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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics, Co. Ltd.
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Gyeonggi-do 443-742, Korea

Date of Testing:
03/24/14 - 04/02/14
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1403240599.A3L

FCC ID: **A3LSMP607T**

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

DUT Type: Portable Tablet
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-P607T

Equipment Class	Band & Mode	Tx Frequency	SAR
			1 gm Body (W/kg)
PCB	UMTS 850	826.40 - 846.60 MHz	0.35
PCB	UMTS 1750	1712.4 - 1752.5 MHz	0.68
PCB	UMTS 1900	1852.4 - 1907.6 MHz	0.87
PCB	LTE Band 17	706.5 - 713.5 MHz	0.23
PCB	LTE Band 5 (Cell)	825.5 - 847.5 MHz	0.34
PCB	LTE Band 4 (AWS)	1712.5 - 1752.5 MHz	0.81
PCB	LTE Band 2 (PCS)	1851.5 - 1908.5 MHz	0.69
DTS	2.4 GHz WLAN	2412 - 2462 MHz	1.09
DTS	Bluetooth LE	2402 - 2480 MHz	N/A
DTS	5.8 GHz WLAN	5745 - 5825 MHz	0.91
NII	5.2 GHz WLAN	5180 - 5240 MHz	0.91
NII	5.3 GHz WLAN	5260 - 5320 MHz	0.98
NII	5.5 GHz WLAN	5500 - 5700 MHz	1.01
DSS	Bluetooth	2402 - 2480 MHz	<0.1
Simultaneous SAR per KDB 690783 D01v01r02:			1.57

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 1.7 of this report; for North American frequency bands only.

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

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
UMTS 850	Data	826.40 - 846.60 MHz
UMTS 1750	Data	1712.4 - 1752.5 MHz
UMTS 1900	Data	1852.4 - 1907.6 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 5 (Cell)	Data	825.5 - 847.5 MHz
LTE Band 4 (AWS)	Data	1712.5 - 1752.5 MHz
LTE Band 2 (PCS)	Data	1851.5 - 1908.5 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
Bluetooth LE	Data	2402 - 2480 MHz
5.8 GHz WLAN	Data	5745 - 5825 MHz
5.2 GHz WLAN	Data	5180 - 5240 MHz
5.3 GHz WLAN	Data	5260 - 5320 MHz
5.5 GHz WLAN	Data	5500 - 5700 MHz
Bluetooth	Data	2402 - 2480 MHz
ANT+	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device uses a sensor for SAR compliance. The sensor is activated when used in close proximity to the user's body. The sensor triggers power reduction for data modes and is only applicable for tablet operations.

Since the device is a full size tablet, the Body SAR was evaluated per FCC KDB Publication 616217 D04 for full sized tablets.

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

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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	**24.5**
	Nominal	**24.0**
LTE Band 2 (PCS)	Maximum	**23.5**
	Nominal	**23.0**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**16.0**
	Nominal	**15.5**
IEEE 802.11g (2.4 GHz)	Maximum	**14.0**
	Nominal	**13.5**
IEEE 802.11n (2.4 GHz)	Maximum	**14.0**
	Nominal	**13.5**
IEEE 802.11a (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11n (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11ac (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
Bluetooth	Maximum	**10.5**
	Nominal	**10.0**
Bluetooth LE	Maximum	**6.0**
	Nominal	**5.5**

1.3.2 Reduced Power (Body at 0mm):

Mode / Band		Modulated Average (dBm)			
		3GPP Rel. 99	*3GPP Rel. 5*	*3GPP Rel. 6*	*3GPP Rel. 8*
		RMC	*HSDPA*	*HSUPA*	*DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**17.5**	**16.5**	**16.5**	**16.5**
	Nominal	**17.0**	**16.0**	**16.0**	**16.0**
UMTS Band 4 (1750 MHz)	Maximum	**15.5**	**15.0**	**15.0**	**15.0**
	Nominal	**15.0**	**14.5**	**14.5**	**14.5**
UMTS Band 2 (1900 MHz)	Maximum	**15.5**	**14.5**	**14.5**	**14.5**
	Nominal	**15.0**	**14.0**	**14.0**	**14.0**

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**13.5**
	Nominal	**13.0**
LTE Band 5 (Cell)	Maximum	**17.0**
	Nominal	**16.5**
LTE Band 4 (AWS)	Maximum	**16.5**
	Nominal	**16.0**
LTE Band 2 (PCS)	Maximum	**15.5**
	Nominal	**15.0**

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1.4 DUT Antenna Locations

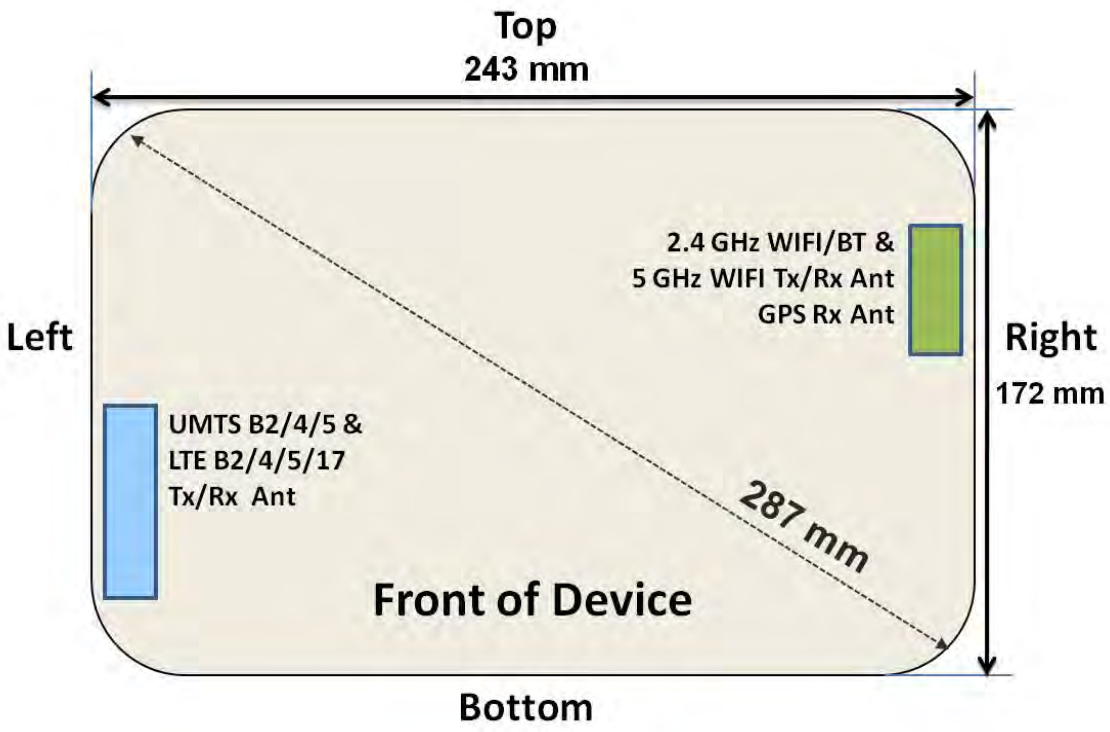

Figure 1-1
DUT Antenna Locations

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

Table 1-1
Sides for SAR Testing

Mode	Back	Top	Bottom	Right	Left
UMTS 850	Yes	No	Yes	No	Yes
UMTS 1750	Yes	No	Yes	No	Yes
UMTS 1900	Yes	No	Yes	No	Yes
LTE Band 17	Yes	No	Yes	No	Yes
LTE Band 5 (Cell)	Yes	No	Yes	No	Yes
LTE Band 4 (AWS)	Yes	No	Yes	No	Yes
LTE Band 2 (PCS)	Yes	No	Yes	No	Yes
2.4 GHz WLAN	Yes	No	No	Yes	No
5 GHz WLAN	Yes	No	No	Yes	No
Bluetooth	Yes	No	No	Yes	No

Note: Per FCC KDB 616217 D04v01r01, Particular DUT edges were not required to be evaluated for SAR based on the SAR exclusion threshold in KDB 447498 D01v05r01.

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1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D05v01, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 1-2 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 1-2
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Body
1	UMTS + 2.4 GHz WI-FI	Yes
2	UMTS + 5 GHz WI-FI	Yes
3	UMTS + 2.4 GHz Bluetooth	Yes
4	LTE + 2.4 GHz WI-FI	Yes
5	LTE + 5 GHz WI-FI	Yes
6	LTE + 2.4 GHz Bluetooth	Yes

Notes:

1. 2.4 GHz WLAN, 2.4 GHz Bluetooth, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously
2. UMTS and LTE share the same antenna path and cannot transmit simultaneously.

1.6 SAR Test Exclusions Applied

(A) WIFI/BT

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

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

Based on the maximum conducted power of Bluetooth LE (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth LE SAR was not required; [(4/5)* √2.440] = 1.2< 3.0. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

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

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This device supports IEEE 802.11ac with the following features:
a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 1 Tx antenna output
d) 256 QAM is supported
e) No new 5 GHz channels

(B) Licensed Transmitter(s)

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

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02.

1.7 Guidance Applied

- FCC KDB Publication 941225 D01v02r02, D02v02r02, D05v02r03 (3G/4G)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 616217 D04 (Tablet SAR Considerations)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)

1.8 Device Serial Numbers

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

Band/Mode	Max Power Serial Number	Reduced Power Serial Number
UMTS 850	FL-112-F	FL-112-B
UMTS 1750	FL-112-E	FL-112-B
UMTS 1900	FL-112-F	FL-112-B
LTE Band 17	FL-112-C	FL-112-A
LTE Band 5 (Cell)	FL-112-F	FL-112-A
LTE Band 4 (AWS)	FL-112-E	FL-112-B
LTE Band 2 (PCS)	FL-112-E	FL-112-B
2.4 GHz WLAN	FL-112-F	-
5 GHz WLAN	FL-112-E	-
Bluetooth	FL-112-F	-

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2 LTE INFORMATION

LTE Information			
FCC ID	**A3LSMP607T**		
Form Factor	Portable Tablet		
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	3		
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/m^3)
E = Total RMS electric field strength (V/m)

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

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

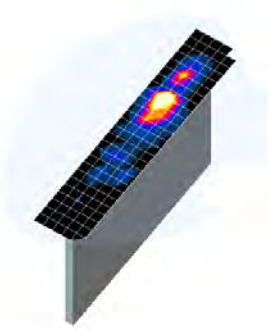

Figure 4-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

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

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

*Also compliant to IEEE 1528-2013 Table 6

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5 SAR TESTING PROCEDURES

5.1 SAR Testing for Tablet per KDB Publication 616217 D04v01

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v05 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

5.2 Proximity Sensor Considerations

This device uses a proximity sensor to reduce data powers in tablet-device use conditions.

While the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum output power allowed. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, an additional exposure condition is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level.

FCC KDB 616217 D04 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional exposure conditions. Since the sensor activation distance for the back side of the device is 13 mm, a conservative distance of 12 mm was tested for SAR on the back side at maximum power. Since the sensor activation distance for the left edge of the device is 16 mm, a conservative distance of 15 mm was tested for SAR on the left edge at maximum power. Sensor triggering distance summary data is included in Appendix G. The sensor does not trigger power reduction from the front of the device.

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antenna.

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6 RF EXPOSURE LIMITS

6.1 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.

6.2 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 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

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

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

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7 FCC MEASUREMENT PROCEDURES

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

7.1 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.

7.2 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.

7.3 SAR Measurement Conditions for UMTS

7.3.1 Output Power Verification

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

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

7.3.2 Body SAR Measurements

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

7.3.3 Procedures Used to Establish RF Signal for SAR HSDPA Data Devices

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. Body exposure conditions are typically applicable to these devices, including handsets and data modems operating in various electronic devices. HSDPA operates in conjunction with UMTS and requires an active DPCCH. The default test configuration is to measure SAR in UMTS without HSDPA, with an established radio link between the DUT and a communication test set with 12.2

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kbps RMC mode configured in Test Loop Mode 1; and tested with HSDPA with FRC and a 12.2 kbps RMC using the highest SAR configuration in UMTS. SAR is selectively confirmed for other physical channel configurations according to output power, exposure conditions and device operating capabilities. Maximum output power is verified according to 3GPP TS 23.121 (Release 5) and SAR must be measured according to these maximum output conditions.

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

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{hs} = 30/15$) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{hs} = 24/15$) with $\beta_{hs} = 24/15 * \beta_c$.
Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 7-1
Table C.10.1.4 of TS 234.121-1

7.3.4 SAR Measurement Conditions for HSUPA Data Devices

SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of the KDB 941225 D01 FCC 3G document. In addition, Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher of that measured without HSPA in 12.2 kbps RMC mode or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and EDCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of the FCC 3G document.

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

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

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7.3.5 SAR Measurement Conditions for DC-HSDPA

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

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

7.4 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).

7.4.1 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.

7.4.2 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.

7.4.3 A-MPR

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

7.4.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r01:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    i. The required channel and offset combination with the highest maximum output power is required for SAR.
    ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
    iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

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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.

7.5 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n /ac transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v01r02 for more details.

7.5.1 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.

7.5.2 Frequency Channel Configurations [24]

For 2.4 GHz, the highest average RF output power channel between the low, mid and high channel at the lowest data rate was selected for SAR evaluation in 802.11b mode. 802.11g/n modes and higher data rates for 802.11b were additionally evaluated for SAR if the output power of the respective mode was 0.25 dB or higher than the powers of the SAR configurations tested in the 802.11b mode.

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. When the adjacent channels are higher in power then the default channels, these “required channels” were considered instead of the default channels for SAR testing. 802.11n modes and higher data rates for 802.11a/n were evaluated only if the respective mode was higher than 0.25 dB or more than the 802.11a mode. 802.11ac SAR was evaluated for highest 802.11a configuration in each 5 GHz band and each exposure condition. 802.11ac modes were additionally evaluated for SAR if the output power for the respective mode was more than 0.25 dB higher than powers of 802.11a modes.

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

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8 RF CONDUCTED POWERS

8.1 UMTS Conducted Powers

Table 8-1
Maximum UMTS Average RF Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1862	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.66	22.60	22.62	23.27	23.50	23.28	23.35	23.42	23.41	-
6	HSDPA	Subtest 1	21.57	21.56	21.52	22.41	22.56	22.44	22.39	22.63	22.56	0
6		Subtest 2	21.58	21.53	21.60	22.54	22.44	22.75	22.48	22.71	22.60	0
6		Subtest 3	21.10	21.16	21.07	22.04	22.09	22.06	21.96	22.14	22.15	0.5
6		Subtest 4	21.13	21.12	21.11	22.08	22.08	22.04	21.93	22.17	22.13	0.5
6	HSUPA	Subtest 1	21.33	21.11	21.00	21.85	21.74	21.62	22.01	21.80	22.04	0
6		Subtest 2	20.54	20.47	20.51	21.49	21.11	21.32	21.04	21.23	21.10	2
6		Subtest 3	20.11	20.44	20.20	21.14	21.03	21.08	20.75	21.17	20.80	1
6		Subtest 4	20.35	20.66	20.70	21.50	21.39	21.46	21.41	21.50	21.19	2
6		Subtest 5	21.03	21.05	21.00	21.65	21.71	21.54	21.90	21.53	21.73	0
8	DC-HSDPA	Subtest 1	21.54	21.43	21.42	23.22	22.94	23.12	22.70	22.96	22.66	0
8		Subtest 2	21.47	21.38	21.74	23.26	22.80	23.09	22.72	22.94	22.85	0
8		Subtest 3	21.11	20.95	20.91	22.77	22.37	22.64	22.39	22.46	22.38	0.5
8		Subtest 4	21.09	20.96	20.90	22.82	22.31	22.63	22.25	22.47	22.36	0.5

Table 8-2
Reduced UMTS Average RF Conducted Powers (Representing Body at 0 mm)

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1862	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	17.11	17.18	17.23	15.48	14.65	15.45	14.72	15.12	13.76	-
6	HSDPA	Subtest 1	15.96	15.82	15.84	14.68	13.50	14.36	13.61	13.96	12.57	0
6		Subtest 2	15.93	15.70	15.71	14.52	13.52	14.39	13.63	13.98	12.62	0
6		Subtest 3	15.30	15.25	15.30	14.29	13.51	13.98	13.14	13.54	12.16	0.5
6		Subtest 4	15.33	15.29	15.27	14.35	13.06	14.06	13.16	13.52	12.14	0.5
6	HSUPA	Subtest 1	15.78	15.73	15.65	14.86	13.01	14.56	13.29	14.11	12.53	0
6		Subtest 2	13.68	14.32	14.14	12.66	11.61	12.38	12.46	12.50	11.61	2
6		Subtest 3	13.87	13.99	13.82	13.28	12.48	13.01	12.80	12.42	11.76	1
6		Subtest 4	15.02	15.54	15.34	14.73	13.27	14.34	12.92	13.66	11.88	2
6		Subtest 5	15.50	15.48	15.43	14.70	13.25	14.32	13.90	13.66	12.51	0
8	DC-HSDPA	Subtest 1	16.09	16.03	16.11	14.79	14.10	14.40	14.05	14.09	13.53	0
8		Subtest 2	16.06	16.02	16.08	14.72	14.12	14.45	14.01	14.07	13.50	0
8		Subtest 3	15.56	15.47	15.58	14.20	13.62	13.96	13.50	13.57	13.02	0.5
8		Subtest 4	15.58	15.49	15.57	14.36	13.60	13.93	13.47	13.56	13.01	0.5

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

DC-HSDPA considerations

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

It is expected by the manufacturer that MPR for some HSUPA 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 8-1
Power Measurement Setup

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8.2 LTE Conducted Powers

8.2.1 LTE Band 17

Table 8-3
LTE Band 17 Conducted Powers – 10 MHz Bandwidth
Maximum Power

	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	23.45	0	0
	710.0	23790	10	QPSK	1	25	23.34	0	0
	710.0	23790	10	QPSK	1	49	**23.49**	0	0
	710.0	23790	10	QPSK	25	0	22.48	0-1	1
	710.0	23790	10	QPSK	25	12	22.43	0-1	1
	710.0	23790	10	QPSK	25	25	**22.49**	0-1	1
	710.0	23790	10	QPSK	50	0	22.45	0-1	1
	710.0	23790	10	16QAM	1	0	22.40	0-1	1
	710.0	23790	10	16QAM	1	25	22.38	0-1	1
	710.0	23790	10	16QAM	1	49	22.36	0-1	1
	710.0	23790	10	16QAM	25	0	21.45	0-2	2
	710.0	23790	10	16QAM	25	12	21.47	0-2	2
	710.0	23790	10	16QAM	25	25	21.45	0-2	2
	710.0	23790	10	16QAM	50	0	21.43	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 8-4
LTE Band 17 Conducted Powers – 5 MHz Bandwidth
Maximum Power

	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	23.47	0	0
	710.0	23790	5	QPSK	1	12	23.39	0	0
	710.0	23790	5	QPSK	1	24	23.41	0	0
	710.0	23790	5	QPSK	12	0	22.47	0-1	1
	710.0	23790	5	QPSK	12	6	22.36	0-1	1
	710.0	23790	5	QPSK	12	13	22.46	0-1	1
	710.0	23790	5	QPSK	25	0	22.42	0-1	1
	710.0	23790	5	16-QAM	1	0	22.40	0-1	1
	710.0	23790	5	16-QAM	1	12	22.35	0-1	1
	710.0	23790	5	16-QAM	1	24	22.33	0-1	1
	710.0	23790	5	16-QAM	12	0	21.41	0-2	2
	710.0	23790	5	16-QAM	12	6	21.42	0-2	2
	710.0	23790	5	16-QAM	12	13	21.42	0-2	2
	710.0	23790	5	16-QAM	25	0	21.39	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.

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Table 8-5
LTE Band 17 Conducted Powers – 10 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	12.97	0	0
	710.0	23790	10	QPSK	1	25	12.99	0	0
	710.0	23790	10	QPSK	1	49	**13.20**	0	0
	710.0	23790	10	QPSK	25	0	12.01	0-1	1
	710.0	23790	10	QPSK	25	12	**12.12**	0-1	1
	710.0	23790	10	QPSK	25	25	12.11	0-1	1
	710.0	23790	10	QPSK	50	0	12.08	0-1	1
	710.0	23790	10	16QAM	1	0	12.28	0-1	1
	710.0	23790	10	16QAM	1	25	12.33	0-1	1
	710.0	23790	10	16QAM	1	49	12.40	0-1	1
	710.0	23790	10	16QAM	25	0	11.01	0-2	2
	710.0	23790	10	16QAM	25	12	11.07	0-2	2
	710.0	23790	10	16QAM	25	25	11.08	0-2	2
	710.0	23790	10	16QAM	50	0	11.05	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 8-6
LTE Band 17 Conducted Powers – 5 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	12.90	0	0
	710.0	23790	5	QPSK	1	12	12.91	0	0
	710.0	23790	5	QPSK	1	24	13.00	0	0
	710.0	23790	5	QPSK	12	0	12.12	0-1	1
	710.0	23790	5	QPSK	12	6	12.02	0-1	1
	710.0	23790	5	QPSK	12	13	11.92	0-1	1
	710.0	23790	5	QPSK	25	0	11.93	0-1	1
	710.0	23790	5	16-QAM	1	0	12.10	0-1	1
	710.0	23790	5	16-QAM	1	12	12.09	0-1	1
	710.0	23790	5	16-QAM	1	24	12.21	0-1	1
	710.0	23790	5	16-QAM	12	0	11.08	0-2	2
	710.0	23790	5	16-QAM	12	6	10.89	0-2	2
	710.0	23790	5	16-QAM	12	13	10.88	0-2	2
	710.0	23790	5	16-QAM	25	0	10.89	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.

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8.2.2 LTE Band 5 (Cell)

Table 8-7
LTE Band 5 (Cell) Conducted Powers – 10 MHz Bandwidth
Maximum Power

	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	**23.30**	0	0
	836.5	20525	10	QPSK	1	49	23.29	0	0
	836.5	20525	10	QPSK	25	0	22.17	0-1	1
	836.5	20525	10	QPSK	25	12	22.07	0-1	1
	836.5	20525	10	QPSK	25	25	**22.18**	0-1	1
	836.5	20525	10	QPSK	50	0	22.01	0-1	1
	836.5	20525	10	16QAM	1	0	22.28	0-1	1
	836.5	20525	10	16QAM	1	25	22.28	0-1	1
	836.5	20525	10	16QAM	1	49	22.32	0-1	1
	836.5	20525	10	16QAM	25	0	21.15	0-2	2
	836.5	20525	10	16QAM	25	12	20.97	0-2	2
	836.5	20525	10	16QAM	25	25	21.03	0-2	2
	836.5	20525	10	16QAM	50	0	20.91	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 8-8
LTE Band 5 (Cell) Conducted Powers – 5 MHz Bandwidth
Maximum Power

	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	23.01	0	0
	826.5	20425	5	QPSK	1	12	23.14	0	0
	826.5	20425	5	QPSK	1	24	23.13	0	0
	826.5	20425	5	QPSK	12	0	22.01	0-1	1
	826.5	20425	5	QPSK	12	6	22.00	0-1	1
	826.5	20425	5	QPSK	12	13	22.05	0-1	1
	826.5	20425	5	QPSK	25	0	22.00	0-1	1
	826.5	20425	5	16-QAM	1	0	22.07	0-1	1
	826.5	20425	5	16-QAM	1	12	22.19	0-1	1
	826.5	20425	5	16-QAM	1	24	22.23	0-1	1
	826.5	20425	5	16-QAM	12	0	21.12	0-2	2
	826.5	20425	5	16-QAM	12	6	21.00	0-2	2
	826.5	20425	5	16-QAM	12	13	21.06	0-2	2
	826.5	20425	5	16-QAM	25	0	20.98	0-2	2
Mid	836.5	20525	5	QPSK	1	0	23.13	0	0
	836.5	20525	5	QPSK	1	12	23.29	0	0
	836.5	20525	5	QPSK	1	24	23.28	0	0
	836.5	20525	5	QPSK	12	0	22.18	0-1	1
	836.5	20525	5	QPSK	12	6	22.10	0-1	1
	836.5	20525	5	QPSK	12	13	22.21	0-1	1
	836.5	20525	5	QPSK	25	0	22.12	0-1	1
	836.5	20525	5	16-QAM	1	0	22.16	0-1	1
	836.5	20525	5	16-QAM	1	12	22.30	0-1	1
	836.5	20525	5	16-QAM	1	24	22.27	0-1	1
	836.5	20525	5	16-QAM	12	0	21.14	0-2	2
	836.5	20525	5	16-QAM	12	6	21.09	0-2	2
	836.5	20525	5	16-QAM	12	13	21.19	0-2	2
	836.5	20525	5	16-QAM	25	0	21.03	0-2	2
High	846.5	20625	5	QPSK	1	0	23.25	0	0
	846.5	20625	5	QPSK	1	12	23.34	0	0
	846.5	20625	5	QPSK	1	24	23.31	0	0
	846.5	20625	5	QPSK	12	0	22.19	0-1	1
	846.5	20625	5	QPSK	12	6	22.30	0-1	1
	846.5	20625	5	QPSK	12	13	22.35	0-1	1
	846.5	20625	5	QPSK	25	0	22.26	0-1	1
	846.5	20625	5	16-QAM	1	0	22.40	0-1	1
	846.5	20625	5	16-QAM	1	12	22.35	0-1	1
	846.5	20625	5	16-QAM	1	24	22.30	0-1	1
	846.5	20625	5	16-QAM	12	0	21.18	0-2	2
	846.5	20625	5	16-QAM	12	6	21.21	0-2	2
	846.5	20625	5	16-QAM	12	13	21.27	0-2	2
	846.5	20625	5	16-QAM	25	0	21.15	0-2	2

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Table 8-9
LTE Band 5 (Cell) Conducted Powers – 3 MHz Bandwidth
Maximum Power

	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	22.99	0	0
	825.5	20415	3	QPSK	1	7	23.04	0	0
	825.5	20415	3	QPSK	1	14	23.09	0	0
	825.5	20415	3	QPSK	8	0	21.95	0-1	1
	825.5	20415	3	QPSK	8	4	22.04	0-1	1
	825.5	20415	3	QPSK	8	7	22.03	0-1	1
	825.5	20415	3	QPSK	15	0	22.02	0-1	1
	825.5	20415	3	16-QAM	1	0	22.01	0-1	1
	825.5	20415	3	16-QAM	1	7	22.20	0-1	1
	825.5	20415	3	16-QAM	1	14	22.23	0-1	1
	825.5	20415	3	16-QAM	8	0	20.86	0-2	2
	825.5	20415	3	16-QAM	8	4	20.95	0-2	2
	825.5	20415	3	16-QAM	8	7	20.93	0-2	2
	825.5	20415	3	16-QAM	15	0	20.99	0-2	2
Mid	836.5	20525	3	QPSK	1	0	23.23	0	0
	836.5	20525	3	QPSK	1	7	23.32	0	0
	836.5	20525	3	QPSK	1	14	23.33	0	0
	836.5	20525	3	QPSK	8	0	22.14	0-1	1
	836.5	20525	3	QPSK	8	4	22.21	0-1	1
	836.5	20525	3	QPSK	8	7	22.23	0-1	1
	836.5	20525	3	QPSK	15	0	22.14	0-1	1
	836.5	20525	3	16-QAM	1	0	22.19	0-1	1
	836.5	20525	3	16-QAM	1	7	22.26	0-1	1
	836.5	20525	3	16-QAM	1	14	22.33	0-1	1
	836.5	20525	3	16-QAM	8	0	20.96	0-2	2
	836.5	20525	3	16-QAM	8	4	21.04	0-2	2
	836.5	20525	3	16-QAM	8	7	21.01	0-2	2
	836.5	20525	3	16-QAM	15	0	20.98	0-2	2
High	847.5	20635	3	QPSK	1	0	23.30	0	0
	847.5	20635	3	QPSK	1	7	23.27	0	0
	847.5	20635	3	QPSK	1	14	23.36	0	0
	847.5	20635	3	QPSK	8	0	22.29	0-1	1
	847.5	20635	3	QPSK	8	4	22.28	0-1	1
	847.5	20635	3	QPSK	8	7	22.23	0-1	1
	847.5	20635	3	QPSK	15	0	22.28	0-1	1
	847.5	20635	3	16-QAM	1	0	22.33	0-1	1
	847.5	20635	3	16-QAM	1	7	22.25	0-1	1
	847.5	20635	3	16-QAM	1	14	22.33	0-1	1
	847.5	20635	3	16-QAM	8	0	21.12	0-2	2
	847.5	20635	3	16-QAM	8	4	21.11	0-2	2
	847.5	20635	3	16-QAM	8	7	21.08	0-2	2
	847.5	20635	3	16-QAM	15	0	21.18	0-2	2

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Table 8-10
LTE Band 5 (Cell) Conducted Powers – 1.4 MHz Bandwidth
Maximum Power

	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	23.00	0	0
	824.7	20407	1.4	QPSK	1	2	23.09	0	0
	824.7	20407	1.4	QPSK	1	5	23.05	0	0
	824.7	20407	1.4	QPSK	3	0	22.93	0	0
	824.7	20407	1.4	QPSK	3	2	23.03	0	0
	824.7	20407	1.4	QPSK	3	3	23.03	0	0
	824.7	20407	1.4	QPSK	6	0	22.07	0-1	1
	824.7	20407	1.4	16-QAM	1	0	22.03	0-1	1
	824.7	20407	1.4	16-QAM	1	2	22.22	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.24	0-1	1
	824.7	20407	1.4	16-QAM	3	0	21.89	0-1	1
	824.7	20407	1.4	16-QAM	3	2	21.90	0-1	1
	824.7	20407	1.4	16-QAM	3	3	21.94	0-1	1
	824.7	20407	1.4	16-QAM	6	0	20.94	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	23.21	0	0
	836.5	20525	1.4	QPSK	1	2	23.27	0	0
	836.5	20525	1.4	QPSK	1	5	23.38	0	0
	836.5	20525	1.4	QPSK	3	0	23.11	0	0
	836.5	20525	1.4	QPSK	3	2	23.23	0	0
	836.5	20525	1.4	QPSK	3	3	23.22	0	0
	836.5	20525	1.4	QPSK	6	0	22.15	0-1	1
	836.5	20525	1.4	16-QAM	1	0	22.14	0-1	1
	836.5	20525	1.4	16-QAM	1	2	22.21	0-1	1
	836.5	20525	1.4	16-QAM	1	5	22.33	0-1	1
	836.5	20525	1.4	16-QAM	3	0	21.95	0-1	1
	836.5	20525	1.4	16-QAM	3	2	21.99	0-1	1
	836.5	20525	1.4	16-QAM	3	3	22.02	0-1	1
	836.5	20525	1.4	16-QAM	6	0	20.94	0-2	2
High	848.3	20643	1.4	QPSK	1	0	23.33	0	0
	848.3	20643	1.4	QPSK	1	2	23.27	0	0
	848.3	20643	1.4	QPSK	1	5	23.38	0	0
	848.3	20643	1.4	QPSK	3	0	23.30	0	0
	848.3	20643	1.4	QPSK	3	2	23.28	0	0
	848.3	20643	1.4	QPSK	3	3	23.23	0	0
	848.3	20643	1.4	QPSK	6	0	22.27	0-1	1
	848.3	20643	1.4	16-QAM	1	0	22.33	0-1	1
	848.3	20643	1.4	16-QAM	1	2	22.24	0-1	1
	848.3	20643	1.4	16-QAM	1	5	22.28	0-1	1
	848.3	20643	1.4	16-QAM	3	0	22.16	0-1	1
	848.3	20643	1.4	16-QAM	3	2	22.16	0-1	1
	848.3	20643	1.4	16-QAM	3	3	22.10	0-1	1
	848.3	20643	1.4	16-QAM	6	0	21.17	0-2	2

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Table 8-11
LTE Band 5 (Cell) Conducted Powers – 10 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.40	0	0
	836.5	20525	10	QPSK	1	25	16.44	0	0
	836.5	20525	10	QPSK	1	49	**16.60**	0	0
	836.5	20525	10	QPSK	25	0	15.67	0-1	1
	836.5	20525	10	QPSK	25	12	15.72	0-1	1
	836.5	20525	10	QPSK	25	25	**15.81**	0-1	1
	836.5	20525	10	QPSK	50	0	15.62	0-1	1
	836.5	20525	10	16QAM	1	0	15.82	0-1	1
	836.5	20525	10	16QAM	1	25	15.87	0-1	1
	836.5	20525	10	16QAM	1	49	15.82	0-1	1
	836.5	20525	10	16QAM	25	0	14.54	0-2	2
	836.5	20525	10	16QAM	25	12	14.60	0-2	2
	836.5	20525	10	16QAM	25	25	14.66	0-2	2
	836.5	20525	10	16QAM	50	0	14.64	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 8-12
LTE Band 5 (Cell) Conducted Powers – 5 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.26	0	0
	826.5	20425	5	QPSK	1	12	16.33	0	0
	826.5	20425	5	QPSK	1	24	16.26	0	0
	826.5	20425	5	QPSK	12	0	15.15	0-1	1
	826.5	20425	5	QPSK	12	6	15.13	0-1	1
	826.5	20425	5	QPSK	12	13	15.10	0-1	1
	826.5	20425	5	QPSK	25	0	15.09	0-1	1
	826.5	20425	5	16-QAM	1	0	15.34	0-1	1
	826.5	20425	5	16-QAM	1	12	15.44	0-1	1
	826.5	20425	5	16-QAM	1	24	15.48	0-1	1
	826.5	20425	5	16-QAM	12	0	14.18	0-2	2
	826.5	20425	5	16-QAM	12	6	14.25	0-2	2
	826.5	20425	5	16-QAM	12	13	14.27	0-2	2
	826.5	20425	5	16-QAM	25	0	14.02	0-2	2
Mid	836.5	20525	5	QPSK	1	0	16.27	0	0
	836.5	20525	5	QPSK	1	12	16.37	0	0
	836.5	20525	5	QPSK	1	24	16.44	0	0
	836.5	20525	5	QPSK	12	0	15.26	0-1	1
	836.5	20525	5	QPSK	12	6	15.21	0-1	1
	836.5	20525	5	QPSK	12	13	15.44	0-1	1
	836.5	20525	5	QPSK	25	0	15.35	0-1	1
	836.5	20525	5	16-QAM	1	0	15.25	0-1	1
	836.5	20525	5	16-QAM	1	12	15.35	0-1	1
	836.5	20525	5	16-QAM	1	24	15.49	0-1	1
	836.5	20525	5	16-QAM	12	0	14.27	0-2	2
	836.5	20525	5	16-QAM	12	6	14.14	0-2	2
	836.5	20525	5	16-QAM	12	13	14.36	0-2	2
	836.5	20525	5	16-QAM	25	0	14.18	0-2	2
High	846.5	20625	5	QPSK	1	0	16.31	0	0
	846.5	20625	5	QPSK	1	12	16.18	0	0
	846.5	20625	5	QPSK	1	24	16.22	0	0
	846.5	20625	5	QPSK	12	0	15.33	0-1	1
	846.5	20625	5	QPSK	12	6	15.32	0-1	1
	846.5	20625	5	QPSK	12	13	15.43	0-1	1
	846.5	20625	5	QPSK	25	0	15.20	0-1	1
	846.5	20625	5	16-QAM	1	0	15.12	0-1	1
	846.5	20625	5	16-QAM	1	12	15.13	0-1	1
	846.5	20625	5	16-QAM	1	24	15.11	0-1	1
	846.5	20625	5	16-QAM	12	0	14.34	0-2	2
	846.5	20625	5	16-QAM	12	6	14.28	0-2	2
	846.5	20625	5	16-QAM	12	13	14.49	0-2	2
	846.5	20625	5	16-QAM	25	0	14.38	0-2	2

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Table 8-13
LTE Band 5 (Cell) Conducted Powers – 3 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.11	0	0
	825.5	20415	3	QPSK	1	7	16.25	0	0
	825.5	20415	3	QPSK	1	14	16.29	0	0
	825.5	20415	3	QPSK	8	0	15.07	0-1	1
	825.5	20415	3	QPSK	8	4	15.13	0-1	1
	825.5	20415	3	QPSK	8	7	15.06	0-1	1
	825.5	20415	3	QPSK	15	0	15.10	0-1	1
	825.5	20415	3	16-QAM	1	0	15.06	0-1	1
	825.5	20415	3	16-QAM	1	7	15.09	0-1	1
	825.5	20415	3	16-QAM	1	14	15.15	0-1	1
	825.5	20415	3	16-QAM	8	0	14.01	0-2	2
	825.5	20415	3	16-QAM	8	4	14.27	0-2	2
	825.5	20415	3	16-QAM	8	7	14.19	0-2	2
	825.5	20415	3	16-QAM	15	0	14.20	0-2	2
Mid	836.5	20525	3	QPSK	1	0	16.12	0	0
	836.5	20525	3	QPSK	1	7	16.20	0	0
	836.5	20525	3	QPSK	1	14	16.22	0	0
	836.5	20525	3	QPSK	8	0	15.13	0-1	1
	836.5	20525	3	QPSK	8	4	15.30	0-1	1
	836.5	20525	3	QPSK	8	7	15.32	0-1	1
	836.5	20525	3	QPSK	15	0	15.33	0-1	1
	836.5	20525	3	16-QAM	1	0	15.15	0-1	1
	836.5	20525	3	16-QAM	1	7	15.16	0-1	1
	836.5	20525	3	16-QAM	1	14	15.30	0-1	1
	836.5	20525	3	16-QAM	8	0	14.24	0-2	2
	836.5	20525	3	16-QAM	8	4	14.32	0-2	2
	836.5	20525	3	16-QAM	8	7	14.40	0-2	2
	836.5	20525	3	16-QAM	15	0	14.25	0-2	2
High	847.5	20635	3	QPSK	1	0	16.30	0	0
	847.5	20635	3	QPSK	1	7	16.07	0	0
	847.5	20635	3	QPSK	1	14	16.33	0	0
	847.5	20635	3	QPSK	8	0	15.33	0-1	1
	847.5	20635	3	QPSK	8	4	15.30	0-1	1
	847.5	20635	3	QPSK	8	7	15.29	0-1	1
	847.5	20635	3	QPSK	15	0	15.34	0-1	1
	847.5	20635	3	16-QAM	1	0	15.19	0-1	1
	847.5	20635	3	16-QAM	1	7	15.20	0-1	1
	847.5	20635	3	16-QAM	1	14	15.27	0-1	1
	847.5	20635	3	16-QAM	8	0	14.36	0-2	2
	847.5	20635	3	16-QAM	8	4	14.45	0-2	2
	847.5	20635	3	16-QAM	8	7	14.30	0-2	2
	847.5	20635	3	16-QAM	15	0	14.31	0-2	2

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Table 8-14
LTE Band 5 (Cell) Conducted Powers – 1.4 MHz Bandwidth
Reduced Power – Body at 0 mm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]	Deviation [dB]
Low	824.7	20407	1.4	QPSK	1	0	16.08	0	0	-0.42
	824.7	20407	1.4	QPSK	1	2	16.20	0	0	-0.30
	824.7	20407	1.4	QPSK	1	5	16.33	0	0	-0.17
	824.7	20407	1.4	QPSK	3	0	16.05	0	0	-0.45
	824.7	20407	1.4	QPSK	3	2	16.16	0	0	-0.34
	824.7	20407	1.4	QPSK	3	3	16.01	0	0	-0.49
	824.7	20407	1.4	QPSK	6	0	15.12	0-1	1	-0.38
	824.7	20407	1.4	16-QAM	1	0	15.08	0-1	1	-0.42
	824.7	20407	1.4	16-QAM	1	2	15.12	0-1	1	-0.38
	824.7	20407	1.4	16-QAM	1	5	15.14	0-1	1	-0.36
	824.7	20407	1.4	16-QAM	3	0	15.03	0-1	1	-0.47
	824.7	20407	1.4	16-QAM	3	2	15.27	0-1	1	-0.23
	824.7	20407	1.4	16-QAM	3	3	15.24	0-1	1	-0.26
	824.7	20407	1.4	16-QAM	6	0	14.18	0-2	2	-0.32
Mid	836.5	20525	1.4	QPSK	1	0	16.10	0	0	-0.40
	836.5	20525	1.4	QPSK	1	2	16.18	0	0	-0.32
	836.5	20525	1.4	QPSK	1	5	16.22	0	0	-0.28
	836.5	20525	1.4	QPSK	3	0	16.09	0	0	-0.41
	836.5	20525	1.4	QPSK	3	2	16.33	0	0	-0.17
	836.5	20525	1.4	QPSK	3	3	16.36	0	0	-0.14
	836.5	20525	1.4	QPSK	6	0	15.35	0-1	1	-0.15
	836.5	20525	1.4	16-QAM	1	0	15.14	0-1	1	-0.36
	836.5	20525	1.4	16-QAM	1	2	15.20	0-1	1	-0.30
	836.5	20525	1.4	16-QAM	1	5	15.27	0-1	1	-0.23
	836.5	20525	1.4	16-QAM	3	0	15.20	0-1	1	-0.30
	836.5	20525	1.4	16-QAM	3	2	15.33	0-1	1	-0.17
	836.5	20525	1.4	16-QAM	3	3	15.37	0-1	1	-0.13
	836.5	20525	1.4	16-QAM	6	0	14.26	0-2	2	-0.24
High	848.3	20643	1.4	QPSK	1	0	16.32	0	0	-0.18
	848.3	20643	1.4	QPSK	1	2	16.05	0	0	-0.45
	848.3	20643	1.4	QPSK	1	5	16.29	0	0	-0.21
	848.3	20643	1.4	QPSK	3	0	16.32	0	0	-0.18
	848.3	20643	1.4	QPSK	3	2	16.35	0	0	-0.15
	848.3	20643	1.4	QPSK	3	3	16.34	0	0	-0.16
	848.3	20643	1.4	QPSK	6	0	15.34	0-1	1	-0.16
	848.3	20643	1.4	16-QAM	1	0	15.15	0-1	1	-0.35
	848.3	20643	1.4	16-QAM	1	2	15.24	0-1	1	-0.26
	848.3	20643	1.4	16-QAM	1	5	15.28	0-1	1	-0.22
	848.3	20643	1.4	16-QAM	3	0	15.32	0-1	1	-0.18
	848.3	20643	1.4	16-QAM	3	2	15.41	0-1	1	-0.09
	848.3	20643	1.4	16-QAM	3	3	15.34	0-1	1	-0.16
	848.3	20643	1.4	16-QAM	6	0	14.35	0-2	2	-0.15

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8.2.3 LTE Band 4 (AWS)

Table 8-15
LTE Band 4 (AWS) Conducted Powers – 20 MHz Bandwidth
Maximum Power

	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	**24.38**	0	0
	1732.5	20175	20	QPSK	1	50	24.31	0	0
	1732.5	20175	20	QPSK	1	99	24.22	0	0
	1732.5	20175	20	QPSK	50	0	**23.18**	0-1	1
	1732.5	20175	20	QPSK	50	25	23.12	0-1	1
	1732.5	20175	20	QPSK	50	50	23.03	0-1	1
	1732.5	20175	20	QPSK	100	0	23.12	0-1	1
	1732.5	20175	20	16QAM	1	0	23.26	0-1	1
	1732.5	20175	20	16QAM	1	50	23.23	0-1	1
	1732.5	20175	20	16QAM	1	99	23.27	0-1	1
	1732.5	20175	20	16QAM	50	0	22.08	0-2	2
	1732.5	20175	20	16QAM	50	25	22.12	0-2	2
	1732.5	20175	20	16QAM	50	50	22.04	0-2	2
	1732.5	20175	20	16QAM	100	0	22.13	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 8-16
LTE Band 4 (AWS) Conducted Powers – 15 MHz Bandwidth
Maximum Power

	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	23.93	0	0
	1717.5	20025	15	QPSK	1	36	24.16	0	0
	1717.5	20025	15	QPSK	1	74	24.33	0	0
	1717.5	20025	15	QPSK	36	0	22.92	0-1	1
	1717.5	20025	15	QPSK	36	18	22.97	0-1	1
	1717.5	20025	15	QPSK	36	37	23.02	0-1	1
	1717.5	20025	15	QPSK	75	0	23.08	0-1	1
	1717.5	20025	15	16QAM	1	0	23.10	0-1	1
	1717.5	20025	15	16QAM	1	36	23.21	0-1	1
	1717.5	20025	15	16QAM	1	74	23.26	0-1	1
	1717.5	20025	15	16QAM	36	0	21.99	0-2	2
	1717.5	20025	15	16QAM	36	18	21.90	0-2	2
	1717.5	20025	15	16QAM	36	37	22.08	0-2	2
	1717.5	20025	15	16QAM	75	0	21.89	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	24.42	0	0
	1732.5	20175	15	QPSK	1	36	24.37	0	0
	1732.5	20175	15	QPSK	1	74	24.27	0	0
	1732.5	20175	15	QPSK	36	0	23.20	0-1	1
	1732.5	20175	15	QPSK	36	18	23.16	0-1	1
	1732.5	20175	15	QPSK	36	37	23.16	0-1	1
	1732.5	20175	15	QPSK	75	0	23.11	0-1	1
	1732.5	20175	15	16QAM	1	0	23.37	0-1	1
	1732.5	20175	15	16QAM	1	36	23.05	0-1	1
	1732.5	20175	15	16QAM	1	74	23.26	0-1	1
	1732.5	20175	15	16QAM	36	0	22.23	0-2	2
	1732.5	20175	15	16QAM	36	18	22.24	0-2	2
	1732.5	20175	15	16QAM	36	37	22.22	0-2	2
	1732.5	20175	15	16QAM	75	0	22.15	0-2	2
High	1747.5	20325	15	QPSK	1	0	24.36	0	0
	1747.5	20325	15	QPSK	1	36	24.18	0	0
	1747.5	20325	15	QPSK	1	74	24.15	0	0
	1747.5	20325	15	QPSK	36	0	23.10	0-1	1
	1747.5	20325	15	QPSK	36	18	23.07	0-1	1
	1747.5	20325	15	QPSK	36	37	23.00	0-1	1
	1747.5	20325	15	QPSK	75	0	23.11	0-1	1
	1747.5	20325	15	16QAM	1	0	23.26	0-1	1
	1747.5	20325	15	16QAM	1	36	23.31	0-1	1
	1747.5	20325	15	16QAM	1	74	23.30	0-1	1
	1747.5	20325	15	16QAM	36	0	22.28	0-2	2
	1747.5	20325	15	16QAM	36	18	22.17	0-2	2
	1747.5	20325	15	16QAM	36	37	22.12	0-2	2
	1747.5	20325	15	16QAM	75	0	22.08	0-2	2

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Table 8-17
LTE Band 4 (AWS) Conducted Powers – 10 MHz Bandwidth
Maximum Power

	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	23.86	0	0
	1715	20000	10	QPSK	1	25	23.94	0	0
	1715	20000	10	QPSK	1	49	24.12	0	0
	1715	20000	10	QPSK	25	0	22.87	0-1	1
	1715	20000	10	QPSK	25	12	22.93	0-1	1
	1715	20000	10	QPSK	25	25	23.05	0-1	1
	1715	20000	10	QPSK	50	0	22.87	0-1	1
	1715	20000	10	16QAM	1	0	22.96	0-1	1
	1715	20000	10	16QAM	1	25	23.01	0-1	1
	1715	20000	10	16QAM	1	49	23.18	0-1	1
	1715	20000	10	16QAM	25	0	21.82	0-2	2
	1715	20000	10	16QAM	25	12	21.90	0-2	2
	1715	20000	10	16QAM	25	25	21.97	0-2	2
	1715	20000	10	16QAM	50	0	21.85	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	24.46	0	0
	1732.5	20175	10	QPSK	1	25	24.48	0	0
	1732.5	20175	10	QPSK	1	49	24.41	0	0
	1732.5	20175	10	QPSK	25	0	23.32	0-1	1
	1732.5	20175	10	QPSK	25	12	23.25	0-1	1
	1732.5	20175	10	QPSK	25	25	23.17	0-1	1
	1732.5	20175	10	QPSK	50	0	23.13	0-1	1
	1732.5	20175	10	16QAM	1	0	23.43	0-1	1
	1732.5	20175	10	16QAM	1	25	23.42	0-1	1
	1732.5	20175	10	16QAM	1	49	23.34	0-1	1
	1732.5	20175	10	16QAM	25	0	22.36	0-2	2
	1732.5	20175	10	16QAM	25	12	22.28	0-2	2
	1732.5	20175	10	16QAM	25	25	22.20	0-2	2
	1732.5	20175	10	16QAM	50	0	22.16	0-2	2
High	1750	20350	10	QPSK	1	0	24.18	0	0
	1750	20350	10	QPSK	1	25	24.09	0	0
	1750	20350	10	QPSK	1	49	24.17	0	0
	1750	20350	10	QPSK	25	0	23.18	0-1	1
	1750	20350	10	QPSK	25	12	23.10	0-1	1
	1750	20350	10	QPSK	25	25	23.08	0-1	1
	1750	20350	10	QPSK	50	0	23.04	0-1	1
	1750	20350	10	16QAM	1	0	23.28	0-1	1
	1750	20350	10	16QAM	1	25	23.18	0-1	1
	1750	20350	10	16QAM	1	49	23.17	0-1	1
	1750	20350	10	16QAM	25	0	22.14	0-2	2
	1750	20350	10	16QAM	25	12	22.15	0-2	2
	1750	20350	10	16QAM	25	25	22.04	0-2	2
	1750	20350	10	16QAM	50	0	22.09	0-2	2

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Table 8-18
LTE Band 4 (AWS) Conducted Powers – 5 MHz Bandwidth
Maximum Power

	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	23.78	0	0
	1712.5	19975	5	QPSK	1	12	23.84	0	0
	1712.5	19975	5	QPSK	1	24	23.93	0	0
	1712.5	19975	5	QPSK	12	0	22.91	0-1	1
	1712.5	19975	5	QPSK	12	6	22.88	0-1	1
	1712.5	19975	5	QPSK	12	13	22.90	0-1	1
	1712.5	19975	5	QPSK	25	0	22.84	0-1	1
	1712.5	19975	5	16-QAM	1	0	22.91	0-1	1
	1712.5	19975	5	16-QAM	1	12	22.96	0-1	1
	1712.5	19975	5	16-QAM	1	24	23.07	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.99	0-2	2
	1712.5	19975	5	16-QAM	12	6	21.98	0-2	2
	1712.5	19975	5	16-QAM	12	13	21.97	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.90	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	24.39	0	0
	1732.5	20175	5	QPSK	1	12	24.42	0	0
	1732.5	20175	5	QPSK	1	24	24.40	0	0
	1732.5	20175	5	QPSK	12	0	23.31	0-1	1
	1732.5	20175	5	QPSK	12	6	23.29	0-1	1
	1732.5	20175	5	QPSK	12	13	23.26	0-1	1
	1732.5	20175	5	QPSK	25	0	23.28	0-1	1
	1732.5	20175	5	16-QAM	1	0	23.49	0-1	1
	1732.5	20175	5	16-QAM	1	12	23.42	0-1	1
	1732.5	20175	5	16-QAM	1	24	23.43	0-1	1
	1732.5	20175	5	16-QAM	12	0	22.45	0-2	2
	1732.5	20175	5	16-QAM	12	6	22.41	0-2	2
	1732.5	20175	5	16-QAM	12	13	22.37	0-2	2
	1732.5	20175	5	16-QAM	25	0	22.33	0-2	2
High	1752.5	20375	5	QPSK	1	0	24.09	0	0
	1752.5	20375	5	QPSK	1	12	24.06	0	0
	1752.5	20375	5	QPSK	1	24	24.12	0	0
	1752.5	20375	5	QPSK	12	0	23.11	0-1	1
	1752.5	20375	5	QPSK	12	6	23.10	0-1	1
	1752.5	20375	5	QPSK	12	13	23.09	0-1	1
	1752.5	20375	5	QPSK	25	0	23.04	0-1	1
	1752.5	20375	5	16-QAM	1	0	23.21	0-1	1
	1752.5	20375	5	16-QAM	1	12	23.12	0-1	1
	1752.5	20375	5	16-QAM	1	24	23.28	0-1	1
	1752.5	20375	5	16-QAM	12	0	22.22	0-2	2
	1752.5	20375	5	16-QAM	12	6	22.11	0-2	2
	1752.5	20375	5	16-QAM	12	13	22.14	0-2	2
	1752.5	20375	5	16-QAM	25	0	22.15	0-2	2

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Table 8-19
LTE Band 4 (AWS) Conducted Powers – 3 MHz Bandwidth
Maximum Power

	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	23.76	0	0
	1711.5	19965	3	QPSK	1	7	23.83	0	0
	1711.5	19965	3	QPSK	1	14	23.88	0	0
	1711.5	19965	3	QPSK	8	0	22.86	0-1	1
	1711.5	19965	3	QPSK	8	4	22.90	0-1	1
	1711.5	19965	3	QPSK	8	7	22.88	0-1	1
	1711.5	19965	3	QPSK	15	0	22.81	0-1	1
	1711.5	19965	3	16-QAM	1	0	22.96	0-1	1
	1711.5	19965	3	16-QAM	1	7	22.92	0-1	1
	1711.5	19965	3	16-QAM	1	14	23.07	0-1	1
	1711.5	19965	3	16-QAM	8	0	22.03	0-2	2
	1711.5	19965	3	16-QAM	8	4	22.01	0-2	2
	1711.5	19965	3	16-QAM	8	7	21.95	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.92	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	24.39	0	0
	1732.5	20175	3	QPSK	1	7	24.37	0	0
	1732.5	20175	3	QPSK	1	14	24.43	0	0
	1732.5	20175	3	QPSK	8	0	23.34	0-1	1
	1732.5	20175	3	QPSK	8	4	23.25	0-1	1
	1732.5	20175	3	QPSK	8	7	23.26	0-1	1
	1732.5	20175	3	QPSK	15	0	23.29	0-1	1
	1732.5	20175	3	16-QAM	1	0	23.46	0-1	1
	1732.5	20175	3	16-QAM	1	7	23.42	0-1	1
	1732.5	20175	3	16-QAM	1	14	23.40	0-1	1
	1732.5	20175	3	16-QAM	8	0	22.50	0-2	2
	1732.5	20175	3	16-QAM	8	4	22.43	0-2	2
	1732.5	20175	3	16-QAM	8	7	22.35	0-2	2
	1732.5	20175	3	16-QAM	15	0	22.31	0-2	2
High	1753.5	20385	3	QPSK	1	0	24.08	0	0
	1753.5	20385	3	QPSK	1	7	24.01	0	0
	1753.5	20385	3	QPSK	1	14	24.15	0	0
	1753.5	20385	3	QPSK	8	0	23.08	0-1	1
	1753.5	20385	3	QPSK	8	4	23.10	0-1	1
	1753.5	20385	3	QPSK	8	7	23.13	0-1	1
	1753.5	20385	3	QPSK	15	0	22.99	0-1	1
	1753.5	20385	3	16-QAM	1	0	23.16	0-1	1
	1753.5	20385	3	16-QAM	1	7	23.07	0-1	1
	1753.5	20385	3	16-QAM	1	14	23.24	0-1	1
	1753.5	20385	3	16-QAM	8	0	22.19	0-2	2
	1753.5	20385	3	16-QAM	8	4	22.09	0-2	2
	1753.5	20385	3	16-QAM	8	7	22.09	0-2	2
	1753.5	20385	3	16-QAM	15	0	22.10	0-2	2

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Table 8-20
LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth
Maximum Power

	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	23.71	0	0
	1710.7	19957	1.4	QPSK	1	2	23.80	0	0
	1710.7	19957	1.4	QPSK	1	5	23.83	0	0
	1710.7	19957	1.4	QPSK	3	0	23.90	0	0
	1710.7	19957	1.4	QPSK	3	2	23.95	0	0
	1710.7	19957	1.4	QPSK	3	3	23.89	0	0
	1710.7	19957	1.4	QPSK	6	0	22.85	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	22.93	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	22.96	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	23.09	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	23.02	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	23.03	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	22.90	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	21.94	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	24.35	0	0
	1732.5	20175	1.4	QPSK	1	2	24.33	0	0
	1732.5	20175	1.4	QPSK	1	5	24.45	0	0
	1732.5	20175	1.4	QPSK	3	0	24.33	0	0
	1732.5	20175	1.4	QPSK	3	2	24.30	0	0
	1732.5	20175	1.4	QPSK	3	3	24.30	0	0
	1732.5	20175	1.4	QPSK	6	0	23.27	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	23.45	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	23.47	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	23.42	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	23.50	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	23.38	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	23.40	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	22.32	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	24.13	0	0
	1754.3	20393	1.4	QPSK	1	2	23.99	0	0
	1754.3	20393	1.4	QPSK	1	5	24.16	0	0
	1754.3	20393	1.4	QPSK	3	0	24.06	0	0
	1754.3	20393	1.4	QPSK	3	2	24.14	0	0
	1754.3	20393	1.4	QPSK	3	3	24.11	0	0
	1754.3	20393	1.4	QPSK	6	0	22.97	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	23.15	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	23.12	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	23.22	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	23.15	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	23.05	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	23.07	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	22.06	0-2	2

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Table 8-21
LTE Band 4 (AWS) Conducted Powers – 20 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.34	0	0
	1732.5	20175	20	QPSK	1	50	16.40	0	0
	1732.5	20175	20	QPSK	1	99	**16.43**	0	0
	1732.5	20175	20	QPSK	50	0	**15.39**	0-1	1
	1732.5	20175	20	QPSK	50	25	15.23	0-1	1
	1732.5	20175	20	QPSK	50	50	15.26	0-1	1
	1732.5	20175	20	QPSK	100	0	15.23	0-1	1
	1732.5	20175	20	16QAM	1	0	15.30	0-1	1
	1732.5	20175	20	16QAM	1	50	15.31	0-1	1
	1732.5	20175	20	16QAM	1	99	15.32	0-1	1
	1732.5	20175	20	16QAM	50	0	14.45	0-2	2
	1732.5	20175	20	16QAM	50	25	14.46	0-2	2
	1732.5	20175	20	16QAM	50	50	14.34	0-2	2
	1732.5	20175	20	16QAM	100	0	14.26	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 8-22
LTE Band 4 (AWS) Conducted Powers – 15 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.25	0	0
	1717.5	20025	15	QPSK	1	36	16.33	0	0
	1717.5	20025	15	QPSK	1	74	16.45	0	0
	1717.5	20025	15	QPSK	36	0	15.29	0-1	1
	1717.5	20025	15	QPSK	36	18	15.36	0-1	1
	1717.5	20025	15	QPSK	36	37	15.35	0-1	1
	1717.5	20025	15	QPSK	75	0	15.32	0-1	1
	1717.5	20025	15	16QAM	1	0	15.13	0-1	1
	1717.5	20025	15	16QAM	1	36	15.05	0-1	1
	1717.5	20025	15	16QAM	1	74	15.42	0-1	1
	1717.5	20025	15	16QAM	36	0	14.16	0-2	2
	1717.5	20025	15	16QAM	36	18	14.27	0-2	2
	1717.5	20025	15	16QAM	36	37	14.28	0-2	2
	1717.5	20025	15	16QAM	75	0	14.27	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	16.25	0	0
	1732.5	20175	15	QPSK	1	36	16.50	0	0
	1732.5	20175	15	QPSK	1	74	16.47	0	0
	1732.5	20175	15	QPSK	36	0	15.41	0-1	1
	1732.5	20175	15	QPSK	36	18	15.47	0-1	1
	1732.5	20175	15	QPSK	36	37	15.39	0-1	1
	1732.5	20175	15	QPSK	75	0	15.35	0-1	1
	1732.5	20175	15	16QAM	1	0	15.21	0-1	1
	1732.5	20175	15	16QAM	1	36	15.35	0-1	1
	1732.5	20175	15	16QAM	1	74	15.35	0-1	1
	1732.5	20175	15	16QAM	36	0	14.44	0-2	2
	1732.5	20175	15	16QAM	36	18	14.50	0-2	2
	1732.5	20175	15	16QAM	36	37	14.44	0-2	2
	1732.5	20175	15	16QAM	75	0	14.42	0-2	2
High	1747.5	20325	15	QPSK	1	0	16.50	0	0
	1747.5	20325	15	QPSK	1	36	16.35	0	0
	1747.5	20325	15	QPSK	1	74	16.41	0	0
	1747.5	20325	15	QPSK	36	0	15.41	0-1	1
	1747.5	20325	15	QPSK	36	18	15.30	0-1	1
	1747.5	20325	15	QPSK	36	37	15.36	0-1	1
	1747.5	20325	15	QPSK	75	0	15.35	0-1	1
	1747.5	20325	15	16QAM	1	0	15.16	0-1	1
	1747.5	20325	15	16QAM	1	36	15.08	0-1	1
	1747.5	20325	15	16QAM	1	74	15.03	0-1	1
	1747.5	20325	15	16QAM	36	0	14.33	0-2	2
	1747.5	20325	15	16QAM	36	18	14.31	0-2	2
	1747.5	20325	15	16QAM	36	37	14.28	0-2	2
	1747.5	20325	15	16QAM	75	0	14.26	0-2	2

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Table 8-23
LTE Band 4 (AWS) Conducted Powers – 10 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.16	0	0
	1715	20000	10	QPSK	1	25	16.41	0	0
	1715	20000	10	QPSK	1	49	16.35	0	0
	1715	20000	10	QPSK	25	0	15.32	0-1	1
	1715	20000	10	QPSK	25	12	15.34	0-1	1
	1715	20000	10	QPSK	25	25	15.40	0-1	1
	1715	20000	10	QPSK	50	0	15.34	0-1	1
	1715	20000	10	16QAM	1	0	15.13	0-1	1
	1715	20000	10	16QAM	1	25	15.27	0-1	1
	1715	20000	10	16QAM	1	49	15.31	0-1	1
	1715	20000	10	16QAM	25	0	14.24	0-2	2
	1715	20000	10	16QAM	25	12	14.36	0-2	2
	1715	20000	10	16QAM	25	25	14.32	0-2	2
	1715	20000	10	16QAM	50	0	14.16	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	16.48	0	0
	1732.5	20175	10	QPSK	1	25	16.39	0	0
	1732.5	20175	10	QPSK	1	49	16.40	0	0
	1732.5	20175	10	QPSK	25	0	15.47	0-1	1
	1732.5	20175	10	QPSK	25	12	15.49	0-1	1
	1732.5	20175	10	QPSK	25	25	15.45	0-1	1
	1732.5	20175	10	QPSK	50	0	15.43	0-1	1
	1732.5	20175	10	16QAM	1	0	15.45	0-1	1
	1732.5	20175	10	16QAM	1	25	15.25	0-1	1
	1732.5	20175	10	16QAM	1	49	15.22	0-1	1
	1732.5	20175	10	16QAM	25	0	14.50	0-2	2
	1732.5	20175	10	16QAM	25	12	14.44	0-2	2
	1732.5	20175	10	16QAM	25	25	14.45	0-2	2
	1732.5	20175	10	16QAM	50	0	14.44	0-2	2
High	1750	20350	10	QPSK	1	0	16.18	0	0
	1750	20350	10	QPSK	1	25	16.15	0	0
	1750	20350	10	QPSK	1	49	16.38	0	0
	1750	20350	10	QPSK	25	0	15.32	0-1	1
	1750	20350	10	QPSK	25	12	15.33	0-1	1
	1750	20350	10	QPSK	25	25	15.22	0-1	1
	1750	20350	10	QPSK	50	0	15.44	0-1	1
	1750	20350	10	16QAM	1	0	15.19	0-1	1
	1750	20350	10	16QAM	1	25	15.02	0-1	1
	1750	20350	10	16QAM	1	49	15.19	0-1	1
	1750	20350	10	16QAM	25	0	14.37	0-2	2
	1750	20350	10	16QAM	25	12	14.29	0-2	2
	1750	20350	10	16QAM	25	25	14.16	0-2	2
	1750	20350	10	16QAM	50	0	14.33	0-2	2

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Table 8-24
LTE Band 4 (AWS) Conducted Powers – 5 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.25	0	0
	1712.5	19975	5	QPSK	1	12	16.32	0	0
	1712.5	19975	5	QPSK	1	24	16.36	0	0
	1712.5	19975	5	QPSK	12	0	15.16	0-1	1
	1712.5	19975	5	QPSK	12	6	15.33	0-1	1
	1712.5	19975	5	QPSK	12	13	15.37	0-1	1
	1712.5	19975	5	QPSK	25	0	15.24	0-1	1
	1712.5	19975	5	16-QAM	1	0	15.32	0-1	1
	1712.5	19975	5	16-QAM	1	12	15.41	0-1	1
	1712.5	19975	5	16-QAM	1	24	15.47	0-1	1
	1712.5	19975	5	16-QAM	12	0	14.30	0-2	2
	1712.5	19975	5	16-QAM	12	6	14.23	0-2	2
	1712.5	19975	5	16-QAM	12	13	14.23	0-2	2
	1712.5	19975	5	16-QAM	25	0	14.19	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	16.43	0	0
	1732.5	20175	5	QPSK	1	12	16.35	0	0
	1732.5	20175	5	QPSK	1	24	16.44	0	0
	1732.5	20175	5	QPSK	12	0	15.38	0-1	1
	1732.5	20175	5	QPSK	12	6	15.44	0-1	1
	1732.5	20175	5	QPSK	12	13	15.40	0-1	1
	1732.5	20175	5	QPSK	25	0	15.39	0-1	1
	1732.5	20175	5	16-QAM	1	0	15.29	0-1	1
	1732.5	20175	5	16-QAM	1	12	15.17	0-1	1
	1732.5	20175	5	16-QAM	1	24	15.26	0-1	1
	1732.5	20175	5	16-QAM	12	0	14.47	0-2	2
	1732.5	20175	5	16-QAM	12	6	14.46	0-2	2
	1732.5	20175	5	16-QAM	12	13	14.47	0-2	2
	1732.5	20175	5	16-QAM	25	0	14.38	0-2	2
High	1752.5	20375	5	QPSK	1	0	16.30	0	0
	1752.5	20375	5	QPSK	1	12	16.35	0	0
	1752.5	20375	5	QPSK	1	24	16.50	0	0
	1752.5	20375	5	QPSK	12	0	15.48	0-1	1
	1752.5	20375	5	QPSK	12	6	15.28	0-1	1
	1752.5	20375	5	QPSK	12	13	15.44	0-1	1
	1752.5	20375	5	QPSK	25	0	15.32	0-1	1
	1752.5	20375	5	16-QAM	1	0	15.04	0-1	1
	1752.5	20375	5	16-QAM	1	12	15.05	0-1	1
	1752.5	20375	5	16-QAM	1	24	15.21	0-1	1
	1752.5	20375	5	16-QAM	12	0	14.18	0-2	2
	1752.5	20375	5	16-QAM	12	6	14.15	0-2	2
	1752.5	20375	5	16-QAM	12	13	14.23	0-2	2
	1752.5	20375	5	16-QAM	25	0	14.14	0-2	2

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Table 8-25
LTE Band 4 (AWS) Conducted Powers – 3 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.21	0	0
	1711.5	19965	3	QPSK	1	7	16.34	0	0
	1711.5	19965	3	QPSK	1	14	16.32	0	0
	1711.5	19965	3	QPSK	8	0	15.14	0-1	1
	1711.5	19965	3	QPSK	8	4	15.35	0-1	1
	1711.5	19965	3	QPSK	8	7	15.33	0-1	1
	1711.5	19965	3	QPSK	15	0	15.28	0-1	1
	1711.5	19965	3	16-QAM	1	0	15.35	0-1	1
	1711.5	19965	3	16-QAM	1	7	15.37	0-1	1
	1711.5	19965	3	16-QAM	1	14	15.44	0-1	1
	1711.5	19965	3	16-QAM	8	0	14.32	0-2	2
	1711.5	19965	3	16-QAM	8	4	14.23	0-2	2
	1711.5	19965	3	16-QAM	8	7	14.24	0-2	2
	1711.5	19965	3	16-QAM	15	0	14.22	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	16.47	0	0
	1732.5	20175	3	QPSK	1	7	16.40	0	0
	1732.5	20175	3	QPSK	1	14	16.41	0	0
	1732.5	20175	3	QPSK	8	0	15.39	0-1	1
	1732.5	20175	3	QPSK	8	4	15.39	0-1	1
	1732.5	20175	3	QPSK	8	7	15.38	0-1	1
	1732.5	20175	3	QPSK	15	0	15.43	0-1	1
	1732.5	20175	3	16-QAM	1	0	15.26	0-1	1
	1732.5	20175	3	16-QAM	1	7	15.17	0-1	1
	1732.5	20175	3	16-QAM	1	14	15.24	0-1	1
	1732.5	20175	3	16-QAM	8	0	14.49	0-2	2
	1732.5	20175	3	16-QAM	8	4	14.47	0-2	2
	1732.5	20175	3	16-QAM	8	7	14.43	0-2	2
	1732.5	20175	3	16-QAM	15	0	14.41	0-2	2
High	1753.5	20385	3	QPSK	1	0	16.27	0	0
	1753.5	20385	3	QPSK	1	7	16.36	0	0
	1753.5	20385	3	QPSK	1	14	16.49	0	0
	1753.5	20385	3	QPSK	8	0	15.46	0-1	1
	1753.5	20385	3	QPSK	8	4	15.33	0-1	1
	1753.5	20385	3	QPSK	8	7	15.43	0-1	1
	1753.5	20385	3	QPSK	15	0	15.34	0-1	1
	1753.5	20385	3	16-QAM	1	0	15.05	0-1	1
	1753.5	20385	3	16-QAM	1	7	15.00	0-1	1
	1753.5	20385	3	16-QAM	1	14	15.22	0-1	1
	1753.5	20385	3	16-QAM	8	0	14.23	0-2	2
	1753.5	20385	3	16-QAM	8	4	14.18	0-2	2
	1753.5	20385	3	16-QAM	8	7	14.19	0-2	2
	1753.5	20385	3	16-QAM	15	0	14.19	0-2	2

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Table 8-26
LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	16.26	0	0
	1710.7	19957	1.4	QPSK	1	2	16.31	0	0
	1710.7	19957	1.4	QPSK	1	5	16.33	0	0
	1710.7	19957	1.4	QPSK	3	0	16.17	0	0
	1710.7	19957	1.4	QPSK	3	2	16.39	0	0
	1710.7	19957	1.4	QPSK	3	3	16.29	0	0
	1710.7	19957	1.4	QPSK	6	0	15.32	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	15.38	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	15.33	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	15.43	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	15.29	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	15.18	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	15.24	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	14.26	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	16.42	0	0
	1732.5	20175	1.4	QPSK	1	2	16.43	0	0
	1732.5	20175	1.4	QPSK	1	5	16.38	0	0
	1732.5	20175	1.4	QPSK	3	0	16.37	0	0
	1732.5	20175	1.4	QPSK	3	2	16.37	0	0
	1732.5	20175	1.4	QPSK	3	3	16.39	0	0
	1732.5	20175	1.4	QPSK	6	0	15.48	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	15.28	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	15.22	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	15.24	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	15.46	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	15.44	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	15.47	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	14.37	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	16.32	0	0
	1754.3	20393	1.4	QPSK	1	2	16.32	0	0
	1754.3	20393	1.4	QPSK	1	5	16.44	0	0
	1754.3	20393	1.4	QPSK	3	0	16.46	0	0
	1754.3	20393	1.4	QPSK	3	2	16.34	0	0
	1754.3	20393	1.4	QPSK	3	3	16.44	0	0
	1754.3	20393	1.4	QPSK	6	0	15.33	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	15.03	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	14.97	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	15.27	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	15.19	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	15.15	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	15.18	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	14.24	0-2	2

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8.2.4 LTE Band 2 (PCS)

Table 8-27
LTE Band 2 (PCS) Conducted Powers – 20 MHz Bandwidth
Maximum Power

	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	23.19	0	0
	1860	18700	20	QPSK	1	50	23.15	0	0
	1860	18700	20	QPSK	1	99	23.26	0	0
	1860	18700	20	QPSK	50	0	22.30	0-1	1
	1860	18700	20	QPSK	50	25	22.31	0-1	1
	1860	18700	20	QPSK	50	50	22.33	0-1	1
	1860	18700	20	QPSK	100	0	22.32	0-1	1
	1860	18700	20	16QAM	1	0	22.41	0-1	1
	1860	18700	20	16QAM	1	50	22.37	0-1	1
	1860	18700	20	16QAM	1	99	22.38	0-1	1
	1860	18700	20	16QAM	50	0	21.46	0-2	2
	1860	18700	20	16QAM	50	25	21.38	0-2	2
	1860	18700	20	16QAM	50	50	21.31	0-2	2
	1860	18700	20	16QAM	100	0	21.46	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	23.43	0	0
	1880.0	18900	20	QPSK	1	50	**23.50**	0	0
	1880.0	18900	20	QPSK	1	99	23.46	0	0
	1880.0	18900	20	QPSK	50	0	22.42	0-1	1
	1880.0	18900	20	QPSK	50	25	**22.49**	0-1	1
	1880.0	18900	20	QPSK	50	50	22.47	0-1	1
	1880.0	18900	20	QPSK	100	0	22.48	0-1	1
	1880.0	18900	20	16QAM	1	0	22.38	0-1	1
	1880.0	18900	20	16QAM	1	50	22.42	0-1	1
	1880.0	18900	20	16QAM	1	99	22.37	0-1	1
	1880.0	18900	20	16QAM	50	0	21.40	0-2	2
	1880.0	18900	20	16QAM	50	25	21.47	0-2	2
	1880.0	18900	20	16QAM	50	50	21.38	0-2	2
	1880.0	18900	20	16QAM	100	0	21.33	0-2	2
High	1900	19100	20	QPSK	1	0	23.45	0	0
	1900	19100	20	QPSK	1	50	23.20	0	0
	1900	19100	20	QPSK	1	99	23.10	0	0
	1900	19100	20	QPSK	50	0	22.48	0-1	1
	1900	19100	20	QPSK	50	25	22.45	0-1	1
	1900	19100	20	QPSK	50	50	22.43	0-1	1
	1900	19100	20	QPSK	100	0	22.40	0-1	1
	1900	19100	20	16QAM	1	0	22.37	0-1	1
	1900	19100	20	16QAM	1	50	22.42	0-1	1
	1900	19100	20	16QAM	1	99	22.39	0-1	1
	1900	19100	20	16QAM	50	0	21.41	0-2	2
	1900	19100	20	16QAM	50	25	21.39	0-2	2
	1900	19100	20	16QAM	50	50	21.45	0-2	2
	1900	19100	20	16QAM	100	0	21.39	0-2	2

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Table 8-28
LTE Band 2 (PCS) Conducted Powers – 15 MHz Bandwidth
Maximum Power

	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	23.18	0	0
	1857.5	18675	15	QPSK	1	36	23.14	0	0
	1857.5	18675	15	QPSK	1	74	23.25	0	0
	1857.5	18675	15	QPSK	36	0	22.29	0-1	1
	1857.5	18675	15	QPSK	36	18	22.30	0-1	1
	1857.5	18675	15	QPSK	36	37	22.32	0-1	1
	1857.5	18675	15	QPSK	75	0	22.31	0-1	1
	1857.5	18675	15	16QAM	1	0	22.40	0-1	1
	1857.5	18675	15	16QAM	1	36	22.36	0-1	1
	1857.5	18675	15	16QAM	1	74	22.37	0-1	1
	1857.5	18675	15	16QAM	36	0	21.45	0-2	2
	1857.5	18675	15	16QAM	36	18	21.38	0-2	2
	1857.5	18675	15	16QAM	36	37	21.39	0-2	2
	1857.5	18675	15	16QAM	75	0	21.45	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	23.43	0	0
	1880.0	18900	15	QPSK	1	36	23.48	0	0
	1880.0	18900	15	QPSK	1	74	23.42	0	0
	1880.0	18900	15	QPSK	36	0	22.41	0-1	1
	1880.0	18900	15	QPSK	36	18	22.48	0-1	1
	1880.0	18900	15	QPSK	36	37	22.46	0-1	1
	1880.0	18900	15	QPSK	75	0	22.47	0-1	1
	1880.0	18900	15	16QAM	1	0	22.37	0-1	1
	1880.0	18900	15	16QAM	1	36	22.41	0-1	1
	1880.0	18900	15	16QAM	1	74	22.36	0-1	1
	1880.0	18900	15	16QAM	36	0	21.32	0-2	2
	1880.0	18900	15	16QAM	36	18	21.45	0-2	2
	1880.0	18900	15	16QAM	36	37	21.37	0-2	2
	1880.0	18900	15	16QAM	75	0	21.40	0-2	2
High	1902.5	19125	15	QPSK	1	0	23.48	0	0
	1902.5	19125	15	QPSK	1	36	23.45	0	0
	1902.5	19125	15	QPSK	1	74	23.44	0	0
	1902.5	19125	15	QPSK	36	0	22.47	0-1	1
	1902.5	19125	15	QPSK	36	18	22.44	0-1	1
	1902.5	19125	15	QPSK	36	37	22.42	0-1	1
	1902.5	19125	15	QPSK	75	0	22.39	0-1	1
	1902.5	19125	15	16QAM	1	0	22.41	0-1	1
	1902.5	19125	15	16QAM	1	36	22.36	0-1	1
	1902.5	19125	15	16QAM	1	74	22.38	0-1	1
	1902.5	19125	15	16QAM	36	0	21.37	0-2	2
	1902.5	19125	15	16QAM	36	18	21.40	0-2	2
	1902.5	19125	15	16QAM	36	37	21.45	0-2	2
	1902.5	19125	15	16QAM	75	0	21.42	0-2	2

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Table 8-29
LTE Band 2 (PCS) Conducted Powers – 10 MHz Bandwidth
Maximum Power

	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	23.21	0	0
	1855	18650	10	QPSK	1	25	23.24	0	0
	1855	18650	10	QPSK	1	49	23.25	0	0
	1855	18650	10	QPSK	25	0	22.29	0-1	1
	1855	18650	10	QPSK	25	12	22.30	0-1	1
	1855	18650	10	QPSK	25	25	22.32	0-1	1
	1855	18650	10	QPSK	50	0	22.43	0-1	1
	1855	18650	10	16QAM	1	0	22.35	0-1	1
	1855	18650	10	16QAM	1	25	22.36	0-1	1
	1855	18650	10	16QAM	1	49	22.37	0-1	1
	1855	18650	10	16QAM	25	0	21.41	0-2	2
	1855	18650	10	16QAM	25	12	21.37	0-2	2
	1855	18650	10	16QAM	25	25	21.30	0-2	2
	1855	18650	10	16QAM	50	0	21.38	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	23.45	0	0
	1880.0	18900	10	QPSK	1	25	23.47	0	0
	1880.0	18900	10	QPSK	1	49	23.40	0	0
	1880.0	18900	10	QPSK	25	0	22.41	0-1	1
	1880.0	18900	10	QPSK	25	12	22.48	0-1	1
	1880.0	18900	10	QPSK	25	25	22.46	0-1	1
	1880.0	18900	10	QPSK	50	0	22.43	0-1	1
	1880.0	18900	10	16QAM	1	0	22.37	0-1	1
	1880.0	18900	10	16QAM	1	25	22.39	0-1	1
	1880.0	18900	10	16QAM	1	49	22.36	0-1	1
	1880.0	18900	10	16QAM	25	0	21.39	0-2	2
	1880.0	18900	10	16QAM	25	12	21.46	0-2	2
	1880.0	18900	10	16QAM	25	25	21.37	0-2	2
	1880.0	18900	10	16QAM	50	0	21.42	0-2	2
High	1905	19150	10	QPSK	1	0	23.36	0	0
	1905	19150	10	QPSK	1	25	23.17	0	0
	1905	19150	10	QPSK	1	49	23.09	0	0
	1905	19150	10	QPSK	25	0	22.42	0-1	1
	1905	19150	10	QPSK	25	12	22.41	0-1	1
	1905	19150	10	QPSK	25	25	22.43	0-1	1
	1905	19150	10	QPSK	50	0	22.39	0-1	1
	1905	19150	10	16QAM	1	0	22.36	0-1	1
	1905	19150	10	16QAM	1	25	22.39	0-1	1
	1905	19150	10	16QAM	1	49	22.34	0-1	1
	1905	19150	10	16QAM	25	0	21.43	0-2	2
	1905	19150	10	16QAM	25	12	21.40	0-2	2
	1905	19150	10	16QAM	25	25	21.43	0-2	2
	1905	19150	10	16QAM	50	0	21.37	0-2	2

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Table 8-30
LTE Band 2 (PCS) Conducted Powers – 5 MHz Bandwidth
Maximum Power

	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	23.16	0	0
	1852.5	18625	5	QPSK	1	12	23.12	0	0
	1852.5	18625	5	QPSK	1	24	23.23	0	0
	1852.5	18625	5	QPSK	12	0	22.27	0-1	1
	1852.5	18625	5	QPSK	12	6	22.28	0-1	1
	1852.5	18625	5	QPSK	12	13	22.30	0-1	1
	1852.5	18625	5	QPSK	25	0	22.29	0-1	1
	1852.5	18625	5	16-QAM	1	0	22.38	0-1	1
	1852.5	18625	5	16-QAM	1	12	22.34	0-1	1
	1852.5	18625	5	16-QAM	1	24	22.35	0-1	1
	1852.5	18625	5	16-QAM	12	0	21.43	0-2	2
	1852.5	18625	5	16-QAM	12	6	21.36	0-2	2
	1852.5	18625	5	16-QAM	12	13	21.37	0-2	2
	1852.5	18625	5	16-QAM	25	0	21.43	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	23.41	0	0
	1880.0	18900	5	QPSK	1	12	23.48	0	0
	1880.0	18900	5	QPSK	1	24	23.50	0	0
	1880.0	18900	5	QPSK	12	0	22.39	0-1	1
	1880.0	18900	5	QPSK	12	6	22.46	0-1	1
	1880.0	18900	5	QPSK	12	13	22.44	0-1	1
	1880.0	18900	5	QPSK	25	0	22.45	0-1	1
	1880.0	18900	5	16-QAM	1	0	22.35	0-1	1
	1880.0	18900	5	16-QAM	1	12	22.39	0-1	1
	1880.0	18900	5	16-QAM	1	24	22.34	0-1	1
	1880.0	18900	5	16-QAM	12	0	21.30	0-2	2
	1880.0	18900	5	16-QAM	12	6	21.43	0-2	2
	1880.0	18900	5	16-QAM	12	13	21.35	0-2	2
	1880.0	18900	5	16-QAM	25	0	21.38	0-2	2
High	1907.5	19175	5	QPSK	1	0	23.46	0	0
	1907.5	19175	5	QPSK	1	12	23.43	0	0
	1907.5	19175	5	QPSK	1	24	23.42	0	0
	1907.5	19175	5	QPSK	12	0	22.45	0-1	1
	1907.5	19175	5	QPSK	12	6	22.42	0-1	1
	1907.5	19175	5	QPSK	12	13	22.40	0-1	1
	1907.5	19175	5	QPSK	25	0	22.37	0-1	1
	1907.5	19175	5	16-QAM	1	0	22.39	0-1	1
	1907.5	19175	5	16-QAM	1	12	22.35	0-1	1
	1907.5	19175	5	16-QAM	1	24	22.36	0-1	1
	1907.5	19175	5	16-QAM	12	0	21.42	0-2	2
	1907.5	19175	5	16-QAM	12	6	21.40	0-2	2
	1907.5	19175	5	16-QAM	12	13	21.43	0-2	2
	1907.5	19175	5	16-QAM	25	0	21.40	0-2	2

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Table 8-31
LTE Band 2 (PCS) Conducted Powers – 3 MHz Bandwidth
Maximum Power

	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	23.16	0	0
	1851.5	18615	3	QPSK	1	7	23.12	0	0
	1851.5	18615	3	QPSK	1	14	23.23	0	0
	1851.5	18615	3	QPSK	8	0	22.27	0-1	1
	1851.5	18615	3	QPSK	8	4	22.28	0-1	1
	1851.5	18615	3	QPSK	8	7	22.30	0-1	1
	1851.5	18615	3	QPSK	15	0	22.29	0-1	1
	1851.5	18615	3	16-QAM	1	0	22.38	0-1	1
	1851.5	18615	3	16-QAM	1	7	22.34	0-1	1
	1851.5	18615	3	16-QAM	1	14	22.35	0-1	1
	1851.5	18615	3	16-QAM	8	0	21.34	0-2	2
	1851.5	18615	3	16-QAM	8	4	21.35	0-2	2
	1851.5	18615	3	16-QAM	8	7	21.26	0-2	2
	1851.5	18615	3	16-QAM	15	0	21.36	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	23.43	0	0
	1880.0	18900	3	QPSK	1	7	23.45	0	0
	1880.0	18900	3	QPSK	1	14	23.37	0	0
	1880.0	18900	3	QPSK	8	0	22.39	0-1	1
	1880.0	18900	3	QPSK	8	4	22.46	0-1	1
	1880.0	18900	3	QPSK	8	7	22.44	0-1	1
	1880.0	18900	3	QPSK	15	0	22.45	0-1	1
	1880.0	18900	3	16-QAM	1	0	22.35	0-1	1
	1880.0	18900	3	16-QAM	1	7	22.37	0-1	1
	1880.0	18900	3	16-QAM	1	14	22.34	0-1	1
	1880.0	18900	3	16-QAM	8	0	21.32	0-2	2
	1880.0	18900	3	16-QAM	8	4	21.46	0-2	2
	1880.0	18900	3	16-QAM	8	7	21.35	0-2	2
	1880.0	18900	3	16-QAM	15	0	21.30	0-2	2
High	1908.5	19185	3	QPSK	1	0	23.34	0	0
	1908.5	19185	3	QPSK	1	7	23.15	0	0
	1908.5	19185	3	QPSK	1	14	23.07	0	0
	1908.5	19185	3	QPSK	8	0	22.45	0-1	1
	1908.5	19185	3	QPSK	8	4	22.42	0-1	1
	1908.5	19185	3	QPSK	8	7	22.41	0-1	1
	1908.5	19185	3	QPSK	15	0	22.37	0-1	1
	1908.5	19185	3	16-QAM	1	0	22.34	0-1	1
	1908.5	19185	3	16-QAM	1	7	22.36	0-1	1
	1908.5	19185	3	16-QAM	1	14	22.32	0-1	1
	1908.5	19185	3	16-QAM	8	0	21.38	0-2	2
	1908.5	19185	3	16-QAM	8	4	21.37	0-2	2
	1908.5	19185	3	16-QAM	8	7	21.42	0-2	2
	1908.5	19185	3	16-QAM	15	0	21.36	0-2	2

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Table 8-32
LTE Band 2 (PCS) Conducted Powers – 1.4 MHz Bandwidth
Maximum Power

	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	23.19	0	0
	1850.7	18607	1.4	QPSK	1	2	23.12	0	0
	1850.7	18607	1.4	QPSK	1	5	23.25	0	0
	1850.7	18607	1.4	QPSK	3	0	23.32	0	0
	1850.7	18607	1.4	QPSK	3	2	23.31	0	0
	1850.7	18607	1.4	QPSK	3	3	23.31	0	0
	1850.7	18607	1.4	QPSK	6	0	22.32	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	22.38	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	22.39	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	22.30	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	22.32	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	22.39	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	22.28	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	21.32	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	23.46	0	0
	1880.0	18900	1.4	QPSK	1	2	23.41	0	0
	1880.0	18900	1.4	QPSK	1	5	23.36	0	0
	1880.0	18900	1.4	QPSK	3	0	23.36	0	0
	1880.0	18900	1.4	QPSK	3	2	23.44	0	0
	1880.0	18900	1.4	QPSK	3	3	23.41	0	0
	1880.0	18900	1.4	QPSK	6	0	22.43	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	22.33	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	22.34	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	22.31	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	22.34	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	22.48	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	22.32	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	21.35	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	23.30	0	0
	1909.3	19193	1.4	QPSK	1	2	23.17	0	0
	1909.3	19193	1.4	QPSK	1	5	23.05	0	0
	1909.3	19193	1.4	QPSK	3	0	23.47	0	0
	1909.3	19193	1.4	QPSK	3	2	23.40	0	0
	1909.3	19193	1.4	QPSK	3	3	23.45	0	0
	1909.3	19193	1.4	QPSK	6	0	22.33	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	22.37	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	22.31	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	22.34	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	22.33	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	22.42	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	22.42	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	21.36	0-2	2

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Table 8-33
LTE Band 2 (PCS) Conducted Powers – 20 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	14.77	0	0
	1860	18700	20	QPSK	1	50	14.98	0	0
	1860	18700	20	QPSK	1	99	14.92	0	0
	1860	18700	20	QPSK	50	0	13.92	0-1	1
	1860	18700	20	QPSK	50	25	13.97	0-1	1
	1860	18700	20	QPSK	50	50	14.08	0-1	1
	1860	18700	20	QPSK	100	0	13.96	0-1	1
	1860	18700	20	16QAM	1	0	13.82	0-1	1
	1860	18700	20	16QAM	1	50	13.89	0-1	1
	1860	18700	20	16QAM	1	99	13.72	0-1	1
	1860	18700	20	16QAM	50	0	12.97	0-2	2
	1860	18700	20	16QAM	50	25	13.17	0-2	2
	1860	18700	20	16QAM	50	50	12.82	0-2	2
	1860	18700	20	16QAM	100	0	12.88	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	15.01	0	0
	1880.0	18900	20	QPSK	1	50	**15.29**	0	0
	1880.0	18900	20	QPSK	1	99	14.96	0	0
	1880.0	18900	20	QPSK	50	0	14.10	0-1	1
	1880.0	18900	20	QPSK	50	25	**14.13**	0-1	1
	1880.0	18900	20	QPSK	50	50	14.12	0-1	1
	1880.0	18900	20	QPSK	100	0	14.11	0-1	1
	1880.0	18900	20	16QAM	1	0	13.79	0-1	1
	1880.0	18900	20	16QAM	1	50	14.04	0-1	1
	1880.0	18900	20	16QAM	1	99	13.51	0-1	1
	1880.0	18900	20	16QAM	50	0	12.53	0-2	2
	1880.0	18900	20	16QAM	50	25	12.59	0-2	2
	1880.0	18900	20	16QAM	50	50	12.52	0-2	2
	1880.0	18900	20	16QAM	100	0	13.13	0-2	2
High	1900	19100	20	QPSK	1	0	15.10	0	0
	1900	19100	20	QPSK	1	50	15.15	0	0
	1900	19100	20	QPSK	1	99	15.19	0	0
	1900	19100	20	QPSK	50	0	14.02	0-1	1
	1900	19100	20	QPSK	50	25	13.90	0-1	1
	1900	19100	20	QPSK	50	50	13.72	0-1	1
	1900	19100	20	QPSK	100	0	13.89	0-1	1
	1900	19100	20	16QAM	1	0	14.14	0-1	1
	1900	19100	20	16QAM	1	50	14.15	0-1	1
	1900	19100	20	16QAM	1	99	14.22	0-1	1
	1900	19100	20	16QAM	50	0	12.94	0-2	2
	1900	19100	20	16QAM	50	25	13.01	0-2	2
	1900	19100	20	16QAM	50	50	12.96	0-2	2
	1900	19100	20	16QAM	100	0	12.94	0-2	2

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Table 8-34
LTE Band 2 (PCS) Conducted Powers – 15 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	14.91	0	0
	1857.5	18675	15	QPSK	1	36	15.03	0	0
	1857.5	18675	15	QPSK	1	74	14.91	0	0
	1857.5	18675	15	QPSK	36	0	14.05	0-1	1
	1857.5	18675	15	QPSK	36	18	13.91	0-1	1
	1857.5	18675	15	QPSK	36	37	13.72	0-1	1
	1857.5	18675	15	QPSK	75	0	13.84	0-1	1
	1857.5	18675	15	16QAM	1	0	13.94	0-1	1
	1857.5	18675	15	16QAM	1	36	13.98	0-1	1
	1857.5	18675	15	16QAM	1	74	13.78	0-1	1
	1857.5	18675	15	16QAM	36	0	12.89	0-2	2
	1857.5	18675	15	16QAM	36	18	12.93	0-2	2
	1857.5	18675	15	16QAM	36	37	12.73	0-2	2
	1857.5	18675	15	16QAM	75	0	12.88	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	15.03	0	0
	1880.0	18900	15	QPSK	1	36	15.12	0	0
	1880.0	18900	15	QPSK	1	74	15.03	0	0
	1880.0	18900	15	QPSK	36	0	13.86	0-1	1
	1880.0	18900	15	QPSK	36	18	14.00	0-1	1
	1880.0	18900	15	QPSK	36	37	14.08	0-1	1
	1880.0	18900	15	QPSK	75	0	13.95	0-1	1
	1880.0	18900	15	16QAM	1	0	14.21	0-1	1
	1880.0	18900	15	16QAM	1	36	14.50	0-1	1
	1880.0	18900	15	16QAM	1	74	14.23	0-1	1
	1880.0	18900	15	16QAM	36	0	12.85	0-2	2
	1880.0	18900	15	16QAM	36	18	13.05	0-2	2
	1880.0	18900	15	16QAM	36	37	13.14	0-2	2
	1880.0	18900	15	16QAM	75	0	12.95	0-2	2
High	1902.5	19125	15	QPSK	1	0	15.10	0	0
	1902.5	19125	15	QPSK	1	36	14.95	0	0
	1902.5	19125	15	QPSK	1	74	15.18	0	0
	1902.5	19125	15	QPSK	36	0	13.92	0-1	1
	1902.5	19125	15	QPSK	36	18	13.87	0-1	1
	1902.5	19125	15	QPSK	36	37	13.87	0-1	1
	1902.5	19125	15	QPSK	75	0	13.58	0-1	1
	1902.5	19125	15	16QAM	1	0	14.03	0-1	1
	1902.5	19125	15	16QAM	1	36	13.93	0-1	1
	1902.5	19125	15	16QAM	1	74	13.74	0-1	1
	1902.5	19125	15	16QAM	36	0	12.60	0-2	2
	1902.5	19125	15	16QAM	36	18	12.63	0-2	2
	1902.5	19125	15	16QAM	36	37	12.69	0-2	2
	1902.5	19125	15	16QAM	75	0	12.56	0-2	2

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Table 8-35
LTE Band 2 (PCS) Conducted Powers – 10 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	14.96	0	0
	1855	18650	10	QPSK	1	25	14.96	0	0
	1855	18650	10	QPSK	1	49	15.14	0	0
	1855	18650	10	QPSK	25	0	13.88	0-1	1
	1855	18650	10	QPSK	25	12	13.95	0-1	1
	1855	18650	10	QPSK	25	25	13.80	0-1	1
	1855	18650	10	QPSK	50	0	13.81	0-1	1
	1855	18650	10	16QAM	1	0	13.78	0-1	1
	1855	18650	10	16QAM	1	25	14.05	0-1	1
	1855	18650	10	16QAM	1	49	13.75	0-1	1
	1855	18650	10	16QAM	25	0	12.89	0-2	2
	1855	18650	10	16QAM	25	12	12.96	0-2	2
	1855	18650	10	16QAM	25	25	12.81	0-2	2
	1855	18650	10	16QAM	50	0	12.78	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	15.09	0	0
	1880.0	18900	10	QPSK	1	25	15.14	0	0
	1880.0	18900	10	QPSK	1	49	15.21	0	0
	1880.0	18900	10	QPSK	25	0	14.17	0-1	1
	1880.0	18900	10	QPSK	25	12	14.29	0-1	1
	1880.0	18900	10	QPSK	25	25	14.26	0-1	1
	1880.0	18900	10	QPSK	50	0	14.29	0-1	1
	1880.0	18900	10	16QAM	1	0	14.20	0-1	1
	1880.0	18900	10	16QAM	1	25	14.26	0-1	1
	1880.0	18900	10	16QAM	1	49	14.16	0-1	1
	1880.0	18900	10	16QAM	25	0	12.86	0-2	2
	1880.0	18900	10	16QAM	25	12	12.99	0-2	2
	1880.0	18900	10	16QAM	25	25	13.04	0-2	2
	1880.0	18900	10	16QAM	50	0	12.97	0-2	2
High	1905	19150	10	QPSK	1	0	15.23	0	0
	1905	19150	10	QPSK	1	25	14.84	0	0
	1905	19150	10	QPSK	1	49	15.33	0	0
	1905	19150	10	QPSK	25	0	13.78	0-1	1
	1905	19150	10	QPSK	25	12	14.03	0-1	1
	1905	19150	10	QPSK	25	25	13.72	0-1	1
	1905	19150	10	QPSK	50	0	13.59	0-1	1
	1905	19150	10	16QAM	1	0	13.66	0-1	1
	1905	19150	10	16QAM	1	25	13.90	0-1	1
	1905	19150	10	16QAM	1	49	13.64	0-1	1
	1905	19150	10	16QAM	25	0	12.63	0-2	2
	1905	19150	10	16QAM	25	12	12.66	0-2	2
	1905	19150	10	16QAM	25	25	12.75	0-2	2
	1905	19150	10	16QAM	50	0	12.61	0-2	2

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Table 8-36
LTE Band 2 (PCS) Conducted Powers – 5 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	15.03	0	0
	1852.5	18625	5	QPSK	1	12	14.92	0	0
	1852.5	18625	5	QPSK	1	24	14.98	0	0
	1852.5	18625	5	QPSK	12	0	13.95	0-1	1
	1852.5	18625	5	QPSK	12	6	13.97	0-1	1
	1852.5	18625	5	QPSK	12	13	13.91	0-1	1
	1852.5	18625	5	QPSK	25	0	13.86	0-1	1
	1852.5	18625	5	16-QAM	1	0	14.04	0-1	1
	1852.5	18625	5	16-QAM	1	12	14.16	0-1	1
	1852.5	18625	5	16-QAM	1	24	14.11	0-1	1
	1852.5	18625	5	16-QAM	12	0	12.81	0-2	2
	1852.5	18625	5	16-QAM	12	6	12.86	0-2	2
	1852.5	18625	5	16-QAM	12	13	12.80	0-2	2
	1852.5	18625	5	16-QAM	25	0	12.75	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	15.12	0	0
	1880.0	18900	5	QPSK	1	12	15.17	0	0
	1880.0	18900	5	QPSK	1	24	15.19	0	0
	1880.0	18900	5	QPSK	12	0	14.21	0-1	1
	1880.0	18900	5	QPSK	12	6	14.25	0-1	1
	1880.0	18900	5	QPSK	12	13	14.29	0-1	1
	1880.0	18900	5	QPSK	25	0	14.33	0-1	1
	1880.0	18900	5	16-QAM	1	0	14.16	0-1	1
	1880.0	18900	5	16-QAM	1	12	14.21	0-1	1
	1880.0	18900	5	16-QAM	1	24	14.34	0-1	1
	1880.0	18900	5	16-QAM	12	0	12.99	0-2	2
	1880.0	18900	5	16-QAM	12	6	13.02	0-2	2
	1880.0	18900	5	16-QAM	12	13	13.06	0-2	2
	1880.0	18900	5	16-QAM	25	0	13.04	0-2	2
High	1907.5	19175	5	QPSK	1	0	14.89	0	0
	1907.5	19175	5	QPSK	1	12	14.96	0	0
	1907.5	19175	5	QPSK	1	24	15.26	0	0
	1907.5	19175	5	QPSK	12	0	13.70	0-1	1
	1907.5	19175	5	QPSK	12	6	13.71	0-1	1
	1907.5	19175	5	QPSK	12	13	13.65	0-1	1
	1907.5	19175	5	QPSK	25	0	13.73	0-1	1
	1907.5	19175	5	16-QAM	1	0	13.74	0-1	1
	1907.5	19175	5	16-QAM	1	12	13.85	0-1	1
	1907.5	19175	5	16-QAM	1	24	13.71	0-1	1
	1907.5	19175	5	16-QAM	12	0	12.59	0-2	2
	1907.5	19175	5	16-QAM	12	6	12.57	0-2	2
	1907.5	19175	5	16-QAM	12	13	12.64	0-2	2
	1907.5	19175	5	16-QAM	25	0	12.57	0-2	2

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Table 8-37
LTE Band 2 (PCS) Conducted Powers – 3 MHz Bandwidth
Reduced Power – Body at 0 mm

	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	14.96	0	0
	1851.5	18615	3	QPSK	1	7	14.78	0	0
	1851.5	18615	3	QPSK	1	14	14.78	0	0
	1851.5	18615	3	QPSK	8	0	13.54	0-1	1
	1851.5	18615	3	QPSK	8	4	13.63	0-1	1
	1851.5	18615	3	QPSK	8	7	13.62	0-1	1
	1851.5	18615	3	QPSK	15	0	13.58	0-1	1
	1851.5	18615	3	16-QAM	1	0	13.96	0-1	1
	1851.5	18615	3	16-QAM	1	7	14.02	0-1	1
	1851.5	18615	3	16-QAM	1	14	14.09	0-1	1
	1851.5	18615	3	16-QAM	8	0	12.70	0-2	2
	1851.5	18615	3	16-QAM	8	4	12.79	0-2	2
	1851.5	18615	3	16-QAM	8	7	12.77	0-2	2
	1851.5	18615	3	16-QAM	15	0	12.79	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	15.12	0	0
	1880.0	18900	3	QPSK	1	7	14.97	0	0
	1880.0	18900	3	QPSK	1	14	15.18	0	0
	1880.0	18900	3	QPSK	8	0	14.20	0-1	1
	1880.0	18900	3	QPSK	8	4	14.21	0-1	1
	1880.0	18900	3	QPSK	8	7	13.72	0-1	1
	1880.0	18900	3	QPSK	15	0	13.70	0-1	1
	1880.0	18900	3	16-QAM	1	0	14.48	0-1	1
	1880.0	18900	3	16-QAM	1	7	14.50	0-1	1
	1880.0	18900	3	16-QAM	1	14	14.50	0-1	1
	1880.0	18900	3	16-QAM	8	0	12.97	0-2	2
	1880.0	18900	3	16-QAM	8	4	13.03	0-2	2
	1880.0	18900	3	16-QAM	8	7	13.02	0-2	2
	1880.0	18900	3	16-QAM	15	0	12.94	0-2	2
High	1908.5	19185	3	QPSK	1	0	14.85	0	0
	1908.5	19185	3	QPSK	1	7	14.84	0	0
	1908.5	19185	3	QPSK	1	14	14.90	0	0
	1908.5	19185	3	QPSK	8	0	13.93	0-1	1
	1908.5	19185	3	QPSK	8	4	13.91	0-1	1
	1908.5	19185	3	QPSK	8	7	13.92	0-1	1
	1908.5	19185	3	QPSK	15	0	13.84	0-1	1
	1908.5	19185	3	16-QAM	1	0	14.05	0-1	1
	1908.5	19185	3	16-QAM	1	7	13.83	0-1	1
	1908.5	19185	3	16-QAM	1	14	13.82	0-1	1
	1908.5	19185	3	16-QAM	8	0	12.61	0-2	2
	1908.5	19185	3	16-QAM	8	4	12.61	0-2	2
	1908.5	19185	3	16-QAM	8	7	12.53	0-2	2
	1908.5	19185	3	16-QAM	15	0	12.56	0-2	2

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Table 8-38
LTE Band 2 (PCS) Conducted Powers – 1.4 MHz Bandwidth
Reduced Power – Body at 0 mm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	Target MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	14.92	0	0
	1850.7	18607	1.4	QPSK	1	2	14.74	0	0
	1850.7	18607	1.4	QPSK	1	5	14.75	0	0
	1850.7	18607	1.4	QPSK	3	0	14.59	0	0
	1850.7	18607	1.4	QPSK	3	2	14.64	0	0
	1850.7	18607	1.4	QPSK	3	3	14.62	0	0
	1850.7	18607	1.4	QPSK	6	0	13.55	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	14.00	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	14.01	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	14.08	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	13.72	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	13.78	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	13.76	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	12.84	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	15.15	0	0
	1880.0	18900	1.4	QPSK	1	2	15.00	0	0
	1880.0	18900	1.4	QPSK	1	5	15.13	0	0
	1880.0	18900	1.4	QPSK	3	0	15.20	0	0
	1880.0	18900	1.4	QPSK	3	2	15.23	0	0
	1880.0	18900	1.4	QPSK	3	3	14.75	0	0
	1880.0	18900	1.4	QPSK	6	0	13.73	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	14.48	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	14.45	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	14.46	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	13.93	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	14.07	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	14.04	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	12.90	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	14.83	0	0
	1909.3	19193	1.4	QPSK	1	2	14.79	0	0
	1909.3	19193	1.4	QPSK	1	5	14.91	0	0
	1909.3	19193	1.4	QPSK	3	0	14.90	0	0
	1909.3	19193	1.4	QPSK	3	2	14.93	0	0
	1909.3	19193	1.4	QPSK	3	3	14.97	0	0
	1909.3	19193	1.4	QPSK	6	0	13.87	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	14.00	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	13.83	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	13.82	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	13.56	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	13.64	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	13.54	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	12.51	0-2	2

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8.3 WLAN/BT Conducted Powers

Table 8-39
IEEE 802.11b Average RF Power

Mode	Freq	Channel	802.11b (2.4 GHz) Conducted Power [dBm]			
			Data Rate [Mbps]			
	[MHz]		1	2	5.5	11
802.11b	2412	1*	15.47	15.31	15.39	15.39
802.11b	2437	6*	**15.56**	15.61	15.65	15.65
802.11b	2462	11*	15.41	15.45	15.48	15.45

Table 8-40
IEEE 802.11g Average RF Power

Mode	Freq	Channel	802.11g (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11g	2412	1	13.76	13.67	13.73	13.79	13.79	13.81	13.73	13.60
802.11g	2437	6	13.78	13.74	13.82	13.81	13.71	13.78	13.70	13.56
802.11g	2462	11	13.48	13.54	13.62	13.59	13.61	13.46	13.50	13.39

Table 8-41
IEEE 802.11n Average RF Power

Mode	Freq	Channel	802.11n (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	2412	1	13.70	13.76	13.77	13.66	13.68	13.71	13.51	13.60
802.11n	2437	6	13.66	13.76	13.76	13.75	13.75	13.77	13.87	13.70
802.11n	2462	11	13.47	13.47	13.52	13.48	13.51	13.48	13.39	13.56

Table 8-42
IEEE 802.11a Average RF Power

Mode	Freq	Channel	802.11a (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11a	5180	36*	**10.42**	10.41	10.42	10.39	10.42	10.48	10.43	10.38
802.11a	5200	40	10.38	10.44	10.34	10.40	10.43	10.28	10.48	10.30
802.11a	5220	44	10.33	10.30	10.46	10.25	10.41	10.28	10.23	10.36
802.11a	5240	48*	10.27	10.36	10.15	10.34	10.37	10.32	10.40	10.19
802.11a	5260	52*	**10.37**	10.35	10.46	10.40	10.34	10.44	10.43	10.45
802.11a	5280	56	10.19	10.28	10.29	10.21	10.28	10.28	10.22	10.06
802.11a	5300	60	10.11	10.01	10.01	10.02	10.05	10.23	10.22	10.20
802.11a	5320	64*	10.25	10.35	10.16	10.20	10.36	10.33	10.26	10.29
802.11a	5500	100	**10.31**	10.41	10.29	10.40	10.27	10.39	10.41	10.21
802.11a	5520	104*	10.21	10.22	10.11	10.19	10.13	10.23	10.17	10.31
802.11a	5540	108	10.23	10.14	10.30	10.24	10.29	10.30	10.17	10.35
802.11a	5560	112	10.12	10.02	10.23	10.23	10.20	10.16	10.06	10.00
802.11a	5580	116*	10.02	10.09	10.13	10.10	9.96	9.91	10.01	10.00
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	9.86	9.77	9.87	9.94	9.80	9.87	9.93	9.78
802.11a	5680	136*	9.74	9.67	9.78	9.78	9.62	9.85	9.87	9.72
802.11a	5700	140	9.73	9.67	9.79	9.71	9.76	9.75	9.71	9.62
802.11a	5745	149*	**10.15**	10.09	10.17	10.13	10.28	10.08	10.05	10.10
802.11a	5765	153	10.02	10.08	10.07	9.94	9.99	9.94	9.92	10.01
802.11a	5785	157*	9.87	9.77	9.77	9.85	9.92	9.90	9.88	9.75
802.11a	5805	161	9.72	9.81	9.82	9.65	9.70	9.63	9.73	9.78
802.11a	5825	165*	9.64	9.72	9.69	9.54	9.69	9.59	9.71	9.76

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.
(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 8-43
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	10.08	10.04	10.00	10.02	10.05	10.03	10.17	10.16
802.11n	5200	40	10.05	10.04	9.98	9.97	10.00	9.92	10.06	10.19
802.11n	5220	44	10.06	10.12	10.05	9.93	10.08	10.05	10.04	10.07
802.11n	5240	48	10.05	10.06	9.98	9.97	10.00	10.00	10.08	10.10
802.11n	5260	52	10.07	10.04	10.16	10.13	10.04	10.20	9.99	10.06
802.11n	5280	56	10.00	9.88	9.98	9.93	9.87	10.10	10.11	9.90
802.11n	5300	60	9.97	9.98	9.94	9.94	9.93	10.07	10.05	9.93
802.11n	5320	64	10.00	10.01	10.10	9.92	10.04	9.87	10.00	9.94
802.11n	5500	100	10.01	10.06	9.89	9.94	9.98	9.98	9.94	9.93
802.11n	5520	104	9.95	10.03	9.87	9.93	10.01	9.81	9.92	9.83
802.11n	5540	108	9.88	9.91	9.78	9.94	9.86	9.80	9.77	9.88
802.11n	5560	112	9.95	9.84	9.94	9.83	10.00	9.88	9.94	9.95
802.11n	5580	116	9.72	9.84	9.59	9.59	9.84	9.85	9.79	9.74
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	9.56	9.48	9.59	9.55	9.68	9.62	9.51	9.53
802.11n	5680	136	9.43	9.35	9.41	9.33	9.40	9.55	9.54	9.40
802.11n	5700	140	10.45	10.46	10.32	10.46	10.32	10.40	10.45	10.47
802.11n	5745	149	9.63	9.62	9.52	9.51	9.66	9.66	9.61	9.63
802.11n	5765	153	9.73	9.76	9.77	9.63	9.75	9.76	9.66	9.63
802.11n	5785	157	9.61	9.65	9.68	9.56	9.66	9.59	9.72	9.50
802.11n	5805	161	9.57	9.44	9.54	9.52	9.47	9.49	9.52	9.64
802.11n	5825	165	9.47	9.36	9.59	9.37	9.44	9.53	9.35	9.36

Table 8-44
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	10.12	10.08	10.07	10.07	10.05	10.08	10.00	10.13
802.11n	5230	46	10.03	10.09	10.01	10.01	10.13	10.17	9.98	9.96
802.11n	5270	54	10.06	10.00	9.95	10.14	10.12	10.14	9.98	10.08
802.11n	5310	62	10.08	10.03	9.99	10.20	10.21	9.98	10.05	10.07
802.11n	5510	102	9.78	9.87	9.86	9.85	9.77	9.76	9.88	9.73
802.11n	5550	110	9.72	9.66	9.74	9.68	9.77	9.72	9.85	9.65
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	9.47	9.35	9.38	9.42	9.60	9.43	9.54	9.57
802.11n	5755	151	10.37	10.27	10.35	10.37	10.21	10.22	10.38	10.23
802.11n	5795	159	10.33	10.30	10.21	10.21	10.32	10.38	10.24	10.25

Table 8-45
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth

Mode	Freq	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
			Data Rate [Mbps]									
	[MHz]		29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac	5210	42	**10.15**	10.37	10.32	10.37	10.38	10.36	9.92	9.36	8.69	8.16
802.11ac	5290	58	**10.14**	10.02	10.04	10.18	10.09	10.24	10.14	10.24	10.14	10.05
802.11ac	5530	106	**9.93**	10.04	9.86	9.84	9.96	9.84	9.83	9.98	10.06	9.97
802.11ac	5775	155	**9.39**	9.34	9.46	9.38	9.45	9.47	9.49	9.26	9.44	9.29

Table 8-46
Bluetooth RF Conducted Powers

Mode	Freq	Channel	Bluetooth (2.4GHz) Average Conducted Power [dBm]		
			Data Rate [Mbps]		
	[MHz]		1	2	3
Bluetooth	2402	0	8.34	5.76	5.83
Bluetooth	2441	39	**10.35**	6.87	6.94
Bluetooth	2480	78	8.76	5.47	5.51

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

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

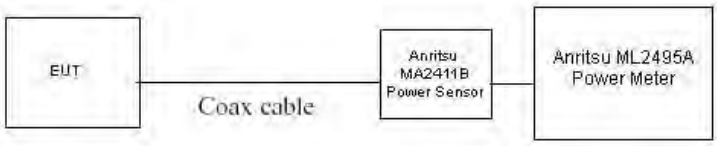

Figure 8-2
Power Measurement Setup for Signal < 50 MHz

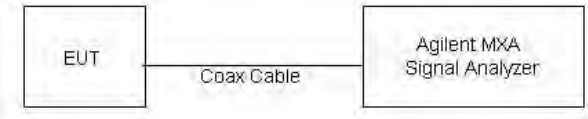

Figure 8-3
Power Measurement Setup for Signal > 50 MHz

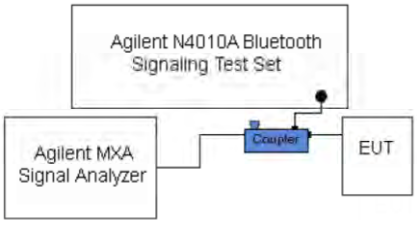

Figure 8-4
Bluetooth Power Measurement Setup

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9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
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
04/02/2014	750B	23.1	710	0.958	56.516	0.960	55.687	-0.21%	1.49%
			725	0.972	56.362	0.961	55.629	1.14%	1.32%
			740	0.985	56.216	0.963	55.570	2.28%	1.16%
			755	0.998	56.054	0.964	55.512	3.53%	0.98%
03/24/2014	835B	22.1	820	0.986	54.640	0.969	55.258	1.75%	-1.12%
			835	1.001	54.502	0.970	55.200	3.20%	-1.26%
			850	1.016	54.323	0.988	55.154	2.83%	-1.51%
03/31/2014	1750B	20.0	1710	1.466	52.130	1.463	53.537	0.21%	-2.63%
			1750	1.511	51.910	1.488	53.432	1.55%	-2.85%
			1790	1.550	51.781	1.514	53.326	2.38%	-2.90%
03/31/2014	1900B	23.3	1850	1.510	51.115	1.520	53.300	-0.66%	-4.10%
			1880	1.545	51.042	1.520	53.300	1.64%	-4.24%
			1910	1.581	50.925	1.520	53.300	4.01%	-4.46%
03/24/2014	2450B	23.6	2401	1.960	52.548	1.903	52.765	3.00%	-0.41%
			2450	2.027	52.361	1.950	52.700	3.95%	-0.64%
			2499	2.094	52.214	2.019	52.638	3.71%	-0.81%
03/27/2014	2450B	22.9	2401	1.974	52.038	1.903	52.765	3.73%	-1.38%
			2450	2.042	51.875	1.950	52.700	4.72%	-1.57%
			2499	2.111	51.737	2.019	52.638	4.56%	-1.71%
03/25/2014	5200B-5800B	23.2	5180	5.092	47.454	5.276	49.041	-3.49%	-3.24%
			5200	5.127	47.380	5.299	49.014	-3.25%	-3.33%
			5220	5.156	47.259	5.323	48.987	-3.14%	-3.53%
			5260	5.234	47.029	5.369	48.933	-2.51%	-3.89%
			5280	5.273	46.904	5.393	48.906	-2.23%	-4.09%
			5300	5.317	46.864	5.416	48.879	-1.83%	-4.12%
			5320	5.363	46.824	5.439	48.851	-1.40%	-4.15%
			5500	5.769	46.401	5.650	48.607	2.11%	-4.54%
			5520	5.815	46.400	5.673	48.580	2.50%	-4.49%
			5540	5.867	46.417	5.696	48.553	3.00%	-4.40%
			5560	5.897	46.433	5.720	48.526	3.09%	-4.31%
			5600	5.976	46.409	5.766	48.471	3.64%	-4.25%
			5660	6.098	46.487	5.837	48.390	4.47%	-3.93%
			5745	6.203	46.617	5.936	48.275	4.50%	-3.43%
			5765	6.228	46.672	5.959	48.248	4.51%	-3.27%
			5785	6.257	46.725	5.982	48.220	4.60%	-3.10%
			5800	6.279	46.726	6.000	48.200	4.65%	-3.06%
			5805	6.282	46.744	6.006	48.193	4.60%	-3.01%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB 865664 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

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9.2 Test System Verification

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

Table 9-2
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)	$Deviation_{1g}$ (%)
K	750	BODY	04/02/2014	24.5	23.1	0.100	1003	3333	0.846	8.770	8.460	-3.53%
K	835	BODY	03/24/2014	23.9	22.2	0.100	4d119	3333	0.988	9.540	9.880	3.56%
C	1750	BODY	03/31/2014	23.3	20.0	0.100	1008	3263	4.090	38.200	40.900	7.07%
D	1900	BODY	03/31/2014	23.2	21.6	0.100	5d149	3022	4.200	40.500	42.000	3.70%
H	2450	BODY	03/24/2014	23.6	23.3	0.040	719	3589	2.040	51.700	51.000	-1.35%
H	2450	BODY	03/27/2014	23.8	23.0	0.040	719	3589	2.010	51.700	50.250	-2.80%
A	5200	BODY	03/25/2014	22.3	21.8	0.100	1007	3920	7.370	72.600	73.700	1.52%
A	5300	BODY	03/25/2014	22.4	21.8	0.100	1007	3920	7.770	74.700	77.700	4.02%
A	5500	BODY	03/25/2014	22.4	21.9	0.100	1007	3920	7.780	75.900	77.800	2.50%
A	5600	BODY	03/25/2014	22.4	21.9	0.100	1007	3920	8.070	77.300	80.700	4.40%
A	5800	BODY	03/25/2014	22.5	21.9	0.100	1007	3920	7.570	72.900	75.700	3.84%

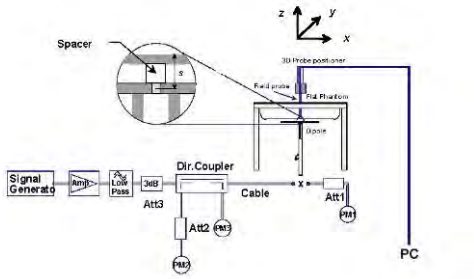

Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

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10 SAR DATA SUMMARY

10.1 Standalone Body SAR Data

Table 10-1
UMTS Body SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	23.0	22.60	0.03	12 mm	FL-112-F	1:1	back	0.323	1.096	0.354	A1
836.60	4183	UMTS 850	RMC	23.0	22.60	-0.05	0 mm	FL-112-F	1:1	bottom	0.061	1.096	0.067	
836.60	4183	UMTS 850	RMC	23.0	22.60	-0.01	15 mm	FL-112-F	1:1	left	0.193	1.096	0.212	
836.60	4183	UMTS 850	RMC	17.5	17.18	-0.10	0 mm	FL-112-B	1:1	back	0.255	1.076	0.274	
836.60	4183	UMTS 850	RMC	17.5	17.18	-0.15	0 mm	FL-112-B	1:1	left	0.126	1.076	0.136	
1732.40	1412	UMTS 1750	RMC	23.5	23.50	-0.06	12 mm	FL-112-E	1:1	back	0.564	1.000	0.564	
1732.40	1412	UMTS 1750	RMC	23.5	23.50	0.03	0 mm	FL-112-E	1:1	bottom	0.049	1.000	0.049	
1732.40	1412	UMTS 1750	RMC	23.5	23.50	-0.01	15 mm	FL-112-E	1:1	left	0.366	1.000	0.366	
1712.40	1312	UMTS 1750	RMC	15.5	15.48	0.01	0 mm	FL-112-B	1:1	back	0.677	1.005	0.680	A2
1712.40	1312	UMTS 1750	RMC	15.5	15.48	-0.17	0 mm	FL-112-B	1:1	left	0.332	1.005	0.334	
1880.00	9400	UMTS 1900	RMC	23.5	23.42	-0.12	12 mm	FL-112-F	1:1	back	0.296	1.019	0.302	
1880.00	9400	UMTS 1900	RMC	23.5	23.42	-0.12	0 mm	FL-112-F	1:1	bottom	0.053	1.019	0.054	
1880.00	9400	UMTS 1900	RMC	23.5	23.42	-0.05	15 mm	FL-112-F	1:1	left	0.148	1.019	0.151	
1852.40	9262	UMTS 1900	RMC	15.5	14.72	0.13	0 mm	FL-112-B	1:1	back	0.665	1.197	0.796	
1880.00	9400	UMTS 1900	RMC	15.5	15.12	0.12	0 mm	FL-112-B	1:1	back	0.793	1.091	**0.865**	A3
1907.60	9538	UMTS 1900	RMC	15.5	13.76	0.12	0 mm	FL-112-B	1:1	back	0.560	1.493	0.836	
1880.00	9400	UMTS 1900	RMC	15.5	15.12	0.09	0 mm	FL-112-B	1:1	left	0.468	1.091	0.511	
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 10-2
LTE Band 17 Body SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
710.00	23790	Mid	LTE Band 17	10	23.5	23.49	0.01	0	FL-112-C	QPSK	1	49	12 mm	back	1:1	0.117	1.002	0.117	
710.00	23790	Mid	LTE Band 17	10	22.5	22.49	0.06	1	FL-112-C	QPSK	25	25	12 mm	back	1:1	0.099	1.002	0.099	
710.00	23790	Mid	LTE Band 17	10	23.5	23.49	0.14	0	FL-112-C	QPSK	1	49	0 mm	bottom	1:1	0.023	1.002	0.023	
710.00	23790	Mid	LTE Band 17	10	22.5	22.49	-0.19	1	FL-112-C	QPSK	25	25	0 mm	bottom	1:1	0.020	1.002	0.020	
710.00	23790	Mid	LTE Band 17	10	23.5	23.49	0.04	0	FL-112-C	QPSK	1	49	15 mm	left	1:1	0.091	1.002	0.091	
710.00	23790	Mid	LTE Band 17	10	22.5	22.49	0.00	1	FL-112-C	QPSK	25	25	15 mm	left	1:1	0.077	1.002	0.077	
710.00	23790	Mid	LTE Band 17	10	13.5	13.20	0.07	0	FL-112-A	QPSK	1	49	0 mm	back	1:1	0.211	1.072	0.226	A4
710.00	23790	Mid	LTE Band 17	10	12.5	12.12	-0.12	1	FL-112-A	QPSK	25	12	0 mm	back	1:1	0.162	1.091	0.177	
710.00	23790	Mid	LTE Band 17	10	13.5	13.20	0.13	0	FL-112-A	QPSK	1	49	0 mm	left	1:1	0.157	1.072	0.168	
710.00	23790	Mid	LTE Band 17	10	12.5	12.12	0.18	1	FL-112-A	QPSK	25	12	0 mm	left	1:1	0.129	1.091	0.141	
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 10-3
LTE Band 5 (Cell) Body SAR Data

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	23.30	-0.01	0	FL-112-F	QPSK	1	25	12 mm	back	1:1	0.324	1.047	0.339	A5
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.18	0.03	1	FL-112-F	QPSK	25	25	12 mm	back	1:1	0.250	1.076	0.269	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.30	0.01	0	FL-112-F	QPSK	1	25	0 mm	bottom	1:1	0.083	1.047	0.087	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.18	0.10	1	FL-112-F	QPSK	25	25	0 mm	bottom	1:1	0.054	1.076	0.058	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.30	0.05	0	FL-112-F	QPSK	1	25	15 mm	left	1:1	0.248	1.047	0.260	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.18	0.09	1	FL-112-F	QPSK	25	25	15 mm	left	1:1	0.209	1.076	0.225	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.60	-0.08	0	FL-112-A	QPSK	1	49	0 mm	back	1:1	0.254	1.096	0.278	
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.0	15.81	0.03	1	FL-112-A	QPSK	25	25	0 mm	back	1:1	0.203	1.045	0.212	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.60	-0.03	0	FL-112-A	QPSK	1	49	0 mm	left	1:1	0.141	1.096	0.155	
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.0	15.81	0.01	1	FL-112-A	QPSK	25	25	0 mm	left	1:1	0.112	1.045	0.117	
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 10-4
LTE Band 4 (AWS) Body SAR Data

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)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.38	0.04	0	FL-112-E	QPSK	1	0	12 mm	back	1:1	0.665	1.028	0.684	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.18	-0.03	1	FL-112-E	QPSK	50	0	12 mm	back	1:1	0.550	1.076	0.592	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.38	-0.05	0	FL-112-E	QPSK	1	0	0 mm	bottom	1:1	0.067	1.028	0.069	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.18	0.11	1	FL-112-E	QPSK	50	0	0 mm	bottom	1:1	0.058	1.076	0.062	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.38	-0.03	0	FL-112-E	QPSK	1	0	15 mm	left	1:1	0.513	1.028	0.527	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.18	0.01	1	FL-112-E	QPSK	50	0	15 mm	left	1:1	0.402	1.076	0.433	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.5	16.43	0.06	0	FL-112-B	QPSK	1	99	0 mm	back	1:1	0.795	1.016	0.808	A6
1732.50	20175	Mid	LTE Band 4 (AWS)	20	15.5	15.39	-0.07	1	FL-112-B	QPSK	50	0	0 mm	back	1:1	0.695	1.026	0.713	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	15.5	15.23	0.01	1	FL-112-B	QPSK	100	0	0 mm	back	1:1	0.681	1.064	0.725	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.5	16.43	-0.03	0	FL-112-B	QPSK	1	99	0 mm	left	1:1	0.429	1.016	0.436	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	15.5	15.39	-0.10	1	FL-112-B	QPSK	50	0	0 mm	left	1:1	0.413	1.026	0.424	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Body 1.6 W/kg (mW/g) averaged over 1 gram			

Table 10-5
LTE Band 2 (PCS) Body SAR Data

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	23.5	23.50	-0.01	0	FL-112-E	QPSK	1	50	12 mm	back	1:1	0.260	1.000	0.260	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.5	22.49	-0.08	1	FL-112-E	QPSK	50	25	12 mm	back	1:1	0.202	1.002	0.202	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.50	-0.01	0	FL-112-E	QPSK	1	50	0 mm	bottom	1:1	0.052	1.000	0.052	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.5	22.49	-0.03	1	FL-112-E	QPSK	50	25	0 mm	bottom	1:1	0.040	1.002	0.040	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.50	-0.01	0	FL-112-E	QPSK	1	50	15 mm	left	1:1	0.153	1.000	0.153	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.5	22.49	0.02	1	FL-112-E	QPSK	50	25	15 mm	left	1:1	0.119	1.002	0.119	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	15.5	15.29	0.03	0	FL-112-B	QPSK	1	50	0 mm	back	1:1	0.654	1.050	0.687	A7
1880.00	18900	Mid	LTE Band 2 (PCS)	20	14.5	14.13	0.05	1	FL-112-B	QPSK	50	25	0 mm	back	1:1	0.569	1.089	0.620	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	15.5	15.29	-0.08	0	FL-112-B	QPSK	1	50	0 mm	left	1:1	0.384	1.050	0.403	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	14.5	14.13	-0.11	1	FL-112-B	QPSK	50	25	0 mm	left	1:1	0.345	1.089	0.376	
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 10-6
DTS Body SAR Data

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	16.0	15.47	-0.12	0 mm	FL-112-F	1	back	1:1	0.643	1.130	0.727	
2437	6	IEEE 802.11b	DSSS	16.0	15.56	-0.04	0 mm	FL-112-F	1	back	1:1	0.860	1.107	0.952	
2462	11	IEEE 802.11b	DSSS	16.0	15.41	-0.13	0 mm	FL-112-F	1	back	1:1	0.951	1.146	1.090	
2412	1	IEEE 802.11b	DSSS	16.0	15.47	0.03	0 mm	FL-112-F	1	right	1:1	0.820	1.130	0.927	
2437	6	IEEE 802.11b	DSSS	16.0	15.56	0.06	0 mm	FL-112-F	1	right	1:1	0.975	1.107	1.079	A8
2462	11	IEEE 802.11b	DSSS	16.0	15.41	0.04	0 mm	FL-112-F	1	right	1:1	0.940	1.146	1.077	
2437	6	IEEE 802.11b	DSSS	16.0	15.56	0.05	0 mm	FL-112-F	1	right	1:1	0.932	1.107	1.032	
5745	149	IEEE 802.11a	OFDM	10.5	10.15	0.16	0 mm	FL-112-E	6	back	1:1	0.761	1.084	0.825	A9
5765	153	IEEE 802.11a	OFDM	10.5	10.02	0.17	0 mm	FL-112-E	6	back	1:1	0.715	1.117	0.799	
5805	161	IEEE 802.11a	OFDM	10.5	9.72	-0.01	0 mm	FL-112-E	6	back	1:1	0.757	1.197	0.906	
5775	155	IEEE 802.11ac	OFDM	10.5	9.39	-0.14	0 mm	FL-112-E	29.3	back	1:1	0.407	1.291	0.525	
5745	149	IEEE 802.11a	OFDM	10.5	10.15	-0.20	0 mm	FL-112-E	6	right	1:1	0.690	1.084	0.748	
5765	153	IEEE 802.11a	OFDM	10.5	10.02	-0.15	0 mm	FL-112-E	6	right	1:1	0.699	1.117	0.781	
5805	161	IEEE 802.11a	OFDM	10.5	9.72	-0.19	0 mm	FL-112-E	6	right	1:1	0.736	1.197	0.881	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note: Blue entry represents variability measurement.

Table 10-7
NII Body SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5180	36	IEEE 802.11a	OFDM	10.5	10.42	0.15	0 mm	FL-112-E	6	back	1:1	0.645	1.019	0.657	
5220	44	IEEE 802.11a	OFDM	10.5	10.33	0.13	0 mm	FL-112-E	6	back	1:1	0.873	1.040	0.908	
5210	42	IEEE 802.11ac	OFDM	10.5	10.15	-0.14	0 mm	FL-112-E	29.3	back	1:1	0.526	1.084	0.570	
5180	36	IEEE 802.11a	OFDM	10.5	10.42	-0.12	0 mm	FL-112-E	6	right	1:1	0.573	1.019	0.584	
5220	44	IEEE 802.11a	OFDM	10.5	10.33	-0.16	0 mm	FL-112-E	6	right	1:1	0.611	1.040	0.635	
5220	44	IEEE 802.11a	OFDM	10.5	10.33	0.12	0 mm	FL-112-E	6	back	1:1	0.845	1.040	0.879	
5260	52	IEEE 802.11a	OFDM	10.5	10.37	-0.14	0 mm	FL-112-E	6	back	1:1	0.777	1.030	0.800	
5320	64	IEEE 802.11a	OFDM	10.5	10.25	0.13	0 mm	FL-112-E	6	back	1:1	0.922	1.059	0.976	A10
5290	58	IEEE 802.11ac	OFDM	10.5	10.14	-0.13	0 mm	FL-112-E	29.3	back	1:1	0.551	1.086	0.598	
5260	52	IEEE 802.11a	OFDM	10.5	10.37	-0.12	0 mm	FL-112-E	6	right	1:1	0.589	1.030	0.607	
5320	64	IEEE 802.11a	OFDM	10.5	10.25	-0.17	0 mm	FL-112-E	6	right	1:1	0.616	1.059	0.652	
5320	64	IEEE 802.11a	OFDM	10.5	10.25	0.12	0 mm	FL-112-E	6	back	1:1	0.890	1.059	0.943	
5500	100	IEEE 802.11a	OFDM	10.5	10.31	-0.14	0 mm	FL-112-E	6	back	1:1	0.913	1.045	0.954	
5560	112	IEEE 802.11a	OFDM	10.5	10.12	0.18	0 mm	FL-112-E	6	back	1:1	0.827	1.091	0.902	
5660	132	IEEE 802.11a	OFDM	10.5	9.86	0.15	0 mm	FL-112-E	6	back	1:1	0.868	1.159	1.006	
5530	106	IEEE 802.11ac	OFDM	10.5	9.93	-0.18	0 mm	FL-112-E	29.3	back	1:1	0.691	1.140	0.788	
5500	100	IEEE 802.11a	OFDM	10.5	10.31	-0.13	0 mm	FL-112-E	6	right	1:1	0.781	1.045	0.816	
5560	112	IEEE 802.11a	OFDM	10.5	10.12	-0.20	0 mm	FL-112-E	6	right	1:1	0.801	1.091	0.874	
5660	132	IEEE 802.11a	OFDM	10.5	9.86	-0.09	0 mm	FL-112-E	6	right	1:1	0.776	1.159	0.899	
5500	100	IEEE 802.11a	OFDM	10.5	10.31	0.13	0 mm	FL-112-E	6	back	1:1	0.907	1.045	0.948	
5660	132	IEEE 802.11a	OFDM	10.5	9.86	0.02	0 mm	FL-112-E	6	back	1:1	0.760	1.159	0.881	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note: Blue entries represent variability measurements.

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Table 10-8
DSS Body SAR Data

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)	
2441	39	Bluetooth	FHSS	10.5	10.35	-0.19	0 mm	FL-112-F	1	back	1:1	0.089	1.035	**0.092**	A11
2441	39	Bluetooth	FHSS	10.5	10.35	0.02	0 mm	FL-112-F	1	right	1:1	0.086	1.035	0.089	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

10.2 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. Per FCC KDB 865664 D01 v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
7. Per FCC KDB 616217 D04 Section 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v05 was applied to determine SAR test exclusion for adjacent edge configurations. SAR tests were required for bottom and left edge for the main antenna and right edge for the BT/WLAN antenna.

UMTS Notes:

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

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r01. The general test procedures used for testing can be found in Section 7.4.4.
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).

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WLAN/BT Notes:

1. There is no proximity sensor power reduction mechanism applied for WLAN or Bluetooth.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
3. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz bandwidths) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
4. Per April 2013 TCB Workshop notes, full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
5. WIFI transmission was verified using an uncalibrated spectrum analyzer.
6. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is >1.6 W/kg or the reported 1g averaged SAR is >0.8 W/kg, SAR testing on other default channels was required.
7. The Bluetooth highest output power channel was tested for SAR.

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11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1.iii and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

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

Table 11-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Configuration	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[W/kg]	[mm]	[W/kg]
2.4 GHz WLAN	2437	16.00	Top	45	**0.185**
5.8 GHz WLAN	5785	10.50	Top	45	**0.078**
Bluetooth	2441	10.50	Top	45	**0.051**
Bluetooth LE	2440	6.00	Back, Right	5*	**0.167**

Notes:

1. (*) - Per FCC KDB Publication 447498, when the test separation distance is < 5 mm, a distance of 5 mm is applied to determine estimated SAR.
2. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.
3. When the test separation distance was > 50 mm, an estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR exclusion, for configurations excluded per FCC KDB Publication 447498 D01v05. When the test separation distance was < 50 mm, an estimated SAR was determined per FCC KDB Publication 447498 D01v05.

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11.3 Body Simultaneous Transmission Analysis

Table 11-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.274	1.090	1.364	N/A
	Top	0.400	0.185	0.585	N/A
	Bottom	0.067	0.400	0.467	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.136	0.400	0.536	N/A

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.680	1.090	See Note 1	0.01
	Top	0.400	0.185	0.585	N/A
	Bottom	0.049	0.400	0.449	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.334	0.400	0.734	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.865	1.090	See Note 1	0.01
	Top	0.400	0.185	0.585	N/A
	Bottom	0.054	0.400	0.454	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.511	0.400	0.911	N/A

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.226	1.090	1.316	N/A
	Top	0.400	0.185	0.585	N/A
	Bottom	0.023	0.400	0.423	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.168	0.400	0.568	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.278	1.090	1.368	N/A
	Top	0.400	0.185	0.585	N/A
	Bottom	0.087	0.400	0.487	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.155	0.400	0.555	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.808	1.090	See Note 1	0.01
	Top	0.400	0.185	0.585	N/A
	Bottom	0.069	0.400	0.469	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.436	0.400	0.836	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.687	1.090	See Note 1	0.01
	Top	0.400	0.185	0.585	N/A
	Bottom	0.052	0.400	0.452	N/A
	Right	0.400	1.079	**1.479**	N/A
	Left	0.403	0.400	0.803	N/A

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Table 11-3
Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.274	1.006	1.280	N/A
	Top	0.400	0.078	0.478	N/A
	Bottom	0.067	0.400	0.467	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.136	0.400	0.536	N/A

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.680	1.006	See Note 1	0.01
	Top	0.400	0.078	0.478	N/A
	Bottom	0.049	0.400	0.449	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.334	0.400	0.734	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.865	1.006	See Note 1	0.01
	Top	0.400	0.078	0.478	N/A
	Bottom	0.054	0.400	0.454	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.511	0.400	0.911	N/A

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.226	1.006	1.232	N/A
	Top	0.400	0.078	0.478	N/A
	Bottom	0.023	0.400	0.423	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.168	0.400	0.568	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.278	1.006	1.284	N/A
	Top	0.400	0.078	0.478	N/A
	Bottom	0.087	0.400	0.487	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.155	0.400	0.555	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.808	1.006	See Note 1	0.01
	Top	0.400	0.078	0.478	N/A
	Bottom	0.069	0.400	0.469	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.436	0.400	0.836	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.687	1.006	See Note 1	0.01
	Top	0.400	0.078	0.478	N/A
	Bottom	0.052	0.400	0.452	N/A
	Right	0.400	0.899	**1.299**	N/A
	Left	0.403	0.400	0.803	N/A

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Table 11-4
Simultaneous Transmission Scenario with Bluetooth (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.274	0.167	0.441	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.067	0.400	0.467	N/A
	Right	0.400	0.167	**0.567**	N/A
	Left	0.136	0.400	0.536	N/A

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.680	0.167	**0.847**	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.049	0.400	0.449	N/A
	Right	0.400	0.167	0.567	N/A
	Left	0.334	0.400	0.734	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.865	0.167	**1.032**	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.054	0.400	0.454	N/A
	Right	0.400	0.167	0.567	N/A
	Left	0.511	0.400	0.911	N/A

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.226	0.167	0.393	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.023	0.400	0.423	N/A
	Right	0.400	0.167	0.567	N/A
	Left	0.168	0.400	**0.568**	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.278	0.167	0.445	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.087	0.400	0.487	N/A
	Right	0.400	0.167	**0.567**	N/A
	Left	0.155	0.400	0.555	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.808	0.167	**0.975**	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.069	0.400	0.469	N/A
	Right	0.400	0.167	0.567	N/A
	Left	0.436	0.400	0.836	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.687	0.167	**0.854**	N/A
	Top	0.400	0.051	0.451	N/A
	Bottom	0.052	0.400	0.452	N/A
	Right	0.400	0.167	0.567	N/A
	Left	0.403	0.400	0.803	N/A

Note: For SAR summation for back side and right edge at 0 mm estimated Bluetooth LE SAR values were used since estimated Bluetooth LE SAR was more conservative than measured Bluetooth SAR.

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Table 11-5
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 1.2 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.354	< 1.090	**< 1.444**	N/A
Back Side	UMTS 1750	0.564	< 1.090	See Note 1	< 0.01
Back Side	UMTS 1900	0.302	< 1.090	< 1.392	N/A
Back Side	LTE Band 17	0.117	< 1.090	< 1.207	N/A
Back Side	LTE Band 5 (Cell)	0.339	< 1.090	< 1.429	N/A
Back Side	LTE Band 4 (AWS)	0.684	< 1.090	See Note 1	< 0.01
Back Side	LTE Band 2 (PCS)	0.260	< 1.090	< 1.350	N/A

Table 11-6
Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 1.2 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.354	< 1.006	< 1.360	N/A
Back Side	UMTS 1750	0.564	< 1.006	**< 1.570**	N/A
Back Side	UMTS 1900	0.302	< 1.006	< 1.308	N/A
Back Side	LTE Band 17	0.117	< 1.006	< 1.123	N/A
Back Side	LTE Band 5 (Cell)	0.339	< 1.006	< 1.345	N/A
Back Side	LTE Band 4 (AWS)	0.684	< 1.006	See Note 1	< 0.01
Back Side	LTE Band 2 (PCS)	0.260	< 1.006	< 1.266	N/A

Table 11-7
Simultaneous Transmission Scenario with Bluetooth (Body at 1.2 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.354	< 0.167	< 0.521	N/A
Back Side	UMTS 1750	0.564	< 0.167	< 0.731	N/A
Back Side	UMTS 1900	0.302	< 0.167	< 0.469	N/A
Back Side	LTE Band 17	0.117	< 0.167	< 0.284	N/A
Back Side	LTE Band 5 (Cell)	0.339	< 0.167	< 0.506	N/A
Back Side	LTE Band 4 (AWS)	0.684	< 0.167	**< 0.851**	N/A
Back Side	LTE Band 2 (PCS)	0.260	< 0.167	< 0.427	N/A

Note: For SAR summation for back side estimated Bluetooth LE SAR values were used since estimated Bluetooth LE SAR was more conservative than measured Bluetooth SAR.

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Table 11-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 1.5 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Left Edge	UMTS 850	0.212	0.400	0.612	N/A
Left Edge	UMTS 1750	0.366	0.400	0.766	N/A
Left Edge	UMTS 1900	0.151	0.400	0.551	N/A
Left Edge	LTE Band 17	0.091	0.400	0.491	N/A
Left Edge	LTE Band 5 (Cell)	0.260	0.400	0.660	N/A
Left Edge	LTE Band 4 (AWS)	0.527	0.400	**0.927**	N/A
Left Edge	LTE Band 2 (PCS)	0.153	0.400	0.553	N/A

Table 11-9
Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 1.5 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Left Edge	UMTS 850	0.212	0.400	0.612	N/A
Left Edge	UMTS 1750	0.366	0.400	0.766	N/A
Left Edge	UMTS 1900	0.151	0.400	0.551	N/A
Left Edge	LTE Band 17	0.091	0.400	0.491	N/A
Left Edge	LTE Band 5 (Cell)	0.260	0.400	0.660	N/A
Left Edge	LTE Band 4 (AWS)	0.527	0.400	**0.927**	N/A
Left Edge	LTE Band 2 (PCS)	0.153	0.400	0.553	N/A

Table 11-10
Simultaneous Transmission Scenario with Bluetooth (Body at 1.5 cm)

Configuration	Mode	UMTS/LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Left Edge	UMTS 850	0.212	0.400	0.612	N/A
Left Edge	UMTS 1750	0.366	0.400	0.766	N/A
Left Edge	UMTS 1900	0.151	0.400	0.551	N/A
Left Edge	LTE Band 17	0.091	0.400	0.491	N/A
Left Edge	LTE Band 5 (Cell)	0.260	0.400	0.660	N/A
Left Edge	LTE Band 4 (AWS)	0.527	0.400	**0.927**	N/A
Left Edge	LTE Band 2 (PCS)	0.153	0.400	0.553	N/A

Notes:

1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not higher than 0.04 per FCC KDB 447498 D01v05. See Section 11.4 for detailed SPLS ratio analysis.
2. When the test separation distance was > 50 mm, an estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR exclusion, for configuration excluded per FCC KDB 447498 D01v05. Therefore, an estimated SAR of 0.4 W/kg for 2.4 GHz WLAN, 5 GHz WLAN, and Bluetooth was used to evaluate the simultaneous sums.
3. For body SAR summations for back side at 1.2 cm, 2.4 GHz WLAN and Bluetooth and 5 GHz WLAN SAR values for 0.0 cm were used since the 0.0 cm test distance for 2.4 GHz WLAN and 5 GHz WLAN and estimated SAR for 2.4 GHz Bluetooth were more conservative. "<" denotes that the 0.0 cm 2.4 GHz WLAN and Bluetooth and 5 GHz WLAN SAR values were used for summation purposes.

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11.4 SPLSR Evaluation and Analysis

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

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

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

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with UMTS 1750 MHz antenna operating at limited output power with 2.4 GHz WIFI.

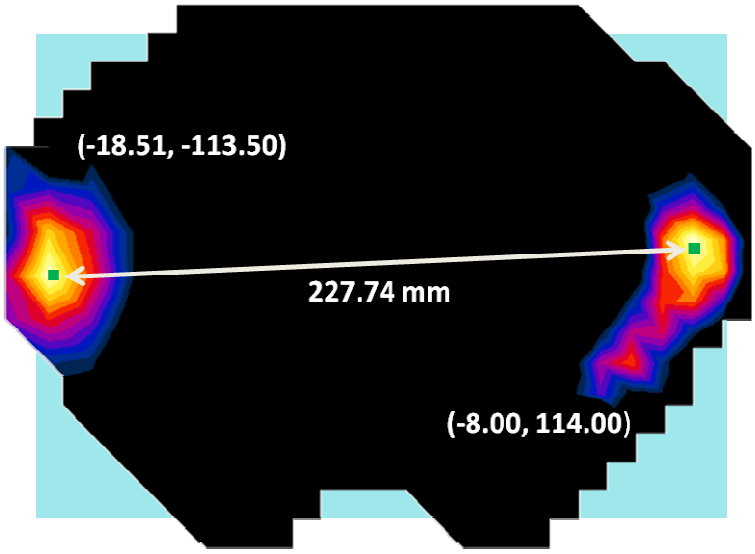

Figure 11-1
Peak SAR Location Plot of UMTS 1750 MHz and 2.4 GHz WLAN

Table 11-11
Peak SAR Locations for Body Back Side at 0 cm UMTS 1750 MHz and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz	-18.51	-113.50
IEEE 802.11b	-8.00	114.00

Table 11-12
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1750 MHz	IEEE 802.11b	0.680	1.090	1.770	227.74	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with UMTS 1900 MHz antenna operating at limited output power with 2.4 GHz WIFI.

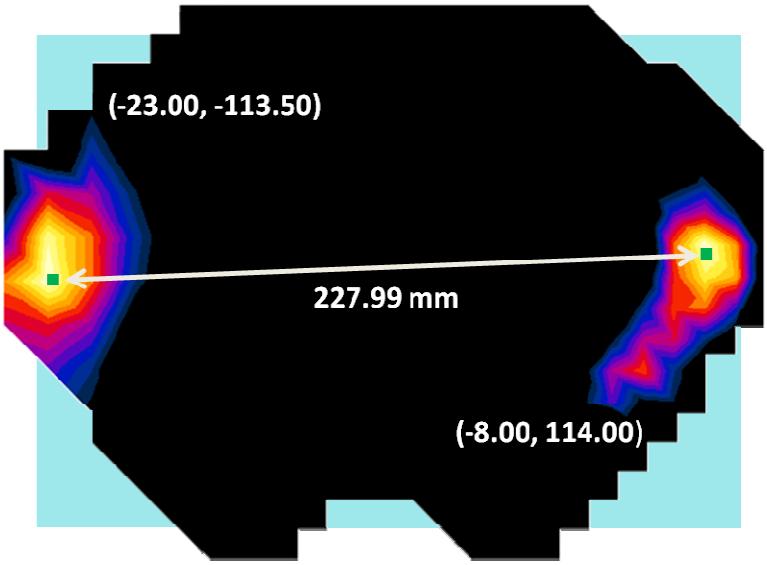

Figure 11-2
Peak SAR Location Plot of UMTS 1900 MHz and 2.4 GHz WLAN

Table 11-13
Peak SAR Locations for Body Back Side at 0 cm UMTS 1900 MHz and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz	-23.00	-113.50
IEEE 802.11b	-8.00	114.00

Table 11-14
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1900 MHz	IEEE 802.11b	0.865	1.090	1.955	227.99	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with LTE Band 4 antenna operating at limited output power with 2.4 GHz WIFI.

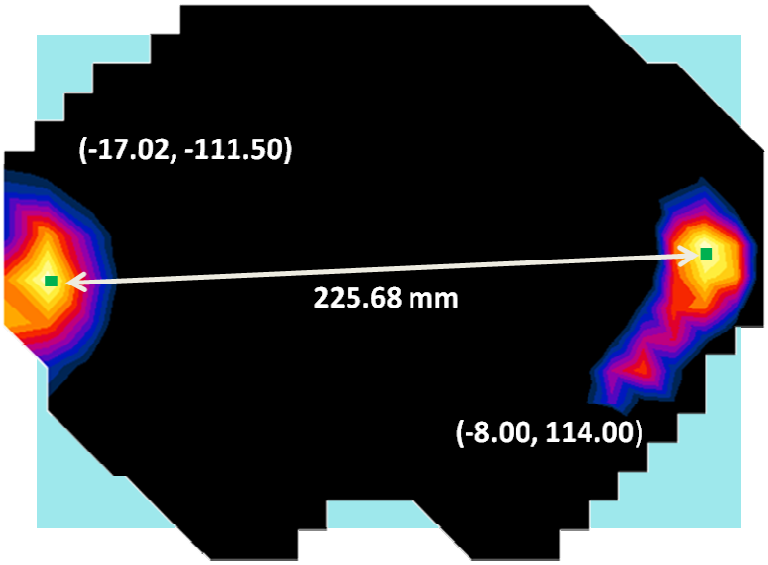

Figure 11-3
Peak SAR Location Plot of LTE Band 4 and 2.4 GHz WLAN

Table 11-15
Peak SAR Locations for Body Back Side at 0 cm LTE Band 4 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 4	-17.02	-111.50
IEEE 802.11b	-8.00	114.00

Table 11-16
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 4	IEEE 802.11b	0.808	1.090	1.898	225.68	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with LTE Band 2 antenna operating at limited output power with 2.4 GHz WIFI.

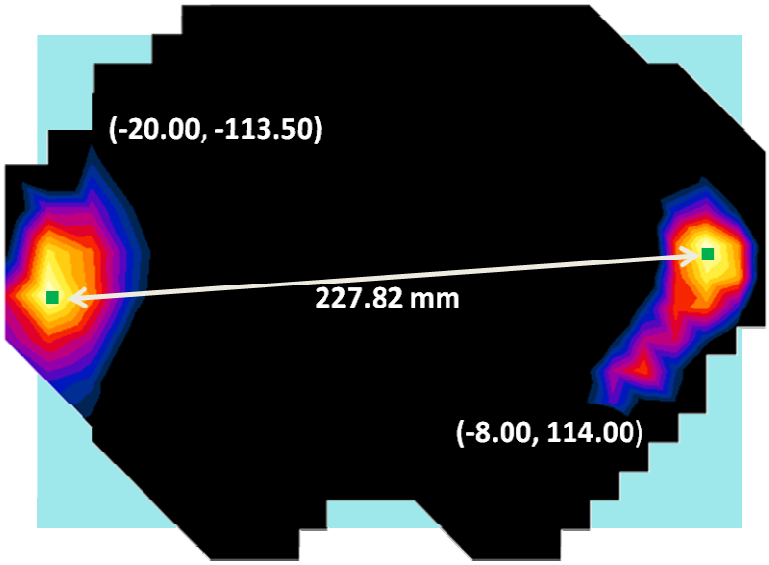

Figure 11-4
Peak SAR Location Plot of LTE Band 2 and 2.4 GHz WLAN

Table 11-17
Peak SAR Locations for Body Back Side at 0 cm LTE Band 2 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 2	-20.00	-113.50
IEEE 802.11b	-8.00	114.00

Table 11-18
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 2	IEEE 802.11b	0.687	1.090	1.777	227.82	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with UMTS 1750 MHz antenna operating at limited output power with 5 GHz WIFI.

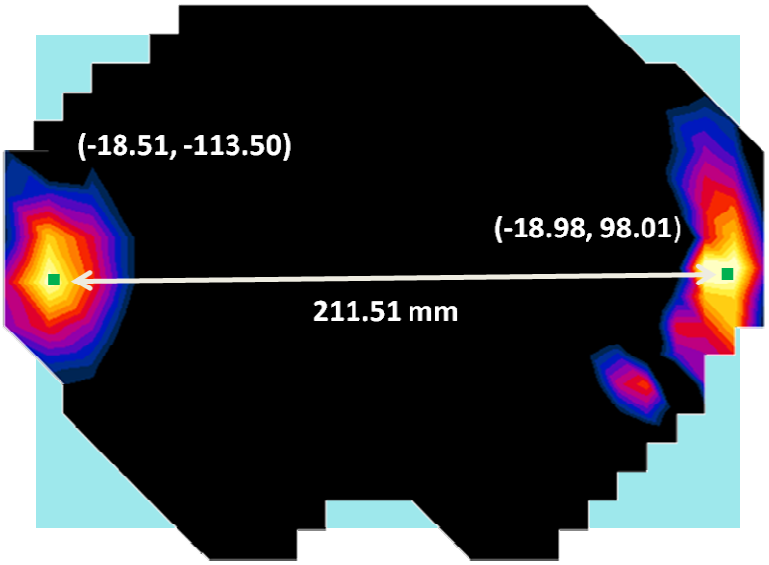

Figure 11-5
Peak SAR Location Plot of UMTS 1750 MHz and 5 GHz WLAN

Table 11-19
Peak SAR Locations for Body Back Side at 0 cm UMTS 1750 MHz and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz	-18.51	-113.50
IEEE 802.11a	-18.98	98.01

Table 11-20
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1750 MHz	IEEE 802.11a	0.68	1.006	1.686	211.51	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with UMTS 1900 MHz antenna operating at limited output power with 5 GHz WIFI.

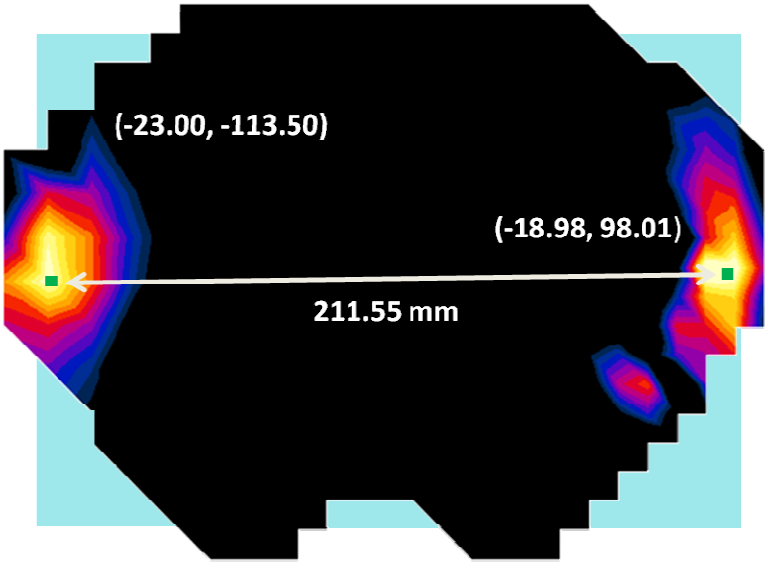

Figure 11-6
Peak SAR Location Plot of UMTS 1900 MHz and 5 GHz WLAN

Table 11-21
Peak SAR Locations for Body Back Side at 0 cm UMTS 1900 MHz and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz	-23.00	-113.50
IEEE 802.11a	-18.98	98.01

Table 11-22
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1900 MHz	IEEE 802.11a	0.865	1.006	1.871	211.55	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with LTE Band 4 antenna operating at limited output power with 5 GHz WIFI.

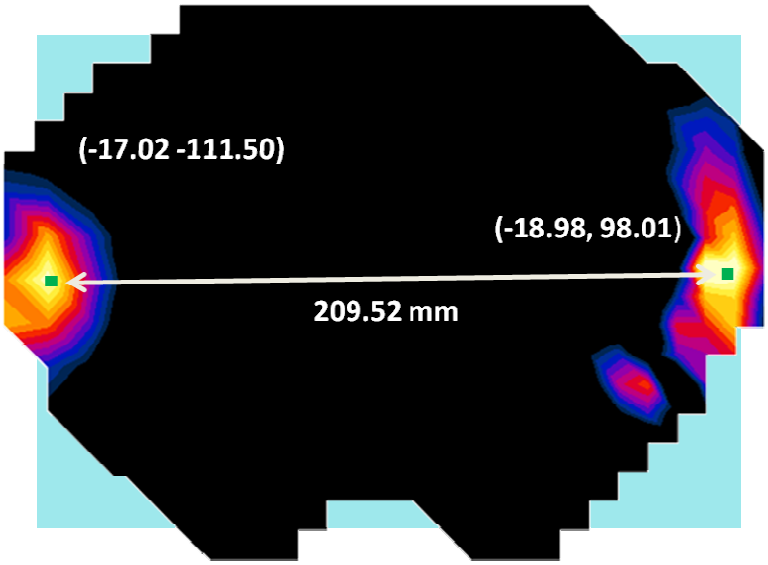

Figure 11-7
Peak SAR Location Plot of LTE Band 4 and 5 GHz WLAN

Table 11-23
Peak SAR Locations for Body Back Side at 0 cm LTE Band 4 and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 4	-17.02	-111.50
IEEE 802.11a	-18.98	98.01

Table 11-24
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 4	IEEE 802.11a	0.808	1.006	1.814	209.52	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 0 mm with LTE Band 2 antenna operating at limited output power with 5 GHz WIFI.

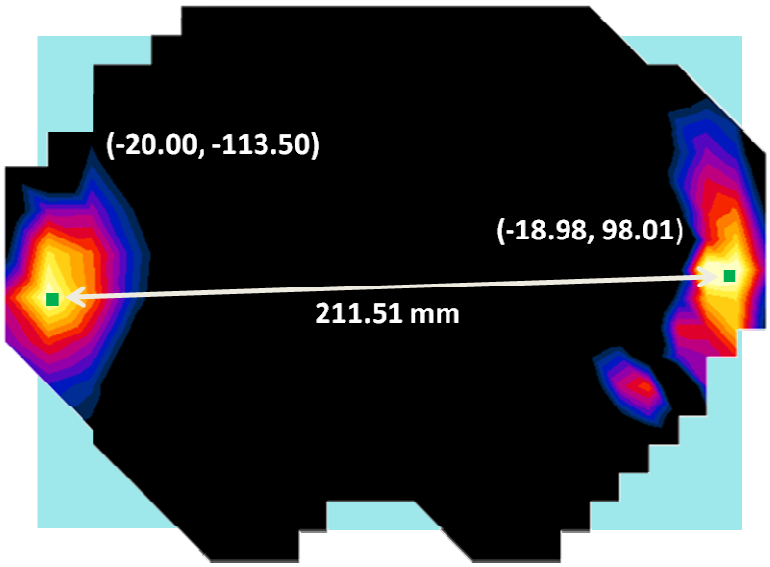

Figure 11-8
Peak SAR Location Plot of LTE Band 2 and 5 GHz WLAN

Table 11-25
Peak SAR Locations for Body Back Side at 0 cm LTE Band 2 and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 2	-20.00	-113.50
IEEE 802.11a	-18.98	98.01

Table 11-26
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 2	IEEE 802.11a	0.687	1.006	1.693	211.51	0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 12 mm with UMTS 1750 MHz antenna operating at maximum output power with 2.4 GHz WIFI.

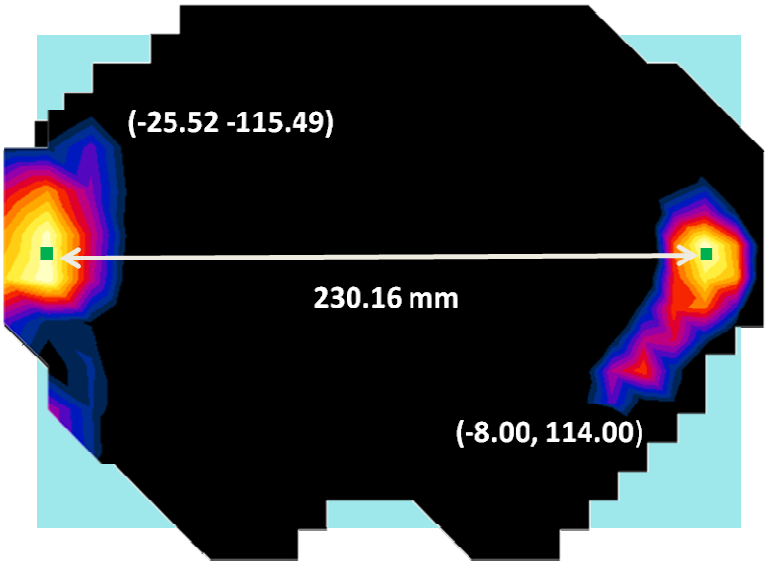

Figure 11-9
Peak SAR Location Plot of UMTS 1750 MHz and 2.4 GHz WLAN

Table 11-27
Peak SAR Locations for Body Back Side at 1.2 cm UMTS 1750 MHz and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz	-25.52	-115.49
IEEE 802.11b	-8.00	114.00

Table 11-28
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1750 MHz	IEEE 802.11b	0.564	< 1.090	< 1.654	230.16	< 0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 12 mm with LTE Band 4 antenna operating at maximum output power with 2.4 GHz WIFI.

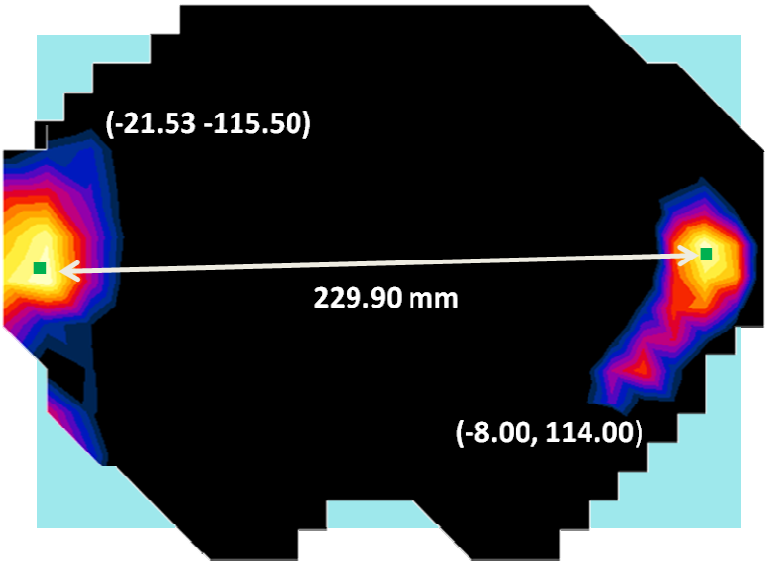

Figure 11-10
Peak SAR Location Plot of LTE Band 4 and 2.4 GHz WLAN

Table 11-29
Peak SAR Locations for Body Back Side at 1.2 cm LTE Band 4 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 4	-21.53	-115.50
IEEE 802.11b	-8.00	114.00

Table 11-30
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 4	IEEE 802.11b	0.684	< 1.090	< 1.774	229.90	< 0.01

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The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 12 mm with LTE Band 4 antenna operating at maximum output power with 5 GHz WIFI.

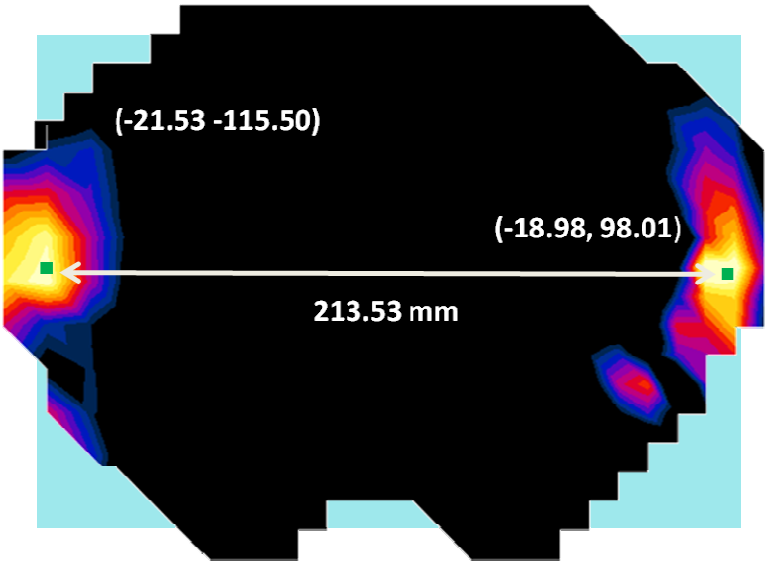

Figure 11-11
Peak SAR Location Plot of LTE Band 4 and 5 GHz WLAN

Table 11-31
Peak SAR Locations for Body Back Side at 1.2 cm LTE Band 4 and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)
LTE Band 4	-21.53	-115.50
IEEE 802.11a	-18.98	98.01

Table 11-32
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
LTE Band 4	IEEE 802.11a	0.684	< 1.006	< 1.690	213.53	< 0.01

11.5 Simultaneous Transmission Conclusion

The above numerical summed SAR results and SPLSR analyses 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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12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

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

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Data Rate (Mbps)	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2450	2437.00	6	IEEE 802.11b	DSSS	1	right	0 mm	0.975	0.932	1.05	N/A	N/A	N/A	N/A
5200	5220.00	44	IEEE 802.11a	OFDM	6	back	0 mm	0.873	0.845	1.03	N/A	N/A	N/A	N/A
5300	5320.00	64	IEEE 802.11a	OFDM	6	back	0 mm	0.922	0.890	1.04	N/A	N/A	N/A	N/A
5500	5500.00	100	IEEE 802.11a	OFDM	6	back	0 mm	0.913	0.907	1.01	N/A	N/A	N/A	N/A
5600	5660.00	132	IEEE 802.11a	OFDM	6	back	0 mm	0.868	0.760	1.14	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram						

12.2 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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13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85047A	S-Parameter Test Set	N/A	N/A	N/A	2904A00579
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/16/2013	Annual	4/16/2014	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433974
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1344554
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1344557
Anritsu	MA2411B	Pulse Power Sensor	11/14/2013	Annual	11/14/2014	1126066
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6200901190
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6201300731
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4052	Long Stem Thermometer	9/27/2013	Biennial	9/27/2015	130567447
Fisher Scientific	15-077-960	Digital Thermometer	12/4/2013	Biennial	12/4/2015	130764558
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671826
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/30/2013	Annual	10/30/2014	1833460
Gigatronics	8651A	Universal Power Meter	10/30/2013	Annual	10/30/2014	8650319
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	9/23/2013	Annual	9/23/2014	109892
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/16/2013	Annual	10/16/2014	100976
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	12/9/2013	Annual	12/9/2014	109366
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	2/20/2014	Biennial	2/20/2016	128633
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Rohde & Schwarz	NRVS	Single Channel Power Meter	10/31/2013	Annual	10/31/2014	835360/0079
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
Rohde & Schwarz	SME06	Signal Generator	10/30/2013	Annual	10/30/2014	832026
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
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	D750V3	750 MHz Dipole	1/20/2014	Annual	1/20/2015	1003
SPEAG	D835V2	835 MHz SAR Dipole	4/25/2013	Annual	4/25/2014	4d119
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2013	Annual	5/14/2014	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2013	Annual	7/22/2014	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2013	Annual	8/23/2014	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/23/2013	Annual	9/23/2014	1007
SPEAG	DAE4	Dasy Data Acquisition Electronics	12/12/2013	Annual	12/12/2014	649
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/13/2013	Annual	5/13/2014	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2014	Annual	1/22/2015	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/21/2013	Annual	8/21/2014	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	ES3DV2	SAR Probe	8/22/2013	Annual	8/22/2014	3022
SPEAG	ES3DV3	SAR Probe	5/16/2013	Annual	5/16/2014	3263
SPEAG	ES3DV3	SAR Probe	11/22/2013	Annual	11/22/2014	3333
SPEAG	ES3DV3	SAR Probe	1/29/2014	Annual	1/29/2015	3589
SPEAG	EX3DV4	SAR Probe	12/18/2013	Annual	12/18/2014	3920
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
VWR	23226-658	Long Stem Thermometer	5/16/2012	Biennial	5/16/2014	122295544
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Annual	8/8/2014	130477877

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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14 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

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

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

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Applicable for frequencies up to 6 GHz.

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

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

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15 CONCLUSION

15.1 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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16 REFERENCES

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

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

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

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

[5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2003, Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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APPENDIX A: SAR TEST DATA

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PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-F

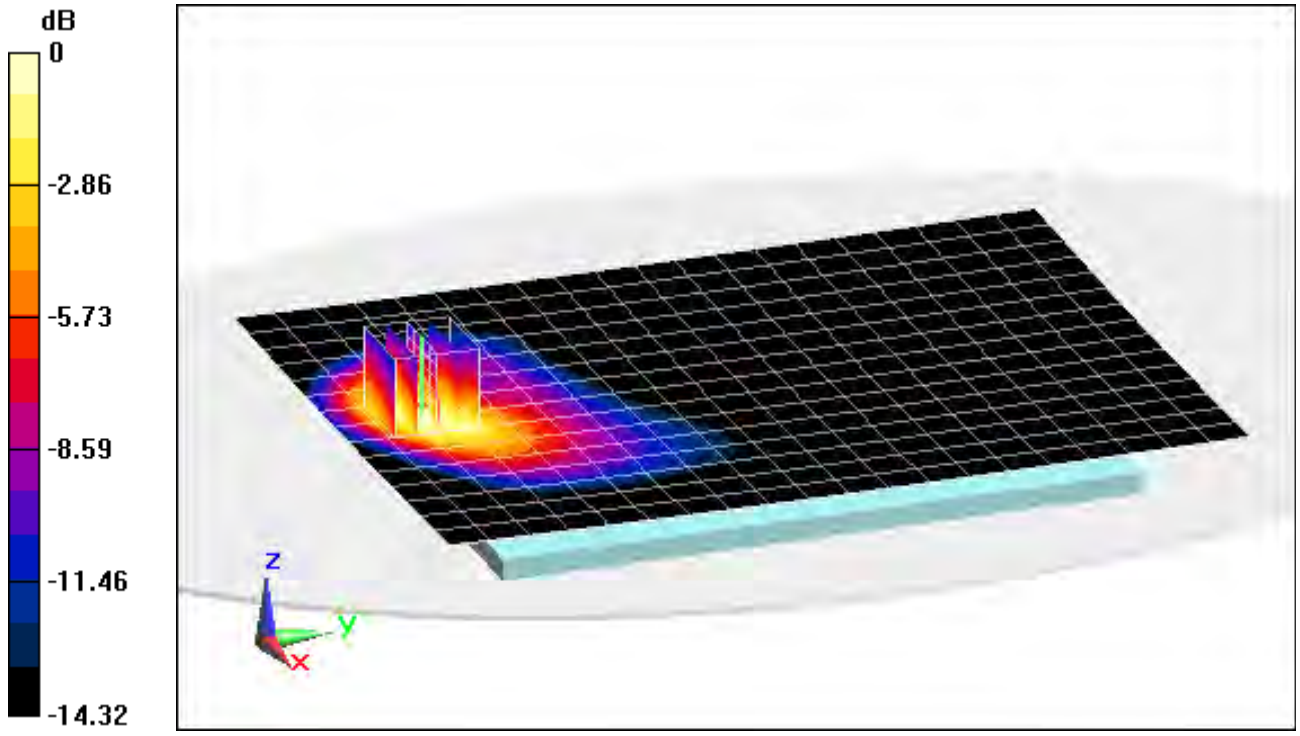
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.003 S/m; ε_r = 54.483; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.2 cm

Test Date: 03-24-2014; Ambient Temp: 23.9°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(6.07, 6.07, 6.07); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (16x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.636 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.323 W/kg



0 dB = 0.354 W/kg = -4.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-B

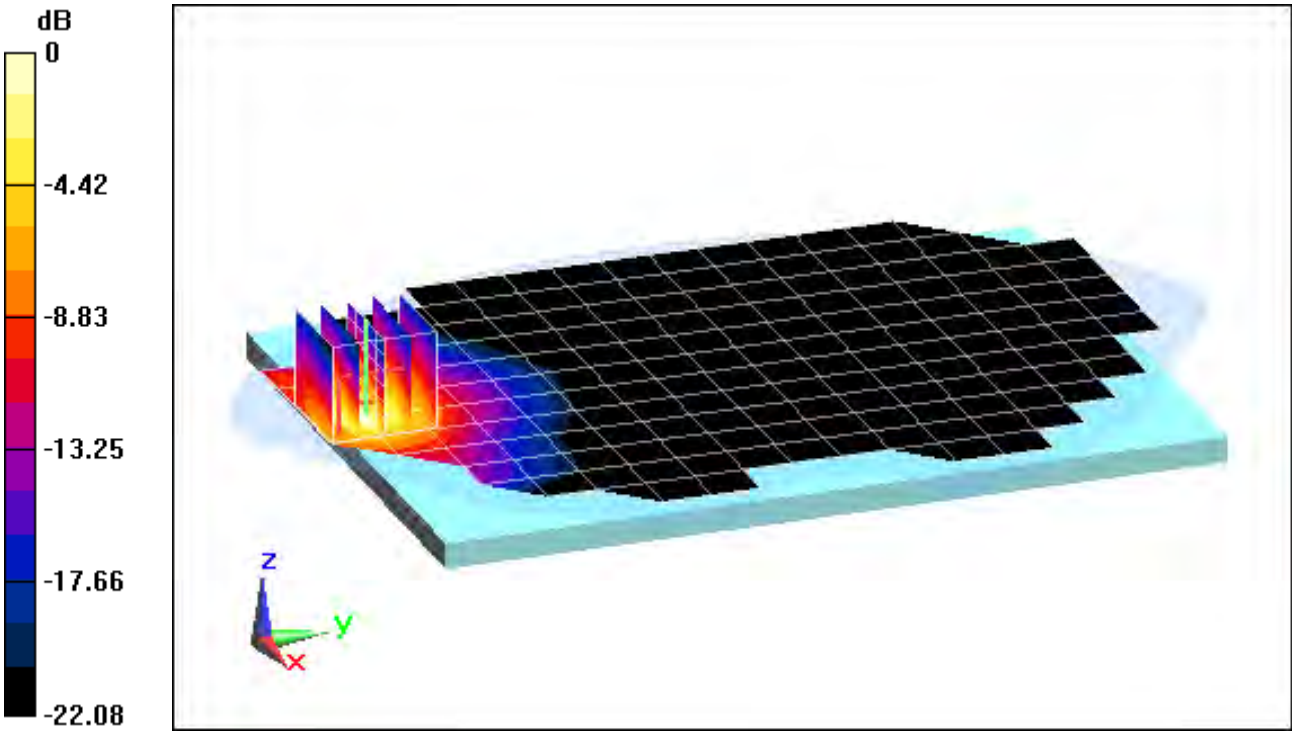
Communication System: UID 0, UMTS; Frequency: 1712.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1712.4 MHz; σ = 1.469 S/m; ε_r = 52.117; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3263; ConvF(5.01, 5.01, 5.01); Calibrated: 5/16/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/13/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1750, Body SAR, Back side, Low.ch

Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.592 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 0.677 W/kg



0 dB = 0.789 W/kg = -1.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-B

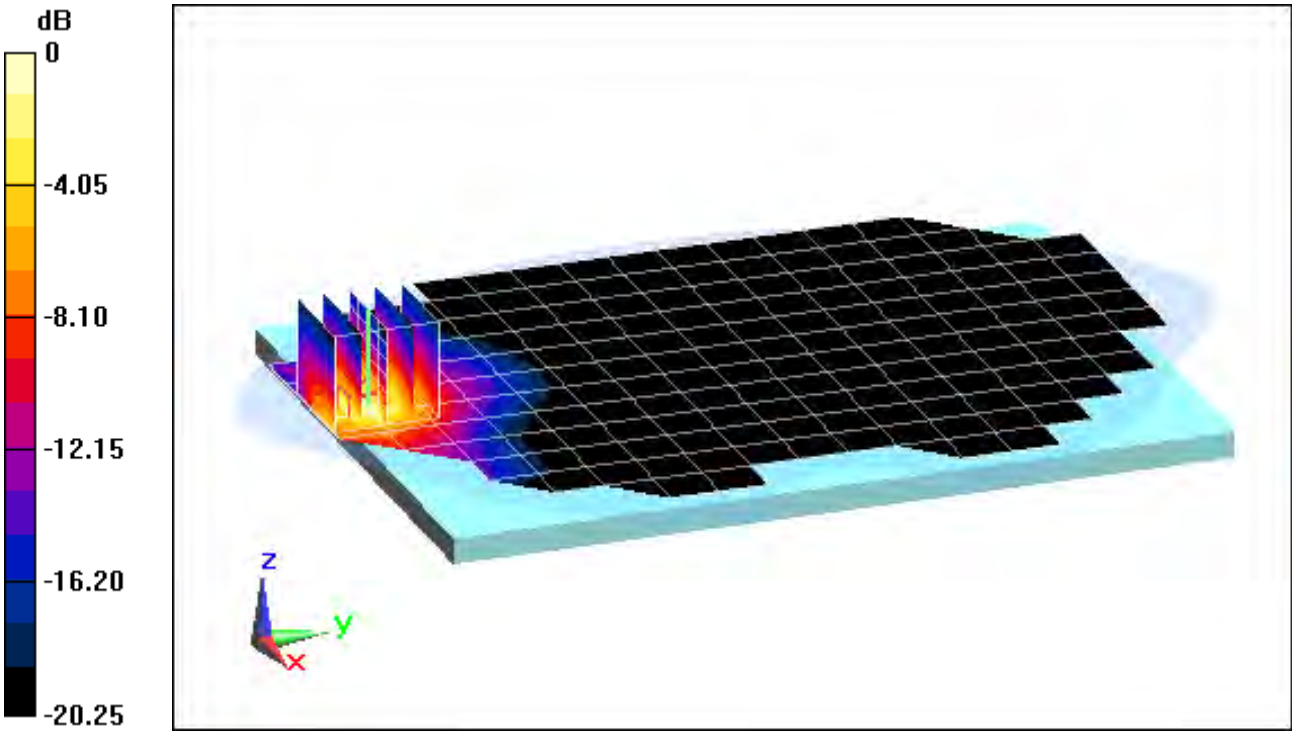
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.545 S/m; ε_r = 51.042; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.2°C; Tissue Temp: 21.6°C

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

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

Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.117 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.793 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-A

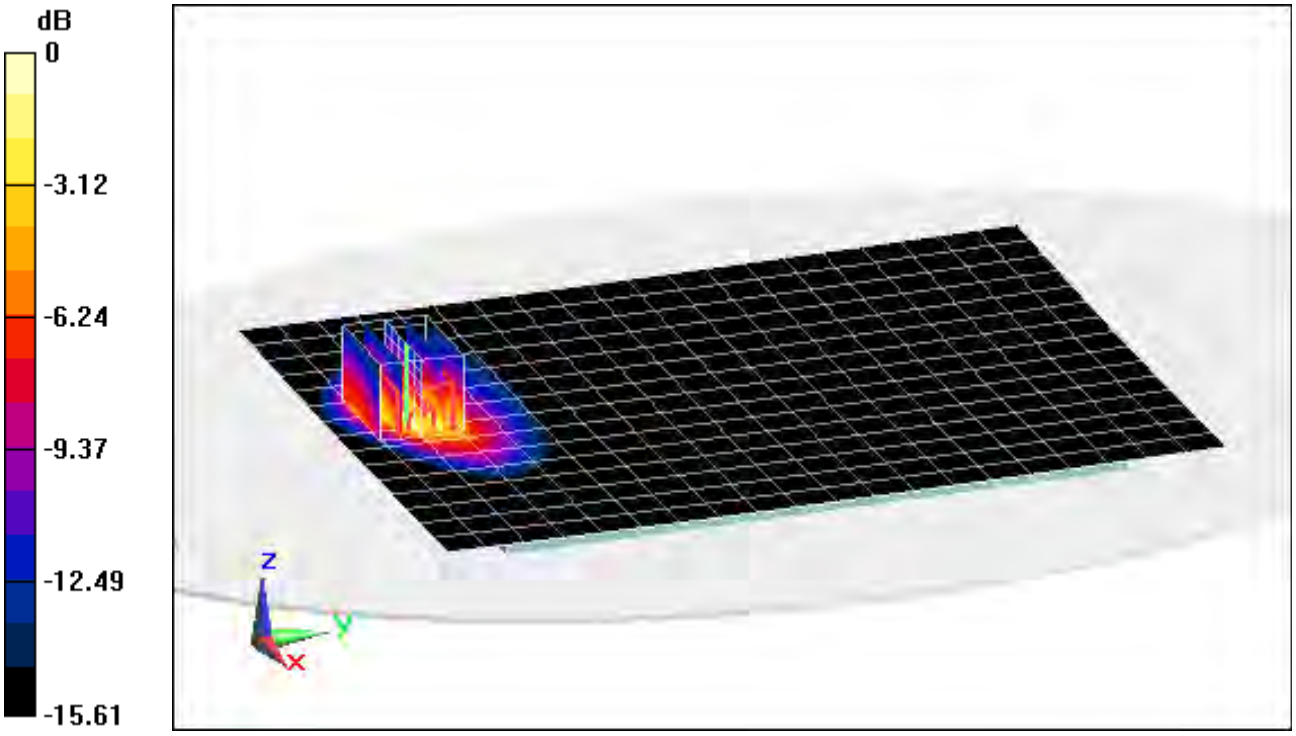
Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used:
f = 710 MHz; σ = 0.958 S/m; ε_r = 56.516; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-02-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3333; ConvF(6.11, 6.11, 6.11); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 17, Body SAR, Back Side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (16x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.838 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.427 W/kg
SAR(1 g) = 0.211 W/kg



0 dB = 0.237 W/kg = -6.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-F

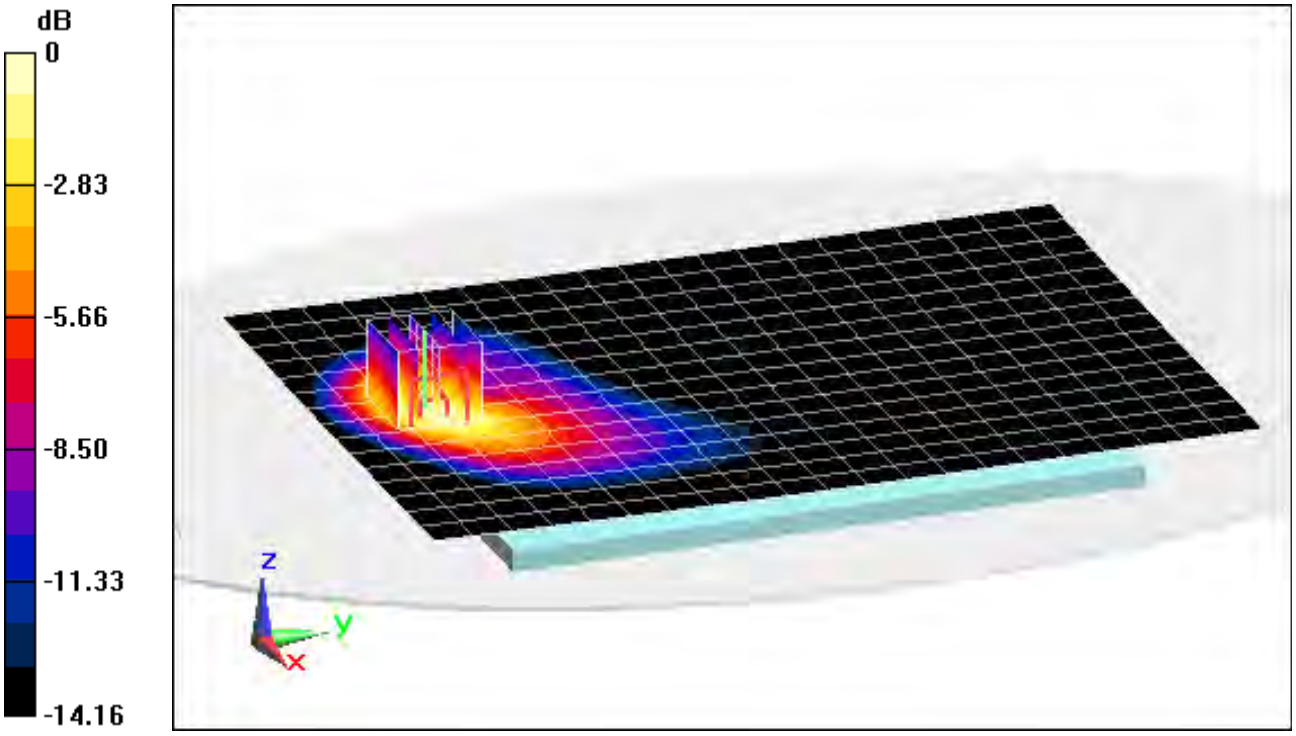
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.002 S/m; ε_r = 54.484; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.2 cm

Test Date: 03-24-2014; Ambient Temp: 23.9°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(6.07, 6.07, 6.07); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (16x22x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.076 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.498 W/kg
SAR(1 g) = 0.324 W/kg



0 dB = 0.354 W/kg = -4.51 dBW/kg

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-B

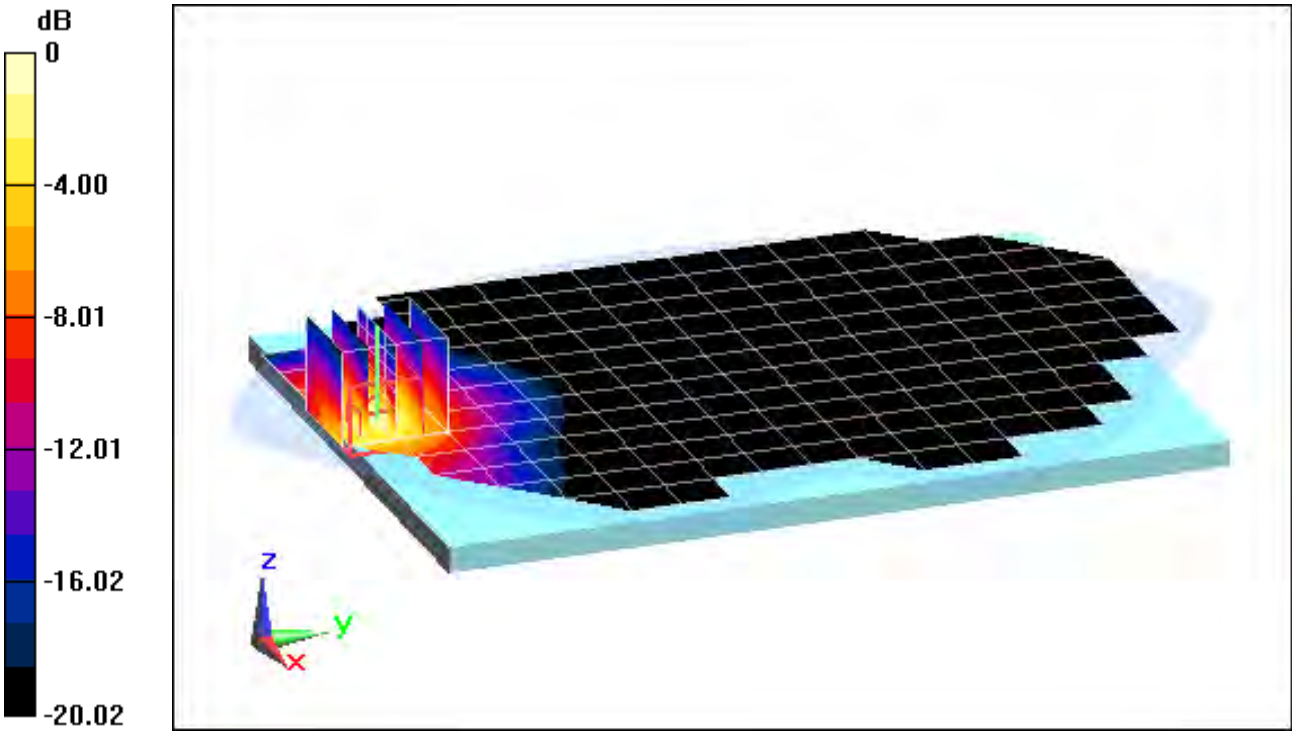
Communication System: UID 0, LTE Band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.491 S/m; ε_r = 52.006; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3263; ConvF(5.01, 5.01, 5.01); Calibrated: 5/16/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/13/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.473 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 0.795 W/kg



0 dB = 0.872 W/kg = -0.59 dBW/kg

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-B

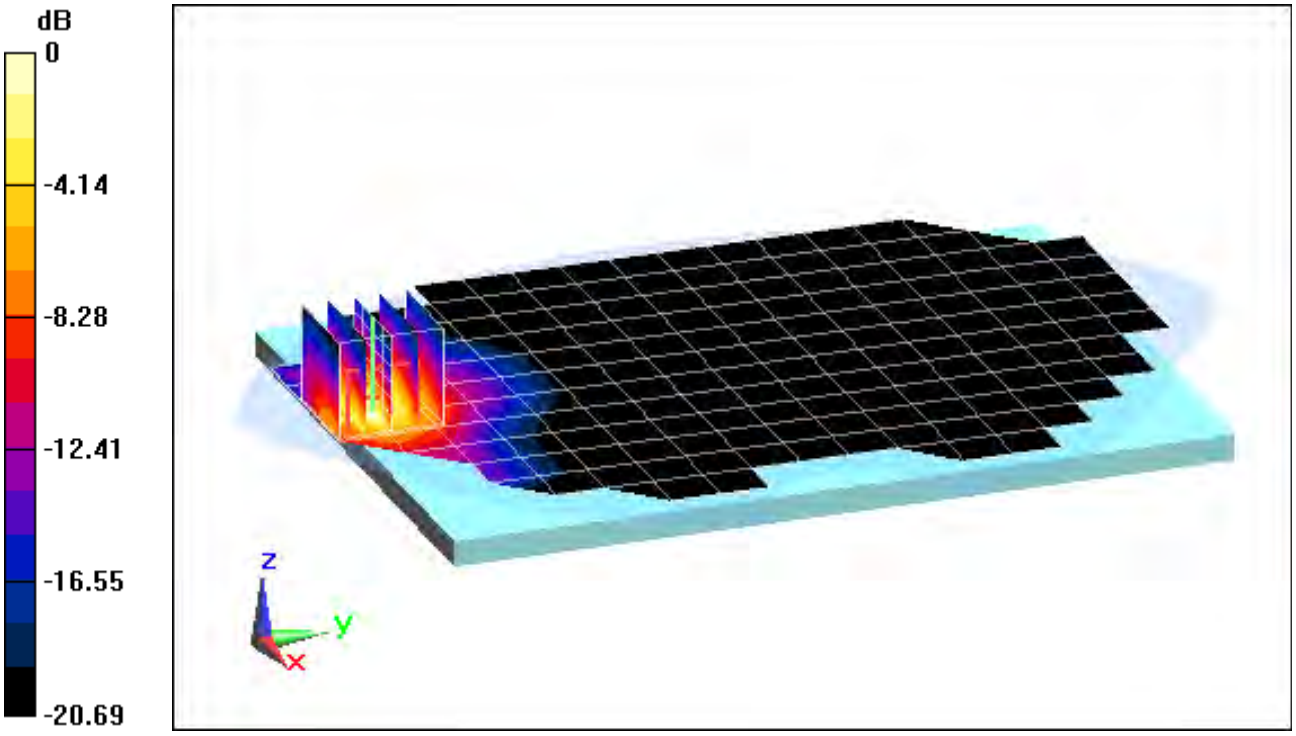
Communication System: UID 0, LTE Band 2; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.545 S/m; ε_r = 51.042; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.2°C; Tissue Temp: 21.6°C

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

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

Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.882 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.654 W/kg



0 dB = 0.779 W/kg = -1.08 dBW/kg

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-F

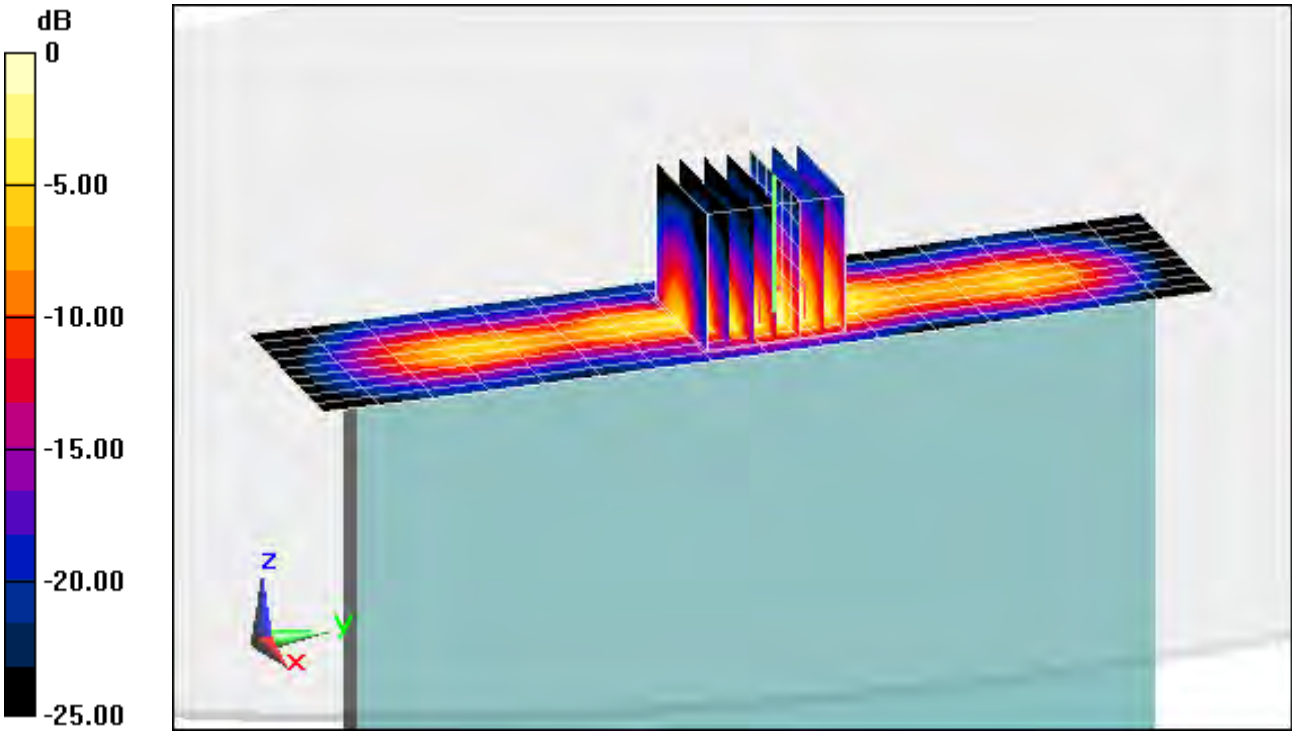
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.009 S/m; ε_r = 52.411; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-24-2014; Ambient Temp: 23.6°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(6.26, 6.26, 6.26); Calibrated: 1/29/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Right Edge

Area Scan (10x17x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.623 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.41 W/kg
SAR(1 g) = 0.975 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-E

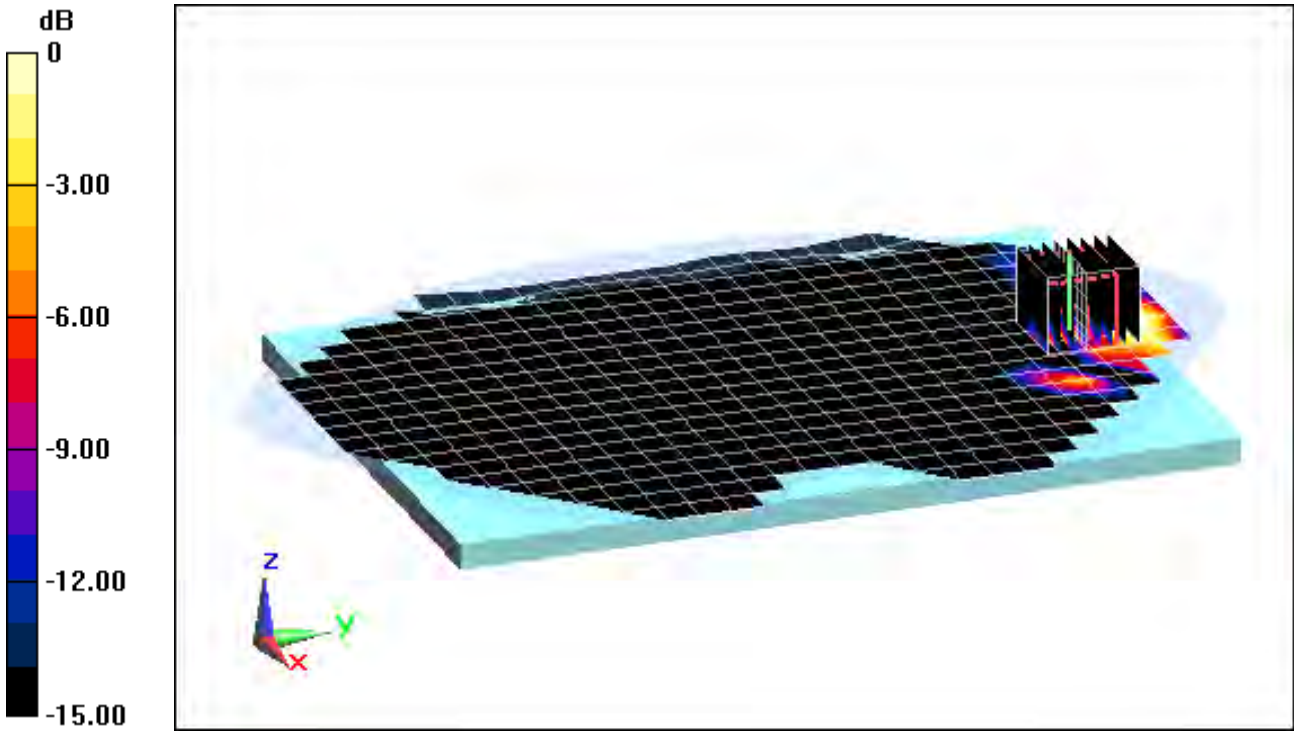
Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5745 MHz; σ = 6.203 S/m; ε_r = 46.617; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3920; ConvF(4, 4, 4); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (20x27x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 9.649 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 6.45 W/kg
SAR(1 g) = 0.761 W/kg



0 dB = 2.18 W/kg = 3.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-E

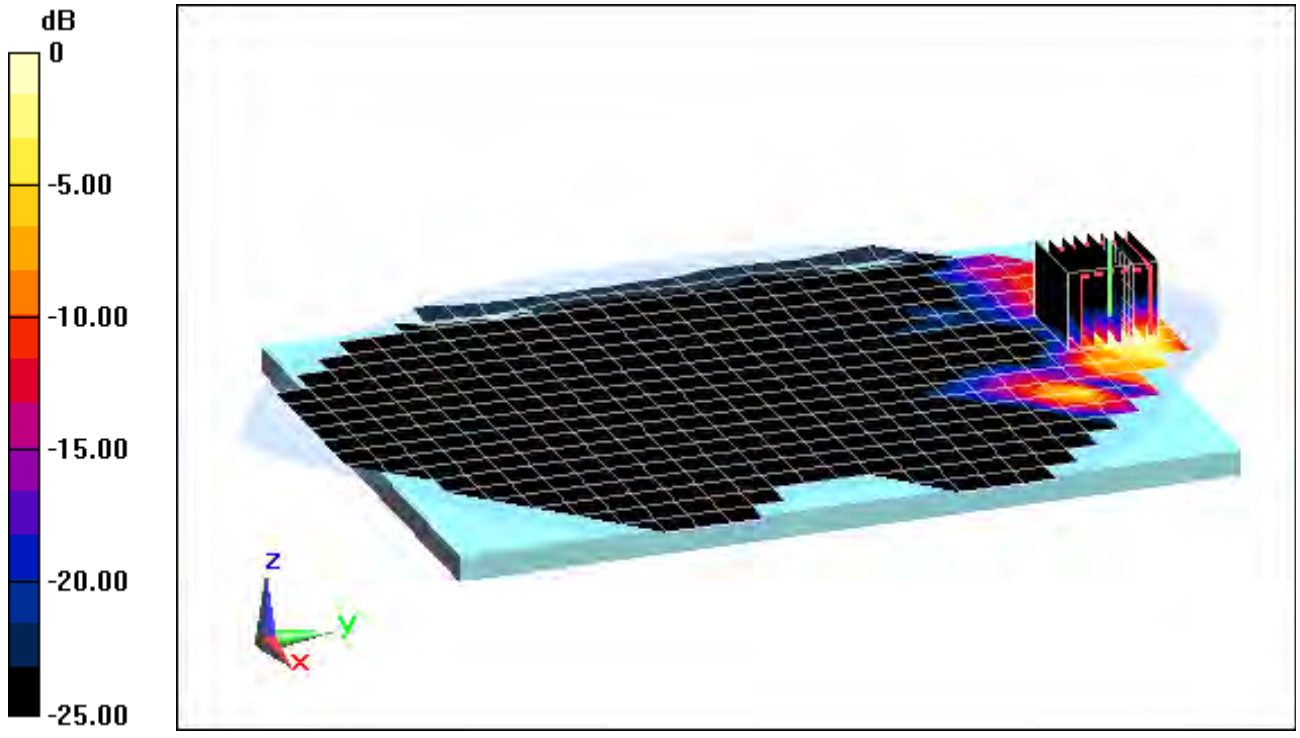
Communication System: UID 0, IEEE 802.11a; Frequency: 5320 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5320 MHz; σ = 5.363 S/m; ε_r = 46.824; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3920; ConvF(4.11, 4.11, 4.11); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.3 GHz, Body SAR, Ch 64, 6 Mbps, Back Side

Area Scan (20x27x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 6.713 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 6.79 W/kg
SAR(1 g) = 0.922 W/kg



0 dB = 2.73 W/kg = 4.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMP607T; Type: Portable Tablet; Serial: FL-112-F

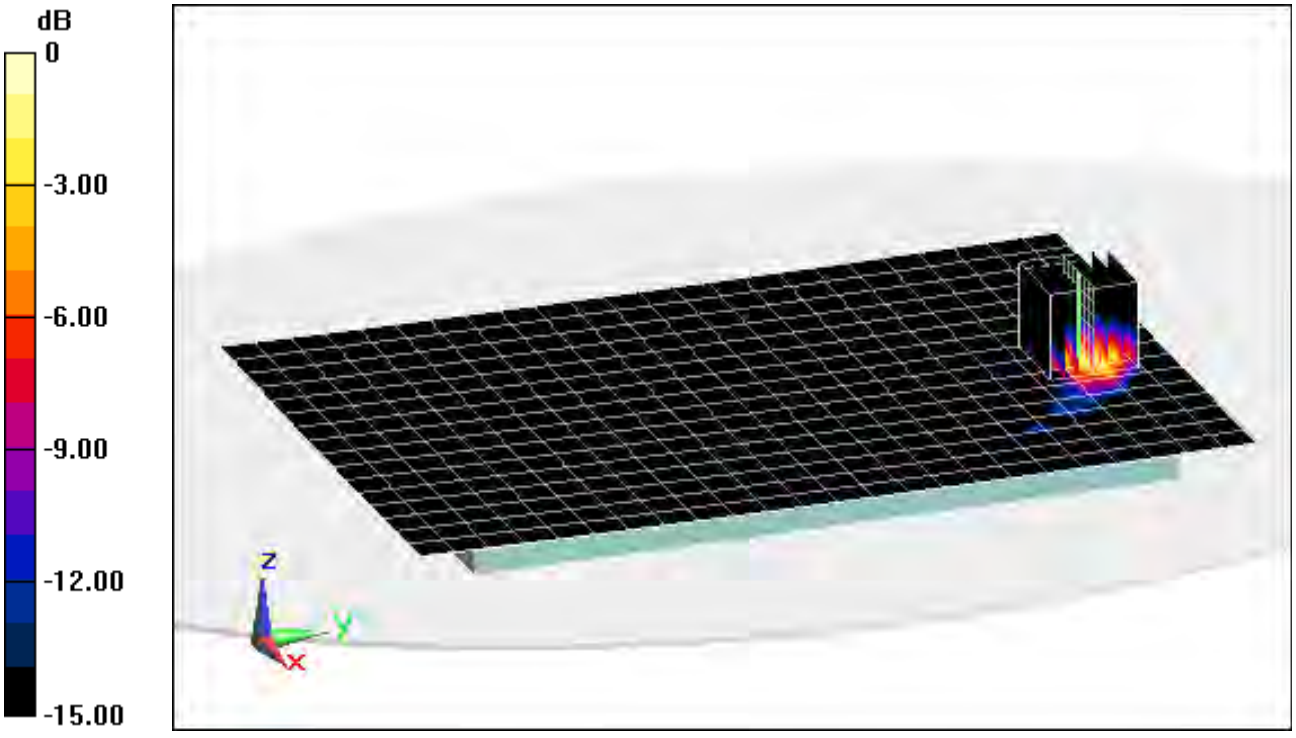
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.03 S/m; ε_r = 51.905; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-27-2014; Ambient Temp: 23.8°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.26, 6.26, 6.26); Calibrated: 1/29/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Bluetooth, Body SAR, Ch 39, 1 Mbps, Back Side

Area Scan (17x25x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.565 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.280 W/kg
SAR(1 g) = 0.089 W/kg



0 dB = 0.149 W/kg = -8.27 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

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PCTEST ENGINEERING LABORATORY, INC.

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

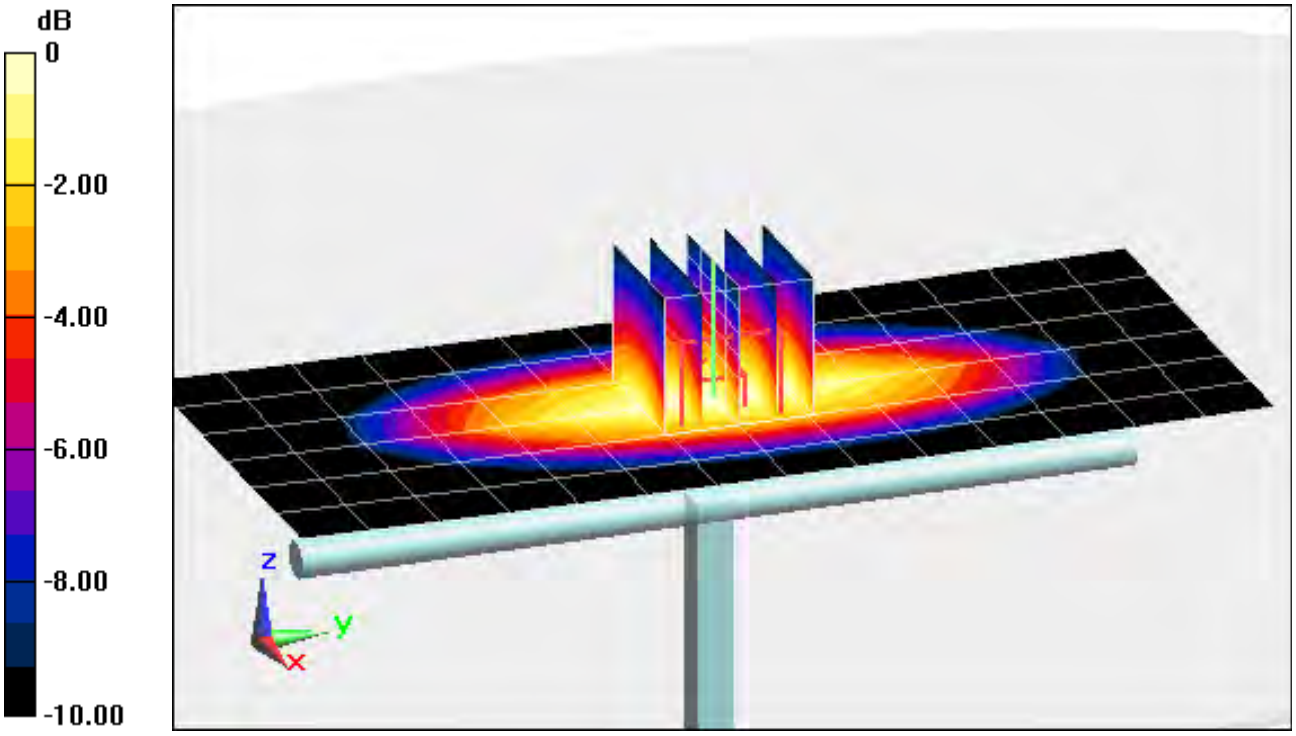
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.994 S/m; ε_r = 56.108; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-02-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3333; ConvF(6.11, 6.11, 6.11); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.846 W/kg
Deviation = -3.53%



0 dB = 0.914 W/kg = -0.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

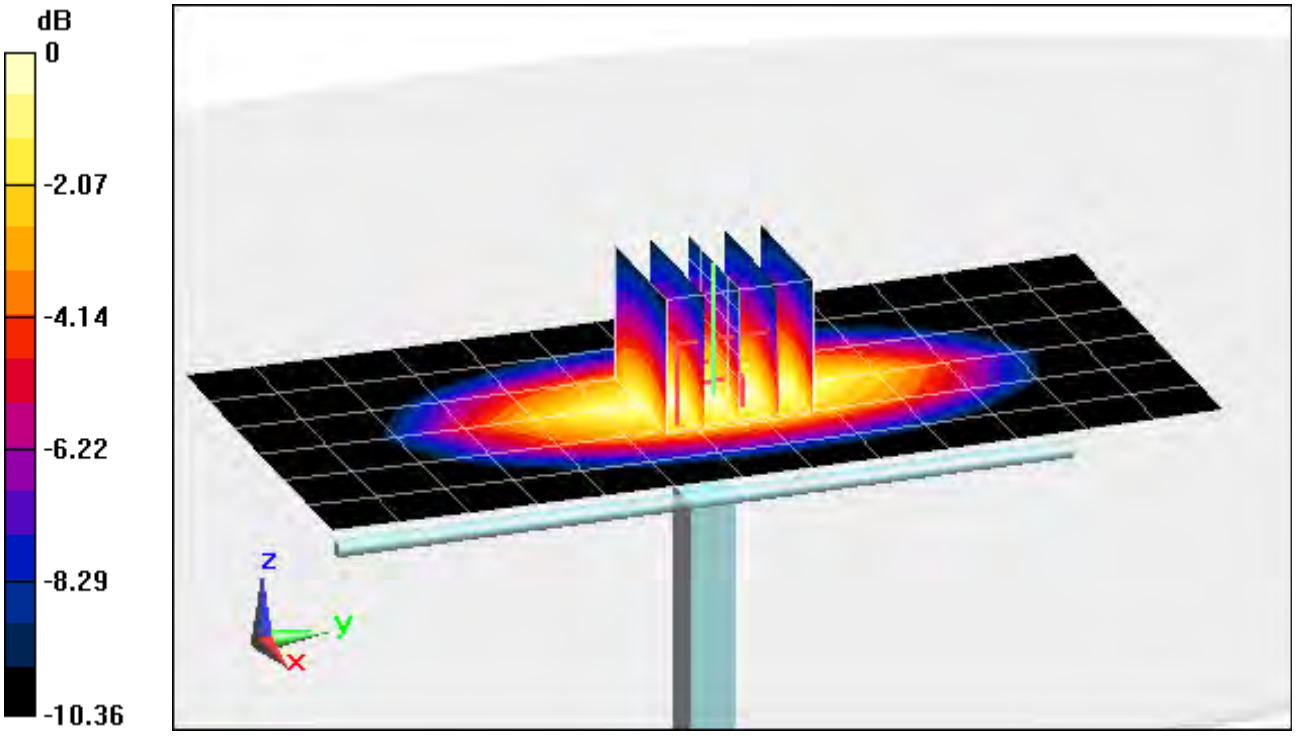
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used:
f = 835 MHz; σ = 1.001 S/m; ε_r = 54.502; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-24-2014; Ambient Temp: 23.9°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(6.07, 6.07, 6.07); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.988 W/kg
Deviation = 3.56%



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

PCTEST ENGINEERING LABORATORY, INC.

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

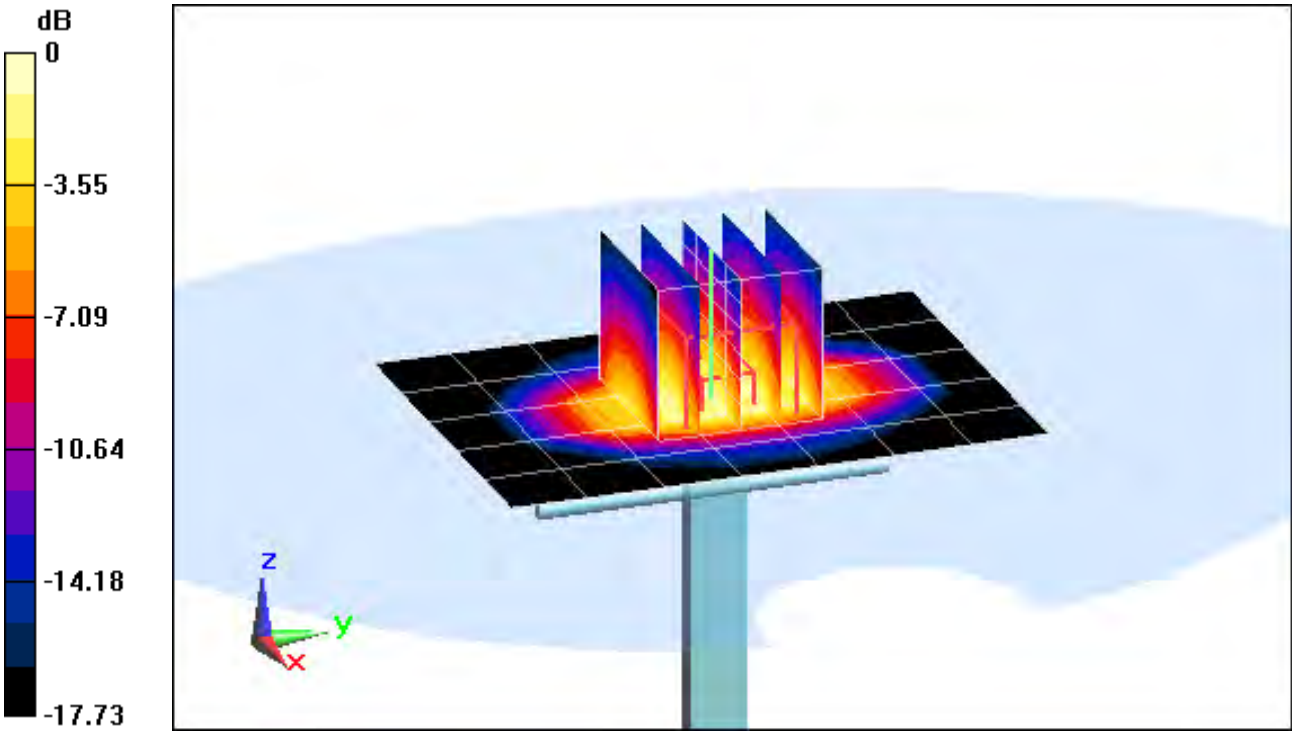
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.511 S/m; ε_r = 51.91; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3263; ConvF(5.01, 5.01, 5.01); Calibrated: 5/16/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/13/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.52 W/kg
SAR(1 g) = 4.09 W/kg
Deviation = 7.07%



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

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

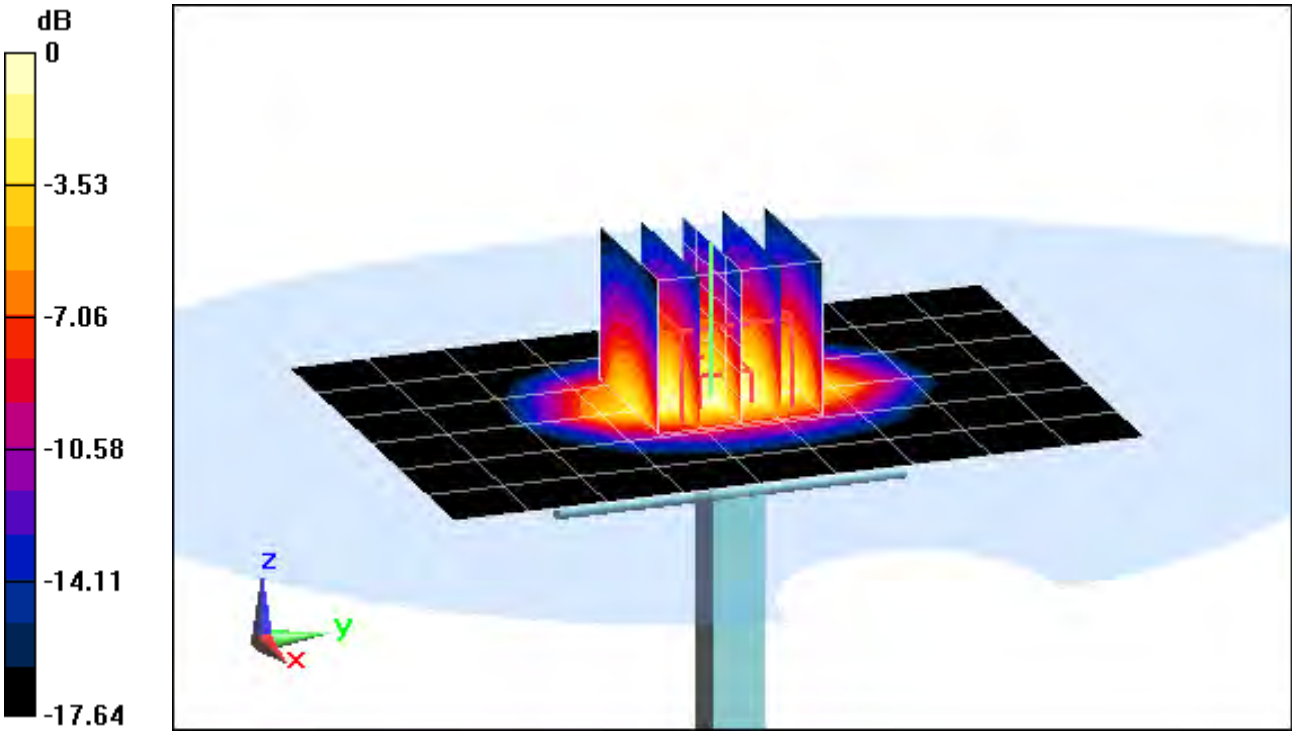
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.569 S/m; ε_r = 50.964; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-31-2014; Ambient Temp: 23.2°C; Tissue Temp: 21.6°C

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

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.65 W/kg
SAR(1 g) = 4.20 W/kg
Deviation = 3.70%



0 dB = 4.73 W/kg = 6.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

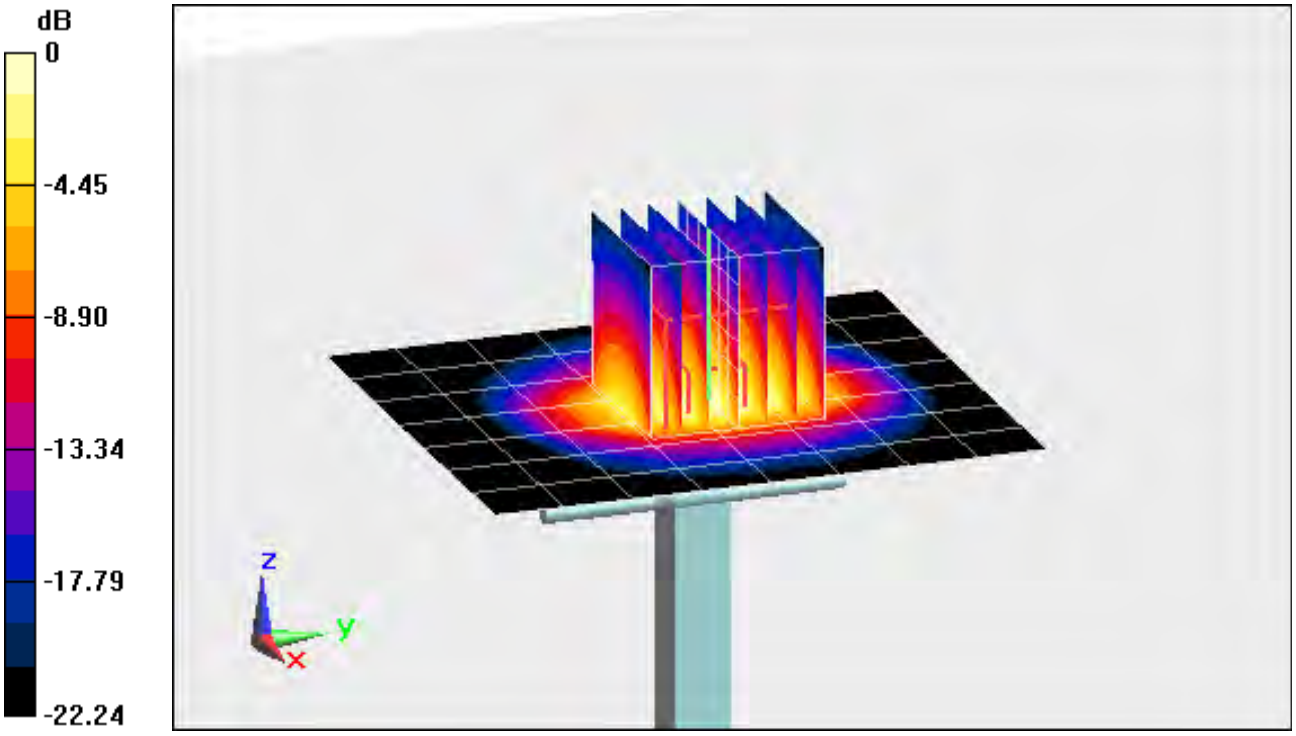
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.042 S/m; ε_r = 51.875; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-27-2014; Ambient Temp: 23.8°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.26, 6.26, 6.26); Calibrated: 1/29/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/22/2014
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 4.15 W/kg
SAR(1 g) = 2.01 W/kg
Deviation = -2.80%



0 dB = 2.66 W/kg = 4.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

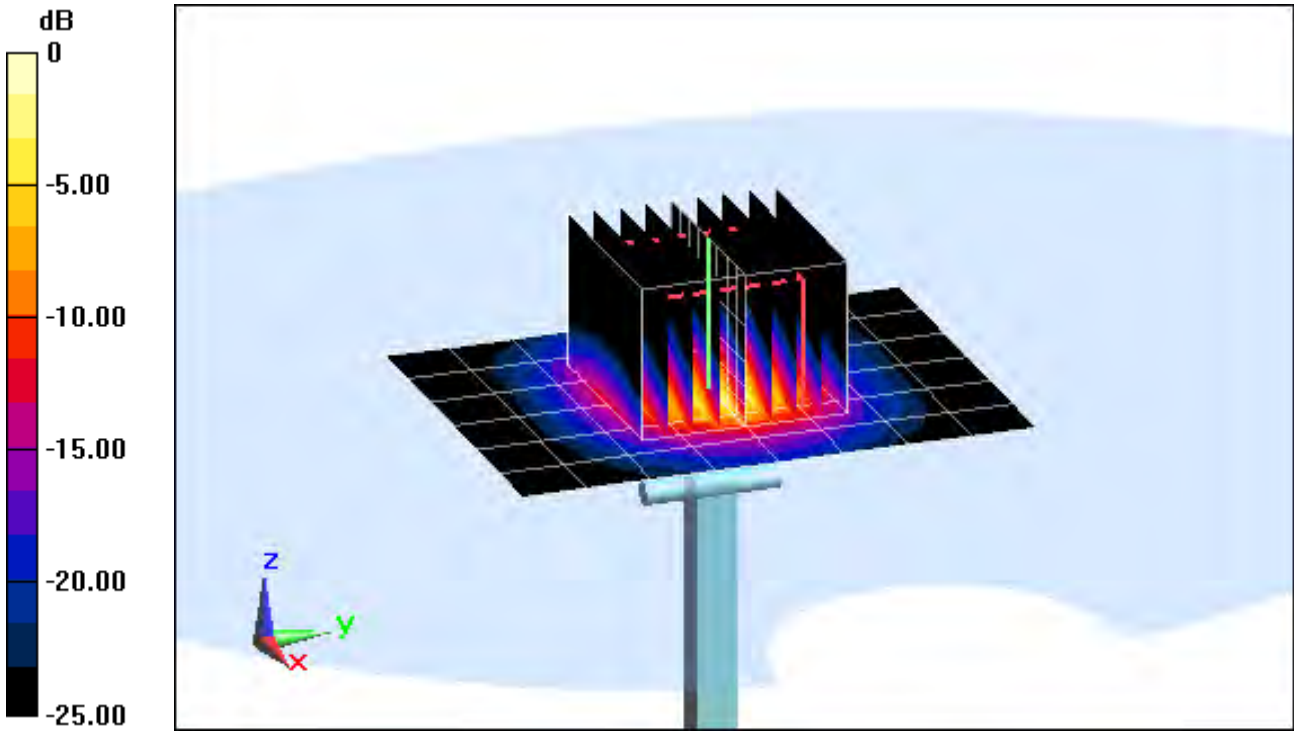
Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.127 S/m; ε_r = 47.38; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3920; ConvF(4.23, 4.23, 4.23); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 7.37 W/kg
Deviation = 1.52%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1007

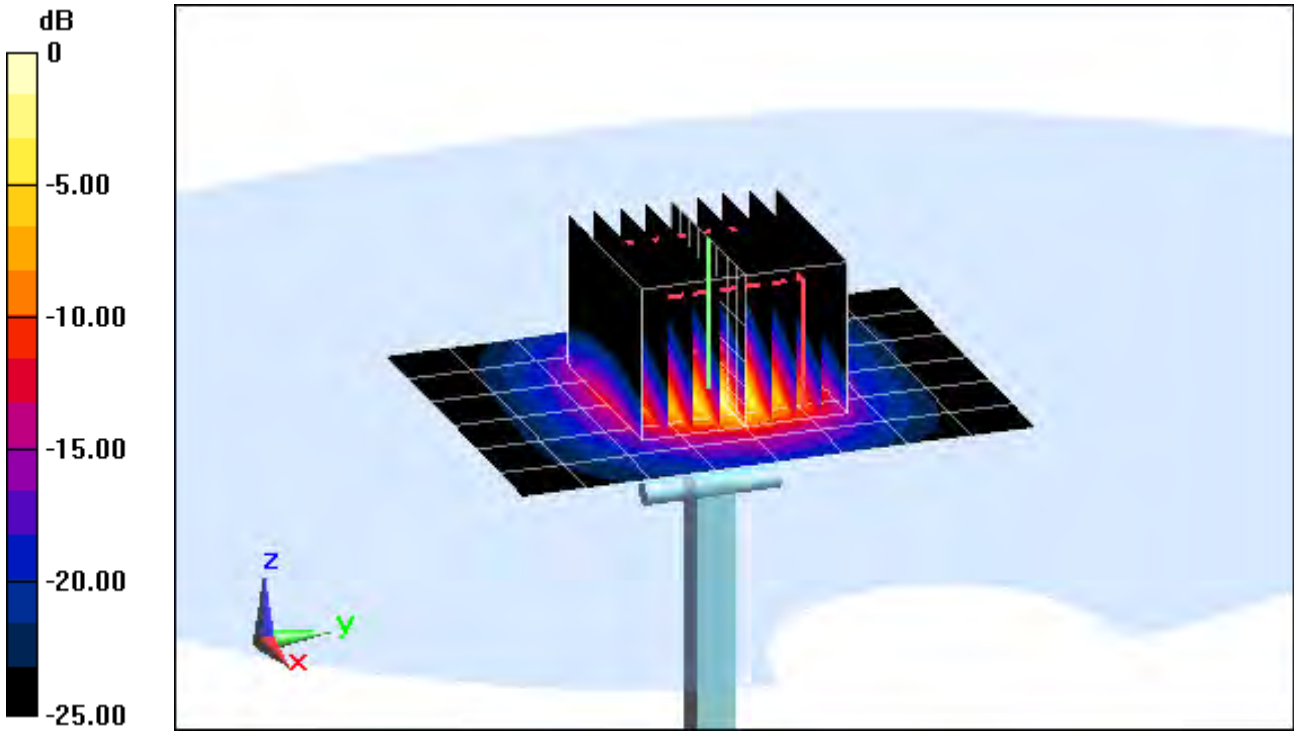
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.317 S/m; ε_r = 46.864; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3920; ConvF(4.11, 4.11, 4.11); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 7.77 W/kg
Deviation = 4.02%



0 dB = 19.4 W/kg = 12.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

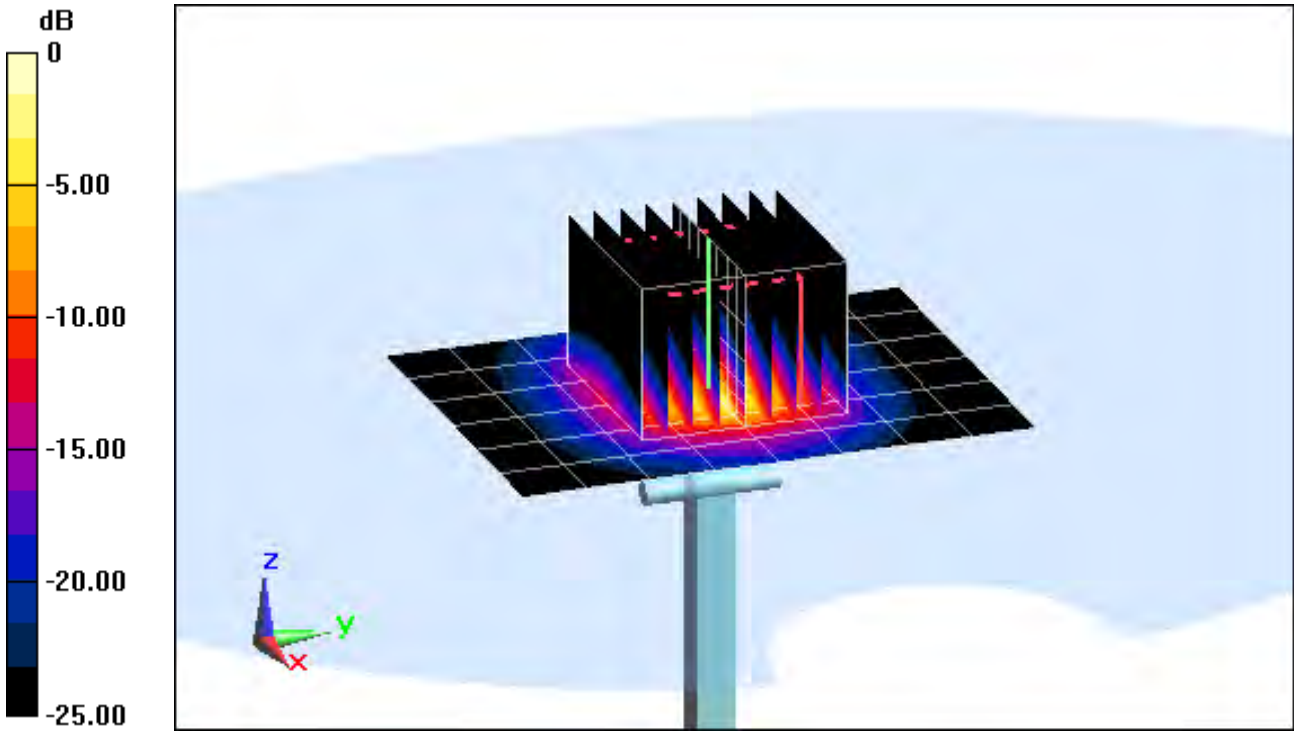
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.769 S/m; ε_r = 46.401; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3920; ConvF(3.8, 3.8, 3.8); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.6 W/kg
SAR(1 g) = 7.78 W/kg
Deviation = 2.50%



0 dB = 21.0 W/kg = 13.22 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1007

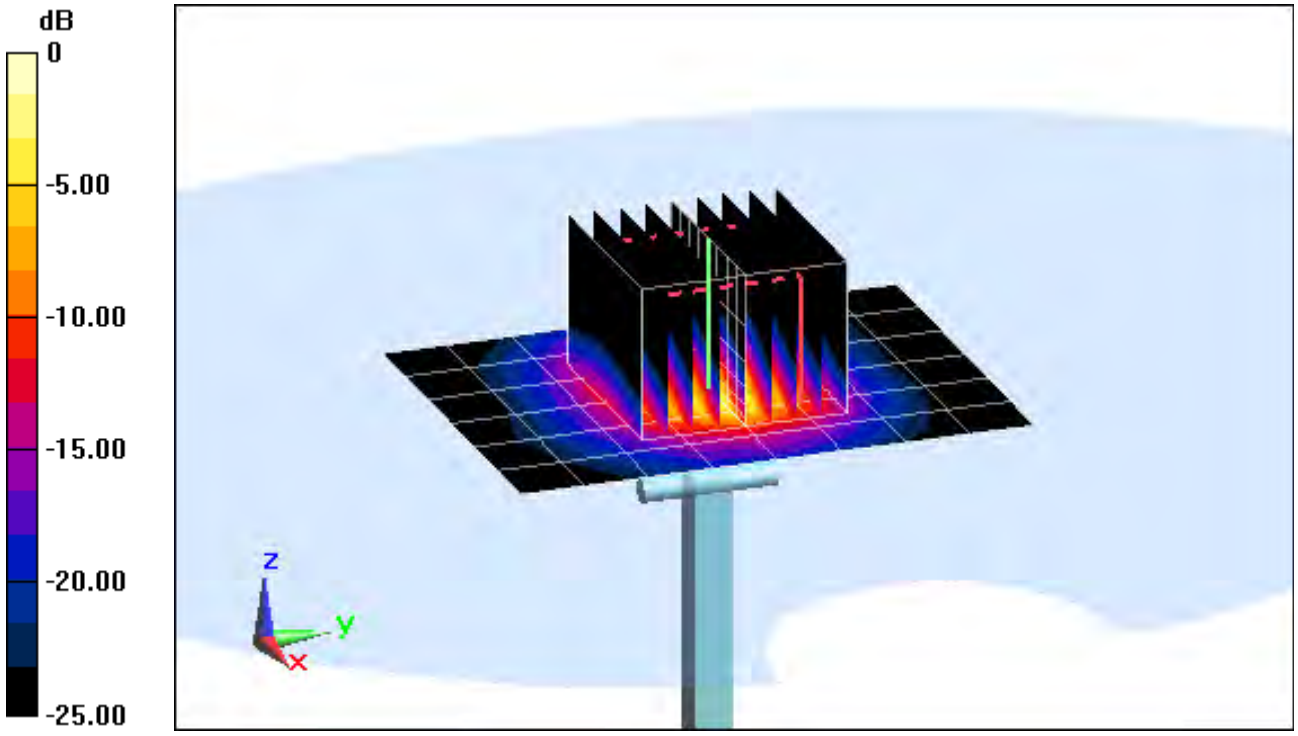
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.976 S/m; ε_r = 46.409; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3920; ConvF(3.62, 3.62, 3.62); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 36.2 W/kg
SAR(1 g) = 8.07 W/kg
Deviation = 4.40%



0 dB = 21.2 W/kg = 13.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

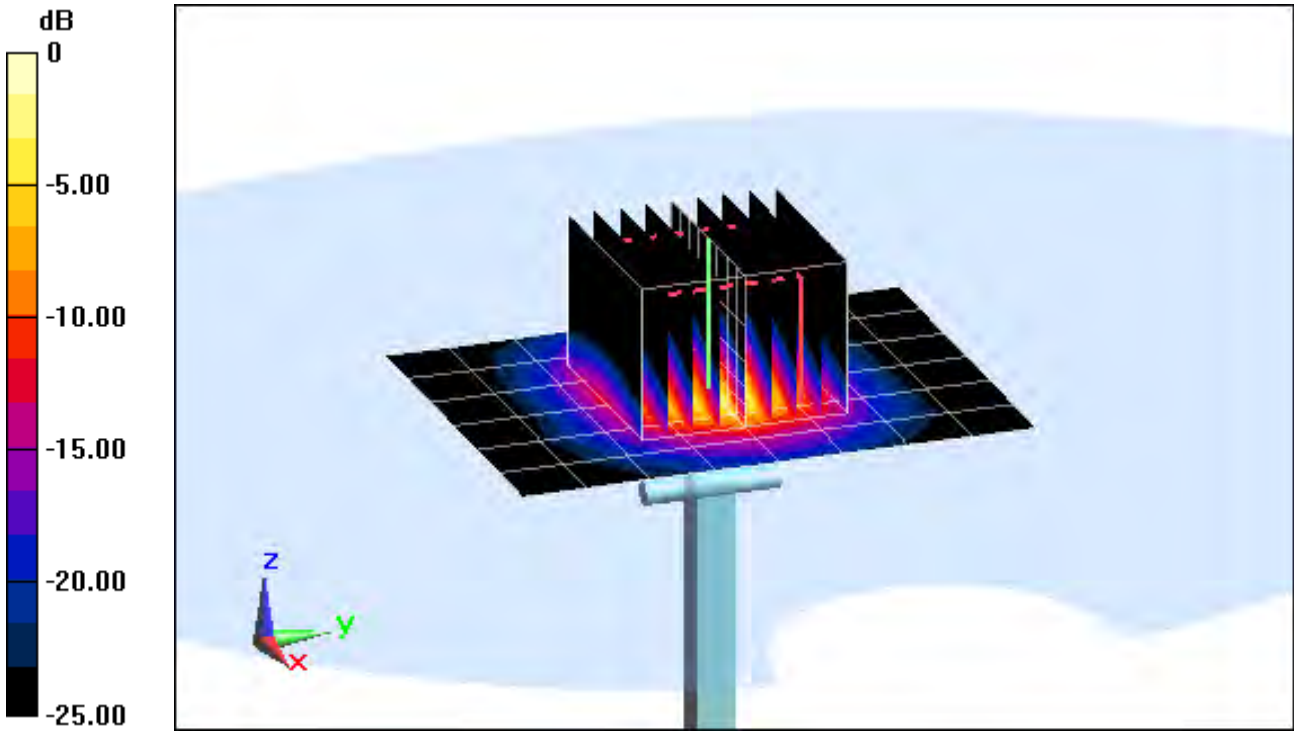
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.279 S/m; ε_r = 46.726; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2014; Ambient Temp: 22.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3920; ConvF(4, 4, 4); Calibrated: 12/18/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn649; Calibrated: 12/12/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 7.57 W/kg
Deviation = 3.84%



0 dB = 19.9 W/kg = 12.99 dBW/kg