAM	8	7	20.35	0-2	0
	1732.5	20175	3	16-QAM	15	0	20.41	0-2	0
	1753.5	20385	3	QPSK	1	0	20.70	0	0
	1753.5	20385	3	QPSK	1	7	20.86	0	0
High	1753.5	20385	3	QPSK	1	14	20.36	0	0
	1753.5	20385	3	QPSK	8	0	20.47	0-1	0
	1753.5	20385	3	QPSK	8	4	20.51	0-1	0
	1753.5	20385	3	QPSK	8	7	20.48	0-1	0
	1753.5	20385	3	QPSK	15	0	20.46	0-1	0
	1753.5	20385	3	16-QAM	1	0	20.56	0-1	0
	1753.5	20385	3	16-QAM	1	7	20.70	0-1	0
	1753.5	20385	3	16-QAM	1	14	20.57	0-1	0
	1753.5	20385	3	16-QAM	8	0	20.56	0-2	0
	1753.5	20385	3	16-QAM	8	4	20.30	0-2	0
	1753.5	20385	3	16-QAM	8	7	20.28	0-2	0
	1753.5	20385	3	16-QAM	15	0	20.63	0-2	0

Table 9-20
Reduced LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	20.82	0	0
	1710.7	19957	1.4	QPSK	1	2	20.64	0	0
	1710.7	19957	1.4	QPSK	1	5	20.59	0	0
	1710.7	19957	1.4	QPSK	3	0	20.57	0	0
	1710.7	19957	1.4	QPSK	3	2	20.69	0	0
	1710.7	19957	1.4	QPSK	3	3	20.51	0	0
	1710.7	19957	1.4	QPSK	6	0	20.59	0-1	0
	1710.7	19957	1.4	16-QAM	1	0	20.63	0-1	0
	1710.7	19957	1.4	16-QAM	1	2	20.48	0-1	0
	1710.7	19957	1.4	16-QAM	1	5	20.33	0-1	0
	1710.7	19957	1.4	16-QAM	3	0	20.30	0-1	0
	1710.7	19957	1.4	16-QAM	3	2	20.31	0-1	0
	1710.7	19957	1.4	16-QAM	3	3	20.36	0-1	0
	1710.7	19957	1.4	16-QAM	6	0	20.37	0-2	0
	1732.5	20175	1.4	QPSK	1	0	20.76	0	0
	1732.5	20175	1.4	QPSK	1	2	20.84	0	0
Mid	1732.5	20175	1.4	QPSK	1	5	20.70	0	0
	1732.5	20175	1.4	QPSK	3	0	20.40	0	0
	1732.5	20175	1.4	QPSK	3	2	20.42	0	0
	1732.5	20175	1.4	QPSK	3	3	20.38	0	0
	1732.5	20175	1.4	QPSK	6	0	20.36	0-1	0
	1732.5	20175	1.4	16-QAM	1	0	20.64	0-1	0
	1732.5	20175	1.4	16-QAM	1	2	20.46	0-1	0
	1732.5	20175	1.4	16-QAM	1	5	20.52	0-1	0
	1732.5	20175	1.4	16-QAM	3	0	20.60	0-1	0
	1732.5	20175	1.4	16-QAM	3	2	20.49	0-1	0
	1732.5	20175	1.4	16-QAM	3	3	20.54	0-1	0
	1732.5	20175	1.4	16-QAM	6	0	20.54	0-2	0
	1754.3	20393	1.4	QPSK	1	0	20.74	0	0
	1754.3	20393	1.4	QPSK	1	2	20.86	0	0
	1754.3	20393	1.4	QPSK	1	5	20.65	0	0
	1754.3	20393	1.4	QPSK	3	0	20.49	0	0
High	1754.3	20393	1.4	QPSK	3	2	20.47	0	0
	1754.3	20393	1.4	QPSK	3	3	20.42	0	0
	1754.3	20393	1.4	QPSK	6	0	20.51	0-1	0
	1754.3	20393	1.4	16-QAM	1	0	20.90	0-1	0
	1754.3	20393	1.4	16-QAM	1	2	20.81	0-1	0
	1754.3	20393	1.4	16-QAM	1	5	20.64	0-1	0
	1754.3	20393	1.4	16-QAM	3	0	20.67	0-1	0
	1754.3	20393	1.4	16-QAM	3	2	20.52	0-1	0
	1754.3	20393	1.4	16-QAM	3	3	20.58	0-1	0
	1754.3	20393	1.4	16-QAM	6	0	20.56	0-2	0

9.3.4 LTE Band 2 (PCS)

Table 9-21
Maximum LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	23.96	0	0
	1860	18700	20	QPSK	1	50	23.62	0	0
	1860	18700	20	QPSK	1	99	23.65	0	0
	1860	18700	20	QPSK	50	0	22.67	0-1	1
	1860	18700	20	QPSK	50	25	22.41	0-1	1
	1860	18700	20	QPSK	50	50	22.66	0-1	1
	1860	18700	20	QPSK	100	0	22.78	0-1	1
	1860	18700	20	16QAM	1	0	22.88	0-1	1
	1860	18700	20	16QAM	1	50	22.84	0-1	1
	1860	18700	20	16QAM	1	99	22.93	0-1	1
	1860	18700	20	16QAM	50	0	21.74	0-2	2
	1860	18700	20	16QAM	50	25	21.50	0-2	2
	1860	18700	20	16QAM	50	50	21.77	0-2	2
	1860	18700	20	16QAM	100	0	21.64	0-2	2
	1880.0	18900	20	QPSK	1	0	23.62	0	0
	1880.0	18900	20	QPSK	1	50	23.97	0	0
Mid	1880.0	18900	20	QPSK	1	99	23.87	0	0
	1880.0	18900	20	QPSK	50	0	22.78	0-1	1
	1880.0	18900	20	QPSK	50	25	22.95	0-1	1
	1880.0	18900	20	QPSK	50	50	22.98	0-1	1
	1880.0	18900	20	QPSK	100	0	22.97	0-1	1
	1880.0	18900	20	16QAM	1	0	22.88	0-1	1
	1880.0	18900	20	16QAM	1	50	22.96	0-1	1
	1880.0	18900	20	16QAM	1	99	22.73	0-1	1
	1880.0	18900	20	16QAM	50	0	21.83	0-2	2
	1880.0	18900	20	16QAM	50	25	21.98	0-2	2
	1880.0	18900	20	16QAM	50	50	21.98	0-2	2
	1880.0	18900	20	16QAM	100	0	21.97	0-2	2
	1900	19100	20	QPSK	1	0	23.81	0	0
	1900	19100	20	QPSK	1	50	23.66	0	0
	1900	19100	20	QPSK	1	99	23.73	0	0
High	1900	19100	20	QPSK	50	0	22.75	0-1	1
	1900	19100	20	QPSK	50	25	22.68	0-1	1
	1900	19100	20	QPSK	50	50	22.79	0-1	1
	1900	19100	20	QPSK	100	0	22.68	0-1	1
	1900	19100	20	16QAM	1	0	22.61	0-1	1
	1900	19100	20	16QAM	1	50	22.94	0-1	1
	1900	19100	20	16QAM	1	99	22.98	0-1	1
	1900	19100	20	16QAM	50	0	21.86	0-2	2
	1900	19100	20	16QAM	50	25	21.79	0-2	2
	1900	19100	20	16QAM	50	50	21.92	0-2	2
	1900	19100	20	16QAM	100	0	21.81	0-2	2

Table 9-22
Maximum LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	18675	15	QPSK	1	0	23.98	0	0
	1857.5	18675	15	QPSK	1	36	23.64	0	0
	1857.5	18675	15	QPSK	1	74	23.67	0	0
	1857.5	18675	15	QPSK	36	0	22.69	0-1	1
	1857.5	18675	15	QPSK	36	18	22.43	0-1	1
	1857.5	18675	15	QPSK	36	37	22.68	0-1	1
	1857.5	18675	15	QPSK	75	0	22.72	0-1	1
	1857.5	18675	15	16QAM	1	0	22.99	0-1	1
	1857.5	18675	15	16QAM	1	36	22.94	0-1	1
	1857.5	18675	15	16QAM	1	74	22.95	0-1	1
	1857.5	18675	15	16QAM	36	0	21.76	0-2	2
	1857.5	18675	15	16QAM	36	18	21.52	0-2	2
	1857.5	18675	15	16QAM	36	37	21.79	0-2	2
	1857.5	18675	15	16QAM	75	0	21.66	0-2	2
	1880.0	18900	15	QPSK	1	0	23.64	0	0
Mid	1880.0	18900	15	QPSK	1	36	23.99	0	0
	1880.0	18900	15	QPSK	1	74	23.89	0	0
	1880.0	18900	15	QPSK	36	0	22.80	0-1	1
	1880.0	18900	15	QPSK	36	18	22.97	0-1	1
	1880.0	18900	15	QPSK	36	37	23.00	0-1	1
	1880.0	18900	15	QPSK	75	0	22.99	0-1	1
	1880.0	18900	15	16QAM	1	0	22.90	0-1	1
	1880.0	18900	15	16QAM	1	36	22.98	0-1	1
	1880.0	18900	15	16QAM	1	74	22.75	0-1	1
	1880.0	18900	15	16QAM	36	0	21.94	0-2	2
	1880.0	18900	15	16QAM	36	18	22.00	0-2	2
	1880.0	18900	15	16QAM	36	37	22.00	0-2	2
	1880.0	18900	15	16QAM	75	0	21.99	0-2	2
	1902.5	19125	15	QPSK	1	0	23.88	0	0
	1902.5	19125	15	QPSK	1	36	23.68	0	0
High	1902.5	19125	15	QPSK	1	74	23.94	0	0
	1902.5	19125	15	QPSK	36	0	22.77	0-1	1
	1902.5	19125	15	QPSK	36	18	22.79	0-1	1
	1902.5	19125	15	QPSK	36	37	22.81	0-1	1
	1902.5	19125	15	QPSK	75	0	22.70	0-1	1
	1902.5	19125	15	16QAM	1	0	22.63	0-1	1
	1902.5	19125	15	16QAM	1	36	22.96	0-1	1
	1902.5	19125	15	16QAM	1	74	23.00	0-1	1
	1902.5	19125	15	16QAM	36	0	21.95	0-2	2
	1902.5	19125	15	16QAM	36	18	21.81	0-2	2
	1902.5	19125	15	16QAM	36	37	21.94	0-2	2
	1902.5	19125	15	16QAM	75	0	21.83	0-2	2

Table 9-23
Maximum LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	24.00	0	0
	1855	18650	10	QPSK	1	25	23.57	0	0
	1855	18650	10	QPSK	1	49	23.60	0	0
	1855	18650	10	QPSK	25	0	22.62	0-1	1
	1855	18650	10	QPSK	25	12	23.00	0-1	1
	1855	18650	10	QPSK	25	25	22.61	0-1	1
	1855	18650	10	QPSK	50	0	22.65	0-1	1
	1855	18650	10	16QAM	1	0	22.83	0-1	1
	1855	18650	10	16QAM	1	25	22.79	0-1	1
	1855	18650	10	16QAM	1	49	22.88	0-1	1
	1855	18650	10	16QAM	25	0	21.69	0-2	2
	1855	18650	10	16QAM	25	12	21.45	0-2	2
	1855	18650	10	16QAM	25	25	21.76	0-2	2
	1855	18650	10	16QAM	50	0	21.59	0-2	2
	1880.0	18900	10	QPSK	1	0	23.59	0	0
Mid	1880.0	18900	10	QPSK	1	25	23.93	0	0
	1880.0	18900	10	QPSK	1	49	23.85	0	0
	1880.0	18900	10	QPSK	25	0	22.75	0-1	1
	1880.0	18900	10	QPSK	25	12	22.92	0-1	1
	1880.0	18900	10	QPSK	25	25	22.96	0-1	1
	1880.0	18900	10	QPSK	50	0	22.94	0-1	1
	1880.0	18900	10	16QAM	1	0	22.85	0-1	1
	1880.0	18900	10	16QAM	1	25	22.93	0-1	1
	1880.0	18900	10	16QAM	1	49	22.70	0-1	1
	1880.0	18900	10	16QAM	25	0	21.80	0-2	2
	1880.0	18900	10	16QAM	25	12	21.95	0-2	2
	1880.0	18900	10	16QAM	25	25	21.95	0-2	2
	1880.0	18900	10	16QAM	50	0	21.94	0-2	2
	1905	19150	10	QPSK	1	0	23.94	0	0
	1905	19150	10	QPSK	1	25	23.99	0	0
High	1905	19150	10	QPSK	1	49	23.69	0	0
	1905	19150	10	QPSK	25	0	22.66	0-1	1
	1905	19150	10	QPSK	25	12	22.59	0-1	1
	1905	19150	10	QPSK	25	25	22.70	0-1	1
	1905	19150	10	QPSK	50	0	22.59	0-1	1
	1905	19150	10	16QAM	1	0	22.67	0-1	1
	1905	19150	10	16QAM	1	25	22.94	0-1	1
	1905	19150	10	16QAM	1	49	22.89	0-1	1
	1905	19150	10	16QAM	25	0	21.74	0-2	2
	1905	19150	10	16QAM	25	12	21.65	0-2	2
	1905	19150	10	16QAM	25	25	21.83	0-2	2
	1905	19150	10	16QAM	50	0	21.72	0-2	2

Table 9-24
Maximum LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	23.92	0	0
	1852.5	18625	5	QPSK	1	12	23.58	0	0
	1852.5	18625	5	QPSK	1	24	23.61	0	0
	1852.5	18625	5	QPSK	12	0	22.63	0-1	1
	1852.5	18625	5	QPSK	12	6	22.37	0-1	1
	1852.5	18625	5	QPSK	12	13	22.62	0-1	1
	1852.5	18625	5	QPSK	25	0	22.66	0-1	1
	1852.5	18625	5	16-QAM	1	0	22.93	0-1	1
	1852.5	18625	5	16-QAM	1	12	22.88	0-1	1
	1852.5	18625	5	16-QAM	1	24	22.89	0-1	1
	1852.5	18625	5	16-QAM	12	0	21.70	0-2	2
	1852.5	18625	5	16-QAM	12	6	21.46	0-2	2
	1852.5	18625	5	16-QAM	12	13	21.73	0-2	2
	1852.5	18625	5	16-QAM	25	0	21.60	0-2	2
	1880.0	18900	5	QPSK	1	0	23.58	0	0
	1880.0	18900	5	QPSK	1	12	23.93	0	0
Mid	1880.0	18900	5	QPSK	1	24	23.83	0	0
	1880.0	18900	5	QPSK	12	0	22.74	0-1	1
	1880.0	18900	5	QPSK	12	6	22.91	0-1	1
	1880.0	18900	5	QPSK	12	13	22.94	0-1	1
	1880.0	18900	5	QPSK	25	0	22.93	0-1	1
	1880.0	18900	5	16-QAM	1	0	22.84	0-1	1
	1880.0	18900	5	16-QAM	1	12	22.92	0-1	1
	1880.0	18900	5	16-QAM	1	24	22.69	0-1	1
	1880.0	18900	5	16-QAM	12	0	21.88	0-2	2
	1880.0	18900	5	16-QAM	12	6	21.95	0-2	2
	1880.0	18900	5	16-QAM	12	13	21.94	0-2	2
	1880.0	18900	5	16-QAM	25	0	21.93	0-2	2
	1907.5	19175	5	QPSK	1	0	23.82	0	0
	1907.5	19175	5	QPSK	1	12	23.62	0	0
	1907.5	19175	5	QPSK	1	24	23.88	0	0
	1907.5	19175	5	QPSK	12	0	22.71	0-1	1
High	1907.5	19175	5	QPSK	12	6	22.73	0-1	1
	1907.5	19175	5	QPSK	12	13	22.75	0-1	1
	1907.5	19175	5	QPSK	25	0	22.64	0-1	1
	1907.5	19175	5	16-QAM	1	0	22.57	0-1	1
	1907.5	19175	5	16-QAM	1	12	22.90	0-1	1
	1907.5	19175	5	16-QAM	1	24	22.94	0-1	1
	1907.5	19175	5	16-QAM	12	0	21.85	0-2	2
	1907.5	19175	5	16-QAM	12	6	21.75	0-2	2
	1907.5	19175	5	16-QAM	12	13	21.88	0-2	2
	1907.5	19175	5	16-QAM	25	0	21.77	0-2	2

Table 9-25
Maximum LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	23.99	0	0
	1851.5	18615	3	QPSK	1	7	23.87	0	0
	1851.5	18615	3	QPSK	1	14	23.68	0	0
	1851.5	18615	3	QPSK	8	0	22.74	0-1	1
	1851.5	18615	3	QPSK	8	4	22.64	0-1	1
	1851.5	18615	3	QPSK	8	7	22.69	0-1	1
	1851.5	18615	3	QPSK	15	0	22.73	0-1	1
	1851.5	18615	3	16-QAM	1	0	22.98	0-1	1
	1851.5	18615	3	16-QAM	1	7	22.96	0-1	1
	1851.5	18615	3	16-QAM	1	14	22.96	0-1	1
	1851.5	18615	3	16-QAM	8	0	21.74	0-2	2
	1851.5	18615	3	16-QAM	8	4	21.53	0-2	2
	1851.5	18615	3	16-QAM	8	7	21.80	0-2	2
	1851.5	18615	3	16-QAM	15	0	21.67	0-2	2
	1880.0	18900	3	QPSK	1	0	23.65	0	0
	1880.0	18900	3	QPSK	1	7	24.00	0	0
Mid	1880.0	18900	3	QPSK	1	14	23.90	0	0
	1880.0	18900	3	QPSK	8	0	22.81	0-1	1
	1880.0	18900	3	QPSK	8	4	22.98	0-1	1
	1880.0	18900	3	QPSK	8	7	22.84	0-1	1
	1880.0	18900	3	QPSK	15	0	23.00	0-1	1
	1880.0	18900	3	16-QAM	1	0	22.91	0-1	1
	1880.0	18900	3	16-QAM	1	7	22.99	0-1	1
	1880.0	18900	3	16-QAM	1	14	22.76	0-1	1
	1880.0	18900	3	16-QAM	8	0	21.95	0-2	2
	1880.0	18900	3	16-QAM	8	4	22.00	0-2	2
	1880.0	18900	3	16-QAM	8	7	21.91	0-2	2
	1880.0	18900	3	16-QAM	15	0	22.00	0-2	2
	1908.5	19185	3	QPSK	1	0	23.89	0	0
	1908.5	19185	3	QPSK	1	7	23.69	0	0
	1908.5	19185	3	QPSK	1	14	23.95	0	0
	1908.5	19185	3	QPSK	8	0	22.78	0-1	1
High	1908.5	19185	3	QPSK	8	4	22.86	0-1	1
	1908.5	19185	3	QPSK	8	7	22.82	0-1	1
	1908.5	19185	3	QPSK	15	0	22.75	0-1	1
	1908.5	19185	3	16-QAM	1	0	22.64	0-1	1
	1908.5	19185	3	16-QAM	1	7	22.94	0-1	1
	1908.5	19185	3	16-QAM	1	14	22.93	0-1	1
	1908.5	19185	3	16-QAM	8	0	21.96	0-2	2
	1908.5	19185	3	16-QAM	8	4	21.87	0-2	2
	1908.5	19185	3	16-QAM	8	7	21.96	0-2	2
	1908.5	19185	3	16-QAM	15	0	21.90	0-2	2

Table 9-26
Maximum LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	23.95	0	0
	1850.7	18607	1.4	QPSK	1	2	23.61	0	0
	1850.7	18607	1.4	QPSK	1	5	23.64	0	0
	1850.7	18607	1.4	QPSK	3	0	23.73	0	0
	1850.7	18607	1.4	QPSK	3	2	23.78	0	0
	1850.7	18607	1.4	QPSK	3	3	23.87	0	0
	1850.7	18607	1.4	QPSK	6	0	22.69	-0.1	1
	1850.7	18607	1.4	16-QAM	1	0	22.95	-0.1	1
	1850.7	18607	1.4	16-QAM	1	2	22.91	-0.1	1
	1850.7	18607	1.4	16-QAM	1	5	22.92	-0.1	1
	1850.7	18607	1.4	16-QAM	3	0	22.96	-0.1	1
	1850.7	18607	1.4	16-QAM	3	2	22.78	-0.1	1
	1850.7	18607	1.4	16-QAM	3	3	22.69	-0.1	1
	1850.7	18607	1.4	16-QAM	6	0	21.63	-0.2	2
	1880.0	18900	1.4	QPSK	1	0	23.61	0	0
	1880.0	18900	1.4	QPSK	1	2	23.96	0	0
Mid	1880.0	18900	1.4	QPSK	1	5	23.86	0	0
	1880.0	18900	1.4	QPSK	3	0	23.16	0	0
	1880.0	18900	1.4	QPSK	3	2	23.21	0	0
	1880.0	18900	1.4	QPSK	3	3	23.20	0	0
	1880.0	18900	1.4	QPSK	6	0	22.96	-0.1	1
	1880.0	18900	1.4	16-QAM	1	0	22.87	-0.1	1
	1880.0	18900	1.4	16-QAM	1	2	22.95	-0.1	1
	1880.0	18900	1.4	16-QAM	1	5	22.72	-0.1	1
	1880.0	18900	1.4	16-QAM	3	0	22.64	-0.1	1
	1880.0	18900	1.4	16-QAM	3	2	22.97	-0.1	1
	1880.0	18900	1.4	16-QAM	3	3	23.00	-0.1	1
	1880.0	18900	1.4	16-QAM	6	0	21.96	-0.2	2
	1909.3	19193	1.4	QPSK	1	0	23.85	0	0
	1909.3	19193	1.4	QPSK	1	2	23.65	0	0
	1909.3	19193	1.4	QPSK	1	5	23.91	0	0
	1909.3	19193	1.4	QPSK	3	0	23.59	0	0
High	1909.3	19193	1.4	QPSK	3	2	23.98	0	0
	1909.3	19193	1.4	QPSK	3	3	23.87	0	0
	1909.3	19193	1.4	QPSK	6	0	23.00	-0.1	1
	1909.3	19193	1.4	16-QAM	1	0	22.60	-0.1	1
	1909.3	19193	1.4	16-QAM	1	2	22.93	-0.1	1
	1909.3	19193	1.4	16-QAM	1	5	22.97	-0.1	1
	1909.3	19193	1.4	16-QAM	3	0	22.98	-0.1	1
	1909.3	19193	1.4	16-QAM	3	2	22.87	-0.1	1
	1909.3	19193	1.4	16-QAM	3	3	22.96	-0.1	1
	1909.3	19193	1.4	16-QAM	6	0	21.80	-0.2	2

Table 9-27
Reduced LTE Band 2 (PCS) Conducted Powers -20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	20.35	0	0
	1860	18700	20	QPSK	1	50	20.27	0	0
	1860	18700	20	QPSK	1	99	20.28	0	0
	1860	18700	20	QPSK	50	0	20.03	-0.1	0
	1860	18700	20	QPSK	50	25	20.01	-0.1	0
	1860	18700	20	QPSK	50	50	19.89	-0.1	0
	1860	18700	20	QPSK	100	0	19.91	-0.1	0
	1860	18700	20	16QAM	1	0	19.68	-0.1	0
	1860	18700	20	16QAM	1	50	19.66	-0.1	0
	1860	18700	20	16QAM	1	99	19.73	-0.1	0
	1860	18700	20	16QAM	50	0	20.01	-0.2	0
	1860	18700	20	16QAM	50	25	19.93	-0.2	0
	1860	18700	20	16QAM	50	50	19.79	-0.2	0
	1860	18700	20	16QAM	100	0	19.80	-0.2	0
	1880.0	18900	20	QPSK	1	0	20.50	0	0
	1880.0	18900	20	QPSK	1	50	20.56	0	0
	1880.0	18900	20	QPSK	1	99	20.44	0	0
	1880.0	18900	20	QPSK	50	0	19.98	-0.1	0
	1880.0	18900	20	QPSK	50	25	19.93	-0.1	0
	1880.0	18900	20	QPSK	50	50	20.06	-0.1	0
Mid	1880.0	18900	20	QPSK	100	0	19.93	-0.1	0
	1880.0	18900	20	16QAM	1	0	19.97	-0.1	0
	1880.0	18900	20	16QAM	1	50	19.79	-0.1	0
	1880.0	18900	20	16QAM	1	99	19.62	-0.1	0
	1880.0	18900	20	16QAM	50	0	19.87	-0.2	0
	1880.0	18900	20	16QAM	50	25	19.91	-0.2	0
	1880.0	18900	20	16QAM	50	50	19.98	-0.2	0
	1880.0	18900	20	16QAM	100	0	19.86	-0.2	0
	1900	19100	20	QPSK	1	0	20.18	0	0
	1900	19100	20	QPSK	1	50	20.35	0	0
	1900	19100	20	QPSK	1	99	20.47	0	0
	1900	19100	20	QPSK	50	0	19.96	-0.1	0
	1900	19100	20	QPSK	50	25	19.93	-0.1	0
	1900	19100	20	QPSK	50	50	20.04	-0.1	0
	1900	19100	20	QPSK	100	0	20.04	-0.1	0
	1900	19100	20	16QAM	1	0	20.08	-0.1	0
	1900	19100	20	16QAM	1	50	20.12	-0.1	0
	1900	19100	20	16QAM	1	99	20.02	-0.1	0
	1900	19100	20	16QAM	50	0	19.84	-0.2	0
	1900	19100	20	16QAM	50	25	19.88	-0.2	0
	1900	19100	20	16QAM	50	50	19.75	-0.2	0
High	1900	19100	20	16QAM	100	0	19.79	-0.2	0

Table 9-28
Reduced LTE Band 2 (PCS) Conducted Powers -15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	18675	15	QPSK	1	0	20.47	0	0
	1857.5	18675	15	QPSK	1	36	20.03	0	0
	1857.5	18675	15	QPSK	1	74	19.98	0	0
	1857.5	18675	15	QPSK	36	0	19.90	0-1	0
	1857.5	18675	15	QPSK	36	18	19.91	0-1	0
	1857.5	18675	15	QPSK	36	37	19.61	0-1	0
	1857.5	18675	15	QPSK	75	0	19.94	0-1	0
	1857.5	18675	15	16QAM	1	0	19.96	0-1	0
	1857.5	18675	15	16QAM	1	36	19.79	0-1	0
	1857.5	18675	15	16QAM	1	74	20.01	0-1	0
	1857.5	18675	15	16QAM	36	0	20.28	0-2	0
	1857.5	18675	15	16QAM	36	18	19.75	0-2	0
	1857.5	18675	15	16QAM	36	37	19.61	0-2	0
	1857.5	18675	15	16QAM	75	0	19.98	0-2	0
	1880.0	18900	15	QPSK	1	0	20.49	0	0
Mid	1880.0	18900	15	QPSK	1	36	20.57	0	0
	1880.0	18900	15	QPSK	1	74	20.45	0	0
	1880.0	18900	15	QPSK	36	0	20.07	0-1	0
	1880.0	18900	15	QPSK	36	18	19.66	0-1	0
	1880.0	18900	15	QPSK	36	37	19.97	0-1	0
	1880.0	18900	15	QPSK	75	0	19.82	0-1	0
	1880.0	18900	15	16QAM	1	0	20.21	0-1	0
	1880.0	18900	15	16QAM	1	36	19.96	0-1	0
	1880.0	18900	15	16QAM	1	74	19.66	0-1	0
	1880.0	18900	15	16QAM	36	0	19.89	0-2	0
	1880.0	18900	15	16QAM	36	18	19.62	0-2	0
	1880.0	18900	15	16QAM	36	37	19.86	0-2	0
	1880.0	18900	15	16QAM	75	0	19.81	0-2	0
High	1902.5	19125	15	QPSK	1	0	20.42	0	0
	1902.5	19125	15	QPSK	1	36	20.46	0	0
	1902.5	19125	15	QPSK	1	74	20.51	0	0
	1902.5	19125	15	QPSK	36	0	20.20	0-1	0
	1902.5	19125	15	QPSK	36	18	19.76	0-1	0
	1902.5	19125	15	QPSK	36	37	20.34	0-1	0
	1902.5	19125	15	QPSK	75	0	19.95	0-1	0
	1902.5	19125	15	16QAM	1	0	19.83	0-1	0
	1902.5	19125	15	16QAM	1	36	20.24	0-1	0
	1902.5	19125	15	16QAM	1	74	19.99	0-1	0
	1902.5	19125	15	16QAM	36	0	19.70	0-2	0
	1902.5	19125	15	16QAM	36	18	19.84	0-2	0
	1902.5	19125	15	16QAM	36	37	19.90	0-2	0
	1902.5	19125	15	16QAM	75	0	20.05	0-2	0

Table 9-29
Reduced LTE Band 2 (PCS) Conducted Powers -10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	20.60	0	0
	1855	18650	10	QPSK	1	25	20.03	0	0
	1855	18650	10	QPSK	1	49	20.12	0	0
	1855	18650	10	QPSK	25	0	19.72	0-1	0
	1855	18650	10	QPSK	25	12	20.10	0-1	0
	1855	18650	10	QPSK	25	25	19.68	0-1	0
	1855	18650	10	QPSK	50	0	20.05	0-1	0
	1855	18650	10	16QAM	1	0	19.78	0-1	0
	1855	18650	10	16QAM	1	25	19.99	0-1	0
	1855	18650	10	16QAM	1	49	20.18	0-1	0
	1855	18650	10	16QAM	25	0	20.37	0-2	0
	1855	18650	10	16QAM	25	12	19.77	0-2	0
	1855	18650	10	16QAM	25	25	19.63	0-2	0
	1855	18650	10	16QAM	50	0	19.99	0-2	0
Mid	1880.0	18900	10	QPSK	1	0	20.54	0	0
	1880.0	18900	10	QPSK	1	25	20.58	0	0
	1880.0	18900	10	QPSK	1	49	20.51	0	0
	1880.0	18900	10	QPSK	25	0	20.04	0-1	0
	1880.0	18900	10	QPSK	25	12	19.76	0-1	0
	1880.0	18900	10	QPSK	25	25	20.07	0-1	0
	1880.0	18900	10	QPSK	50	0	19.93	0-1	0
	1880.0	18900	10	16QAM	1	0	20.26	0-1	0
	1880.0	18900	10	16QAM	1	25	19.76	0-1	0
	1880.0	18900	10	16QAM	1	49	19.66	0-1	0
	1880.0	18900	10	16QAM	25	0	19.85	0-2	0
	1880.0	18900	10	16QAM	25	12	19.76	0-2	0
	1880.0	18900	10	16QAM	25	25	19.70	0-2	0
	1880.0	18900	10	16QAM	50	0	19.79	0-2	0
High	1905	19150	10	QPSK	1	0	20.39	0	0
	1905	19150	10	QPSK	1	25	20.47	0	0
	1905	19150	10	QPSK	1	49	20.59	0	0
	1905	19150	10	QPSK	25	0	20.04	0-1	0
	1905	19150	10	QPSK	25	12	19.85	0-1	0
	1905	19150	10	QPSK	25	25	20.22	0-1	0
	1905	19150	10	QPSK	50	0	19.89	0-1	0
	1905	19150	10	16QAM	1	0	19.85	0-1	0
	1905	19150	10	16QAM	1	25	20.26	0-1	0
	1905	19150	10	16QAM	1	49	19.97	0-1	0
	1905	19150	10	16QAM	25	0	19.88	0-2	0
	1905	19150	10	16QAM	25	12	19.85	0-2	0
	1905	19150	10	16QAM	25	25	19.91	0-2	0
	1905	19150	10	16QAM	50	0	20.02	0-2	0

Table 9-30
Reduced LTE Band 2 (PCS) Conducted Powers -5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	20.50	0	0
	1852.5	18625	5	QPSK	1	12	19.97	0	0
	1852.5	18625	5	QPSK	1	24	20.28	0	0
	1852.5	18625	5	QPSK	12	0	19.71	0-1	0
	1852.5	18625	5	QPSK	12	6	20.08	0-1	0
	1852.5	18625	5	QPSK	12	13	19.66	0-1	0
	1852.5	18625	5	QPSK	25	0	20.03	0-1	0
	1852.5	18625	5	16-QAM	1	0	19.82	0-1	0
	1852.5	18625	5	16-QAM	1	12	20.06	0-1	0
	1852.5	18625	5	16-QAM	1	24	19.98	0-1	0
	1852.5	18625	5	16-QAM	12	0	20.32	0-2	0
	1852.5	18625	5	16-QAM	12	6	19.75	0-2	0
	1852.5	18625	5	16-QAM	12	13	19.69	0-2	0
	1852.5	18625	5	16-QAM	25	0	20.00	0-2	0
	1880.0	18900	5	QPSK	1	0	20.48	0	0
	1880.0	18900	5	QPSK	1	12	20.41	0	0
Mid	1880.0	18900	5	QPSK	1	24	20.46	0	0
	1880.0	18900	5	QPSK	12	0	19.91	0-1	0
	1880.0	18900	5	QPSK	12	6	19.86	0-1	0
	1880.0	18900	5	QPSK	12	13	19.94	0-1	0
	1880.0	18900	5	QPSK	25	0	20.13	0-1	0
	1880.0	18900	5	16-QAM	1	0	20.45	0-1	0
	1880.0	18900	5	16-QAM	1	12	19.70	0-1	0
	1880.0	18900	5	16-QAM	1	24	19.68	0-1	0
	1880.0	18900	5	16-QAM	12	0	19.68	0-2	0
	1880.0	18900	5	16-QAM	12	6	19.89	0-2	0
	1880.0	18900	5	16-QAM	12	13	19.90	0-2	0
	1880.0	18900	5	16-QAM	25	0	19.92	0-2	0
	1907.5	19175	5	QPSK	1	0	20.47	0	0
	1907.5	19175	5	QPSK	1	12	20.57	0	0
	1907.5	19175	5	QPSK	1	24	20.41	0	0
	1907.5	19175	5	QPSK	12	0	20.09	0-1	0
High	1907.5	19175	5	QPSK	12	6	19.93	0-1	0
	1907.5	19175	5	QPSK	12	13	20.11	0-1	0
	1907.5	19175	5	QPSK	25	0	19.76	0-1	0
	1907.5	19175	5	16-QAM	1	0	19.87	0-1	0
	1907.5	19175	5	16-QAM	1	12	20.36	0-1	0
	1907.5	19175	5	16-QAM	1	24	19.89	0-1	0
	1907.5	19175	5	16-QAM	12	0	19.69	0-2	0
	1907.5	19175	5	16-QAM	12	6	19.86	0-2	0
	1907.5	19175	5	16-QAM	12	13	19.79	0-2	0
	1907.5	19175	5	16-QAM	25	0	19.93	0-2	0

Table 9-31
Reduced LTE Band 2 (PCS) Conducted Powers -3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	20.33	0	0
	1851.5	18615	3	QPSK	1	7	19.98	0	0
	1851.5	18615	3	QPSK	1	14	20.42	0	0
	1851.5	18615	3	QPSK	8	0	19.85	0-1	0
	1851.5	18615	3	QPSK	8	4	19.93	0-1	0
	1851.5	18615	3	QPSK	8	7	19.64	0-1	0
	1851.5	18615	3	QPSK	15	0	20.00	0-1	0
	1851.5	18615	3	16-QAM	1	0	19.84	0-1	0
	1851.5	18615	3	16-QAM	1	7	20.22	0-1	0
	1851.5	18615	3	16-QAM	1	14	19.87	0-1	0
	1851.5	18615	3	16-QAM	8	0	20.41	0-2	0
	1851.5	18615	3	16-QAM	8	4	19.84	0-2	0
	1851.5	18615	3	16-QAM	8	7	19.66	0-2	0
	1851.5	18615	3	16-QAM	15	0	19.83	0-2	0
	1880.0	18900	3	QPSK	1	0	20.55	0	0
	1880.0	18900	3	QPSK	1	7	20.55	0	0
Mid	1880.0	18900	3	QPSK	1	14	20.54	0	0
	1880.0	18900	3	QPSK	8	0	19.72	0-1	0
	1880.0	18900	3	QPSK	8	4	19.84	0-1	0
	1880.0	18900	3	QPSK	8	7	19.76	0-1	0
	1880.0	18900	3	QPSK	15	0	20.19	0-1	0
	1880.0	18900	3	16-QAM	1	0	20.43	0-1	0
	1880.0	18900	3	16-QAM	1	7	19.88	0-1	0
	1880.0	18900	3	16-QAM	1	14	19.76	0-1	0
	1880.0	18900	3	16-QAM	8	0	19.76	0-2	0
	1880.0	18900	3	16-QAM	8	4	19.73	0-2	0
	1880.0	18900	3	16-QAM	8	7	20.10	0-2	0
	1880.0	18900	3	16-QAM	15	0	19.76	0-2	0
	1908.5	19185	3	QPSK	1	0	20.33	0	0
	1908.5	19185	3	QPSK	1	7	20.49	0	0
	1908.5	19185	3	QPSK	1	14	20.46	0	0
	1908.5	19185	3	QPSK	8	0	20.14	0-1	0
High	1908.5	19185	3	QPSK	8	4	20.11	0-1	0
	1908.5	19185	3	QPSK	8	7	20.30	0-1	0
	1908.5	19185	3	QPSK	15	0	19.65	0-1	0
	1908.5	19185	3	16-QAM	1	0	19.71	0-1	0
	1908.5	19185	3	16-QAM	1	7	20.55	0-1	0
	1908.5	19185	3	16-QAM	1	14	19.71	0-1	0
	1908.5	19185	3	16-QAM	8	0	19.66	0-2	0
	1908.5	19185	3	16-QAM	8	4	19.84	0-2	0
	1908.5	19185	3	16-QAM	8	7	19.94	0-2	0
	1908.5	19185	3	16-QAM	15	0	20.02	0-2	0

Table 9-32
Reduced LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	20.48	0	0
	1850.7	18607	1.4	QPSK	1	2	19.84	0	0
	1850.7	18607	1.4	QPSK	1	5	20.58	0	0
	1850.7	18607	1.4	QPSK	3	0	19.86	0	0
	1850.7	18607	1.4	QPSK	3	2	20.10	0	0
	1850.7	18607	1.4	QPSK	3	3	19.65	0	0
	1850.7	18607	1.4	QPSK	6	0	20.08	0-1	0
	1850.7	18607	1.4	16-QAM	1	0	19.76	0-1	0
	1850.7	18607	1.4	16-QAM	1	2	20.11	0-1	0
	1850.7	18607	1.4	16-QAM	1	5	19.88	0-1	0
	1850.7	18607	1.4	16-QAM	3	0	20.27	0-1	0
	1850.7	18607	1.4	16-QAM	3	2	20.01	0-1	0
	1850.7	18607	1.4	16-QAM	3	3	19.67	0-1	0
	1850.7	18607	1.4	16-QAM	6	0	19.92	0-2	0
Mid	1880.0	18900	1.4	QPSK	1	0	20.60	0	0
	1880.0	18900	1.4	QPSK	1	2	20.58	0	0
	1880.0	18900	1.4	QPSK	1	5	20.55	0	0
	1880.0	18900	1.4	QPSK	3	0	19.87	0	0
	1880.0	18900	1.4	QPSK	3	2	20.01	0	0
	1880.0	18900	1.4	QPSK	3	3	19.76	0	0
	1880.0	18900	1.4	QPSK	6	0	20.31	0-1	0
	1880.0	18900	1.4	16-QAM	1	0	20.39	0-1	0
	1880.0	18900	1.4	16-QAM	1	2	19.70	0-1	0
	1880.0	18900	1.4	16-QAM	1	5	19.87	0-1	0
	1880.0	18900	1.4	16-QAM	3	0	19.69	0-1	0
	1880.0	18900	1.4	16-QAM	3	2	19.61	0-1	0
	1880.0	18900	1.4	16-QAM	3	3	19.96	0-1	0
	1880.0	18900	1.4	16-QAM	6	0	19.66	0-2	0
High	1909.3	19193	1.4	QPSK	1	0	20.37	0	0
	1909.3	19193	1.4	QPSK	1	2	20.52	0	0
	1909.3	19193	1.4	QPSK	1	5	20.60	0	0
	1909.3	19193	1.4	QPSK	3	0	20.23	0	0
	1909.3	19193	1.4	QPSK	3	2	20.15	0	0
	1909.3	19193	1.4	QPSK	3	3	20.43	0	0
	1909.3	19193	1.4	QPSK	6	0	19.77	0-1	0
	1909.3	19193	1.4	16-QAM	1	0	19.90	0-1	0
	1909.3	19193	1.4	16-QAM	1	2	20.47	0-1	0
	1909.3	19193	1.4	16-QAM	1	5	19.68	0-1	0
	1909.3	19193	1.4	16-QAM	3	0	19.84	0-1	0
	1909.3	19193	1.4	16-QAM	3	2	19.92	0-1	0
	1909.3	19193	1.4	16-QAM	3	3	19.85	0-1	0
	1909.3	19193	1.4	16-QAM	6	0	20.13	0-2	0

9.4 WLAN 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*	16.67	16.65	16.69	16.64
802.11b	2437	6*	16.53	16.62	16.61	16.63
802.11b	2462	11*	16.29	16.31	16.34	16.36

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	13.56	13.56	13.63	13.66	13.60	13.66	13.61	13.63
802.11g	2437	6	14.38	14.37	14.49	14.45	14.45	14.35	14.39	14.41
802.11g	2462	11	14.02	14.07	14.15	14.04	14.03	14.17	14.05	14.09

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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	12.61	12.71	12.69	12.70	12.76	12.70	12.71	12.81
802.11n	2437	6	13.38	13.43	13.48	13.54	13.56	13.48	13.49	13.58
802.11n	2462	11	12.95	13.12	13.03	13.02	13.19	13.05	13.11	13.19

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 operations, 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.
- Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required.
- The bolded data rate and channel above were tested for SAR.

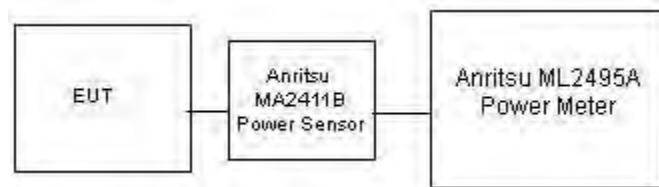


Figure 9-3
Power Measurement Setup

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
1/5/2015	750H	21.9	710	0.878	41.609	0.890	42.149	-1.35%	-1.28%
			725	0.889	41.415	0.891	42.071	-0.22%	-1.56%
			740	0.902	41.245	0.893	41.994	1.01%	-1.78%
			755	0.916	41.049	0.894	41.916	2.46%	-2.07%
1/2/2015	835H	22.5	820	0.924	43.602	0.899	41.578	2.78%	4.87%
			835	0.939	43.405	0.900	41.500	4.33%	4.59%
			850	0.953	43.249	0.916	41.500	4.04%	4.21%
1/5/2015	835H	21.2	820	0.928	42.396	0.899	41.578	3.23%	1.97%
			835	0.943	42.191	0.900	41.500	4.78%	1.67%
			850	0.957	41.980	0.916	41.500	4.48%	1.16%
1/6/2015	1750H	21.7	1710	1.319	39.616	1.348	40.142	-2.15%	-1.31%
			1750	1.362	39.469	1.371	40.079	-0.66%	-1.52%
			1790	1.401	39.237	1.394	40.016	0.50%	-1.95%
1/5/2015	1900H	23.1	1850	1.344	39.441	1.400	40.000	-4.00%	-1.40%
			1880	1.374	39.346	1.400	40.000	-1.86%	-1.64%
			1910	1.403	39.238	1.400	40.000	0.21%	-1.91%
12/31/2014	2450H	22.1	2401	1.732	38.648	1.756	39.287	-1.37%	-1.63%
			2450	1.771	38.468	1.800	39.200	-1.61%	-1.87%
			2499	1.825	38.328	1.853	39.138	-1.51%	-2.07%
1/6/2015	750B	23.0	710	0.931	56.175	0.960	55.687	-3.02%	0.88%
			725	0.942	55.996	0.961	55.629	-1.98%	0.66%
			740	0.955	55.830	0.963	55.570	-0.83%	0.47%
			755	0.970	55.660	0.964	55.512	0.62%	0.27%
1/5/2015	835B	21.1	820	1.001	53.781	0.969	55.258	3.30%	-2.67%
			835	1.016	53.636	0.970	55.200	4.74%	-2.83%
			850	1.030	53.458	0.988	55.154	4.25%	-3.08%
1/19/2015	1750B	23.0	1710	1.418	51.678	1.463	53.537	-3.08%	-3.47%
			1750	1.461	51.563	1.488	53.432	-1.81%	-3.50%
			1790	1.498	51.358	1.514	53.326	-1.06%	-3.69%
1/5/2015	1750B	21.2	1710	1.480	51.153	1.463	53.537	1.16%	-4.45%
			1750	1.523	51.022	1.488	53.432	2.35%	-4.51%
			1790	1.565	50.842	1.514	53.326	3.37%	-4.66%
1/2/2015	1900B	22.8	1850	1.513	52.201	1.520	53.300	-0.46%	-2.06%
			1880	1.548	52.153	1.520	53.300	1.84%	-2.15%
			1910	1.578	52.058	1.520	53.300	3.82%	-2.33%
1/5/2015	1900B	21.9	1850	1.496	51.326	1.520	53.300	-1.58%	-3.70%
			1880	1.527	51.272	1.520	53.300	0.46%	-3.80%
			1910	1.551	51.246	1.520	53.300	2.04%	-3.85%
12/31/2014	2450B	22.4	2401	1.928	52.577	1.903	52.765	1.31%	-0.36%
			2450	1.977	52.472	1.950	52.700	1.38%	-0.43%
			2499	2.037	52.314	2.019	52.638	0.89%	-0.62%

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 Publication 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.

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Test System Verification

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

Table 10-2
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
D	750	HEAD	01/05/2015	23.1	22.3	0.100	1054	3263	0.888	8.330	8.880	6.60%
K	835	HEAD	01/02/2015	24.3	22.5	0.100	4d133	3288	0.925	9.200	9.250	0.54%
K	835	HEAD	01/05/2015	23.4	21.2	0.100	4d119	3288	0.902	9.220	9.020	-2.17%
C	1750	HEAD	01/06/2015	23.6	21.7	0.100	1051	3333	3.870	36.200	38.700	6.91%
G	1900	HEAD	01/05/2015	23.4	23.1	0.100	5d141	3258	4.100	40.100	41.000	2.24%
G	2450	HEAD	12/31/2014	23.8	22.1	0.100	797	3258	4.960	51.800	49.600	-4.25%
D	750	BODY	01/06/2015	23.3	22.5	0.100	1054	3263	0.948	8.640	9.480	9.72%
K	835	BODY	01/05/2015	23.4	22.1	0.100	4d119	3288	0.972	9.340	9.720	4.07%
C	1750	BODY	01/05/2015	23.0	21.2	0.100	1051	3333	3.940	37.400	39.400	5.35%
D	1750	BODY	01/19/2015	23.0	23.0	0.100	1008	3263	3.690	37.600	36.900	-1.86%
J	1900	BODY	01/02/2015	24.4	22.8	0.100	5d141	3022	4.010	40.600	40.100	-1.23%
G	1900	BODY	01/05/2015	24.5	22.8	0.100	5d141	3258	3.910	40.600	39.100	-3.69%
G	2450	BODY	12/31/2014	23.7	22.4	0.100	797	3258	5.050	49.400	50.500	2.23%

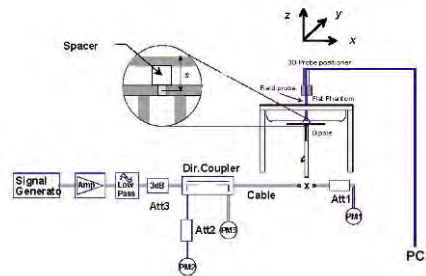


Figure 10-1
System Verification Setup Diagram



Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.31	0.00	Right	Cheek	3012-9	1:8.3	0.317	1.172	0.372	
836.60	190	GSM 850	GSM	33.0	32.31	0.02	Right	Tilt	3012-9	1:8.3	0.188	1.172	0.220	
836.60	190	GSM 850	GSM	33.0	32.31	0.02	Left	Cheek	3012-9	1:8.3	0.330	1.172	0.387	A1
836.60	190	GSM 850	GSM	33.0	32.31	0.07	Left	Tilt	3012-9	1:8.3	0.184	1.172	0.216	
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	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.00	Right	Cheek	3012-9	1:1	0.311	1.230	0.383	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.14	Right	Tilt	3012-9	1:1	0.218	1.230	0.268	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.04	Left	Cheek	3012-9	1:1	0.354	1.230	0.435	A2
836.60	4183	UMTS 850	RMC	23.5	22.60	0.09	Left	Tilt	3012-9	1:1	0.209	1.230	0.257	
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
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.5	29.81	0.06	Right	Cheek	3012-9	1:8.3	0.169	1.172	0.198	
1880.00	661	GSM 1900	GSM	30.5	29.81	0.08	Right	Tilt	3012-9	1:8.3	0.098	1.172	0.115	
1880.00	661	GSM 1900	GSM	30.5	29.81	0.06	Left	Cheek	3012-9	1:8.3	0.278	1.172	0.326	A3
1880.00	661	GSM 1900	GSM	30.5	29.81	0.20	Left	Tilt	3012-9	1:8.3	0.074	1.172	0.087	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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Table 11-4
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	23.5	22.57	0.02	Right	Cheek	3012-9	1:1	0.317	1.239	0.393	
1880.00	9400	UMTS 1900	RMC	23.5	22.57	0.01	Right	Tilt	3012-9	1:1	0.189	1.239	0.234	
1880.00	9400	UMTS 1900	RMC	23.5	22.57	0.04	Left	Cheek	3012-9	1:1	0.470	1.239	0.582	A4
1880.00	9400	UMTS 1900	RMC	23.5	22.57	0.00	Left	Tilt	3012-9	1:1	0.120	1.239	0.149	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-5
LTE Band 17 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.01	0	Right	Cheek	QPSK	1	0	3012-10	1:1	0.281	1.000	0.281	A5
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.02	1	Right	Cheek	QPSK	25	0	3012-10	1:1	0.254	1.021	0.259	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.06	0	Right	Tilt	QPSK	1	0	3012-10	1:1	0.220	1.000	0.220	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.05	1	Right	Tilt	QPSK	25	0	3012-10	1:1	0.197	1.021	0.201	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.03	0	Left	Cheek	QPSK	1	0	3012-10	1:1	0.326	1.000	0.326	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.03	1	Left	Cheek	QPSK	25	0	3012-10	1:1	0.300	1.021	0.306	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.01	0	Left	Tilt	QPSK	1	0	3012-10	1:1	0.211	1.000	0.211	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.06	1	Left	Tilt	QPSK	25	0	3012-10	1:1	0.197	1.021	0.201	
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 5 (Cell) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.03	0	Right	Cheek	QPSK	1	25	3012-2	1:1	0.350	1.057	0.370	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.20	1	Right	Cheek	QPSK	25	25	3012-2	1:1	0.260	1.130	0.294	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.14	0	Right	Tilt	QPSK	1	25	3012-2	1:1	0.231	1.057	0.244	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.20	1	Right	Tilt	QPSK	25	25	3012-2	1:1	0.170	1.130	0.192	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.05	0	Left	Cheek	QPSK	1	25	3012-2	1:1	0.352	1.057	0.372	A6
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.07	1	Left	Cheek	QPSK	25	25	3012-2	1:1	0.256	1.130	0.289	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.08	0	Left	Tilt	QPSK	1	25	3012-2	1:1	0.219	1.057	0.231	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.06	1	Left	Tilt	QPSK	25	25	3012-2	1:1	0.184	1.130	0.208	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 11-7
LTE Band 4 (AWS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Md	LTE Band 4 (AWS)	20	24.0	23.60	0.19	0	Right	Cheek	QPSK	1	0	3012-2	1:1	0.219	1.096	0.240	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.0	22.49	0.05	1	Right	Cheek	QPSK	50	0	3012-2	1:1	0.165	1.125	0.186	
1732.50	20175	Md	LTE Band 4 (AWS)	20	24.0	23.60	0.20	0	Right	Tilt	QPSK	1	0	3012-2	1:1	0.168	1.096	0.184	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.0	22.49	0.10	1	Right	Tilt	QPSK	50	0	3012-2	1:1	0.127	1.125	0.143	
1732.50	20175	Md	LTE Band 4 (AWS)	20	24.0	23.60	0.20	0	Left	Cheek	QPSK	1	0	3012-2	1:1	0.381	1.096	0.418	A7
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.0	22.49	0.03	1	Left	Cheek	QPSK	50	0	3012-2	1:1	0.293	1.125	0.330	
1732.50	20175	Md	LTE Band 4 (AWS)	20	24.0	23.60	0.06	0	Left	Tilt	QPSK	1	0	3012-2	1:1	0.171	1.096	0.187	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.0	22.49	0.00	1	Left	Tilt	QPSK	50	0	3012-2	1:1	0.126	1.125	0.142	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.85	0.13	0	Right	Cheek	QPSK	1	0	3012-4	1:1	0.123	1.035	0.127	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.53	0.00	0	Right	Cheek	QPSK	50	0	3012-4	1:1	0.111	1.114	0.124	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.55	0.01	0	Right	Cheek	QPSK	100	0	3012-4	1:1	0.111	1.109	0.123	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.85	0.13	0	Right	Tilt	QPSK	1	0	3012-4	1:1	0.105	1.035	0.109	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.53	0.01	0	Right	Tilt	QPSK	50	0	3012-4	1:1	0.090	1.114	0.100	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.55	0.09	0	Right	Tilt	QPSK	100	0	3012-4	1:1	0.091	1.109	0.101	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.85	0.20	0	Left	Cheek	QPSK	1	0	3012-4	1:1	0.230	1.035	0.238	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.53	0.03	0	Left	Cheek	QPSK	50	0	3012-4	1:1	0.212	1.114	0.236	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.55	0.03	0	Left	Cheek	QPSK	100	0	3012-4	1:1	0.214	1.109	0.237	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.85	0.02	0	Left	Tilt	QPSK	1	0	3012-4	1:1	0.100	1.035	0.104	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.53	0.04	0	Left	Tilt	QPSK	50	0	3012-4	1:1	0.091	1.114	0.101	
1732.50	20175	Md	LTE Band 4 (AWS)	20	21.0	20.55	0.08	0	Left	Tilt	QPSK	100	0	3012-4	1:1	0.090	1.109	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 11-8
LTE Band 2 (PCS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.0	23.97	0.02	0	Right	Cheek	QPSK	1	50	3012-10	1:1	0.265	1.007	0.267	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	22.98	0.07	1	Right	Cheek	QPSK	50	50	3012-10	1:1	0.196	1.005	0.197	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.0	23.97	0.08	0	Right	Tilt	QPSK	1	50	3012-10	1:1	0.152	1.007	0.153	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	22.98	0.12	1	Right	Tilt	QPSK	50	50	3012-10	1:1	0.113	1.005	0.114	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.0	23.97	0.06	0	Left	Cheek	QPSK	1	50	3012-10	1:1	0.381	1.007	0.384	A8
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	22.98	0.08	1	Left	Cheek	QPSK	50	50	3012-10	1:1	0.300	1.005	0.302	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.0	23.97	0.04	0	Left	Tilt	QPSK	1	50	3012-10	1:1	0.078	1.007	0.079	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	22.98	0.02	1	Left	Tilt	QPSK	50	50	3012-10	1:1	0.064	1.005	0.064	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.20	0	Right	Cheek	QPSK	1	50	3012-11	1:1	0.141	1.107	0.156	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.09	0	Right	Cheek	QPSK	50	50	3012-11	1:1	0.127	1.242	0.158	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.20	0	Right	Tilt	QPSK	1	50	3012-11	1:1	0.077	1.107	0.085	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.02	0	Right	Tilt	QPSK	50	50	3012-11	1:1	0.078	1.242	0.097	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.20	0	Left	Cheek	QPSK	1	50	3012-11	1:1	0.249	1.107	0.276	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.01	0	Left	Cheek	QPSK	50	50	3012-11	1:1	0.254	1.242	0.315	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.04	0	Left	Tilt	QPSK	1	50	3012-11	1:1	0.052	1.107	0.058	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.06	0	Left	Tilt	QPSK	50	50	3012-11	1:1	0.059	1.242	0.073	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-9
DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.02	Right	Cheek	3012-5	1	1:1	0.189	1.211	0.229	A9
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.16	Right	Tilt	3012-5	1	1:1	0.106	1.211	0.128	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.03	Left	Cheek	3012-5	1	1:1	0.132	1.211	0.160	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.06	Left	Tilt	3012-5	1	1:1	0.112	1.211	0.136	
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 11-10
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.31	0.01	10.0 mm	3012-9	1	1:8.3	back	0.618	1.172	0.724	A10
836.60	4183	UMTS 850	RMC	23.5	22.60	0.11	10.0 mm	3012-9	N/A	1:1	back	0.542	1.230	0.667	A12
1880.00	661	GSM 1900	GSM	30.5	29.81	0.06	10.0 mm	3012-9	1	1:8.3	back	0.629	1.172	0.737	A13
1880.00	9400	UMTS 1900	RMC	23.5	22.57	0.03	15.0 mm	3012-9	N/A	1:1	back	0.617	1.239	0.764	A15
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 11-11
LTE Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.04	0	3012-10	QPSK	1	0	10.0 mm	back	1:1	0.398	1.000	0.398	A17
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.02	1	3012-10	QPSK	25	0	10.0 mm	back	1:1	0.300	1.021	0.306	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.14	0	3012-2	QPSK	1	25	10.0 mm	back	1:1	0.584	1.057	0.617	A19
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.02	1	3012-2	QPSK	25	25	10.0 mm	back	1:1	0.434	1.130	0.490	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.60	0.10	0	3012-2	QPSK	1	0	15.0 mm	back	1:1	0.408	1.096	0.447	A20
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.49	0.06	1	3012-2	QPSK	50	0	15.0 mm	back	1:1	0.299	1.125	0.336	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.0	23.97	0.09	0	3012-10	QPSK	1	50	15.0 mm	back	1:1	0.509	1.007	0.513	A22
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	22.98	0.01	1	3012-10	QPSK	50	50	15.0 mm	back	1:1	0.368	1.005	0.370	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-12
DTS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.06	10.0 mm	3012-5	1	back	1:1	0.193	1.211	0.234	A24
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 11-13
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	30.0	29.11	0.01	10.0 mm	3012-9	2	1:4.15	back	0.566	1.227	0.694	A11
836.60	190	GSM 850	GPRS	30.0	29.11	0.14	10.0 mm	3012-9	2	1:4.15	front	0.379	1.227	0.465	
836.60	190	GSM 850	GPRS	30.0	29.11	0.06	10.0 mm	3012-9	2	1:4.15	bottom	0.049	1.227	0.060	
836.60	190	GSM 850	GPRS	30.0	29.11	0.16	10.0 mm	3012-9	2	1:4.15	right	0.277	1.227	0.340	
836.60	190	GSM 850	GPRS	30.0	29.11	0.01	10.0 mm	3012-9	2	1:4.15	left	0.335	1.227	0.411	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.11	10.0 mm	3012-9	N/A	1:1	back	0.542	1.230	0.667	A12
836.60	4183	UMTS 850	RMC	23.5	22.60	0.01	10.0 mm	3012-9	N/A	1:1	front	0.448	1.230	0.551	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.18	10.0 mm	3012-9	N/A	1:1	bottom	0.056	1.230	0.069	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.07	10.0 mm	3012-9	N/A	1:1	right	0.352	1.230	0.433	
836.60	4183	UMTS 850	RMC	23.5	22.60	0.01	10.0 mm	3012-9	N/A	1:1	left	0.458	1.230	0.563	
1850.20	512	GSM 1900	GPRS	27.5	27.04	0.05	10.0 mm	3012-9	2	1:4.15	back	0.694	1.112	0.772	
1880.00	661	GSM 1900	GPRS	27.5	26.88	0.08	10.0 mm	3012-9	2	1:4.15	back	0.708	1.153	0.816	
1909.80	810	GSM 1900	GPRS	27.5	27.01	0.13	10.0 mm	3012-9	2	1:4.15	back	0.720	1.119	0.806	A14
1880.00	661	GSM 1900	GPRS	27.5	26.88	0.12	10.0 mm	3012-9	2	1:4.15	front	0.608	1.153	0.701	
1880.00	661	GSM 1900	GPRS	27.5	26.88	0.01	10.0 mm	3012-9	2	1:4.15	bottom	0.446	1.153	0.514	
1880.00	661	GSM 1900	GPRS	27.5	26.88	0.08	10.0 mm	3012-9	2	1:4.15	right	0.030	1.153	0.035	
1880.00	661	GSM 1900	GPRS	27.5	26.88	0.20	10.0 mm	3012-9	2	1:4.15	left	0.211	1.153	0.243	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	0.07	10.0 mm	3012-3	N/A	1:1	back	0.611	1.089	0.665	A16
1880.00	9400	UMTS 1900	RMC	20.5	20.13	0.04	10.0 mm	3012-3	N/A	1:1	front	0.542	1.089	0.590	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	0.01	10.0 mm	3012-3	N/A	1:1	bottom	0.413	1.089	0.450	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	0.09	10.0 mm	3012-3	N/A	1:1	right	0.027	1.089	0.029	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	0.03	10.0 mm	3012-3	N/A	1:1	left	0.151	1.089	0.164	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 11-14
LTE Band 17 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #	
MHz	Ch.														(W/kg)				
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.04	0	3012-10	QPSK	1	0	10.0 mm	back	1:1	0.398	1.000	0.398	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.02	1	3012-10	QPSK	25	0	10.0 mm	back	1:1	0.300	1.021	0.306	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.20	0	3012-10	QPSK	1	0	10.0 mm	front	1:1	0.364	1.000	0.364	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.05	1	3012-10	QPSK	25	0	10.0 mm	front	1:1	0.360	1.021	0.368	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.03	0	3012-10	QPSK	1	0	10.0 mm	bottom	1:1	0.054	1.000	0.054	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.04	1	3012-10	QPSK	25	0	10.0 mm	bottom	1:1	0.044	1.021	0.045	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.04	0	3012-10	QPSK	1	0	10.0 mm	right	1:1	0.487	1.000	0.487	
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.04	1	3012-10	QPSK	25	0	10.0 mm	right	1:1	0.361	1.021	0.369	
710.00	23790	Mid	LTE Band 17	10	23.5	23.50	0.01	0	3012-10	QPSK	1	0	10.0 mm	left	1:1	0.589	1.000	0.589	A18
710.00	23790	Mid	LTE Band 17	10	22.5	22.41	0.03	1	3012-10	QPSK	25	0	10.0 mm	left	1:1	0.425	1.021	0.434	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

Table 11-15
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.14	0	3012-2	QPSK	1	25	10.0 mm	back	1:1	0.584	1.057	0.617	A19
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.02	1	3012-2	QPSK	25	25	10.0 mm	back	1:1	0.434	1.130	0.490	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.01	0	3012-2	QPSK	1	25	10.0 mm	front	1:1	0.446	1.057	0.471	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.01	1	3012-2	QPSK	25	25	10.0 mm	front	1:1	0.346	1.130	0.391	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.07	0	3012-2	QPSK	1	25	10.0 mm	bottom	1:1	0.062	1.057	0.066	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.08	1	3012-2	QPSK	25	25	10.0 mm	bottom	1:1	0.050	1.130	0.057	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.20	0	3012-2	QPSK	1	25	10.0 mm	right	1:1	0.339	1.057	0.358	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.05	1	3012-2	QPSK	25	25	10.0 mm	right	1:1	0.264	1.130	0.298	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.26	0.06	0	3012-2	QPSK	1	25	10.0 mm	left	1:1	0.466	1.057	0.493	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.97	0.03	1	3012-2	QPSK	25	25	10.0 mm	left	1:1	0.319	1.130	0.360	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT																			
Spatial Peak								Body											
Uncontrolled Exposure/General Population								1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-16
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #	
MHz	Ch.																		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.85	0.03	0	3012-4	QPSK	1	0	10.0 mm	back	1:1	0.393	1.035	0.407	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.53	0.09	0	3012-4	QPSK	50	0	10.0 mm	back	1:1	0.365	1.114	0.407	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.55	-0.07	0	3012-4	QPSK	100	0	10.0 mm	back	1:1	0.441	1.109	0.489	A21
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.85	0.13	0	3012-4	QPSK	1	0	10.0 mm	front	1:1	0.406	1.035	0.420	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.53	0.01	0	3012-4	QPSK	50	0	10.0 mm	front	1:1	0.385	1.114	0.429	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.55	0.09	0	3012-4	QPSK	100	0	10.0 mm	front	1:1	0.356	1.109	0.395	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.85	0.03	0	3012-4	QPSK	1	0	10.0 mm	bottom	1:1	0.354	1.035	0.366	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.53	0.01	0	3012-4	QPSK	50	0	10.0 mm	bottom	1:1	0.325	1.114	0.362	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.55	0.07	0	3012-4	QPSK	100	0	10.0 mm	bottom	1:1	0.309	1.109	0.343	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.85	0.19	0	3012-4	QPSK	1	0	10.0 mm	right	1:1	0.023	1.035	0.024	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.53	0.02	0	3012-4	QPSK	50	0	10.0 mm	right	1:1	0.023	1.114	0.026	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.55	0.08	0	3012-4	QPSK	100	0	10.0 mm	right	1:1	0.021	1.109	0.023	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.85	0.08	0	3012-4	QPSK	1	0	10.0 mm	left	1:1	0.147	1.035	0.152	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.53	0.02	0	3012-4	QPSK	50	0	10.0 mm	left	1:1	0.137	1.114	0.153	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.55	-0.04	0	3012-4	QPSK	100	0	10.0 mm	left	1:1	0.136	1.109	0.151	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-17
LTE Band 2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth (MHz)	Maximum Allowed Power (dBm)	Conducted Power (dBm)	Power Drift (dB)	MPR (dB)	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.06	0	3012-11	QPSK	1	50	10.0 mm	back	1:1	0.686	1.107	0.759	A23
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.04	0	3012-11	QPSK	50	50	10.0 mm	back	1:1	0.612	1.242	0.760	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.02	0	3012-11	QPSK	1	50	10.0 mm	front	1:1	0.636	1.107	0.704	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.09	0	3012-11	QPSK	50	50	10.0 mm	front	1:1	0.589	1.242	0.732	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.03	0	3012-11	QPSK	1	50	10.0 mm	bottom	1:1	0.406	1.107	0.449	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.00	0	3012-11	QPSK	50	50	10.0 mm	bottom	1:1	0.405	1.242	0.503	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.13	0	3012-11	QPSK	1	50	10.0 mm	right	1:1	0.034	1.107	0.038	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.18	0	3012-11	QPSK	50	50	10.0 mm	right	1:1	0.034	1.242	0.042	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.56	0.03	0	3012-11	QPSK	1	50	10.0 mm	left	1:1	0.179	1.107	0.198	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.0	20.06	0.00	0	3012-11	QPSK	50	50	10.0 mm	left	1:1	0.176	1.242	0.219	
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
WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.06	10.0 mm	3012-5	1	back	1:1	0.193	1.211	0.234	A24
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.09	10.0 mm	3012-5	1	front	1:1	0.075	1.211	0.091	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.16	10.0 mm	3012-5	1	top	1:1	0.030	1.211	0.036	
2412	1	IEEE 802.11b	DSSS	17.5	16.67	0.00	10.0 mm	3012-5	1	left	1:1	0.130	1.211	0.157	
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.
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 15 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. A test separation distance of 10 mm for body-worn SAR was also used for GSM 850/1900, UMTS Band 5, LTE Band 17/5, and 2.4 GHz WLAN as it is more conservative.
7. Per FCC KDB Publication 648474 D04v01, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01 v01, variability SAR tests were not performed since the measured SAR results for a frequency band was less than 0.8 W/kg. 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 6.5 for more details).

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10. This device utilizes power reduction for UMTS Band 2, LTE Band 2/4 under portable Hotspot for SAR compliance. Therefore, these wireless router configurations were tested at reduced output power levels.

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 $> \frac{1}{2}$ 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 $> \frac{1}{2}$ 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 WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI operations: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. WIFI transmission was verified using an uncalibrated spectrum analyzer.
3. 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 default channels was required.

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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11b/g/n 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.

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

Table 12-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2480	10.00	15	0.140

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.

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12.3 Head SAR Simultaneous Transmission Analysis

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

Simult Tx	Configuration	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	0.372	0.229	0.601	Head SAR	Right Cheek	0.383	0.229	0.612
	Right Tilt	0.220	0.128	0.348		Right Tilt	0.268	0.128	0.396
	Left Cheek	0.387	0.160	0.547		Left Cheek	0.435	0.160	0.595
	Left Tilt	0.216	0.136	0.352		Left Tilt	0.257	0.136	0.393
Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.198	0.229	0.427	Head SAR	Right Cheek	0.393	0.229	0.622
	Right Tilt	0.115	0.128	0.243		Right Tilt	0.234	0.128	0.362
	Left Cheek	0.326	0.160	0.486		Left Cheek	0.582	0.160	0.742
	Left Tilt	0.087	0.136	0.223		Left Tilt	0.149	0.136	0.285
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.281	0.229	0.510	Head SAR	Right Cheek	0.370	0.229	0.599
	Right Tilt	0.220	0.128	0.348		Right Tilt	0.244	0.128	0.372
	Left Cheek	0.326	0.160	0.486		Left Cheek	0.372	0.160	0.532
	Left Tilt	0.211	0.136	0.347		Left Tilt	0.231	0.136	0.367
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	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	0.127	0.229	0.356	Head SAR	Right Cheek	0.158	0.229	0.387
	Right Tilt	0.109	0.128	0.237		Right Tilt	0.097	0.128	0.225
	Left Cheek	0.238	0.160	0.398		Left Cheek	0.315	0.160	0.475
	Left Tilt	0.104	0.136	0.240		Left Tilt	0.073	0.136	0.209

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12.4 Body-Worn Simultaneous Transmission Analysis

Notes:

1. For SAR summation for body-worn back side at 15mm, GSM 850/1900, UMTS 850, and LTE B17/5 SAR values at 10mm were used since the 10mm test distance was more conservative. "<" denotes that the 10mm GSM 850/1900, UMTS 850, and LTE B17/5 SAR values were used for summation purposes.
2. For SAR summations for body-worn back side at 15mm, WLAN SAR values for 10mm were used since the 10mm test distance is more conservative. "<" denotes that the 10mm WLAN SAR values were used for summation purposes.
3. For SAR summations for body-worn back side LTE Band 2/4 SAR values at maximum power are used since the 15mm test distance is more conservative. "<" denotes that maximum LTE Band 2/4 SAR values were used for summation purposes.

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	<0.724	<0.234	<0.958
Back Side	UMTS 850	<0.667	<0.234	<0.901
Back Side	GSM 1900	<0.737	<0.234	<0.971
Back Side	UMTS 1900	0.764	<0.234	<0.998
Back Side	LTE Band 17	<0.398	<0.234	<0.632
Back Side	LTE Band 5 (Cell)	<0.617	<0.234	<0.851
Back Side	LTE Band 4 (AWS)	<0.447	<0.234	<0.681
Back Side	LTE Band 2 (PCS)	<0.513	<0.234	<0.747

Table 12-4
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	<0.724	0.140	<0.864
Back Side	UMTS 850	<0.667	0.140	<0.807
Back Side	GSM 1900	<0.737	0.140	<0.877
Back Side	UMTS 1900	0.764	0.140	0.904
Back Side	LTE Band 17	<0.398	0.140	<0.538
Back Side	LTE Band 5 (Cell)	<0.617	0.140	<0.757
Back Side	LTE Band 4 (AWS)	0.447	0.140	0.587
Back Side	LTE Band 2 (PCS)	0.513	0.140	0.653

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.

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12.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

Table 12-5
Simultaneous Transmission Scenario (2.4 GHz Hotspot 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	0.694	0.234	0.928	Body SAR	Back	0.667	0.234	0.901
	Front	0.465	0.091	0.556		Front	0.551	0.091	0.642
	Top	-	0.036	0.036		Top	-	0.036	0.036
	Bottom	0.060	-	0.060		Bottom	0.069	-	0.069
	Right	0.340	-	0.340		Right	0.433	-	0.433
	Left	0.411	0.157	0.568		Left	0.563	0.157	0.720
Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.816	0.234	1.050	Body SAR	Back	0.665	0.234	0.899
	Front	0.701	0.091	0.792		Front	0.590	0.091	0.681
	Top	-	0.036	0.036		Top	-	0.036	0.036
	Bottom	0.514	-	0.514		Bottom	0.450	-	0.450
	Right	0.035	-	0.035		Right	0.029	-	0.029
	Left	0.243	0.157	0.400		Left	0.164	0.157	0.321
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.398	0.234	0.632	Body SAR	Back	0.617	0.234	0.851
	Front	0.368	0.091	0.459		Front	0.471	0.091	0.562
	Top	-	0.036	0.036		Top	-	0.036	0.036
	Bottom	0.054	-	0.054		Bottom	0.066	-	0.066
	Right	0.487	-	0.487		Right	0.358	-	0.358
	Left	0.589	0.157	0.746		Left	0.493	0.157	0.650
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.489	0.234	0.723	Body SAR	Back	0.760	0.234	0.994
	Front	0.420	0.091	0.511		Front	0.732	0.091	0.823
	Top	-	0.036	0.036		Top	-	0.036	0.036
	Bottom	0.366	-	0.366		Bottom	0.503	-	0.503
	Right	0.026	-	0.026		Right	0.042	-	0.042
	Left	0.153	0.157	0.310		Left	0.219	0.157	0.376

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.

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, SAR measurement variability is assessed when the highest measured SAR is ≥ 0.80 W/kg. Since all measured SAR values are <0.8 W/kg for this device, SAR measurement variability was not assessed.

13.2 Measurement Uncertainty

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

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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/15/2014	Annual	4/15/2015	MY45470194
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/15/2014	Annual	4/15/2015	3629U00687
Agilent	E4407B	ESA Spectrum Analyzer	4/16/2014	Annual	4/16/2015	US39210313
Agilent	E4438C	ESG Vector Signal Generator	4/25/2014	Annual	4/25/2015	MY42082385
Agilent	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420651
Agilent	8753ES	S-Parameter Network Analyzer	5/22/2014	Annual	5/22/2015	US39170118
Agilent	E5515C	Wireless Communications Test Set	11/20/2014	Annual	11/20/2015	GB42361078
Agilent	E5515C	Wireless Communications Test Set	11/20/2014	Biennial	11/20/2016	GB43163447
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433975
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433976
Anritsu	ML2495A	Power Meter	10/31/2013	Biennial	10/31/2015	941001
Anritsu	ML2469A	Power Meter	3/14/2014	Annual	3/14/2015	1306009
Anritsu	MA2411B	Pulse Power Sensor	3/25/2014	Annual	3/25/2015	1207470
Anritsu	MA2411B	Pulse Power Sensor	11/13/2014	Annual	11/13/2015	1339018
Anritsu	MT8820C	Radio Communication Analyzer	5/6/2014	Annual	5/6/2015	6201144419
Anritsu	MT8820C	Radio Communication Analyzer	8/28/2014	Annual	8/28/2015	6201240328
Anritsu	MA24106A	USB Power Sensor	5/14/2014	Annual	5/14/2015	1231538
Anritsu	MA24106A	USB Power Sensor	5/15/2014	Annual	5/15/2015	1244512
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3WIA00-1002
COMTECH	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671801
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671821
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264165
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	4/24/2014	Annual	4/24/2015	836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester	2/20/2014	Annual	2/20/2015	128633
Rohde & Schwarz	CMW500	Radio Communication Tester	7/9/2014	Annual	7/9/2015	106578
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	N/A
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	N/A
SPEAG	D1765V2	1765 MHz SAR Dipole	5/7/2014	Annual	5/7/2015	1008
SPEAG	D1750V2	1750 MHz SAR Dipole	4/10/2014	Annual	4/10/2015	1051
SPEAG	D1900V2	1900 MHz SAR Dipole	4/9/2014	Annual	4/9/2015	5d141
SPEAG	D2450V2	2450 MHz SAR Dipole	1/21/2014	Annual	1/21/2015	797
SPEAG	D750V3	750 MHz Dipole	3/17/2014	Annual	3/17/2015	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/7/2014	Annual	4/7/2015	4d119
SPEAG	D835V2	835 MHz SAR Dipole	7/24/2014	Annual	7/24/2015	4d133
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/26/2014	Annual	2/26/2015	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/14/2014	Annual	5/14/2015	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/12/2014	Annual	8/12/2015	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/18/2014	Annual	9/18/2015	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/23/2014	Annual	10/23/2015	1408
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/6/2014	Annual	5/6/2015	1070
SPEAG	ES3DV3	SAR Probe	2/25/2014	Annual	2/25/2015	3258
SPEAG	ES3DV3	SAR Probe	5/15/2014	Annual	5/15/2015	3263
SPEAG	ES3DV2	SAR Probe	8/19/2014	Annual	8/19/2015	3022
SPEAG	ES3DV3	SAR Probe	9/24/2014	Annual	9/24/2015	3288
SPEAG	ES3DV3	SAR Probe	10/24/2014	Annual	10/24/2015	3333
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Biennial	8/8/2015	130477877
VWR	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	111859332

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

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15 MEASUREMENT UNCERTAINTIES

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

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

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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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17 REFERENCES

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FCC ID A3LSMG530AZ		SAR EVALUATION REPORT	 Reviewed by: Quality Manager
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FCC ID A3LSMG530AZ		SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Document S/N: 0Y1412292326.A3L	Test Dates: 12/31/14 – 01/19/15	DUT Type: Portable Handset	Page 57 of 57

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.944 \text{ S/m}$; $\epsilon_r = 42.168$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3288; ConvF(6.51, 6.51, 6.51); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

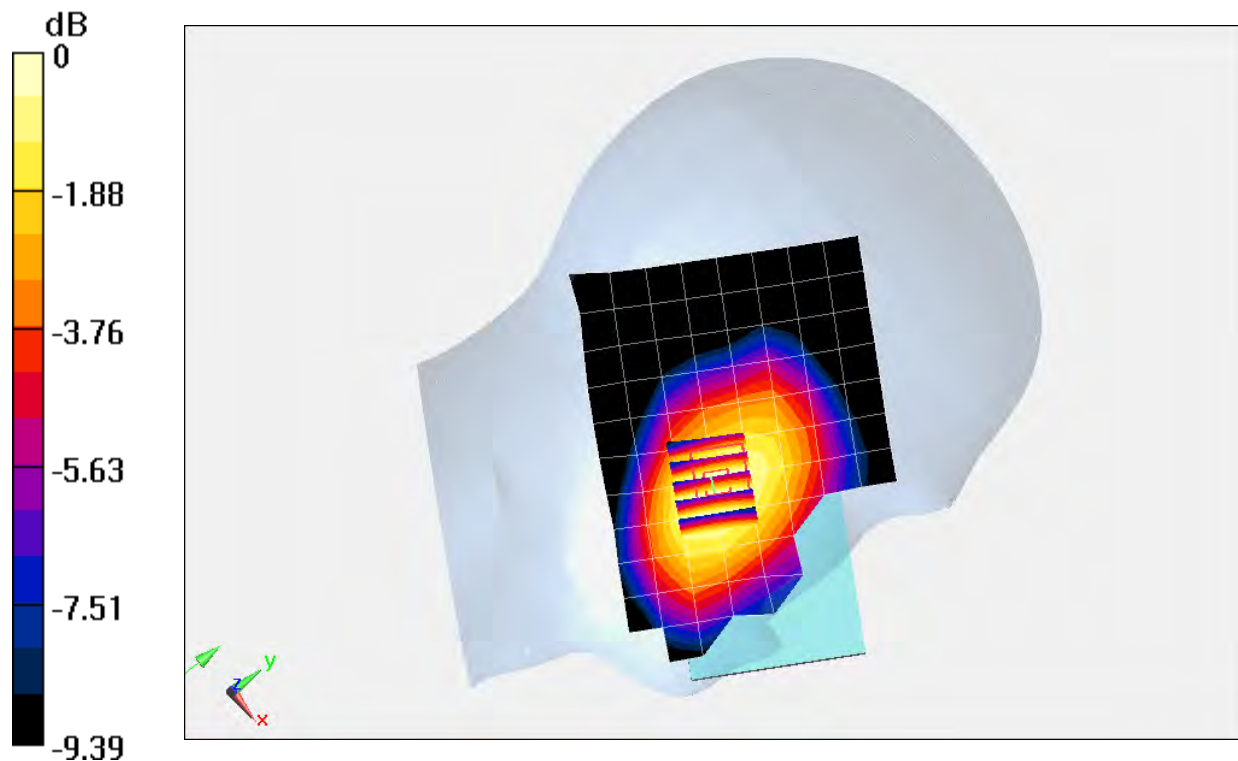
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.20 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.423 W/kg

SAR(1 g) = 0.330 W/kg



0 dB = 0.364 W/kg = -4.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.944 \text{ S/m}$; $\epsilon_r = 42.168$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3288; ConvF(6.51, 6.51, 6.51); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

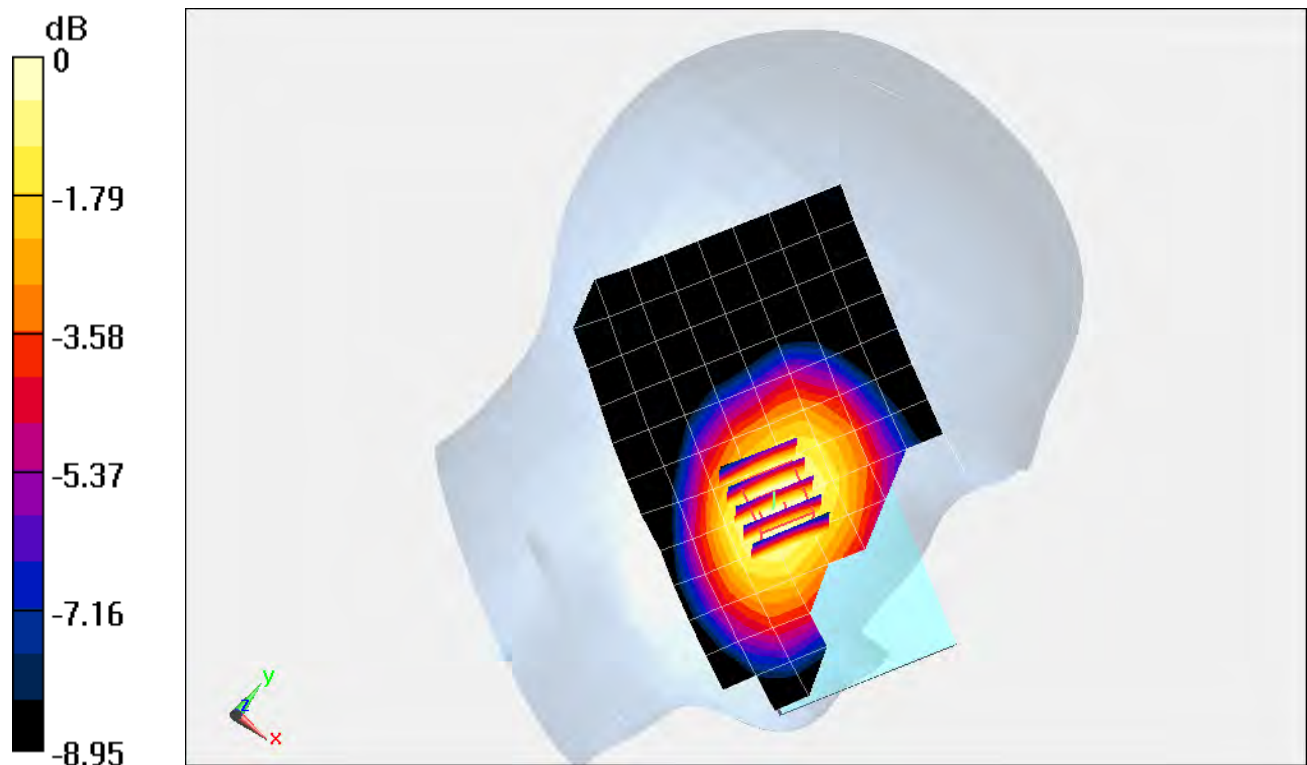
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.92 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.449 W/kg

SAR(1 g) = 0.354 W/kg



0 dB = 0.390 W/kg = -4.09 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.374 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

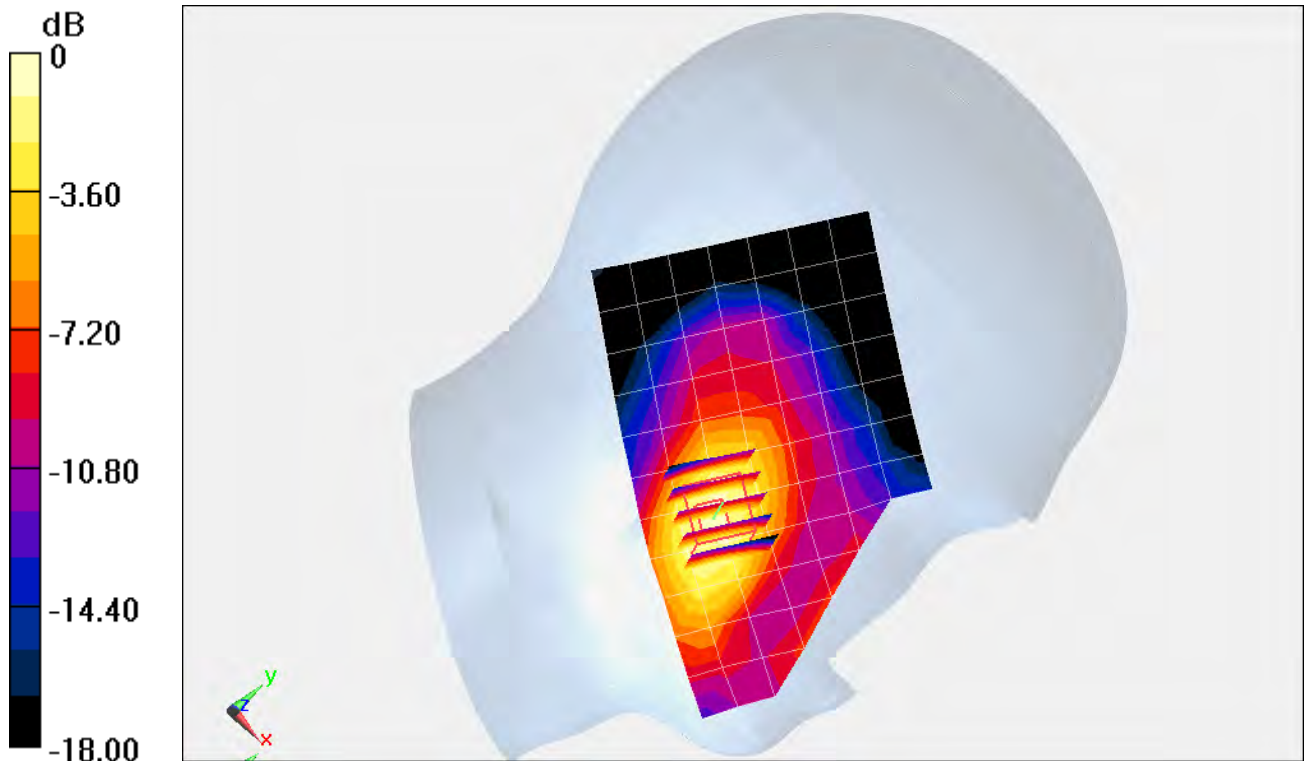
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.38 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.425 W/kg

SAR(1 g) = 0.278 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.374 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

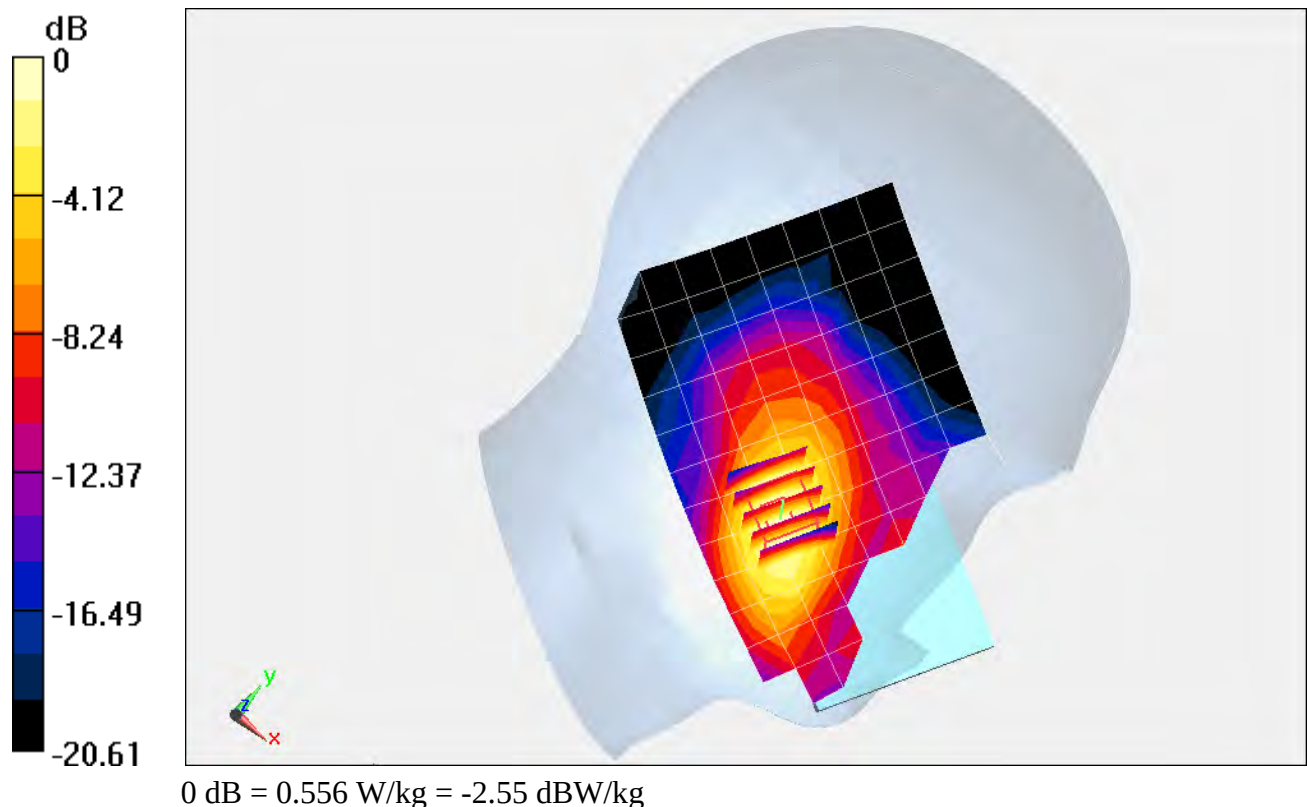
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.51 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.738 W/kg

SAR(1 g) = 0.470 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-10

Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.878 \text{ S/m}$; $\epsilon_r = 41.609$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.42, 6.42, 6.42); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

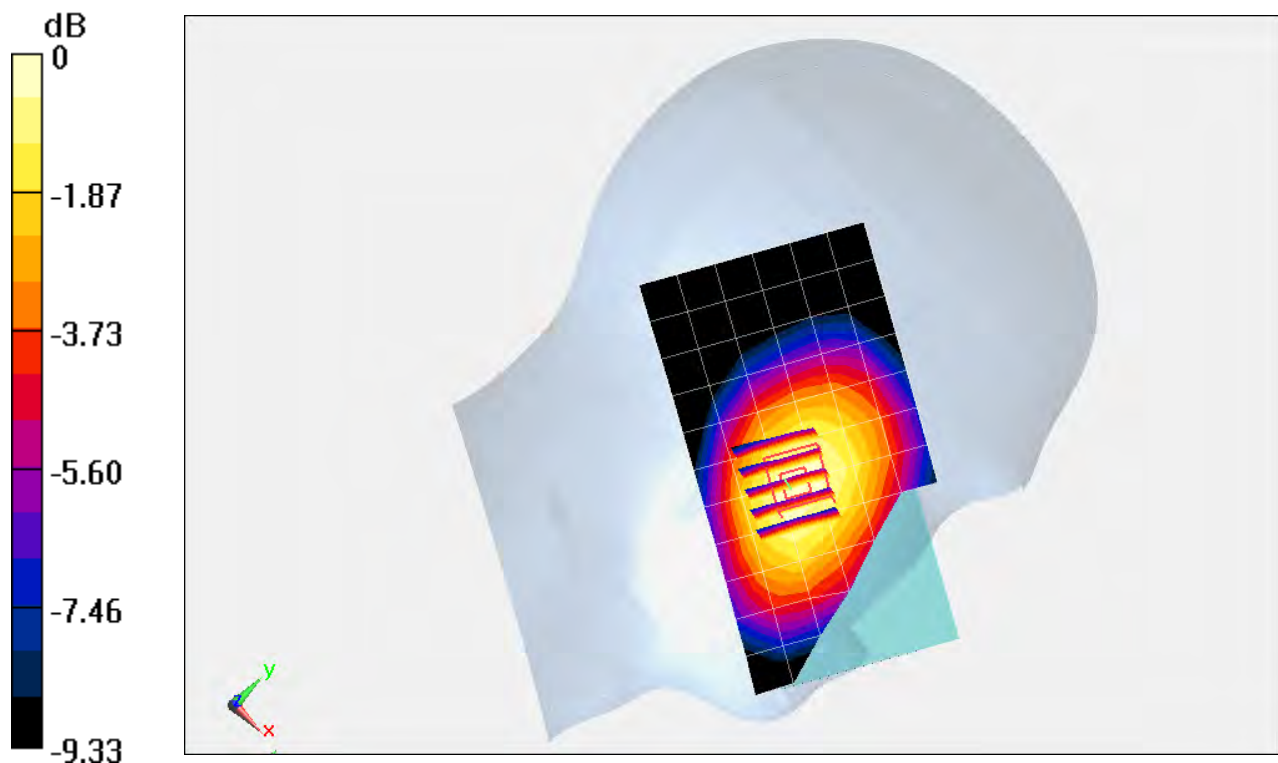
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 6.924 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.424 W/kg

SAR(1 g) = 0.326 W/kg



0 dB = 0.362 W/kg = -4.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-2

Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.94 \text{ S/m}$; $\epsilon_r = 43.389$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-02-2015; Ambient Temp: 24.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3288; ConvF(6.51, 6.51, 6.51); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell), Left Head, Cheek, Mid.ch,

QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset

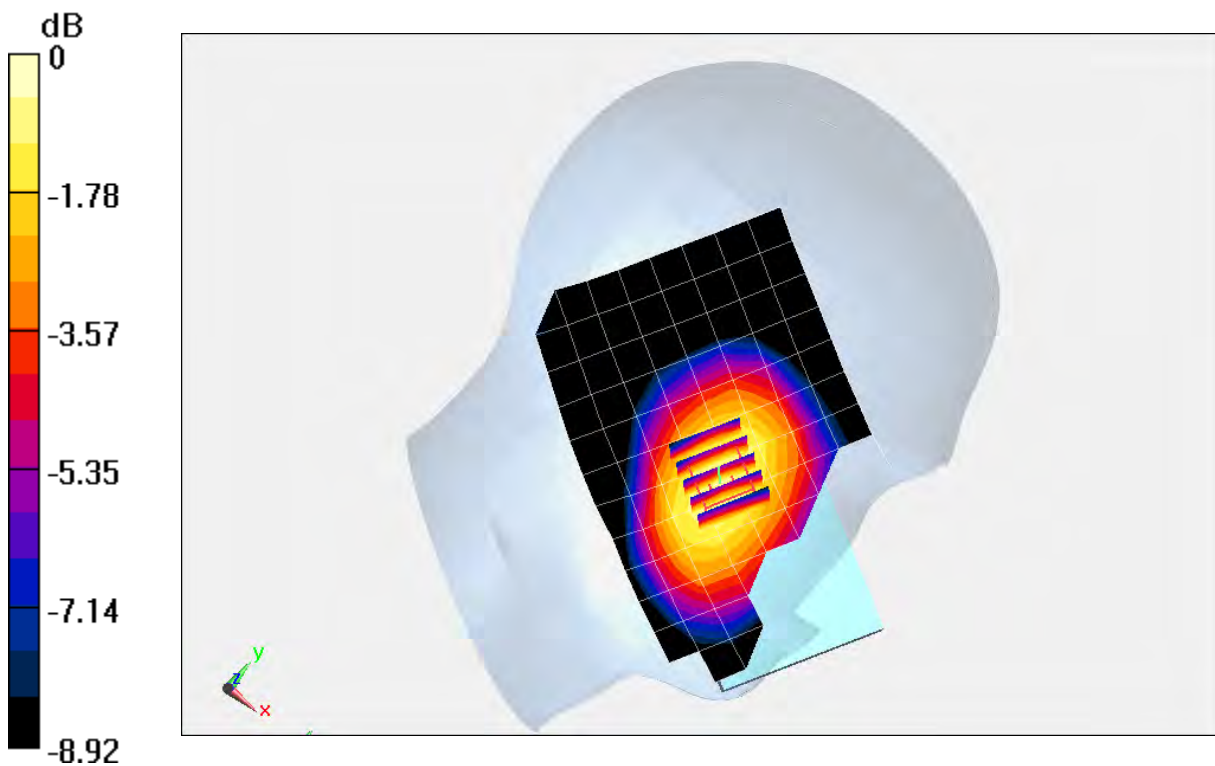
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.70 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.352 W/kg



0 dB = 0.397 W/kg = -4.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-2

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.343 \text{ S/m}$; $\epsilon_r = 39.533$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-06-2015; Ambient Temp: 23.6°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3333; ConvF(5.26, 5.26, 5.26); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Sub TWIN SAM; Type: QD000P40CC; Serial: TP-1357

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch,

QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset

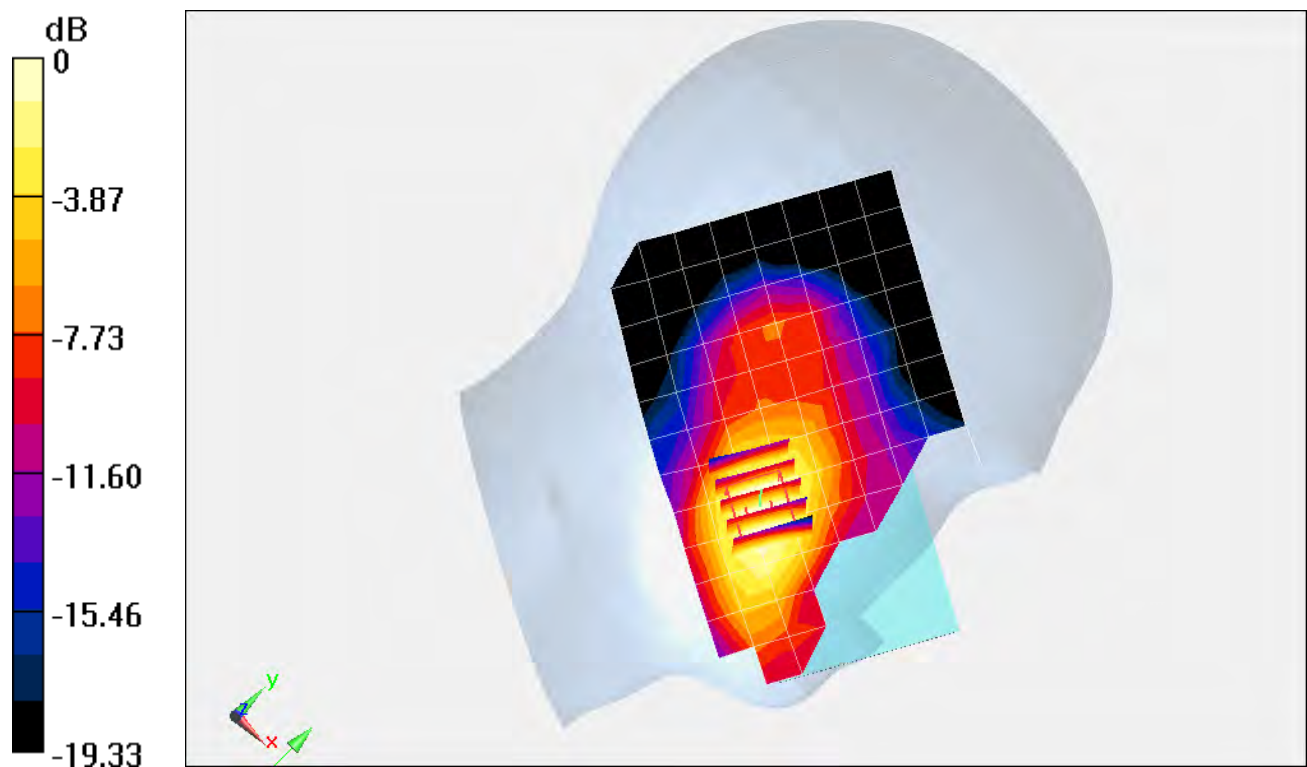
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.22 V/m; Power Drift = 0.20 dB

Peak SAR (extrapolated) = 0.572 W/kg

SAR(1 g) = 0.381 W/kg



0 dB = 0.449 W/kg = -3.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-10

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.374 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Left Head, Cheek, Mid.ch,

QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset

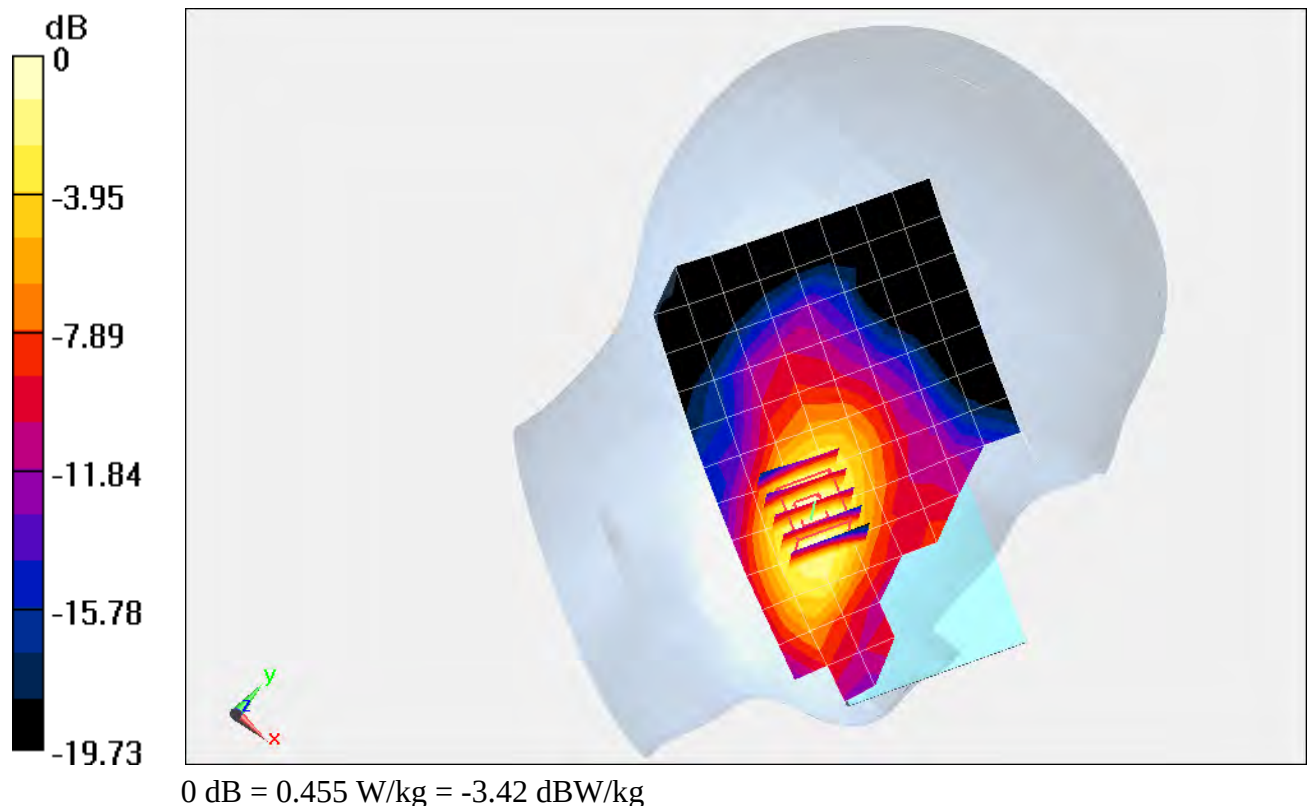
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.29 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.596 W/kg

SAR(1 g) = 0.381 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-5

Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2412 \text{ MHz}$; $\sigma = 1.741 \text{ S/m}$; $\epsilon_r = 38.608$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 12-31-2014; Ambient Temp: 23.8°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(4.52, 4.52, 4.52); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Right Head, Cheek, Ch 01, 1 Mbps

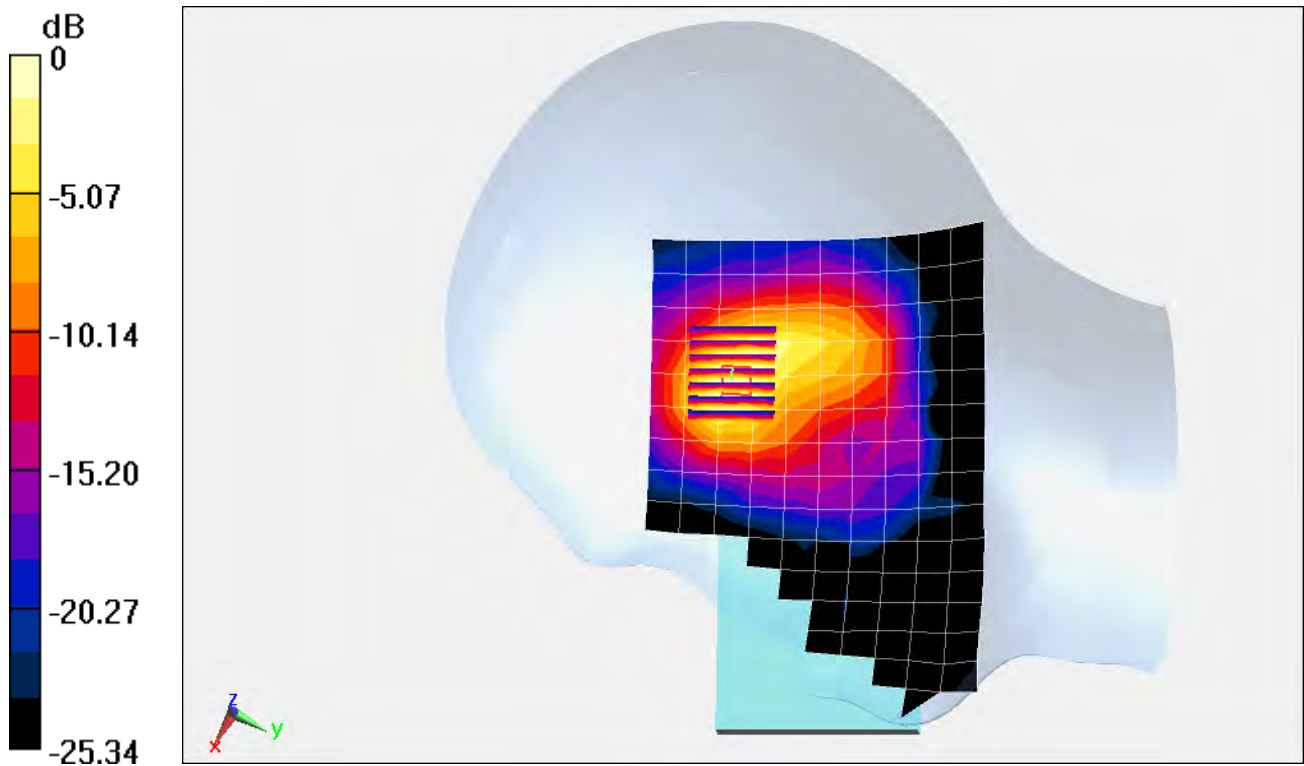
Area Scan (11x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.301 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.443 W/kg

SAR(1 g) = 0.189 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1.017 \text{ S/m}$; $\epsilon_r = 53.617$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

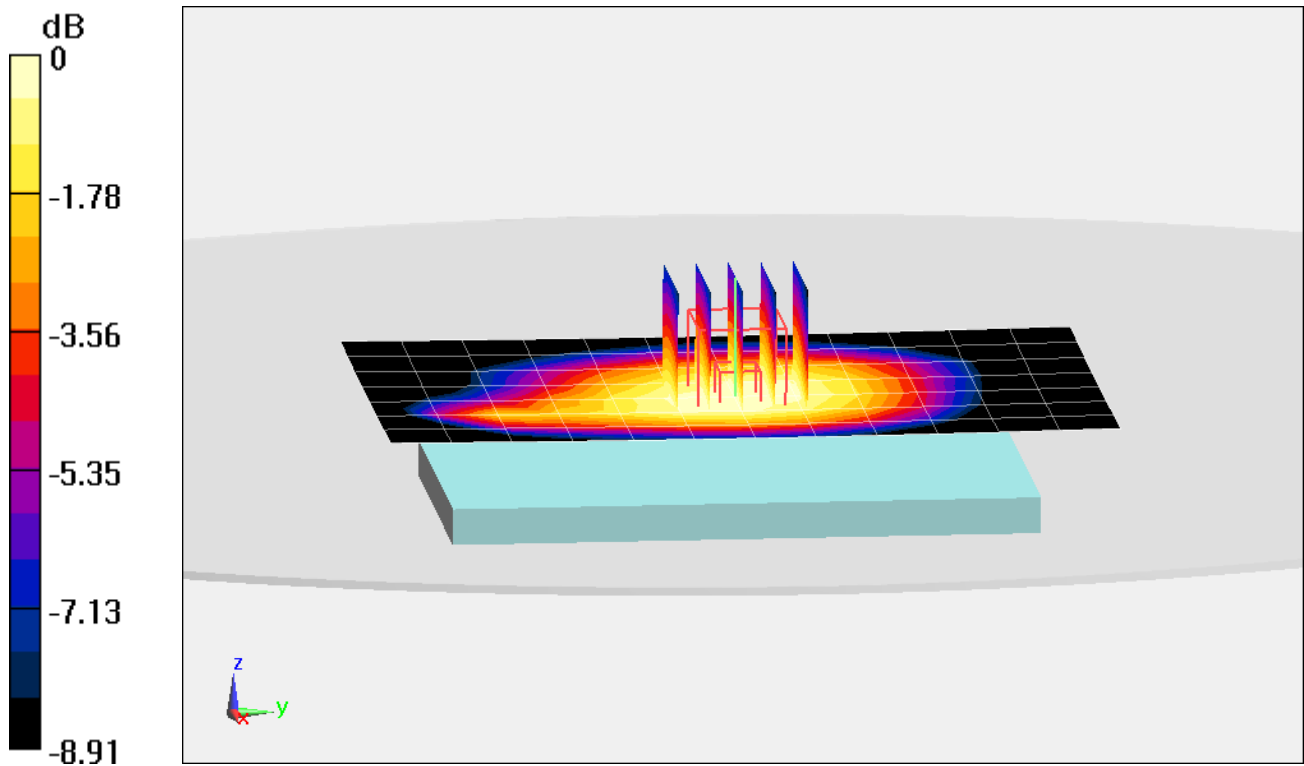
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.61 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.798 W/kg

SAR(1 g) = 0.618 W/kg



0 dB = 0.678 W/kg = -1.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1.017 \text{ S/m}$; $\epsilon_r = 53.617$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

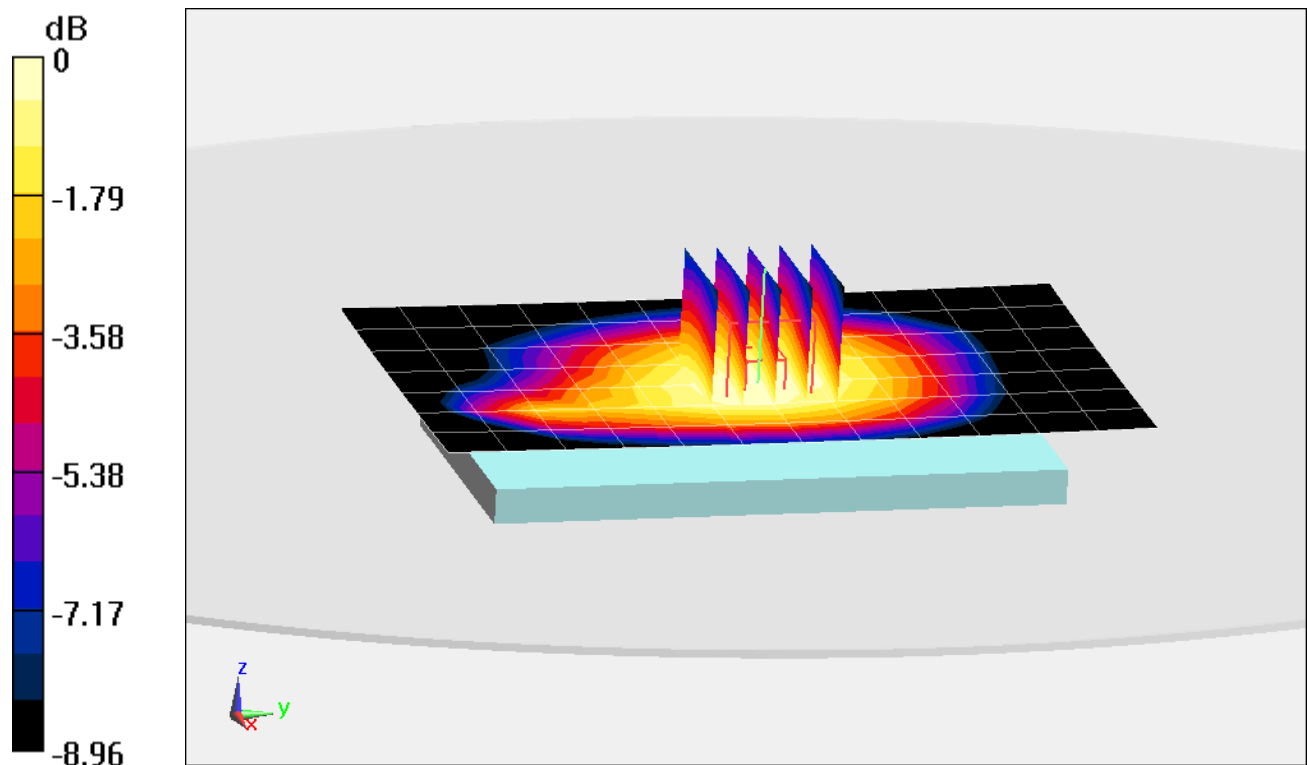
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 24.38 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.729 W/kg

SAR(1 g) = 0.566 W/kg



0 dB = 0.628 W/kg = -2.02 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1.017 \text{ S/m}$; $\epsilon_r = 53.617$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

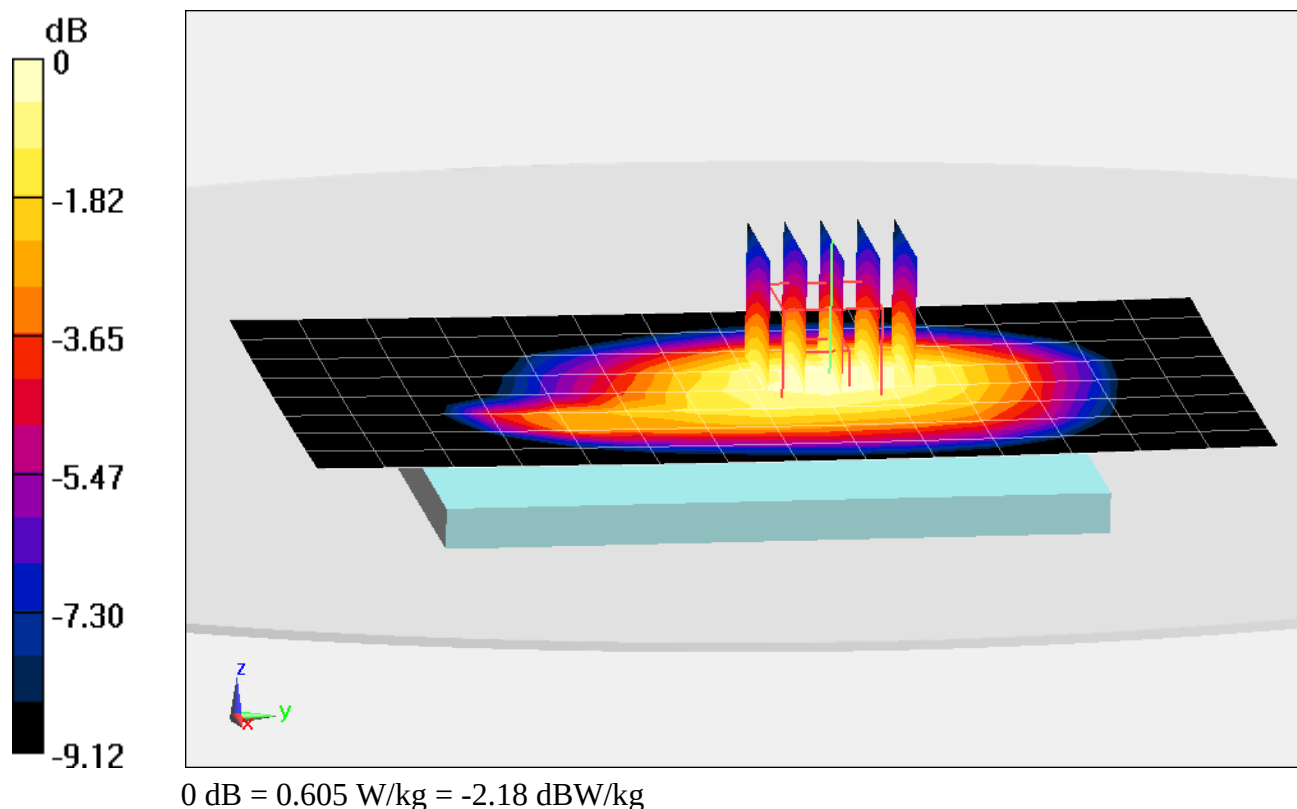
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.42 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.711 W/kg

SAR(1 g) = 0.542 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.548 \text{ S/m}$; $\epsilon_r = 52.153$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-02-2015; Ambient Temp: 24.4°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

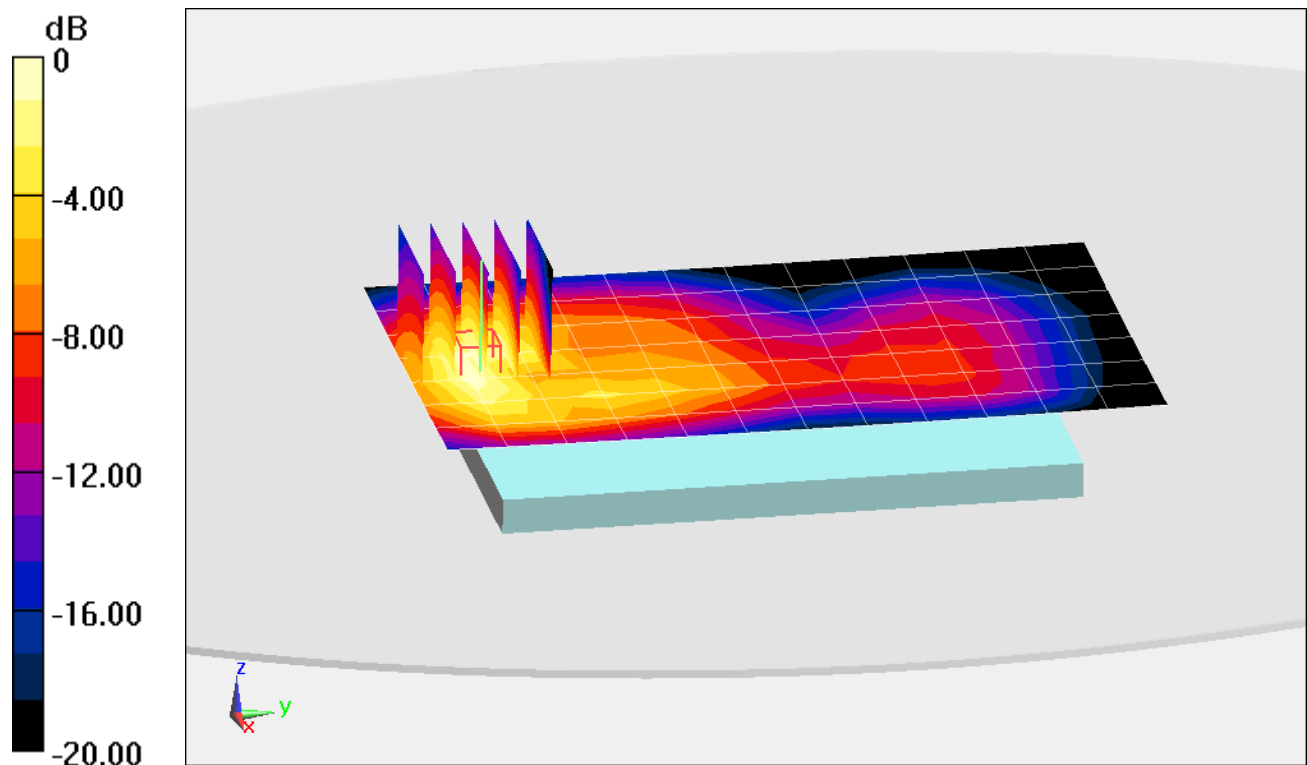
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.58 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.629 W/kg



0 dB = 0.760 W/kg = -1.19 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$f = 1910 \text{ MHz}$; $\sigma = 1.578 \text{ S/m}$; $\epsilon_r = 52.058$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-02-2015; Ambient Temp: 24.4°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

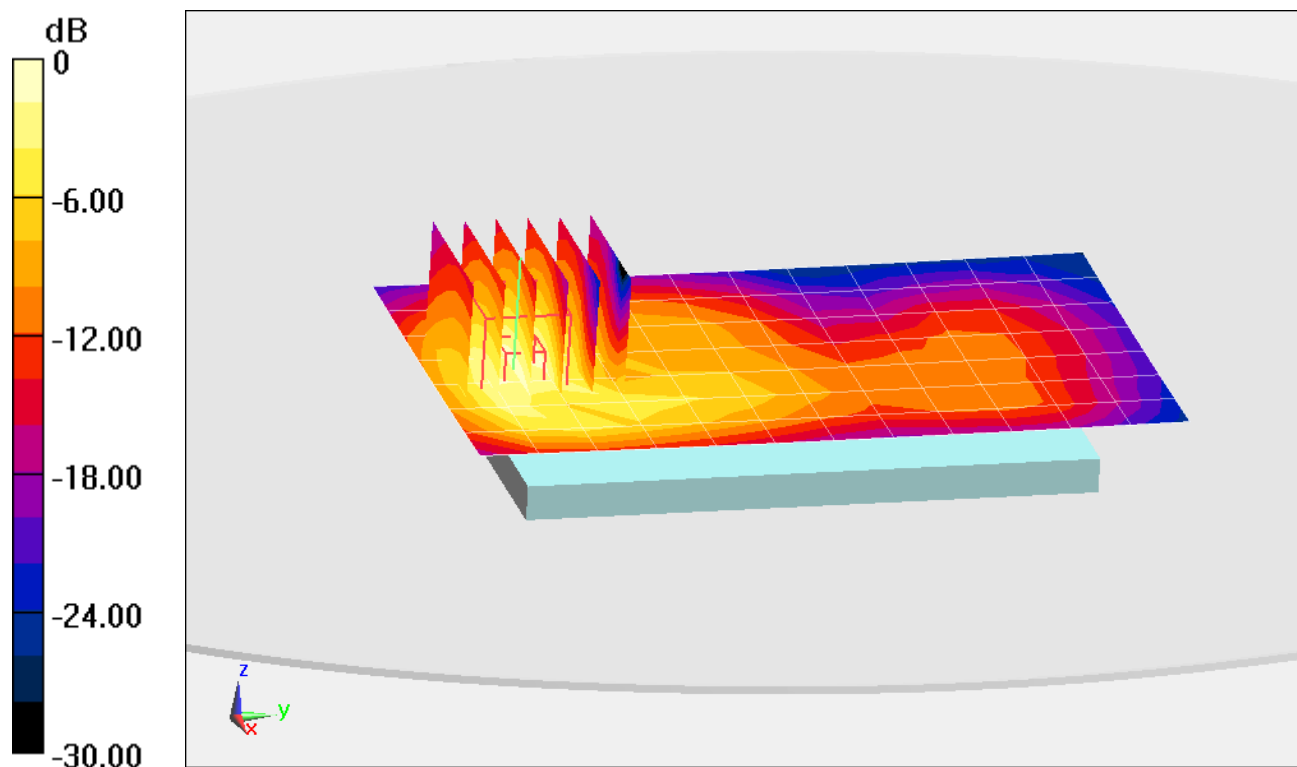
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.35 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.720 W/kg



0 dB = 0.875 W/kg = -0.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-9

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.527 \text{ S/m}$; $\epsilon_r = 51.272$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 24.5°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

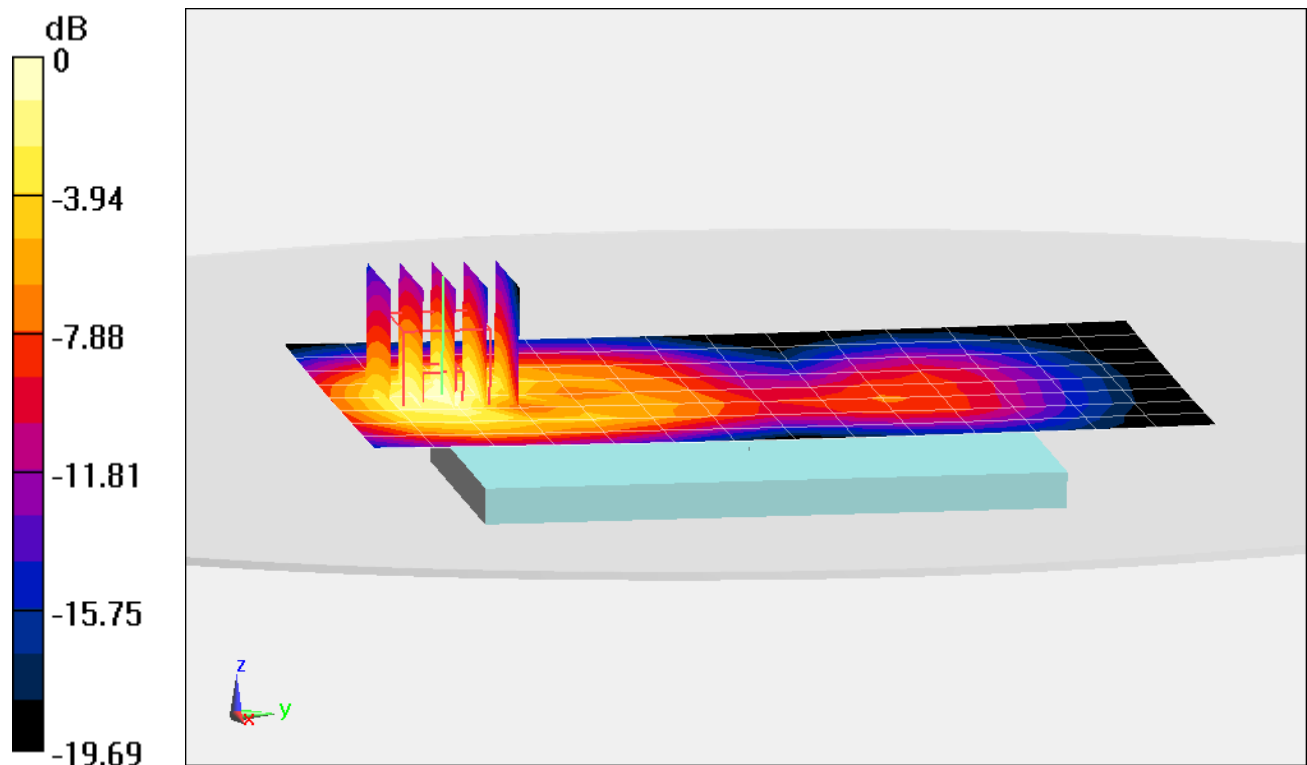
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.68 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.977 W/kg

SAR(1 g) = 0.617 W/kg



0 dB = 0.742 W/kg = -1.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-3

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.527 \text{ S/m}$; $\epsilon_r = 51.272$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 24.5°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

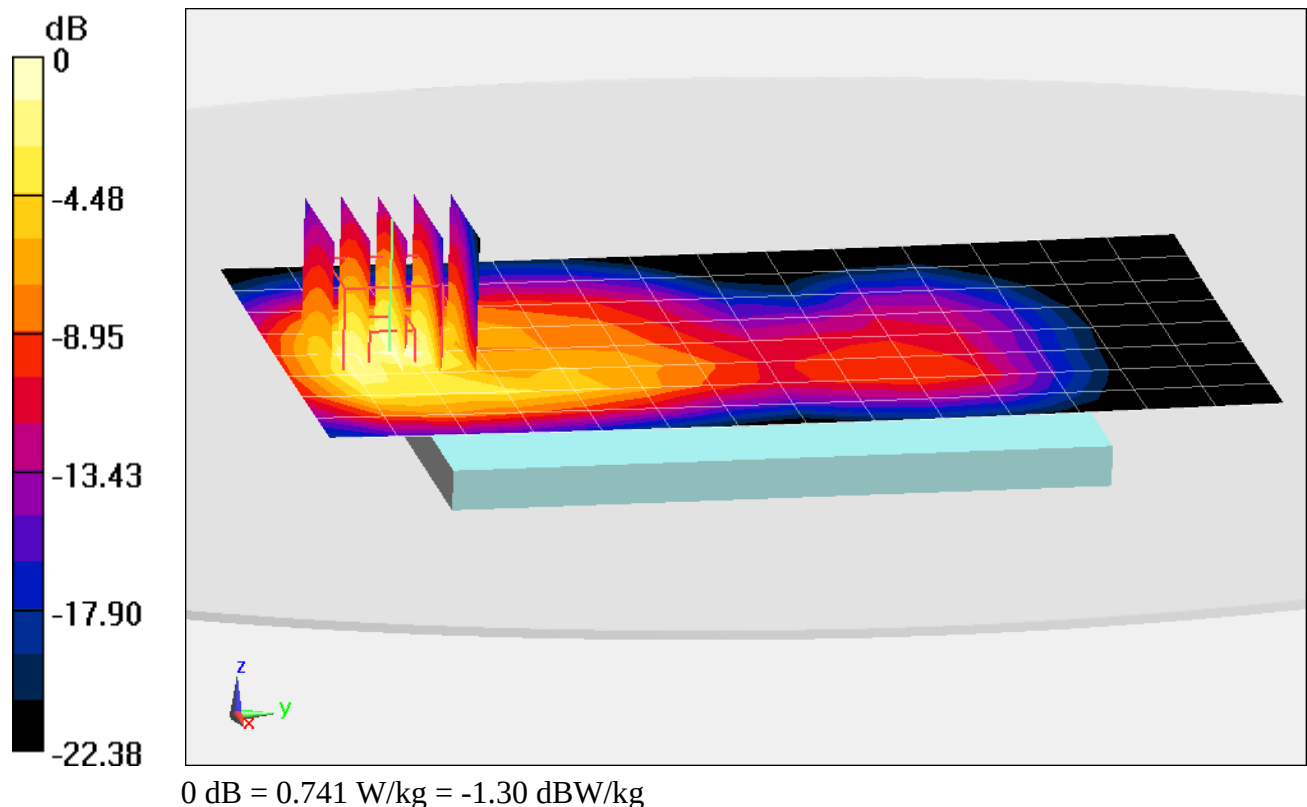
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.20 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.611 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-10

Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.931 \text{ S/m}$; $\epsilon_r = 56.175$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 17, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

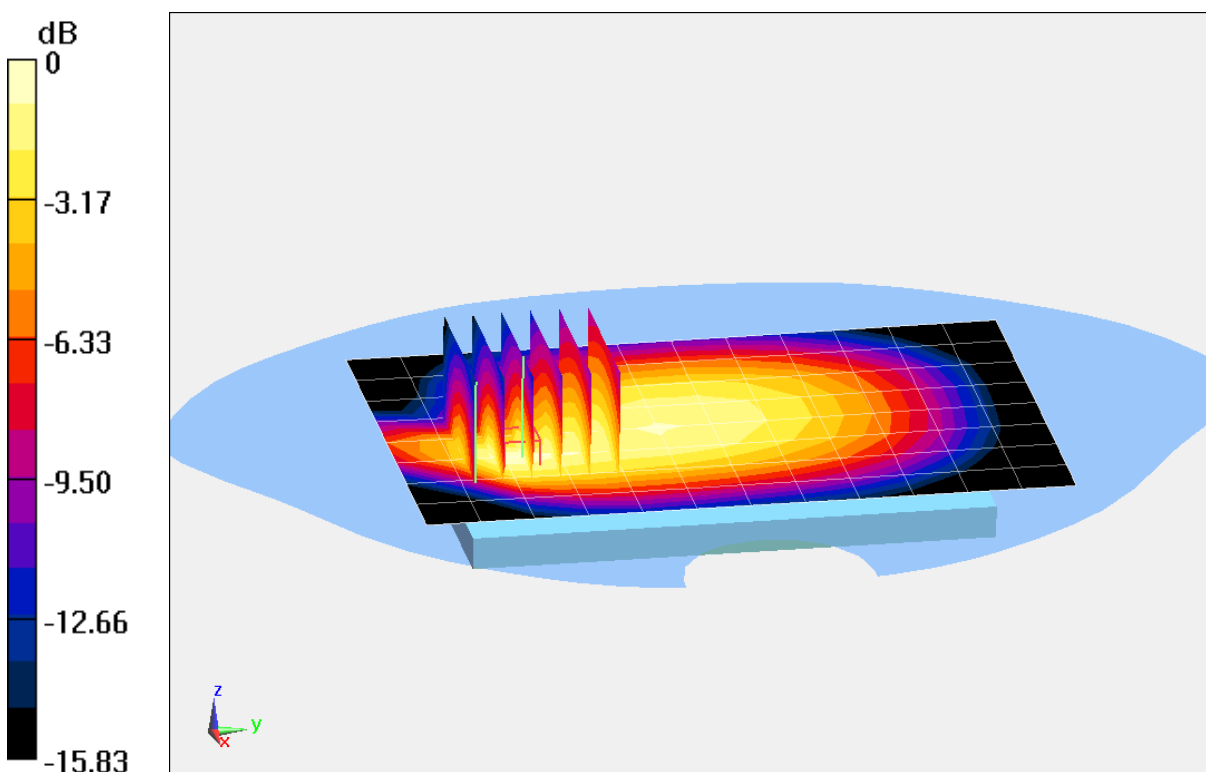
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (7x10x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.01 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.696 W/kg

SAR(1 g) = 0.398 W/kg



0 dB = 0.492 W/kg = -3.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-10

Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.931 \text{ S/m}$; $\epsilon_r = 56.175$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 17, Body SAR, Left Edge, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

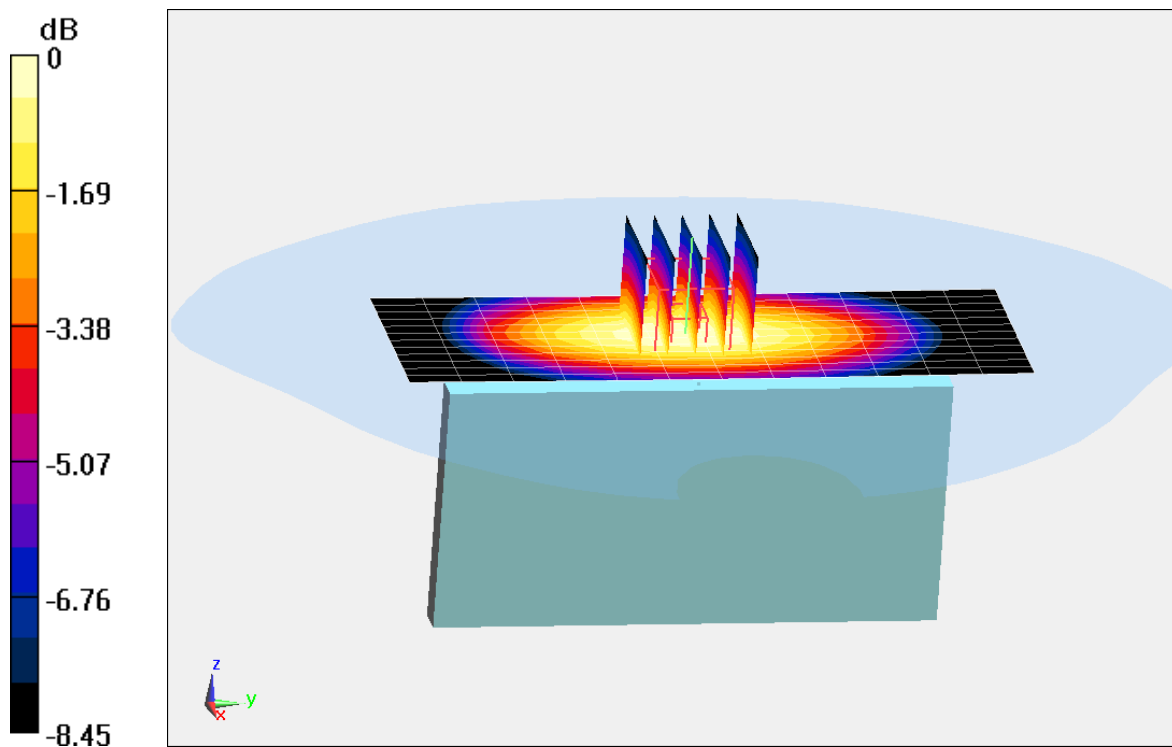
Area Scan (13x13x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.19 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.807 W/kg

SAR(1 g) = 0.589 W/kg



0 dB = 0.668 W/kg = -1.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-2

Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 1.017 \text{ S/m}$; $\epsilon_r = 53.618$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 5 (Cell.), Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

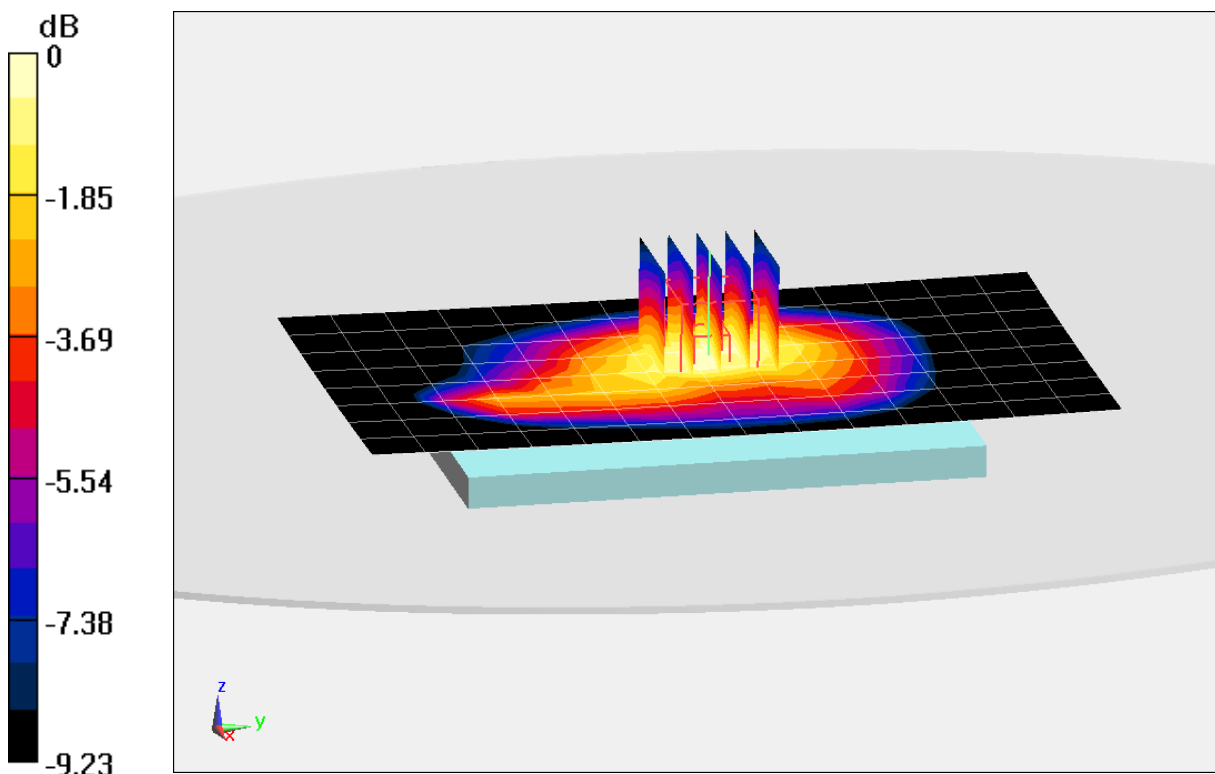
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.41 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.756 W/kg

SAR(1 g) = 0.584 W/kg



0 dB = 0.656 W/kg = -1.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-2

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.504 \text{ S/m}$; $\epsilon_r = 51.079$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 23.0°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3333; ConvF(4.89, 4.89, 4.89); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

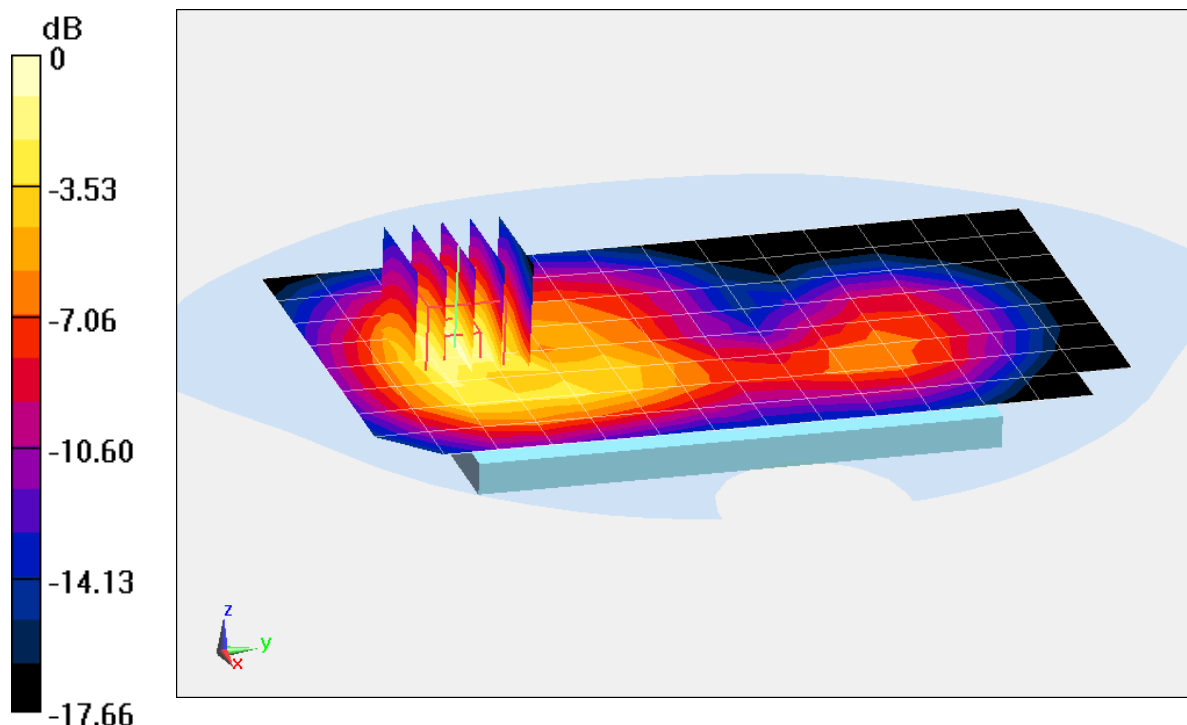
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.72 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.644 W/kg

SAR(1 g) = 0.408 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-4

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.442 \text{ S/m}$; $\epsilon_r = 51.613$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(4.98, 4.98, 4.98); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset**

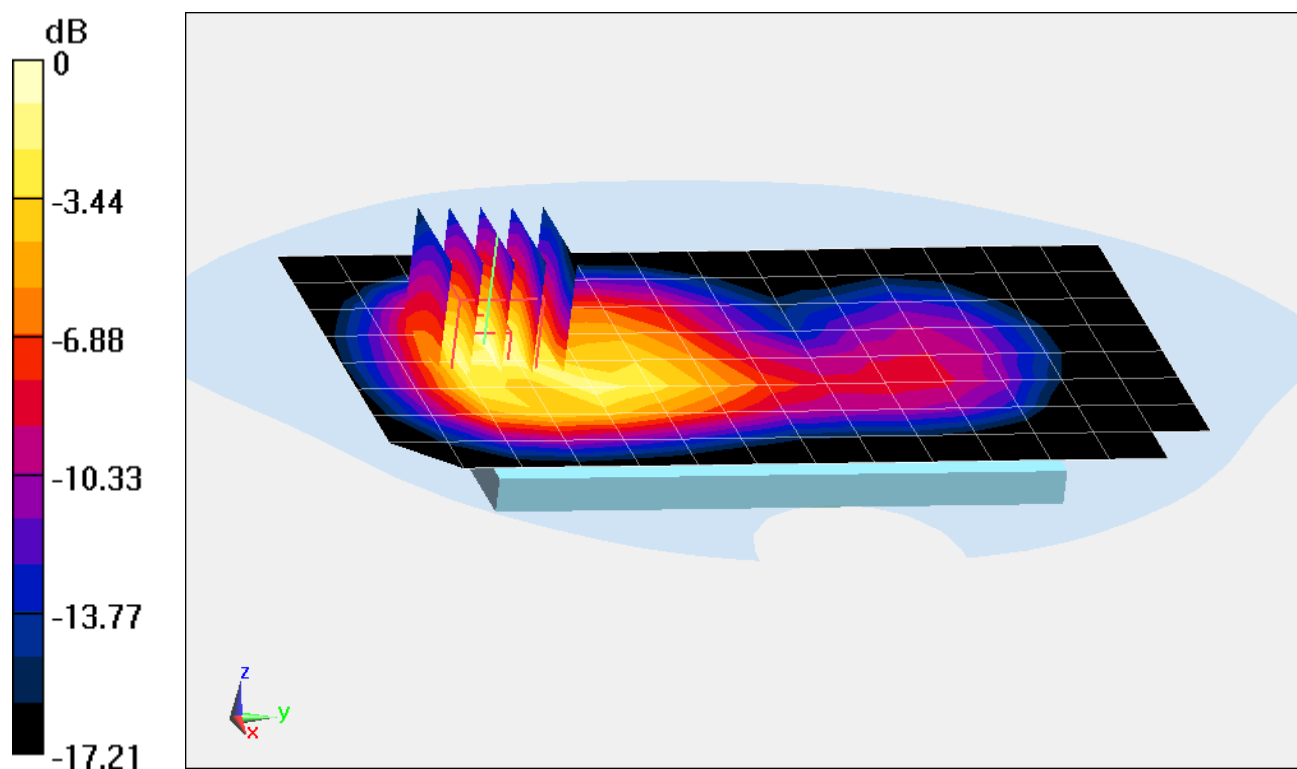
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.03 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.723 W/kg

SAR(1 g) = 0.441 W/kg



0 dB = 0.544 W/kg = -2.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-10

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.527 \text{ S/m}$; $\epsilon_r = 51.272$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 24.5°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 2 (PCS), Body SAR, Back side,
Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

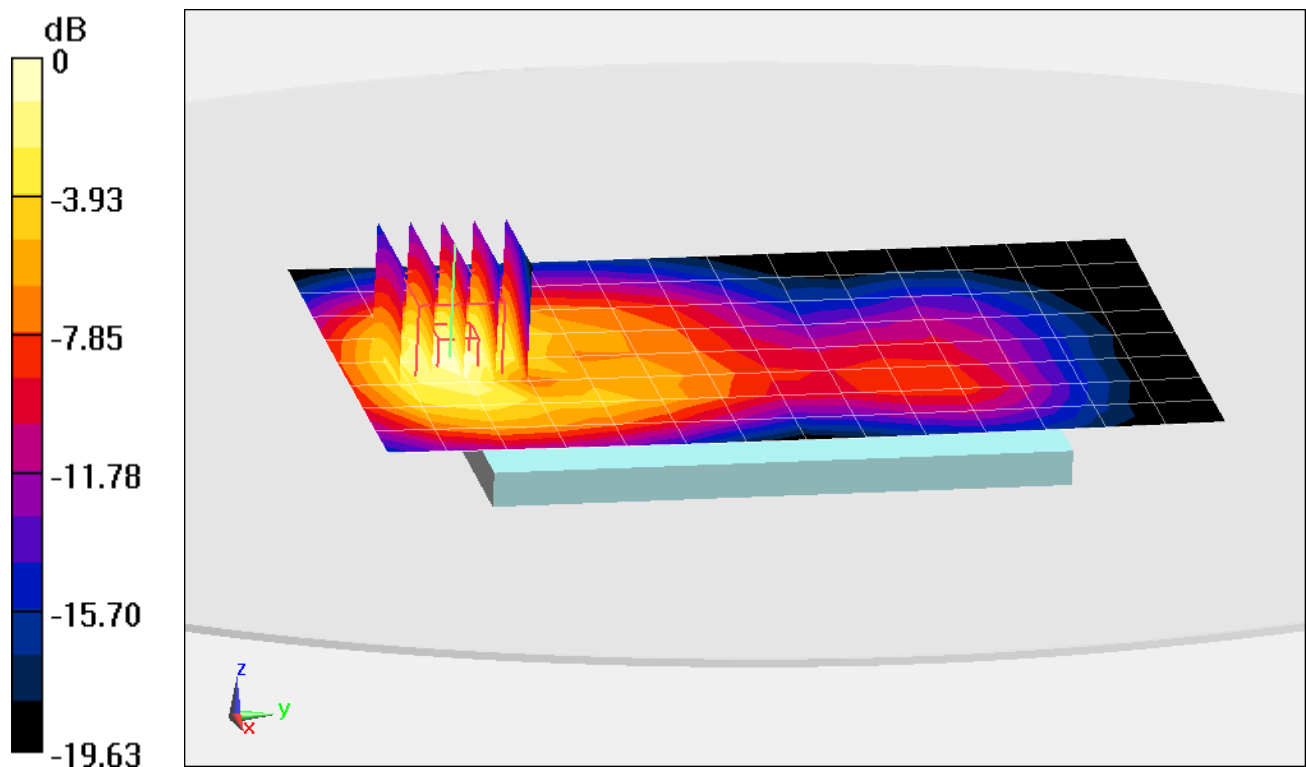
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.80 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.805 W/kg

SAR(1 g) = 0.509 W/kg



0 dB = 0.613 W/kg = -2.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-11

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.527 \text{ S/m}$; $\epsilon_r = 51.272$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 24.5°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 2 (PCS), Body SAR, Back side,
Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

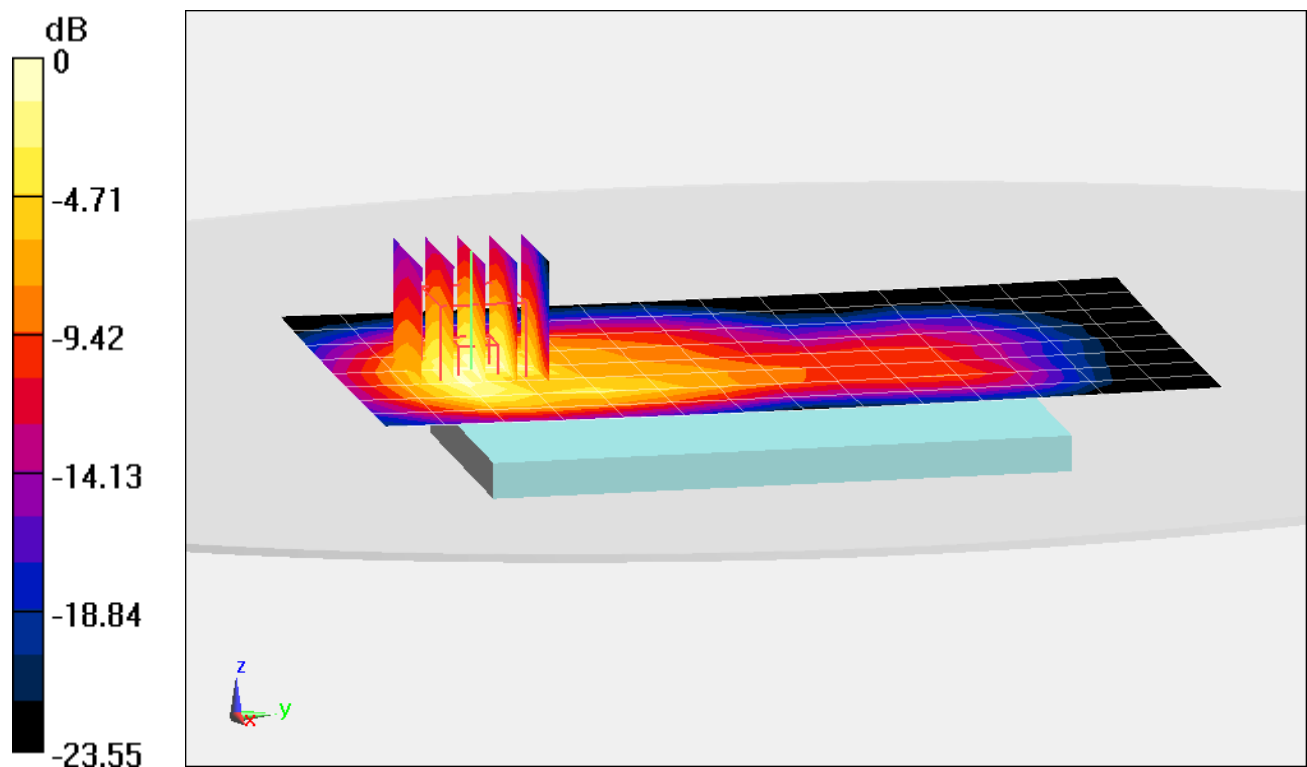
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.71 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.686 W/kg



0 dB = 0.848 W/kg = -0.72 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG530AZ; Type: Portable Handset; Serial: 3012-5

Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2412 \text{ MHz}$; $\sigma = 1.939 \text{ S/m}$; $\epsilon_r = 52.553$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2014; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Body SAR, Ch 01, 1 Mbps, Back Side

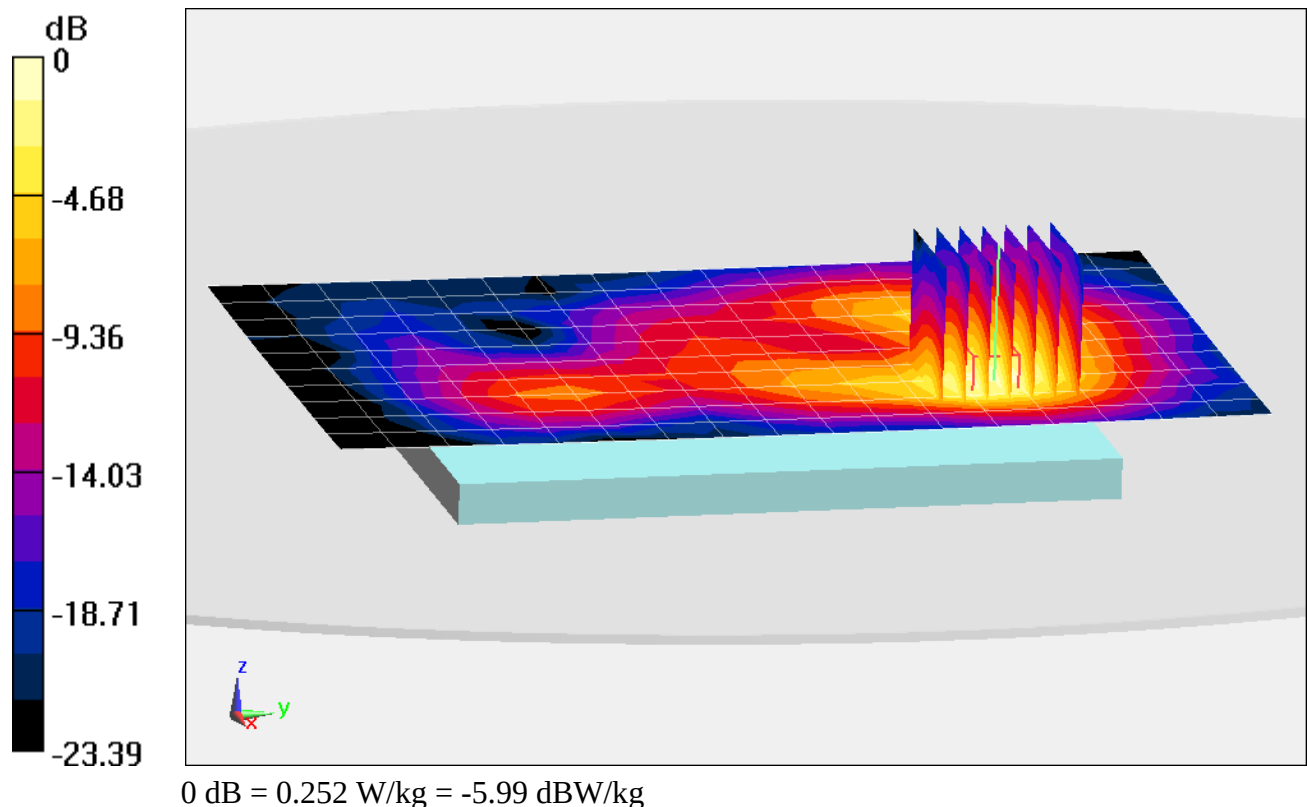
Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.09 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.398 W/kg

SAR(1 g) = 0.193 W/kg



APPENDIX B: SYSTEM VERIFICATION

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 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.911 \text{ S/m}$; $\epsilon_r = 41.114$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 23.1°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.42, 6.42, 6.42); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

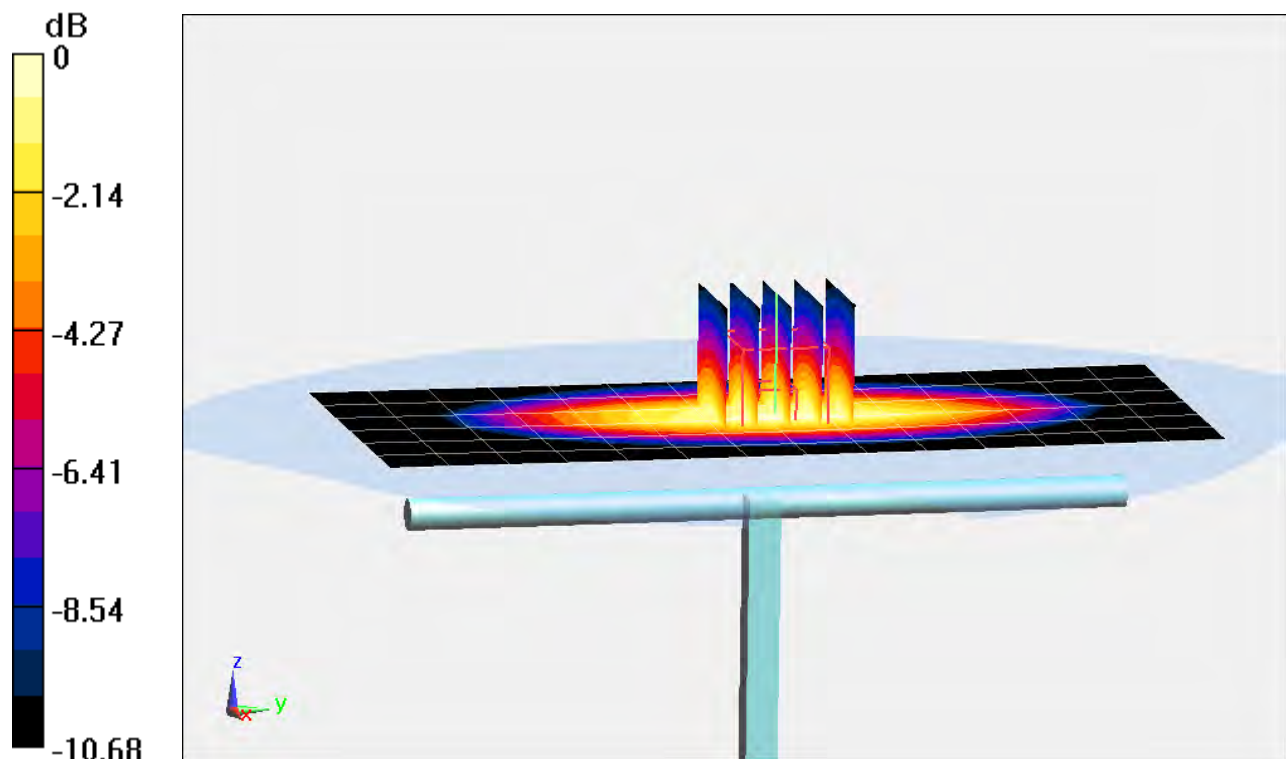
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.888 W/kg

Deviation = 6.60%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d133

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.939 \text{ S/m}$; $\epsilon_r = 43.405$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-02-2015; Ambient Temp: 24.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3288; ConvF(6.51, 6.51, 6.51); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

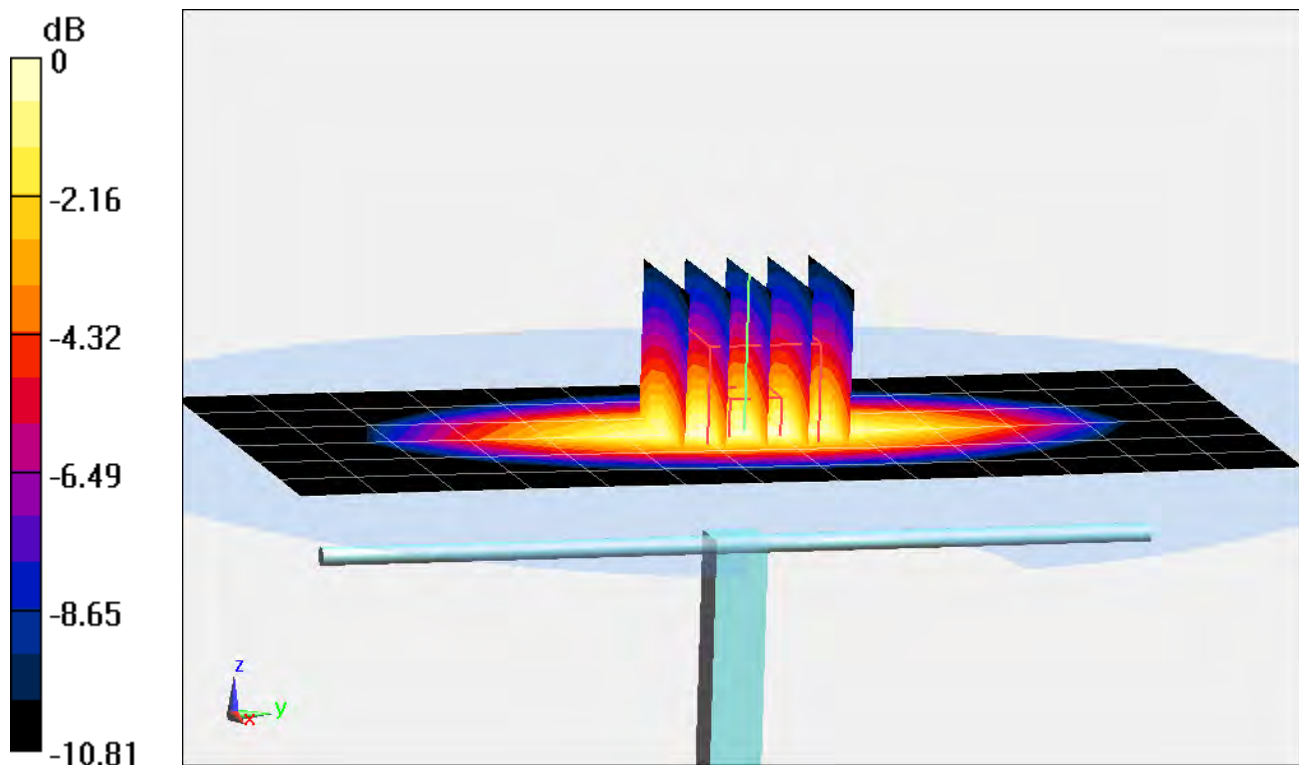
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.925 W/kg

Deviation = 0.54%



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:

$f = 835 \text{ MHz}$; $\sigma = 0.943 \text{ S/m}$; $\epsilon_r = 42.191$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3288; ConvF(6.51, 6.51, 6.51); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

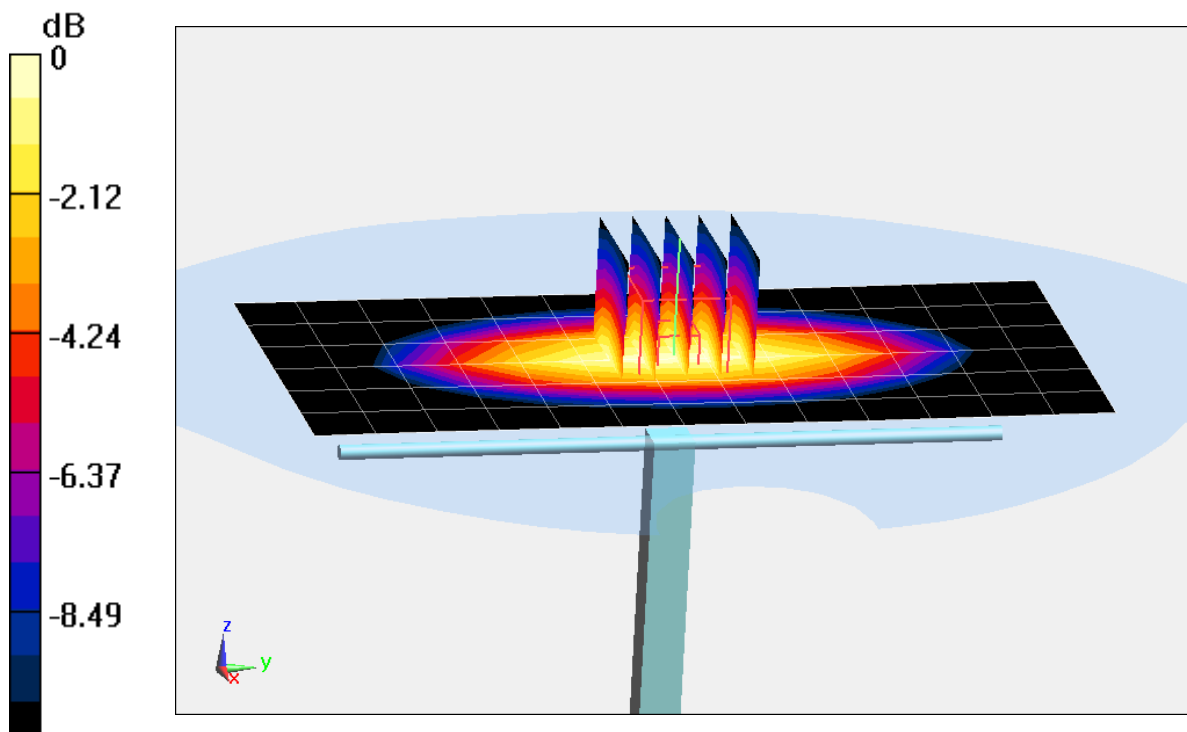
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.902 W/kg

Deviation = -2.17%



0 dB = 1.06 W/kg = 0.25 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:

$f = 1750 \text{ MHz}$; $\sigma = 1.362 \text{ S/m}$; $\epsilon_r = 39.469$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2015; Ambient Temp: 23.6°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3333; ConvF(5.26, 5.26, 5.26); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Sub TWIN SAM; Type: QD000P40CC; Serial: TP-1357

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

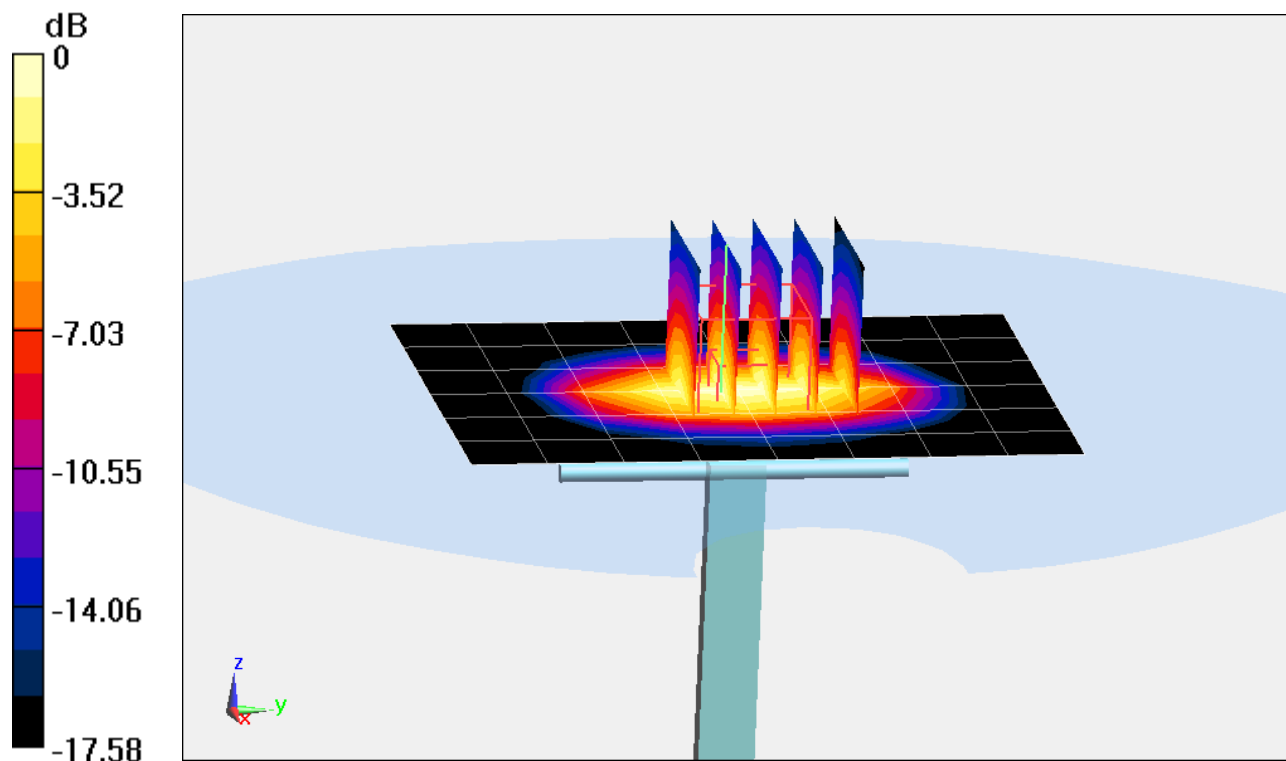
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.90 W/kg

SAR(1 g) = 3.87 W/kg

Deviation = 6.91%



PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.393 \text{ S/m}$; $\epsilon_r = 39.274$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Validation

Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

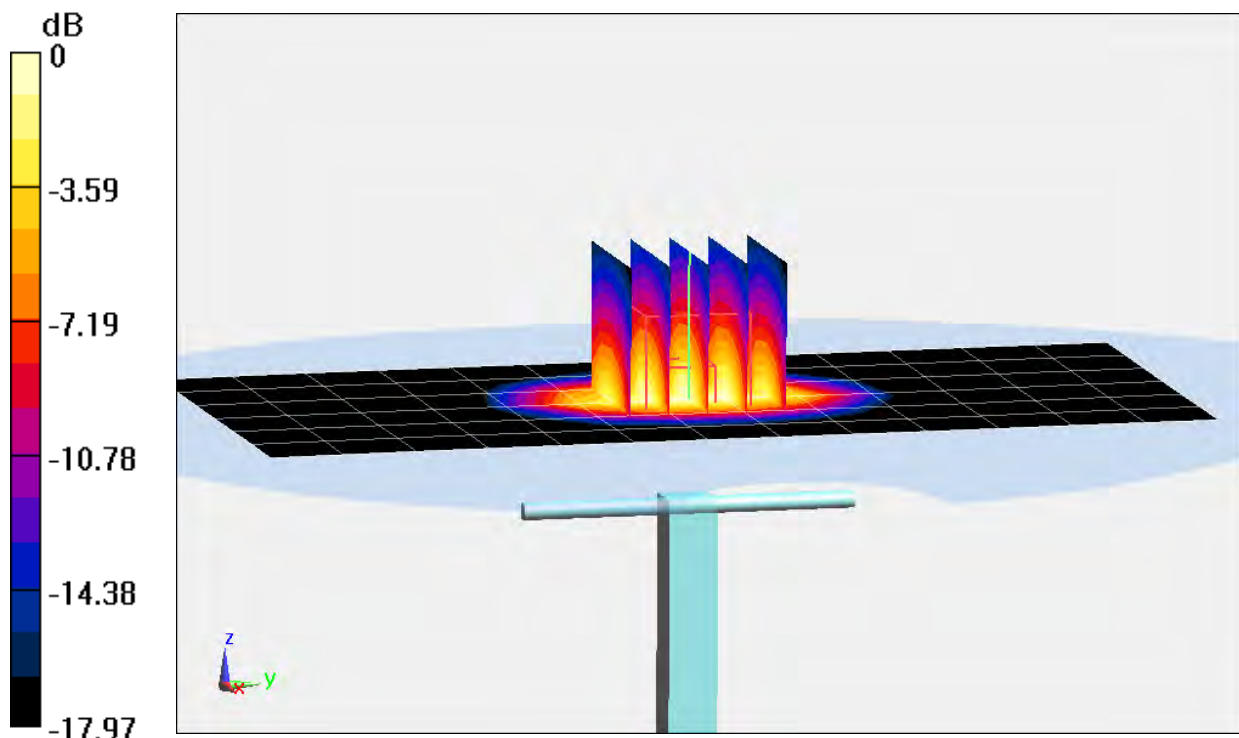
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.51 W/kg

SAR(1 g) = 4.1 W/kg

Deviation = 2.24%



0 dB = 4.96 W/kg = 6.95 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.771 \text{ S/m}$; $\epsilon_r = 38.468$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2014; Ambient Temp: 23.8°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3258; ConvF(4.52, 4.52, 4.52); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

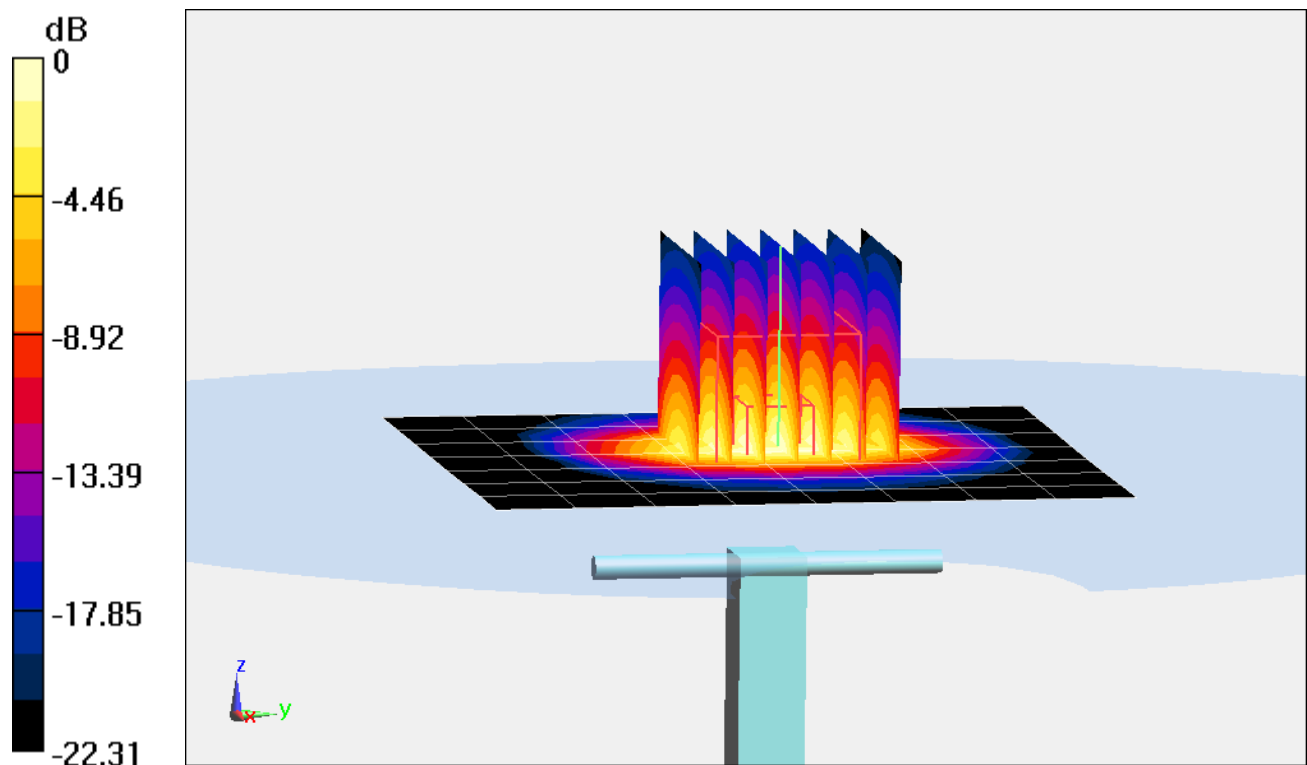
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 4.96 W/kg

Deviation = -4.25%



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):

$f = 750 \text{ MHz}$; $\sigma = 0.965 \text{ S/m}$; $\epsilon_r = 55.717$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-06-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

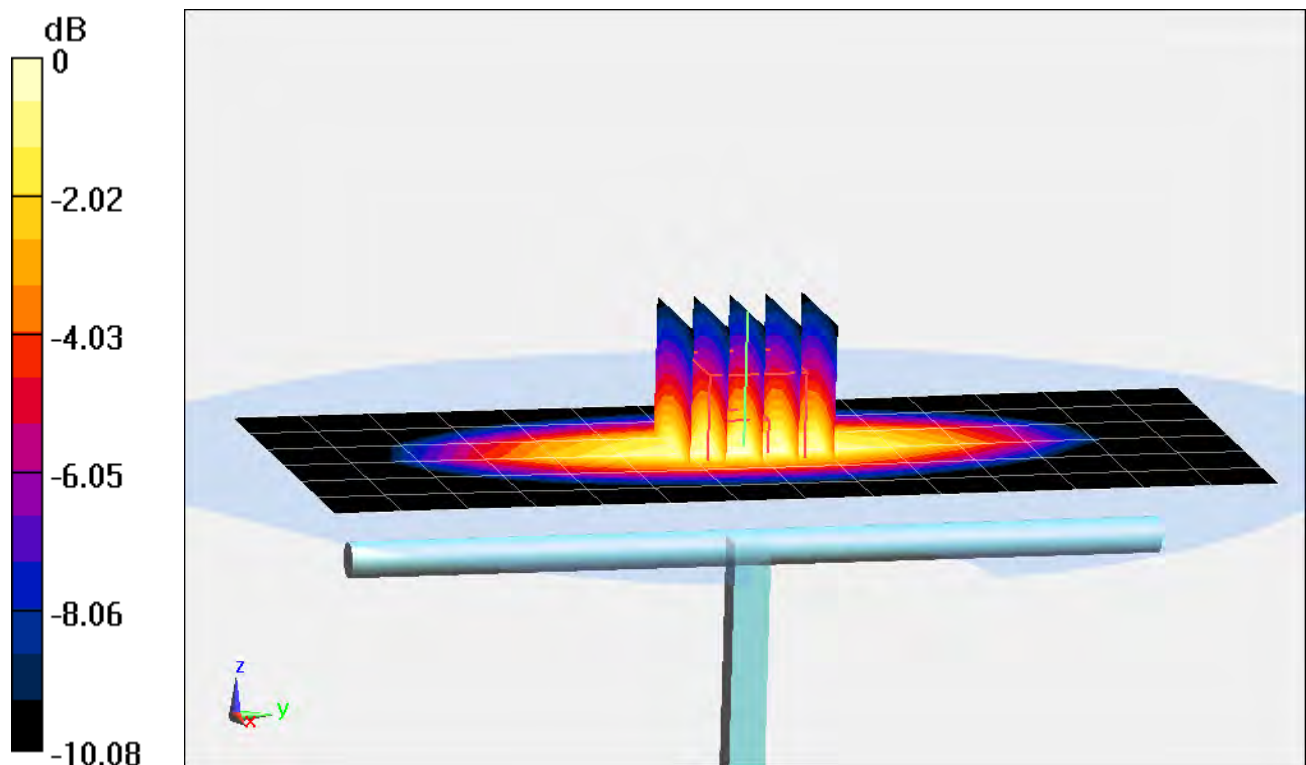
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.948 W/kg

Deviation = 9.72%



0 dB = 1.11 W/kg = 0.45 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 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 1.016 \text{ S/m}$; $\epsilon_r = 53.636$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-05-2015; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1364; Calibrated: 9/18/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

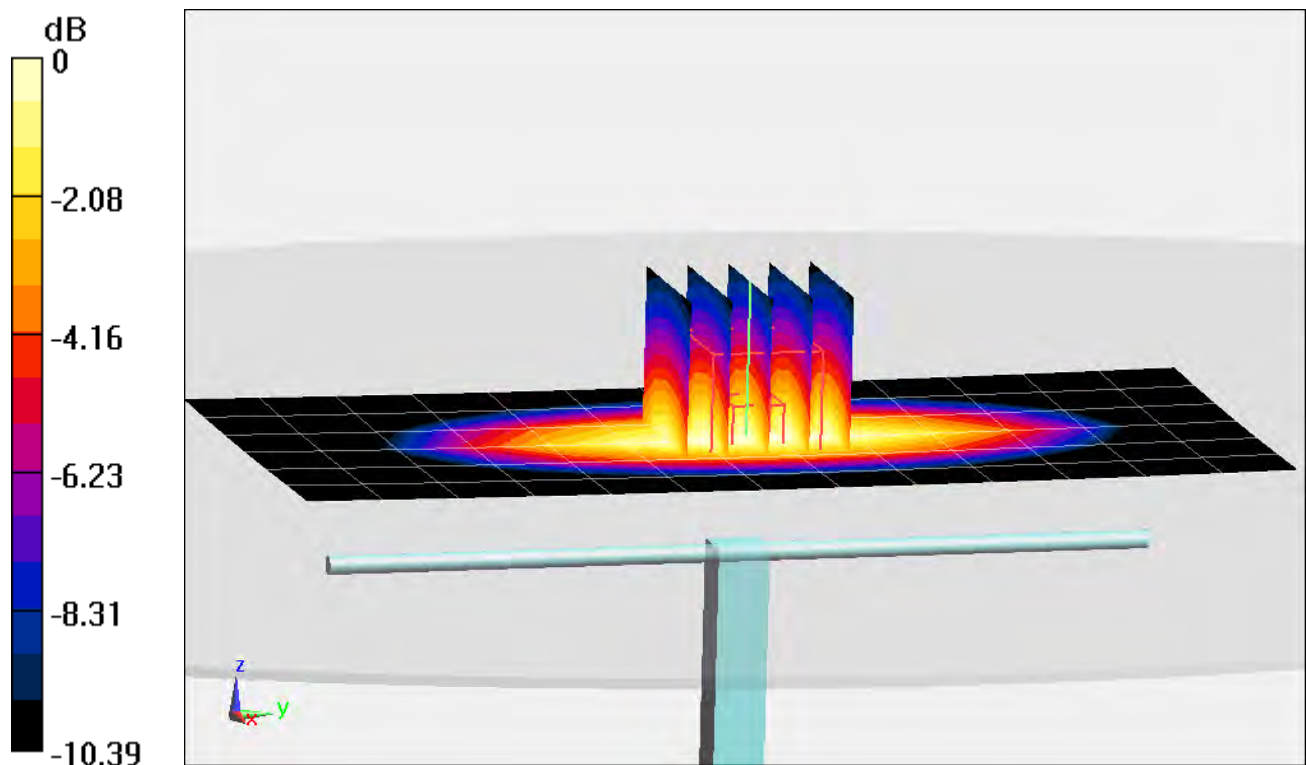
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.972 W/kg

Deviation = 4.07%



0 dB = 1.14 W/kg = 0.57 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:

$f = 1750 \text{ MHz}$; $\sigma = 1.523 \text{ S/m}$; $\epsilon_r = 51.022$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 23.0°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3333; ConvF(4.89, 4.89, 4.89); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

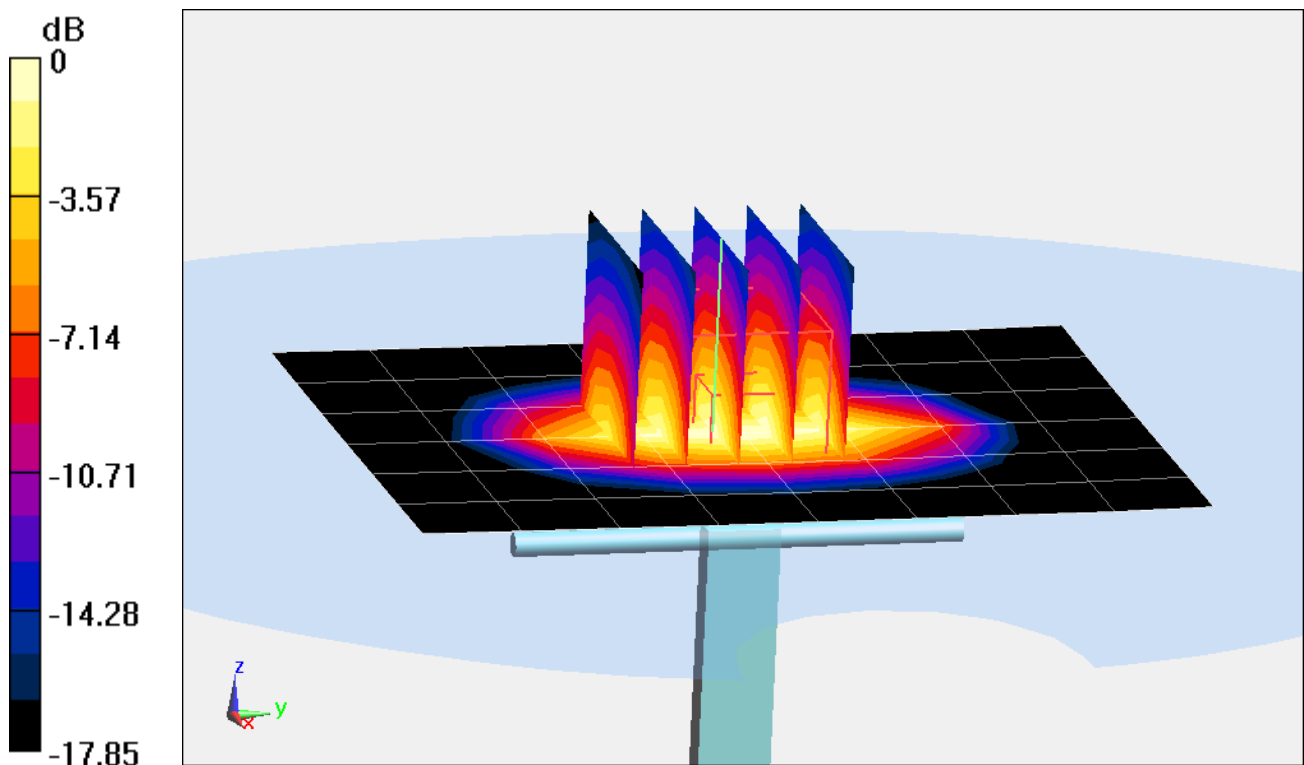
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.04 W/kg

SAR(1 g) = 3.94 W/kg

Deviation = 5.35%



0 dB = 4.90 W/kg = 6.90 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:

$f = 1750 \text{ MHz}$; $\sigma = 1.461 \text{ S/m}$; $\epsilon_r = 51.563$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(4.98, 4.98, 4.98); Calibrated: 5/15/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/14/2014

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

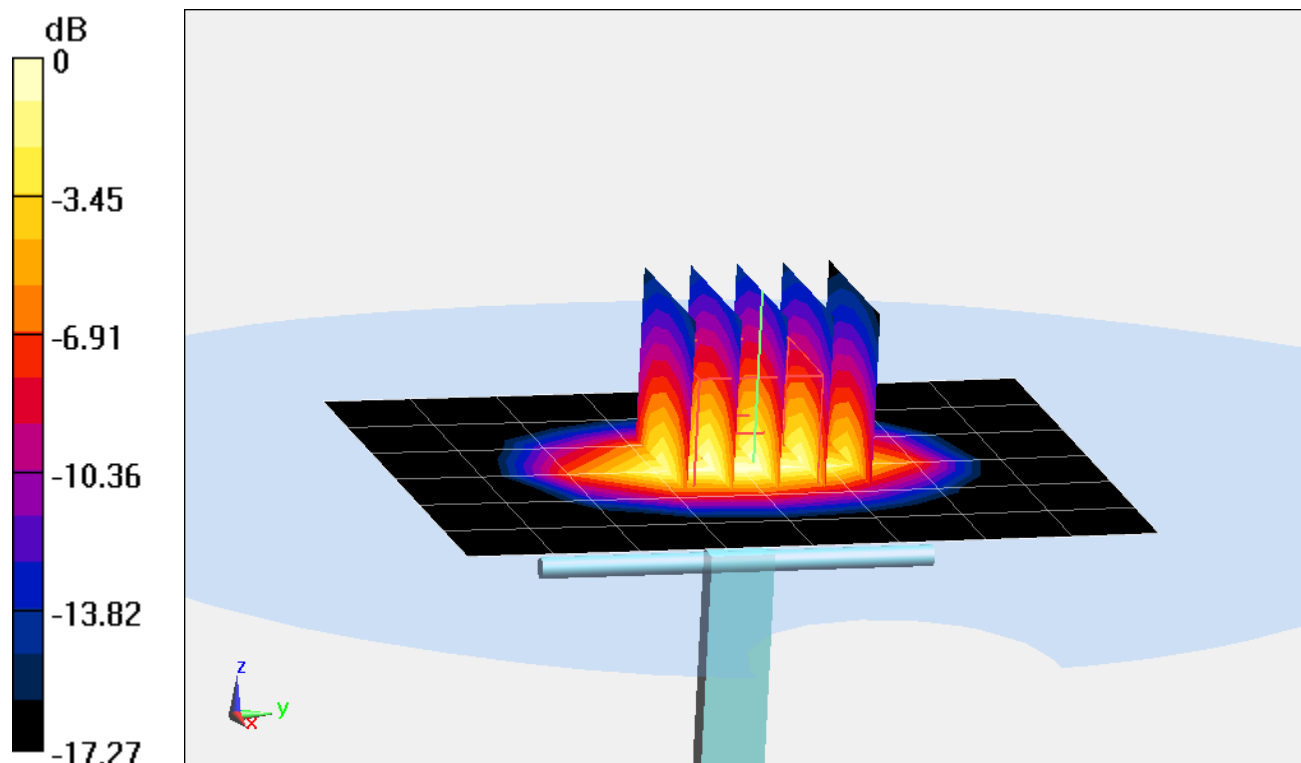
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.40 W/kg

SAR(1 g) = 3.69 W/kg

Deviation = -1.86%



0 dB = 4.57 W/kg = 6.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.568 \text{ S/m}$; $\epsilon_r = 52.09$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-02-2015; Ambient Temp: 24.4°C; Tissue Temp: 22.8°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

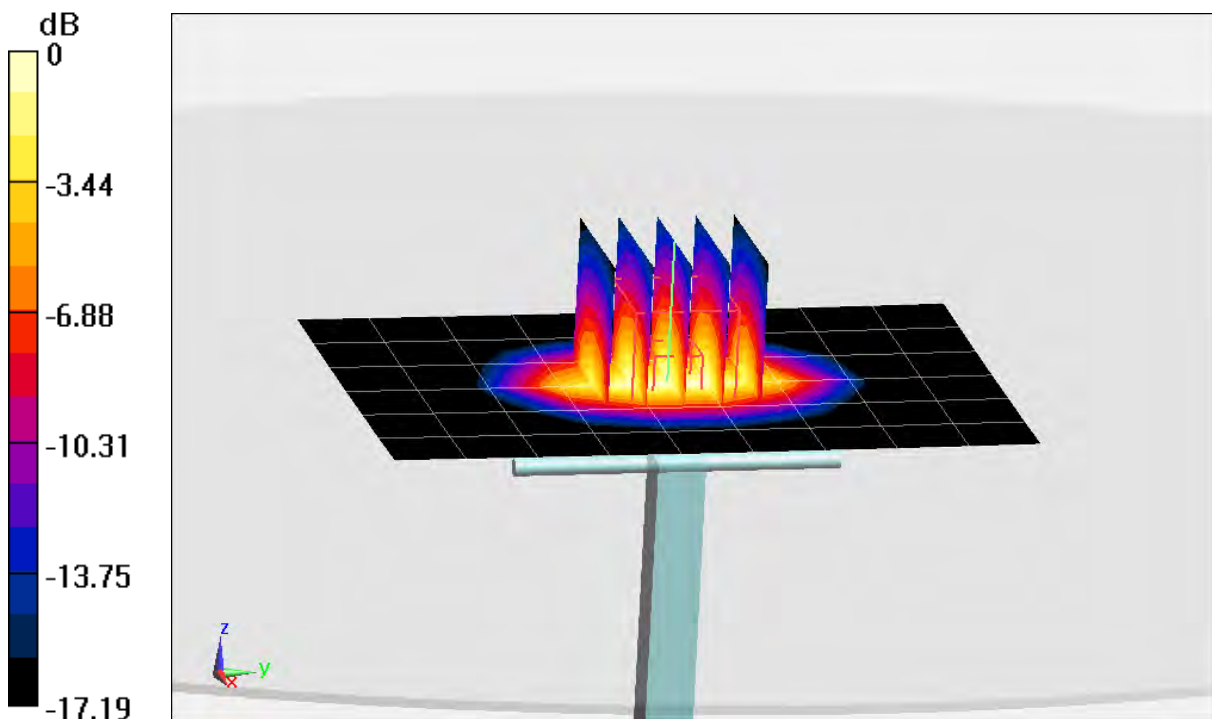
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.01 W/kg

SAR(1 g) = 4.01 W/kg

Deviation = -1.23%



0 dB = 5.06 W/kg = 7.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.543 \text{ S/m}$; $\epsilon_r = 51.255$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-05-2015; Ambient Temp: 24.5°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

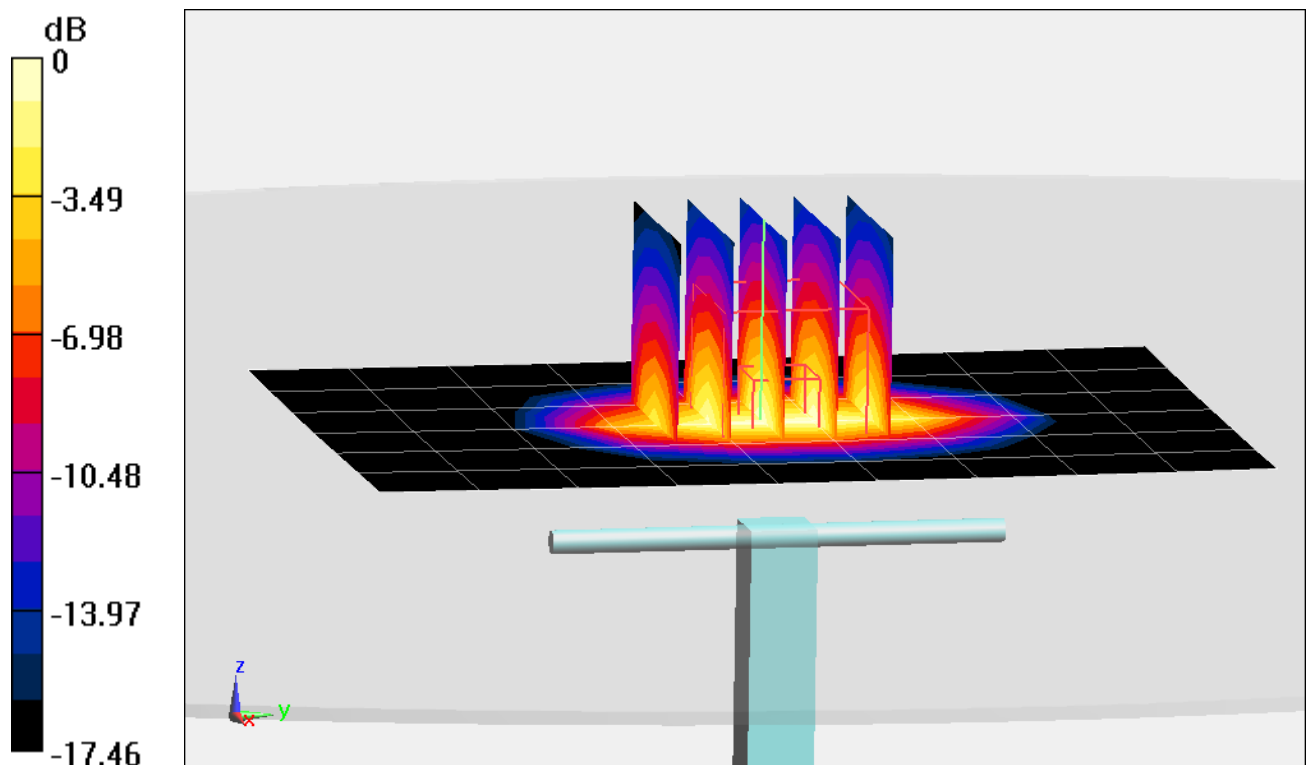
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.74 W/kg

SAR(1 g) = 3.91 W/kg

Deviation = -3.69%



0 dB = 4.88 W/kg = 6.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.977 \text{ S/m}$; $\epsilon_r = 52.472$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2014; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

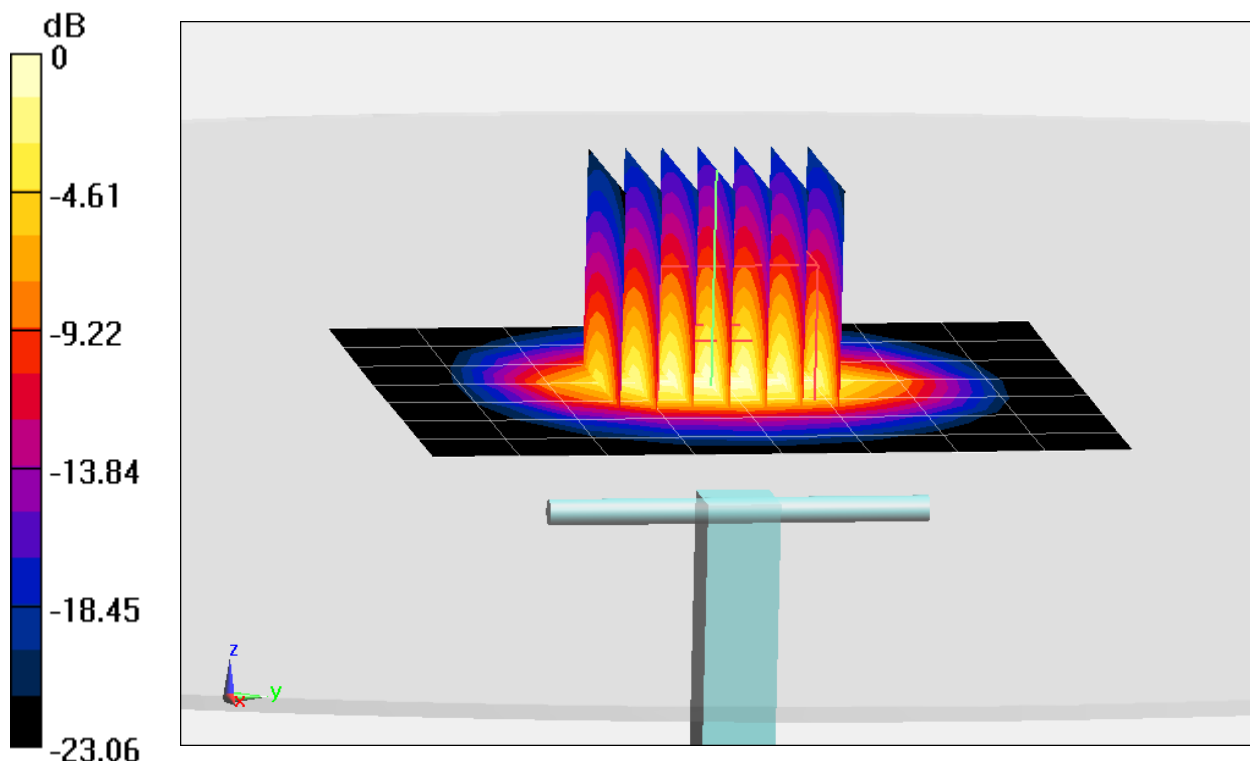
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 10.8 W/kg

SAR(1 g) = 5.05 W/kg

Deviation = 2.23%



0 dB = 6.43 W/kg = 8.08 dBW/kg