PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctestlab.com

SAR EVALUATION REPORT

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

Date of Testing:
06/16/14 – 08/01/14
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1407301582.A3L

FCC ID: A3LSMT807T

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

DUT Type: Portable Tablet
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-T807T

Equipment Class	Band & Mode	Tx Frequency	SAR 1 gm Body (W/kg)
PCB	UMTS 850	826.40 - 846.60 MHz	1.00
PCB	UMTS 1750	1712.4 - 1752.5 MHz	0.80
PCB	UMTS 1900	1852.4 - 1907.6 MHz	0.79
PCB	LTE Band 12	699.7 - 715.3 MHz	0.60
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.82
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.76
PCB	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.71
DTS	2.4 GHz WLAN	2412 - 2462 MHz	1.09
DTS	5.8 GHz WLAN	5745 - 5825 MHz	1.07
NII	5.2 GHz WLAN	5180 - 5240 MHz	0.90
NII	5.3 GHz WLAN	5260 - 5320 MHz	0.80
NII	5.5 GHz WLAN	5500 - 5700 MHz	0.98
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A
Simultaneous SAR per KDB 690783 D01v01r02:			1.59

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 CERT#2041.01

© 2014 PCTEST Engineering Laboratory, Inc.

TABLE OF CONTENTS

1 DEVICE UNDER TEST 3

2 LTE INFORMATION 9

3 INTRODUCTION 10

4 DOSIMETRIC ASSESSMENT 11

5 SAR TESTING PROCEDURES 12

6 RF EXPOSURE LIMITS 13

7 FCC MEASUREMENT PROCEDURES 14

8 RF CONDUCTED POWERS 19

9 SYSTEM VERIFICATION 65

10 SAR DATA SUMMARY 67

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS 73

12 SAR MEASUREMENT VARIABILITY 115

13 EQUIPMENT LIST 116

14 MEASUREMENT UNCERTAINTIES 117

15 CONCLUSION 119

16 REFERENCES 120

APPENDIX A: SAR TEST PLOTS

APPENDIX B: SAR DIPOLE VERIFICATION PLOTS

APPENDIX C: PROBE AND DIPOLE CALIBRATION CERTIFICATES

APPENDIX D: SAR TISSUE SPECIFICATIONS

APPENDIX E: SAR SYSTEM VALIDATION

APPENDIX F: SAR TEST SETUP PHOTOGRAPHS

APPENDIX G: SENSOR TRIGGERING INFORMATION

© 2014 PCTEST Engineering Laboratory, Inc.

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 12	Data	699.7 - 715.3 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
5.8 GHz WLAN	Data	5745 - 5825 MHz
5.2 GHz WLAN	Data	5180 - 5240 MHz
5.3 GHz WLAN	Data	5260 - 5320 MHz
5.5 GHz WLAN	Data	5500 - 5700 MHz
Bluetooth	Data	2402 - 2480 MHz
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 for main antenna and is only applicable for tablet operations. There is no power reduction mechanism for WIFI/BT modes for SAR purposes.

Since this device is a full tablet size, Body SAR was evaluated per FCC KDB Publication 616217 D04v01 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.

Maximum Power:

Mode / Band		Modulated Average (dBm)		
		3GPP RMC Rel. 99	*3GPP HSDPA Rel. 5*	*3GPP HSUPA Rel. 6*
UMTS Band 5 (850 MHz)	Maximum	**23.5**	**23.0**	**22.5**
	Nominal	**23.0**	**22.5**	**22.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.0**	**22.5**	**22.5**
	Nominal	**23.5**	**22.0**	**22.0**
UMTS Band 2 (1900 MHz)	Maximum	**23.5**	**23.0**	**23.0**
	Nominal	**23.0**	**22.5**	**22.5**

© 2014 PCTEST Engineering Laboratory, Inc.

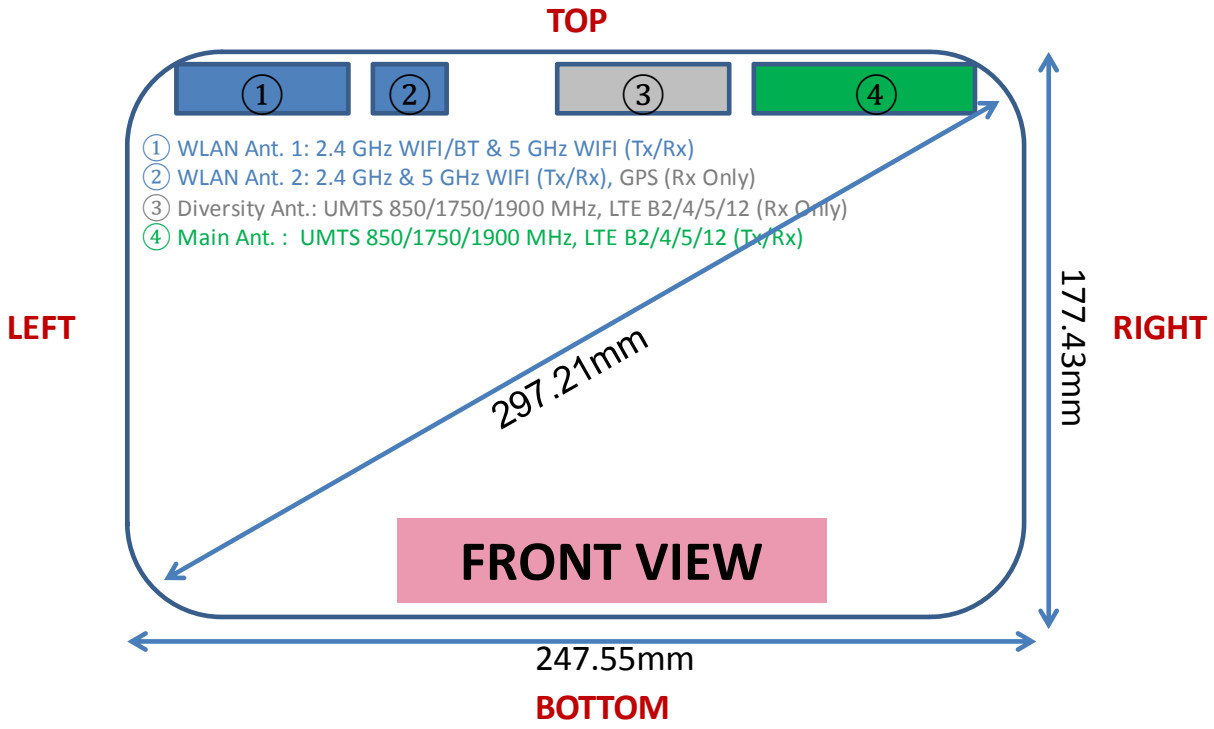
Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 5 (Cell)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 4 (AWS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 2 (PCS)	Maximum	**24.0**
	Nominal	**23.5**
Mode / Band		Modulated Average (dBm)
SISO IEEE 802.11b (2.4 GHz)	Maximum	**11.5**
	Nominal	**11.0**
SISO IEEE 802.11g (2.4 GHz)	Maximum	**11.5**
	Nominal	**11.0**
SISO IEEE 802.11n (2.4 GHz)	Maximum	**11.5**
	Nominal	**11.0**
MIMO IEEE 802.11n (2.4 GHz)	Maximum	**10.5**
	Nominal	**10.0**
SISO IEEE 802.11a (5 GHz)	Maximum	**9.5**
	Nominal	**9.0**
SISO & MIMO IEEE 802.11n (5 GHz) 20 MHz Bandwidth	Maximum	**9.5**
	Nominal	**9.0**
SISO & MIMO IEEE 802.11n (5 GHz) 40 MHz Bandwidth	Maximum	**9.5**
	Nominal	**9.0**
SISO & MIMO IEEE 802.11ac (5 GHz) 80 MHz Bandwidth	Maximum	**9.5**
	Nominal	**9.0**
Bluetooth	Maximum	**8.5**
	Nominal	**8.0**
Bluetooth LE	Maximum	**7.0**
	Nominal	**6.5**

With Power Backoff (Body at 0mm):

Mode / Band		Modulated Average (dBm)		
		3GPP RMC Rel. 99	*3GPP HSDPA Rel. 5*	*3GPP HSUPA Rel. 6*
UMTS Band 5 (850 MHz)	Maximum	**20.5**	**20.0**	**19.5**
	Nominal	**20.0**	**19.5**	**19.0**
UMTS Band 4 (1750 MHz)	Maximum	**12.5**	**11.5**	**11.5**
	Nominal	**12.0**	**11.0**	**11.0**
UMTS Band 2 (1900 MHz)	Maximum	**12.5**	**12.0**	**12.0**
	Nominal	**12.0**	**11.5**	**11.5**
Mode / Band		Modulated Average (dBm)		
LTE Band 12	Maximum	**20.5**		
	Nominal	**20.0**		
LTE Band 5 (Cell)	Maximum	**20.5**		
	Nominal	**20.0**		
LTE Band 4 (AWS)	Maximum	**12.5**		
	Nominal	**12.0**		
LTE Band 2 (PCS)	Maximum	**12.5**		
	Nominal	**12.0**		

© 2014 PCTEST Engineering Laboratory, Inc.

1.4 DUT Antenna Locations



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

Figure 1-1
DUT Antenna Locations

Table 1-1
Body Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
UMTS 850	Yes	No	Yes	No	Yes	No
UMTS 1750	Yes	No	Yes	No	Yes	No
UMTS 1900	Yes	No	Yes	No	Yes	No
LTE Band 12	Yes	No	Yes	No	Yes	No
LTE Band 5 (Cell)	Yes	No	Yes	No	Yes	No
LTE Band 4 (AWS)	Yes	No	Yes	No	Yes	No
LTE Band 2 (PCS)	Yes	No	Yes	No	Yes	No
2.4 GHz WLAN	Yes	No	Yes	No	No	Yes
5 GHz WLAN	Yes	No	Yes	No	No	Yes

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.

© 2014 PCTEST Engineering Laboratory, Inc.

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.

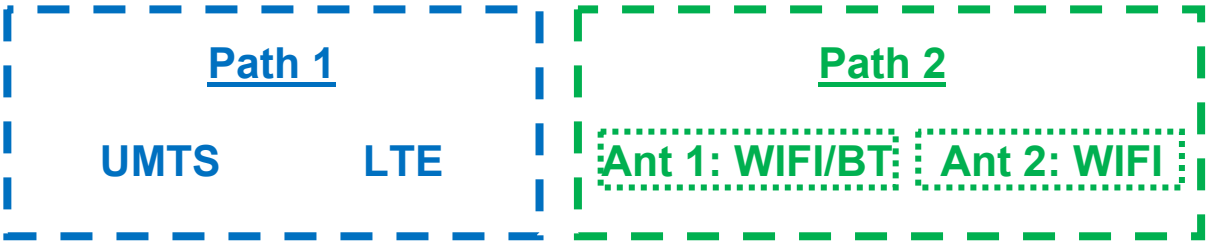


Figure 1-2
Simultaneous Transmission Paths

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 BT, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously.
2. UMT and LTE share the same antenna path and cannot transmit simultaneously.
3. This device supports 2x2 MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.

© 2014 PCTEST Engineering Laboratory, Inc.

1.6 SAR Test Exclusions Applied

(A) BT/WIFI

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

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth SAR was not required; [(7/5)* √2.441] = 2.2 < 3.0. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

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

This device supports IEEE 802.11ac with the following features:

a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 2 Tx antenna output
d) 256 QAM is supported
e) No new 5 GHz channels

(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.

This device supports inter-band LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC guidance, LTE CA SAR was not needed for testing since the data sent by uplink on uplink physical channels does not changes between Rel. 8 and Rel. 10.

1.7 Guidance Applied

- FCC KDB Publication 941225 D01-D05 (3G/4G)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 616217 D04v01 (Tablet SAR Consideration)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)

© 2014 PCTEST Engineering Laboratory, Inc.

1.8 Device Serial Numbers

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

.

	Body Serial Number Max Power	Body Serial Number Reduced Power
UMTS 850	1606-3	3006-1
UMTS 1750	3007-3	3007-2
UMTS 1900	1606-3	1606-2
LTE Band 12	3007-4	3007-1
LTE Band 5 (Cell)	1606-5	1606-2
LTE Band 4 (AWS)	1606-3	3006-1
LTE Band 2 (PCS)	1606-5	1606-2
2.4 GHz WLAN	1606-5	-
5 GHz WLAN	0307-1	-

© 2014 PCTEST Engineering Laboratory, Inc.

2 LTE INFORMATION

LTE Information				
FCC ID	**A3LSMT807T**			
Form Factor	Portable Tablet			
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 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 12: 1.4 MHz, 3 MHz, 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 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)
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	6			
Modulations Supported in UL	QPSK, 16QAM			
LTE Carrier Aggregation Possible Considerations	B2 (PCC) + B12 (SCC)	B12 (PCC) + B2 (SCC)	B4(PCC) + B12 (SCC)	B12 (PCC) + B4 (SCC)
	5MHz (B2) + 3MHz (B12)	3MHz (B12) + 5MHz (B2)	1.4MHz (B4) + 3MHz (B12)	3MHz (B12) + 1.4MHz (B4)
	5MHz (B2) + 5MHz (B12)	3MHz (B12) + 10MHz (B2)	1.4MHz (B4) + 5MHz (B12)	3MHz (B12) + 3MHz (B4)
	5MHz (B2) + 10MHz (B12)	3MHz (B12) + 15MHz (B2)	1.4MHz (B4) + 10MHz (B12)	3MHz (B12) + 5MHz (B4)
	10MHz (B2) + 3MHz (B12)	3MHz (B12) + 20MHz (B2)	3MHz (B4) + 3MHz (B12)	3MHz (B12) + 10MHz (B4)
	10MHz (B2) + 5MHz (B12)	5MHz (B12) + 5MHz (B2)	3MHz (B4) + 5MHz (B12)	3MHz (B12) + 15MHz (B4)
	10MHz (B2) + 10MHz (B12)	5MHz (B12) + 10MHz (B2)	3MHz (B4) + 10MHz (B12)	3MHz (B12) + 20MHz (B4)
	15MHz (B2) + 3MHz (B12)	5MHz (B12) + 15MHz (B2)	5MHz (B4) + 3MHz (B12)	5MHz (B12) + 1.4MHz (B4)
	15MHz (B2) + 5MHz (B12)	5MHz (B12) + 20MHz (B2)	5MHz (B4) + 5MHz (B12)	5MHz (B12) + 3MHz (B4)
	15MHz (B2) + 10MHz (B12)	10MHz (B12) + 5MHz (B2)	5MHz (B4) + 10MHz (B12)	5MHz (B12) + 5MHz (B4)
	20MHz (B2) + 3MHz (B12)	10MHz (B12) + 10MHz (B2)	10MHz (B4) + 3MHz (B12)	5MHz (B12) + 10MHz (B4)
	20MHz (B2) + 5MHz (B12)	10MHz (B12) + 15MHz (B2)	10MHz (B4) + 5MHz (B12)	5MHz (B12) + 15MHz (B4)
	20MHz (B2) + 10MHz (B12)	10MHz (B12) + 20MHz (B2)	10MHz (B4) + 10MHz (B12)	5MHz (B12) + 20MHz (B4)
			15MHz (B4) + 3MHz (B12)	10MHz (B12) + 1.4MHz (B4)
			15MHz (B4) + 5MHz (B12)	10MHz (B12) + 3MHz (B4)
			15MHz (B4) + 10MHz (B12)	10MHz (B12) + 5MHz (B4)
			20MHz (B4) + 3MHz (B12)	10MHz (B12) + 10MHz (B4)
			20MHz (B4) + 5MHz (B12)	10MHz (B12) + 15MHz (B4)
			20MHz (B4) + 10MHz (B12)	10MHz (B12) + 20MHz (B4)
LTE Aggregation Additional Information	This device does not support full CA features on 3GPP Release 10. It supports 1 maximum of 2 carriers in the downlink with a total maximum bandwidth of 20 MHz of the spectrum. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only B2 (PCC) + B12 (SCC), B12 (PCC) + B2 (SCC), B4 (PCC) + B12 (SCC) and B12 (PCC) + B4 (SCC) are supported.			
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			

The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI offloading, MDT, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.

© 2014 PCTEST Engineering Laboratory, Inc.

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]

© 2014 PCTEST Engineering Laboratory, Inc.

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:

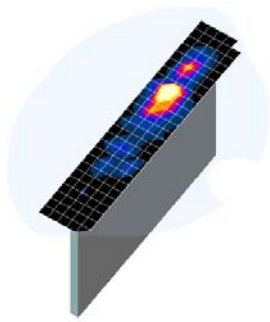


Figure 4-1
Sample SAR Area Scan

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

© 2014 PCTEST Engineering Laboratory, Inc.

5 SAR TESTING PROCEDURES

5.1 SAR Testing for Tablet per FCC 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 Additional Test Positions due to Sensor Considerations

This device uses a 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 21 mm, a conservative distance of 20 mm was tested for SAR on the back side at maximum power. Since the capacitive proximity sensor activation distance for the top edge of the device is 21 mm, a conservative distance of 20 mm was tested for SAR on the top 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.

© 2014 PCTEST Engineering Laboratory, Inc.

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.

© 2014 PCTEST Engineering Laboratory, Inc.

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”.

© 2014 PCTEST Engineering Laboratory, Inc.

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

Figure 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.

© 2014 PCTEST Engineering Laboratory, Inc.

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

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.

© 2014 PCTEST Engineering Laboratory, Inc.

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

7.4.5 Carrier Aggregation

LTE Carrier Aggregation (CA) measurements were made in accordance to 3GPP TS 36.521-1 V10.4.0 (2012-12). The RRC connection is only handled by one cell, the Primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds the Secondary component carrier (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC. Additional output powers were measured using two carriers in the downlink for the release 8 configurations with the highest output power among all channels, RB configurations and bandwidths for each uplink band. Per FCC Guidance, no SAR measurements were required.

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

© 2014 PCTEST Engineering Laboratory, Inc.

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.

7.5.3 MIMO SAR Considerations

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

© 2014 PCTEST Engineering Laboratory, Inc.

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	22.75	22.71	22.78	23.36	23.32	23.43	22.87	22.72	22.85	-
6	HSDPA	Subtest 1	22.70	22.69	22.78	22.16	22.14	22.00	22.90	22.75	22.88	0
6		Subtest 2	22.21	22.19	22.29	21.90	21.92	21.44	22.74	22.54	22.64	0
6		Subtest 3	21.71	21.68	21.78	21.25	21.45	21.02	22.47	22.28	22.41	0.5
6		Subtest 4	21.49	21.46	21.56	21.03	21.16	20.61	22.17	21.94	22.10	0.5
6	HSUPA	Subtest 1	21.97	21.96	21.94	21.47	21.44	21.53	22.71	22.55	22.67	0
6		Subtest 2	20.00	19.99	20.09	20.87	20.97	20.94	20.69	20.59	20.73	2
6		Subtest 3	21.03	21.01	21.10	21.28	21.41	21.50	21.55	21.53	21.70	1
6		Subtest 4	20.26	20.25	20.23	21.28	21.44	21.49	20.90	20.80	20.91	2
6		Subtest 5	21.92	21.90	21.79	22.09	22.27	22.25	22.39	22.25	22.59	0

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	19.75	19.76	19.87	11.42	11.51	11.48	11.73	11.79	11.89	-
6	HSDPA	Subtest 1	19.80	19.75	19.79	10.85	10.85	10.81	11.89	11.90	11.87	0
6		Subtest 2	19.79	19.74	19.76	10.82	10.84	10.76	11.93	11.92	11.89	0
6		Subtest 3	19.77	19.74	19.75	10.79	10.85	10.82	11.96	11.93	11.90	0.5
6		Subtest 4	19.79	19.73	19.76	10.77	10.74	10.77	11.90	11.93	11.92	0.5
6	HSUPA	Subtest 1	19.05	18.90	18.53	9.94	9.81	9.83	11.63	11.62	11.45	0
6		Subtest 2	18.75	19.00	19.03	9.72	9.76	9.70	11.87	11.27	11.85	2
6		Subtest 3	18.65	18.35	19.07	10.07	10.15	10.08	11.51	11.51	11.50	1
6		Subtest 4	18.68	18.47	18.51	9.94	9.97	9.95	11.78	11.78	11.73	2
6		Subtest 5	19.25	19.17	19.23	10.19	10.09	9.83	11.17	11.36	11.38	0

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

This device does not support DC-HSDPA.

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

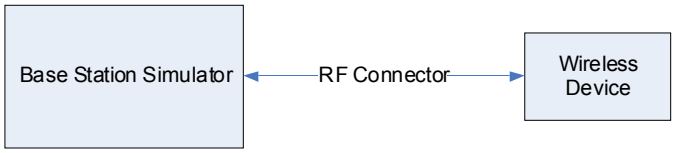


Figure 8-1
Power Measurement Setup

© 2014 PCTEST Engineering Laboratory, Inc.

8.2 LTE Conducted Powers

8.2.1 LTE Band 12

Table 8-3
Maximum LTE Band 12 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	707.5	23095	10	QPSK	1	0	**24.23**	0	0
	707.5	23095	10	QPSK	1	25	24.22	0	0
	707.5	23095	10	QPSK	1	49	24.11	0	0
	707.5	23095	10	QPSK	25	0	23.27	0-1	1
	707.5	23095	10	QPSK	25	12	**23.30**	0-1	1
	707.5	23095	10	QPSK	25	25	23.21	0-1	1
	707.5	23095	10	QPSK	50	0	23.24	0-1	1
	707.5	23095	10	16QAM	1	0	23.49	0-1	1
	707.5	23095	10	16QAM	1	25	23.43	0-1	1
	707.5	23095	10	16QAM	1	49	23.42	0-1	1
	707.5	23095	10	16QAM	25	0	22.31	0-2	2
	707.5	23095	10	16QAM	25	12	22.28	0-2	2
	707.5	23095	10	16QAM	25	25	22.23	0-2	2
	707.5	23095	10	16QAM	50	0	22.29	0-2	2

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

Table 8-4
Reduced LTE Band 12 Conducted Powers - 10 MHz Bandwidth
Representing 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	707.5	23095	10	QPSK	1	0	20.15	0	0
	707.5	23095	10	QPSK	1	25	**20.35**	0	0
	707.5	23095	10	QPSK	1	49	19.91	0	0
	707.5	23095	10	QPSK	25	0	**19.20**	0-1	1
	707.5	23095	10	QPSK	25	12	19.19	0-1	1
	707.5	23095	10	QPSK	25	25	19.09	0-1	1
	707.5	23095	10	QPSK	50	0	19.14	0-1	1
	707.5	23095	10	16QAM	1	0	19.40	0-1	1
	707.5	23095	10	16QAM	1	25	19.38	0-1	1
	707.5	23095	10	16QAM	1	49	19.23	0-1	1
	707.5	23095	10	16QAM	25	0	18.21	0-2	2
	707.5	23095	10	16QAM	25	12	18.14	0-2	2
	707.5	23095	10	16QAM	25	25	18.13	0-2	2
	707.5	23095	10	16QAM	50	0	18.18	0-2	2

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

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-5
Maximum LTE Band 12 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	701.5	23035	5	QPSK	1	0	24.14	0	0
	701.5	23035	5	QPSK	1	12	24.19	0	0
	701.5	23035	5	QPSK	1	24	24.05	0	0
	701.5	23035	5	QPSK	12	0	23.23	0-1	1
	701.5	23035	5	QPSK	12	6	23.26	0-1	1
	701.5	23035	5	QPSK	12	13	23.19	0-1	1
	701.5	23035	5	QPSK	25	0	23.29	0-1	1
	701.5	23035	5	16-QAM	1	0	23.17	0-1	1
	701.5	23035	5	16-QAM	1	12	23.40	0-1	1
	701.5	23035	5	16-QAM	1	24	23.07	0-1	1
	701.5	23035	5	16-QAM	12	0	22.20	0-2	2
	701.5	23035	5	16-QAM	12	6	22.22	0-2	2
	701.5	23035	5	16-QAM	12	13	22.26	0-2	2
	701.5	23035	5	16-QAM	25	0	22.30	0-2	2
Mid	707.5	23095	5	QPSK	1	0	24.12	0	0
	707.5	23095	5	QPSK	1	12	24.17	0	0
	707.5	23095	5	QPSK	1	24	24.03	0	0
	707.5	23095	5	QPSK	12	0	23.21	0-1	1
	707.5	23095	5	QPSK	12	6	23.14	0-1	1
	707.5	23095	5	QPSK	12	13	23.15	0-1	1
	707.5	23095	5	QPSK	25	0	23.15	0-1	1
	707.5	23095	5	16-QAM	1	0	23.16	0-1	1
	707.5	23095	5	16-QAM	1	12	23.30	0-1	1
	707.5	23095	5	16-QAM	1	24	23.14	0-1	1
	707.5	23095	5	16-QAM	12	0	22.24	0-2	2
	707.5	23095	5	16-QAM	12	6	22.31	0-2	2
	707.5	23095	5	16-QAM	12	13	22.27	0-2	2
	707.5	23095	5	16-QAM	25	0	22.21	0-2	2
High	713.5	23155	5	QPSK	1	0	24.15	0	0
	713.5	23155	5	QPSK	1	12	24.20	0	0
	713.5	23155	5	QPSK	1	24	24.03	0	0
	713.5	23155	5	QPSK	12	0	23.15	0-1	1
	713.5	23155	5	QPSK	12	6	23.19	0-1	1
	713.5	23155	5	QPSK	12	13	23.22	0-1	1
	713.5	23155	5	QPSK	25	0	23.20	0-1	1
	713.5	23155	5	16-QAM	1	0	23.28	0-1	1
	713.5	23155	5	16-QAM	1	12	23.34	0-1	1
	713.5	23155	5	16-QAM	1	24	23.34	0-1	1
	713.5	23155	5	16-QAM	12	0	22.22	0-2	2
	713.5	23155	5	16-QAM	12	6	22.10	0-2	2
	713.5	23155	5	16-QAM	12	13	22.25	0-2	2
	713.5	23155	5	16-QAM	25	0	22.10	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-6
Reduced LTE Band 12 Conducted Powers - 5 MHz Bandwidth
Representing 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	701.5	23035	5	QPSK	1	0	19.86	0	0
	701.5	23035	5	QPSK	1	12	20.17	0	0
	701.5	23035	5	QPSK	1	24	19.98	0	0
	701.5	23035	5	QPSK	12	0	19.25	0-1	1
	701.5	23035	5	QPSK	12	6	19.29	0-1	1
	701.5	23035	5	QPSK	12	13	19.11	0-1	1
	701.5	23035	5	QPSK	25	0	19.13	0-1	1
	701.5	23035	5	16-QAM	1	0	19.26	0-1	1
	701.5	23035	5	16-QAM	1	12	19.39	0-1	1
	701.5	23035	5	16-QAM	1	24	19.22	0-1	1
	701.5	23035	5	16-QAM	12	0	18.11	0-2	2
	701.5	23035	5	16-QAM	12	6	18.19	0-2	2
	701.5	23035	5	16-QAM	12	13	18.16	0-2	2
	701.5	23035	5	16-QAM	25	0	18.08	0-2	2
Mid	707.5	23095	5	QPSK	1	0	19.88	0	0
	707.5	23095	5	QPSK	1	12	19.82	0	0
	707.5	23095	5	QPSK	1	24	19.69	0	0
	707.5	23095	5	QPSK	12	0	19.23	0-1	1
	707.5	23095	5	QPSK	12	6	19.12	0-1	1
	707.5	23095	5	QPSK	12	13	19.09	0-1	1
	707.5	23095	5	QPSK	25	0	19.13	0-1	1
	707.5	23095	5	16-QAM	1	0	19.13	0-1	1
	707.5	23095	5	16-QAM	1	12	19.20	0-1	1
	707.5	23095	5	16-QAM	1	24	19.09	0-1	1
	707.5	23095	5	16-QAM	12	0	18.24	0-2	2
	707.5	23095	5	16-QAM	12	6	18.27	0-2	2
	707.5	23095	5	16-QAM	12	13	18.18	0-2	2
	707.5	23095	5	16-QAM	25	0	18.13	0-2	2
High	713.5	23155	5	QPSK	1	0	19.90	0	0
	713.5	23155	5	QPSK	1	12	19.81	0	0
	713.5	23155	5	QPSK	1	24	19.71	0	0
	713.5	23155	5	QPSK	12	0	19.11	0-1	1
	713.5	23155	5	QPSK	12	6	19.08	0-1	1
	713.5	23155	5	QPSK	12	13	19.11	0-1	1
	713.5	23155	5	QPSK	25	0	19.10	0-1	1
	713.5	23155	5	16-QAM	1	0	19.14	0-1	1
	713.5	23155	5	16-QAM	1	12	19.17	0-1	1
	713.5	23155	5	16-QAM	1	24	19.07	0-1	1
	713.5	23155	5	16-QAM	12	0	18.23	0-2	2
	713.5	23155	5	16-QAM	12	6	18.24	0-2	2
	713.5	23155	5	16-QAM	12	13	18.10	0-2	2
	713.5	23155	5	16-QAM	25	0	18.11	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-7
Maximum LTE Band 12 Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	700.5	23025	3	QPSK	1	0	23.74	0	0
	700.5	23025	3	QPSK	1	7	23.81	0	0
	700.5	23025	3	QPSK	1	14	23.72	0	0
	700.5	23025	3	QPSK	8	0	23.36	0-1	1
	700.5	23025	3	QPSK	8	4	23.34	0-1	1
	700.5	23025	3	QPSK	8	7	23.41	0-1	1
	700.5	23025	3	QPSK	15	0	23.34	0-1	1
	700.5	23025	3	16-QAM	1	0	23.23	0-1	1
	700.5	23025	3	16-QAM	1	7	23.38	0-1	1
	700.5	23025	3	16-QAM	1	14	23.28	0-1	1
	700.5	23025	3	16-QAM	8	0	22.21	0-2	2
	700.5	23025	3	16-QAM	8	4	22.25	0-2	2
	700.5	23025	3	16-QAM	8	7	22.23	0-2	2
	700.5	23025	3	16-QAM	15	0	22.43	0-2	2
Mid	707.5	23095	3	QPSK	1	0	23.76	0	0
	707.5	23095	3	QPSK	1	7	23.88	0	0
	707.5	23095	3	QPSK	1	14	23.77	0	0
	707.5	23095	3	QPSK	8	0	23.33	0-1	1
	707.5	23095	3	QPSK	8	4	23.28	0-1	1
	707.5	23095	3	QPSK	8	7	23.27	0-1	1
	707.5	23095	3	QPSK	15	0	23.30	0-1	1
	707.5	23095	3	16-QAM	1	0	23.37	0-1	1
	707.5	23095	3	16-QAM	1	7	23.42	0-1	1
	707.5	23095	3	16-QAM	1	14	23.24	0-1	1
	707.5	23095	3	16-QAM	8	0	22.30	0-2	2
	707.5	23095	3	16-QAM	8	4	22.24	0-2	2
	707.5	23095	3	16-QAM	8	7	22.24	0-2	2
	707.5	23095	3	16-QAM	15	0	22.46	0-2	2
High	714.5	23165	3	QPSK	1	0	23.63	0	0
	714.5	23165	3	QPSK	1	7	23.75	0	0
	714.5	23165	3	QPSK	1	14	23.68	0	0
	714.5	23165	3	QPSK	8	0	23.28	0-1	1
	714.5	23165	3	QPSK	8	4	23.27	0-1	1
	714.5	23165	3	QPSK	8	7	23.26	0-1	1
	714.5	23165	3	QPSK	15	0	23.29	0-1	1
	714.5	23165	3	16-QAM	1	0	23.24	0-1	1
	714.5	23165	3	16-QAM	1	7	23.36	0-1	1
	714.5	23165	3	16-QAM	1	14	23.27	0-1	1
	714.5	23165	3	16-QAM	8	0	22.46	0-2	2
	714.5	23165	3	16-QAM	8	4	22.31	0-2	2
	714.5	23165	3	16-QAM	8	7	22.28	0-2	2
	714.5	23165	3	16-QAM	15	0	22.35	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-8
Reduced LTE Band 12 Conducted Powers - 3 MHz Bandwidth
Representing 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	700.5	23025	3	QPSK	1	0	20.28	0	0
	700.5	23025	3	QPSK	1	7	20.03	0	0
	700.5	23025	3	QPSK	1	14	20.00	0	0
	700.5	23025	3	QPSK	8	0	19.04	0-1	1
	700.5	23025	3	QPSK	8	4	19.05	0-1	1
	700.5	23025	3	QPSK	8	7	18.96	0-1	1
	700.5	23025	3	QPSK	15	0	19.16	0-1	1
	700.5	23025	3	16-QAM	1	0	19.24	0-1	1
	700.5	23025	3	16-QAM	1	7	19.23	0-1	1
	700.5	23025	3	16-QAM	1	14	19.26	0-1	1
	700.5	23025	3	16-QAM	8	0	18.17	0-2	2
	700.5	23025	3	16-QAM	8	4	18.14	0-2	2
	700.5	23025	3	16-QAM	8	7	18.06	0-2	2
	700.5	23025	3	16-QAM	15	0	18.22	0-2	2
Mid	707.5	23095	3	QPSK	1	0	19.84	0	0
	707.5	23095	3	QPSK	1	7	19.57	0	0
	707.5	23095	3	QPSK	1	14	19.51	0	0
	707.5	23095	3	QPSK	8	0	18.50	0-1	1
	707.5	23095	3	QPSK	8	4	18.53	0-1	1
	707.5	23095	3	QPSK	8	7	18.50	0-1	1
	707.5	23095	3	QPSK	15	0	18.61	0-1	1
	707.5	23095	3	16-QAM	1	0	19.24	0-1	1
	707.5	23095	3	16-QAM	1	7	19.07	0-1	1
	707.5	23095	3	16-QAM	1	14	18.71	0-1	1
	707.5	23095	3	16-QAM	8	0	17.55	0-2	2
	707.5	23095	3	16-QAM	8	4	17.51	0-2	2
	707.5	23095	3	16-QAM	8	7	18.44	0-2	2
	707.5	23095	3	16-QAM	15	0	17.51	0-2	2
High	714.5	23165	3	QPSK	1	0	19.76	0	0
	714.5	23165	3	QPSK	1	7	19.91	0	0
	714.5	23165	3	QPSK	1	14	19.86	0	0
	714.5	23165	3	QPSK	8	0	18.52	0-1	1
	714.5	23165	3	QPSK	8	4	18.50	0-1	1
	714.5	23165	3	QPSK	8	7	18.54	0-1	1
	714.5	23165	3	QPSK	15	0	18.60	0-1	1
	714.5	23165	3	16-QAM	1	0	19.14	0-1	1
	714.5	23165	3	16-QAM	1	7	18.99	0-1	1
	714.5	23165	3	16-QAM	1	14	18.72	0-1	1
	714.5	23165	3	16-QAM	8	0	17.51	0-2	2
	714.5	23165	3	16-QAM	8	4	17.56	0-2	2
	714.5	23165	3	16-QAM	8	7	17.68	0-2	2
	714.5	23165	3	16-QAM	15	0	17.50	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-9
Maximum LTE Band 12 Conducted Powers – 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	699.7	23017	1.4	QPSK	1	0	23.75	0	0
	699.7	23017	1.4	QPSK	1	2	23.54	0	0
	699.7	23017	1.4	QPSK	1	5	23.70	0	0
	699.7	23017	1.4	QPSK	3	0	23.75	0	0
	699.7	23017	1.4	QPSK	3	2	23.77	0	0
	699.7	23017	1.4	QPSK	3	3	23.68	0	0
	699.7	23017	1.4	QPSK	6	0	23.42	0-1	1
	699.7	23017	1.4	16-QAM	1	0	22.69	0-1	1
	699.7	23017	1.4	16-QAM	1	2	23.41	0-1	1
	699.7	23017	1.4	16-QAM	1	5	22.79	0-1	1
	699.7	23017	1.4	16-QAM	3	0	23.32	0-1	1
	699.7	23017	1.4	16-QAM	3	2	22.79	0-1	1
	699.7	23017	1.4	16-QAM	3	3	23.32	0-1	1
	699.7	23017	1.4	16-QAM	6	0	22.49	0-2	2
Mid	707.5	23095	1.4	QPSK	1	0	24.19	0	0
	707.5	23095	1.4	QPSK	1	2	24.04	0	0
	707.5	23095	1.4	QPSK	1	5	24.15	0	0
	707.5	23095	1.4	QPSK	3	0	23.75	0	0
	707.5	23095	1.4	QPSK	3	2	23.77	0	0
	707.5	23095	1.4	QPSK	3	3	23.68	0	0
	707.5	23095	1.4	QPSK	6	0	23.28	0-1	1
	707.5	23095	1.4	16-QAM	1	0	22.83	0-1	1
	707.5	23095	1.4	16-QAM	1	2	23.09	0-1	1
	707.5	23095	1.4	16-QAM	1	5	23.47	0-1	1
	707.5	23095	1.4	16-QAM	3	0	23.49	0-1	1
	707.5	23095	1.4	16-QAM	3	2	23.27	0-1	1
	707.5	23095	1.4	16-QAM	3	3	23.41	0-1	1
	707.5	23095	1.4	16-QAM	6	0	22.36	0-2	2
High	715.3	23173	1.4	QPSK	1	0	24.17	0	0
	715.3	23173	1.4	QPSK	1	2	24.03	0	0
	715.3	23173	1.4	QPSK	1	5	24.18	0	0
	715.3	23173	1.4	QPSK	3	0	23.55	0	0
	715.3	23173	1.4	QPSK	3	2	23.52	0	0
	715.3	23173	1.4	QPSK	3	3	23.54	0	0
	715.3	23173	1.4	QPSK	6	0	23.03	0-1	1
	715.3	23173	1.4	16-QAM	1	0	22.69	0-1	1
	715.3	23173	1.4	16-QAM	1	2	22.81	0-1	1
	715.3	23173	1.4	16-QAM	1	5	22.80	0-1	1
	715.3	23173	1.4	16-QAM	3	0	23.03	0-1	1
	715.3	23173	1.4	16-QAM	3	2	22.94	0-1	1
	715.3	23173	1.4	16-QAM	3	3	22.98	0-1	1
	715.3	23173	1.4	16-QAM	6	0	22.48	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-10
Reduced LTE Band 12 Conducted Powers – 1.4 MHz Bandwidth
Representing 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	699.7	23017	1.4	QPSK	1	0	20.07	0	0
	699.7	23017	1.4	QPSK	1	2	19.94	0	0
	699.7	23017	1.4	QPSK	1	5	20.50	0	0
	699.7	23017	1.4	QPSK	3	0	19.68	0	0
	699.7	23017	1.4	QPSK	3	2	19.55	0	0
	699.7	23017	1.4	QPSK	3	3	19.78	0	0
	699.7	23017	1.4	QPSK	6	0	19.33	0-1	1
	699.7	23017	1.4	16-QAM	1	0	19.03	0-1	1
	699.7	23017	1.4	16-QAM	1	2	19.19	0-1	1
	699.7	23017	1.4	16-QAM	1	5	19.16	0-1	1
	699.7	23017	1.4	16-QAM	3	0	19.21	0-1	1
	699.7	23017	1.4	16-QAM	3	2	19.19	0-1	1
	699.7	23017	1.4	16-QAM	3	3	19.32	0-1	1
	699.7	23017	1.4	16-QAM	6	0	18.49	0-2	2
Mid	707.5	23095	1.4	QPSK	1	0	19.84	0	0
	707.5	23095	1.4	QPSK	1	2	19.57	0	0
	707.5	23095	1.4	QPSK	1	5	19.51	0	0
	707.5	23095	1.4	QPSK	3	0	19.67	0	0
	707.5	23095	1.4	QPSK	3	2	19.55	0	0
	707.5	23095	1.4	QPSK	3	3	19.55	0	0
	707.5	23095	1.4	QPSK	6	0	18.61	0-1	1
	707.5	23095	1.4	16-QAM	1	0	19.24	0-1	1
	707.5	23095	1.4	16-QAM	1	2	19.07	0-1	1
	707.5	23095	1.4	16-QAM	1	5	18.71	0-1	1
	707.5	23095	1.4	16-QAM	3	0	19.00	0-1	1
	707.5	23095	1.4	16-QAM	3	2	18.58	0-1	1
	707.5	23095	1.4	16-QAM	3	3	18.56	0-1	1
	707.5	23095	1.4	16-QAM	6	0	17.51	0-2	2
High	715.3	23173	1.4	QPSK	1	0	19.83	0	0
	715.3	23173	1.4	QPSK	1	2	19.58	0	0
	715.3	23173	1.4	QPSK	1	5	19.50	0	0
	715.3	23173	1.4	QPSK	3	0	19.69	0	0
	715.3	23173	1.4	QPSK	3	2	19.51	0	0
	715.3	23173	1.4	QPSK	3	3	19.52	0	0
	715.3	23173	1.4	QPSK	6	0	18.60	0-1	1
	715.3	23173	1.4	16-QAM	1	0	19.24	0-1	1
	715.3	23173	1.4	16-QAM	1	2	19.08	0-1	1
	715.3	23173	1.4	16-QAM	1	5	18.72	0-1	1
	715.3	23173	1.4	16-QAM	3	0	19.00	0-1	1
	715.3	23173	1.4	16-QAM	3	2	18.63	0-1	1
	715.3	23173	1.4	16-QAM	3	3	18.65	0-1	1
	715.3	23173	1.4	16-QAM	6	0	17.51	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

8.2.2 LTE Band 5 (Cell)

Table 8-11
Maximum LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	836.5	20525	10	QPSK	1	0	**23.32**	0	0
	836.5	20525	10	QPSK	1	25	23.29	0	0
	836.5	20525	10	QPSK	1	49	23.25	0	0
	836.5	20525	10	QPSK	25	0	**22.32**	0-1	1
	836.5	20525	10	QPSK	25	12	22.26	0-1	1
	836.5	20525	10	QPSK	25	25	22.28	0-1	1
	836.5	20525	10	QPSK	50	0	22.30	0-1	1
	836.5	20525	10	16QAM	1	0	22.50	0-1	1
	836.5	20525	10	16QAM	1	25	22.46	0-1	1
	836.5	20525	10	16QAM	1	49	22.50	0-1	1
	836.5	20525	10	16QAM	25	0	21.35	0-2	2
	836.5	20525	10	16QAM	25	12	21.34	0-2	2
	836.5	20525	10	16QAM	25	25	21.40	0-2	2
	836.5	20525	10	16QAM	50	0	21.35	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.

Table 8-12
Reduced LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth
Representing 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	**20.08**	0	0
	836.5	20525	10	QPSK	1	25	20.03	0	0
	836.5	20525	10	QPSK	1	49	20.07	0	0
	836.5	20525	10	QPSK	25	0	19.16	0-1	1
	836.5	20525	10	QPSK	25	12	19.14	0-1	1
	836.5	20525	10	QPSK	25	25	**19.17**	0-1	1
	836.5	20525	10	QPSK	50	0	19.16	0-1	1
	836.5	20525	10	16QAM	1	0	19.50	0-1	1
	836.5	20525	10	16QAM	1	25	19.44	0-1	1
	836.5	20525	10	16QAM	1	49	19.50	0-1	1
	836.5	20525	10	16QAM	25	0	18.24	0-2	2
	836.5	20525	10	16QAM	25	12	18.22	0-2	2
	836.5	20525	10	16QAM	25	25	18.24	0-2	2
	836.5	20525	10	16QAM	50	0	18.21	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.

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-13
Maximum LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	826.5	20425	5	QPSK	1	0	23.30	0	0
	826.5	20425	5	QPSK	1	12	22.96	0	0
	826.5	20425	5	QPSK	1	24	23.28	0	0
	826.5	20425	5	QPSK	12	0	22.20	0-1	1
	826.5	20425	5	QPSK	12	6	22.05	0-1	1
	826.5	20425	5	QPSK	12	13	22.17	0-1	1
	826.5	20425	5	QPSK	25	0	22.14	0-1	1
	826.5	20425	5	16-QAM	1	0	22.50	0-1	1
	826.5	20425	5	16-QAM	1	12	22.22	0-1	1
	826.5	20425	5	16-QAM	1	24	22.48	0-1	1
	826.5	20425	5	16-QAM	12	0	21.12	0-2	2
	826.5	20425	5	16-QAM	12	6	20.99	0-2	2
	826.5	20425	5	16-QAM	12	13	21.06	0-2	2
	826.5	20425	5	16-QAM	25	0	21.07	0-2	2
Mid	836.5	20525	5	QPSK	1	0	23.31	0	0
	836.5	20525	5	QPSK	1	12	23.03	0	0
	836.5	20525	5	QPSK	1	24	23.30	0	0
	836.5	20525	5	QPSK	12	0	22.26	0-1	1
	836.5	20525	5	QPSK	12	6	22.13	0-1	1
	836.5	20525	5	QPSK	12	13	22.23	0-1	1
	836.5	20525	5	QPSK	25	0	22.23	0-1	1
	836.5	20525	5	16-QAM	1	0	22.50	0-1	1
	836.5	20525	5	16-QAM	1	12	22.28	0-1	1
	836.5	20525	5	16-QAM	1	24	22.49	0-1	1
	836.5	20525	5	16-QAM	12	0	21.21	0-2	2
	836.5	20525	5	16-QAM	12	6	21.06	0-2	2
	836.5	20525	5	16-QAM	12	13	21.19	0-2	2
	836.5	20525	5	16-QAM	25	0	21.18	0-2	2
High	846.5	20625	5	QPSK	1	0	23.31	0	0
	846.5	20625	5	QPSK	1	12	22.94	0	0
	846.5	20625	5	QPSK	1	24	23.23	0	0
	846.5	20625	5	QPSK	12	0	22.17	0-1	1
	846.5	20625	5	QPSK	12	6	22.00	0-1	1
	846.5	20625	5	QPSK	12	13	22.09	0-1	1
	846.5	20625	5	QPSK	25	0	22.10	0-1	1
	846.5	20625	5	16-QAM	1	0	22.50	0-1	1
	846.5	20625	5	16-QAM	1	12	22.24	0-1	1
	846.5	20625	5	16-QAM	1	24	22.47	0-1	1
	846.5	20625	5	16-QAM	12	0	21.14	0-2	2
	846.5	20625	5	16-QAM	12	6	20.96	0-2	2
	846.5	20625	5	16-QAM	12	13	21.05	0-2	2
	846.5	20625	5	16-QAM	25	0	21.08	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-14
Reduced LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth
Representing 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	19.97	0	0
	826.5	20425	5	QPSK	1	12	19.59	0	0
	826.5	20425	5	QPSK	1	24	19.92	0	0
	826.5	20425	5	QPSK	12	0	18.88	0-1	1
	826.5	20425	5	QPSK	12	6	18.71	0-1	1
	826.5	20425	5	QPSK	12	13	18.81	0-1	1
	826.5	20425	5	QPSK	25	0	18.84	0-1	1
	826.5	20425	5	16-QAM	1	0	19.31	0-1	1
	826.5	20425	5	16-QAM	1	12	18.99	0-1	1
	826.5	20425	5	16-QAM	1	24	19.19	0-1	1
	826.5	20425	5	16-QAM	12	0	17.93	0-2	2
	826.5	20425	5	16-QAM	12	6	17.78	0-2	2
	826.5	20425	5	16-QAM	12	13	17.86	0-2	2
	826.5	20425	5	16-QAM	25	0	17.86	0-2	2
Mid	836.5	20525	5	QPSK	1	0	19.93	0	0
	836.5	20525	5	QPSK	1	12	19.60	0	0
	836.5	20525	5	QPSK	1	24	19.93	0	0
	836.5	20525	5	QPSK	12	0	18.85	0-1	1
	836.5	20525	5	QPSK	12	6	18.72	0-1	1
	836.5	20525	5	QPSK	12	13	18.83	0-1	1
	836.5	20525	5	QPSK	25	0	18.90	0-1	1
	836.5	20525	5	16-QAM	1	0	19.40	0-1	1
	836.5	20525	5	16-QAM	1	12	19.03	0-1	1
	836.5	20525	5	16-QAM	1	24	19.35	0-1	1
	836.5	20525	5	16-QAM	12	0	17.98	0-2	2
	836.5	20525	5	16-QAM	12	6	17.89	0-2	2
	836.5	20525	5	16-QAM	12	13	17.96	0-2	2
	836.5	20525	5	16-QAM	25	0	17.92	0-2	2
High	846.5	20625	5	QPSK	1	0	19.97	0	0
	846.5	20625	5	QPSK	1	12	19.55	0	0
	846.5	20625	5	QPSK	1	24	19.87	0	0
	846.5	20625	5	QPSK	12	0	18.86	0-1	1
	846.5	20625	5	QPSK	12	6	18.69	0-1	1
	846.5	20625	5	QPSK	12	13	18.77	0-1	1
	846.5	20625	5	QPSK	25	0	18.82	0-1	1
	846.5	20625	5	16-QAM	1	0	19.35	0-1	1
	846.5	20625	5	16-QAM	1	12	18.93	0-1	1
	846.5	20625	5	16-QAM	1	24	19.24	0-1	1
	846.5	20625	5	16-QAM	12	0	17.95	0-2	2
	846.5	20625	5	16-QAM	12	6	17.75	0-2	2
	846.5	20625	5	16-QAM	12	13	17.84	0-2	2
	846.5	20625	5	16-QAM	25	0	17.84	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-15
Maximum LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	825.5	20415	3	QPSK	1	0	23.09	0	0
	825.5	20415	3	QPSK	1	7	23.05	0	0
	825.5	20415	3	QPSK	1	14	23.10	0	0
	825.5	20415	3	QPSK	8	0	22.16	0-1	1
	825.5	20415	3	QPSK	8	4	22.15	0-1	1
	825.5	20415	3	QPSK	8	7	22.13	0-1	1
	825.5	20415	3	QPSK	15	0	22.13	0-1	1
	825.5	20415	3	16-QAM	1	0	22.38	0-1	1
	825.5	20415	3	16-QAM	1	7	22.29	0-1	1
	825.5	20415	3	16-QAM	1	14	22.27	0-1	1
	825.5	20415	3	16-QAM	8	0	21.14	0-2	2
	825.5	20415	3	16-QAM	8	4	21.13	0-2	2
	825.5	20415	3	16-QAM	8	7	21.11	0-2	2
	825.5	20415	3	16-QAM	15	0	21.08	0-2	2
Mid	836.5	20525	3	QPSK	1	0	23.12	0	0
	836.5	20525	3	QPSK	1	7	23.14	0	0
	836.5	20525	3	QPSK	1	14	23.13	0	0
	836.5	20525	3	QPSK	8	0	22.20	0-1	1
	836.5	20525	3	QPSK	8	4	22.17	0-1	1
	836.5	20525	3	QPSK	8	7	22.15	0-1	1
	836.5	20525	3	QPSK	15	0	22.19	0-1	1
	836.5	20525	3	16-QAM	1	0	22.41	0-1	1
	836.5	20525	3	16-QAM	1	7	22.48	0-1	1
	836.5	20525	3	16-QAM	1	14	22.39	0-1	1
	836.5	20525	3	16-QAM	8	0	21.17	0-2	2
	836.5	20525	3	16-QAM	8	4	21.18	0-2	2
	836.5	20525	3	16-QAM	8	7	21.18	0-2	2
	836.5	20525	3	16-QAM	15	0	21.15	0-2	2
High	847.5	20635	3	QPSK	1	0	23.07	0	0
	847.5	20635	3	QPSK	1	7	23.05	0	0
	847.5	20635	3	QPSK	1	14	23.04	0	0
	847.5	20635	3	QPSK	8	0	22.14	0-1	1
	847.5	20635	3	QPSK	8	4	22.07	0-1	1
	847.5	20635	3	QPSK	8	7	22.09	0-1	1
	847.5	20635	3	QPSK	15	0	22.11	0-1	1
	847.5	20635	3	16-QAM	1	0	22.35	0-1	1
	847.5	20635	3	16-QAM	1	7	22.35	0-1	1
	847.5	20635	3	16-QAM	1	14	22.26	0-1	1
	847.5	20635	3	16-QAM	8	0	21.13	0-2	2
	847.5	20635	3	16-QAM	8	4	21.07	0-2	2
	847.5	20635	3	16-QAM	8	7	21.06	0-2	2
	847.5	20635	3	16-QAM	15	0	21.00	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-16
Reduced LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth
Representing 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	19.99	0	0
	825.5	20415	3	QPSK	1	7	19.98	0	0
	825.5	20415	3	QPSK	1	14	19.98	0	0
	825.5	20415	3	QPSK	8	0	19.10	0-1	1
	825.5	20415	3	QPSK	8	4	19.08	0-1	1
	825.5	20415	3	QPSK	8	7	19.08	0-1	1
	825.5	20415	3	QPSK	15	0	19.11	0-1	1
	825.5	20415	3	16-QAM	1	0	19.34	0-1	1
	825.5	20415	3	16-QAM	1	7	19.24	0-1	1
	825.5	20415	3	16-QAM	1	14	19.36	0-1	1
	825.5	20415	3	16-QAM	8	0	18.20	0-2	2
	825.5	20415	3	16-QAM	8	4	18.16	0-2	2
	825.5	20415	3	16-QAM	8	7	18.20	0-2	2
	825.5	20415	3	16-QAM	15	0	18.12	0-2	2
Mid	836.5	20525	3	QPSK	1	0	20.03	0	0
	836.5	20525	3	QPSK	1	7	20.00	0	0
	836.5	20525	3	QPSK	1	14	20.02	0	0
	836.5	20525	3	QPSK	8	0	19.12	0-1	1
	836.5	20525	3	QPSK	8	4	19.11	0-1	1
	836.5	20525	3	QPSK	8	7	19.13	0-1	1
	836.5	20525	3	QPSK	15	0	19.13	0-1	1
	836.5	20525	3	16-QAM	1	0	19.36	0-1	1
	836.5	20525	3	16-QAM	1	7	19.36	0-1	1
	836.5	20525	3	16-QAM	1	14	19.39	0-1	1
	836.5	20525	3	16-QAM	8	0	18.23	0-2	2
	836.5	20525	3	16-QAM	8	4	18.23	0-2	2
	836.5	20525	3	16-QAM	8	7	18.22	0-2	2
	836.5	20525	3	16-QAM	15	0	18.15	0-2	2
High	847.5	20635	3	QPSK	1	0	19.94	0	0
	847.5	20635	3	QPSK	1	7	19.89	0	0
	847.5	20635	3	QPSK	1	14	19.90	0	0
	847.5	20635	3	QPSK	8	0	19.03	0-1	1
	847.5	20635	3	QPSK	8	4	18.99	0-1	1
	847.5	20635	3	QPSK	8	7	19.01	0-1	1
	847.5	20635	3	QPSK	15	0	18.99	0-1	1
	847.5	20635	3	16-QAM	1	0	19.36	0-1	1
	847.5	20635	3	16-QAM	1	7	19.35	0-1	1
	847.5	20635	3	16-QAM	1	14	19.33	0-1	1
	847.5	20635	3	16-QAM	8	0	18.03	0-2	2
	847.5	20635	3	16-QAM	8	4	18.07	0-2	2
	847.5	20635	3	16-QAM	8	7	18.10	0-2	2
	847.5	20635	3	16-QAM	15	0	18.01	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-17
Maximum LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	824.7	20407	1.4	QPSK	1	0	23.15	0	0
	824.7	20407	1.4	QPSK	1	2	23.11	0	0
	824.7	20407	1.4	QPSK	1	5	23.18	0	0
	824.7	20407	1.4	QPSK	3	0	23.19	0	0
	824.7	20407	1.4	QPSK	3	2	23.16	0	0
	824.7	20407	1.4	QPSK	3	3	23.13	0	0
	824.7	20407	1.4	QPSK	6	0	22.15	0-1	1
	824.7	20407	1.4	16-QAM	1	0	22.50	0-1	1
	824.7	20407	1.4	16-QAM	1	2	22.49	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.43	0-1	1
	824.7	20407	1.4	16-QAM	3	0	22.34	0-1	1
	824.7	20407	1.4	16-QAM	3	2	22.31	0-1	1
	824.7	20407	1.4	16-QAM	3	3	22.27	0-1	1
	824.7	20407	1.4	16-QAM	6	0	21.24	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	23.20	0	0
	836.5	20525	1.4	QPSK	1	2	23.19	0	0
	836.5	20525	1.4	QPSK	1	5	23.21	0	0
	836.5	20525	1.4	QPSK	3	0	23.22	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	22.24	0-1	1
	836.5	20525	1.4	16-QAM	1	0	22.43	0-1	1
	836.5	20525	1.4	16-QAM	1	2	22.50	0-1	1
	836.5	20525	1.4	16-QAM	1	5	22.48	0-1	1
	836.5	20525	1.4	16-QAM	3	0	22.35	0-1	1
	836.5	20525	1.4	16-QAM	3	2	22.38	0-1	1
	836.5	20525	1.4	16-QAM	3	3	22.37	0-1	1
	836.5	20525	1.4	16-QAM	6	0	21.24	0-2	2
High	848.3	20643	1.4	QPSK	1	0	23.10	0	0
	848.3	20643	1.4	QPSK	1	2	23.11	0	0
	848.3	20643	1.4	QPSK	1	5	23.12	0	0
	848.3	20643	1.4	QPSK	3	0	23.14	0	0
	848.3	20643	1.4	QPSK	3	2	23.17	0	0
	848.3	20643	1.4	QPSK	3	3	23.13	0	0
	848.3	20643	1.4	QPSK	6	0	22.18	0-1	1
	848.3	20643	1.4	16-QAM	1	0	22.43	0-1	1
	848.3	20643	1.4	16-QAM	1	2	22.50	0-1	1
	848.3	20643	1.4	16-QAM	1	5	22.33	0-1	1
	848.3	20643	1.4	16-QAM	3	0	22.30	0-1	1
	848.3	20643	1.4	16-QAM	3	2	22.32	0-1	1
	848.3	20643	1.4	16-QAM	3	3	22.35	0-1	1
	848.3	20643	1.4	16-QAM	6	0	21.25	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-18
Reduced LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth
Representing 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	824.7	20407	1.4	QPSK	1	0	20.05	0	0
	824.7	20407	1.4	QPSK	1	2	20.04	0	0
	824.7	20407	1.4	QPSK	1	5	20.03	0	0
	824.7	20407	1.4	QPSK	3	0	20.08	0	0
	824.7	20407	1.4	QPSK	3	2	20.09	0	0
	824.7	20407	1.4	QPSK	3	3	20.07	0	0
	824.7	20407	1.4	QPSK	6	0	19.14	0-1	1
	824.7	20407	1.4	16-QAM	1	0	19.45	0-1	1
	824.7	20407	1.4	16-QAM	1	2	19.41	0-1	1
	824.7	20407	1.4	16-QAM	1	5	19.47	0-1	1
	824.7	20407	1.4	16-QAM	3	0	19.28	0-1	1
	824.7	20407	1.4	16-QAM	3	2	19.25	0-1	1
	824.7	20407	1.4	16-QAM	3	3	19.23	0-1	1
	824.7	20407	1.4	16-QAM	6	0	18.27	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	20.08	0	0
	836.5	20525	1.4	QPSK	1	2	20.10	0	0
	836.5	20525	1.4	QPSK	1	5	20.06	0	0
	836.5	20525	1.4	QPSK	3	0	20.16	0	0
	836.5	20525	1.4	QPSK	3	2	20.14	0	0
	836.5	20525	1.4	QPSK	3	3	20.14	0	0
	836.5	20525	1.4	QPSK	6	0	19.17	0-1	1
	836.5	20525	1.4	16-QAM	1	0	19.44	0-1	1
	836.5	20525	1.4	16-QAM	1	2	19.35	0-1	1
	836.5	20525	1.4	16-QAM	1	5	19.41	0-1	1
	836.5	20525	1.4	16-QAM	3	0	19.32	0-1	1
	836.5	20525	1.4	16-QAM	3	2	19.29	0-1	1
	836.5	20525	1.4	16-QAM	3	3	19.30	0-1	1
	836.5	20525	1.4	16-QAM	6	0	18.30	0-2	2
High	848.3	20643	1.4	QPSK	1	0	20.01	0	0
	848.3	20643	1.4	QPSK	1	2	19.95	0	0
	848.3	20643	1.4	QPSK	1	5	19.99	0	0
	848.3	20643	1.4	QPSK	3	0	20.01	0	0
	848.3	20643	1.4	QPSK	3	2	20.03	0	0
	848.3	20643	1.4	QPSK	3	3	20.01	0	0
	848.3	20643	1.4	QPSK	6	0	19.08	0-1	1
	848.3	20643	1.4	16-QAM	1	0	19.39	0-1	1
	848.3	20643	1.4	16-QAM	1	2	19.30	0-1	1
	848.3	20643	1.4	16-QAM	1	5	19.39	0-1	1
	848.3	20643	1.4	16-QAM	3	0	19.31	0-1	1
	848.3	20643	1.4	16-QAM	3	2	19.23	0-1	1
	848.3	20643	1.4	16-QAM	3	3	19.19	0-1	1
	848.3	20643	1.4	16-QAM	6	0	18.13	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

8.2.3 LTE Band 4 (AWS)

Table 8-19
Maximum LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	**23.85**	0	0
	1732.5	20175	20	QPSK	1	50	23.79	0	0
	1732.5	20175	20	QPSK	1	99	23.32	0	0
	1732.5	20175	20	QPSK	50	0	**22.91**	0-1	1
	1732.5	20175	20	QPSK	50	25	22.72	0-1	1
	1732.5	20175	20	QPSK	50	50	22.60	0-1	1
	1732.5	20175	20	QPSK	100	0	22.70	0-1	1
	1732.5	20175	20	16QAM	1	0	22.96	0-1	1
	1732.5	20175	20	16QAM	1	50	22.86	0-1	1
	1732.5	20175	20	16QAM	1	99	22.50	0-1	1
	1732.5	20175	20	16QAM	50	0	21.91	0-2	2
	1732.5	20175	20	16QAM	50	25	21.73	0-2	2
	1732.5	20175	20	16QAM	50	50	21.58	0-2	2
	1732.5	20175	20	16QAM	100	0	21.71	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.

Table 8-20
Reduced LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth
Representing 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	**11.93**	0	0
	1732.5	20175	20	QPSK	1	50	11.86	0	0
	1732.5	20175	20	QPSK	1	99	11.55	0	0
	1732.5	20175	20	QPSK	50	0	**11.03**	0-1	1
	1732.5	20175	20	QPSK	50	25	10.83	0-1	1
	1732.5	20175	20	QPSK	50	50	10.72	0-1	1
	1732.5	20175	20	QPSK	100	0	10.83	0-1	1
	1732.5	20175	20	16QAM	1	0	11.26	0-1	1
	1732.5	20175	20	16QAM	1	50	11.11	0-1	1
	1732.5	20175	20	16QAM	1	99	10.64	0-1	1
	1732.5	20175	20	16QAM	50	0	10.10	0-2	2
	1732.5	20175	20	16QAM	50	25	9.93	0-2	2
	1732.5	20175	20	16QAM	50	50	9.85	0-2	2
	1732.5	20175	20	16QAM	100	0	9.95	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.

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-21
Maximum LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	24.00	0	0
	1717.5	20025	15	QPSK	1	36	23.51	0	0
	1717.5	20025	15	QPSK	1	74	23.81	0	0
	1717.5	20025	15	QPSK	36	0	22.71	0-1	1
	1717.5	20025	15	QPSK	36	18	22.47	0-1	1
	1717.5	20025	15	QPSK	36	37	22.53	0-1	1
	1717.5	20025	15	QPSK	75	0	22.59	0-1	1
	1717.5	20025	15	16QAM	1	0	23.00	0-1	1
	1717.5	20025	15	16QAM	1	36	22.69	0-1	1
	1717.5	20025	15	16QAM	1	74	22.95	0-1	1
	1717.5	20025	15	16QAM	36	0	21.72	0-2	2
	1717.5	20025	15	16QAM	36	18	21.50	0-2	2
	1717.5	20025	15	16QAM	36	37	21.59	0-2	2
	1717.5	20025	15	16QAM	75	0	21.59	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	23.90	0	0
	1732.5	20175	15	QPSK	1	36	23.31	0	0
	1732.5	20175	15	QPSK	1	74	23.62	0	0
	1732.5	20175	15	QPSK	36	0	22.59	0-1	1
	1732.5	20175	15	QPSK	36	18	22.30	0-1	1
	1732.5	20175	15	QPSK	36	37	22.36	0-1	1
	1732.5	20175	15	QPSK	75	0	22.43	0-1	1
	1732.5	20175	15	16QAM	1	0	23.00	0-1	1
	1732.5	20175	15	16QAM	1	36	22.45	0-1	1
	1732.5	20175	15	16QAM	1	74	22.85	0-1	1
	1732.5	20175	15	16QAM	36	0	21.62	0-2	2
	1732.5	20175	15	16QAM	36	18	21.38	0-2	2
	1732.5	20175	15	16QAM	36	37	21.39	0-2	2
	1732.5	20175	15	16QAM	75	0	21.49	0-2	2
High	1747.5	20325	15	QPSK	1	0	24.00	0	0
	1747.5	20325	15	QPSK	1	36	23.28	0	0
	1747.5	20325	15	QPSK	1	74	23.81	0	0
	1747.5	20325	15	QPSK	36	0	22.64	0-1	1
	1747.5	20325	15	QPSK	36	18	22.29	0-1	1
	1747.5	20325	15	QPSK	36	37	22.37	0-1	1
	1747.5	20325	15	QPSK	75	0	22.48	0-1	1
	1747.5	20325	15	16QAM	1	0	22.38	0-1	1
	1747.5	20325	15	16QAM	1	36	22.35	0-1	1
	1747.5	20325	15	16QAM	1	74	22.95	0-1	1
	1747.5	20325	15	16QAM	36	0	21.59	0-2	2
	1747.5	20325	15	16QAM	36	18	21.24	0-2	2
	1747.5	20325	15	16QAM	36	37	21.38	0-2	2
	1747.5	20325	15	16QAM	75	0	21.45	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-22
Reduced LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth
Representing 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	12.08	0	0
	1717.5	20025	15	QPSK	1	36	11.53	0	0
	1717.5	20025	15	QPSK	1	74	11.75	0	0
	1717.5	20025	15	QPSK	36	0	10.72	0-1	1
	1717.5	20025	15	QPSK	36	18	10.50	0-1	1
	1717.5	20025	15	QPSK	36	37	10.56	0-1	1
	1717.5	20025	15	QPSK	75	0	10.62	0-1	1
	1717.5	20025	15	16QAM	1	0	11.46	0-1	1
	1717.5	20025	15	16QAM	1	36	10.74	0-1	1
	1717.5	20025	15	16QAM	1	74	11.06	0-1	1
	1717.5	20025	15	16QAM	36	0	9.84	0-2	2
	1717.5	20025	15	16QAM	36	18	9.62	0-2	2
	1717.5	20025	15	16QAM	36	37	9.67	0-2	2
	1717.5	20025	15	16QAM	75	0	9.71	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	11.97	0	0
	1732.5	20175	15	QPSK	1	36	11.53	0	0
	1732.5	20175	15	QPSK	1	74	11.59	0	0
	1732.5	20175	15	QPSK	36	0	10.62	0-1	1
	1732.5	20175	15	QPSK	36	18	10.51	0-1	1
	1732.5	20175	15	QPSK	36	37	10.53	0-1	1
	1732.5	20175	15	QPSK	75	0	10.56	0-1	1
	1732.5	20175	15	16QAM	1	0	11.35	0-1	1
	1732.5	20175	15	16QAM	1	36	10.74	0-1	1
	1732.5	20175	15	16QAM	1	74	10.91	0-1	1
	1732.5	20175	15	16QAM	36	0	9.79	0-2	2
	1732.5	20175	15	16QAM	36	18	9.56	0-2	2
	1732.5	20175	15	16QAM	36	37	9.55	0-2	2
	1732.5	20175	15	16QAM	75	0	9.63	0-2	2
High	1747.5	20325	15	QPSK	1	0	11.91	0	0
	1747.5	20325	15	QPSK	1	36	11.51	0	0
	1747.5	20325	15	QPSK	1	74	11.58	0	0
	1747.5	20325	15	QPSK	36	0	10.53	0-1	1
	1747.5	20325	15	QPSK	36	18	10.54	0-1	1
	1747.5	20325	15	QPSK	36	37	10.52	0-1	1
	1747.5	20325	15	QPSK	75	0	10.53	0-1	1
	1747.5	20325	15	16QAM	1	0	10.56	0-1	1
	1747.5	20325	15	16QAM	1	36	10.70	0-1	1
	1747.5	20325	15	16QAM	1	74	10.97	0-1	1
	1747.5	20325	15	16QAM	36	0	9.64	0-2	2
	1747.5	20325	15	16QAM	36	18	9.53	0-2	2
	1747.5	20325	15	16QAM	36	37	9.55	0-2	2
	1747.5	20325	15	16QAM	75	0	9.54	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-23
Maximum LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	23.98	0	0
	1715	20000	10	QPSK	1	25	23.86	0	0
	1715	20000	10	QPSK	1	49	23.75	0	0
	1715	20000	10	QPSK	25	0	22.90	0-1	1
	1715	20000	10	QPSK	25	12	22.85	0-1	1
	1715	20000	10	QPSK	25	25	22.79	0-1	1
	1715	20000	10	QPSK	50	0	22.85	0-1	1
	1715	20000	10	16QAM	1	0	22.99	0-1	1
	1715	20000	10	16QAM	1	25	22.96	0-1	1
	1715	20000	10	16QAM	1	49	22.98	0-1	1
	1715	20000	10	16QAM	25	0	21.96	0-2	2
	1715	20000	10	16QAM	25	12	21.92	0-2	2
	1715	20000	10	16QAM	25	25	21.87	0-2	2
	1715	20000	10	16QAM	50	0	21.88	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	23.83	0	0
	1732.5	20175	10	QPSK	1	25	23.77	0	0
	1732.5	20175	10	QPSK	1	49	23.57	0	0
	1732.5	20175	10	QPSK	25	0	22.80	0-1	1
	1732.5	20175	10	QPSK	25	12	22.71	0-1	1
	1732.5	20175	10	QPSK	25	25	22.66	0-1	1
	1732.5	20175	10	QPSK	50	0	22.73	0-1	1
	1732.5	20175	10	16QAM	1	0	22.97	0-1	1
	1732.5	20175	10	16QAM	1	25	22.97	0-1	1
	1732.5	20175	10	16QAM	1	49	22.73	0-1	1
	1732.5	20175	10	16QAM	25	0	21.87	0-2	2
	1732.5	20175	10	16QAM	25	12	21.78	0-2	2
	1732.5	20175	10	16QAM	25	25	21.72	0-2	2
	1732.5	20175	10	16QAM	50	0	21.75	0-2	2
High	1750	20350	10	QPSK	1	0	23.73	0	0
	1750	20350	10	QPSK	1	25	23.66	0	0
	1750	20350	10	QPSK	1	49	23.51	0	0
	1750	20350	10	QPSK	25	0	22.66	0-1	1
	1750	20350	10	QPSK	25	12	22.61	0-1	1
	1750	20350	10	QPSK	25	25	22.56	0-1	1
	1750	20350	10	QPSK	50	0	22.61	0-1	1
	1750	20350	10	16QAM	1	0	22.83	0-1	1
	1750	20350	10	16QAM	1	25	22.71	0-1	1
	1750	20350	10	16QAM	1	49	22.70	0-1	1
	1750	20350	10	16QAM	25	0	21.71	0-2	2
	1750	20350	10	16QAM	25	12	21.62	0-2	2
	1750	20350	10	16QAM	25	25	21.58	0-2	2
	1750	20350	10	16QAM	50	0	21.60	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-24
Reduced LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth
Representing 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	11.99	0	0
	1715	20000	10	QPSK	1	25	11.83	0	0
	1715	20000	10	QPSK	1	49	11.74	0	0
	1715	20000	10	QPSK	25	0	10.98	0-1	1
	1715	20000	10	QPSK	25	12	10.88	0-1	1
	1715	20000	10	QPSK	25	25	10.90	0-1	1
	1715	20000	10	QPSK	50	0	10.97	0-1	1
	1715	20000	10	16QAM	1	0	11.34	0-1	1
	1715	20000	10	16QAM	1	25	11.24	0-1	1
	1715	20000	10	16QAM	1	49	11.05	0-1	1
	1715	20000	10	16QAM	25	0	10.15	0-2	2
	1715	20000	10	16QAM	25	12	10.13	0-2	2
	1715	20000	10	16QAM	25	25	10.03	0-2	2
	1715	20000	10	16QAM	50	0	10.09	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	11.91	0	0
	1732.5	20175	10	QPSK	1	25	11.83	0	0
	1732.5	20175	10	QPSK	1	49	11.62	0	0
	1732.5	20175	10	QPSK	25	0	10.89	0-1	1
	1732.5	20175	10	QPSK	25	12	10.82	0-1	1
	1732.5	20175	10	QPSK	25	25	10.78	0-1	1
	1732.5	20175	10	QPSK	50	0	10.83	0-1	1
	1732.5	20175	10	16QAM	1	0	11.30	0-1	1
	1732.5	20175	10	16QAM	1	25	11.16	0-1	1
	1732.5	20175	10	16QAM	1	49	11.01	0-1	1
	1732.5	20175	10	16QAM	25	0	10.06	0-2	2
	1732.5	20175	10	16QAM	25	12	9.98	0-2	2
	1732.5	20175	10	16QAM	25	25	9.88	0-2	2
	1732.5	20175	10	16QAM	50	0	9.93	0-2	2
High	1750	20350	10	QPSK	1	0	11.72	0	0
	1750	20350	10	QPSK	1	25	11.70	0	0
	1750	20350	10	QPSK	1	49	11.50	0	0
	1750	20350	10	QPSK	25	0	10.71	0-1	1
	1750	20350	10	QPSK	25	12	10.66	0-1	1
	1750	20350	10	QPSK	25	25	10.57	0-1	1
	1750	20350	10	QPSK	50	0	10.70	0-1	1
	1750	20350	10	16QAM	1	0	11.10	0-1	1
	1750	20350	10	16QAM	1	25	11.10	0-1	1
	1750	20350	10	16QAM	1	49	10.88	0-1	1
	1750	20350	10	16QAM	25	0	10.00	0-2	2
	1750	20350	10	16QAM	25	12	9.90	0-2	2
	1750	20350	10	16QAM	25	25	9.97	0-2	2
	1750	20350	10	16QAM	50	0	9.76	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-25
Maximum LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	23.96	0	0
	1712.5	19975	5	QPSK	1	12	23.74	0	0
	1712.5	19975	5	QPSK	1	24	23.96	0	0
	1712.5	19975	5	QPSK	12	0	22.90	0-1	1
	1712.5	19975	5	QPSK	12	6	22.78	0-1	1
	1712.5	19975	5	QPSK	12	13	22.83	0-1	1
	1712.5	19975	5	QPSK	25	0	22.84	0-1	1
	1712.5	19975	5	16-QAM	1	0	22.99	0-1	1
	1712.5	19975	5	16-QAM	1	12	22.98	0-1	1
	1712.5	19975	5	16-QAM	1	24	23.00	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.95	0-2	2
	1712.5	19975	5	16-QAM	12	6	21.78	0-2	2
	1712.5	19975	5	16-QAM	12	13	21.90	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.90	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	23.97	0	0
	1732.5	20175	5	QPSK	1	12	23.67	0	0
	1732.5	20175	5	QPSK	1	24	23.90	0	0
	1732.5	20175	5	QPSK	12	0	22.79	0-1	1
	1732.5	20175	5	QPSK	12	6	22.60	0-1	1
	1732.5	20175	5	QPSK	12	13	22.71	0-1	1
	1732.5	20175	5	QPSK	25	0	22.75	0-1	1
	1732.5	20175	5	16-QAM	1	0	23.00	0-1	1
	1732.5	20175	5	16-QAM	1	12	22.79	0-1	1
	1732.5	20175	5	16-QAM	1	24	22.99	0-1	1
	1732.5	20175	5	16-QAM	12	0	21.88	0-2	2
	1732.5	20175	5	16-QAM	12	6	21.69	0-2	2
	1732.5	20175	5	16-QAM	12	13	21.78	0-2	2
	1732.5	20175	5	16-QAM	25	0	21.80	0-2	2
High	1752.5	20375	5	QPSK	1	0	23.91	0	0
	1752.5	20375	5	QPSK	1	12	23.58	0	0
	1752.5	20375	5	QPSK	1	24	23.80	0	0
	1752.5	20375	5	QPSK	12	0	22.62	0-1	1
	1752.5	20375	5	QPSK	12	6	22.48	0-1	1
	1752.5	20375	5	QPSK	12	13	22.56	0-1	1
	1752.5	20375	5	QPSK	25	0	22.60	0-1	1
	1752.5	20375	5	16-QAM	1	0	22.97	0-1	1
	1752.5	20375	5	16-QAM	1	12	22.77	0-1	1
	1752.5	20375	5	16-QAM	1	24	22.92	0-1	1
	1752.5	20375	5	16-QAM	12	0	21.67	0-2	2
	1752.5	20375	5	16-QAM	12	6	21.49	0-2	2
	1752.5	20375	5	16-QAM	12	13	21.59	0-2	2
	1752.5	20375	5	16-QAM	25	0	21.59	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-26
Reduced LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth
Representing 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	11.98	0	0
	1712.5	19975	5	QPSK	1	12	11.79	0	0
	1712.5	19975	5	QPSK	1	24	11.96	0	0
	1712.5	19975	5	QPSK	12	0	10.93	0-1	1
	1712.5	19975	5	QPSK	12	6	10.80	0-1	1
	1712.5	19975	5	QPSK	12	13	10.88	0-1	1
	1712.5	19975	5	QPSK	25	0	10.89	0-1	1
	1712.5	19975	5	16-QAM	1	0	11.46	0-1	1
	1712.5	19975	5	16-QAM	1	12	11.11	0-1	1
	1712.5	19975	5	16-QAM	1	24	11.39	0-1	1
	1712.5	19975	5	16-QAM	12	0	10.10	0-2	2
	1712.5	19975	5	16-QAM	12	6	9.95	0-2	2
	1712.5	19975	5	16-QAM	12	13	10.05	0-2	2
	1712.5	19975	5	16-QAM	25	0	10.08	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	11.98	0	0
	1732.5	20175	5	QPSK	1	12	11.66	0	0
	1732.5	20175	5	QPSK	1	24	11.92	0	0
	1732.5	20175	5	QPSK	12	0	10.84	0-1	1
	1732.5	20175	5	QPSK	12	6	10.69	0-1	1
	1732.5	20175	5	QPSK	12	13	10.77	0-1	1
	1732.5	20175	5	QPSK	25	0	10.80	0-1	1
	1732.5	20175	5	16-QAM	1	0	11.38	0-1	1
	1732.5	20175	5	16-QAM	1	12	10.98	0-1	1
	1732.5	20175	5	16-QAM	1	24	11.29	0-1	1
	1732.5	20175	5	16-QAM	12	0	10.10	0-2	2
	1732.5	20175	5	16-QAM	12	6	9.89	0-2	2
	1732.5	20175	5	16-QAM	12	13	9.90	0-2	2
	1732.5	20175	5	16-QAM	25	0	9.96	0-2	2
High	1752.5	20375	5	QPSK	1	0	11.84	0	0
	1752.5	20375	5	QPSK	1	12	11.50	0	0
	1752.5	20375	5	QPSK	1	24	11.76	0	0
	1752.5	20375	5	QPSK	12	0	10.64	0-1	1
	1752.5	20375	5	QPSK	12	6	10.50	0-1	1
	1752.5	20375	5	QPSK	12	13	10.58	0-1	1
	1752.5	20375	5	QPSK	25	0	10.61	0-1	1
	1752.5	20375	5	16-QAM	1	0	11.20	0-1	1
	1752.5	20375	5	16-QAM	1	12	10.80	0-1	1
	1752.5	20375	5	16-QAM	1	24	11.10	0-1	1
	1752.5	20375	5	16-QAM	12	0	9.80	0-2	2
	1752.5	20375	5	16-QAM	12	6	9.66	0-2	2
	1752.5	20375	5	16-QAM	12	13	9.75	0-2	2
	1752.5	20375	5	16-QAM	25	0	9.75	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-27
Maximum LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	23.90	0	0
	1711.5	19965	3	QPSK	1	7	23.87	0	0
	1711.5	19965	3	QPSK	1	14	23.87	0	0
	1711.5	19965	3	QPSK	8	0	22.86	0-1	1
	1711.5	19965	3	QPSK	8	4	22.86	0-1	1
	1711.5	19965	3	QPSK	8	7	22.86	0-1	1
	1711.5	19965	3	QPSK	15	0	22.87	0-1	1
	1711.5	19965	3	16-QAM	1	0	22.99	0-1	1
	1711.5	19965	3	16-QAM	1	7	23.00	0-1	1
	1711.5	19965	3	16-QAM	1	14	22.98	0-1	1
	1711.5	19965	3	16-QAM	8	0	21.96	0-2	2
	1711.5	19965	3	16-QAM	8	4	21.92	0-2	2
	1711.5	19965	3	16-QAM	8	7	21.95	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.88	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	23.78	0	0
	1732.5	20175	3	QPSK	1	7	23.76	0	0
	1732.5	20175	3	QPSK	1	14	23.73	0	0
	1732.5	20175	3	QPSK	8	0	22.76	0-1	1
	1732.5	20175	3	QPSK	8	4	22.70	0-1	1
	1732.5	20175	3	QPSK	8	7	22.71	0-1	1
	1732.5	20175	3	QPSK	15	0	22.73	0-1	1
	1732.5	20175	3	16-QAM	1	0	22.92	0-1	1
	1732.5	20175	3	16-QAM	1	7	22.98	0-1	1
	1732.5	20175	3	16-QAM	1	14	22.94	0-1	1
	1732.5	20175	3	16-QAM	8	0	21.85	0-2	2
	1732.5	20175	3	16-QAM	8	4	21.83	0-2	2
	1732.5	20175	3	16-QAM	8	7	21.86	0-2	2
	1732.5	20175	3	16-QAM	15	0	21.76	0-2	2
High	1753.5	20385	3	QPSK	1	0	23.68	0	0
	1753.5	20385	3	QPSK	1	7	23.66	0	0
	1753.5	20385	3	QPSK	1	14	23.61	0	0
	1753.5	20385	3	QPSK	8	0	22.58	0-1	1
	1753.5	20385	3	QPSK	8	4	22.56	0-1	1
	1753.5	20385	3	QPSK	8	7	22.55	0-1	1
	1753.5	20385	3	QPSK	15	0	22.58	0-1	1
	1753.5	20385	3	16-QAM	1	0	22.84	0-1	1
	1753.5	20385	3	16-QAM	1	7	22.78	0-1	1
	1753.5	20385	3	16-QAM	1	14	22.78	0-1	1
	1753.5	20385	3	16-QAM	8	0	21.67	0-2	2
	1753.5	20385	3	16-QAM	8	4	21.63	0-2	2
	1753.5	20385	3	16-QAM	8	7	21.65	0-2	2
	1753.5	20385	3	16-QAM	15	0	21.60	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-28
Reduced LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth
Representing at 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	11.87	0	0
	1711.5	19965	3	QPSK	1	7	11.85	0	0
	1711.5	19965	3	QPSK	1	14	11.80	0	0
	1711.5	19965	3	QPSK	8	0	10.88	0-1	1
	1711.5	19965	3	QPSK	8	4	10.86	0-1	1
	1711.5	19965	3	QPSK	8	7	10.85	0-1	1
	1711.5	19965	3	QPSK	15	0	10.88	0-1	1
	1711.5	19965	3	16-QAM	1	0	11.23	0-1	1
	1711.5	19965	3	16-QAM	1	7	11.25	0-1	1
	1711.5	19965	3	16-QAM	1	14	11.11	0-1	1
	1711.5	19965	3	16-QAM	8	0	10.07	0-2	2
	1711.5	19965	3	16-QAM	8	4	10.07	0-2	2
	1711.5	19965	3	16-QAM	8	7	10.08	0-2	2
	1711.5	19965	3	16-QAM	15	0	10.02	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	11.74	0	0
	1732.5	20175	3	QPSK	1	7	11.73	0	0
	1732.5	20175	3	QPSK	1	14	11.69	0	0
	1732.5	20175	3	QPSK	8	0	10.77	0-1	1
	1732.5	20175	3	QPSK	8	4	10.73	0-1	1
	1732.5	20175	3	QPSK	8	7	10.71	0-1	1
	1732.5	20175	3	QPSK	15	0	10.76	0-1	1
	1732.5	20175	3	16-QAM	1	0	11.02	0-1	1
	1732.5	20175	3	16-QAM	1	7	10.95	0-1	1
	1732.5	20175	3	16-QAM	1	14	11.03	0-1	1
	1732.5	20175	3	16-QAM	8	0	9.98	0-2	2
	1732.5	20175	3	16-QAM	8	4	9.96	0-2	2
	1732.5	20175	3	16-QAM	8	7	9.95	0-2	2
	1732.5	20175	3	16-QAM	15	0	9.91	0-2	2
High	1753.5	20385	3	QPSK	1	0	11.53	0	0
	1753.5	20385	3	QPSK	1	7	11.52	0	0
	1753.5	20385	3	QPSK	1	14	11.58	0	0
	1753.5	20385	3	QPSK	8	0	10.53	0-1	1
	1753.5	20385	3	QPSK	8	4	10.51	0-1	1
	1753.5	20385	3	QPSK	8	7	10.51	0-1	1
	1753.5	20385	3	QPSK	15	0	10.53	0-1	1
	1753.5	20385	3	16-QAM	1	0	10.84	0-1	1
	1753.5	20385	3	16-QAM	1	7	10.86	0-1	1
	1753.5	20385	3	16-QAM	1	14	10.74	0-1	1
	1753.5	20385	3	16-QAM	8	0	9.76	0-2	2
	1753.5	20385	3	16-QAM	8	4	9.72	0-2	2
	1753.5	20385	3	16-QAM	8	7	9.72	0-2	2
	1753.5	20385	3	16-QAM	15	0	9.66	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-29
Maximum LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	23.96	0	0
	1710.7	19957	1.4	QPSK	1	2	23.98	0	0
	1710.7	19957	1.4	QPSK	1	5	23.96	0	0
	1710.7	19957	1.4	QPSK	3	0	24.00	0	0
	1710.7	19957	1.4	QPSK	3	2	23.96	0	0
	1710.7	19957	1.4	QPSK	3	3	23.98	0	0
	1710.7	19957	1.4	QPSK	6	0	22.90	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	23.00	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	22.99	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.98	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	23.00	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	22.99	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	22.97	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	22.00	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	23.86	0	0
	1732.5	20175	1.4	QPSK	1	2	23.88	0	0
	1732.5	20175	1.4	QPSK	1	5	23.85	0	0
	1732.5	20175	1.4	QPSK	3	0	23.87	0	0
	1732.5	20175	1.4	QPSK	3	2	23.87	0	0
	1732.5	20175	1.4	QPSK	3	3	23.86	0	0
	1732.5	20175	1.4	QPSK	6	0	22.83	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	23.00	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	22.99	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	22.99	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	22.90	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	22.95	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	22.88	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	21.95	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	23.74	0	0
	1754.3	20393	1.4	QPSK	1	2	23.72	0	0
	1754.3	20393	1.4	QPSK	1	5	23.74	0	0
	1754.3	20393	1.4	QPSK	3	0	23.72	0	0
	1754.3	20393	1.4	QPSK	3	2	23.72	0	0
	1754.3	20393	1.4	QPSK	3	3	23.67	0	0
	1754.3	20393	1.4	QPSK	6	0	22.62	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.86	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	22.86	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.89	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	22.71	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	22.75	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.76	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	21.71	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-30
Reduced LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth
Representing 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	11.87	0	0
	1710.7	19957	1.4	QPSK	1	2	11.86	0	0
	1710.7	19957	1.4	QPSK	1	5	11.86	0	0
	1710.7	19957	1.4	QPSK	3	0	11.90	0	0
	1710.7	19957	1.4	QPSK	3	2	11.90	0	0
	1710.7	19957	1.4	QPSK	3	3	11.89	0	0
	1710.7	19957	1.4	QPSK	6	0	10.85	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	11.20	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	11.22	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	11.33	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	10.98	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	10.94	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	10.99	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	10.09	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	11.75	0	0
	1732.5	20175	1.4	QPSK	1	2	11.77	0	0
	1732.5	20175	1.4	QPSK	1	5	11.76	0	0
	1732.5	20175	1.4	QPSK	3	0	11.82	0	0
	1732.5	20175	1.4	QPSK	3	2	11.77	0	0
	1732.5	20175	1.4	QPSK	3	3	11.78	0	0
	1732.5	20175	1.4	QPSK	6	0	10.76	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	11.11	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	11.16	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	11.11	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	10.86	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	10.93	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	10.91	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	10.03	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	11.59	0	0
	1754.3	20393	1.4	QPSK	1	2	11.58	0	0
	1754.3	20393	1.4	QPSK	1	5	11.55	0	0
	1754.3	20393	1.4	QPSK	3	0	11.62	0	0
	1754.3	20393	1.4	QPSK	3	2	11.62	0	0
	1754.3	20393	1.4	QPSK	3	3	11.59	0	0
	1754.3	20393	1.4	QPSK	6	0	10.57	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	10.84	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	10.98	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	10.83	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	10.70	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	10.67	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	10.70	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	9.75	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

8.2.4 LTE Band 2 (PCS)

Table 8-31
Maximum LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	23.35	0	0
	1860	18700	20	QPSK	1	50	23.14	0	0
	1860	18700	20	QPSK	1	99	23.01	0	0
	1860	18700	20	QPSK	50	0	22.34	0-1	1
	1860	18700	20	QPSK	50	25	22.21	0-1	1
	1860	18700	20	QPSK	50	50	22.15	0-1	1
	1860	18700	20	QPSK	100	0	22.23	0-1	1
	1860	18700	20	16QAM	1	0	22.50	0-1	1
	1860	18700	20	16QAM	1	50	22.20	0-1	1
	1860	18700	20	16QAM	1	99	22.05	0-1	1
	1860	18700	20	16QAM	50	0	21.37	0-2	2
	1860	18700	20	16QAM	50	25	21.21	0-2	2
	1860	18700	20	16QAM	50	50	21.15	0-2	2
	1860	18700	20	16QAM	100	0	21.26	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	23.31	0	0
	1880.0	18900	20	QPSK	1	50	23.25	0	0
	1880.0	18900	20	QPSK	1	99	23.00	0	0
	1880.0	18900	20	QPSK	50	0	22.41	0-1	1
	1880.0	18900	20	QPSK	50	25	22.28	0-1	1
	1880.0	18900	20	QPSK	50	50	22.25	0-1	1
	1880.0	18900	20	QPSK	100	0	22.33	0-1	1
	1880.0	18900	20	16QAM	1	0	22.50	0-1	1
	1880.0	18900	20	16QAM	1	50	22.43	0-1	1
	1880.0	18900	20	16QAM	1	99	22.35	0-1	1
	1880.0	18900	20	16QAM	50	0	21.48	0-2	2
	1880.0	18900	20	16QAM	50	25	21.33	0-2	2
	1880.0	18900	20	16QAM	50	50	21.29	0-2	2
	1880.0	18900	20	16QAM	100	0	21.30	0-2	2
High	1900	19100	20	QPSK	1	0	**23.40**	0	0
	1900	19100	20	QPSK	1	50	23.23	0	0
	1900	19100	20	QPSK	1	99	23.00	0	0
	1900	19100	20	QPSK	50	0	**22.50**	0-1	1
	1900	19100	20	QPSK	50	25	22.27	0-1	1
	1900	19100	20	QPSK	50	50	22.25	0-1	1
	1900	19100	20	QPSK	100	0	22.34	0-1	1
	1900	19100	20	16QAM	1	0	22.50	0-1	1
	1900	19100	20	16QAM	1	50	22.38	0-1	1
	1900	19100	20	16QAM	1	99	22.24	0-1	1
	1900	19100	20	16QAM	50	0	21.44	0-2	2
	1900	19100	20	16QAM	50	25	21.30	0-2	2
	1900	19100	20	16QAM	50	50	21.30	0-2	2
	1900	19100	20	16QAM	100	0	21.38	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-32
Reduced LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth
Representing 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	11.92	0	0
	1860	18700	20	QPSK	1	50	11.90	0	0
	1860	18700	20	QPSK	1	99	11.59	0	0
	1860	18700	20	QPSK	50	0	11.09	0-1	1
	1860	18700	20	QPSK	50	25	10.98	0-1	1
	1860	18700	20	QPSK	50	50	10.95	0-1	1
	1860	18700	20	QPSK	100	0	11.02	0-1	1
	1860	18700	20	16QAM	1	0	11.26	0-1	1
	1860	18700	20	16QAM	1	50	11.26	0-1	1
	1860	18700	20	16QAM	1	99	11.02	0-1	1
	1860	18700	20	16QAM	50	0	10.12	0-2	2
	1860	18700	20	16QAM	50	25	10.01	0-2	2
	1860	18700	20	16QAM	50	50	9.96	0-2	2
	1860	18700	20	16QAM	100	0	10.03	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	11.84	0	0
	1880.0	18900	20	QPSK	1	50	11.92	0	0
	1880.0	18900	20	QPSK	1	99	11.59	0	0
	1880.0	18900	20	QPSK	50	0	11.06	0-1	1
	1880.0	18900	20	QPSK	50	25	11.02	0-1	1
	1880.0	18900	20	QPSK	50	50	10.97	0-1	1
	1880.0	18900	20	QPSK	100	0	11.03	0-1	1
	1880.0	18900	20	16QAM	1	0	11.41	0-1	1
	1880.0	18900	20	16QAM	1	50	11.38	0-1	1
	1880.0	18900	20	16QAM	1	99	11.23	0-1	1
	1880.0	18900	20	16QAM	50	0	10.21	0-2	2
	1880.0	18900	20	16QAM	50	25	10.04	0-2	2
	1880.0	18900	20	16QAM	50	50	9.95	0-2	2
	1880.0	18900	20	16QAM	100	0	10.04	0-2	2
High	1900	19100	20	QPSK	1	0	**12.10**	0	0
	1900	19100	20	QPSK	1	50	11.97	0	0
	1900	19100	20	QPSK	1	99	11.74	0	0
	1900	19100	20	QPSK	50	0	**11.19**	0-1	1
	1900	19100	20	QPSK	50	25	11.03	0-1	1
	1900	19100	20	QPSK	50	50	10.97	0-1	1
	1900	19100	20	QPSK	100	0	11.06	0-1	1
	1900	19100	20	16QAM	1	0	11.42	0-1	1
	1900	19100	20	16QAM	1	50	11.38	0-1	1
	1900	19100	20	16QAM	1	99	11.12	0-1	1
	1900	19100	20	16QAM	50	0	10.24	0-2	2
	1900	19100	20	16QAM	50	25	10.06	0-2	2
	1900	19100	20	16QAM	50	50	10.07	0-2	2
	1900	19100	20	16QAM	100	0	10.16	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-33
Maximum LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	18675	15	QPSK	1	0	23.80	0	0
	1857.5	18675	15	QPSK	1	36	23.07	0	0
	1857.5	18675	15	QPSK	1	74	23.53	0	0
	1857.5	18675	15	QPSK	36	0	22.37	0-1	1
	1857.5	18675	15	QPSK	36	18	22.09	0-1	1
	1857.5	18675	15	QPSK	36	37	22.19	0-1	1
	1857.5	18675	15	QPSK	75	0	22.24	0-1	1
	1857.5	18675	15	16QAM	1	0	22.94	0-1	1
	1857.5	18675	15	16QAM	1	36	22.20	0-1	1
	1857.5	18675	15	16QAM	1	74	22.67	0-1	1
	1857.5	18675	15	16QAM	36	0	21.35	0-2	2
	1857.5	18675	15	16QAM	36	18	21.07	0-2	2
	1857.5	18675	15	16QAM	36	37	21.16	0-2	2
	1857.5	18675	15	16QAM	75	0	21.19	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	23.79	0	0
	1880.0	18900	15	QPSK	1	36	23.07	0	0
	1880.0	18900	15	QPSK	1	74	23.57	0	0
	1880.0	18900	15	QPSK	36	0	22.34	0-1	1
	1880.0	18900	15	QPSK	36	18	22.08	0-1	1
	1880.0	18900	15	QPSK	36	37	22.20	0-1	1
	1880.0	18900	15	QPSK	75	0	22.21	0-1	1
	1880.0	18900	15	16QAM	1	0	22.90	0-1	1
	1880.0	18900	15	16QAM	1	36	22.32	0-1	1
	1880.0	18900	15	16QAM	1	74	22.77	0-1	1
	1880.0	18900	15	16QAM	36	0	21.38	0-2	2
	1880.0	18900	15	16QAM	36	18	21.16	0-2	2
	1880.0	18900	15	16QAM	36	37	21.26	0-2	2
	1880.0	18900	15	16QAM	75	0	21.28	0-2	2
High	1902.5	19125	15	QPSK	1	0	23.77	0	0
	1902.5	19125	15	QPSK	1	36	23.15	0	0
	1902.5	19125	15	QPSK	1	74	23.49	0	0
	1902.5	19125	15	QPSK	36	0	22.37	0-1	1
	1902.5	19125	15	QPSK	36	18	22.12	0-1	1
	1902.5	19125	15	QPSK	36	37	22.18	0-1	1
	1902.5	19125	15	QPSK	75	0	22.25	0-1	1
	1902.5	19125	15	16QAM	1	0	22.96	0-1	1
	1902.5	19125	15	16QAM	1	36	22.38	0-1	1
	1902.5	19125	15	16QAM	1	74	22.65	0-1	1
	1902.5	19125	15	16QAM	36	0	21.37	0-2	2
	1902.5	19125	15	16QAM	36	18	21.21	0-2	2
	1902.5	19125	15	16QAM	36	37	21.26	0-2	2
	1902.5	19125	15	16QAM	75	0	21.28	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-34
Reduced LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth
Representing 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	12.20	0	0
	1857.5	18675	15	QPSK	1	36	11.58	0	0
	1857.5	18675	15	QPSK	1	74	12.04	0	0
	1857.5	18675	15	QPSK	36	0	10.86	0-1	1
	1857.5	18675	15	QPSK	36	18	10.62	0-1	1
	1857.5	18675	15	QPSK	36	37	10.73	0-1	1
	1857.5	18675	15	QPSK	75	0	10.80	0-1	1
	1857.5	18675	15	16QAM	1	0	11.00	0-1	1
	1857.5	18675	15	16QAM	1	36	11.50	0-1	1
	1857.5	18675	15	16QAM	1	74	11.34	0-1	1
	1857.5	18675	15	16QAM	36	0	9.92	0-2	2
	1857.5	18675	15	16QAM	36	18	9.65	0-2	2
	1857.5	18675	15	16QAM	36	37	9.76	0-2	2
	1857.5	18675	15	16QAM	75	0	9.98	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	12.26	0	0
	1880.0	18900	15	QPSK	1	36	11.53	0	0
	1880.0	18900	15	QPSK	1	74	12.16	0	0
	1880.0	18900	15	QPSK	36	0	10.92	0-1	1
	1880.0	18900	15	QPSK	36	18	10.66	0-1	1
	1880.0	18900	15	QPSK	36	37	10.82	0-1	1
	1880.0	18900	15	QPSK	75	0	10.87	0-1	1
	1880.0	18900	15	16QAM	1	0	11.50	0-1	1
	1880.0	18900	15	16QAM	1	36	11.02	0-1	1
	1880.0	18900	15	16QAM	1	74	11.45	0-1	1
	1880.0	18900	15	16QAM	36	0	9.96	0-2	2
	1880.0	18900	15	16QAM	36	18	9.70	0-2	2
	1880.0	18900	15	16QAM	36	37	9.84	0-2	2
	1880.0	18900	15	16QAM	75	0	9.88	0-2	2
High	1902.5	19125	15	QPSK	1	0	12.12	0	0
	1902.5	19125	15	QPSK	1	36	11.62	0	0
	1902.5	19125	15	QPSK	1	74	11.89	0	0
	1902.5	19125	15	QPSK	36	0	10.89	0-1	1
	1902.5	19125	15	QPSK	36	18	10.72	0-1	1
	1902.5	19125	15	QPSK	36	37	10.77	0-1	1
	1902.5	19125	15	QPSK	75	0	10.83	0-1	1
	1902.5	19125	15	16QAM	1	0	11.50	0-1	1
	1902.5	19125	15	16QAM	1	36	10.99	0-1	1
	1902.5	19125	15	16QAM	1	74	11.28	0-1	1
	1902.5	19125	15	16QAM	36	0	9.94	0-2	2
	1902.5	19125	15	16QAM	36	18	9.77	0-2	2
	1902.5	19125	15	16QAM	36	37	9.81	0-2	2
	1902.5	19125	15	16QAM	75	0	9.86	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-35
Maximum LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	23.41	0	0
	1855	18650	10	QPSK	1	25	23.28	0	0
	1855	18650	10	QPSK	1	49	23.22	0	0
	1855	18650	10	QPSK	25	0	22.37	0-1	1
	1855	18650	10	QPSK	25	12	22.29	0-1	1
	1855	18650	10	QPSK	25	25	22.26	0-1	1
	1855	18650	10	QPSK	50	0	22.28	0-1	1
	1855	18650	10	16QAM	1	0	22.68	0-1	1
	1855	18650	10	16QAM	1	25	22.43	0-1	1
	1855	18650	10	16QAM	1	49	22.49	0-1	1
	1855	18650	10	16QAM	25	0	21.42	0-2	2
	1855	18650	10	16QAM	25	12	21.34	0-2	2
	1855	18650	10	16QAM	25	25	21.30	0-2	2
	1855	18650	10	16QAM	50	0	21.33	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	23.43	0	0
	1880.0	18900	10	QPSK	1	25	23.40	0	0
	1880.0	18900	10	QPSK	1	49	23.23	0	0
	1880.0	18900	10	QPSK	25	0	22.37	0-1	1
	1880.0	18900	10	QPSK	25	12	22.32	0-1	1
	1880.0	18900	10	QPSK	25	25	22.30	0-1	1
	1880.0	18900	10	QPSK	50	0	22.32	0-1	1
	1880.0	18900	10	16QAM	1	0	22.61	0-1	1
	1880.0	18900	10	16QAM	1	25	22.51	0-1	1
	1880.0	18900	10	16QAM	1	49	22.36	0-1	1
	1880.0	18900	10	16QAM	25	0	21.44	0-2	2
	1880.0	18900	10	16QAM	25	12	21.38	0-2	2
	1880.0	18900	10	16QAM	25	25	21.36	0-2	2
	1880.0	18900	10	16QAM	50	0	21.37	0-2	2
High	1905	19150	10	QPSK	1	0	23.58	0	0
	1905	19150	10	QPSK	1	25	23.46	0	0
	1905	19150	10	QPSK	1	49	23.20	0	0
	1905	19150	10	QPSK	25	0	22.43	0-1	1
	1905	19150	10	QPSK	25	12	22.41	0-1	1
	1905	19150	10	QPSK	25	25	22.28	0-1	1
	1905	19150	10	QPSK	50	0	22.33	0-1	1
	1905	19150	10	16QAM	1	0	22.59	0-1	1
	1905	19150	10	16QAM	1	25	22.70	0-1	1
	1905	19150	10	16QAM	1	49	22.34	0-1	1
	1905	19150	10	16QAM	25	0	21.48	0-2	2
	1905	19150	10	16QAM	25	12	21.43	0-2	2
	1905	19150	10	16QAM	25	25	21.39	0-2	2
	1905	19150	10	16QAM	50	0	21.41	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-36
Reduced LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth
Representing 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	11.85	0	0
	1855	18650	10	QPSK	1	25	11.71	0	0
	1855	18650	10	QPSK	1	49	11.68	0	0
	1855	18650	10	QPSK	25	0	10.87	0-1	1
	1855	18650	10	QPSK	25	12	10.79	0-1	1
	1855	18650	10	QPSK	25	25	10.79	0-1	1
	1855	18650	10	QPSK	50	0	10.81	0-1	1
	1855	18650	10	16QAM	1	0	11.20	0-1	1
	1855	18650	10	16QAM	1	25	11.17	0-1	1
	1855	18650	10	16QAM	1	49	11.11	0-1	1
	1855	18650	10	16QAM	25	0	9.92	0-2	2
	1855	18650	10	16QAM	25	12	9.88	0-2	2
	1855	18650	10	16QAM	25	25	9.86	0-2	2
	1855	18650	10	16QAM	50	0	9.85	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	11.83	0	0
	1880.0	18900	10	QPSK	1	25	11.86	0	0
	1880.0	18900	10	QPSK	1	49	11.70	0	0
	1880.0	18900	10	QPSK	25	0	10.89	0-1	1
	1880.0	18900	10	QPSK	25	12	10.86	0-1	1
	1880.0	18900	10	QPSK	25	25	10.85	0-1	1
	1880.0	18900	10	QPSK	50	0	10.86	0-1	1
	1880.0	18900	10	16QAM	1	0	11.16	0-1	1
	1880.0	18900	10	16QAM	1	25	11.19	0-1	1
	1880.0	18900	10	16QAM	1	49	11.12	0-1	1
	1880.0	18900	10	16QAM	25	0	9.95	0-2	2
	1880.0	18900	10	16QAM	25	12	9.90	0-2	2
	1880.0	18900	10	16QAM	25	25	9.91	0-2	2
	1880.0	18900	10	16QAM	50	0	9.91	0-2	2
High	1905	19150	10	QPSK	1	0	11.98	0	0
	1905	19150	10	QPSK	1	25	11.85	0	0
	1905	19150	10	QPSK	1	49	11.71	0	0
	1905	19150	10	QPSK	25	0	10.92	0-1	1
	1905	19150	10	QPSK	25	12	10.95	0-1	1
	1905	19150	10	QPSK	25	25	10.89	0-1	1
	1905	19150	10	QPSK	50	0	10.91	0-1	1
	1905	19150	10	16QAM	1	0	11.27	0-1	1
	1905	19150	10	16QAM	1	25	11.23	0-1	1
	1905	19150	10	16QAM	1	49	11.15	0-1	1
	1905	19150	10	16QAM	25	0	10.00	0-2	2
	1905	19150	10	16QAM	25	12	9.97	0-2	2
	1905	19150	10	16QAM	25	25	9.93	0-2	2
	1905	19150	10	16QAM	50	0	9.96	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-37
Maximum LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	23.55	0	0
	1852.5	18625	5	QPSK	1	12	23.09	0	0
	1852.5	18625	5	QPSK	1	24	23.45	0	0
	1852.5	18625	5	QPSK	12	0	22.32	0-1	1
	1852.5	18625	5	QPSK	12	6	22.15	0-1	1
	1852.5	18625	5	QPSK	12	13	22.24	0-1	1
	1852.5	18625	5	QPSK	25	0	22.27	0-1	1
	1852.5	18625	5	16-QAM	1	0	22.73	0-1	1
	1852.5	18625	5	16-QAM	1	12	22.37	0-1	1
	1852.5	18625	5	16-QAM	1	24	22.68	0-1	1
	1852.5	18625	5	16-QAM	12	0	21.40	0-2	2
	1852.5	18625	5	16-QAM	12	6	21.24	0-2	2
	1852.5	18625	5	16-QAM	12	13	21.33	0-2	2
	1852.5	18625	5	16-QAM	25	0	21.33	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	23.55	0	0
	1880.0	18900	5	QPSK	1	12	23.19	0	0
	1880.0	18900	5	QPSK	1	24	23.47	0	0
	1880.0	18900	5	QPSK	12	0	22.34	0-1	1
	1880.0	18900	5	QPSK	12	6	22.18	0-1	1
	1880.0	18900	5	QPSK	12	13	22.30	0-1	1
	1880.0	18900	5	QPSK	25	0	22.28	0-1	1
	1880.0	18900	5	16-QAM	1	0	22.79	0-1	1
	1880.0	18900	5	16-QAM	1	12	22.31	0-1	1
	1880.0	18900	5	16-QAM	1	24	22.65	0-1	1
	1880.0	18900	5	16-QAM	12	0	21.41	0-2	2
	1880.0	18900	5	16-QAM	12	6	21.30	0-2	2
	1880.0	18900	5	16-QAM	12	13	21.36	0-2	2
	1880.0	18900	5	16-QAM	25	0	21.38	0-2	2
High	1907.5	19175	5	QPSK	1	0	23.57	0	0
	1907.5	19175	5	QPSK	1	12	23.20	0	0
	1907.5	19175	5	QPSK	1	24	23.44	0	0
	1907.5	19175	5	QPSK	12	0	22.37	0-1	1
	1907.5	19175	5	QPSK	12	6	22.17	0-1	1
	1907.5	19175	5	QPSK	12	13	22.26	0-1	1
	1907.5	19175	5	QPSK	25	0	22.30	0-1	1
	1907.5	19175	5	16-QAM	1	0	22.90	0-1	1
	1907.5	19175	5	16-QAM	1	12	22.41	0-1	1
	1907.5	19175	5	16-QAM	1	24	22.70	0-1	1
	1907.5	19175	5	16-QAM	12	0	21.47	0-2	2
	1907.5	19175	5	16-QAM	12	6	21.32	0-2	2
	1907.5	19175	5	16-QAM	12	13	21.36	0-2	2
	1907.5	19175	5	16-QAM	25	0	21.38	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-38
Reduced LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth
Representing 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	11.97	0	0
	1852.5	18625	5	QPSK	1	12	11.60	0	0
	1852.5	18625	5	QPSK	1	24	11.95	0	0
	1852.5	18625	5	QPSK	12	0	10.86	0-1	1
	1852.5	18625	5	QPSK	12	6	10.67	0-1	1
	1852.5	18625	5	QPSK	12	13	10.84	0-1	1
	1852.5	18625	5	QPSK	25	0	10.83	0-1	1
	1852.5	18625	5	16-QAM	1	0	11.36	0-1	1
	1852.5	18625	5	16-QAM	1	12	11.04	0-1	1
	1852.5	18625	5	16-QAM	1	24	11.27	0-1	1
	1852.5	18625	5	16-QAM	12	0	9.91	0-2	2
	1852.5	18625	5	16-QAM	12	6	9.75	0-2	2
	1852.5	18625	5	16-QAM	12	13	9.87	0-2	2
	1852.5	18625	5	16-QAM	25	0	9.87	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	11.97	0	0
	1880.0	18900	5	QPSK	1	12	11.71	0	0
	1880.0	18900	5	QPSK	1	24	11.96	0	0
	1880.0	18900	5	QPSK	12	0	10.88	0-1	1
	1880.0	18900	5	QPSK	12	6	10.90	0-1	1
	1880.0	18900	5	QPSK	12	13	10.91	0-1	1
	1880.0	18900	5	QPSK	25	0	10.91	0-1	1
	1880.0	18900	5	16-QAM	1	0	11.44	0-1	1
	1880.0	18900	5	16-QAM	1	12	11.08	0-1	1
	1880.0	18900	5	16-QAM	1	24	11.41	0-1	1
	1880.0	18900	5	16-QAM	12	0	10.00	0-2	2
	1880.0	18900	5	16-QAM	12	6	9.86	0-2	2
	1880.0	18900	5	16-QAM	12	13	9.95	0-2	2
	1880.0	18900	5	16-QAM	25	0	9.93	0-2	2
High	1907.5	19175	5	QPSK	1	0	11.97	0	0
	1907.5	19175	5	QPSK	1	12	11.76	0	0
	1907.5	19175	5	QPSK	1	24	11.96	0	0
	1907.5	19175	5	QPSK	12	0	10.96	0-1	1
	1907.5	19175	5	QPSK	12	6	10.79	0-1	1
	1907.5	19175	5	QPSK	12	13	10.89	0-1	1
	1907.5	19175	5	QPSK	25	0	10.92	0-1	1
	1907.5	19175	5	16-QAM	1	0	11.47	0-1	1
	1907.5	19175	5	16-QAM	1	12	11.17	0-1	1
	1907.5	19175	5	16-QAM	1	24	11.45	0-1	1
	1907.5	19175	5	16-QAM	12	0	10.04	0-2	2
	1907.5	19175	5	16-QAM	12	6	9.89	0-2	2
	1907.5	19175	5	16-QAM	12	13	9.98	0-2	2
	1907.5	19175	5	16-QAM	25	0	9.95	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-39
Maximum LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	23.29	0	0
	1851.5	18615	3	QPSK	1	7	23.20	0	0
	1851.5	18615	3	QPSK	1	14	23.23	0	0
	1851.5	18615	3	QPSK	8	0	22.29	0-1	1
	1851.5	18615	3	QPSK	8	4	22.26	0-1	1
	1851.5	18615	3	QPSK	8	7	22.28	0-1	1
	1851.5	18615	3	QPSK	15	0	22.28	0-1	1
	1851.5	18615	3	16-QAM	1	0	22.40	0-1	1
	1851.5	18615	3	16-QAM	1	7	22.45	0-1	1
	1851.5	18615	3	16-QAM	1	14	22.42	0-1	1
	1851.5	18615	3	16-QAM	8	0	21.43	0-2	2
	1851.5	18615	3	16-QAM	8	4	21.37	0-2	2
	1851.5	18615	3	16-QAM	8	7	21.37	0-2	2
	1851.5	18615	3	16-QAM	15	0	21.30	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	23.33	0	0
	1880.0	18900	3	QPSK	1	7	23.32	0	0
	1880.0	18900	3	QPSK	1	14	23.30	0	0
	1880.0	18900	3	QPSK	8	0	22.30	0-1	1
	1880.0	18900	3	QPSK	8	4	22.29	0-1	1
	1880.0	18900	3	QPSK	8	7	22.29	0-1	1
	1880.0	18900	3	QPSK	15	0	22.31	0-1	1
	1880.0	18900	3	16-QAM	1	0	22.55	0-1	1
	1880.0	18900	3	16-QAM	1	7	22.47	0-1	1
	1880.0	18900	3	16-QAM	1	14	22.50	0-1	1
	1880.0	18900	3	16-QAM	8	0	21.45	0-2	2
	1880.0	18900	3	16-QAM	8	4	21.42	0-2	2
	1880.0	18900	3	16-QAM	8	7	21.39	0-2	2
	1880.0	18900	3	16-QAM	15	0	21.32	0-2	2
High	1908.5	19185	3	QPSK	1	0	23.33	0	0
	1908.5	19185	3	QPSK	1	7	23.28	0	0
	1908.5	19185	3	QPSK	1	14	23.23	0	0
	1908.5	19185	3	QPSK	8	0	22.31	0-1	1
	1908.5	19185	3	QPSK	8	4	22.26	0-1	1
	1908.5	19185	3	QPSK	8	7	22.25	0-1	1
	1908.5	19185	3	QPSK	15	0	22.29	0-1	1
	1908.5	19185	3	16-QAM	1	0	22.65	0-1	1
	1908.5	19185	3	16-QAM	1	7	22.48	0-1	1
	1908.5	19185	3	16-QAM	1	14	22.40	0-1	1
	1908.5	19185	3	16-QAM	8	0	21.44	0-2	2
	1908.5	19185	3	16-QAM	8	4	21.43	0-2	2
	1908.5	19185	3	16-QAM	8	7	21.39	0-2	2
	1908.5	19185	3	16-QAM	15	0	21.32	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-40
Reduced LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth
Representing 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	11.96	0	0
	1851.5	18615	3	QPSK	1	7	11.87	0	0
	1851.5	18615	3	QPSK	1	14	11.85	0	0
	1851.5	18615	3	QPSK	8	0	11.03	0-1	1
	1851.5	18615	3	QPSK	8	4	11.09	0-1	1
	1851.5	18615	3	QPSK	8	7	10.99	0-1	1
	1851.5	18615	3	QPSK	15	0	11.13	0-1	1
	1851.5	18615	3	16-QAM	1	0	11.20	0-1	1
	1851.5	18615	3	16-QAM	1	7	11.39	0-1	1
	1851.5	18615	3	16-QAM	1	14	10.99	0-1	1
	1851.5	18615	3	16-QAM	8	0	10.20	0-2	2
	1851.5	18615	3	16-QAM	8	4	10.15	0-2	2
	1851.5	18615	3	16-QAM	8	7	10.14	0-2	2
	1851.5	18615	3	16-QAM	15	0	10.17	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	11.89	0	0
	1880.0	18900	3	QPSK	1	7	11.93	0	0
	1880.0	18900	3	QPSK	1	14	11.91	0	0
	1880.0	18900	3	QPSK	8	0	11.09	0-1	1
	1880.0	18900	3	QPSK	8	4	10.97	0-1	1
	1880.0	18900	3	QPSK	8	7	11.09	0-1	1
	1880.0	18900	3	QPSK	15	0	11.05	0-1	1
	1880.0	18900	3	16-QAM	1	0	11.50	0-1	1
	1880.0	18900	3	16-QAM	1	7	10.95	0-1	1
	1880.0	18900	3	16-QAM	1	14	11.05	0-1	1
	1880.0	18900	3	16-QAM	8	0	10.17	0-2	2
	1880.0	18900	3	16-QAM	8	4	10.20	0-2	2
	1880.0	18900	3	16-QAM	8	7	10.26	0-2	2
	1880.0	18900	3	16-QAM	15	0	10.09	0-2	2
High	1908.5	19185	3	QPSK	1	0	11.97	0	0
	1908.5	19185	3	QPSK	1	7	11.97	0	0
	1908.5	19185	3	QPSK	1	14	11.74	0	0
	1908.5	19185	3	QPSK	8	0	11.07	0-1	1
	1908.5	19185	3	QPSK	8	4	10.99	0-1	1
	1908.5	19185	3	QPSK	8	7	11.00	0-1	1
	1908.5	19185	3	QPSK	15	0	11.03	0-1	1
	1908.5	19185	3	16-QAM	1	0	11.33	0-1	1
	1908.5	19185	3	16-QAM	1	7	10.93	0-1	1
	1908.5	19185	3	16-QAM	1	14	11.36	0-1	1
	1908.5	19185	3	16-QAM	8	0	10.10	0-2	2
	1908.5	19185	3	16-QAM	8	4	10.19	0-2	2
	1908.5	19185	3	16-QAM	8	7	10.25	0-2	2
	1908.5	19185	3	16-QAM	15	0	10.04	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-41
Maximum LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	23.40	0	0
	1850.7	18607	1.4	QPSK	1	2	23.38	0	0
	1850.7	18607	1.4	QPSK	1	5	23.38	0	0
	1850.7	18607	1.4	QPSK	3	0	23.41	0	0
	1850.7	18607	1.4	QPSK	3	2	23.39	0	0
	1850.7	18607	1.4	QPSK	3	3	23.41	0	0
	1850.7	18607	1.4	QPSK	6	0	22.37	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	22.59	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	22.57	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	22.58	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	22.50	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	22.48	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	22.48	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	21.43	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	23.42	0	0
	1880.0	18900	1.4	QPSK	1	2	23.41	0	0
	1880.0	18900	1.4	QPSK	1	5	23.43	0	0
	1880.0	18900	1.4	QPSK	3	0	23.46	0	0
	1880.0	18900	1.4	QPSK	3	2	23.44	0	0
	1880.0	18900	1.4	QPSK	3	3	23.43	0	0
	1880.0	18900	1.4	QPSK	6	0	22.41	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	22.59	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	22.62	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	22.55	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	22.53	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	22.56	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	22.51	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	21.47	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	23.35	0	0
	1909.3	19193	1.4	QPSK	1	2	23.35	0	0
	1909.3	19193	1.4	QPSK	1	5	23.35	0	0
	1909.3	19193	1.4	QPSK	3	0	23.41	0	0
	1909.3	19193	1.4	QPSK	3	2	23.37	0	0
	1909.3	19193	1.4	QPSK	3	3	23.36	0	0
	1909.3	19193	1.4	QPSK	6	0	22.38	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	22.65	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	22.64	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	22.57	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	22.43	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	22.46	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	22.48	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	21.45	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8- 42
Reduced LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth
Representing 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	1850.7	18607	1.4	QPSK	1	0	11.96	0	0
	1850.7	18607	1.4	QPSK	1	2	11.95	0	0
	1850.7	18607	1.4	QPSK	1	5	11.93	0	0
	1850.7	18607	1.4	QPSK	3	0	11.94	0	0
	1850.7	18607	1.4	QPSK	3	2	11.95	0	0
	1850.7	18607	1.4	QPSK	3	3	11.97	0	0
	1850.7	18607	1.4	QPSK	6	0	11.18	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	11.49	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	11.38	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	11.37	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	11.23	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	11.29	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	11.28	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	10.24	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	11.96	0	0
	1880.0	18900	1.4	QPSK	1	2	11.95	0	0
	1880.0	18900	1.4	QPSK	1	5	11.94	0	0
	1880.0	18900	1.4	QPSK	3	0	11.96	0	0
	1880.0	18900	1.4	QPSK	3	2	11.96	0	0
	1880.0	18900	1.4	QPSK	3	3	11.97	0	0
	1880.0	18900	1.4	QPSK	6	0	11.12	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	11.37	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	11.37	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	11.49	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	11.35	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	11.11	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	11.38	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	10.11	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	11.93	0	0
	1909.3	19193	1.4	QPSK	1	2	11.95	0	0
	1909.3	19193	1.4	QPSK	1	5	11.93	0	0
	1909.3	19193	1.4	QPSK	3	0	11.95	0	0
	1909.3	19193	1.4	QPSK	3	2	11.96	0	0
	1909.3	19193	1.4	QPSK	3	3	11.97	0	0
	1909.3	19193	1.4	QPSK	6	0	11.12	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	11.48	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	11.37	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	11.50	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	11.28	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	11.18	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	11.19	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	10.23	0-2	2

© 2014 PCTEST Engineering Laboratory, Inc.

8.3 LTE Carrier Aggregation Conducted Powers

Table 8-43
LTE Carrier Aggregation Conducted Powers
Maximum Band 12 (PCC) 10 MHz BW + Band 4 (SCC) 20 MHz BW

Band 12(PCC) 10 MHz + Band 4(SCC), 20 MHz				
707.5 MHz / ch.23095 + 2132.5 MHz / ch. 2175	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	23.88	24.23

Table 8-44
LTE Carrier Aggregation Conducted Powers
Reduced Band 12 (PCC) 10 MHz BW + Band 4 (SCC) 20 MHz BW - Representing Body at 0 mm

Band 12(PCC) 10MHz + Band 4(SCC), 20 MHz				
707.5 MHz / ch.23095 + 2132.5 MHz / ch. 2175	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	25	20.48	20.35

Table 8-45
LTE Carrier Aggregation Conducted Powers
Maximum Band 12 (PCC) 10 MHz BW + Band 2 (SCC) 20 MHz BW

Band 12(PCC) 10 MHz + Band 2(SCC), 20 MHz				
707.5 MHz / ch.23095 + 1960 MHz / ch. 900	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	23.73	24.23

Table 8-46
LTE Carrier Aggregation Conducted Powers
Reduced Band 12 (PCC) 10 MHz BW + Band 2 (SCC) 20 MHz BW - Representing Body at 0 mm

Band 12(PCC) 10 MHz+ Band 2(SCC), 20 MHz				
707.5 MHz / ch.23095 + 1960 MHz / ch. 900	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	25	20.49	20.35

Table 8-47
LTE Carrier Aggregation Conducted Powers
Maximum Band 4 (PCC) 15 MHz BW + Band 12 (SCC) 10 MHz BW

Band 4(PCC) 15 MHz + Band 12(SCC), 10 MHz				
1747.5 MHz / ch. 20325 + 737.5 MHz / ch.5095	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	23.43	24.00

Table 8-48
LTE Carrier Aggregation Conducted Powers
Reduced Band 4 (PCC) 15 MHz BW + Band 12 (SCC) 10 MHz BW - Representing Body at 0 mm

Band 4(PCC) 15 MHz + Band 12(SCC), 10 MHz				
1717.5 MHz / ch. 20025 + 737.5 MHz / ch. 5095	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	11.67	12.08

Table 8-49
LTE Carrier Aggregation Conducted Powers
Maximum Band 2 (PCC) 15 MHz BW + Band 12 (SCC) 10 MHz BW

Band 2(PCC) 15 MHz + Band 12(SCC), 10 MHz				
1857.5 MHz / ch. 18675 + 737.5 MHz / ch. 5095	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	23.01	23.80

Table 8-50
LTE Carrier Aggregation Conducted Powers
Reduced Band 2 (PCC) 15 MHz BW + Band 12 (SCC) 10 MHz BW - Representing Body at 0 mm

Band 2(PCC) 15 MHz + Band 12(SCC), 10 MHz				
1880 MHz / ch. 18900 + 737.5 MHz / ch. 5095	PCC UL # RB	PCC UL RB Offset	LTE Rel 10 Tx. Power (dBm)	LTE Rel 8 Tx. Power (dBm)
	1	0	11.61	12.26

© 2014 PCTEST Engineering Laboratory, Inc.

Notes:

1. The device does not support all Rel. 10 Carrier Aggregation features due to modem chipset limitation.
2. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest out power (across all bandwidths, channels, and RB configuration) for each band.
3. This device only supports inter-band CA (B12+B4, B12+B2, B4+B12, B2+B12) with a maximum of 20 MHz of spectrum.
4. All control and acknowledge data is sent on uplink channels that operate identical to Rel. 8 specifications.

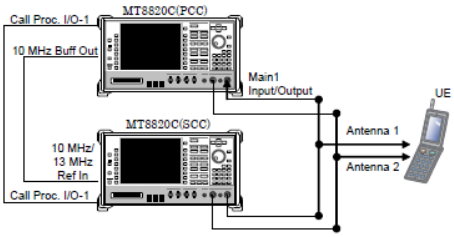


Figure 8-2
Power Measurement Setup

8.4 WLAN Conducted Powers

Table 8-55
IEEE 802.11b Average RF Power

	Antenna	Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
					Data Rate [Mbps]			
					1	2	5.5	11
802.11b	Antenna 1	802.11b	2412	1*	**11.40**	11.45	11.49	11.48
		802.11b	2437	6*	10.72	10.90	10.91	11.09
		802.11b	2462	11*	10.56	10.65	10.68	10.67
	Antenna 2	802.11b	2412	1*	11.20	11.18	11.18	11.02
		802.11b	2437	6*	11.00	11.02	11.13	10.86
		802.11b	2462	11*	**11.33**	11.38	11.37	11.49

Table 8-56
IEEE 802.11g Average RF Power

	Antenna	Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
					Data Rate [Mbps]							
					6	9	12	18	24	36	48	54
802.11g	Antenna 1	802.11g	2412	1	11.03	11.15	10.99	10.86	11.26	11.26	11.34	11.03
		802.11g	2437	6	11.40	11.38	11.44	11.39	11.45	11.49	11.35	11.38
		802.11g	2462	11	11.35	11.32	11.33	11.21	11.47	11.45	11.41	11.39
	Antenna 2	802.11g	2412	1	10.51	10.47	10.18	10.46	10.78	10.60	10.78	10.81
		802.11g	2437	6	10.32	10.30	9.97	10.28	10.23	10.45	10.29	10.19
		802.11g	2462	11	10.55	10.53	10.41	10.52	10.54	10.55	10.51	10.50

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-57
IEEE 802.11n Average RF Power

802.11n (2.4GHz)	Antenna	Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
					Data Rate [Mbps]							
					6.5	13	19.5	26	39	52	58.5	65
	Antenna 1	802.11n	2412	1	10.89	10.95	10.86	11.43	11.20	11.16	11.43	11.25
		802.11n	2437	6	11.43	11.40	11.44	11.47	11.35	11.34	11.41	11.42
		802.11n	2462	11	11.20	11.31	11.21	11.41	11.46	11.43	11.26	11.42
	Antenna 2	802.11n	2412	1	10.42	10.34	10.25	10.42	10.46	10.44	10.38	10.51
		802.11n	2437	6	10.26	10.16	10.11	10.27	10.30	10.32	10.30	10.33
		802.11n	2462	11	10.45	10.39	10.33	10.45	10.42	10.45	10.44	10.54

Table 8-58
MIMO IEEE 802.11n Average RF Power

802.11n (2.4GHz)	Antenna	Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]
					Data Rate [Mbps]
					13
	MIMO	802.11n	2412	1*	9.33
		802.11n	2437	6*	**9.65**
		802.11n	2462	11*	9.22

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-59
IEEE 802.11a Average RF Power

	Antenna	Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
					Data Rate [Mbps]							
					6	9	12	18	24	36	48	54
802.11a	Antenna 1	802.11a	5180	36*	9.03	9.12	9.21	8.76	9.21	9.00	9.12	9.21
		802.11a	5200	40	**9.07**	9.23	9.15	8.87	9.28	9.10	9.18	9.04
		802.11a	5220	44	8.50	9.05	9.11	9.03	9.07	9.11	9.08	9.02
		802.11a	5240	48*	8.50	9.20	9.26	8.82	9.31	9.08	9.18	9.20
		802.11a	5260	52*	8.62	8.89	8.90	8.56	8.95	8.77	8.91	8.85
		802.11a	5280	56	8.78	9.09	9.11	8.70	9.16	8.99	9.07	9.07
		802.11a	5300	60	8.75	9.01	9.12	8.71	9.12	8.92	9.01	8.95
		802.11a	5320	64*	**9.00**	9.07	9.03	8.60	9.13	8.89	9.00	8.97
		802.11a	5500	100	9.28	8.38	8.31	8.20	8.60	8.26	8.57	8.71
		802.11a	5520	104*	**9.41**	8.48	8.37	8.17	8.59	8.30	8.58	8.72
		802.11a	5540	108	9.35	8.65	8.66	8.47	8.91	8.57	8.82	8.78
		802.11a	5560	112	8.50	8.43	8.36	8.29	8.68	8.38	8.58	8.72
		802.11a	5580	116*	8.66	8.32	8.23	8.14	8.47	8.24	8.46	8.59
		802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11a	5660	132	8.62	7.88	7.86	7.78	8.20	7.76	8.11	8.24
		802.11a	5680	136*	8.50	8.54	8.47	8.28	8.77	8.41	8.69	8.83
		802.11a	5700	140	8.50	8.36	8.24	8.16	8.58	8.25	8.61	8.69
		802.11a	5745	149*	9.23	8.45	8.63	8.67	8.89	8.62	8.81	8.91
		802.11a	5765	153	**9.30**	8.45	8.63	8.65	8.90	8.64	8.82	8.90
		802.11a	5785	157*	9.15	8.20	8.43	8.41	8.70	8.38	8.55	8.72
		802.11a	5805	161	9.04	8.79	9.03	9.05	9.18	8.91	9.08	9.14
		802.11a	5825	165*	9.04	8.63	8.76	8.80	9.07	8.75	8.90	9.08
	Antenna 2	802.11a	5180	36*	9.31	8.92	8.95	8.90	9.18	9.10	9.29	9.27
		802.11a	5200	40	**9.43**	9.02	9.07	9.03	9.18	9.18	9.41	9.31
		802.11a	5220	44	8.91	9.08	8.98	8.99	9.33	9.18	9.43	9.39
		802.11a	5240	48*	9.10	9.13	9.26	9.13	9.36	9.35	9.38	9.40
		802.11a	5260	52*	**9.06**	9.05	9.13	8.97	9.26	9.21	9.24	9.30
		802.11a	5280	56	9.03	8.95	9.05	8.90	9.25	9.13	9.27	9.27
		802.11a	5300	60	9.03	8.95	9.03	8.84	9.17	9.03	9.03	9.22
		802.11a	5320	64*	8.89	9.04	9.14	9.04	9.26	9.19	9.27	9.24
		802.11a	5500	100	8.70	8.84	8.66	8.52	8.93	8.66	8.84	8.95
		802.11a	5520	104*	8.50	8.73	8.53	8.34	8.77	8.51	8.70	8.74
		802.11a	5540	108	8.51	8.58	8.45	8.31	8.70	8.41	8.58	8.66
		802.11a	5560	112	8.51	8.47	8.32	8.14	8.57	8.27	8.38	8.62
		802.11a	5580	116*	8.52	8.46	8.25	8.08	8.49	8.14	8.38	8.50
		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	**9.23**	8.95	8.94	8.81	8.69	8.99	8.82	8.92
		802.11a	5680	136*	8.89	8.74	8.54	8.39	8.85	8.62	8.76	8.85
		802.11a	5700	140	8.91	8.59	8.36	8.26	8.65	8.37	8.52	8.71
		802.11a	5745	149*	**9.17**	9.19	9.22	8.90	9.38	9.22	9.34	9.38
		802.11a	5765	153	9.10	9.19	9.22	8.90	9.38	9.22	9.34	9.38
		802.11a	5785	157*	8.88	8.86	8.87	8.64	9.04	8.90	9.02	9.00
		802.11a	5805	161	8.80	8.76	8.75	8.56	8.93	8.83	8.90	9.07
		802.11a	5825	165*	8.77	8.79	8.80	8.55	9.06	8.90	8.96	8.98

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.

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-60
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

	Antenna	Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
					Data Rate [Mbps]							
					6.5	13	19.5	26	39	52	58.5	65
20MHz 802.11n (5GHz)	Antenna 1	802.11n	5180	36	8.72	8.79	8.69	8.75	8.78	8.93	8.88	8.76
		802.11n	5200	40	8.77	8.84	8.73	8.72	8.80	8.97	8.95	8.79
		802.11n	5220	44	8.76	8.85	8.69	8.78	8.81	8.92	8.99	8.82
		802.11n	5240	48	8.86	8.90	8.84	8.94	8.88	9.10	8.94	8.86
		802.11n	5260	52	9.02	8.99	8.96	9.09	9.17	9.15	9.15	9.08
		802.11n	5280	56	9.04	9.01	9.01	9.11	9.15	9.08	9.11	9.13
		802.11n	5300	60	8.91	8.86	8.88	8.98	9.09	9.05	9.01	9.00
		802.11n	5320	64	8.99	8.88	8.89	9.01	9.07	9.14	9.20	9.06
		802.11n	5500	100	8.48	8.65	8.46	8.61	8.67	8.48	8.68	8.67
		802.11n	5520	104	8.57	8.69	8.55	8.73	8.73	8.58	8.80	8.73
		802.11n	5540	108	8.41	8.58	8.42	8.58	8.61	8.39	8.63	8.64
		802.11n	5560	112	8.38	8.53	8.34	8.51	8.63	8.39	8.60	8.56
		802.11n	5580	116	8.30	8.44	8.23	8.47	8.53	8.28	8.50	8.52
		802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5660	132	8.23	8.45	8.14	8.38	8.34	8.23	8.44	8.35
		802.11n	5680	136	8.62	8.73	8.61	8.72	8.79	8.62	8.85	8.72
		802.11n	5700	140	8.44	8.67	8.44	8.57	8.63	8.44	8.62	8.67
		802.11n	5745	149	9.02	8.97	8.88	9.20	9.19	9.19	9.22	9.15
		802.11n	5765	153	8.66	8.62	8.55	8.78	8.90	8.84	8.82	8.69
		802.11n	5785	157	8.48	8.44	8.31	8.63	8.72	8.61	8.68	8.64
		802.11n	5805	161	8.28	8.25	8.12	8.41	8.53	8.37	8.48	8.39
		802.11n	5825	165	8.06	8.08	7.98	8.22	8.24	8.16	8.23	8.13
	Antenna 2	802.11n	5180	36	8.66	8.73	8.84	8.91	9.03	9.03	8.97	9.05
		802.11n	5200	40	8.92	8.97	9.11	9.13	9.27	9.30	9.25	9.38
		802.11n	5220	44	9.03	9.15	9.21	9.29	9.42	9.36	9.35	9.42
		802.11n	5240	48	9.18	9.22	9.38	9.30	9.29	9.32	9.46	9.22
		802.11n	5260	52	9.12	9.06	9.16	9.11	9.21	9.16	9.25	9.12
		802.11n	5280	56	9.27	9.16	9.30	9.29	9.25	9.30	9.29	9.15
		802.11n	5300	60	9.16	9.15	9.23	9.18	9.22	9.16	9.15	9.17
		802.11n	5320	64	9.15	9.10	9.18	9.20	9.21	9.21	9.17	9.25
		802.11n	5500	100	9.04	8.92	9.16	9.36	9.31	9.20	9.32	9.41
		802.11n	5520	104	9.02	8.90	9.13	9.33	9.30	9.13	9.29	9.38
		802.11n	5540	108	9.06	8.88	9.22	9.40	9.36	9.14	9.43	9.40
		802.11n	5560	112	8.78	8.68	8.91	9.04	9.01	9.00	8.98	9.15
		802.11n	5580	116	8.96	8.82	9.14	9.25	9.22	9.13	9.28	9.34
		802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		802.11n	5660	132	8.35	8.28	8.47	8.64	8.53	8.48	8.65	8.67
		802.11n	5680	136	9.23	9.11	9.37	9.44	9.42	9.40	9.40	9.42
		802.11n	5700	140	9.12	9.03	9.16	9.43	9.33	9.29	9.42	9.42
		802.11n	5745	149	9.14	9.20	9.26	9.22	9.20	9.07	9.20	9.20
		802.11n	5765	153	9.04	9.01	9.19	9.10	9.15	8.96	9.13	9.04
		802.11n	5785	157	8.86	8.89	8.89	8.95	8.90	8.84	8.92	8.91
		802.11n	5805	161	8.77	8.75	8.83	8.85	8.83	8.73	8.83	8.79
		802.11n	5825	165	8.55	8.60	8.68	8.64	8.61	8.53	8.64	8.65

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-61
MIMO IEEE 802.11n Average RF Power – 20 MHz Bandwidth

	Antenna	Mode	Freq [MHz]	Channel	802.11n (5GHz) Conducted Power [dBm]
					Data Rate [Mbps]
					13
20MHz 802.11n (5GHz)	MIMO	802.11n	5180	36*	8.78
		802.11n	5200	40	8.95
		802.11n	5220	44	9.01
		802.11n	5240	48*	**9.08**
		802.11n	5260	52*	9.18
		802.11n	5280	56	9.26
		802.11n	5300	60	9.34
		802.11n	5320	64*	**9.37**
		802.11n	5500	100	**9.39**
		802.11n	5520	104*	9.34
		802.11n	5540	108	9.22
		802.11n	5560	112	9.22
		802.11n	5580	116*	9.15
		802.11n	5600	120	N/A
		802.11n	5620	124	N/A
		802.11n	5640	128	N/A
		802.11n	5660	132	8.85
		802.11n	5680	136*	8.74
		802.11n	5700	140	8.62
		802.11n	5745	149*	**9.47**
		802.11n	5765	153	9.32
		802.11n	5785	157*	9.33
		802.11n	5805	161	9.13
		802.11n	5825	165*	9.13

Table 8-62
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

	Antenna	Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
					Data Rate [Mbps]							
					13.5	27	40.5	54	81	108	121.5	135
40MHz 802.11n (5GHz)	Antenna 1	802.11n	5190	38	8.72	8.89	9.02	9.12	9.00	8.95	9.02	8.97
		802.11n	5230	46	8.74	8.97	9.05	9.16	9.06	8.97	9.04	9.00
		802.11n	5270	54	9.10	9.10	9.13	9.09	9.19	9.24	9.20	9.21
		802.11n	5310	62	8.94	8.91	8.96	8.95	9.10	9.08	9.13	9.10
		802.11n	5510	102	8.65	8.61	8.71	8.79	8.93	8.84	8.92	8.91
		802.11n	5550	110	8.32	8.28	8.37	8.44	8.63	8.56	8.52	8.53
		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	9.01	9.02	9.05	9.15	9.22	9.20	9.21	9.19
		802.11n	5755	151	9.22	9.11	9.25	9.34	9.30	9.20	9.38	9.39
		802.11n	5795	159	9.16	9.06	9.17	9.31	9.26	9.12	9.30	9.36
	Antenna 2	802.11n	5190	38	8.89	9.10	8.95	9.13	9.25	9.16	9.10	9.18
		802.11n	5230	46	9.07	9.34	9.09	9.36	9.44	9.36	9.35	9.33
		802.11n	5270	54	9.22	9.25	9.24	9.20	9.22	9.20	9.28	9.25
		802.11n	5310	62	9.30	9.25	9.29	9.22	9.18	9.17	9.25	9.24
		802.11n	5510	102	9.18	9.38	9.38	9.43	9.44	9.43	9.44	9.36
		802.11n	5550	110	9.04	9.31	9.23	9.26	9.28	9.36	9.29	9.22
		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	9.25	9.43	9.43	9.43	9.45	9.36	9.44	9.43
		802.11n	5755	151	8.66	8.64	8.76	8.97	8.77	8.88	8.73	8.91
		802.11n	5795	159	9.05	9.08	9.09	9.34	9.11	9.36	9.16	9.30

© 2014 PCTEST Engineering Laboratory, Inc.

Table 8-63
MIMO IEEE 802.11n Average RF Power – 40 MHz Bandwidth

40MHz 802.11n (5GHz)	Antenna	Mode	Freq [MHz]	Channel	40MHz 802.11n (5GHz) Conducted Power [dBm]
					Data Rate [Mbps]
					27
	MIMO	802.11n	5190	38	9.08
		802.11n	5230	46	9.23
		802.11n	5270	54	9.38
		802.11n	5310	62	9.36
		802.11n	5510	102	8.87
		802.11n	5550	110	8.74
		802.11n	5590	118	N/A
		802.11n	5630	126	N/A
		802.11n	5670	134	9.03
		802.11n	5755	151	8.33
		802.11n	5795	159	9.14

Table 8-64
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth

80MHz 802.11ac (5GHz)	Antenna	Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
					Data Rate [Mbps]									
					29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
	Antenna 1	802.11ac	5210	42	**8.95**	8.87	8.85	9.05	9.04	9.01	9.11	9.15	9.18	9.15
		802.11ac	5290	58	**8.69**	8.40	8.71	8.72	8.80	8.90	8.88	8.82	8.91	8.87
		802.11ac	5530	106	**8.50**	8.51	8.55	8.66	8.70	8.68	8.72	8.73	8.74	8.70
		802.11ac	5775	155	**9.08**	8.91	8.87	9.10	9.02	8.94	9.05	9.06	9.04	9.03
	Antenna 2	802.11ac	5210	42	**8.55**	8.43	8.60	8.69	8.55	8.65	8.59	8.65	8.60	8.61
		802.11ac	5290	58	**8.95**	8.81	8.83	8.75	8.87	8.75	8.84	8.87	8.91	9.11
		802.11ac	5530	106	**8.61**	8.56	8.61	8.79	8.82	8.80	8.82	8.66	8.64	8.82
		802.11ac	5775	155	**8.51**	8.70	8.67	8.64	8.73	8.72	8.70	8.48	8.73	8.67

Table 8-65
MIMO IEEE 802.11ac Average RF Power – 80 MHz Bandwidth

80MHz 802.11ac (5GHz)	Antenna	Mode	Freq [MHz]	Channel	80MHz 802.11ac (5GHz) Conducted Power [dBm]
					Data Rate [Mbps]
					58.5
	MIMO	802.11ac	5210	42	8.96
		802.11ac	5290	58	9.07
		802.11ac	5530	106	8.62
		802.11ac	5775	155	8.91

© 2014 PCTEST Engineering Laboratory, Inc.

Per FCC KDB 662911 D01v02r01, the individual spectra for each 2x2 MIMO WIFI Antenna were summed mathematically in linear power units for the MIMO output power measurements.

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

- For SISO 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 MIMO 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11n was selected for SAR evaluation.
- For SISO 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.
- For MIMO 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11n were selected for SAR evaluation.
- Full SAR tests for all SISO IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than SISO IEEE 802.11a mode. SISO IEEE 802.11ac was evaluated for the highest SISO 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.

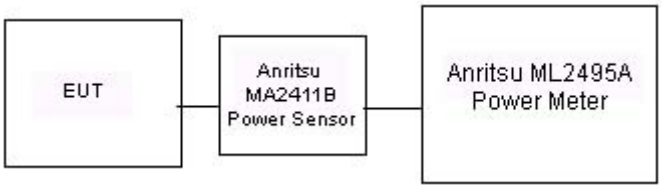


Figure 8-3
Power Measurement Setup for Bandwidths < 50 MHz

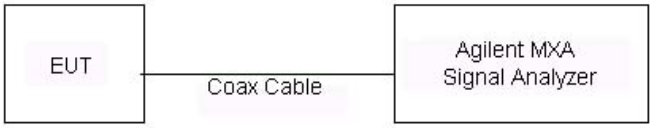


Figure 8-4
Power Measurement Setup for Bandwidths > 50 MHz

© 2014 PCTEST Engineering Laboratory, Inc.

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
08/01/2014	750B	23.4	695	0.939	56.712	0.959	55.745	-2.09%	1.73%
			710	0.953	56.572	0.960	55.687	-0.73%	1.59%
			725	0.967	56.444	0.961	55.629	0.62%	1.47%
			740	0.981	56.308	0.963	55.570	1.87%	1.33%
			755	0.996	56.184	0.964	55.512	3.32%	1.21%
06/16/2014	835B	23.4	820	1.002	54.772	0.969	55.258	3.41%	-0.88%
			835	1.017	54.617	0.970	55.200	4.85%	-1.06%
			850	1.030	54.470	0.988	55.154	4.25%	-1.24%
06/20/2014	1750B	23.0	1710	1.404	52.253	1.463	53.537	-4.03%	-2.40%
			1750	1.449	52.082	1.488	53.432	-2.62%	-2.53%
			1790	1.494	51.961	1.514	53.326	-1.32%	-2.56%
07/30/2014	1750B	21.5	1710	1.443	52.987	1.463	53.537	-1.37%	-1.03%
			1750	1.487	52.816	1.488	53.432	-0.07%	-1.15%
			1790	1.529	52.724	1.514	53.326	0.99%	-1.13%
06/18/2014	1900B	23.0	1850	1.448	52.105	1.520	53.300	-4.74%	-2.24%
			1880	1.484	52.001	1.520	53.300	-2.37%	-2.44%
			1910	1.515	51.884	1.520	53.300	-0.33%	-2.66%
07/14/2014	1900B	23.4	1850	1.462	51.931	1.520	53.300	-3.82%	-2.57%
			1880	1.497	51.818	1.520	53.300	-1.51%	-2.78%
			1910	1.530	51.729	1.520	53.300	0.66%	-2.95%
06/17/2014	2450B	22.4	2401	1.956	51.261	1.903	52.765	2.79%	-2.85%
			2450	2.024	51.126	1.950	52.700	3.79%	-2.99%
			2499	2.084	50.907	2.019	52.638	3.22%	-3.29%
07/08/2014	5200B-5800B	21.7	5200	5.358	47.305	5.299	49.014	1.11%	-3.49%
			5220	5.381	47.276	5.323	48.987	1.09%	-3.49%
			5240	5.405	47.239	5.346	48.960	1.10%	-3.52%
			5260	5.435	47.200	5.369	48.933	1.23%	-3.54%
			5280	5.460	47.160	5.393	48.906	1.24%	-3.57%
			5300	5.505	47.133	5.416	48.879	1.64%	-3.57%
			5320	5.529	47.145	5.439	48.851	1.65%	-3.49%
			5500	5.799	46.887	5.650	48.607	2.64%	-3.54%
			5520	5.827	46.838	5.673	48.580	2.71%	-3.59%
			5540	5.859	46.825	5.696	48.553	2.86%	-3.56%
			5560	5.885	46.818	5.720	48.526	2.88%	-3.52%
			5580	5.919	46.806	5.743	48.499	3.06%	-3.49%
			5600	5.953	46.751	5.766	48.471	3.24%	-3.55%
			5660	6.020	46.633	5.837	48.390	3.14%	-3.63%
			5745	6.122	46.451	5.936	48.275	3.13%	-3.78%
			5765	6.152	46.416	5.959	48.248	3.24%	-3.80%
			5785	6.167	46.343	5.982	48.220	3.09%	-3.89%
			5800	6.188	46.321	6.000	48.200	3.13%	-3.90%
			5805	6.199	46.298	6.006	48.193	3.21%	-3.93%
			5825	6.224	46.347	6.029	48.166	3.23%	-3.78%

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

© 2014 PCTEST Engineering Laboratory, Inc.

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)	$Deviation_{1g}$ (%)
C	750	BODY	08/01/2014	21.6	23.1	0.100	1046	3213	0.906	8.540	9.060	6.09%
K	835	BODY	06/16/2014	24.1	23.4	0.100	4d119	3287	0.935	9.340	9.350	0.11%
K	1750	BODY	06/20/2014	23.7	23.0	0.100	1051	3287	3.750	37.400	37.500	0.27%
C	1750	BODY	07/30/2014	18.9	21.5	0.100	1051	3213	3.830	37.400	38.300	2.41%
D	1900	BODY	06/18/2014	25.0	23.0	0.100	5d149	3022	4.110	40.500	41.100	1.48%
K	1900	BODY	07/14/2014	24.5	23.5	0.100	5d141	3287	4.150	40.600	41.500	2.22%
G	2450	BODY	06/17/2014	23.6	22.9	0.100	797	3258	5.260	49.400	52.600	6.48%
A	5200	BODY	07/08/2014	23.9	21.8	0.100	1007	3920	7.390	72.600	73.900	1.79%
A	5300	BODY	07/08/2014	23.9	21.9	0.100	1007	3920	7.590	74.700	75.900	1.61%
A	5500	BODY	07/08/2014	23.8	21.9	0.100	1007	3920	7.880	75.900	78.800	3.82%
A	5600	BODY	07/08/2014	23.8	21.8	0.100	1007	3920	7.840	77.300	78.400	1.42%
A	5800	BODY	07/08/2014	23.9	21.9	0.100	1007	3920	7.540	72.900	75.400	3.43%

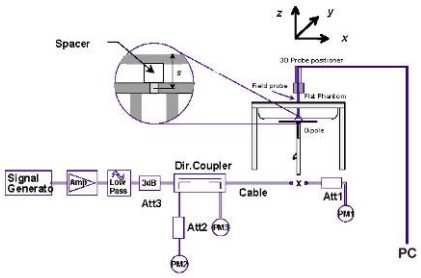


Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

© 2014 PCTEST Engineering Laboratory, Inc.

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	23.5	22.71	0.00	20 mm	1606-3	1:1	back	0.105	1.199	0.126	
836.60	4183	UMTS 850	RMC	23.5	22.71	0.02	20 mm	1606-3	1:1	top	0.025	1.199	0.030	
836.60	4183	UMTS 850	RMC	23.5	22.71	-0.04	0 mm	1606-3	1:1	right	0.128	1.199	0.153	
826.40	4132	UMTS 850	RMC	20.5	19.75	0.12	0 mm	3006-1	1:1	back	0.840	1.189	**0.999**	A1
836.60	4183	UMTS 850	RMC	20.5	19.76	0.18	0 mm	3006-1	1:1	back	0.806	1.186	0.956	
846.60	4233	UMTS 850	RMC	20.5	19.87	0.17	0 mm	3006-1	1:1	back	0.789	1.156	0.912	
836.60	4183	UMTS 850	RMC	20.5	19.76	-0.09	0 mm	3006-1	1:1	top	0.529	1.186	0.627	
826.40	4132	UMTS 850	RMC	20.5	19.75	0.03	0 mm	3006-1	1:1	back	0.781	1.189	0.929	
1732.40	1412	UMTS 1750	RMC	24.0	23.32	0.02	20 mm	3007-3	1:1	back	0.669	1.169	0.782	A2
1732.40	1412	UMTS 1750	RMC	24.0	23.32	0.00	20 mm	3007-3	1:1	top	0.644	1.169	0.753	
1732.40	1412	UMTS 1750	RMC	24.0	23.32	0.04	0 mm	3007-3	1:1	right	0.232	1.169	0.271	
1732.40	1412	UMTS 1750	RMC	12.5	11.51	0.03	0 mm	3007-2	1:1	back	0.634	1.256	0.796	
1732.40	1412	UMTS 1750	RMC	12.5	11.51	-0.03	0 mm	3007-2	1:1	top	0.427	1.256	0.536	
1880.00	9400	UMTS 1900	RMC	23.5	22.72	-0.03	20 mm	1606-3	1:1	back	0.657	1.197	0.786	A3
1880.00	9400	UMTS 1900	RMC	23.5	22.72	0.05	20 mm	1606-3	1:1	top	0.593	1.197	0.710	
1880.00	9400	UMTS 1900	RMC	23.5	22.72	-0.20	0 mm	1606-3	1:1	right	0.029	1.197	0.035	
1880.00	9400	UMTS 1900	RMC	12.5	11.79	-0.14	0 mm	1606-2	1:1	back	0.635	1.178	0.748	
1880.00	9400	UMTS 1900	RMC	12.5	11.79	0.12	0 mm	1606-2	1:1	top	0.535	1.178	0.630	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram							

Blue entry represents variability measurement.

Table 10-2
LTE Band 12 Body SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.5	24.23	0.00	0	3007-4	QPSK	1	0	20 mm	back	1:1	0.122	1.064	0.130	
707.50	23095	Mid	LTE Band 12	10	23.5	23.30	-0.02	1	3007-4	QPSK	25	12	20 mm	back	1:1	0.116	1.047	0.121	
707.50	23095	Mid	LTE Band 12	10	24.5	24.23	0.02	0	3007-4	QPSK	1	0	20 mm	top	1:1	0.027	1.064	0.029	
707.50	23095	Mid	LTE Band 12	10	23.5	23.30	0.00	1	3007-4	QPSK	25	12	20 mm	top	1:1	0.027	1.047	0.028	
707.50	23095	Mid	LTE Band 12	10	24.5	24.23	0.03	0	3007-4	QPSK	1	0	0 mm	right	1:1	0.190	1.064	0.202	
707.50	23095	Mid	LTE Band 12	10	23.5	23.30	-0.02	1	3007-4	QPSK	25	12	0 mm	right	1:1	0.198	1.047	0.207	
707.50	23095	Mid	LTE Band 12	10	20.5	20.35	0.10	0	3007-1	QPSK	1	25	0 mm	back	1:1	0.575	1.035	0.595	A4
707.50	23095	Mid	LTE Band 12	10	19.5	19.20	0.10	1	3007-1	QPSK	25	0	0 mm	back	1:1	0.505	1.072	0.541	
707.50	23095	Mid	LTE Band 12	10	20.5	20.35	-0.08	0	3007-1	QPSK	1	25	0 mm	top	1:1	0.347	1.035	0.359	
707.50	23095	Mid	LTE Band 12	10	19.5	19.20	-0.10	1	3007-1	QPSK	25	0	0 mm	top	1:1	0.256	1.072	0.274	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

© 2014 PCTEST Engineering Laboratory, Inc.

Table 10-3
LTE Band 5 (Cell) Body SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.32	0.07	0	1606-5	QPSK	1	0	20 mm	back	1:1	0.159	1.042	0.166	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.32	0.02	1	1606-5	QPSK	25	0	20 mm	back	1:1	0.135	1.042	0.141	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.32	-0.01	0	1606-5	QPSK	1	0	20 mm	top	1:1	0.038	1.042	0.040	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.32	-0.03	1	1606-5	QPSK	25	0	20 mm	top	1:1	0.032	1.042	0.033	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.32	0.01	0	1606-5	QPSK	1	0	0 mm	right	1:1	0.267	1.042	0.278	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	22.32	0.01	1	1606-5	QPSK	25	0	0 mm	right	1:1	0.211	1.042	0.220	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.5	20.08	0.00	0	1606-2	QPSK	1	0	0 mm	back	1:1	0.743	1.102	0.819	A5
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	19.17	-0.07	1	1606-2	QPSK	25	25	0 mm	back	1:1	0.593	1.079	0.640	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	19.16	-0.06	1	1606-2	QPSK	50	0	0 mm	back	1:1	0.598	1.081	0.646	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.5	20.08	-0.04	0	1606-2	QPSK	1	0	0 mm	top	1:1	0.492	1.102	0.542	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	19.17	-0.06	1	1606-2	QPSK	25	25	0 mm	top	1:1	0.401	1.079	0.433	
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

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	24.0	23.85	-0.01	0	1606-3	QPSK	1	0	20 mm	back	1:1	0.480	1.035	0.497	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.91	-0.05	1	1606-3	QPSK	50	0	20 mm	back	1:1	0.357	1.021	0.364	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.85	-0.01	0	1606-3	QPSK	1	0	20 mm	top	1:1	0.502	1.035	0.520	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.91	-0.08	1	1606-3	QPSK	50	0	20 mm	top	1:1	0.380	1.021	0.388	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.85	-0.05	0	1606-3	QPSK	1	0	0 mm	right	1:1	0.156	1.035	0.161	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.91	-0.03	1	1606-3	QPSK	50	0	0 mm	right	1:1	0.107	1.021	0.109	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	12.5	11.93	0.08	0	3006-1	QPSK	1	0	0 mm	back	1:1	0.664	1.140	0.757	A6
1732.50	20175	Mid	LTE Band 4 (AWS)	20	11.5	11.03	-0.17	1	3006-1	QPSK	50	0	0 mm	back	1:1	0.546	1.114	0.608	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	12.5	11.93	0.07	0	3006-1	QPSK	1	0	0 mm	top	1:1	0.623	1.140	0.710	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	11.5	11.03	0.00	1	3006-1	QPSK	50	0	0 mm	top	1:1	0.514	1.114	0.573	
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

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)	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.40	0.00	0	1606-5	QPSK	1	0	20 mm	back	1:1	0.368	1.148	0.422	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.50	0.01	1	1606-5	QPSK	50	0	20 mm	back	1:1	0.287	1.122	0.322	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.40	-0.03	0	1606-5	QPSK	1	0	20 mm	top	1:1	0.320	1.148	0.367	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.50	0.01	1	1606-5	QPSK	50	0	20 mm	top	1:1	0.253	1.122	0.284	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.40	-0.01	0	1606-5	QPSK	1	0	0 mm	right	1:1	0.052	1.148	0.060	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.50	0.02	1	1606-5	QPSK	50	0	0 mm	right	1:1	0.048	1.122	0.054	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.10	0.02	0	1606-2	QPSK	1	0	0 mm	back	1:1	0.647	1.096	0.709	A7
1900.00	19100	High	LTE Band 2 (PCS)	20	11.5	11.19	-0.04	1	1606-2	QPSK	50	0	0 mm	back	1:1	0.521	1.074	0.560	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.10	-0.04	0	1606-2	QPSK	1	0	0 mm	top	1:1	0.572	1.096	0.627	
1900.00	19100	High	LTE Band 2 (PCS)	20	11.5	11.19	0.10	1	1606-2	QPSK	50	0	0 mm	top	1:1	0.474	1.074	0.509	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram												

© 2014 PCTEST Engineering Laboratory, Inc.

Table 10-6
DTS WLAN Body SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna #	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	11.5	11.40	-0.05	0 mm	Antenna 1	1606-5	1	back	1:1	0.747	1.023	0.764	
2437	6	IEEE 802.11b	DSSS	11.5	10.72	0.07	0 mm	Antenna 1	1606-5	1	back	1:1	0.751	1.197	0.899	
2462	11	IEEE 802.11b	DSSS	11.5	10.56	-0.03	0 mm	Antenna 1	1606-5	1	back	1:1	0.835	1.242	1.037	
2412	1	IEEE 802.11b	DSSS	11.5	11.40	0.01	0 mm	Antenna 1	1606-5	1	top	1:1	0.213	1.023	0.218	
2412	1	IEEE 802.11b	DSSS	11.5	11.40	0.04	0 mm	Antenna 1	1606-5	1	left	1:1	0.048	1.023	0.049	
2412	1	IEEE 802.11b	DSSS	11.5	11.20	-0.14	0 mm	Antenna 2	1606-5	1	back	1:1	0.885	1.072	0.949	
2437	6	IEEE 802.11b	DSSS	11.5	11.00	0.05	0 mm	Antenna 2	1606-5	1	back	1:1	0.920	1.122	1.032	
2462	11	IEEE 802.11b	DSSS	11.5	11.33	-0.08	0 mm	Antenna 2	1606-5	1	back	1:1	0.821	1.040	0.854	
2462	11	IEEE 802.11b	DSSS	11.5	11.33	0.01	0 mm	Antenna 2	1606-5	1	top	1:1	0.279	1.040	0.290	
2462	11	IEEE 802.11b	DSSS	11.5	11.33	0.09	0 mm	Antenna 2	1606-5	1	left	1:1	0.001	1.040	0.001	
2437	6	IEEE 802.11n	OFDM	10.5	9.65	0.03	0 mm	MIMO	1606-5	13	back	1:1	0.419	1.216	0.510	
2437	6	IEEE 802.11n	OFDM	10.5	9.65	0.02	0 mm	MIMO	1606-5	13	top	1:1	0.169	1.216	0.206	
2437	6	IEEE 802.11n	OFDM	10.5	9.65	0.05	0 mm	MIMO	1606-5	13	left	1:1	0.022	1.216	0.027	
2437	6	IEEE 802.11b	DSSS	11.5	11.00	0.07	0 mm	Antenna 2	1606-5	1	back	1:1	0.969	1.122	1.087	A8
5765	153	IEEE 802.11a	OFDM	9.5	9.30	0.09	0 mm	Antenna 1	0307-1	6	back	1:1	0.658	1.047	0.689	
5785	157	IEEE 802.11a	OFDM	9.5	9.15	0.04	0 mm	Antenna 1	0307-1	6	back	1:1	0.747	1.084	0.810	
5825	165	IEEE 802.11a	OFDM	9.5	9.04	0.08	0 mm	Antenna 1	0307-1	6	back	1:1	0.663	1.112	0.737	
5775	155	IEEE 802.11ac	OFDM	9.5	9.08	0.04	0 mm	Antenna 1	0307-1	29.3	back	1:1	0.458	1.102	0.505	
5765	153	IEEE 802.11a	OFDM	9.5	9.30	0.03	0 mm	Antenna 1	0307-1	6	top	1:1	0.072	1.047	0.075	
5765	153	IEEE 802.11a	OFDM	9.5	9.30	0.19	0 mm	Antenna 1	0307-1	6	left	1:1	0.022	1.047	0.023	
5745	149	IEEE 802.11a	OFDM	9.5	9.17	0.05	0 mm	Antenna 2	0307-1	6	back	1:1	0.922	1.079	0.995	
5765	153	IEEE 802.11a	OFDM	9.5	9.10	0.11	0 mm	Antenna 2	0307-1	6	back	1:1	0.933	1.096	1.023	A9
5805	161	IEEE 802.11a	OFDM	9.5	8.80	0.21	0 mm	Antenna 2	0307-1	6	back	1:1	0.914	1.175	1.074	
5775	155	IEEE 802.11ac	OFDM	9.5	8.51	0.09	0 mm	Antenna 2	0307-1	29.3	back	1:1	0.618	1.256	0.776	
5745	149	IEEE 802.11a	OFDM	9.5	9.17	0.03	0 mm	Antenna 2	0307-1	6	top	1:1	0.298	1.079	0.322	
5745	149	IEEE 802.11a	OFDM	9.5	9.17	-0.04	0 mm	Antenna 2	0307-1	6	left	1:1	0.025	1.079	0.027	
5745	149	IEEE 802.11n	OFDM	9.5	9.47	-0.04	0 mm	MIMO	0307-1	13	back	1:1	0.318	1.007	0.320	
5785	157	IEEE 802.11n	OFDM	9.5	9.33	0.05	0 mm	MIMO	0307-1	13	back	1:1	0.306	1.040	0.318	
5825	165	IEEE 802.11n	OFDM	9.5	9.13	0.09	0 mm	MIMO	0307-1	13	back	1:1	0.310	1.089	0.338	
5745	149	IEEE 802.11n	OFDM	9.5	9.47	0.02	0 mm	MIMO	0307-1	13	top	1:1	0.112	1.007	0.113	
5745	149	IEEE 802.11n	OFDM	9.5	9.47	-0.09	0 mm	MIMO	0307-1	13	left	1:1	0.020	1.007	0.020	
5765	153	IEEE 802.11a	OFDM	9.5	9.10	0.02	0 mm	Antenna 2	0307-1	6	back	1:1	0.871	1.096	0.955	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram								

Blue entry represents variability measurement.

© 2014 PCTEST Engineering Laboratory, Inc.

Table 10-7
NII WLAN Body SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna #	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5200	40	IEEE 802.11a	OFDM	9.5	9.07	0.06	0 mm	Antenna 1	0307-1	6	back	1:1	0.422	1.104	0.466	
5240	48	IEEE 802.11a	OFDM	9.5	8.50	0.14	0 mm	Antenna 1	0307-1	6	back	1:1	0.346	1.259	0.436	
5210	42	IEEE 802.11ac	OFDM	9.5	8.95	0.18	0 mm	Antenna 1	0307-1	29.3	back	1:1	0.399	1.135	0.453	
5200	40	IEEE 802.11a	OFDM	9.5	9.07	0.20	0 mm	Antenna 1	0307-1	6	top	1:1	0.048	1.104	0.053	
5200	40	IEEE 802.11a	OFDM	9.5	9.07	-0.07	0 mm	Antenna 1	0307-1	6	left	1:1	0.018	1.104	0.020	
5200	40	IEEE 802.11a	OFDM	9.5	9.43	0.04	0 mm	Antenna 2	0307-1	6	back	1:1	0.702	1.016	0.713	
5240	48	IEEE 802.11a	OFDM	9.5	9.10	0.13	0 mm	Antenna 2	0307-1	6	back	1:1	0.706	1.096	0.774	
5210	42	IEEE 802.11ac	OFDM	9.5	8.55	-0.03	0 mm	Antenna 2	0307-1	29.3	back	1:1	0.722	1.245	0.899	
5200	40	IEEE 802.11a	OFDM	9.5	9.43	-0.10	0 mm	Antenna 2	0307-1	6	top	1:1	0.224	1.016	0.228	
5200	40	IEEE 802.11a	OFDM	9.5	9.43	0.13	0 mm	Antenna 2	0307-1	6	left	1:1	0.027	1.016	0.027	
5200	40	IEEE 802.11n	OFDM	9.5	8.95	0.19	0 mm	MIMO	0307-1	13	back	1:1	0.175	1.135	0.199	
5240	48	IEEE 802.11n	OFDM	9.5	9.08	-0.01	0 mm	MIMO	0307-1	13	back	1:1	0.176	1.101	0.194	
5240	48	IEEE 802.11n	OFDM	9.5	9.08	-0.03	0 mm	MIMO	0307-1	13	top	1:1	0.095	1.101	0.105	
5240	48	IEEE 802.11n	OFDM	9.5	9.08	0.01	0 mm	MIMO	0307-1	13	left	1:1	0.018	1.101	0.020	
5280	56	IEEE 802.11a	OFDM	9.5	8.78	-0.02	0 mm	Antenna 1	0307-1	6	back	1:1	0.447	1.180	0.527	
5320	64	IEEE 802.11a	OFDM	9.5	9.00	0.13	0 mm	Antenna 1	0307-1	6	back	1:1	0.414	1.122	0.465	
5290	58	IEEE 802.11ac	OFDM	9.5	8.69	0.04	0 mm	Antenna 1	0307-1	29.3	back	1:1	0.332	1.205	0.400	
5320	64	IEEE 802.11a	OFDM	9.5	9.00	0.08	0 mm	Antenna 1	0307-1	6	top	1:1	0.054	1.122	0.061	
5320	64	IEEE 802.11a	OFDM	9.5	9.00	0.03	0 mm	Antenna 1	0307-1	6	left	1:1	0.016	1.122	0.018	
5260	52	IEEE 802.11a	OFDM	9.5	9.06	0.03	0 mm	Antenna 2	0307-1	6	back	1:1	0.694	1.107	0.768	
5300	60	IEEE 802.11a	OFDM	9.5	9.03	0.00	0 mm	Antenna 2	0307-1	6	back	1:1	0.681	1.114	0.759	
5290	58	IEEE 802.11ac	OFDM	9.5	8.95	0.01	0 mm	Antenna 2	0307-1	29.3	back	1:1	0.707	1.135	0.802	
5260	52	IEEE 802.11a	OFDM	9.5	9.06	-0.07	0 mm	Antenna 2	0307-1	6	top	1:1	0.167	1.107	0.185	
5260	52	IEEE 802.11a	OFDM	9.5	9.06	-0.04	0 mm	Antenna 2	0307-1	6	left	1:1	0.019	1.107	0.021	
5280	56	IEEE 802.11n	OFDM	9.5	9.26	0.11	0 mm	MIMO	0307-1	13	back	1:1	0.195	1.057	0.206	
5320	64	IEEE 802.11n	OFDM	9.5	9.37	0.03	0 mm	MIMO	0307-1	13	back	1:1	0.206	1.030	0.212	
5320	64	IEEE 802.11n	OFDM	9.5	9.37	0.02	0 mm	MIMO	0307-1	13	top	1:1	0.113	1.030	0.116	
5320	64	IEEE 802.11n	OFDM	9.5	9.37	-0.18	0 mm	MIMO	0307-1	13	left	1:1	0.018	1.030	0.019	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

© 2014 PCTEST Engineering Laboratory, Inc.

Table 10-8
NII WLAN Body SAR (Cont.)

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna #	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
5520	104	IEEE 802.11a	OFDM	9.5	9.41	0.07	0 mm	Antenna 1	0307-1	6	back	1:1	0.702	1.021	0.717	
5580	116	IEEE 802.11a	OFDM	9.5	8.66	0.09	0 mm	Antenna 1	0307-1	6	back	1:1	0.730	1.213	0.885	
5660	132	IEEE 802.11a	OFDM	9.5	8.62	0.10	0 mm	Antenna 1	0307-1	6	back	1:1	0.703	1.225	0.861	
5530	106	IEEE 802.11ac	OFDM	9.5	8.50	0.12	0 mm	Antenna 1	0307-1	29.3	back	1:1	0.411	1.259	0.517	
5520	104	IEEE 802.11a	OFDM	9.5	9.41	-0.03	0 mm	Antenna 1	0307-1	6	top	1:1	0.087	1.021	0.089	
5520	104	IEEE 802.11a	OFDM	9.5	9.41	-0.15	0 mm	Antenna 1	0307-1	6	left	1:1	0.024	1.021	0.025	
5500	100	IEEE 802.11a	OFDM	9.5	8.70	0.08	0 mm	Antenna 2	0307-1	6	back	1:1	0.754	1.202	0.906	
5580	116	IEEE 802.11a	OFDM	9.5	8.52	0.17	0 mm	Antenna 2	0307-1	6	back	1:1	0.767	1.253	0.961	
5660	132	IEEE 802.11a	OFDM	9.5	9.23	0.01	0 mm	Antenna 2	0307-1	6	back	1:1	0.830	1.064	0.883	
5530	106	IEEE 802.11ac	OFDM	9.5	8.61	-0.03	0 mm	Antenna 2	0307-1	29.3	back	1:1	0.639	1.227	0.784	
5660	132	IEEE 802.11a	OFDM	9.5	9.23	-0.05	0 mm	Antenna 2	0307-1	6	top	1:1	0.296	1.064	0.315	
5660	132	IEEE 802.11a	OFDM	9.5	9.23	-0.03	0 mm	Antenna 2	0307-1	6	left	1:1	0.021	1.064	0.022	
5500	100	IEEE 802.11n	OFDM	9.5	9.39	0.08	0 mm	MIMO	0307-1	13	back	1:1	0.258	1.026	0.265	
5560	112	IEEE 802.11n	OFDM	9.5	9.22	0.04	0 mm	MIMO	0307-1	13	back	1:1	0.303	1.067	0.323	
5660	132	IEEE 802.11n	OFDM	9.5	8.85	0.10	0 mm	MIMO	0307-1	13	back	1:1	0.266	1.162	0.309	
5500	100	IEEE 802.11n	OFDM	9.5	9.39	0.17	0 mm	MIMO	0307-1	13	top	1:1	0.124	1.026	0.127	
5500	100	IEEE 802.11n	OFDM	9.5	9.39	0.07	0 mm	MIMO	0307-1	13	left	1:1	0.020	1.026	0.021	
5660	132	IEEE 802.11a	OFDM	9.5	9.23	-0.05	0 mm	Antenna 2	0307-1	6	back	1:1	0.918	1.064	**0.977**	A10
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Blue entry represents variability measurement.

10.2 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB 616217 and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. 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. Top and right edges SAR tests were required for the main antenna. Top and left edges SAR tests were required for the WLAN/BT antennas.

© 2014 PCTEST Engineering Laboratory, Inc.

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).
4. Per FCC Guidance, LTE CA SAR was not needed for testing since the data sent by uplink on uplink physical channels does not change between Rel 8 and Rel 10.

WLAN Notes:

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

© 2014 PCTEST Engineering Laboratory, Inc.

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	Estimated SAR	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[W/kg]	[mm]	[W/kg]
Bluetooth	2441	8.50	Back Side Touching(*)	5	**0.292**
Bluetooth	2441	8.50	Top Edge Touching	5.5	**0.265**
Bluetooth	2441	8.50	Left Edge Touching	22.3	**0.065**
Bluetooth	2441	8.50	Back & Top Edge	20	**0.073**

Note1:

1. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.
2. When 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.
3. (*) – Per FCC KDB 447498, when the test separation distance is < 5 mm, a distance of 5 mm is applied to determine estimated SAR.

© 2014 PCTEST Engineering Laboratory, Inc.

11.3 Body Simultaneous Transmission Analysis

Table 11-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN Ant. 1 (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	1.037	See Note 1	0.02
	Top	0.627	0.218	0.845	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.796	1.037	See Note 1	0.02
	Top	0.536	0.218	0.754	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.271	0.400	0.671	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	1.037	See Note 1	0.02
	Top	0.630	0.218	0.848	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.595	1.037	See Note 1	0.01
	Top	0.359	0.218	0.577	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.207	0.400	0.607	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	1.037	See Note 1	0.02
	Top	0.542	0.218	0.760	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.757	1.037	See Note 1	0.02
	Top	0.710	0.218	0.928	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.161	0.400	0.561	N/A
	Left	0.400	0.049	0.449	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	1.037	See Note 1	0.02
	Top	0.627	0.218	0.845	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.049	0.449	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN Ant. 2 (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	1.087	See Note 1	0.02	Body SAR	Back	0.796	1.087	See Note 1	0.02
	Top	0.627	0.290	0.917	N/A		Top	0.536	0.290	0.826	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.001	0.401	N/A		Left	0.400	0.001	0.401	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	1.087	See Note 1	0.02	Body SAR	Back	0.595	1.087	See Note 1	0.02
	Top	0.630	0.290	0.920	N/A		Top	0.359	0.290	0.649	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.001	0.401	N/A		Left	0.400	0.001	0.401	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	1.087	See Note 1	0.02	Body SAR	Back	0.757	1.087	See Note 1	0.02
	Top	0.542	0.290	0.832	N/A		Top	0.710	0.290	1.000	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.001	0.401	N/A		Left	0.400	0.001	0.401	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	1.087	See Note 1	0.02
	Top	0.627	0.290	0.917	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.001	0.401	N/A

Table 11-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	0.510	**1.509**	N/A	Body SAR	Back	0.796	0.510	**1.306**	N/A
	Top	0.627	0.206	0.833	N/A		Top	0.536	0.206	0.742	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	0.510	**1.258**	N/A	Body SAR	Back	0.595	0.510	**1.105**	N/A
	Top	0.630	0.206	0.836	N/A		Top	0.359	0.206	0.565	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	0.510	**1.329**	N/A	Body SAR	Back	0.757	0.510	**1.267**	N/A
	Top	0.542	0.206	0.748	N/A		Top	0.710	0.206	0.916	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	0.510	**1.219**	N/A
	Top	0.627	0.206	0.833	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.027	0.427	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-5
Simultaneous Transmission Scenario with 5 GHz WLAN Ant. 1 (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	0.885	See Note 1	0.02	Body SAR	Back	0.796	0.885	See Note 1	0.02
	Top	0.627	0.089	0.716	N/A		Top	0.536	0.089	0.625	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.025	0.425	N/A		Left	0.400	0.025	0.425	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	0.885	See Note 1	0.02	Body SAR	Back	0.595	0.885	**1.480**	N/A
	Top	0.630	0.089	0.719	N/A		Top	0.359	0.089	0.448	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.025	0.425	N/A		Left	0.400	0.025	0.425	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	0.885	See Note 1	0.01	Body SAR	Back	0.757	0.885	See Note 1	0.02
	Top	0.542	0.089	0.631	N/A		Top	0.710	0.089	0.799	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.025	0.425	N/A		Left	0.400	0.025	0.425	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	0.885	**1.594**	N/A
	Top	0.627	0.089	0.716	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.025	0.425	N/A

Table 11-6
Simultaneous Transmission Scenario with 5 GHz WLAN Ant. 2 (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	1.074	See Note 1	0.02	Body SAR	Back	0.796	1.074	See Note 1	0.02
	Top	0.627	0.322	0.949	N/A		Top	0.536	0.322	0.858	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	1.074	See Note 1	0.02	Body SAR	Back	0.595	1.074	See Note 1	0.02
	Top	0.630	0.322	0.952	N/A		Top	0.359	0.322	0.681	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	1.074	See Note 1	0.02	Body SAR	Back	0.757	1.074	See Note 1	0.02
	Top	0.542	0.322	0.864	N/A		Top	0.710	0.322	1.032	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.027	0.427	N/A		Left	0.400	0.027	0.427	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	1.074	See Note 1	0.02
	Top	0.627	0.322	0.949	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.027	0.427	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-7
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Body at 0.0 cm)

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	0.338	**1.337**	N/A	Body SAR	Back	0.796	0.338	**1.134**	N/A
	Top	0.627	0.127	0.754	N/A		Top	0.536	0.127	0.663	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.021	0.421	N/A		Left	0.400	0.021	0.421	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	0.338	**1.086**	N/A	Body SAR	Back	0.595	0.338	**0.933**	N/A
	Top	0.630	0.127	0.757	N/A		Top	0.359	0.127	0.486	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.021	0.421	N/A		Left	0.400	0.021	0.421	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	0.338	**1.157**	N/A	Body SAR	Back	0.757	0.338	**1.095**	N/A
	Top	0.542	0.127	0.669	N/A		Top	0.710	0.127	0.837	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.021	0.421	N/A		Left	0.400	0.021	0.421	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	0.338	**1.047**	N/A
	Top	0.627	0.127	0.754	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.021	0.421	N/A

Table 11-8
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	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.999	0.292	**1.291**	N/A	Body SAR	Back	0.796	0.292	**1.088**	N/A
	Top	0.627	0.265	0.892	N/A		Top	0.536	0.265	0.801	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.153	0.400	0.553	N/A		Right	0.271	0.400	0.671	N/A
	Left	0.400	0.065	0.465	N/A		Left	0.400	0.065	0.465	N/A
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.748	0.292	**1.040**	N/A	Body SAR	Back	0.595	0.292	**0.887**	N/A
	Top	0.630	0.265	0.895	N/A		Top	0.359	0.265	0.624	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.035	0.400	0.435	N/A		Right	0.207	0.400	0.607	N/A
	Left	0.400	0.065	0.465	N/A		Left	0.400	0.065	0.465	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.819	0.292	**1.111**	N/A	Body SAR	Back	0.757	0.292	**1.049**	N/A
	Top	0.542	0.265	0.807	N/A		Top	0.710	0.265	0.975	N/A
	Bottom	0.400	0.400	0.800	N/A		Bottom	0.400	0.400	0.800	N/A
	Right	0.278	0.400	0.678	N/A		Right	0.161	0.400	0.561	N/A
	Left	0.400	0.065	0.465	N/A		Left	0.400	0.065	0.465	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Body SAR	Back	0.709	0.292	**1.001**	N/A
	Top	0.627	0.265	0.892	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.060	0.400	0.460	N/A
	Left	0.400	0.065	0.465	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-9
Simultaneous Transmission Scenario (2.4 GHz Body Back Side at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<1.037	<1.163	N/A
Back Side	UMTS 1750	0.782	<1.037	See Note 1	<0.02
Back Side	UMTS 1900	0.786	<1.037	See Note 1	<0.02
Back Side	LTE Band 12	0.130	<1.037	<1.167	N/A
Back Side	LTE Band 5 (Cell)	0.166	<1.037	<1.203	N/A
Back Side	LTE Band 4 (AWS)	0.497	<1.037	<1.534	N/A
Back Side	LTE Band 2 (PCS)	0.422	<1.037	<1.459	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<1.087	<1.213	N/A
Back Side	UMTS 1750	0.782	<1.087	See Note 1	<0.02
Back Side	UMTS 1900	0.786	<1.087	See Note 1	<0.02
Back Side	LTE Band 12	0.130	<1.087	<1.217	N/A
Back Side	LTE Band 5 (Cell)	0.166	<1.087	<1.253	N/A
Back Side	LTE Band 4 (AWS)	0.497	<1.087	<1.584	N/A
Back Side	LTE Band 2 (PCS)	0.422	<1.087	<1.509	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<0.510	<0.636	N/A
Back Side	UMTS 1750	0.782	<0.510	**<1.292**	N/A
Back Side	UMTS 1900	0.786	<0.510	<1.296	N/A
Back Side	LTE Band 12	0.130	<0.510	<0.640	N/A
Back Side	LTE Band 5 (Cell)	0.166	<0.510	<0.676	N/A
Back Side	LTE Band 4 (AWS)	0.497	<0.510	<1.007	N/A
Back Side	LTE Band 2 (PCS)	0.422	<0.510	<0.932	N/A

Table 11-10
Simultaneous Transmission Scenario (5 GHz Body Back Side at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<0.885	<1.011	N/A
Back Side	UMTS 1750	0.782	<0.885	See Note 1	<0.02
Back Side	UMTS 1900	0.786	<0.885	See Note 1	<0.01
Back Side	LTE Band 12	0.130	<0.885	<1.015	N/A
Back Side	LTE Band 5 (Cell)	0.166	<0.885	<1.051	N/A
Back Side	LTE Band 4 (AWS)	0.497	<0.885	<1.382	N/A
Back Side	LTE Band 2 (PCS)	0.422	<0.885	<1.307	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<1.074	<1.200	N/A
Back Side	UMTS 1750	0.782	<1.074	See Note 1	<0.02
Back Side	UMTS 1900	0.786	<1.074	See Note 1	<0.02
Back Side	LTE Band 12	0.130	<1.074	<1.204	N/A
Back Side	LTE Band 5 (Cell)	0.166	<1.074	<1.240	N/A
Back Side	LTE Band 4 (AWS)	0.497	<1.074	<1.571	N/A
Back Side	LTE Band 2 (PCS)	0.422	<1.074	<1.496	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	<0.338	<0.464	N/A
Back Side	UMTS 1750	0.782	<0.338	**<1.120**	N/A
Back Side	UMTS 1900	0.786	<0.338	<1.124	N/A
Back Side	LTE Band 12	0.130	<0.338	<0.468	N/A
Back Side	LTE Band 5 (Cell)	0.166	<0.338	<0.504	N/A
Back Side	LTE Band 4 (AWS)	0.497	<0.338	<0.835	N/A
Back Side	LTE Band 2 (PCS)	0.422	<0.338	<0.760	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-11
Simultaneous Transmission Scenario (Bluetooth Body Back Side at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Back Side	UMTS 850	0.126	0.073	0.199	N/A
Back Side	UMTS 1750	0.782	0.073	**0.855**	N/A
Back Side	UMTS 1900	0.786	0.073	0.859	N/A
Back Side	LTE Band 12	0.130	0.073	0.203	N/A
Back Side	LTE Band 5 (Cell)	0.166	0.073	0.239	N/A
Back Side	LTE Band 4 (AWS)	0.497	0.073	0.570	N/A
Back Side	LTE Band 2 (PCS)	0.422	0.073	0.495	N/A

Table 11-12
Simultaneous Transmission Scenario (2.4 GHz Body Top Edge at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 1) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.218	<0.248	N/A
Top Edge	UMTS 1750	0.753	<0.218	**<0.971**	N/A
Top Edge	UMTS 1900	0.710	<0.218	<0.928	N/A
Top Edge	LTE Band 12	0.029	<0.218	<0.247	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.218	<0.258	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.218	<0.738	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.218	<0.585	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 2) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.290	<0.320	N/A
Top Edge	UMTS 1750	0.753	<0.290	**<1.043**	N/A
Top Edge	UMTS 1900	0.710	<0.290	<1.000	N/A
Top Edge	LTE Band 12	0.029	<0.290	<0.319	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.290	<0.330	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.290	<0.810	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.290	<0.657	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(MIMO) 2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.206	<0.236	N/A
Top Edge	UMTS 1750	0.753	<0.206	**<0.959**	N/A
Top Edge	UMTS 1900	0.710	<0.206	<0.916	N/A
Top Edge	LTE Band 12	0.029	<0.206	<0.235	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.206	<0.246	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.206	<0.726	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.206	<0.573	N/A

© 2014 PCTEST Engineering Laboratory, Inc.

Table 11-13
Simultaneous Transmission Scenario (5 GHz Body Top Edge at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 1) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.089	<0.119	N/A
Top Edge	UMTS 1750	0.753	<0.089	**<0.842**	N/A
Top Edge	UMTS 1900	0.710	<0.089	<0.799	N/A
Top Edge	LTE Band 12	0.029	<0.089	<0.118	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.089	<0.129	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.089	<0.609	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.089	<0.456	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(Ant. 2) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.322	<0.352	N/A
Top Edge	UMTS 1750	0.753	<0.322	**<1.075**	N/A
Top Edge	UMTS 1900	0.710	<0.322	<1.032	N/A
Top Edge	LTE Band 12	0.029	<0.322	<0.351	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.322	<0.362	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.322	<0.842	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.322	<0.689	N/A
Configuration	Mode	3G/4G SAR (W/kg)	(MIMO) 5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	<0.127	<0.157	N/A
Top Edge	UMTS 1750	0.753	<0.127	**<0.880**	N/A
Top Edge	UMTS 1900	0.710	<0.127	<0.837	N/A
Top Edge	LTE Band 12	0.029	<0.127	<0.156	N/A
Top Edge	LTE Band 5 (Cell)	0.040	<0.127	<0.167	N/A
Top Edge	LTE Band 4 (AWS)	0.520	<0.127	<0.647	N/A
Top Edge	LTE Band 2 (PCS)	0.367	<0.127	<0.494	N/A

Table 11-14
Simultaneous Transmission Scenario (Bluetooth Body Top Edge at 2.0 cm)

Configuration	Mode	3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
Top Edge	UMTS 850	0.030	0.073	0.103	N/A
Top Edge	UMTS 1750	0.753	0.073	**0.826**	N/A
Top Edge	UMTS 1900	0.710	0.073	0.783	N/A
Top Edge	LTE Band 12	0.029	0.073	0.102	N/A
Top Edge	LTE Band 5 (Cell)	0.040	0.073	0.113	N/A
Top Edge	LTE Band 4 (AWS)	0.520	0.073	0.593	N/A
Top Edge	LTE Band 2 (PCS)	0.367	0.073	0.440	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 less than 0.04 per FCC KDB 447498 D01v05. See Section 11.4 for detailed SPLS ratio analysis.
2. For SAR summation for body (back side at 20mm and top edge at 20mm), WLAN SAR values for 0.0 mm were used since the 0.0 mm test distance for WLAN SAR values were more conservative. “<” denotes that the 0.0 mm WLAN SAR values were used for summation purposes.
3. Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

© 2014 PCTEST Engineering Laboratory, Inc.

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 850 antenna operating at limited output power with 2.4 GHz WIFI Antenna 1.

Table 11-15
Peak SAR Locations for Body Back Side at 0 mm UMTS 850 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 850 MHz (at 0 mm)	-22.00	82.00
802.11b (Ant. 1)	-30.00	-72.00

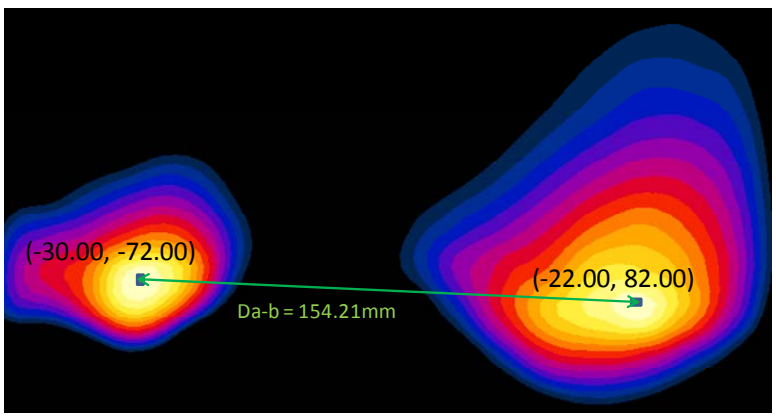


Figure 11-1
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and UMTS 850 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
UMTS 850 MHz (at 0 mm)	802.11b (Ant. 1)	0.999	1.037	2.036	154.21	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 2.4 GHz WIFI Antenna 1.

Table 11-17
Peak SAR Locations for Body Back Side at 0 mm UMTS 1750 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 0 mm)	-19.97	76.51
802.11b (Ant. 1)	-30.00	-72.00

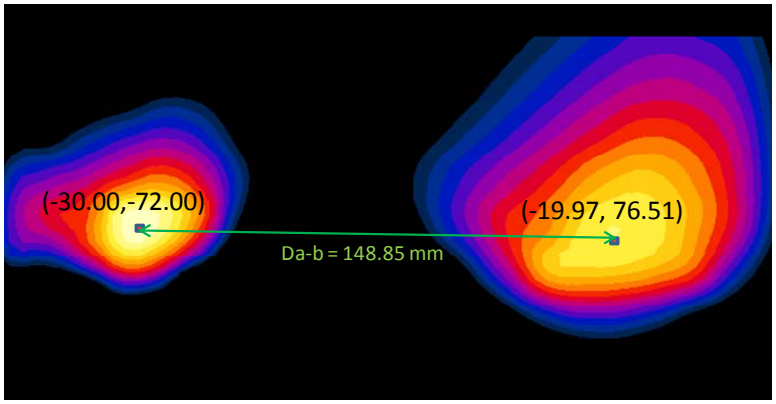


Figure 11-2
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and UMTS 1750 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1750 MHz (at 0 mm)	802.11b (Ant. 1)	0.796	1.037	1.833	148.85	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 2.4 GHz WIFI Antenna 1.

Table 11-19
Peak SAR Locations for Body Back Side at 0 mm UMTS 1900 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 0 mm)	-27.00	70.50
802.11b (Ant. 1)	-30.00	-72.00

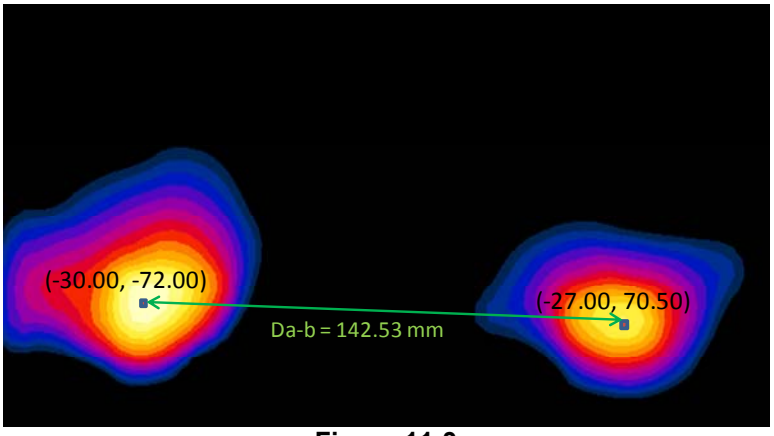


Figure 11-3
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and UMTS 1900 at 0 mm

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 1900 MHz (at 0 mm)	802.11b (Ant. 1)	0.748	1.037	1.785	142.53	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 12 antenna operating at limited output power with 2.4 GHz WIFI Antenna 1.

Table 11-21
Peak SAR Locations for Body Back Side at 0 mm LTE Band 12 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B12 (at 0 mm)	-21.52	87.00
802.11b (Ant. 1)	-30.00	-72.00

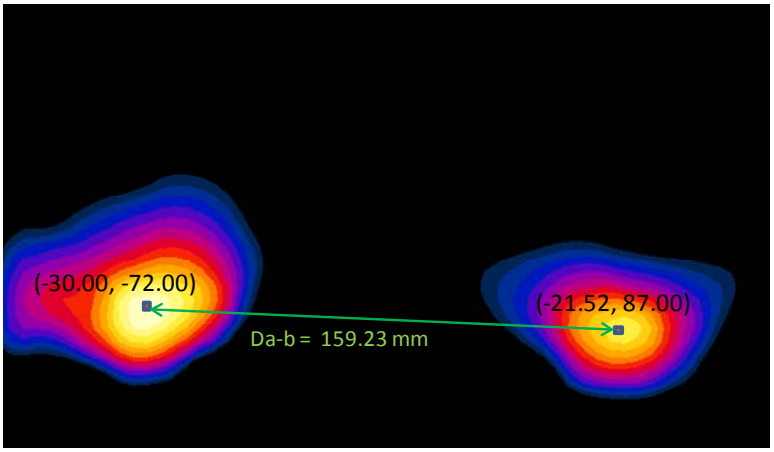


Figure 11-4
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and LTE Band 12 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
LTE B12 (at 0 mm)	802.11b (Ant. 1)	0.595	1.037	1.632	159.23	0.01

© 2014 PCTEST Engineering Laboratory, Inc.

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 5 antenna operating at limited output power with 2.4 GHz WIFI Antenna 1.

Table 11-23
Peak SAR Locations for Body Back Side at 0 mm LTE Band 5 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B5 (at 0 mm)	-29.00	89.00
802.11b (Ant. 1)	-30.00	-72.00

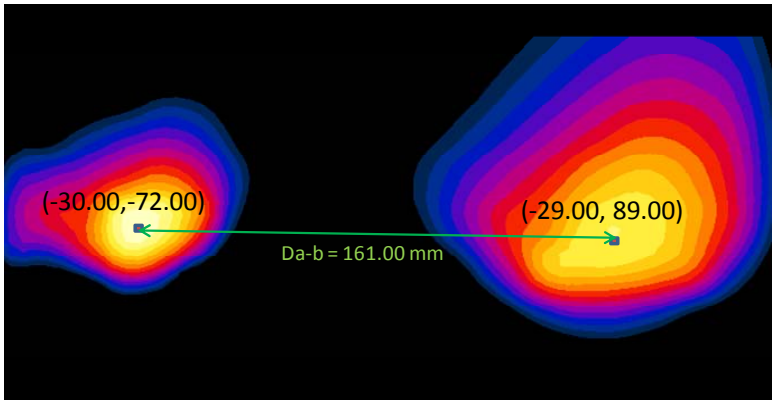


Figure 11-5
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and LTE Band 5 at 0 mm

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 B5 (at 0 mm)	802.11b (Ant. 1)	0.819	1.037	1.856	161.00	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 1.

Table 11-25
Peak SAR Locations for Body Back Side at 0 mm LTE Band 4 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B4 (at 0 mm)	-22.00	69.50
802.11b (Ant. 1)	-30.00	-72.00

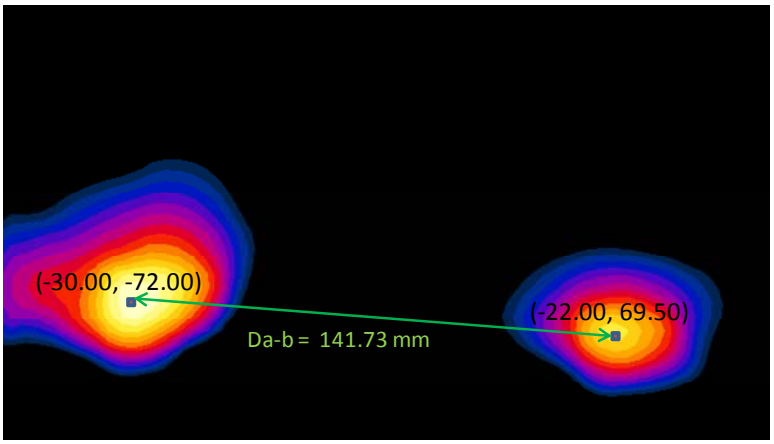


Figure 11-6
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and LTE Band 4 at 0 mm

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 B4 (at 0 mm)	802.11b (Ant. 1)	0.757	1.037	1.794	141.73	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 1.

Table 11-27
Peak SAR Locations for Body Back Side at 0 mm LTE Band 2 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B2 (at 0 mm)	-27.00	70.50
802.11b (Ant. 1)	-30.00	-72.00

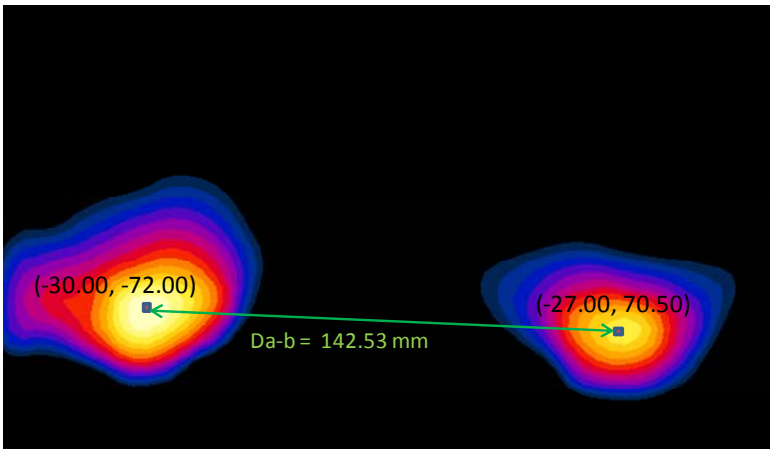


Figure 11-7
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and LTE Band 2 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
LTE B2 (at 0 mm)	802.11b (Ant. 1)	0.709	1.037	1.746	142.53	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 850 antenna operating at limited output power with 2.4 GHz WIFI Antenna 2.

Table 11-29
Peak SAR Locations for Body Back Side at 0 mm UMTS 850 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 850 MHz (at 0 mm)	-22.00	82.00
802.11b (Ant. 2)	-28.00	-41.00

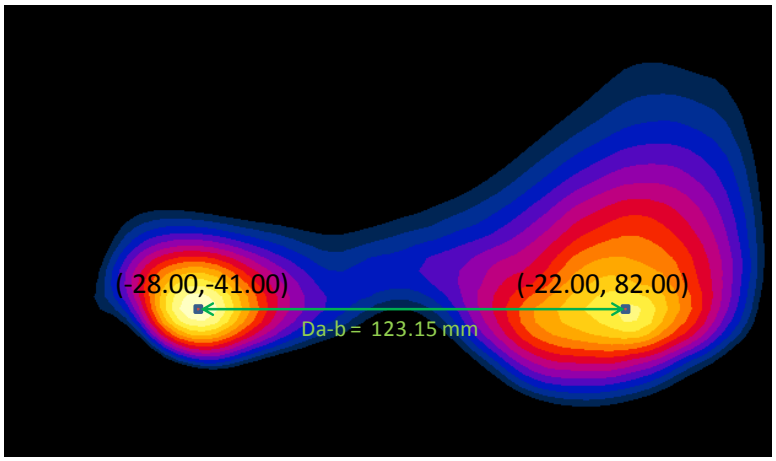


Figure 11-8
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and UMTS 850 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
UMTS 850 MHz (at 0 mm)	802.11b (Ant. 2)	0.999	1.087	2.086	123.15	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 2.4 GHz WIFI Antenna 2.

Table 11-31
Peak SAR Locations for Body Back Side at 0 mm UMTS 1750 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 0 mm)	-19.97	76.51
802.11b (Ant. 2)	-28.00	-41.00

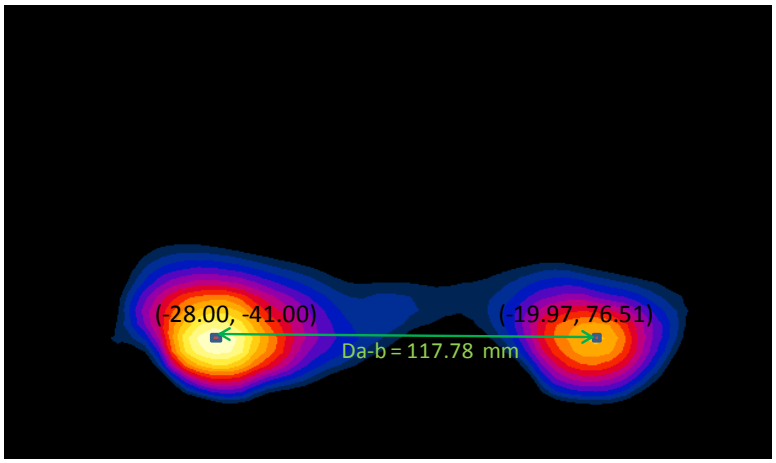


Figure 11-9
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and UMTS 1750 at 0 mm

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}	$(a+b)^{1.5}/D_{a-b}$
UMTS 1750 MHz (at 0 mm)	802.11b (Ant. 2)	0.796	1.087	1.883	117.78	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 2.4 GHz WIFI Antenna 2.

Table 11-33
Peak SAR Locations for Body Back Side at 0 mm UMTS 1900 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 0 mm)	-27.00	70.50
802.11b (Ant. 2)	-28.00	-41.00

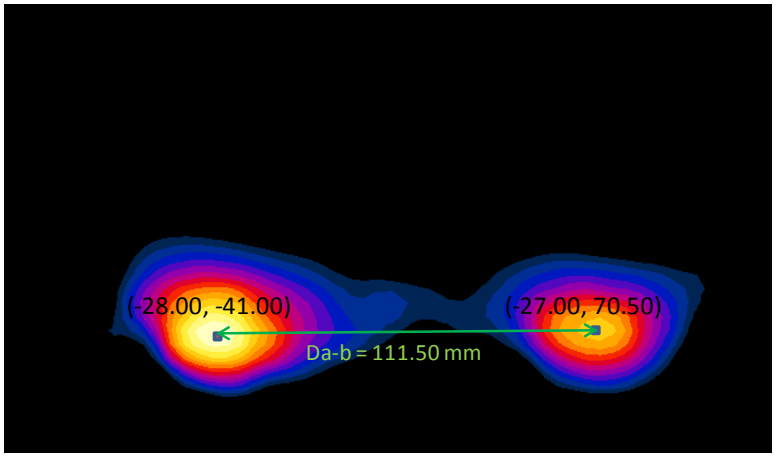


Figure 11-10
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and UMTS 1900 at 0 mm

Table 11-34
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 (at 0 mm)	802.11b (Ant. 2)	0.748	1.087	1.835	111.50	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 12 antenna operating at limited output power with 2.4 GHz WIFI Antenna 2.

Table 11-35
Peak SAR Locations for Body Back Side at 0 mm LTE Band 12 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B12 (at 0 mm)	-21.52	87.00
802.11b (Ant. 2)	-28.00	-41.00

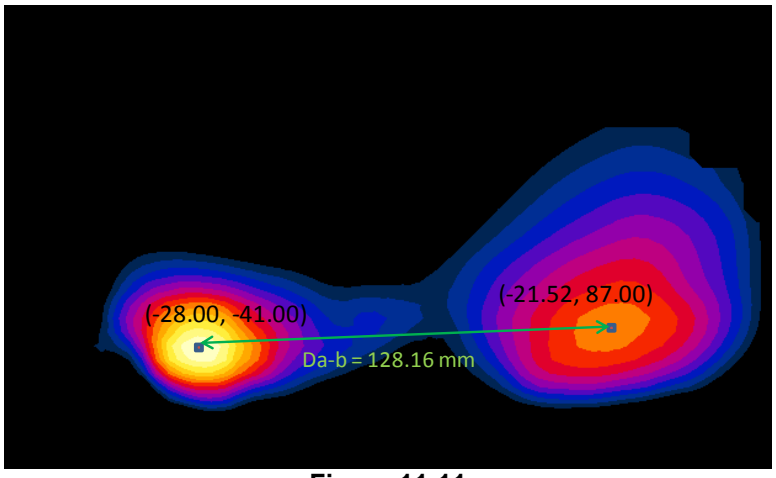


Figure 11-11
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and LTE Band 12 at 0 mm

Table 11-36
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 B12 (at 0 mm)	802.11b (Ant. 2)	0.595	1.087	1.682	128.16	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 5 antenna operating at limited output power with 2.4 GHz WIFI Antenna 2.

Table 11-37
Peak SAR Locations for Body Back Side at 0 mm LTE Band 5 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B5 (at 0 mm)	-29.00	89.00
802.11b (Ant. 2)	-28.00	-41.00

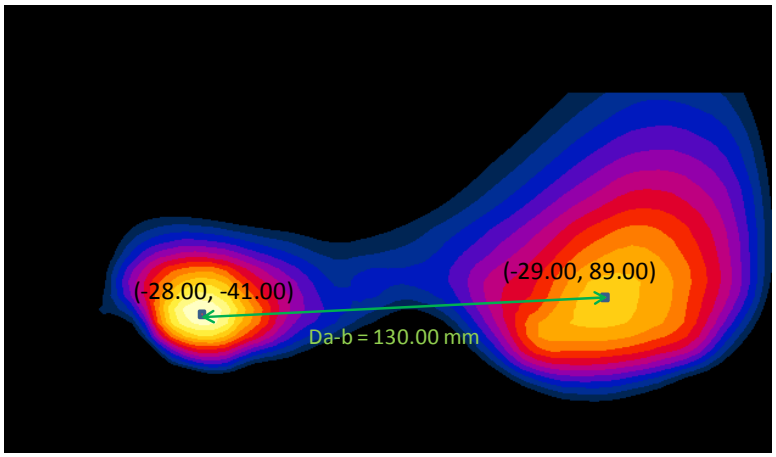


Figure 11-12
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and LTE Band 5 at 0 mm

Table 11-38
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 B5 (at 0 mm)	802.11b (Ant. 2)	0.819	1.087	1.906	130.00	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 2.

Table 11-39
Peak SAR Locations for Body Back Side at 0 mm LTE Band 4 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B4 (at 0 mm)	-22.00	69.50
802.11b (Ant. 2)	-28.00	-41.00

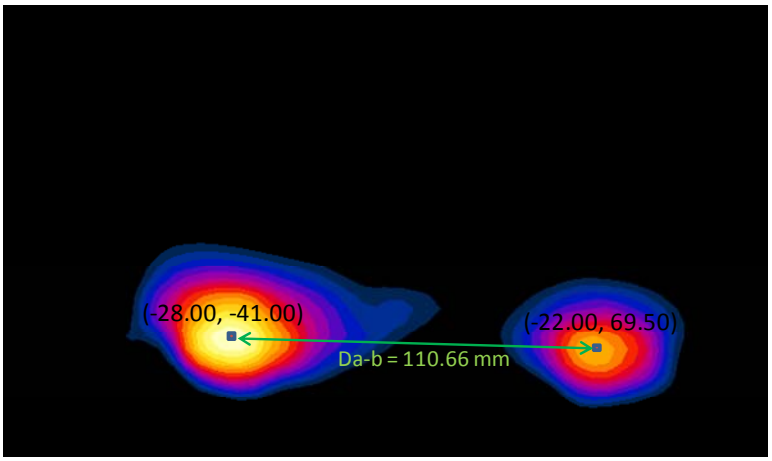


Figure 11-13
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and LTE Band 4 at 0 mm

Table 11-40
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 B4 (at 0 mm)	802.11b (Ant. 2)	0.757	1.087	1.844	110.66	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 2.

Table 11-41
Peak SAR Locations for Body Back Side at 0 mm LTE Band 2 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B2 (at 0 mm)	-27.00	70.50
802.11b (Ant. 2)	-28.00	-41.00

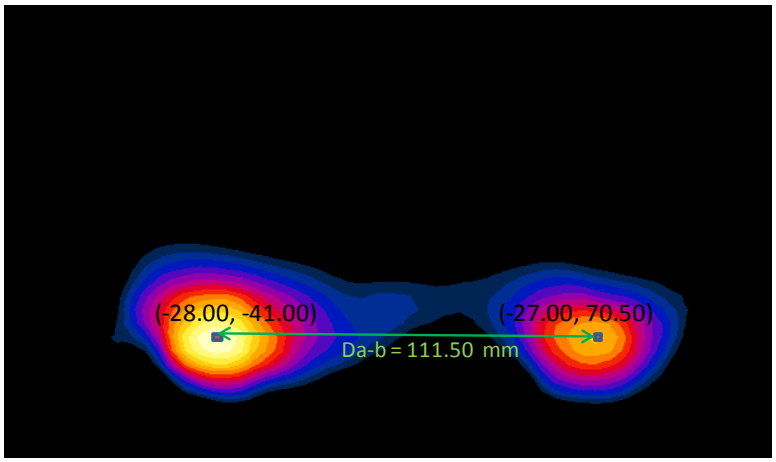


Figure 11-14
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and LTE Band 2 at 0 mm

Table 11-42
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 B2 (at 0 mm)	802.11b (Ant. 2)	0.709	1.087	1.796	111.50	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 850 antenna operating at limited output power with 5 GHz WIFI Antenna 1.

Table 11-43
Peak SAR Locations for Body Back Side at 0 mm UMTS 850 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 850 MHz (at 0 mm)	-22.00	82.00
802.11a (Ant. 1)	-25.02	-68.00

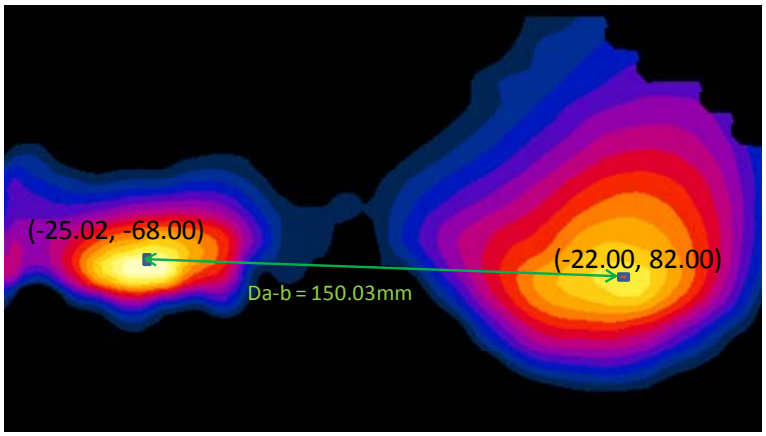


Figure 11-15
Peak SAR Locations of 5 GHz WLAN Ant. 1 and UMTS 850 at 0 mm

Table 11-44
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 850 MHz (at 0 mm)	802.11a (Ant. 1)	0.999	0.885	1.884	150.03	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 5 GHz WIFI Antenna 1.

Table 11-45
Peak SAR Locations for Body Back Side at 0 mm UMTS 1750 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 0 mm)	-19.97	76.51
802.11a (Ant. 1)	-25.02	-68.00

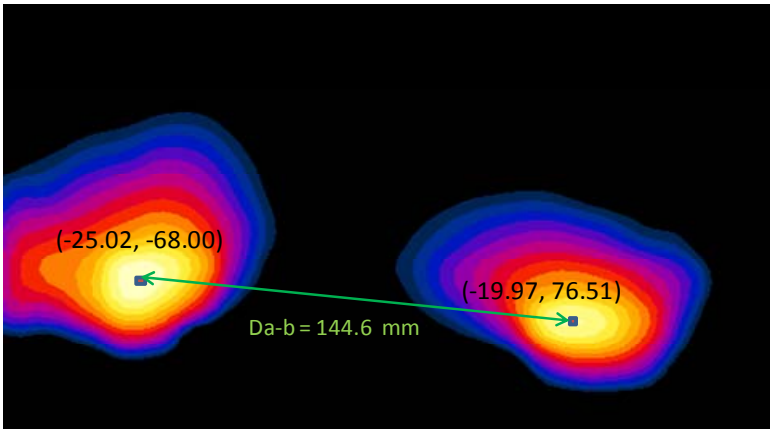


Figure 11-16
Peak SAR Locations of 5 GHz WLAN Ant. 1 and UMTS 1750 at 0 mm

Table 11-46
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 (at 0 mm)	802.11a (Ant. 1)	0.796	0.885	1.681	144.6	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 5 GHz WIFI Antenna 1.

Table 11-47
Peak SAR Locations for Body Back Side at 0 mm UMTS 1900 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 0 mm)	-27.00	70.50
802.11a (Ant. 1)	-25.02	-68.00

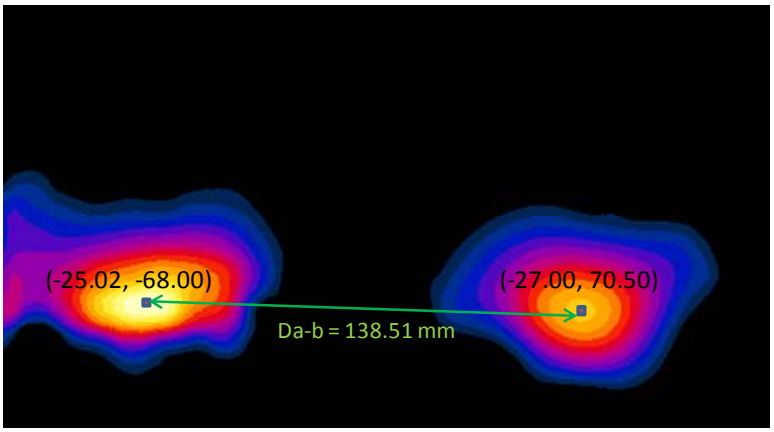


Figure 11-17
Peak SAR Locations of 5 GHz WLAN Ant. 1 and UMTS 1900 at 0 mm

Table 11-48
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 (at 0 mm)	802.11a (Ant. 1)	0.748	0.885	1.633	138.51	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 5 antenna operating at limited output power with 5 GHz WIFI Antenna 1.

Table 11-49
Peak SAR Locations for Body Back Side at 0 mm LTE Band 5 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B5 (at 0 mm)	-29.00	89.00
802.11a (Ant. 1)	-25.02	-68.00

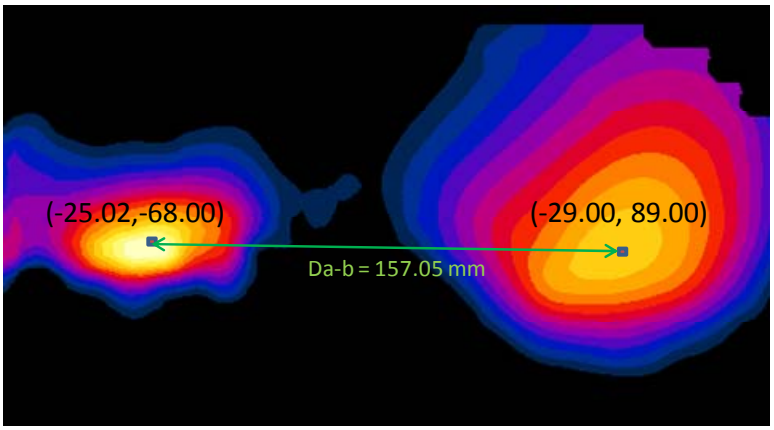


Figure 11-18
Peak SAR Locations of 5 GHz WLAN Ant. 1 and LTE Band 5 at 0 mm

Table 11-50
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 B5 (at 0 mm)	802.11a (Ant. 1)	0.819	0.885	1.704	157.05	0.01

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 1.

Table 11-51
Peak SAR Locations for Body Back Side at 0 mm LTE Band 4 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
LTE B4 (at 0 mm)	-22.00	69.50
802.11a (Ant. 1)	-25.02	-68.00

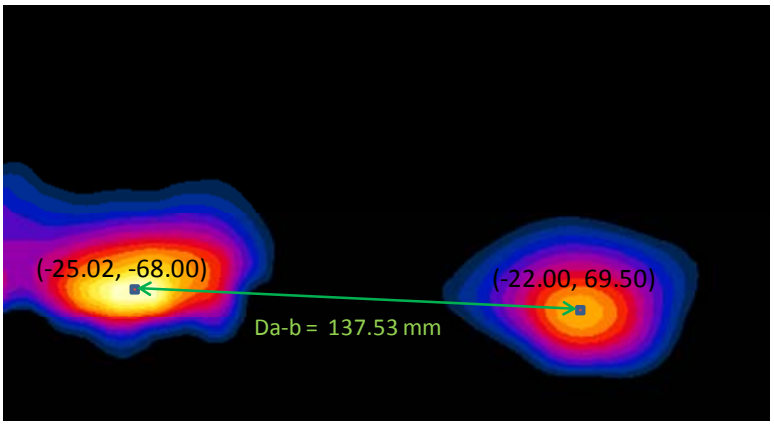


Figure 11-19
Peak SAR Locations of 5 GHz WLAN Ant. 1 and LTE Band 4 at 0 mm

Table 11-52
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 B4 (at 0 mm)	802.11a (Ant. 1)	0.757	0.885	1.642	137.53	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 850 antenna operating at limited output power with 5 GHz WIFI Antenna 2.

Table 11-53
Peak SAR Locations for Body Back Side at 0 mm UMTS 850 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 850 MHz (at 0 mm)	-22.00	82.00
802.11a (Ant. 2)	-25.03	-44.00

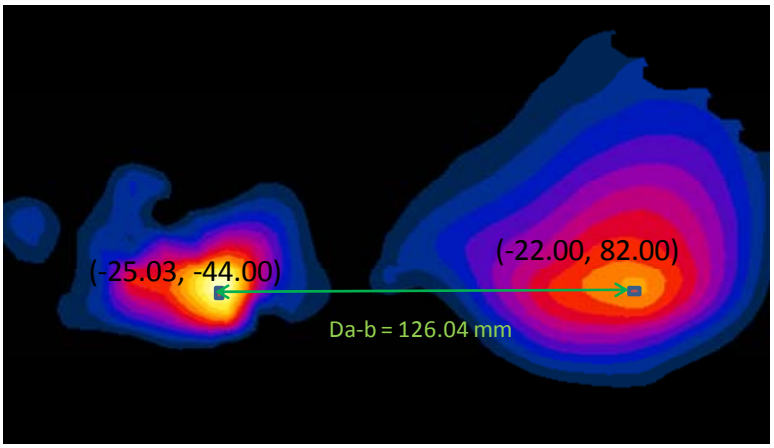


Figure 11-20
Peak SAR Locations of 5 GHz WLAN Ant. 2 and UMTS 850 at 0 mm

Table 11-54
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 850 MHz (at 0 mm)	802.11a (Ant. 2)	0.999	1.074	2.073	126.04	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 5 GHz WIFI Antenna 2.

Table 11-55
Peak SAR Locations for Body Back Side at 0 mm UMTS 1750 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 0 mm)	-19.97	76.51
802.11a (Ant. 2)	-25.03	-44.00

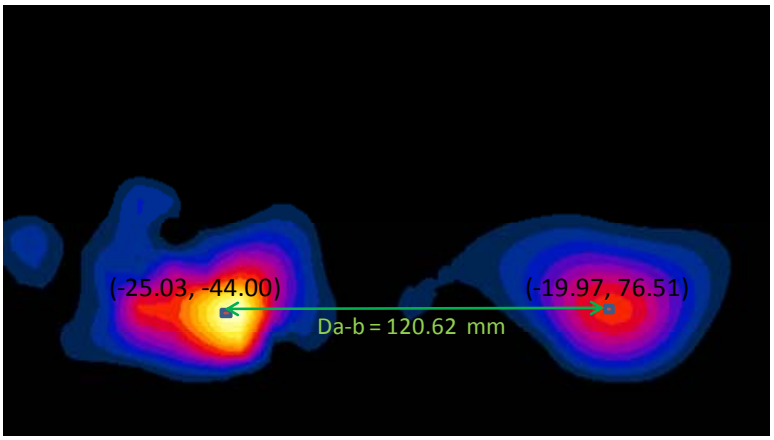


Figure 11-21
Peak SAR Locations of 5 GHz WLAN Ant. 2 and UMTS 1750 at 0 mm

Table 11-56
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 (at 0 mm)	802.11a (Ant. 2)	0.796	1.074	1.87	120.62	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 antenna operating at limited output power with 5 GHz WIFI Antenna 2.

Table 11-57
Peak SAR Locations for Body Back Side at 0 mm UMTS 1900 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 0 mm)	-27.00	70.50
802.11a (Ant. 2)	-25.03	-44.00

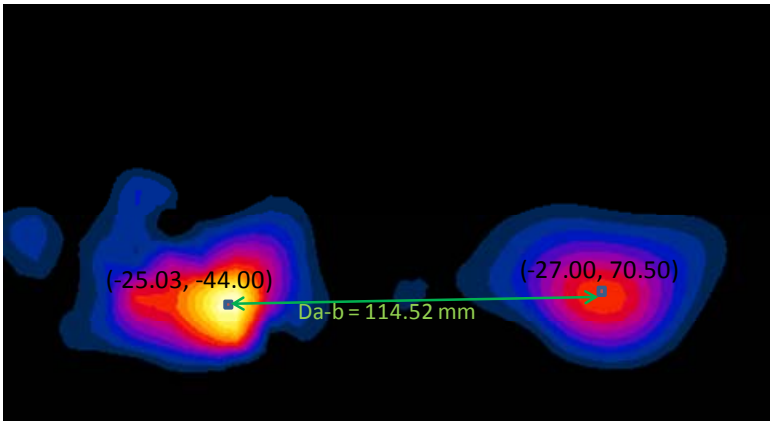


Figure 11-22
Peak SAR Locations of 5 GHz WLAN Ant. 2 and UMTS 1900 at 0 mm

Table 11-58
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 (at 0 mm)	802.11a (Ant. 2)	0.748	1.074	1.822	114.52	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 12 antenna operating at limited output power with 5 GHz WIFI Antenna 2.

Table 11-59
Peak SAR Locations for Body Back Side at 0 mm LTE Band 12 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B12 (at 0 mm)	-21.52	87.00
802.11a (Ant. 2)	-25.03	-44.00

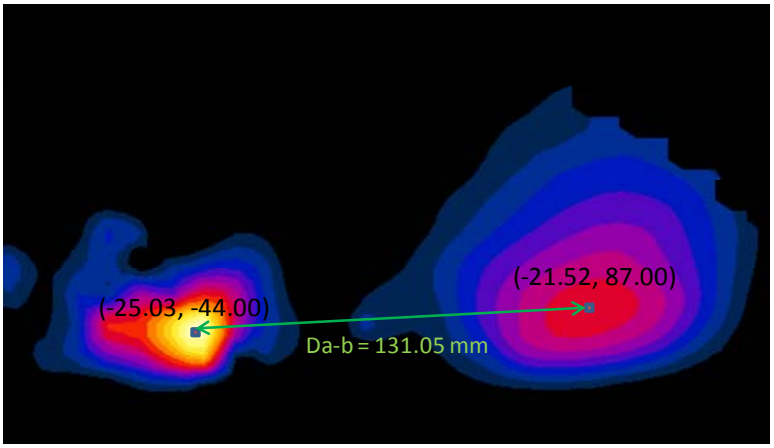


Figure 11-23
Peak SAR Locations of 5 GHz WLAN Ant. 2 and LTE Band 12 at 0 mm

Table 11-60
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 B12 (at 0 mm)	802.11a (Ant. 2)	0.595	1.074	1.669	131.05	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 5 antenna operating at limited output power with 5 GHz WIFI Antenna 2.

Table 11-61
Peak SAR Locations for Body Back Side at 0 mm LTE Band 5 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B5 (at 0 mm)	-29.00	89.00
802.11a (Ant. 2)	-25.03	-44.00

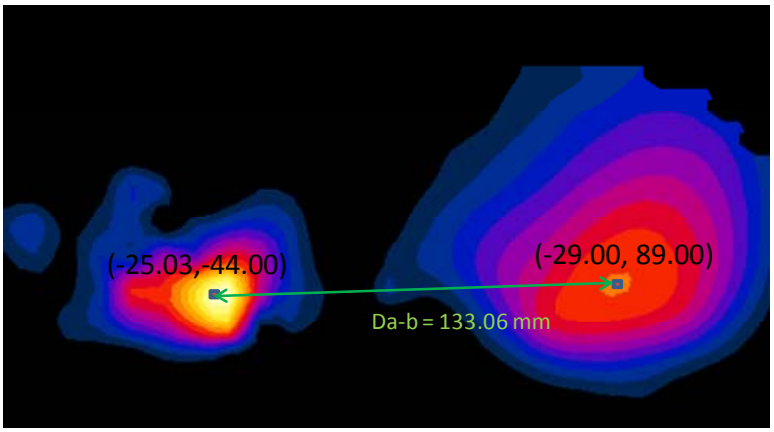


Figure 11-24
Peak SAR Locations of 5 GHz WLAN Ant. 2 and LTE Band 5 at 0 mm

Table 11-62
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 B5 (at 0 mm)	802.11a (Ant. 2)	0.819	1.074	1.893	133.06	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 2.

Table 11-63
Peak SAR Locations for Body Back Side at 0 mm LTE Band 4 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B4 (at 0 mm)	-22.00	69.50
802.11a (Ant. 2)	-25.03	-44.00

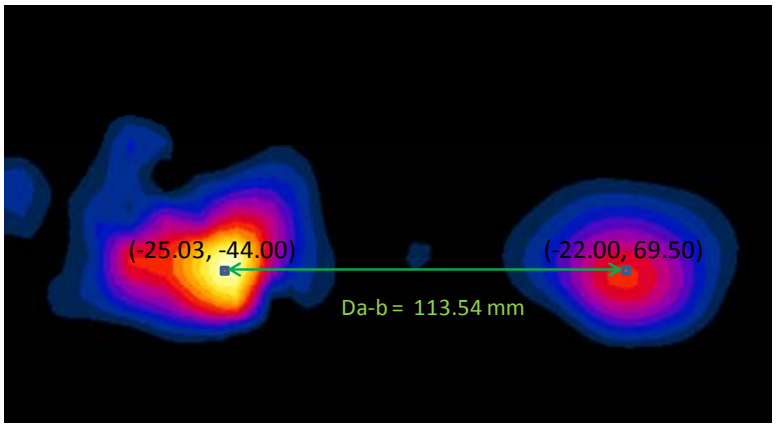


Figure 11-25
Peak SAR Locations of 5 GHz WLAN Ant. 2 and LTE Band 4 at 0 mm

Table 11-64
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 B4 (at 0 mm)	802.11a (Ant. 2)	0.757	1.074	1.831	113.54	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

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 Antenna 2.

Table 11-65
Peak SAR Locations for Body Back Side at 0 mm LTE Band 2 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
LTE B2 (at 0 mm)	-27.00	70.50
802.11a (Ant. 2)	-25.03	-44.00

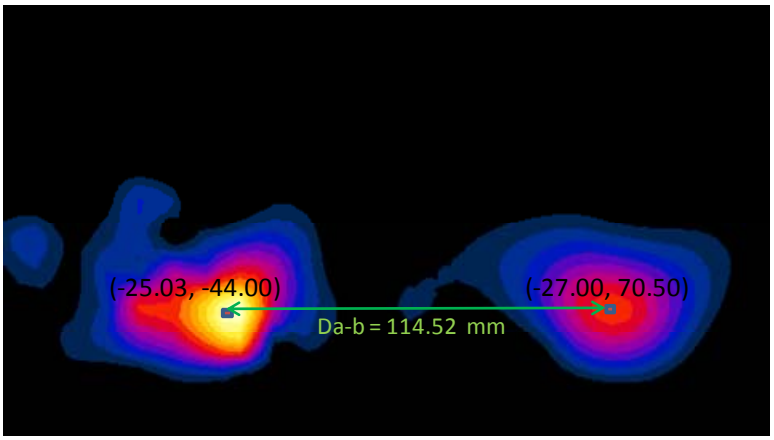


Figure 11-26
Peak SAR Locations of 5 GHz WLAN Ant. 2 and LTE Band 2 at 0 mm

Table 11-66
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 B2 (at 0 mm)	802.11a (Ant. 2)	0.709	1.074	1.783	114.52	0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1750 antenna operating at maximum output power with 2.4 GHz WIFI Antenna 1

Table 11-67
Peak SAR Locations for Body Back Side at 20 mm UMTS 1750 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 20 mm)	-18.55	74.99
802.11b (Ant. 1)	-30.00	-72.00

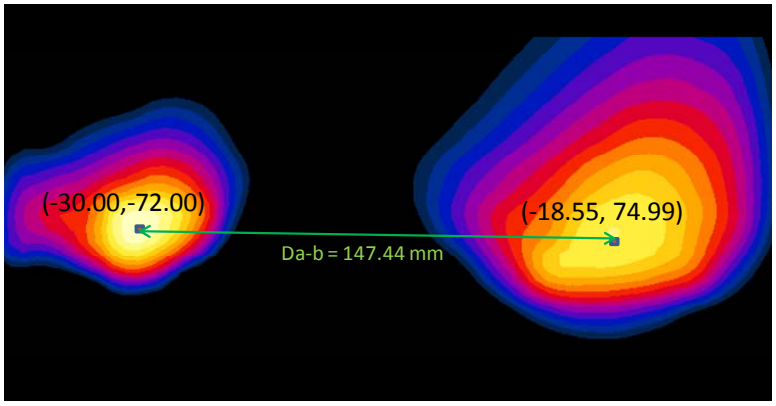


Figure 11-27
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and UMTS 1750 at 20 mm

Table 11-68
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 (at 20 mm)	802.11b (Ant. 1)	0.782	<1.037	<1.819	147.44	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1900 antenna operating at maximum output power with 2.4 GHz WIFI Antenna 1.

Table 11-69
Peak SAR Locations for Body Back Side at 20 mm UMTS 1900 and 2.4 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 20 mm)	-14.00	76.50
802.11b (Ant. 1)	-30.00	-72.00

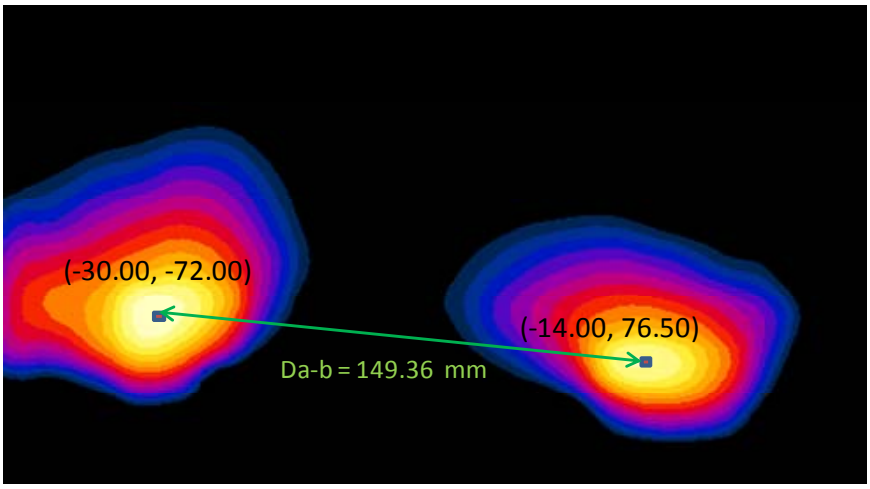


Figure 11-28
Peak SAR Locations of 2.4 GHz WLAN Ant. 1 and UMTS 1900 at 20 mm

Table 11-70
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 (at 20 mm)	802.11b (Ant. 1)	0.786	<1.037	<1.823	149.36	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1750 antenna operating at maximum output power with 2.4 GHz WIFI Antenna 2.

Table 11-71
Peak SAR Locations for Body Back Side at 20 mm UMTS 1750 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 20 mm)	-18.55	74.99
802.11b (Ant. 2)	-28.00	-41.00

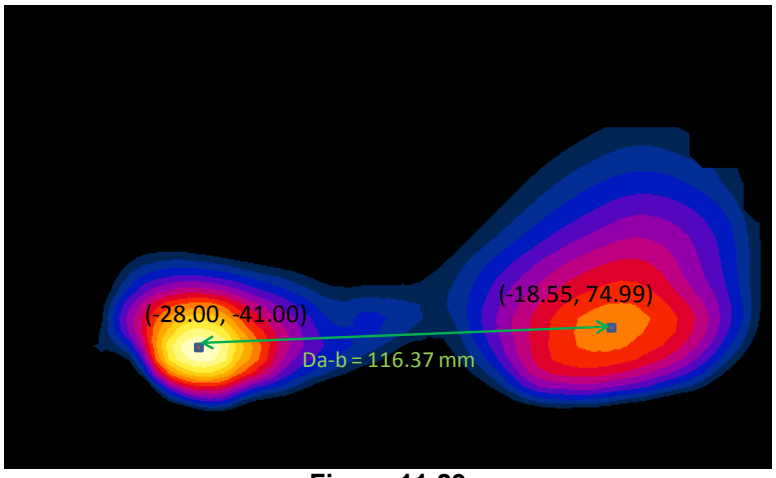


Figure 11-29
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and UMTS 1750 at 20 mm

Table 11-72
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 (at 20 mm)	802.11b (Ant. 2)	0.782	<1.087	<1.869	116.37	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1900 antenna operating at maximum output power with 2.4 GHz WIFI Antenna 2.

Table 11-73
Peak SAR Locations for Body Back Side at 20 mm UMTS 1900 and 2.4 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 20 mm)	-14.00	76.50
802.11b (Ant. 2)	-28.00	-41.00

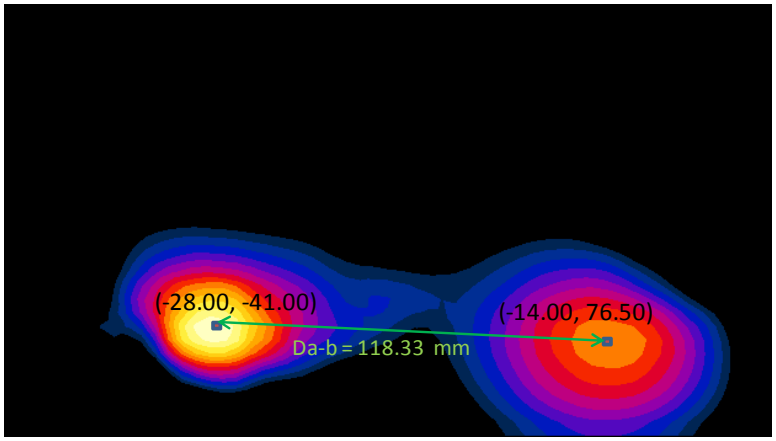


Figure 11-30
Peak SAR Locations of 2.4 GHz WLAN Ant. 2 and UMTS 1900 at 20 mm

Table 11-74
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 (at 20 mm)	802.11b (Ant. 2)	0.786	<1.087	<1.873	118.33	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1750 antenna operating at maximum output power with 5 GHz WIFI Antenna 1.

Table 11-75
Peak SAR Locations for Body Back Side at 20 mm UMTS 1750 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 20 mm)	-18.55	74.99
802.11a (Ant. 1)	-25.02	-68.00

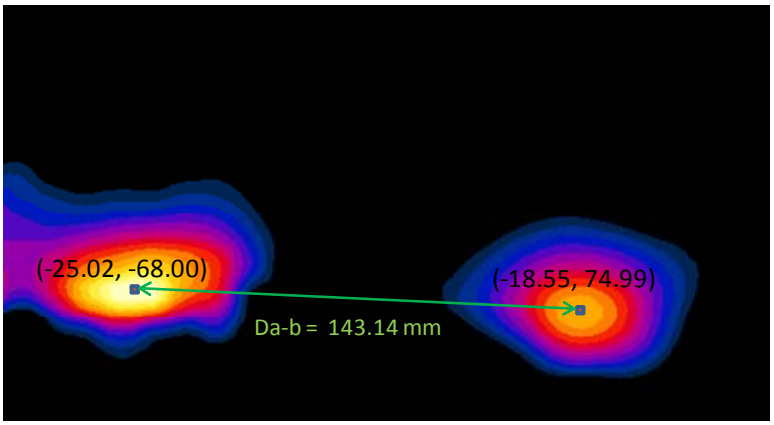


Figure 11-31
Peak SAR Locations of 5 GHz WLAN Ant. 1 and UMTS 1750 at 20 mm

Table 11-76
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 (at 20 mm)	802.11a (Ant. 1)	0.782	<0.885	<1.667	143.14	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1900 antenna operating at maximum output power with 5 GHz WIFI Antenna 1.

Table 11-77
Peak SAR Locations for Body Back Side at 20 mm UMTS 1900 and 5 GHz WLAN Ant. 1

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 20 mm)	-14.00	76.50
802.11a (Ant. 1)	-25.02	-68.00

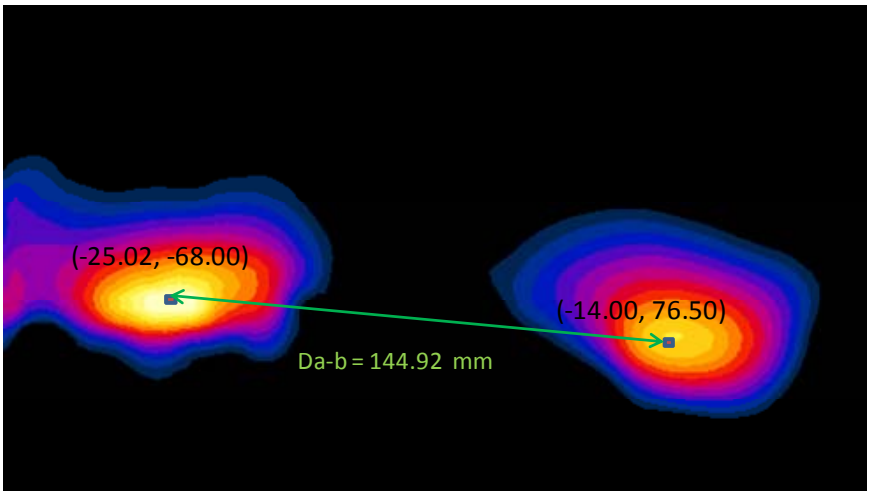


Figure 11-32
Peak SAR Locations of 5 GHz WLAN Ant. 1 and UMTS 1900 at 20 mm

Table 11-78
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 (at 20 mm)	802.11a (Ant. 1)	0.786	<0.885	<1.671	144.92	<0.01

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1750 antenna operating at maximum output power with 5 GHz WIFI Antenna 2.

Table 11-79
Peak SAR Locations for Body Back Side at 20 mm UMTS 1750 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1750 MHz (at 20 mm)	-18.55	74.99
802.11a (Ant. 2)	-25.03	-44.00

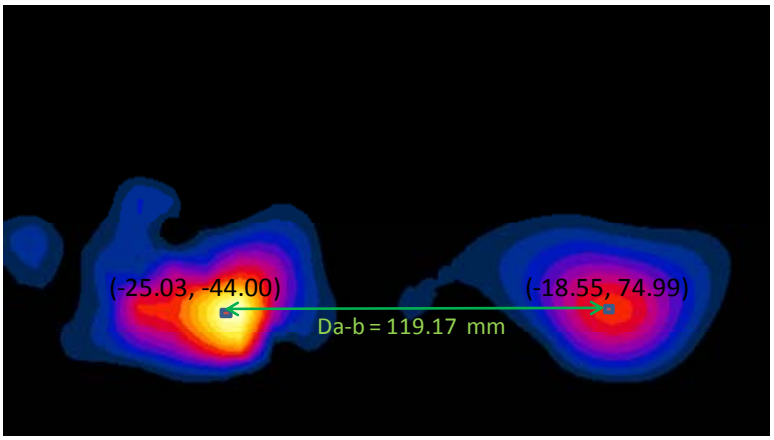


Figure 11-33
Peak SAR Locations of 5 GHz WLAN Ant. 2 and UMTS 1750 at 20 mm

Table 11-80
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 (at 20 mm)	802.11a (Ant. 2)	0.782	<1.074	<1.856	119.17	<0.02

© 2014 PCTEST Engineering Laboratory, Inc.

The sum of the standalone SAR values was above 1.6 W/kg for the Body Back side configuration at a separation distance of 20 mm with UMTS 1900 antenna operating at maximum output power with 5 GHz WIFI Antenna 2.

Table 11-81
Peak SAR Locations for Body Back Side at 20 mm UMTS 1900 and 5 GHz WLAN Ant. 2

Mode/Band	x (mm)	y (mm)
UMTS 1900 MHz (at 20 mm)	-14.00	76.50
802.11a (Ant. 2)	-25.03	-44.00

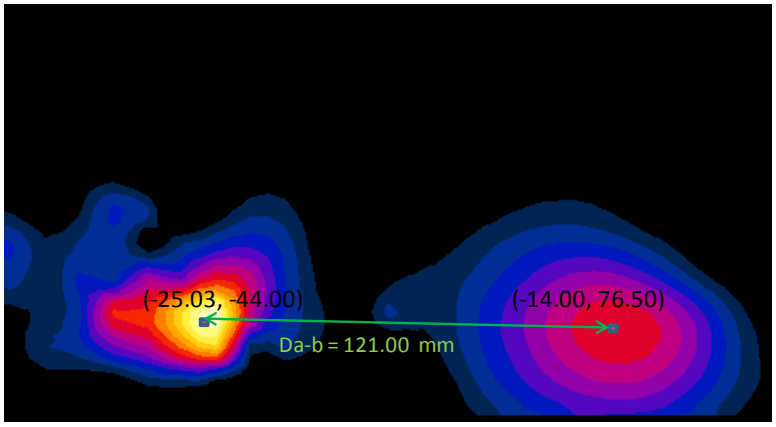


Figure 11-34
Peak SAR Locations of 5 GHz WLAN Ant. 2 and UMTS 1900 at 20 mm

Table 11-82
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 (at 20 mm)	802.11a (Ant. 2)	0.786	<1.074	<1.860	121.00	<0.02

11.5 Simultaneous Transmission Conclusion

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

© 2014 PCTEST Engineering Laboratory, Inc.

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	Antenna #	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)	
835	826.40	4132	UMTS 850	RMC	N/A	N/A	back	0 mm	0.840	0.781	1.08	N/A	N/A	N/A	N/A
2450	2437.00	6	IEEE 802.11b	DSSS	Antenna 2	1	back	0 mm	0.920	0.969	1.05	N/A	N/A	N/A	N/A
5800	5765.00	153	IEEE 802.11a	OFDM	Antenna 2	6	back	0 mm	0.933	0.871	1.07	N/A	N/A	N/A	N/A
5600	5660.00	132	IEEE 802.11a	OFDM	Antenna 2	6	back	0 mm	0.830	0.918	1.11	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.

© 2014 PCTEST Engineering Laboratory, Inc.

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/15/2014	Annual	4/15/2015	MY45470194
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/15/2014	Annual	4/15/2015	3629U00687
Agilent	E4438C	ESG Vector Signal Generator	3/31/2014	Annual	3/31/2015	MY42082659
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420800
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Anritsu	MA2481A	Power Sensor	10/30/2013	Annual	10/30/2014	5605
Anritsu	MA2411B	Pulse Power Sensor	11/14/2013	Annual	11/14/2014	1126066
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6200901190
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
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4353	Long Stem Thermometer	9/25/2012	Biennial	9/25/2014	122541143
Control Company	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	122014488
Fisher Scientific	15-077-960	Digital Thermometer	12/4/2013	Biennial	12/4/2015	130764558
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	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
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
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	6/6/2014	Annual	6/6/2015	109892
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/4/2013	Annual	10/4/2014	108798
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/4/2013	Biennial	10/4/2015	103962
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	NRVS	Single Channel Power Meter	10/31/2013	Annual	10/31/2014	835360/0079
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
SPEAG	D1750V2	1750 MHz SAR Dipole	4/10/2014	Annual	4/10/2015	1051
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2013	Annual	7/22/2014	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	4/9/2014	Annual	4/9/2015	5d141
SPEAG	D2450V2	2450 MHz SAR Dipole	1/21/2014	Annual	1/21/2015	797
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/23/2013	Annual	9/23/2014	1007
SPEAG	D750V3	750 MHz Dipole	2/27/2014	Annual	2/27/2015	1046
SPEAG	D835V2	835 MHz SAR Dipole	4/7/2014	Annual	4/7/2015	4d119
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/21/2013	Annual	8/21/2014	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/17/2014	Annual	3/17/2015	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	12/12/2013	Annual	12/12/2014	649
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/26/2014	Annual	2/26/2015	665
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/13/2013	Annual	11/13/2014	1091
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/6/2014	Annual	5/6/2015	1070
SPEAG	ES3DV2	SAR Probe	8/22/2013	Annual	8/22/2014	3022
SPEAG	ES3DV3	SAR Probe	11/20/2013	Annual	11/20/2014	3287
SPEAG	EX3DV4	SAR Probe	12/18/2013	Annual	12/18/2014	3920
SPEAG	ES3DV3	SAR Probe	2/25/2014	Annual	2/25/2015	3258
SPEAG	ES3DV3	SAR Probe	4/11/2014	Annual	4/11/2015	3213
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/16/2014	Annual	4/16/2015	B010177

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

All equipment was used within the respective calibration dates.

© 2014 PCTEST Engineering Laboratory, Inc.

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

© 2014 PCTEST Engineering Laboratory, Inc.

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

© 2014 PCTEST Engineering Laboratory, Inc.

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]

© 2014 PCTEST Engineering Laboratory, Inc.

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.

© 2014 PCTEST Engineering Laboratory, Inc.

[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.

© 2014 PCTEST Engineering Laboratory, Inc.

APPENDIX A: SAR TEST DATA

© 2014 PCTEST Engineering Laboratory, Inc.

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 3006-1

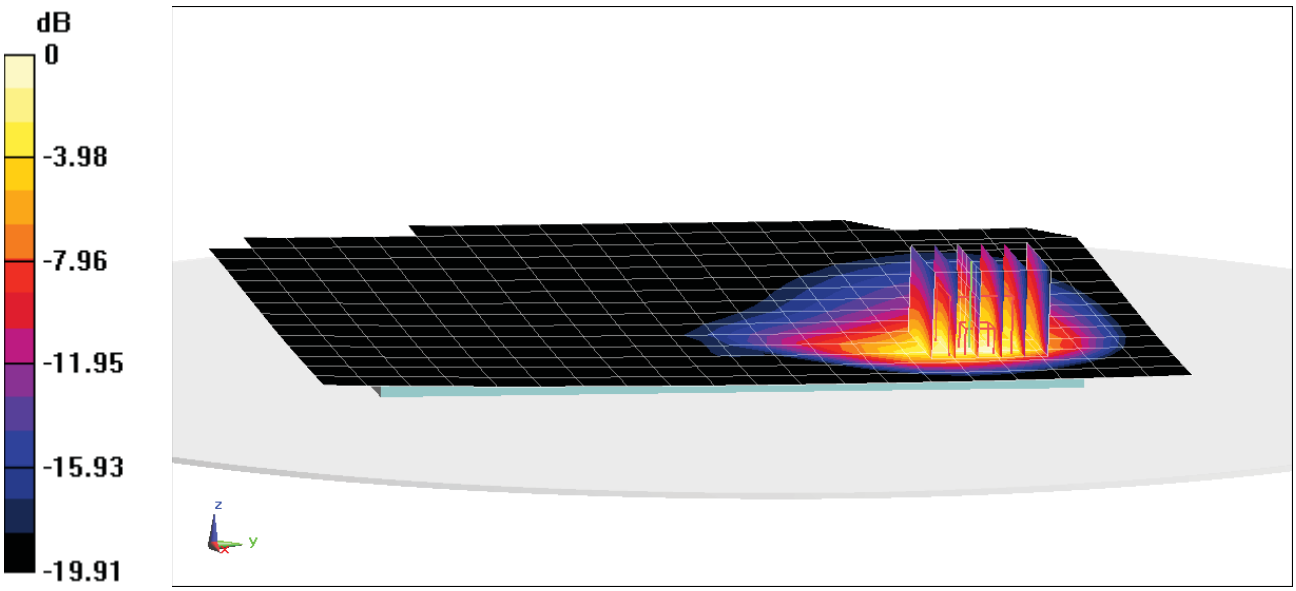
Communication System: UID 0, UMTS (0); Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 826.4 MHz; σ = 1.008 S/m; ε_r = 54.706; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-16-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(6.04, 6.04, 6.04); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

Area Scan (17x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.97 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.93 W/kg
SAR(1 g) = 0.840 W/kg



0 dB = 1.11 W/kg = 0.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 3007-3

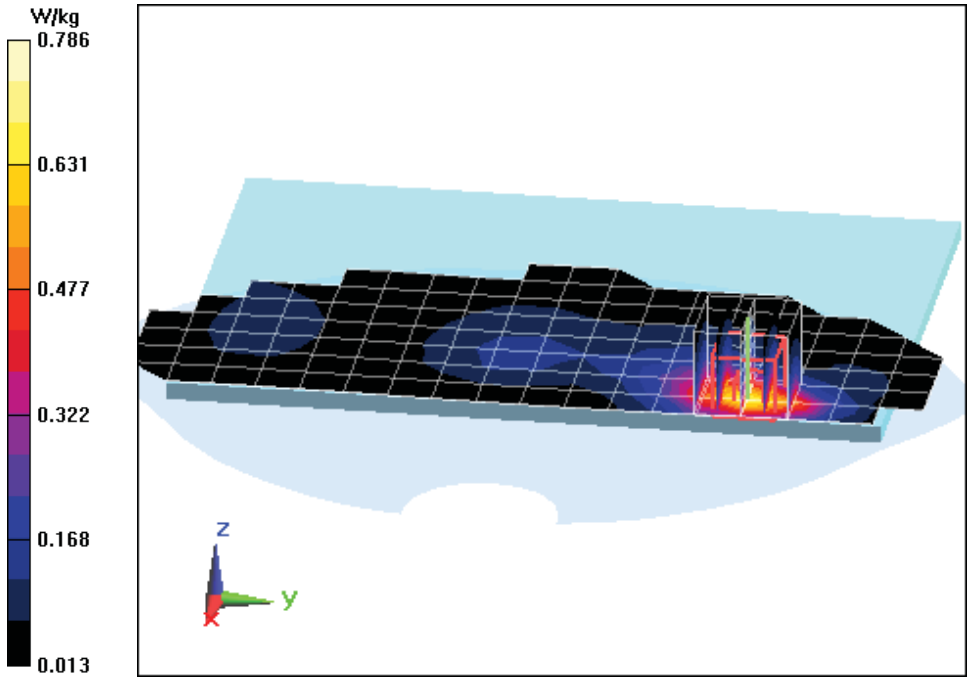
Communication System: UID 0, AWS UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.468 S/m; ε_r = 52.891; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 2.0 cm

Test Date: 07-30-2014; Ambient Temp: 18.9°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3213; ConvF(4.89, 4.89, 4.89); Calibrated: 4/11/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 3/17/2014
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.28 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.669 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 1606-3

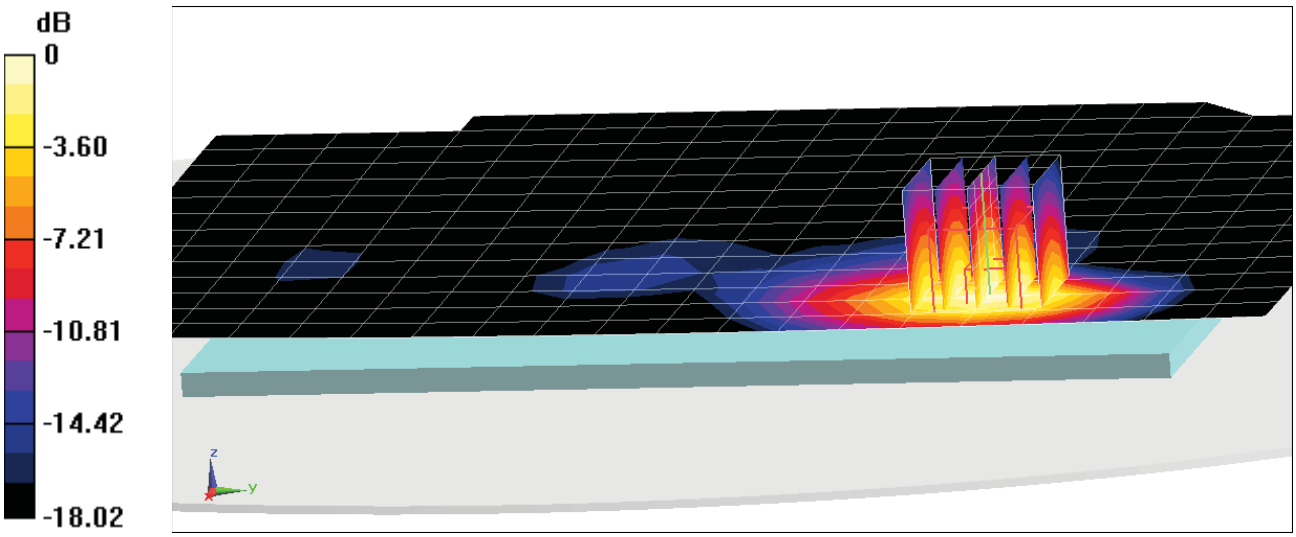
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.497 S/m; ε_r = 51.818; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 2.0 cm

Test Date: 07-14-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3287; ConvF(4.67, 4.67, 4.67); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

Area Scan (17x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.28 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.657 W/kg



0 dB = 0.785 W/kg = -1.05 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 3007-1

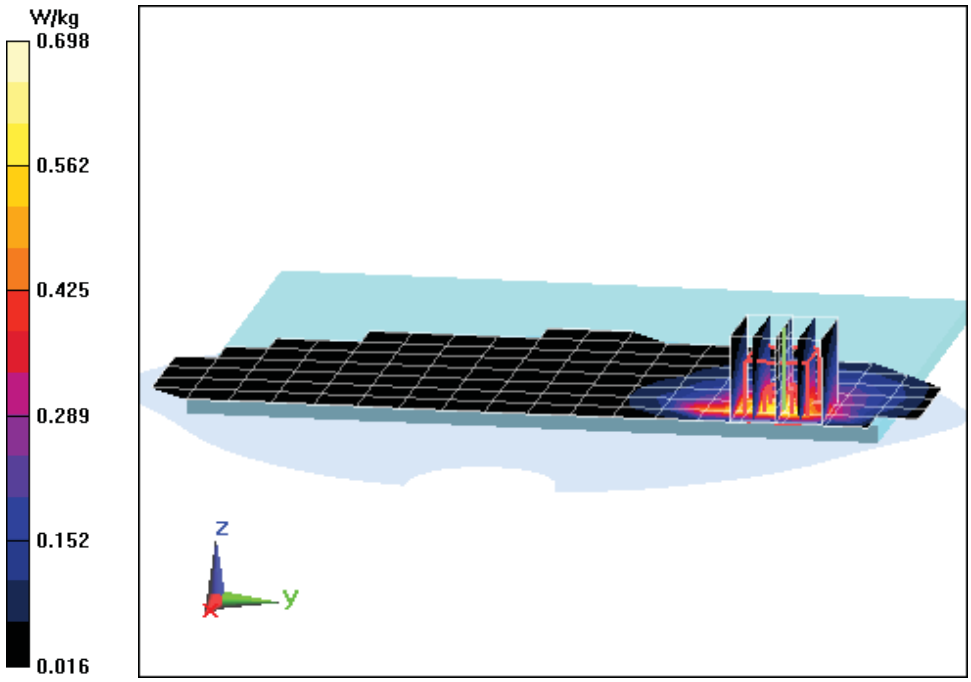
Communication System: UID 0, LTE RF; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 740 Body, Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.951 S/m; ε_r = 56.595; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 08-01-2014; Ambient Temp: 21.6°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.21, 6.21, 6.21); Calibrated: 4/11/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 3/17/2014
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (9x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.00 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.575 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 1606-2

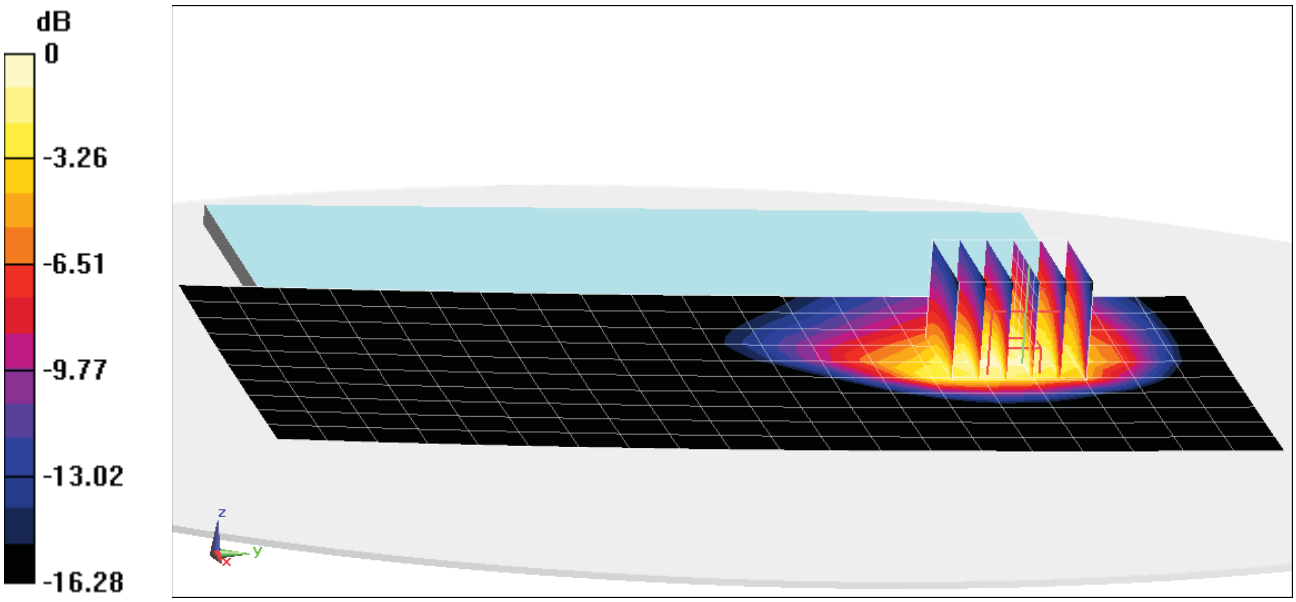
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.018 S/m; ε_r = 54.602; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-16-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(6.04, 6.04, 6.04); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell.), Body SAR, Back Side, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (11x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 0.743 W/kg



0 dB = 0.841 W/kg = -0.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 3006-1

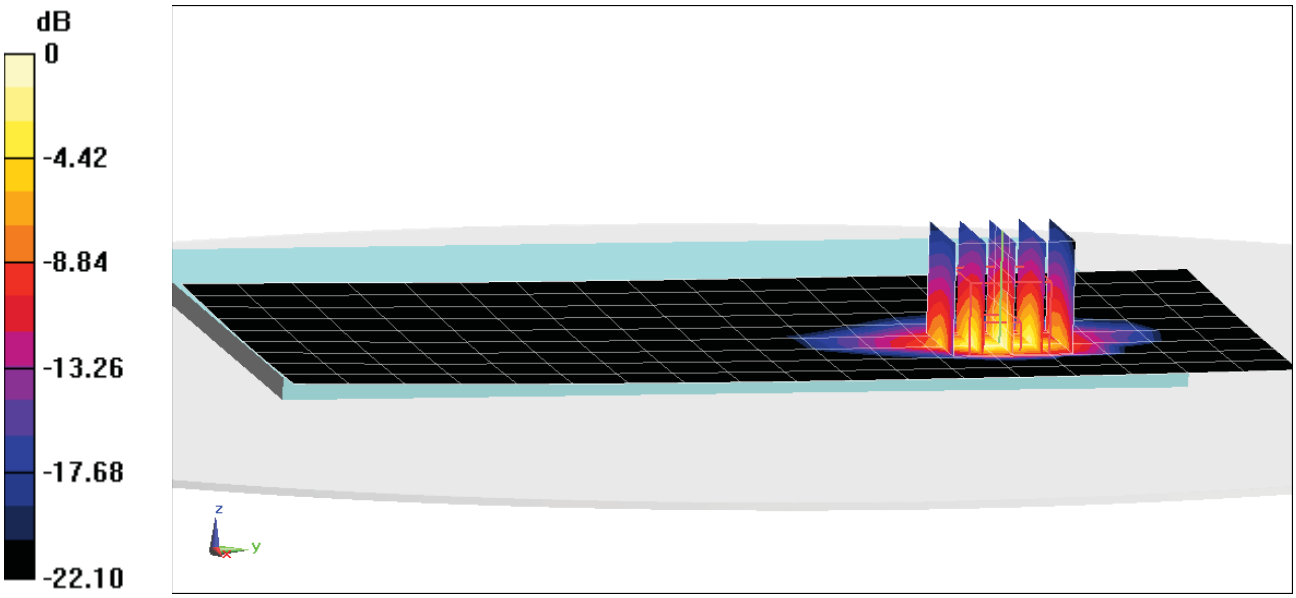
Communication System: UID 0, LTE Band 4 (AWS) (0); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.429 S/m; ε_r = 52.157; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-20-2014; Ambient Temp: 23.7°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.93, 4.93, 4.93); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

Area Scan (10x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.08 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.664 W/kg



0 dB = 0.932 W/kg = -0.31 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 1606-2

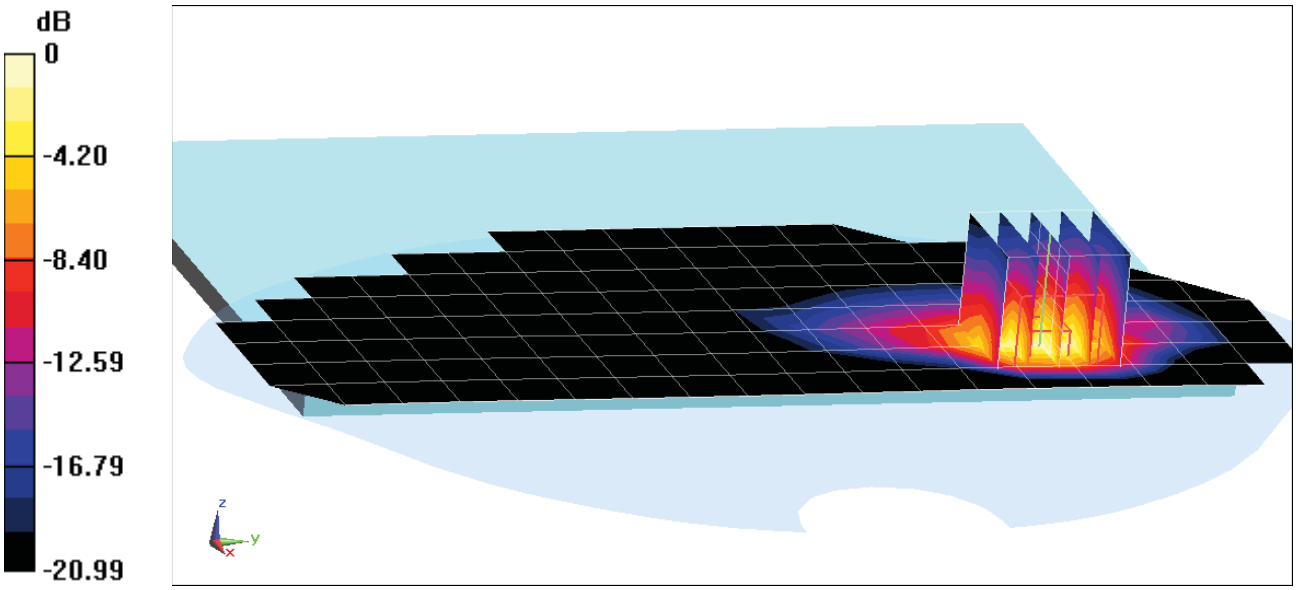
Communication System: UID 0, LTE Band 2 (PCS) (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.505 S/m; ε_r = 51.923; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-18-2014; Ambient Temp: 25.0°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 3mm (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 (8);SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Body SAR, Back side, High.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x21x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.79 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.647 W/kg



0 dB = 0.814 W/kg = -0.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 1606-5

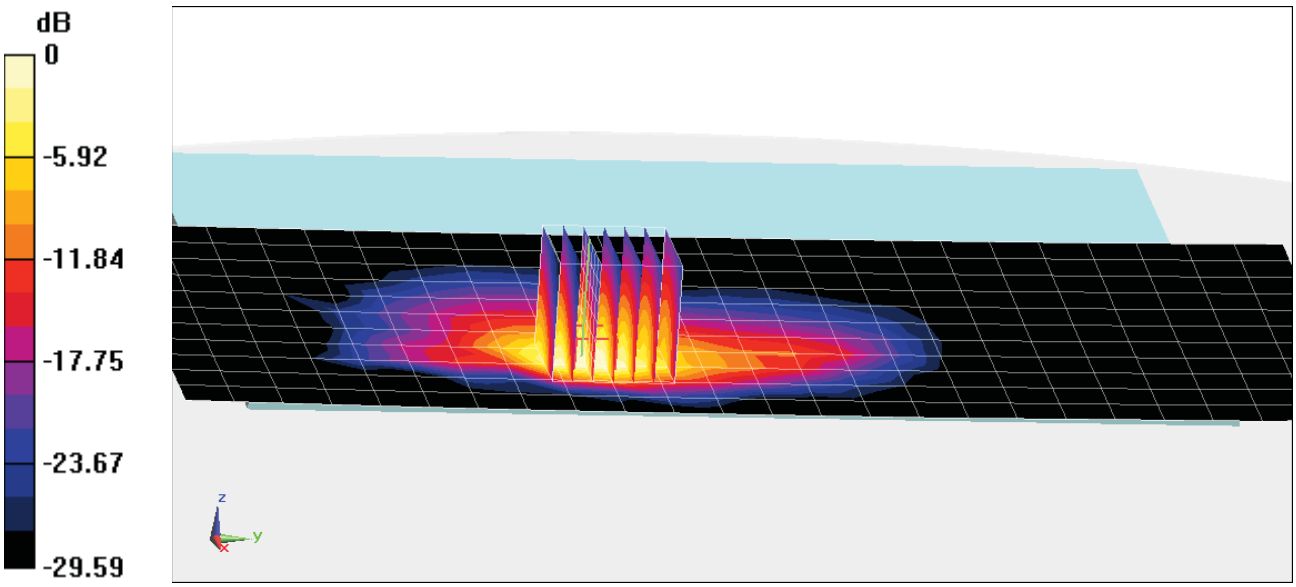
Communication System: UID 0, IEEE 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.006 S/m; ε_r = 51.162; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-17-2014; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b - Ant. 2, Body SAR, Ch 06, 1 Mbps, Back Side

Area Scan (12x25x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.87 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 0.969 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 0307-1

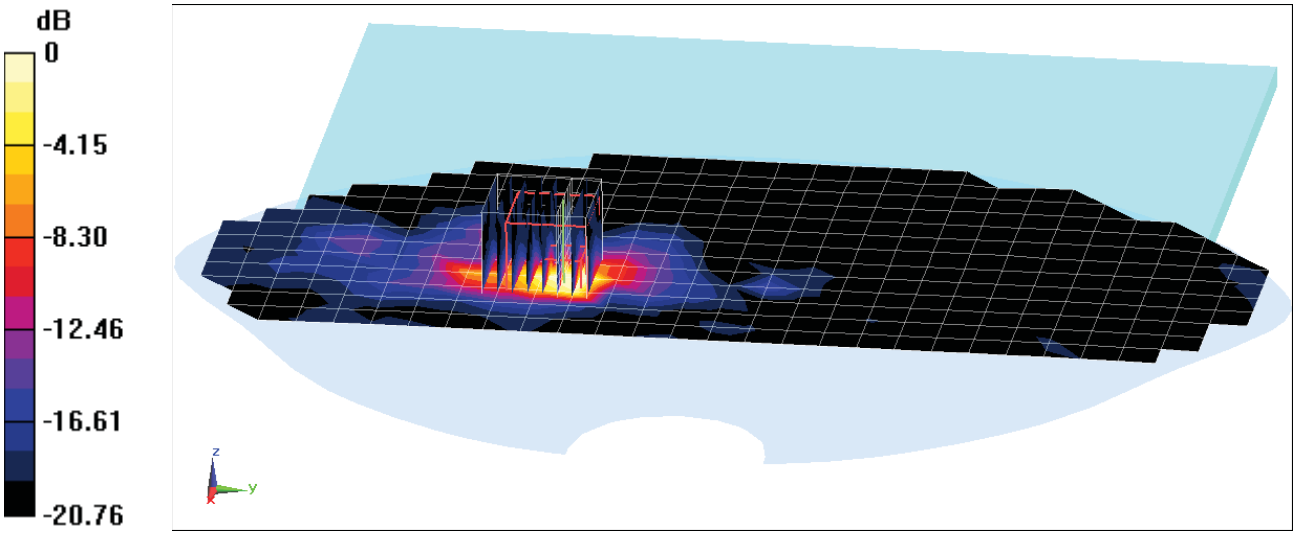
Communication System: UID 0, IEEE 802.11a (0); Frequency: 5765 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5765 MHz; σ = 6.152 S/m; ε_r = 46.416; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.9°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 (7331)

Mode: IEEE 802.11a - Ant. 2, 5.8 GHz, Body SAR, Back Side, Ch 153, 6 Mbps

Area Scan (16x31x1): 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 = 9.299 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 14.4 W/kg
SAR(1 g) = 0.933 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT807T; Type: Portable Tablet; Serial: 0307-1

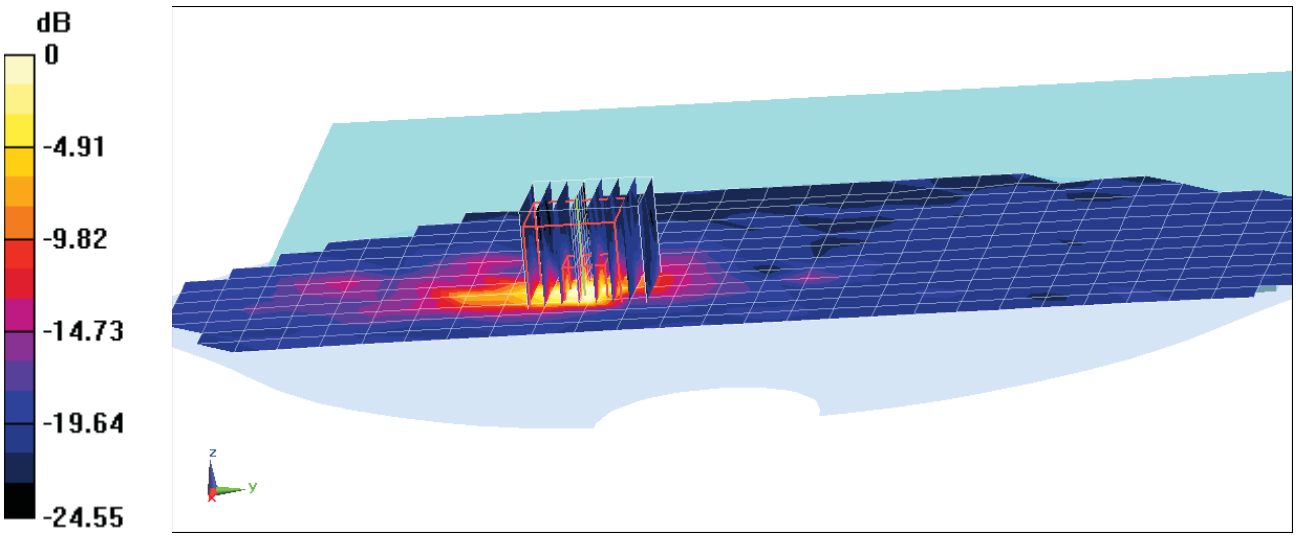
Communication System: UID 0, IEEE 802.11a (0); Frequency: 5660 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5660 MHz; σ = 6.02 S/m; ε_r = 46.633; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.8°C; Tissue Temp: 21.8°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 (7331)

Mode: IEEE 802.11a - Ant. 2, 5.5-5.7 GHz, Body SAR, Back Side, Ch 132, 6 Mbps

Area Scan (16x31x1): 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 = 14.53 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 9.48 W/kg
SAR(1 g) = 0.918 W/kg



0 dB = 2.82 W/kg = 4.50 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

© 2014 PCTEST Engineering Laboratory, Inc.

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

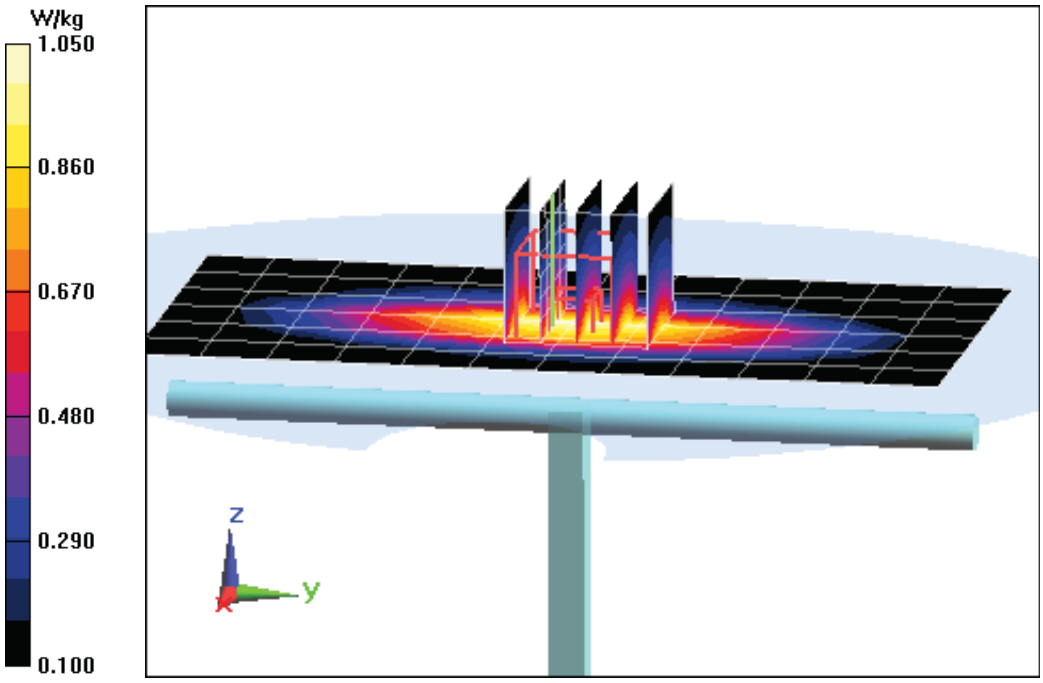
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 740 Body, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.991 S/m; ε_r = 56.225; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-01-2014; Ambient Temp: 21.6°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3213; ConvF(6.21, 6.21, 6.21); Calibrated: 4/11/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 3/17/2014
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7331)

750MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.906 W/kg
Deviation = 6.09%



PCTEST ENGINEERING LABORATORY, INC.

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

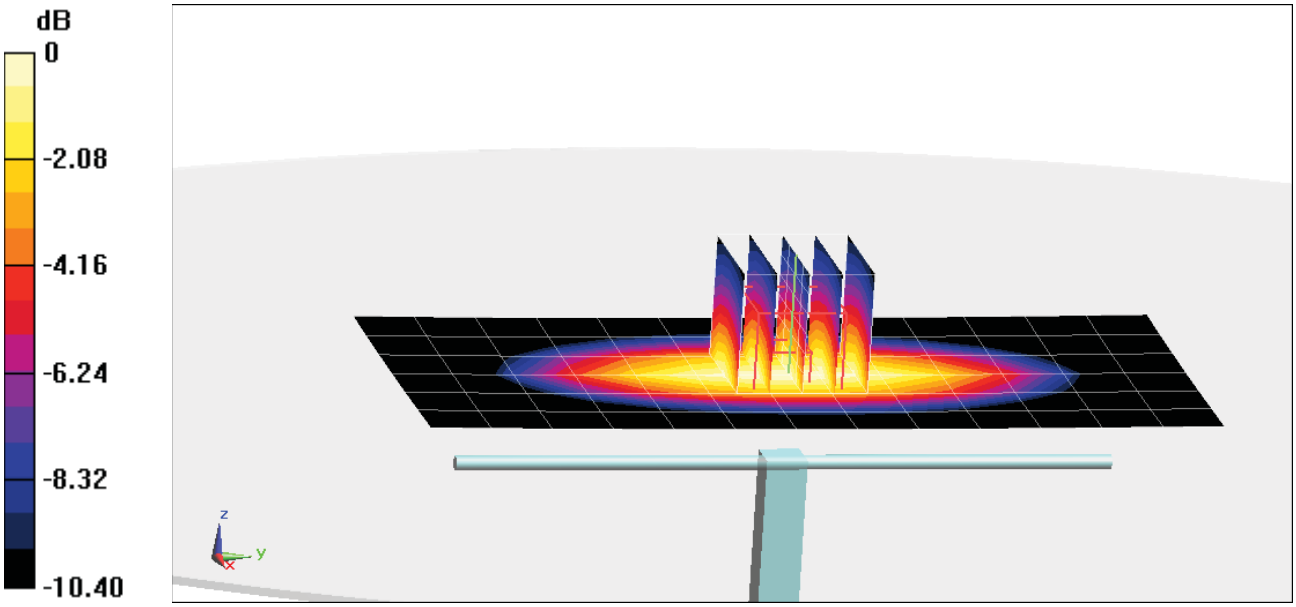
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.017 S/m; ε_r = 54.617; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-16-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(6.04, 6.04, 6.04); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.935 W/kg
Deviation = 0.11%



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

PCTEST ENGINEERING LABORATORY, INC.

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

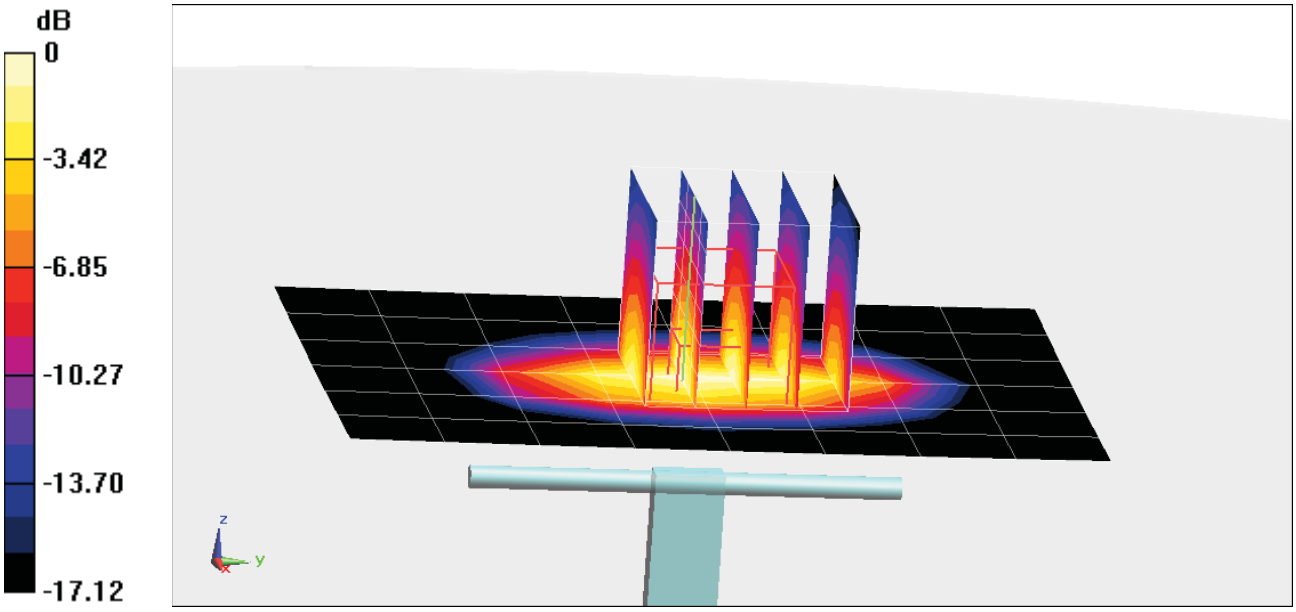
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.449 S/m; ε_r = 52.082; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-20-2014; Ambient Temp: 23.7°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.93, 4.93, 4.93); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.51 W/kg
SAR(1 g) = 3.75 W/kg
Deviation = 0.27%



0 dB = 4.62 W/kg = 6.65 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

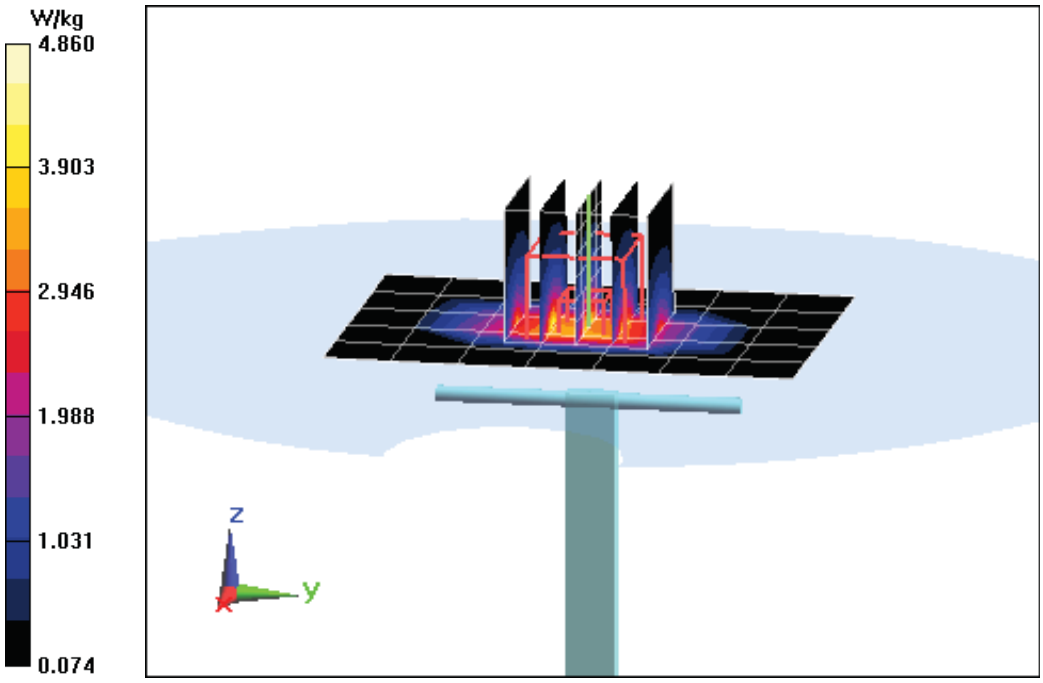
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.487 S/m; ε_r = 52.816; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-30-2014; Ambient Temp: 18.9°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3213; ConvF(4.89, 4.89, 4.89); Calibrated: 4/11/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 3/17/2014
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.83 W/kg
SAR(1 g) = 3.83 W/kg
Deviation = 2.41%



PCTEST ENGINEERING LABORATORY, INC.

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

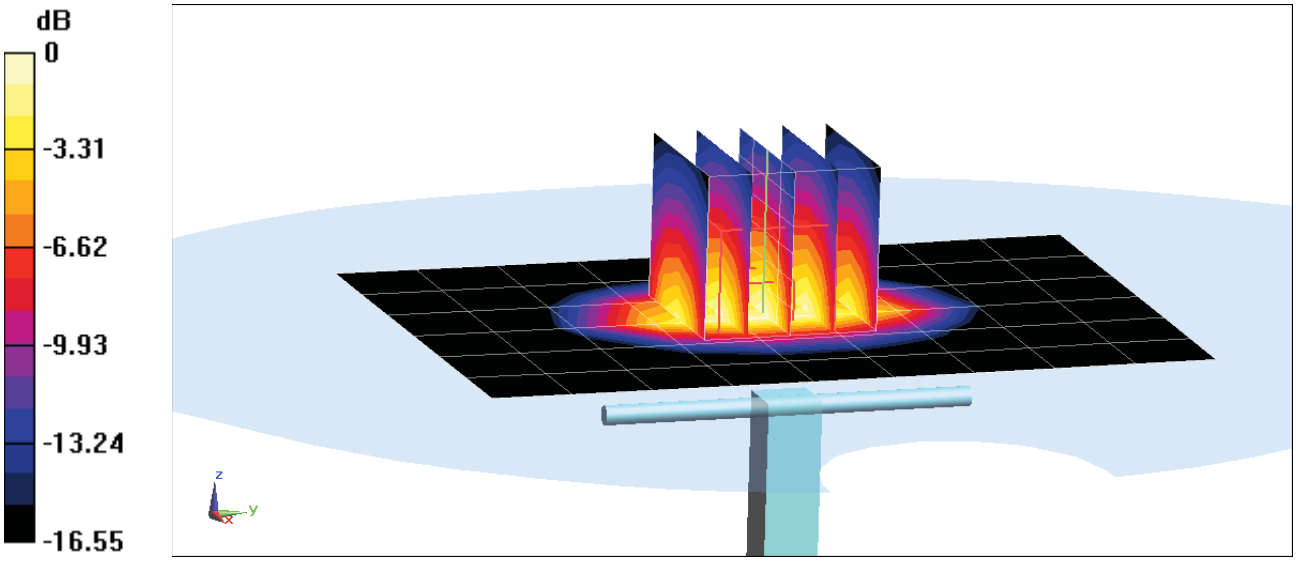
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.505 S/m; ε_r = 51.923; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-18-2014; Ambient Temp: 25.0°C; Tissue Temp: 23.0°C

Probe: ES3DV2 - SN3022; ConvF(4.49, 4.49, 4.49); Calibrated: 8/22/2013;
Sensor-Surface: 3mm (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 (8);SEMCAD X Version 14.6.10 (7331)

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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.03 W/kg
SAR(1 g) = 4.11 W/kg
Deviation = 1.48%



0 dB = 5.17 W/kg = 7.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

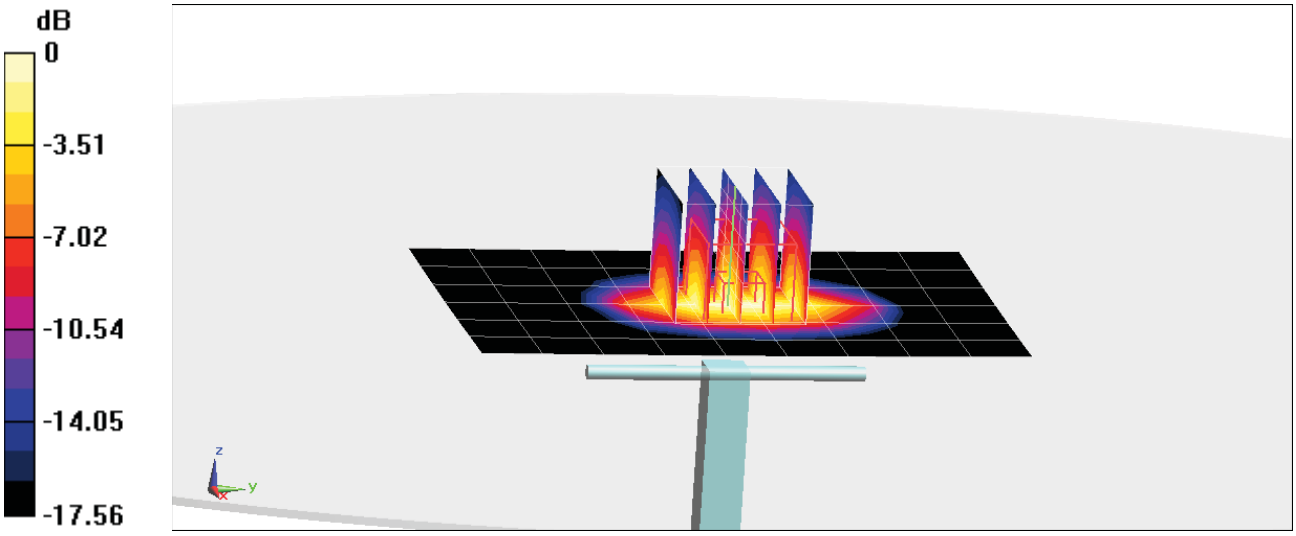
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.519 S/m; ε_r = 51.759; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-14-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3287; ConvF(4.67, 4.67, 4.67); Calibrated: 11/20/2013;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.31 W/kg
SAR(1 g) = 4.15 W/kg
Deviation = 2.22%



0 dB = 5.17 W/kg = 7.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

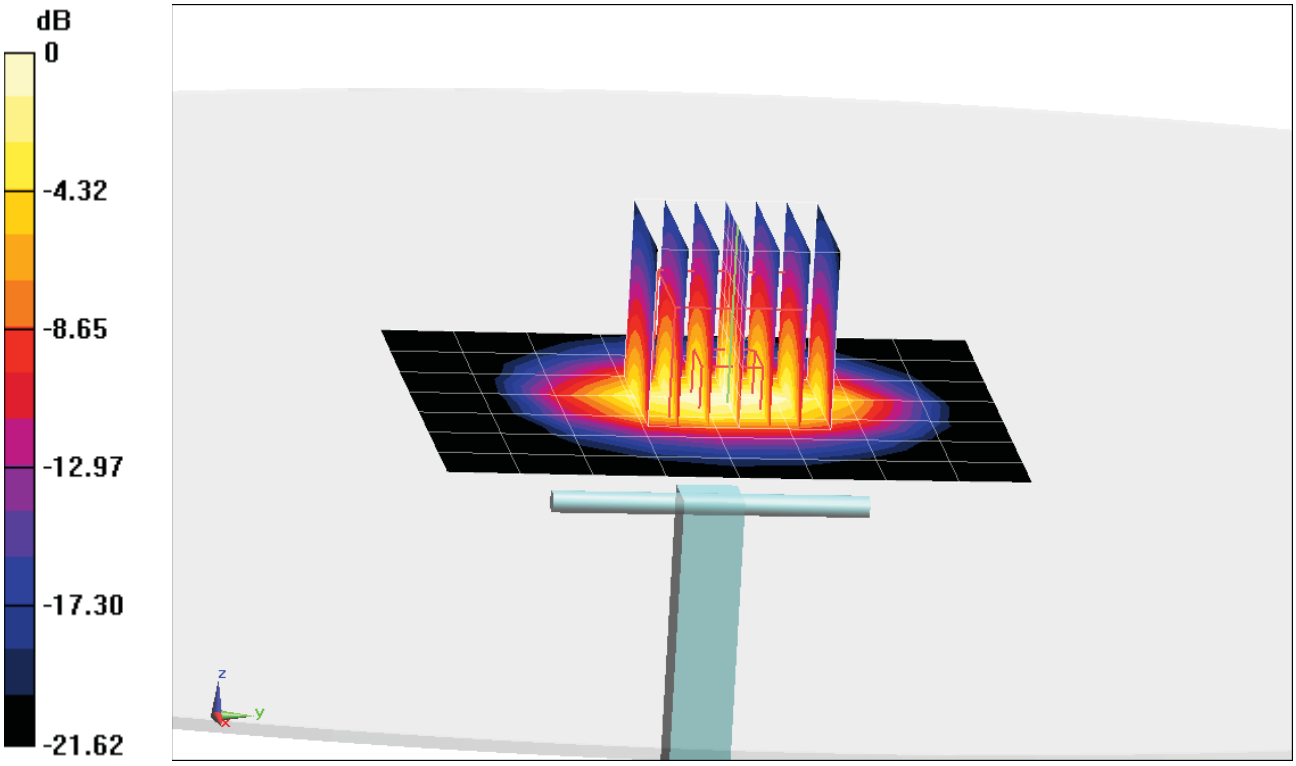
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.024 S/m; ε_r = 51.126; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-17-2014; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.0 W/kg
SAR(1 g) = 5.26 W/kg
Deviation = 6.48%



PCTEST ENGINEERING LABORATORY, INC.

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

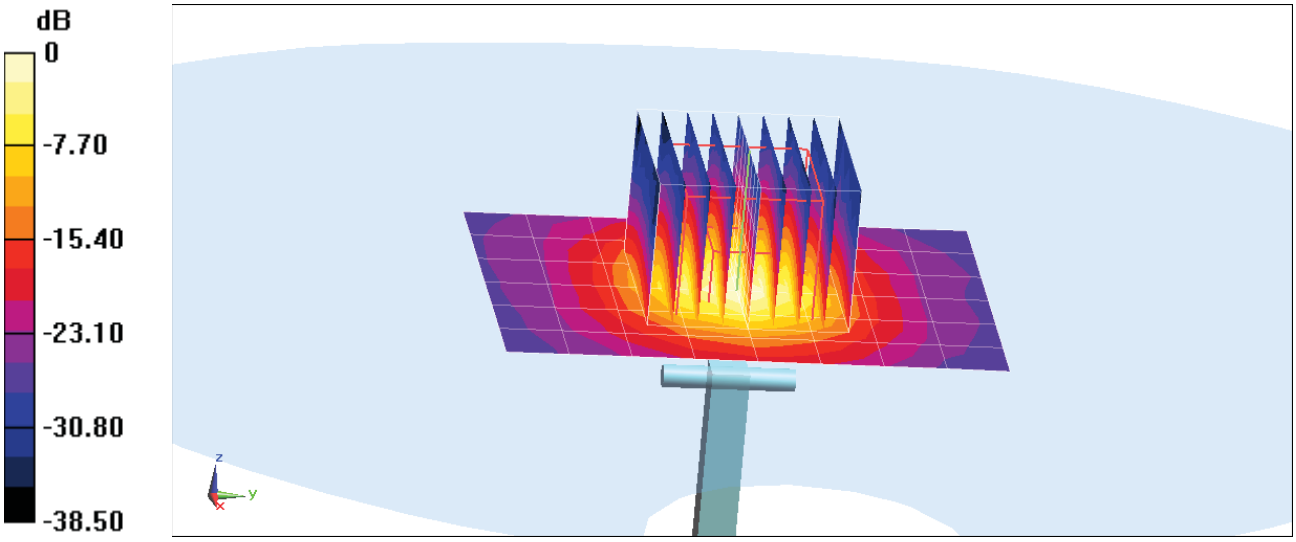
Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5200 MHz; σ = 5.358 S/m; ε_r = 47.305; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.9°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 (7331)

5200MHz 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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 7.39 W/kg
Deviation = 1.79%



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

PCTEST ENGINEERING LABORATORY, INC.

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

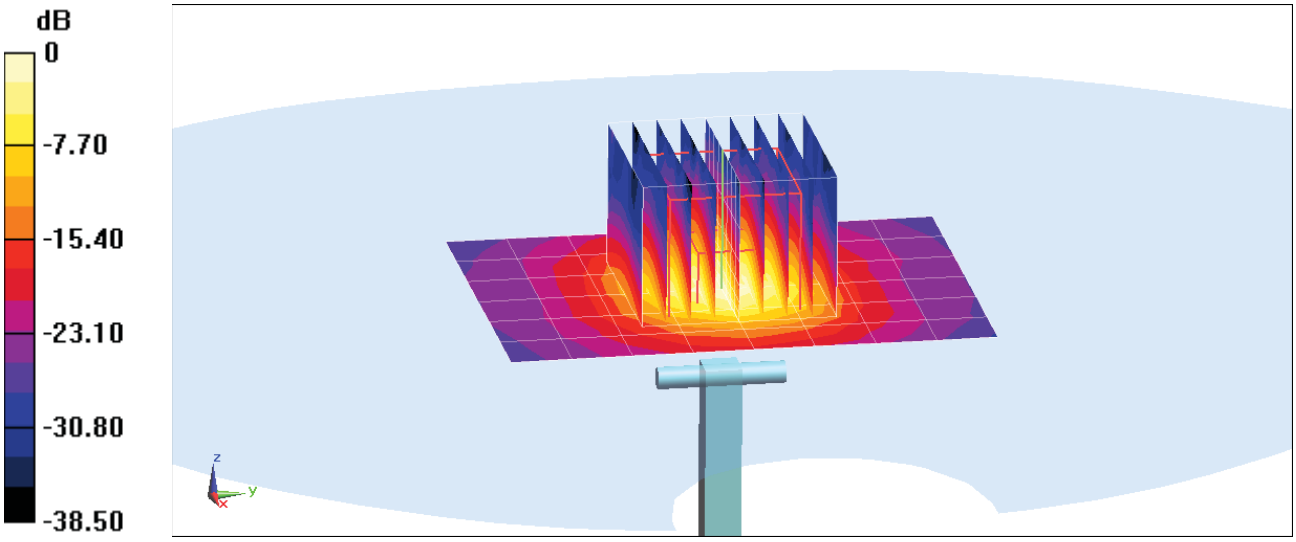
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5300 MHz; σ = 5.505 S/m; ε_r = 47.133; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.9°C; Tissue Temp: 21.9°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 (7331)

5300MHz 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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.5 W/kg
SAR(1 g) = 7.59 W/kg
Deviation = 1.61%



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

PCTEST ENGINEERING LABORATORY, INC.

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

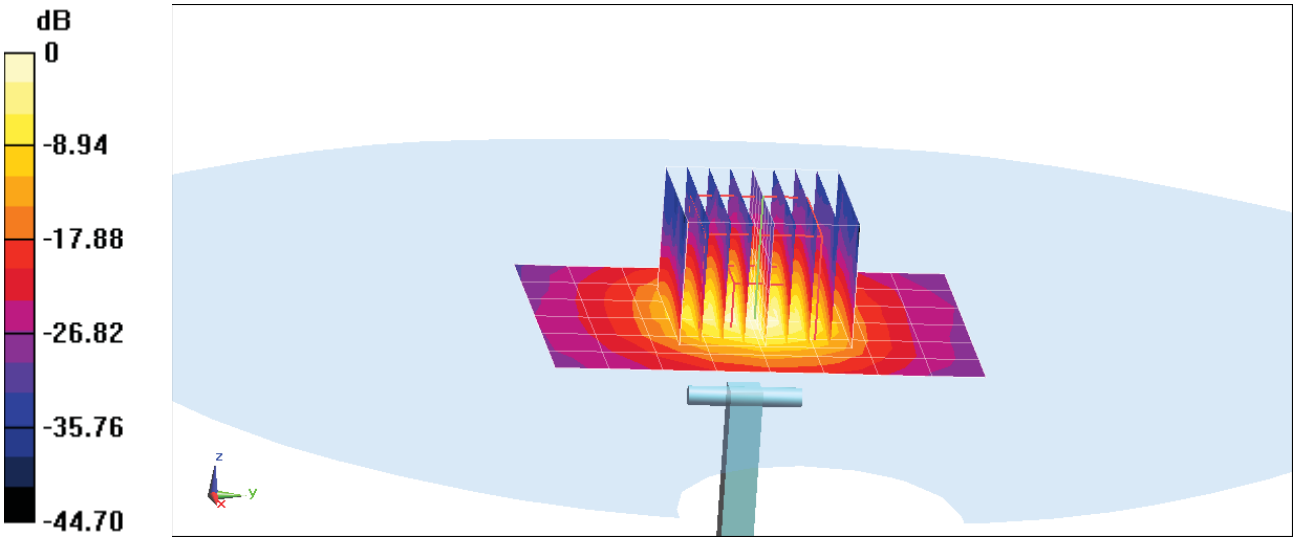
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5500 MHz; σ = 5.799 S/m; ε_r = 46.887; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.8°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 (7331)

5500MHz 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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 35.2 W/kg
SAR(1 g) = 7.88 W/kg
Deviation = 3.82%



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

PCTEST ENGINEERING LABORATORY, INC.

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

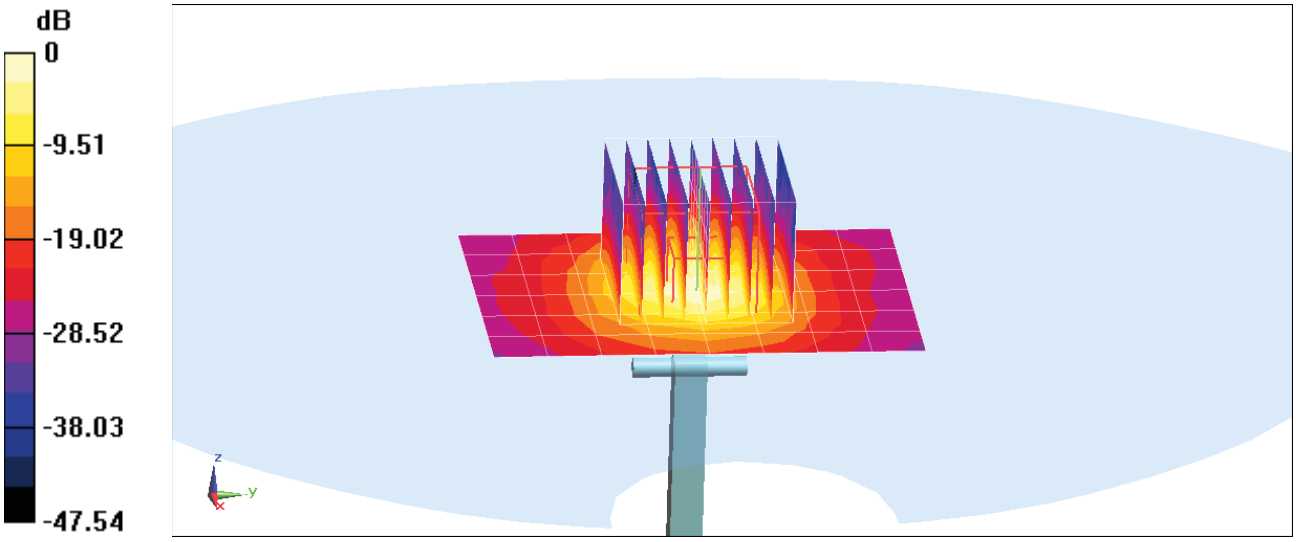
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.953 S/m; ε_r = 46.751; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.8°C; Tissue Temp: 21.8°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 (7331)

5600MHz 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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.9 W/kg
SAR(1 g) = 7.84 W/kg
Deviation = 1.42%



0 dB = 20.1 W/kg = 13.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

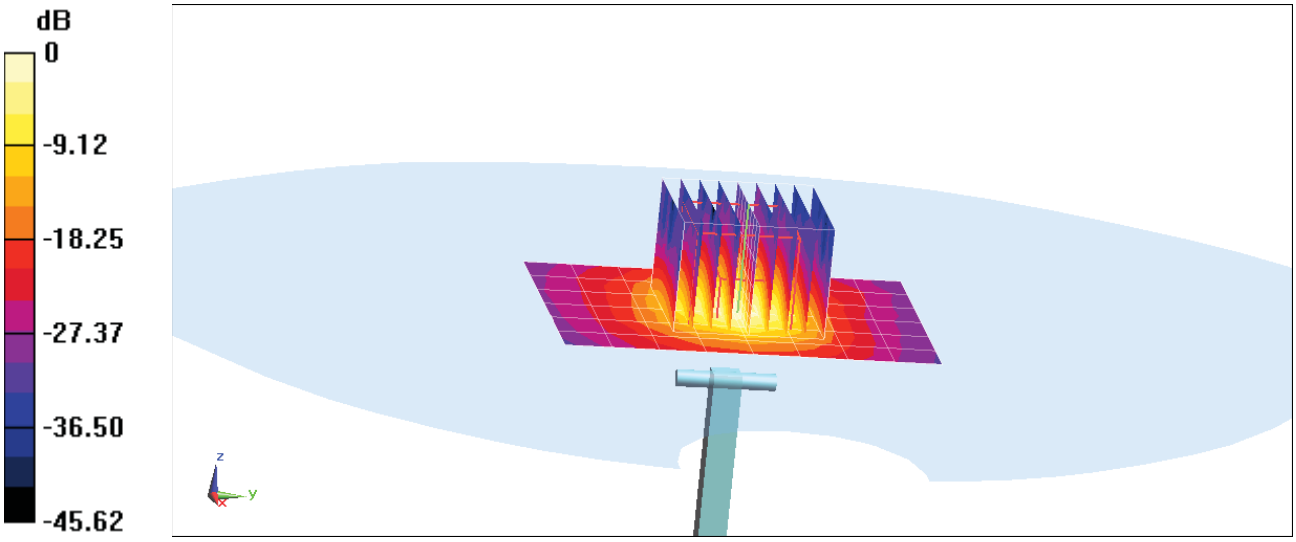
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5800 MHz; σ = 6.188 S/m; ε_r = 46.321; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2014; Ambient Temp: 23.9°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 (7331)

5800MHz 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
Power Input = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.4 W/kg
SAR(1 g) = 7.54 W/kg
Deviation = 3.43%



0 dB = 20.2 W/kg = 13.05 dBW/kg