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SAR EVALUATION REPORT

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
03/16/15 - 03/24/15
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1503160581-R1.ZNF

FCC ID:	**ZNFUK495**
APPLICANT:	**LG ELECTRONICS MOBILECOMM U.S.A., INC.**

DUT Type:	Portable Tablet
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093
Model(s):	LG-UK495, LGUK495, UK495, LG-AK495, LGAK495, AK495

Equipment Class	Band & Mode	Tx Frequency	SAR 1 gm Body (W/kg)
PCB	LTE Band 12	699.7 - 715.3 MHz	0.77
PCB	LTE Band 13	779.5 - 784.5 MHz	0.62
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.60
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.64
PCB	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.73
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.65
NII	5.2 GHz WLAN	5180 - 5240 MHz	0.22
NII	5.3 GHz WLAN	5260 - 5320 MHz	0.21
NII	5.5 GHz WLAN	5500 - 5700 MHz	0.21
NII	5.8 GHz WLAN	5745 - 5825 MHz	0.16
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.42

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.

Note: This revised Test Report (S/N: 0Y1503160581-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

The SAR Tick is an initiative of the Mobile Manufacturers Forum (MMF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MMF. Further details can be obtained by emailing: sartick@mmfai.info.

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
LTE Band 12	Data	699.7 - 715.3 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 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
5.8 GHz WLAN	Data	5745 - 5825 MHz
Bluetooth	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 LTE data modes and is only applicable for tablet operations. The activated sensor does not apply to the WLAN/Bluetooth antenna.

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

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05.

Main Antenna Maximum Power

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 13	Maximum	**24.2**
	Nominal	**23.7**
LTE Band 17	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 5 (Cell)	Maximum	**24.2**
	Nominal	**23.7**
LTE Band 4 (AWS)	Maximum	**24.2**
	Nominal	**23.7**
LTE Band 25 (PCS)	Maximum	**23.7**
	Nominal	**23.2**
LTE Band 2 (PCS)	Maximum	**23.7**
	Nominal	**23.2**

Main Antenna Reduced Power – Body at 0.0 mm

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**20.7**
	Nominal	**20.2**
LTE Band 13	Maximum	**20.2**
	Nominal	**19.7**
LTE Band 17	Maximum	**20.7**
	Nominal	**20.2**
LTE Band 5 (Cell)	Maximum	**20.2**
	Nominal	**19.7**
LTE Band 4 (AWS)	Maximum	**13.2**
	Nominal	**12.7**
LTE Band 25 (PCS)	Maximum	**12.7**
	Nominal	**12.2**
LTE Band 2 (PCS)	Maximum	**12.7**
	Nominal	**12.2**

WLAN/BT Antenna

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**13.0**
	Nominal	**12.0**
IEEE 802.11g (2.4 GHz)	Maximum	**11.0**
	Nominal	**10.0**
IEEE 802.11n (2.4 GHz)	Maximum	**10.0**
	Nominal	**9.0**
IEEE 802.11a (5 GHz)	Maximum	**10.0**
	Nominal	**9.0**
IEEE 802.11n (5 GHz) 40 MHz	Maximum	**8.0**
	Nominal	**7.0**
IEEE 802.11n (5 GHz) 20 MHz	Maximum	**9.0**
	Nominal	**8.0**
Bluetooth	Maximum	**9.5**
	Nominal	**8.5**
Bluetooth LE	Maximum	**0.5**
	Nominal	**-0.5**

1.4 DUT Antenna Locations

The overall diagonal dimension of the device is > 200 mm. A diagram showing the locations of the device antennas can be found in Appendix F: Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC filing.

Table 1-1
Sides for SAR Testing

Mode	Back	Top	Bottom	Right	Left
LTE Band 12	Yes	Yes	No	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes
2.4 GHz WLAN	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	No	No	Yes
Bluetooth	Yes	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.

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 1-1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

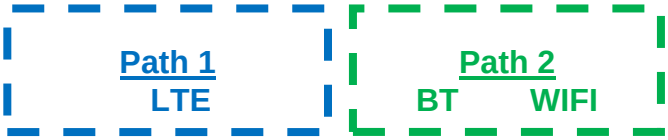

Figure 1-1
Simultaneous Transmission Paths

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.

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

Table 1-2
Simultaneous Transmission Scenarios

1. 2.4 GHz WLAN, 5 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.

1.6 SAR Test Exclusions Applied

(A) WIFI/BT

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

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body Bluetooth SAR was not required; [(9/5)* √2.480] = 2.8 < 3.0. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

This device supports 20 MHz and 40 MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only.

(B) Licensed Transmitter(s)

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

This device additionally supports LTE Band 17. LTE Band 12 and LTE Band 17 share the same transmission path. LTE Band 17 was not evaluated for SAR since the supported frequency range falls within the LTE Band 12 supported frequency range and the Band 17 target power was equal to the Band 12 target power.

This device additionally supports LTE Band 2. LTE Band 25 and LTE Band 2 share the same transmission path. LTE Band 2 was not evaluated for SAR since the supported frequency range falls within the LTE Band 25 supported frequency range and the Band 2 target power was equal to the Band 25 target power.

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 required for testing since the data sent by uplink on uplink physical channels does not change between Rel 8 and Rel 10.

1.7 Guidance Applied

- FCC KDB Publication 941225 D01v03, D05v02r03, D05Av01r01 (4G)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r02 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r03, D02v01r01 (SAR Measurements up to 6 GHz)
  FCC KDB Publication 616217 D04v01r01 (Tablet SAR Considerations)

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.

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	Max Power Serial Number	Reduced Power Serial Number
LTE Band 12	1TA9E	1T4BJ
LTE Band 13	1TA9E	1T4BJ
LTE Band 5 (Cell)	1TA9E	1T4BJ
LTE Band 4 (AWS)	1TA9E	1T4BJ
LTE Band 25 (PCS)	1TA9E	1T4BJ
2.4 GHz WLAN	1TA9H	-
5 GHz WLAN	1TA9H	-

2 LTE INFORMATION

LTE Information			
FCC ID	**ZNFUK495**		
Form Factor	Portable Tablet		
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)		
	LTE Band 13 (779.5 - 784.5 MHz)		
	LTE Band 17 (706.5 - 713.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 25 (PCS) (1850.7 - 1914.3 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 13: 5 MHz, 10 MHz		
	LTE Band 17: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 25 (PCS): 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 13: 5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
LTE Band 13: 10 MHz	782 (23230)	782 (23230)	782 (23230)
LTE Band 17: 5 MHz	706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)	1732.5 (20175)	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	1732.5 (20175)	1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	1732.5 (20175)	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)	1732.5 (20175)	1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)	1732.5 (20175)	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)	1732.5 (20175)	1745 (20300)
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)	1882.5 (26365)	1914.3 (26683)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)	1882.5 (26365)	1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)	1882.5 (26365)	1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)	1882.5 (26365)	1910 (26640)
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)	1882.5 (26365)	1907.5 (26615)
LTE Band 25 (PCS): 20 MHz	1860 (26140)	1882.5 (26365)	1905 (26590)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)	1880 (18900)	1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)	1880 (18900)	1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)	1880 (18900)	1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)	1880 (18900)	1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)	1880 (18900)	1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)	1880 (18900)	1900 (19100)
UE Category	4		
Modulations Supported in UL	QPSK, 16QAM		
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES		
A-MPR (Additional MPR) disabled for SAR Testing?	YES		
LTE Carrier Aggregation Possible Combinations	LTE B4 (PCC) + LTE B12 (SCC)		
	5MHz (B4)+5MHz (B12)		
	5MHz (B4)+10MHz (B12)		
	10MHz (B4)+5MHz (B12)		
	10MHz (B4)+10MHz (B12)		
LTE Carrier Aggregation Additional Information	This device does not support full CA features on 3GPP Release 10. It supports a maximum of 2 carriers in the downlink . All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WIFI Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.		

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

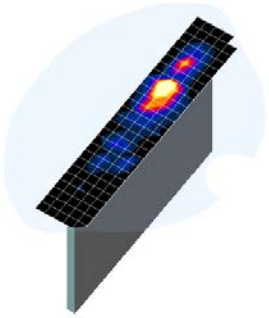

Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

5 SAR TESTING PROCEDURES

5.1 SAR Testing for Tablet per KDB Publication 616217 D04v01

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

5.2 Proximity Sensor Considerations

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

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

FCC KDB 616217 D04 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional exposure conditions. Since the sensor activation distance for the back side of the device is 23 mm, a conservative distance of 22 mm was tested for SAR on the back side at maximum power. Since the sensor activation distance for the top edge of the device is 20 mm, a conservative distance of 19 mm was tested for SAR on the top edge at maximum power. Since the sensor activation distance for the right edge of the device is 8 mm, a conservative distance of 7 mm was tested for SAR on the right 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.

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.

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 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).

7.3.1 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.

7.3.2 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.

7.3.3 A-MPR

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

7.3.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r01:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    i. The required channel and offset combination with the highest maximum output power is required for SAR.
    ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
    iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

7.3.5 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.

7.4 SAR Testing with 802.11 Transmitters

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

7.4.1 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.

7.4.2 Frequency Channel Configurations [24]

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

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

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

8 RF CONDUCTED POWERS

8.1 LTE Conducted Powers

8.1.1 LTE Band 12

Table 8-1
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	24.67	0	0
	707.5	23095	10	QPSK	1	25	24.61	0	0
	707.5	23095	10	QPSK	1	49	**24.70**	0	0
	707.5	23095	10	QPSK	25	0	23.39	0-1	1
	707.5	23095	10	QPSK	25	12	23.41	0-1	1
	707.5	23095	10	QPSK	25	25	**23.47**	0-1	1
	707.5	23095	10	QPSK	50	0	23.45	0-1	1
	707.5	23095	10	16QAM	1	0	23.30	0-1	1
	707.5	23095	10	16QAM	1	25	23.21	0-1	1
	707.5	23095	10	16QAM	1	49	23.41	0-1	1
	707.5	23095	10	16QAM	25	0	22.35	0-2	2
	707.5	23095	10	16QAM	25	12	22.36	0-2	2
	707.5	23095	10	16QAM	25	25	22.35	0-2	2
	707.5	23095	10	16QAM	50	0	22.31	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 8-2
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	24.38	0	0
	701.5	23035	5	QPSK	1	12	24.44	0	0
	701.5	23035	5	QPSK	1	24	24.46	0	0
	701.5	23035	5	QPSK	12	0	23.18	0-1	1
	701.5	23035	5	QPSK	12	6	23.23	0-1	1
	701.5	23035	5	QPSK	12	13	23.31	0-1	1
	701.5	23035	5	QPSK	25	0	23.28	0-1	1
	701.5	23035	5	16-QAM	1	0	23.28	0-1	1
	701.5	23035	5	16-QAM	1	12	23.27	0-1	1
	701.5	23035	5	16-QAM	1	24	23.34	0-1	1
	701.5	23035	5	16-QAM	12	0	22.08	0-2	2
	701.5	23035	5	16-QAM	12	6	22.13	0-2	2
	701.5	23035	5	16-QAM	12	13	22.16	0-2	2
	701.5	23035	5	16-QAM	25	0	22.15	0-2	2
Mid	707.5	23095	5	QPSK	1	0	24.48	0	0
	707.5	23095	5	QPSK	1	12	24.45	0	0
	707.5	23095	5	QPSK	1	24	24.56	0	0
	707.5	23095	5	QPSK	12	0	23.32	0-1	1
	707.5	23095	5	QPSK	12	6	23.15	0-1	1
	707.5	23095	5	QPSK	12	13	23.26	0-1	1
	707.5	23095	5	QPSK	25	0	23.26	0-1	1
	707.5	23095	5	16-QAM	1	0	23.23	0-1	1
	707.5	23095	5	16-QAM	1	12	23.12	0-1	1
	707.5	23095	5	16-QAM	1	24	23.24	0-1	1
	707.5	23095	5	16-QAM	12	0	22.21	0-2	2
	707.5	23095	5	16-QAM	12	6	22.15	0-2	2
	707.5	23095	5	16-QAM	12	13	22.26	0-2	2
	707.5	23095	5	16-QAM	25	0	22.23	0-2	2
High	713.5	23155	5	QPSK	1	0	24.30	0	0
	713.5	23155	5	QPSK	1	12	24.28	0	0
	713.5	23155	5	QPSK	1	24	24.15	0	0
	713.5	23155	5	QPSK	12	0	23.33	0-1	1
	713.5	23155	5	QPSK	12	6	23.34	0-1	1
	713.5	23155	5	QPSK	12	13	23.21	0-1	1
	713.5	23155	5	QPSK	25	0	23.28	0-1	1
	713.5	23155	5	16-QAM	1	0	23.00	0-1	1
	713.5	23155	5	16-QAM	1	12	23.13	0-1	1
	713.5	23155	5	16-QAM	1	24	23.00	0-1	1
	713.5	23155	5	16-QAM	12	0	22.15	0-2	2
	713.5	23155	5	16-QAM	12	6	22.16	0-2	2
	713.5	23155	5	16-QAM	12	13	22.13	0-2	2
	713.5	23155	5	16-QAM	25	0	22.24	0-2	2

Table 8-3
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	24.45	0	0
	700.5	23025	3	QPSK	1	7	24.41	0	0
	700.5	23025	3	QPSK	1	14	24.58	0	0
	700.5	23025	3	QPSK	8	0	23.12	0-1	1
	700.5	23025	3	QPSK	8	4	23.18	0-1	1
	700.5	23025	3	QPSK	8	7	23.28	0-1	1
	700.5	23025	3	QPSK	15	0	23.21	0-1	1
	700.5	23025	3	16-QAM	1	0	23.22	0-1	1
	700.5	23025	3	16-QAM	1	7	23.17	0-1	1
	700.5	23025	3	16-QAM	1	14	23.33	0-1	1
	700.5	23025	3	16-QAM	8	0	22.08	0-2	2
	700.5	23025	3	16-QAM	8	4	22.07	0-2	2
	700.5	23025	3	16-QAM	8	7	22.13	0-2	2
	700.5	23025	3	16-QAM	15	0	22.12	0-2	2
Mid	707.5	23095	3	QPSK	1	0	24.60	0	0
	707.5	23095	3	QPSK	1	7	24.45	0	0
	707.5	23095	3	QPSK	1	14	24.58	0	0
	707.5	23095	3	QPSK	8	0	23.15	0-1	1
	707.5	23095	3	QPSK	8	4	23.19	0-1	1
	707.5	23095	3	QPSK	8	7	23.16	0-1	1
	707.5	23095	3	QPSK	15	0	23.20	0-1	1
	707.5	23095	3	16-QAM	1	0	23.28	0-1	1
	707.5	23095	3	16-QAM	1	7	23.13	0-1	1
	707.5	23095	3	16-QAM	1	14	23.27	0-1	1
	707.5	23095	3	16-QAM	8	0	22.07	0-2	2
	707.5	23095	3	16-QAM	8	4	22.09	0-2	2
	707.5	23095	3	16-QAM	8	7	22.09	0-2	2
	707.5	23095	3	16-QAM	15	0	22.14	0-2	2
High	714.5	23165	3	QPSK	1	0	24.50	0	0
	714.5	23165	3	QPSK	1	7	24.43	0	0
	714.5	23165	3	QPSK	1	14	24.38	0	0
	714.5	23165	3	QPSK	8	0	23.34	0-1	1
	714.5	23165	3	QPSK	8	4	23.33	0-1	1
	714.5	23165	3	QPSK	8	7	23.27	0-1	1
	714.5	23165	3	QPSK	15	0	23.20	0-1	1
	714.5	23165	3	16-QAM	1	0	23.53	0-1	1
	714.5	23165	3	16-QAM	1	7	23.44	0-1	1
	714.5	23165	3	16-QAM	1	14	23.33	0-1	1
	714.5	23165	3	16-QAM	8	0	22.16	0-2	2
	714.5	23165	3	16-QAM	8	4	22.18	0-2	2
	714.5	23165	3	16-QAM	8	7	22.09	0-2	2
	714.5	23165	3	16-QAM	15	0	22.17	0-2	2

Table 8-4
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	24.66	0	0
	699.7	23017	1.4	QPSK	1	2	24.55	0	0
	699.7	23017	1.4	QPSK	1	5	24.60	0	0
	699.7	23017	1.4	QPSK	3	0	24.44	0	0
	699.7	23017	1.4	QPSK	3	2	24.42	0	0
	699.7	23017	1.4	QPSK	3	3	24.43	0	0
	699.7	23017	1.4	QPSK	6	0	23.26	0-1	1
	699.7	23017	1.4	16-QAM	1	0	22.98	0-1	1
	699.7	23017	1.4	16-QAM	1	2	22.89	0-1	1
	699.7	23017	1.4	16-QAM	1	5	22.96	0-1	1
	699.7	23017	1.4	16-QAM	3	0	23.09	0-1	1
	699.7	23017	1.4	16-QAM	3	2	23.12	0-1	1
	699.7	23017	1.4	16-QAM	3	3	23.11	0-1	1
	699.7	23017	1.4	16-QAM	6	0	22.25	0-2	2
Mid	707.5	23095	1.4	QPSK	1	0	24.44	0	0
	707.5	23095	1.4	QPSK	1	2	24.37	0	0
	707.5	23095	1.4	QPSK	1	5	24.46	0	0
	707.5	23095	1.4	QPSK	3	0	24.43	0	0
	707.5	23095	1.4	QPSK	3	2	24.44	0	0
	707.5	23095	1.4	QPSK	3	3	24.50	0	0
	707.5	23095	1.4	QPSK	6	0	23.19	0-1	1
	707.5	23095	1.4	16-QAM	1	0	23.10	0-1	1
	707.5	23095	1.4	16-QAM	1	2	23.13	0-1	1
	707.5	23095	1.4	16-QAM	1	5	23.15	0-1	1
	707.5	23095	1.4	16-QAM	3	0	23.14	0-1	1
	707.5	23095	1.4	16-QAM	3	2	23.13	0-1	1
	707.5	23095	1.4	16-QAM	3	3	23.15	0-1	1
	707.5	23095	1.4	16-QAM	6	0	22.10	0-2	2
High	715.3	23173	1.4	QPSK	1	0	24.49	0	0
	715.3	23173	1.4	QPSK	1	2	24.44	0	0
	715.3	23173	1.4	QPSK	1	5	24.37	0	0
	715.3	23173	1.4	QPSK	3	0	24.40	0	0
	715.3	23173	1.4	QPSK	3	2	24.33	0	0
	715.3	23173	1.4	QPSK	3	3	24.32	0	0
	715.3	23173	1.4	QPSK	6	0	23.23	0-1	1
	715.3	23173	1.4	16-QAM	1	0	23.21	0-1	1
	715.3	23173	1.4	16-QAM	1	2	23.16	0-1	1
	715.3	23173	1.4	16-QAM	1	5	23.13	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	22.95	0-1	1
	715.3	23173	1.4	16-QAM	3	3	22.97	0-1	1
	715.3	23173	1.4	16-QAM	6	0	22.15	0-2	2

Table 8-5
LTE Band 12 Conducted Powers - 10 MHz Bandwidth
Reduced Powers – Body at 0.0 cm

	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	20.27	0	0
	707.5	23095	10	QPSK	1	25	20.33	0	0
	707.5	23095	10	QPSK	1	49	**20.52**	0	0
	707.5	23095	10	QPSK	25	0	20.15	0-1	0
	707.5	23095	10	QPSK	25	12	20.21	0-1	0
	707.5	23095	10	QPSK	25	25	**20.35**	0-1	0
	707.5	23095	10	QPSK	50	0	20.19	0-1	0
	707.5	23095	10	16QAM	1	0	20.06	0-1	0
	707.5	23095	10	16QAM	1	25	20.10	0-1	0
	707.5	23095	10	16QAM	1	49	20.30	0-1	0
	707.5	23095	10	16QAM	25	0	20.15	0-2	0
	707.5	23095	10	16QAM	25	12	20.24	0-2	0
	707.5	23095	10	16QAM	25	25	20.37	0-2	0
	707.5	23095	10	16QAM	50	0	20.19	0-2	0

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 8-6
LTE Band 12 Conducted Powers - 5 MHz Bandwidth
Reduced Powers – Body at 0.0 cm

	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	20.41	0	0
	701.5	23035	5	QPSK	1	12	20.32	0	0
	701.5	23035	5	QPSK	1	24	20.40	0	0
	701.5	23035	5	QPSK	12	0	20.45	0-1	0
	701.5	23035	5	QPSK	12	6	20.37	0-1	0
	701.5	23035	5	QPSK	12	13	20.36	0-1	0
	701.5	23035	5	QPSK	25	0	20.38	0-1	0
	701.5	23035	5	16-QAM	1	0	20.32	0-1	0
	701.5	23035	5	16-QAM	1	12	20.35	0-1	0
	701.5	23035	5	16-QAM	1	24	20.29	0-1	0
	701.5	23035	5	16-QAM	12	0	20.40	0-2	0
	701.5	23035	5	16-QAM	12	6	20.37	0-2	0
	701.5	23035	5	16-QAM	12	13	20.45	0-2	0
	701.5	23035	5	16-QAM	25	0	20.41	0-2	0
Mid	707.5	23095	5	QPSK	1	0	20.49	0	0
	707.5	23095	5	QPSK	1	12	20.50	0	0
	707.5	23095	5	QPSK	1	24	20.65	0	0
	707.5	23095	5	QPSK	12	0	20.44	0-1	0
	707.5	23095	5	QPSK	12	6	20.39	0-1	0
	707.5	23095	5	QPSK	12	13	20.54	0-1	0
	707.5	23095	5	QPSK	25	0	20.42	0-1	0
	707.5	23095	5	16-QAM	1	0	20.38	0-1	0
	707.5	23095	5	16-QAM	1	12	20.38	0-1	0
	707.5	23095	5	16-QAM	1	24	20.54	0-1	0
	707.5	23095	5	16-QAM	12	0	20.47	0-2	0
	707.5	23095	5	16-QAM	12	6	20.45	0-2	0
	707.5	23095	5	16-QAM	12	13	20.57	0-2	0
	707.5	23095	5	16-QAM	25	0	20.46	0-2	0
High	713.5	23155	5	QPSK	1	0	20.36	0	0
	713.5	23155	5	QPSK	1	12	20.35	0	0
	713.5	23155	5	QPSK	1	24	20.46	0	0
	713.5	23155	5	QPSK	12	0	20.45	0-1	0
	713.5	23155	5	QPSK	12	6	20.40	0-1	0
	713.5	23155	5	QPSK	12	13	20.58	0-1	0
	713.5	23155	5	QPSK	25	0	20.58	0-1	0
	713.5	23155	5	16-QAM	1	0	20.26	0-1	0
	713.5	23155	5	16-QAM	1	12	20.29	0-1	0
	713.5	23155	5	16-QAM	1	24	20.28	0-1	0
	713.5	23155	5	16-QAM	12	0	20.34	0-2	0
	713.5	23155	5	16-QAM	12	6	20.38	0-2	0
	713.5	23155	5	16-QAM	12	13	20.35	0-2	0
	713.5	23155	5	16-QAM	25	0	20.37	0-2	0

Table 8-7
LTE Band 12 Conducted Powers - 3 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	20.42	0	0
	700.5	23025	3	QPSK	1	7	20.31	0	0
	700.5	23025	3	QPSK	1	14	20.37	0	0
	700.5	23025	3	QPSK	8	0	20.47	0-1	0
	700.5	23025	3	QPSK	8	4	20.35	0-1	0
	700.5	23025	3	QPSK	8	7	20.36	0-1	0
	700.5	23025	3	QPSK	15	0	20.36	0-1	0
	700.5	23025	3	16-QAM	1	0	20.36	0-1	0
	700.5	23025	3	16-QAM	1	7	20.37	0-1	0
	700.5	23025	3	16-QAM	1	14	20.26	0-1	0
	700.5	23025	3	16-QAM	8	0	20.42	0-2	0
	700.5	23025	3	16-QAM	8	4	20.40	0-2	0
	700.5	23025	3	16-QAM	8	7	20.41	0-2	0
	700.5	23025	3	16-QAM	15	0	20.45	0-2	0
Mid	707.5	23095	3	QPSK	1	0	20.51	0	0
	707.5	23095	3	QPSK	1	7	20.51	0	0
	707.5	23095	3	QPSK	1	14	20.69	0	0
	707.5	23095	3	QPSK	8	0	20.47	0-1	0
	707.5	23095	3	QPSK	8	4	20.42	0-1	0
	707.5	23095	3	QPSK	8	7	20.57	0-1	0
	707.5	23095	3	QPSK	15	0	20.39	0-1	0
	707.5	23095	3	16-QAM	1	0	20.42	0-1	0
	707.5	23095	3	16-QAM	1	7	20.37	0-1	0
	707.5	23095	3	16-QAM	1	14	20.52	0-1	0
	707.5	23095	3	16-QAM	8	0	20.48	0-2	0
	707.5	23095	3	16-QAM	8	4	20.47	0-2	0
	707.5	23095	3	16-QAM	8	7	20.60	0-2	0
	707.5	23095	3	16-QAM	15	0	20.48	0-2	0
High	714.5	23165	3	QPSK	1	0	20.38	0	0
	714.5	23165	3	QPSK	1	7	20.36	0	0
	714.5	23165	3	QPSK	1	14	20.47	0	0
	714.5	23165	3	QPSK	8	0	20.45	0-1	0
	714.5	23165	3	QPSK	8	4	20.39	0-1	0
	714.5	23165	3	QPSK	8	7	20.57	0-1	0
	714.5	23165	3	QPSK	15	0	20.54	0-1	0
	714.5	23165	3	16-QAM	1	0	20.22	0-1	0
	714.5	23165	3	16-QAM	1	7	20.28	0-1	0
	714.5	23165	3	16-QAM	1	14	20.29	0-1	0
	714.5	23165	3	16-QAM	8	0	20.36	0-2	0
	714.5	23165	3	16-QAM	8	4	20.40	0-2	0
	714.5	23165	3	16-QAM	8	7	20.39	0-2	0
	714.5	23165	3	16-QAM	15	0	20.33	0-2	0

Table 8-8
LTE Band 12 Conducted Powers -1.4 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	20.38	0	0
	699.7	23017	1.4	QPSK	1	2	20.33	0	0
	699.7	23017	1.4	QPSK	1	5	20.43	0	0
	699.7	23017	1.4	QPSK	3	0	20.49	0	0
	699.7	23017	1.4	QPSK	3	2	20.37	0	0
	699.7	23017	1.4	QPSK	3	3	20.34	0	0
	699.7	23017	1.4	QPSK	6	0	20.35	0-1	0
	699.7	23017	1.4	16-QAM	1	0	20.30	0-1	0
	699.7	23017	1.4	16-QAM	1	2	20.38	0-1	0
	699.7	23017	1.4	16-QAM	1	5	20.27	0-1	0
	699.7	23017	1.4	16-QAM	3	0	20.40	0-1	0
	699.7	23017	1.4	16-QAM	3	2	20.38	0-1	0
	699.7	23017	1.4	16-QAM	3	3	20.48	0-1	0
	699.7	23017	1.4	16-QAM	6	0	20.38	0-2	0
Mid	707.5	23095	1.4	QPSK	1	0	20.49	0	0
	707.5	23095	1.4	QPSK	1	2	20.52	0	0
	707.5	23095	1.4	QPSK	1	5	20.62	0	0
	707.5	23095	1.4	QPSK	3	0	20.43	0	0
	707.5	23095	1.4	QPSK	3	2	20.39	0	0
	707.5	23095	1.4	QPSK	3	3	20.57	0	0
	707.5	23095	1.4	QPSK	6	0	20.46	0-1	0
	707.5	23095	1.4	16-QAM	1	0	20.42	0-1	0
	707.5	23095	1.4	16-QAM	1	2	20.37	0-1	0
	707.5	23095	1.4	16-QAM	1	5	20.53	0-1	0
	707.5	23095	1.4	16-QAM	3	0	20.51	0-1	0
	707.5	23095	1.4	16-QAM	3	2	20.49	0-1	0
	707.5	23095	1.4	16-QAM	3	3	20.58	0-1	0
	707.5	23095	1.4	16-QAM	6	0	20.50	0-2	0
High	715.3	23173	1.4	QPSK	1	0	20.39	0	0
	715.3	23173	1.4	QPSK	1	2	20.32	0	0
	715.3	23173	1.4	QPSK	1	5	20.44	0	0
	715.3	23173	1.4	QPSK	3	0	20.44	0	0
	715.3	23173	1.4	QPSK	3	2	20.37	0	0
	715.3	23173	1.4	QPSK	3	3	20.57	0	0
	715.3	23173	1.4	QPSK	6	0	20.61	0-1	0
	715.3	23173	1.4	16-QAM	1	0	20.29	0-1	0
	715.3	23173	1.4	16-QAM	1	2	20.30	0-1	0
	715.3	23173	1.4	16-QAM	1	5	20.32	0-1	0
	715.3	23173	1.4	16-QAM	3	0	20.37	0-1	0
	715.3	23173	1.4	16-QAM	3	2	20.41	0-1	0
	715.3	23173	1.4	16-QAM	3	3	20.32	0-1	0
	715.3	23173	1.4	16-QAM	6	0	20.38	0-2	0

8.1.2 LTE Band 13

Table 8-9
LTE Band 13 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	782.0	23230	10	QPSK	1	0	**24.16**	0	0
	782.0	23230	10	QPSK	1	25	24.06	0	0
	782.0	23230	10	QPSK	1	49	24.10	0	0
	782.0	23230	10	QPSK	25	0	22.71	0-1	1
	782.0	23230	10	QPSK	25	12	22.74	0-1	1
	782.0	23230	10	QPSK	25	25	**22.77**	0-1	1
	782.0	23230	10	QPSK	50	0	22.74	0-1	1
	782.0	23230	10	16QAM	1	0	22.83	0-1	1
	782.0	23230	10	16QAM	1	25	22.70	0-1	1
	782.0	23230	10	16QAM	1	49	22.79	0-1	1
	782.0	23230	10	16QAM	25	0	21.73	0-2	2
	782.0	23230	10	16QAM	25	12	21.74	0-2	2
	782.0	23230	10	16QAM	25	25	21.78	0-2	2
	782.0	23230	10	16QAM	50	0	21.72	0-2	2

Table 8-10
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	5	QPSK	1	0	24.20	0	0
	782.0	23230	5	QPSK	1	12	24.19	0	0
	782.0	23230	5	QPSK	1	24	24.14	0	0
	782.0	23230	5	QPSK	12	0	22.97	0-1	1
	782.0	23230	5	QPSK	12	6	22.97	0-1	1
	782.0	23230	5	QPSK	12	13	22.96	0-1	1
	782.0	23230	5	QPSK	25	0	22.97	0-1	1
	782.0	23230	5	16-QAM	1	0	22.86	0-1	1
	782.0	23230	5	16-QAM	1	12	22.90	0-1	1
	782.0	23230	5	16-QAM	1	24	22.95	0-1	1
	782.0	23230	5	16-QAM	12	0	22.03	0-2	2
	782.0	23230	5	16-QAM	12	6	22.07	0-2	2
	782.0	23230	5	16-QAM	12	13	22.00	0-2	2
	782.0	23230	5	16-QAM	25	0	21.92	0-2	2

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 8-11
LTE Band 13 Conducted Powers - 10 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	10	QPSK	1	0	19.87	0	0
	782.0	23230	10	QPSK	1	25	19.86	0	0
	782.0	23230	10	QPSK	1	49	**19.90**	0	0
	782.0	23230	10	QPSK	25	0	19.68	0-1	0
	782.0	23230	10	QPSK	25	12	**19.73**	0-1	0
	782.0	23230	10	QPSK	25	25	19.72	0-1	0
	782.0	23230	10	QPSK	50	0	19.70	0-1	0
	782.0	23230	10	16QAM	1	0	19.77	0-1	0
	782.0	23230	10	16QAM	1	25	19.82	0-1	0
	782.0	23230	10	16QAM	1	49	19.80	0-1	0
	782.0	23230	10	16QAM	25	0	19.69	0-2	0
	782.0	23230	10	16QAM	25	12	19.79	0-2	0
	782.0	23230	10	16QAM	25	25	19.75	0-2	0
	782.0	23230	10	16QAM	50	0	19.69	0-2	0

Table 8-12
LTE Band 13 Conducted Powers - 5 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	5	QPSK	1	0	20.03	0	0
	782.0	23230	5	QPSK	1	12	20.08	0	0
	782.0	23230	5	QPSK	1	24	20.13	0	0
	782.0	23230	5	QPSK	12	0	20.01	0-1	0
	782.0	23230	5	QPSK	12	6	20.05	0-1	0
	782.0	23230	5	QPSK	12	13	20.04	0-1	0
	782.0	23230	5	QPSK	25	0	20.00	0-1	0
	782.0	23230	5	16-QAM	1	0	19.93	0-1	0
	782.0	23230	5	16-QAM	1	12	20.02	0-1	0
	782.0	23230	5	16-QAM	1	24	20.07	0-1	0
	782.0	23230	5	16-QAM	12	0	20.06	0-2	0
	782.0	23230	5	16-QAM	12	6	20.08	0-2	0
	782.0	23230	5	16-QAM	12	13	20.04	0-2	0
	782.0	23230	5	16-QAM	25	0	20.14	0-2	0

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

8.1.3 LTE Band 5 (Cell)

Table 8-13
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	23.89	0	0
	836.5	20525	10	QPSK	1	25	23.97	0	0
	836.5	20525	10	QPSK	1	49	**24.06**	0	0
	836.5	20525	10	QPSK	25	0	22.53	0-1	1
	836.5	20525	10	QPSK	25	12	22.63	0-1	1
	836.5	20525	10	QPSK	25	25	**22.65**	0-1	1
	836.5	20525	10	QPSK	50	0	22.64	0-1	1
	836.5	20525	10	16QAM	1	0	22.36	0-1	1
	836.5	20525	10	16QAM	1	25	22.44	0-1	1
	836.5	20525	10	16QAM	1	49	22.54	0-1	1
	836.5	20525	10	16QAM	25	0	21.50	0-2	2
	836.5	20525	10	16QAM	25	12	21.55	0-2	2
	836.5	20525	10	16QAM	25	25	21.58	0-2	2
	836.5	20525	10	16QAM	50	0	21.54	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 8-14
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	23.98	0	0
	826.5	20425	5	QPSK	1	12	23.97	0	0
	826.5	20425	5	QPSK	1	24	23.97	0	0
	826.5	20425	5	QPSK	12	0	22.68	0-1	1
	826.5	20425	5	QPSK	12	6	22.71	0-1	1
	826.5	20425	5	QPSK	12	13	22.75	0-1	1
	826.5	20425	5	QPSK	25	0	22.68	0-1	1
	826.5	20425	5	16-QAM	1	0	22.62	0-1	1
	826.5	20425	5	16-QAM	1	12	22.67	0-1	1
	826.5	20425	5	16-QAM	1	24	22.69	0-1	1
	826.5	20425	5	16-QAM	12	0	21.69	0-2	2
	826.5	20425	5	16-QAM	12	6	21.69	0-2	2
	826.5	20425	5	16-QAM	12	13	21.67	0-2	2
	826.5	20425	5	16-QAM	25	0	21.64	0-2	2
Mid	836.5	20525	5	QPSK	1	0	23.94	0	0
	836.5	20525	5	QPSK	1	12	24.09	0	0
	836.5	20525	5	QPSK	1	24	24.04	0	0
	836.5	20525	5	QPSK	12	0	22.79	0-1	1
	836.5	20525	5	QPSK	12	6	22.80	0-1	1
	836.5	20525	5	QPSK	12	13	22.80	0-1	1
	836.5	20525	5	QPSK	25	0	22.82	0-1	1
	836.5	20525	5	16-QAM	1	0	22.76	0-1	1
	836.5	20525	5	16-QAM	1	12	22.84	0-1	1
	836.5	20525	5	16-QAM	1	24	22.80	0-1	1
	836.5	20525	5	16-QAM	12	0	21.65	0-2	2
	836.5	20525	5	16-QAM	12	6	21.67	0-2	2
	836.5	20525	5	16-QAM	12	13	21.70	0-2	2
	836.5	20525	5	16-QAM	25	0	22.00	0-2	2
High	846.5	20625	5	QPSK	1	0	24.00	0	0
	846.5	20625	5	QPSK	1	12	23.88	0	0
	846.5	20625	5	QPSK	1	24	23.91	0	0
	846.5	20625	5	QPSK	12	0	23.00	0-1	1
	846.5	20625	5	QPSK	12	6	22.89	0-1	1
	846.5	20625	5	QPSK	12	13	22.85	0-1	1
	846.5	20625	5	QPSK	25	0	22.83	0-1	1
	846.5	20625	5	16-QAM	1	0	22.87	0-1	1
	846.5	20625	5	16-QAM	1	12	22.73	0-1	1
	846.5	20625	5	16-QAM	1	24	22.72	0-1	1
	846.5	20625	5	16-QAM	12	0	21.85	0-2	2
	846.5	20625	5	16-QAM	12	6	21.76	0-2	2
	846.5	20625	5	16-QAM	12	13	21.74	0-2	2
	846.5	20625	5	16-QAM	25	0	21.78	0-2	2

Table 8-15
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	23.97	0	0
	825.5	20415	3	QPSK	1	7	23.95	0	0
	825.5	20415	3	QPSK	1	14	23.95	0	0
	825.5	20415	3	QPSK	8	0	22.72	0-1	1
	825.5	20415	3	QPSK	8	4	22.71	0-1	1
	825.5	20415	3	QPSK	8	7	22.71	0-1	1
	825.5	20415	3	QPSK	15	0	22.70	0-1	1
	825.5	20415	3	16-QAM	1	0	22.96	0-1	1
	825.5	20415	3	16-QAM	1	7	22.92	0-1	1
	825.5	20415	3	16-QAM	1	14	22.91	0-1	1
	825.5	20415	3	16-QAM	8	0	21.56	0-2	2
	825.5	20415	3	16-QAM	8	4	21.55	0-2	2
	825.5	20415	3	16-QAM	8	7	21.58	0-2	2
	825.5	20415	3	16-QAM	15	0	21.64	0-2	2
Mid	836.5	20525	3	QPSK	1	0	24.08	0	0
	836.5	20525	3	QPSK	1	7	24.04	0	0
	836.5	20525	3	QPSK	1	14	24.08	0	0
	836.5	20525	3	QPSK	8	0	22.78	0-1	1
	836.5	20525	3	QPSK	8	4	22.80	0-1	1
	836.5	20525	3	QPSK	8	7	22.76	0-1	1
	836.5	20525	3	QPSK	15	0	22.83	0-1	1
	836.5	20525	3	16-QAM	1	0	22.73	0-1	1
	836.5	20525	3	16-QAM	1	7	22.71	0-1	1
	836.5	20525	3	16-QAM	1	14	22.76	0-1	1
	836.5	20525	3	16-QAM	8	0	21.63	0-2	2
	836.5	20525	3	16-QAM	8	4	21.60	0-2	2
	836.5	20525	3	16-QAM	8	7	21.66	0-2	2
	836.5	20525	3	16-QAM	15	0	21.76	0-2	2
High	847.5	20635	3	QPSK	1	0	24.15	0	0
	847.5	20635	3	QPSK	1	7	24.12	0	0
	847.5	20635	3	QPSK	1	14	24.00	0	0
	847.5	20635	3	QPSK	8	0	22.86	0-1	1
	847.5	20635	3	QPSK	8	4	22.84	0-1	1
	847.5	20635	3	QPSK	8	7	22.88	0-1	1
	847.5	20635	3	QPSK	15	0	22.88	0-1	1
	847.5	20635	3	16-QAM	1	0	23.07	0-1	1
	847.5	20635	3	16-QAM	1	7	23.11	0-1	1
	847.5	20635	3	16-QAM	1	14	23.09	0-1	1
	847.5	20635	3	16-QAM	8	0	21.75	0-2	2
	847.5	20635	3	16-QAM	8	4	21.76	0-2	2
	847.5	20635	3	16-QAM	8	7	21.73	0-2	2
	847.5	20635	3	16-QAM	15	0	21.82	0-2	2

Table 8-16
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	24.20	0	0
	824.7	20407	1.4	QPSK	1	2	24.15	0	0
	824.7	20407	1.4	QPSK	1	5	24.19	0	0
	824.7	20407	1.4	QPSK	3	0	23.97	0	0
	824.7	20407	1.4	QPSK	3	2	23.98	0	0
	824.7	20407	1.4	QPSK	3	3	24.02	0	0
	824.7	20407	1.4	QPSK	6	0	22.79	0-1	1
	824.7	20407	1.4	16-QAM	1	0	22.48	0-1	1
	824.7	20407	1.4	16-QAM	1	2	22.48	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.47	0-1	1
	824.7	20407	1.4	16-QAM	3	0	22.58	0-1	1
	824.7	20407	1.4	16-QAM	3	2	22.63	0-1	1
	824.7	20407	1.4	16-QAM	3	3	22.62	0-1	1
	824.7	20407	1.4	16-QAM	6	0	21.75	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	24.07	0	0
	836.5	20525	1.4	QPSK	1	2	24.02	0	0
	836.5	20525	1.4	QPSK	1	5	24.08	0	0
	836.5	20525	1.4	QPSK	3	0	24.00	0	0
	836.5	20525	1.4	QPSK	3	2	24.05	0	0
	836.5	20525	1.4	QPSK	3	3	24.10	0	0
	836.5	20525	1.4	QPSK	6	0	22.81	0-1	1
	836.5	20525	1.4	16-QAM	1	0	22.83	0-1	1
	836.5	20525	1.4	16-QAM	1	2	22.80	0-1	1
	836.5	20525	1.4	16-QAM	1	5	22.85	0-1	1
	836.5	20525	1.4	16-QAM	3	0	22.65	0-1	1
	836.5	20525	1.4	16-QAM	3	2	22.62	0-1	1
	836.5	20525	1.4	16-QAM	3	3	22.62	0-1	1
	836.5	20525	1.4	16-QAM	6	0	21.71	0-2	2
High	848.3	20643	1.4	QPSK	1	0	24.19	0	0
	848.3	20643	1.4	QPSK	1	2	24.18	0	0
	848.3	20643	1.4	QPSK	1	5	24.13	0	0
	848.3	20643	1.4	QPSK	3	0	24.14	0	0
	848.3	20643	1.4	QPSK	3	2	24.15	0	0
	848.3	20643	1.4	QPSK	3	3	24.19	0	0
	848.3	20643	1.4	QPSK	6	0	22.89	0-1	1
	848.3	20643	1.4	16-QAM	1	0	22.64	0-1	1
	848.3	20643	1.4	16-QAM	1	2	22.61	0-1	1
	848.3	20643	1.4	16-QAM	1	5	22.66	0-1	1
	848.3	20643	1.4	16-QAM	3	0	22.72	0-1	1
	848.3	20643	1.4	16-QAM	3	2	22.73	0-1	1
	848.3	20643	1.4	16-QAM	3	3	22.72	0-1	1
	848.3	20643	1.4	16-QAM	6	0	21.89	0-2	2

Table 8-17
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	20.01	0	0
	836.5	20525	10	QPSK	1	25	19.92	0	0
	836.5	20525	10	QPSK	1	49	**20.02**	0	0
	836.5	20525	10	QPSK	25	0	19.73	0-1	0
	836.5	20525	10	QPSK	25	12	19.76	0-1	0
	836.5	20525	10	QPSK	25	25	**19.81**	0-1	0
	836.5	20525	10	QPSK	50	0	19.77	0-1	0
	836.5	20525	10	16QAM	1	0	19.77	0-1	0
	836.5	20525	10	16QAM	1	25	19.58	0-1	0
	836.5	20525	10	16QAM	1	49	19.72	0-1	0
	836.5	20525	10	16QAM	25	0	19.84	0-2	0
	836.5	20525	10	16QAM	25	12	19.80	0-2	0
	836.5	20525	10	16QAM	25	25	19.87	0-2	0
	836.5	20525	10	16QAM	50	0	19.81	0-2	0

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 8-18
LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	19.70	0	0
	826.5	20425	5	QPSK	1	12	19.67	0	0
	826.5	20425	5	QPSK	1	24	19.61	0	0
	826.5	20425	5	QPSK	12	0	19.88	0-1	0
	826.5	20425	5	QPSK	12	6	19.94	0-1	0
	826.5	20425	5	QPSK	12	13	19.90	0-1	0
	826.5	20425	5	QPSK	25	0	19.80	0-1	0
	826.5	20425	5	16-QAM	1	0	19.87	0-1	0
	826.5	20425	5	16-QAM	1	12	19.84	0-1	0
	826.5	20425	5	16-QAM	1	24	19.75	0-1	0
	826.5	20425	5	16-QAM	12	0	19.79	0-2	0
	826.5	20425	5	16-QAM	12	6	19.86	0-2	0
	826.5	20425	5	16-QAM	12	13	19.84	0-2	0
	826.5	20425	5	16-QAM	25	0	19.83	0-2	0
Mid	836.5	20525	5	QPSK	1	0	19.96	0	0
	836.5	20525	5	QPSK	1	12	19.90	0	0
	836.5	20525	5	QPSK	1	24	19.96	0	0
	836.5	20525	5	QPSK	12	0	19.91	0-1	0
	836.5	20525	5	QPSK	12	6	19.92	0-1	0
	836.5	20525	5	QPSK	12	13	19.91	0-1	0
	836.5	20525	5	QPSK	25	0	19.91	0-1	0
	836.5	20525	5	16-QAM	1	0	19.70	0-1	0
	836.5	20525	5	16-QAM	1	12	19.72	0-1	0
	836.5	20525	5	16-QAM	1	24	19.80	0-1	0
	836.5	20525	5	16-QAM	12	0	19.94	0-2	0
	836.5	20525	5	16-QAM	12	6	20.00	0-2	0
	836.5	20525	5	16-QAM	12	13	19.96	0-2	0
	836.5	20525	5	16-QAM	25	0	19.95	0-2	0
High	846.5	20625	5	QPSK	1	0	19.79	0	0
	846.5	20625	5	QPSK	1	12	19.76	0	0
	846.5	20625	5	QPSK	1	24	19.78	0	0
	846.5	20625	5	QPSK	12	0	19.79	0-1	0
	846.5	20625	5	QPSK	12	6	19.81	0-1	0
	846.5	20625	5	QPSK	12	13	19.78	0-1	0
	846.5	20625	5	QPSK	25	0	19.79	0-1	0
	846.5	20625	5	16-QAM	1	0	19.97	0-1	0
	846.5	20625	5	16-QAM	1	12	19.93	0-1	0
	846.5	20625	5	16-QAM	1	24	19.94	0-1	0
	846.5	20625	5	16-QAM	12	0	19.78	0-2	0
	846.5	20625	5	16-QAM	12	6	19.77	0-2	0
	846.5	20625	5	16-QAM	12	13	19.76	0-2	0
	846.5	20625	5	16-QAM	25	0	19.74	0-2	0

Table 8-19
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	19.77	0	0
	825.5	20415	3	QPSK	1	7	19.70	0	0
	825.5	20415	3	QPSK	1	14	19.84	0	0
	825.5	20415	3	QPSK	8	0	19.76	0-1	0
	825.5	20415	3	QPSK	8	4	19.66	0-1	0
	825.5	20415	3	QPSK	8	7	19.69	0-1	0
	825.5	20415	3	QPSK	15	0	19.65	0-1	0
	825.5	20415	3	16-QAM	1	0	19.86	0-1	0
	825.5	20415	3	16-QAM	1	7	19.87	0-1	0
	825.5	20415	3	16-QAM	1	14	19.78	0-1	0
	825.5	20415	3	16-QAM	8	0	19.76	0-2	0
	825.5	20415	3	16-QAM	8	4	19.86	0-2	0
	825.5	20415	3	16-QAM	8	7	19.80	0-2	0
	825.5	20415	3	16-QAM	15	0	19.86	0-2	0
Mid	836.5	20525	3	QPSK	1	0	19.87	0	0
	836.5	20525	3	QPSK	1	7	19.86	0	0
	836.5	20525	3	QPSK	1	14	19.89	0	0
	836.5	20525	3	QPSK	8	0	19.91	0-1	0
	836.5	20525	3	QPSK	8	4	19.90	0-1	0
	836.5	20525	3	QPSK	8	7	19.96	0-1	0
	836.5	20525	3	QPSK	15	0	19.92	0-1	0
	836.5	20525	3	16-QAM	1	0	19.75	0-1	0
	836.5	20525	3	16-QAM	1	7	19.74	0-1	0
	836.5	20525	3	16-QAM	1	14	19.76	0-1	0
	836.5	20525	3	16-QAM	8	0	19.91	0-2	0
	836.5	20525	3	16-QAM	8	4	19.99	0-2	0
	836.5	20525	3	16-QAM	8	7	19.93	0-2	0
	836.5	20525	3	16-QAM	15	0	19.91	0-2	0
High	847.5	20635	3	QPSK	1	0	19.64	0	0
	847.5	20635	3	QPSK	1	7	19.55	0	0
	847.5	20635	3	QPSK	1	14	19.63	0	0
	847.5	20635	3	QPSK	8	0	19.59	0-1	0
	847.5	20635	3	QPSK	8	4	19.60	0-1	0
	847.5	20635	3	QPSK	8	7	19.61	0-1	0
	847.5	20635	3	QPSK	15	0	19.56	0-1	0
	847.5	20635	3	16-QAM	1	0	19.74	0-1	0
	847.5	20635	3	16-QAM	1	7	19.73	0-1	0
	847.5	20635	3	16-QAM	1	14	19.75	0-1	0
	847.5	20635	3	16-QAM	8	0	19.72	0-2	0
	847.5	20635	3	16-QAM	8	4	19.70	0-2	0
	847.5	20635	3	16-QAM	8	7	19.76	0-2	0
	847.5	20635	3	16-QAM	15	0	19.74	0-2	0

Table 8-20
LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	19.81	0	0
	824.7	20407	1.4	QPSK	1	2	19.68	0	0
	824.7	20407	1.4	QPSK	1	5	19.88	0	0
	824.7	20407	1.4	QPSK	3	0	19.76	0	0
	824.7	20407	1.4	QPSK	3	2	19.62	0	0
	824.7	20407	1.4	QPSK	3	3	19.71	0	0
	824.7	20407	1.4	QPSK	6	0	19.64	0-1	0
	824.7	20407	1.4	16-QAM	1	0	19.88	0-1	0
	824.7	20407	1.4	16-QAM	1	2	19.90	0-1	0
	824.7	20407	1.4	16-QAM	1	5	19.75	0-1	0
	824.7	20407	1.4	16-QAM	3	0	19.72	0-1	0
	824.7	20407	1.4	16-QAM	3	2	19.85	0-1	0
	824.7	20407	1.4	16-QAM	3	3	19.78	0-1	0
	824.7	20407	1.4	16-QAM	6	0	19.85	0-2	0
Mid	836.5	20525	1.4	QPSK	1	0	19.88	0	0
	836.5	20525	1.4	QPSK	1	2	19.88	0	0
	836.5	20525	1.4	QPSK	1	5	19.92	0	0
	836.5	20525	1.4	QPSK	3	0	19.89	0	0
	836.5	20525	1.4	QPSK	3	2	19.94	0	0
	836.5	20525	1.4	QPSK	3	3	19.98	0	0
	836.5	20525	1.4	QPSK	6	0	19.93	0-1	0
	836.5	20525	1.4	16-QAM	1	0	19.71	0-1	0
	836.5	20525	1.4	16-QAM	1	2	19.72	0-1	0
	836.5	20525	1.4	16-QAM	1	5	19.72	0-1	0
	836.5	20525	1.4	16-QAM	3	0	19.88	0-1	0
	836.5	20525	1.4	16-QAM	3	2	20.00	0-1	0
	836.5	20525	1.4	16-QAM	3	3	19.97	0-1	0
	836.5	20525	1.4	16-QAM	6	0	19.87	0-2	0
High	848.3	20643	1.4	QPSK	1	0	19.63	0	0
	848.3	20643	1.4	QPSK	1	2	19.59	0	0
	848.3	20643	1.4	QPSK	1	5	19.60	0	0
	848.3	20643	1.4	QPSK	3	0	19.60	0	0
	848.3	20643	1.4	QPSK	3	2	19.61	0	0
	848.3	20643	1.4	QPSK	3	3	19.58	0	0
	848.3	20643	1.4	QPSK	6	0	19.58	0-1	0
	848.3	20643	1.4	16-QAM	1	0	19.70	0-1	0
	848.3	20643	1.4	16-QAM	1	2	19.77	0-1	0
	848.3	20643	1.4	16-QAM	1	5	19.77	0-1	0
	848.3	20643	1.4	16-QAM	3	0	19.74	0-1	0
	848.3	20643	1.4	16-QAM	3	2	19.69	0-1	0
	848.3	20643	1.4	16-QAM	3	3	19.78	0-1	0
	848.3	20643	1.4	16-QAM	6	0	19.78	0-2	0

8.1.4 LTE Band 4 (AWS)

Table 8-21
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	24.02	0	0
	1732.5	20175	20	QPSK	1	50	24.01	0	0
	1732.5	20175	20	QPSK	1	99	**24.07**	0	0
	1732.5	20175	20	QPSK	50	0	22.80	0-1	1
	1732.5	20175	20	QPSK	50	25	22.78	0-1	1
	1732.5	20175	20	QPSK	50	50	**22.81**	0-1	1
	1732.5	20175	20	QPSK	100	0	22.77	0-1	1
	1732.5	20175	20	16QAM	1	0	22.45	0-1	1
	1732.5	20175	20	16QAM	1	50	22.52	0-1	1
	1732.5	20175	20	16QAM	1	99	22.49	0-1	1
	1732.5	20175	20	16QAM	50	0	21.72	0-2	2
	1732.5	20175	20	16QAM	50	25	21.78	0-2	2
	1732.5	20175	20	16QAM	50	50	21.76	0-2	2
	1732.5	20175	20	16QAM	100	0	21.75	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 8-22
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	23.48	0	0
	1717.5	20025	15	QPSK	1	36	23.45	0	0
	1717.5	20025	15	QPSK	1	74	23.65	0	0
	1717.5	20025	15	QPSK	36	0	22.89	0-1	1
	1717.5	20025	15	QPSK	36	18	22.87	0-1	1
	1717.5	20025	15	QPSK	36	37	22.96	0-1	1
	1717.5	20025	15	QPSK	75	0	23.03	0-1	1
	1717.5	20025	15	16QAM	1	0	22.67	0-1	1
	1717.5	20025	15	16QAM	1	36	22.74	0-1	1
	1717.5	20025	15	16QAM	1	74	23.07	0-1	1
	1717.5	20025	15	16QAM	36	0	21.76	0-2	2
	1717.5	20025	15	16QAM	36	18	21.73	0-2	2
	1717.5	20025	15	16QAM	36	37	21.89	0-2	2
	1717.5	20025	15	16QAM	75	0	21.88	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	24.16	0	0
	1732.5	20175	15	QPSK	1	36	24.18	0	0
	1732.5	20175	15	QPSK	1	74	24.20	0	0
	1732.5	20175	15	QPSK	36	0	23.14	0-1	1
	1732.5	20175	15	QPSK	36	18	23.08	0-1	1
	1732.5	20175	15	QPSK	36	37	23.17	0-1	1
	1732.5	20175	15	QPSK	75	0	23.14	0-1	1
	1732.5	20175	15	16QAM	1	0	23.06	0-1	1
	1732.5	20175	15	16QAM	1	36	23.14	0-1	1
	1732.5	20175	15	16QAM	1	74	23.17	0-1	1
	1732.5	20175	15	16QAM	36	0	22.02	0-2	2
	1732.5	20175	15	16QAM	36	18	21.97	0-2	2
	1732.5	20175	15	16QAM	36	37	22.00	0-2	2
	1732.5	20175	15	16QAM	75	0	22.04	0-2	2
High	1747.5	20325	15	QPSK	1	0	23.84	0	0
	1747.5	20325	15	QPSK	1	36	23.78	0	0
	1747.5	20325	15	QPSK	1	74	23.83	0	0
	1747.5	20325	15	QPSK	36	0	23.08	0-1	1
	1747.5	20325	15	QPSK	36	18	23.03	0-1	1
	1747.5	20325	15	QPSK	36	37	23.14	0-1	1
	1747.5	20325	15	QPSK	75	0	23.18	0-1	1
	1747.5	20325	15	16QAM	1	0	23.06	0-1	1
	1747.5	20325	15	16QAM	1	36	22.94	0-1	1
	1747.5	20325	15	16QAM	1	74	23.02	0-1	1
	1747.5	20325	15	16QAM	36	0	21.97	0-2	2
	1747.5	20325	15	16QAM	36	18	22.09	0-2	2
	1747.5	20325	15	16QAM	36	37	22.15	0-2	2
	1747.5	20325	15	16QAM	75	0	22.07	0-2	2

Table 8-23
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	23.90	0	0
	1715	20000	10	QPSK	1	25	24.00	0	0
	1715	20000	10	QPSK	1	49	24.04	0	0
	1715	20000	10	QPSK	25	0	22.89	0-1	1
	1715	20000	10	QPSK	25	12	22.89	0-1	1
	1715	20000	10	QPSK	25	25	22.92	0-1	1
	1715	20000	10	QPSK	50	0	23.00	0-1	1
	1715	20000	10	16QAM	1	0	22.91	0-1	1
	1715	20000	10	16QAM	1	25	23.01	0-1	1
	1715	20000	10	16QAM	1	49	22.92	0-1	1
	1715	20000	10	16QAM	25	0	21.88	0-2	2
	1715	20000	10	16QAM	25	12	21.95	0-2	2
	1715	20000	10	16QAM	25	25	21.84	0-2	2
	1715	20000	10	16QAM	50	0	21.90	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	24.19	0	0
	1732.5	20175	10	QPSK	1	25	24.20	0	0
	1732.5	20175	10	QPSK	1	49	24.19	0	0
	1732.5	20175	10	QPSK	25	0	23.11	0-1	1
	1732.5	20175	10	QPSK	25	12	23.13	0-1	1
	1732.5	20175	10	QPSK	25	25	23.20	0-1	1
	1732.5	20175	10	QPSK	50	0	23.17	0-1	1
	1732.5	20175	10	16QAM	1	0	22.88	0-1	1
	1732.5	20175	10	16QAM	1	25	22.91	0-1	1
	1732.5	20175	10	16QAM	1	49	22.90	0-1	1
	1732.5	20175	10	16QAM	25	0	22.16	0-2	2
	1732.5	20175	10	16QAM	25	12	22.17	0-2	2
	1732.5	20175	10	16QAM	25	25	22.13	0-2	2
	1732.5	20175	10	16QAM	50	0	22.08	0-2	2
High	1750	20350	10	QPSK	1	0	24.17	0	0
	1750	20350	10	QPSK	1	25	24.20	0	0
	1750	20350	10	QPSK	1	49	24.19	0	0
	1750	20350	10	QPSK	25	0	23.19	0-1	1
	1750	20350	10	QPSK	25	12	23.16	0-1	1
	1750	20350	10	QPSK	25	25	23.16	0-1	1
	1750	20350	10	QPSK	50	0	23.18	0-1	1
	1750	20350	10	16QAM	1	0	23.00	0-1	1
	1750	20350	10	16QAM	1	25	23.00	0-1	1
	1750	20350	10	16QAM	1	49	22.98	0-1	1
	1750	20350	10	16QAM	25	0	22.12	0-2	2
	1750	20350	10	16QAM	25	12	22.14	0-2	2
	1750	20350	10	16QAM	25	25	22.13	0-2	2
	1750	20350	10	16QAM	50	0	22.17	0-2	2

Table 8-24
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	23.95	0	0
	1712.5	19975	5	QPSK	1	12	24.01	0	0
	1712.5	19975	5	QPSK	1	24	24.03	0	0
	1712.5	19975	5	QPSK	12	0	22.88	0-1	1
	1712.5	19975	5	QPSK	12	6	22.92	0-1	1
	1712.5	19975	5	QPSK	12	13	22.90	0-1	1
	1712.5	19975	5	QPSK	25	0	22.97	0-1	1
	1712.5	19975	5	16-QAM	1	0	22.74	0-1	1
	1712.5	19975	5	16-QAM	1	12	22.76	0-1	1
	1712.5	19975	5	16-QAM	1	24	22.77	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.84	0-2	2
	1712.5	19975	5	16-QAM	12	6	21.81	0-2	2
	1712.5	19975	5	16-QAM	12	13	21.80	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.86	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	24.13	0	0
	1732.5	20175	5	QPSK	1	12	24.01	0	0
	1732.5	20175	5	QPSK	1	24	24.00	0	0
	1732.5	20175	5	QPSK	12	0	23.12	0-1	1
	1732.5	20175	5	QPSK	12	6	23.16	0-1	1
	1732.5	20175	5	QPSK	12	13	23.18	0-1	1
	1732.5	20175	5	QPSK	25	0	23.15	0-1	1
	1732.5	20175	5	16-QAM	1	0	22.78	0-1	1
	1732.5	20175	5	16-QAM	1	12	22.80	0-1	1
	1732.5	20175	5	16-QAM	1	24	22.81	0-1	1
	1732.5	20175	5	16-QAM	12	0	22.08	0-2	2
	1732.5	20175	5	16-QAM	12	6	22.05	0-2	2
	1732.5	20175	5	16-QAM	12	13	22.02	0-2	2
	1732.5	20175	5	16-QAM	25	0	22.13	0-2	2
High	1752.5	20375	5	QPSK	1	0	24.20	0	0
	1752.5	20375	5	QPSK	1	12	24.18	0	0
	1752.5	20375	5	QPSK	1	24	24.20	0	0
	1752.5	20375	5	QPSK	12	0	23.19	0-1	1
	1752.5	20375	5	QPSK	12	6	23.18	0-1	1
	1752.5	20375	5	QPSK	12	13	23.17	0-1	1
	1752.5	20375	5	QPSK	25	0	23.20	0-1	1
	1752.5	20375	5	16-QAM	1	0	22.90	0-1	1
	1752.5	20375	5	16-QAM	1	12	22.93	0-1	1
	1752.5	20375	5	16-QAM	1	24	22.97	0-1	1
	1752.5	20375	5	16-QAM	12	0	22.17	0-2	2
	1752.5	20375	5	16-QAM	12	6	22.15	0-2	2
	1752.5	20375	5	16-QAM	12	13	22.20	0-2	2
	1752.5	20375	5	16-QAM	25	0	22.16	0-2	2

Table 8-25
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	24.07	0	0
	1711.5	19965	3	QPSK	1	7	23.96	0	0
	1711.5	19965	3	QPSK	1	14	23.98	0	0
	1711.5	19965	3	QPSK	8	0	22.94	0-1	1
	1711.5	19965	3	QPSK	8	4	22.93	0-1	1
	1711.5	19965	3	QPSK	8	7	22.94	0-1	1
	1711.5	19965	3	QPSK	15	0	22.90	0-1	1
	1711.5	19965	3	16-QAM	1	0	22.87	0-1	1
	1711.5	19965	3	16-QAM	1	7	22.92	0-1	1
	1711.5	19965	3	16-QAM	1	14	22.94	0-1	1
	1711.5	19965	3	16-QAM	8	0	21.83	0-2	2
	1711.5	19965	3	16-QAM	8	4	21.86	0-2	2
	1711.5	19965	3	16-QAM	8	7	21.86	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.89	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	24.20	0	0
	1732.5	20175	3	QPSK	1	7	24.19	0	0
	1732.5	20175	3	QPSK	1	14	24.17	0	0
	1732.5	20175	3	QPSK	8	0	23.13	0-1	1
	1732.5	20175	3	QPSK	8	4	23.09	0-1	1
	1732.5	20175	3	QPSK	8	7	23.11	0-1	1
	1732.5	20175	3	QPSK	15	0	23.15	0-1	1
	1732.5	20175	3	16-QAM	1	0	22.90	0-1	1
	1732.5	20175	3	16-QAM	1	7	22.86	0-1	1
	1732.5	20175	3	16-QAM	1	14	22.87	0-1	1
	1732.5	20175	3	16-QAM	8	0	22.05	0-2	2
	1732.5	20175	3	16-QAM	8	4	22.02	0-2	2
	1732.5	20175	3	16-QAM	8	7	22.02	0-2	2
	1732.5	20175	3	16-QAM	15	0	22.10	0-2	2
High	1753.5	20385	3	QPSK	1	0	24.20	0	0
	1753.5	20385	3	QPSK	1	7	24.16	0	0
	1753.5	20385	3	QPSK	1	14	24.12	0	0
	1753.5	20385	3	QPSK	8	0	23.14	0-1	1
	1753.5	20385	3	QPSK	8	4	23.19	0-1	1
	1753.5	20385	3	QPSK	8	7	23.20	0-1	1
	1753.5	20385	3	QPSK	15	0	23.20	0-1	1
	1753.5	20385	3	16-QAM	1	0	23.03	0-1	1
	1753.5	20385	3	16-QAM	1	7	22.97	0-1	1
	1753.5	20385	3	16-QAM	1	14	23.00	0-1	1
	1753.5	20385	3	16-QAM	8	0	22.11	0-2	2
	1753.5	20385	3	16-QAM	8	4	22.03	0-2	2
	1753.5	20385	3	16-QAM	8	7	22.10	0-2	2
	1753.5	20385	3	16-QAM	15	0	22.14	0-2	2

Table 8-26
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	24.18	0	0
	1710.7	19957	1.4	QPSK	1	2	24.10	0	0
	1710.7	19957	1.4	QPSK	1	5	24.20	0	0
	1710.7	19957	1.4	QPSK	3	0	24.02	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	22.98	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	22.48	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	22.42	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.46	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	22.59	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	22.56	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	22.54	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	22.06	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	24.20	0	0
	1732.5	20175	1.4	QPSK	1	2	24.14	0	0
	1732.5	20175	1.4	QPSK	1	5	24.16	0	0
	1732.5	20175	1.4	QPSK	3	0	24.19	0	0
	1732.5	20175	1.4	QPSK	3	2	24.14	0	0
	1732.5	20175	1.4	QPSK	3	3	24.15	0	0
	1732.5	20175	1.4	QPSK	6	0	23.18	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	22.99	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	22.93	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	22.98	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	22.84	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	22.76	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	22.83	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	22.10	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	24.16	0	0
	1754.3	20393	1.4	QPSK	1	2	24.14	0	0
	1754.3	20393	1.4	QPSK	1	5	24.18	0	0
	1754.3	20393	1.4	QPSK	3	0	24.19	0	0
	1754.3	20393	1.4	QPSK	3	2	24.20	0	0
	1754.3	20393	1.4	QPSK	3	3	24.19	0	0
	1754.3	20393	1.4	QPSK	6	0	23.20	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.76	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	22.70	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.73	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	22.85	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	22.88	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.93	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	22.20	0-2	2

Table 8-27
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.83	0	0
	1732.5	20175	20	QPSK	1	50	12.90	0	0
	1732.5	20175	20	QPSK	1	99	**12.94**	0	0
	1732.5	20175	20	QPSK	50	0	12.85	0-1	0
	1732.5	20175	20	QPSK	50	25	12.91	0-1	0
	1732.5	20175	20	QPSK	50	50	**12.95**	0-1	0
	1732.5	20175	20	QPSK	100	0	12.91	0-1	0
	1732.5	20175	20	16QAM	1	0	12.70	0-1	0
	1732.5	20175	20	16QAM	1	50	12.76	0-1	0
	1732.5	20175	20	16QAM	1	99	12.78	0-1	0
	1732.5	20175	20	16QAM	50	0	12.89	0-2	0
	1732.5	20175	20	16QAM	50	25	12.90	0-2	0
	1732.5	20175	20	16QAM	50	50	12.90	0-2	0
	1732.5	20175	20	16QAM	100	0	12.85	0-2	0

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 8-28
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.64	0	0
	1717.5	20025	15	QPSK	1	36	12.62	0	0
	1717.5	20025	15	QPSK	1	74	12.68	0	0
	1717.5	20025	15	QPSK	36	0	12.67	0-1	0
	1717.5	20025	15	QPSK	36	18	12.73	0-1	0
	1717.5	20025	15	QPSK	36	37	12.77	0-1	0
	1717.5	20025	15	QPSK	75	0	12.72	0-1	0
	1717.5	20025	15	16QAM	1	0	12.49	0-1	0
	1717.5	20025	15	16QAM	1	36	12.48	0-1	0
	1717.5	20025	15	16QAM	1	74	12.46	0-1	0
	1717.5	20025	15	16QAM	36	0	12.64	0-2	0
	1717.5	20025	15	16QAM	36	18	12.65	0-2	0
	1717.5	20025	15	16QAM	36	37	12.64	0-2	0
	1717.5	20025	15	16QAM	75	0	12.73	0-2	0
Mid	1732.5	20175	15	QPSK	1	0	12.64	0	0
	1732.5	20175	15	QPSK	1	36	12.75	0	0
	1732.5	20175	15	QPSK	1	74	12.82	0	0
	1732.5	20175	15	QPSK	36	0	12.79	0-1	0
	1732.5	20175	15	QPSK	36	18	12.83	0-1	0
	1732.5	20175	15	QPSK	36	37	12.80	0-1	0
	1732.5	20175	15	QPSK	75	0	12.81	0-1	0
	1732.5	20175	15	16QAM	1	0	12.64	0-1	0
	1732.5	20175	15	16QAM	1	36	12.62	0-1	0
	1732.5	20175	15	16QAM	1	74	12.70	0-1	0
	1732.5	20175	15	16QAM	36	0	12.82	0-2	0
	1732.5	20175	15	16QAM	36	18	12.77	0-2	0
	1732.5	20175	15	16QAM	36	37	12.81	0-2	0
	1732.5	20175	15	16QAM	75	0	12.79	0-2	0
High	1747.5	20325	15	QPSK	1	0	12.85	0	0
	1747.5	20325	15	QPSK	1	36	12.86	0	0
	1747.5	20325	15	QPSK	1	74	12.83	0	0
	1747.5	20325	15	QPSK	36	0	12.73	0-1	0
	1747.5	20325	15	QPSK	36	18	12.74	0-1	0
	1747.5	20325	15	QPSK	36	37	12.88	0-1	0
	1747.5	20325	15	QPSK	75	0	12.85	0-1	0
	1747.5	20325	15	16QAM	1	0	12.63	0-1	0
	1747.5	20325	15	16QAM	1	36	12.61	0-1	0
	1747.5	20325	15	16QAM	1	74	12.66	0-1	0
	1747.5	20325	15	16QAM	36	0	12.76	0-2	0
	1747.5	20325	15	16QAM	36	18	12.75	0-2	0
	1747.5	20325	15	16QAM	36	37	12.84	0-2	0
	1747.5	20325	15	16QAM	75	0	12.72	0-2	0

Table 8-29
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.60	0	0
	1715	20000	10	QPSK	1	25	12.58	0	0
	1715	20000	10	QPSK	1	49	12.69	0	0
	1715	20000	10	QPSK	25	0	12.65	0-1	0
	1715	20000	10	QPSK	25	12	12.71	0-1	0
	1715	20000	10	QPSK	25	25	12.77	0-1	0
	1715	20000	10	QPSK	50	0	12.74	0-1	0
	1715	20000	10	16QAM	1	0	12.44	0-1	0
	1715	20000	10	16QAM	1	25	12.51	0-1	0
	1715	20000	10	16QAM	1	49	12.43	0-1	0
	1715	20000	10	16QAM	25	0	12.67	0-2	0
	1715	20000	10	16QAM	25	12	12.69	0-2	0
	1715	20000	10	16QAM	25	25	12.67	0-2	0
	1715	20000	10	16QAM	50	0	12.69	0-2	0
Mid	1732.5	20175	10	QPSK	1	0	12.69	0	0
	1732.5	20175	10	QPSK	1	25	12.75	0	0
	1732.5	20175	10	QPSK	1	49	12.82	0	0
	1732.5	20175	10	QPSK	25	0	12.77	0-1	0
	1732.5	20175	10	QPSK	25	12	12.78	0-1	0
	1732.5	20175	10	QPSK	25	25	12.77	0-1	0
	1732.5	20175	10	QPSK	50	0	12.85	0-1	0
	1732.5	20175	10	16QAM	1	0	12.62	0-1	0
	1732.5	20175	10	16QAM	1	25	12.63	0-1	0
	1732.5	20175	10	16QAM	1	49	12.66	0-1	0
	1732.5	20175	10	16QAM	25	0	12.81	0-2	0
	1732.5	20175	10	16QAM	25	12	12.82	0-2	0
	1732.5	20175	10	16QAM	25	25	12.76	0-2	0
	1732.5	20175	10	16QAM	50	0	12.75	0-2	0
High	1750	20350	10	QPSK	1	0	12.83	0	0
	1750	20350	10	QPSK	1	25	12.89	0	0
	1750	20350	10	QPSK	1	49	12.78	0	0
	1750	20350	10	QPSK	25	0	12.74	0-1	0
	1750	20350	10	QPSK	25	12	12.72	0-1	0
	1750	20350	10	QPSK	25	25	12.89	0-1	0
	1750	20350	10	QPSK	50	0	12.83	0-1	0
	1750	20350	10	16QAM	1	0	12.66	0-1	0
	1750	20350	10	16QAM	1	25	12.63	0-1	0
	1750	20350	10	16QAM	1	49	12.63	0-1	0
	1750	20350	10	16QAM	25	0	12.81	0-2	0
	1750	20350	10	16QAM	25	12	12.79	0-2	0
	1750	20350	10	16QAM	25	25	12.81	0-2	0
	1750	20350	10	16QAM	50	0	12.77	0-2	0

Table 8-30
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.69	0	0
	1712.5	19975	5	QPSK	1	12	12.64	0	0
	1712.5	19975	5	QPSK	1	24	12.63	0	0
	1712.5	19975	5	QPSK	12	0	12.72	0-1	0
	1712.5	19975	5	QPSK	12	6	12.75	0-1	0
	1712.5	19975	5	QPSK	12	13	12.78	0-1	0
	1712.5	19975	5	QPSK	25	0	12.70	0-1	0
	1712.5	19975	5	16-QAM	1	0	12.45	0-1	0
	1712.5	19975	5	16-QAM	1	12	12.52	0-1	0
	1712.5	19975	5	16-QAM	1	24	12.47	0-1	0
	1712.5	19975	5	16-QAM	12	0	12.64	0-2	0
	1712.5	19975	5	16-QAM	12	6	12.65	0-2	0
	1712.5	19975	5	16-QAM	12	13	12.61	0-2	0
	1712.5	19975	5	16-QAM	25	0	12.76	0-2	0
Mid	1732.5	20175	5	QPSK	1	0	12.60	0	0
	1732.5	20175	5	QPSK	1	12	12.73	0	0
	1732.5	20175	5	QPSK	1	24	12.77	0	0
	1732.5	20175	5	QPSK	12	0	12.75	0-1	0
	1732.5	20175	5	QPSK	12	6	12.80	0-1	0
	1732.5	20175	5	QPSK	12	13	12.76	0-1	0
	1732.5	20175	5	QPSK	25	0	12.80	0-1	0
	1732.5	20175	5	16-QAM	1	0	12.69	0-1	0
	1732.5	20175	5	16-QAM	1	12	12.64	0-1	0
	1732.5	20175	5	16-QAM	1	24	12.71	0-1	0
	1732.5	20175	5	16-QAM	12	0	12.87	0-2	0
	1732.5	20175	5	16-QAM	12	6	12.81	0-2	0
	1732.5	20175	5	16-QAM	12	13	12.78	0-2	0
	1732.5	20175	5	16-QAM	25	0	12.78	0-2	0
High	1752.5	20375	5	QPSK	1	0	12.80	0	0
	1752.5	20375	5	QPSK	1	12	12.88	0	0
	1752.5	20375	5	QPSK	1	24	12.80	0	0
	1752.5	20375	5	QPSK	12	0	12.72	0-1	0
	1752.5	20375	5	QPSK	12	6	12.74	0-1	0
	1752.5	20375	5	QPSK	12	13	12.89	0-1	0
	1752.5	20375	5	QPSK	25	0	12.84	0-1	0
	1752.5	20375	5	16-QAM	1	0	12.63	0-1	0
	1752.5	20375	5	16-QAM	1	12	12.61	0-1	0
	1752.5	20375	5	16-QAM	1	24	12.69	0-1	0
	1752.5	20375	5	16-QAM	12	0	12.73	0-2	0
	1752.5	20375	5	16-QAM	12	6	12.73	0-2	0
	1752.5	20375	5	16-QAM	12	13	12.87	0-2	0
	1752.5	20375	5	16-QAM	25	0	12.70	0-2	0

Table 8-31
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.61	0	0
	1711.5	19965	3	QPSK	1	7	12.60	0	0
	1711.5	19965	3	QPSK	1	14	12.67	0	0
	1711.5	19965	3	QPSK	8	0	12.70	0-1	0
	1711.5	19965	3	QPSK	8	4	12.69	0-1	0
	1711.5	19965	3	QPSK	8	7	12.74	0-1	0
	1711.5	19965	3	QPSK	15	0	12.77	0-1	0
	1711.5	19965	3	16-QAM	1	0	12.45	0-1	0
	1711.5	19965	3	16-QAM	1	7	12.50	0-1	0
	1711.5	19965	3	16-QAM	1	14	12.50	0-1	0
	1711.5	19965	3	16-QAM	8	0	12.63	0-2	0
	1711.5	19965	3	16-QAM	8	4	12.63	0-2	0
	1711.5	19965	3	16-QAM	8	7	12.65	0-2	0
	1711.5	19965	3	16-QAM	15	0	12.74	0-2	0
Mid	1732.5	20175	3	QPSK	1	0	12.65	0	0
	1732.5	20175	3	QPSK	1	7	12.80	0	0
	1732.5	20175	3	QPSK	1	14	12.83	0	0
	1732.5	20175	3	QPSK	8	0	12.77	0-1	0
	1732.5	20175	3	QPSK	8	4	12.79	0-1	0
	1732.5	20175	3	QPSK	8	7	12.78	0-1	0
	1732.5	20175	3	QPSK	15	0	12.83	0-1	0
	1732.5	20175	3	16-QAM	1	0	12.59	0-1	0
	1732.5	20175	3	16-QAM	1	7	12.62	0-1	0
	1732.5	20175	3	16-QAM	1	14	12.75	0-1	0
	1732.5	20175	3	16-QAM	8	0	12.81	0-2	0
	1732.5	20175	3	16-QAM	8	4	12.82	0-2	0
	1732.5	20175	3	16-QAM	8	7	12.86	0-2	0
	1732.5	20175	3	16-QAM	15	0	12.77	0-2	0
High	1753.5	20385	3	QPSK	1	0	12.82	0	0
	1753.5	20385	3	QPSK	1	7	12.90	0	0
	1753.5	20385	3	QPSK	1	14	12.80	0	0
	1753.5	20385	3	QPSK	8	0	12.68	0-1	0
	1753.5	20385	3	QPSK	8	4	12.75	0-1	0
	1753.5	20385	3	QPSK	8	7	12.88	0-1	0
	1753.5	20385	3	QPSK	15	0	12.86	0-1	0
	1753.5	20385	3	16-QAM	1	0	12.59	0-1	0
	1753.5	20385	3	16-QAM	1	7	12.66	0-1	0
	1753.5	20385	3	16-QAM	1	14	12.69	0-1	0
	1753.5	20385	3	16-QAM	8	0	12.77	0-2	0
	1753.5	20385	3	16-QAM	8	4	12.74	0-2	0
	1753.5	20385	3	16-QAM	8	7	12.89	0-2	0
	1753.5	20385	3	16-QAM	15	0	12.72	0-2	0

Table 8-32
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	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	12.60	0	0
	1710.7	19957	1.4	QPSK	1	2	12.66	0	0
	1710.7	19957	1.4	QPSK	1	5	12.70	0	0
	1710.7	19957	1.4	QPSK	3	0	12.66	0	0
	1710.7	19957	1.4	QPSK	3	2	12.74	0	0
	1710.7	19957	1.4	QPSK	3	3	12.74	0	0
	1710.7	19957	1.4	QPSK	6	0	12.74	0-1	0
	1710.7	19957	1.4	16-QAM	1	0	12.54	0-1	0
	1710.7	19957	1.4	16-QAM	1	2	12.44	0-1	0
	1710.7	19957	1.4	16-QAM	1	5	12.47	0-1	0
	1710.7	19957	1.4	16-QAM	3	0	12.60	0-1	0
	1710.7	19957	1.4	16-QAM	3	2	12.60	0-1	0
	1710.7	19957	1.4	16-QAM	3	3	12.63	0-1	0
	1710.7	19957	1.4	16-QAM	6	0	12.76	0-2	0
Mid	1732.5	20175	1.4	QPSK	1	0	12.69	0	0
	1732.5	20175	1.4	QPSK	1	2	12.75	0	0
	1732.5	20175	1.4	QPSK	1	5	12.84	0	0
	1732.5	20175	1.4	QPSK	3	0	12.82	0	0
	1732.5	20175	1.4	QPSK	3	2	12.79	0	0
	1732.5	20175	1.4	QPSK	3	3	12.85	0	0
	1732.5	20175	1.4	QPSK	6	0	12.76	0-1	0
	1732.5	20175	1.4	16-QAM	1	0	12.63	0-1	0
	1732.5	20175	1.4	16-QAM	1	2	12.59	0-1	0
	1732.5	20175	1.4	16-QAM	1	5	12.74	0-1	0
	1732.5	20175	1.4	16-QAM	3	0	12.81	0-1	0
	1732.5	20175	1.4	16-QAM	3	2	12.81	0-1	0
	1732.5	20175	1.4	16-QAM	3	3	12.81	0-1	0
	1732.5	20175	1.4	16-QAM	6	0	12.84	0-2	0
High	1754.3	20393	1.4	QPSK	1	0	12.83	0	0
	1754.3	20393	1.4	QPSK	1	2	12.90	0	0
	1754.3	20393	1.4	QPSK	1	5	12.81	0	0
	1754.3	20393	1.4	QPSK	3	0	12.72	0	0
	1754.3	20393	1.4	QPSK	3	2	12.77	0	0
	1754.3	20393	1.4	QPSK	3	3	12.90	0	0
	1754.3	20393	1.4	QPSK	6	0	12.83	0-1	0
	1754.3	20393	1.4	16-QAM	1	0	12.67	0-1	0
	1754.3	20393	1.4	16-QAM	1	2	12.59	0-1	0
	1754.3	20393	1.4	16-QAM	1	5	12.65	0-1	0
	1754.3	20393	1.4	16-QAM	3	0	12.81	0-1	0
	1754.3	20393	1.4	16-QAM	3	2	12.77	0-1	0
	1754.3	20393	1.4	16-QAM	3	3	12.80	0-1	0
	1754.3	20393	1.4	16-QAM	6	0	12.67	0-2	0

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Table 8-33
LTE Band 25 (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	26140	20	QPSK	1	0	23.34	0	0
	1860	26140	20	QPSK	1	50	23.33	0	0
	1860	26140	20	QPSK	1	99	23.36	0	0
	1860	26140	20	QPSK	50	0	22.17	0-1	1
	1860	26140	20	QPSK	50	25	22.16	0-1	1
	1860	26140	20	QPSK	50	50	22.11	0-1	1
	1860	26140	20	QPSK	100	0	22.15	0-1	1
	1860	26140	20	16QAM	1	0	21.91	0-1	1
	1860	26140	20	16QAM	1	50	21.80	0-1	1
	1860	26140	20	16QAM	1	99	21.82	0-1	1
	1860	26140	20	16QAM	50	0	21.05	0-2	2
	1860	26140	20	16QAM	50	25	21.11	0-2	2
	1860	26140	20	16QAM	50	50	21.10	0-2	2
	1860	26140	20	16QAM	100	0	21.07	0-2	2
Mid	1882.5	26365	20	QPSK	1	0	**23.44**	0	0
	1882.5	26365	20	QPSK	1	50	23.28	0	0
	1882.5	26365	20	QPSK	1	99	23.27	0	0
	1882.5	26365	20	QPSK	50	0	22.14	0-1	1
	1882.5	26365	20	QPSK	50	25	**22.23**	0-1	1
	1882.5	26365	20	QPSK	50	50	22.16	0-1	1
	1882.5	26365	20	QPSK	100	0	22.19	0-1	1
	1882.5	26365	20	16QAM	1	0	21.96	0-1	1
	1882.5	26365	20	16QAM	1	50	21.78	0-1	1
	1882.5	26365	20	16QAM	1	99	21.75	0-1	1
	1882.5	26365	20	16QAM	50	0	21.08	0-2	2
	1882.5	26365	20	16QAM	50	25	21.15	0-2	2
	1882.5	26365	20	16QAM	50	50	21.10	0-2	2
	1882.5	26365	20	16QAM	100	0	21.14	0-2	2
High	1905	26590	20	QPSK	1	0	23.27	0	0
	1905	26590	20	QPSK	1	50	23.37	0	0
	1905	26590	20	QPSK	1	99	23.32	0	0
	1905	26590	20	QPSK	50	0	22.08	0-1	1
	1905	26590	20	QPSK	50	25	22.17	0-1	1
	1905	26590	20	QPSK	50	50	22.19	0-1	1
	1905	26590	20	QPSK	100	0	22.10	0-1	1
	1905	26590	20	16QAM	1	0	21.80	0-1	1
	1905	26590	20	16QAM	1	50	21.87	0-1	1
	1905	26590	20	16QAM	1	99	21.75	0-1	1
	1905	26590	20	16QAM	50	0	21.08	0-2	2
	1905	26590	20	16QAM	50	25	21.14	0-2	2
	1905	26590	20	16QAM	50	50	21.10	0-2	2
	1905	26590	20	16QAM	100	0	21.17	0-2	2

Table 8-34
LTE Band 25 (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	26115	15	QPSK	1	0	23.35	0	0
	1857.5	26115	15	QPSK	1	36	23.11	0	0
	1857.5	26115	15	QPSK	1	74	23.38	0	0
	1857.5	26115	15	QPSK	36	0	22.27	0-1	1
	1857.5	26115	15	QPSK	36	18	22.30	0-1	1
	1857.5	26115	15	QPSK	36	37	22.34	0-1	1
	1857.5	26115	15	QPSK	75	0	22.37	0-1	1
	1857.5	26115	15	16QAM	1	0	22.27	0-1	1
	1857.5	26115	15	16QAM	1	36	21.98	0-1	1
	1857.5	26115	15	16QAM	1	74	22.08	0-1	1
	1857.5	26115	15	16QAM	36	0	21.25	0-2	2
	1857.5	26115	15	16QAM	36	18	21.22	0-2	2
	1857.5	26115	15	16QAM	36	37	21.25	0-2	2
	1857.5	26115	15	16QAM	75	0	21.38	0-2	2
Mid	1882.5	26365	15	QPSK	1	0	23.40	0	0
	1882.5	26365	15	QPSK	1	36	23.41	0	0
	1882.5	26365	15	QPSK	1	74	23.41	0	0
	1882.5	26365	15	QPSK	36	0	22.41	0-1	1
	1882.5	26365	15	QPSK	36	18	22.39	0-1	1
	1882.5	26365	15	QPSK	36	37	22.36	0-1	1
	1882.5	26365	15	QPSK	75	0	22.37	0-1	1
	1882.5	26365	15	16QAM	1	0	22.32	0-1	1
	1882.5	26365	15	16QAM	1	36	22.31	0-1	1
	1882.5	26365	15	16QAM	1	74	22.17	0-1	1
	1882.5	26365	15	16QAM	36	0	21.43	0-2	2
	1882.5	26365	15	16QAM	36	18	21.41	0-2	2
	1882.5	26365	15	16QAM	36	37	21.33	0-2	2
	1882.5	26365	15	16QAM	75	0	21.35	0-2	2
High	1907.5	26615	15	QPSK	1	0	23.29	0	0
	1907.5	26615	15	QPSK	1	36	23.30	0	0
	1907.5	26615	15	QPSK	1	74	23.33	0	0
	1907.5	26615	15	QPSK	36	0	22.40	0-1	1
	1907.5	26615	15	QPSK	36	18	22.41	0-1	1
	1907.5	26615	15	QPSK	36	37	22.44	0-1	1
	1907.5	26615	15	QPSK	75	0	22.34	0-1	1
	1907.5	26615	15	16QAM	1	0	22.11	0-1	1
	1907.5	26615	15	16QAM	1	36	22.05	0-1	1
	1907.5	26615	15	16QAM	1	74	22.18	0-1	1
	1907.5	26615	15	16QAM	36	0	21.44	0-2	2
	1907.5	26615	15	16QAM	36	18	21.43	0-2	2
	1907.5	26615	15	16QAM	36	37	21.45	0-2	2
	1907.5	26615	15	16QAM	75	0	21.33	0-2	2

Table 8-35
LTE Band 25 (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	26090	10	QPSK	1	0	23.34	0	0
	1855	26090	10	QPSK	1	25	23.22	0	0
	1855	26090	10	QPSK	1	49	23.36	0	0
	1855	26090	10	QPSK	25	0	22.27	0-1	1
	1855	26090	10	QPSK	25	12	22.31	0-1	1
	1855	26090	10	QPSK	25	25	22.34	0-1	1
	1855	26090	10	QPSK	50	0	22.26	0-1	1
	1855	26090	10	16QAM	1	0	22.13	0-1	1
	1855	26090	10	16QAM	1	25	22.33	0-1	1
	1855	26090	10	16QAM	1	49	22.13	0-1	1
	1855	26090	10	16QAM	25	0	21.31	0-2	2
	1855	26090	10	16QAM	25	12	21.29	0-2	2
	1855	26090	10	16QAM	25	25	21.35	0-2	2
	1855	26090	10	16QAM	50	0	21.36	0-2	2
Mid	1882.5	26365	10	QPSK	1	0	23.39	0	0
	1882.5	26365	10	QPSK	1	25	23.38	0	0
	1882.5	26365	10	QPSK	1	49	23.34	0	0
	1882.5	26365	10	QPSK	25	0	22.35	0-1	1
	1882.5	26365	10	QPSK	25	12	22.34	0-1	1
	1882.5	26365	10	QPSK	25	25	22.29	0-1	1
	1882.5	26365	10	QPSK	50	0	22.44	0-1	1
	1882.5	26365	10	16QAM	1	0	22.38	0-1	1
	1882.5	26365	10	16QAM	1	25	22.13	0-1	1
	1882.5	26365	10	16QAM	1	49	22.27	0-1	1
	1882.5	26365	10	16QAM	25	0	21.41	0-2	2
	1882.5	26365	10	16QAM	25	12	21.41	0-2	2
	1882.5	26365	10	16QAM	25	25	21.36	0-2	2
	1882.5	26365	10	16QAM	50	0	21.45	0-2	2
High	1910	26640	10	QPSK	1	0	23.33	0	0
	1910	26640	10	QPSK	1	25	23.35	0	0
	1910	26640	10	QPSK	1	49	23.33	0	0
	1910	26640	10	QPSK	25	0	22.38	0-1	1
	1910	26640	10	QPSK	25	12	22.38	0-1	1
	1910	26640	10	QPSK	25	25	22.27	0-1	1
	1910	26640	10	QPSK	50	0	22.34	0-1	1
	1910	26640	10	16QAM	1	0	22.09	0-1	1
	1910	26640	10	16QAM	1	25	22.12	0-1	1
	1910	26640	10	16QAM	1	49	22.22	0-1	1
	1910	26640	10	16QAM	25	0	21.41	0-2	2
	1910	26640	10	16QAM	25	12	21.28	0-2	2
	1910	26640	10	16QAM	25	25	21.31	0-2	2
	1910	26640	10	16QAM	50	0	21.29	0-2	2

Table 8-36
LTE Band 25 (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	26065	5	QPSK	1	0	23.37	0	0
	1852.5	26065	5	QPSK	1	12	23.32	0	0
	1852.5	26065	5	QPSK	1	24	23.30	0	0
	1852.5	26065	5	QPSK	12	0	22.34	0-1	1
	1852.5	26065	5	QPSK	12	6	22.25	0-1	1
	1852.5	26065	5	QPSK	12	13	22.26	0-1	1
	1852.5	26065	5	QPSK	25	0	22.27	0-1	1
	1852.5	26065	5	16-QAM	1	0	22.28	0-1	1
	1852.5	26065	5	16-QAM	1	12	22.08	0-1	1
	1852.5	26065	5	16-QAM	1	24	22.18	0-1	1
	1852.5	26065	5	16-QAM	12	0	21.27	0-2	2
	1852.5	26065	5	16-QAM	12	6	21.22	0-2	2
	1852.5	26065	5	16-QAM	12	13	21.27	0-2	2
	1852.5	26065	5	16-QAM	25	0	21.25	0-2	2
Mid	1882.5	26365	5	QPSK	1	0	23.36	0	0
	1882.5	26365	5	QPSK	1	12	23.33	0	0
	1882.5	26365	5	QPSK	1	24	23.26	0	0
	1882.5	26365	5	QPSK	12	0	22.40	0-1	1
	1882.5	26365	5	QPSK	12	6	22.39	0-1	1
	1882.5	26365	5	QPSK	12	13	22.27	0-1	1
	1882.5	26365	5	QPSK	25	0	22.31	0-1	1
	1882.5	26365	5	16-QAM	1	0	22.13	0-1	1
	1882.5	26365	5	16-QAM	1	12	22.07	0-1	1
	1882.5	26365	5	16-QAM	1	24	22.15	0-1	1
	1882.5	26365	5	16-QAM	12	0	21.31	0-2	2
	1882.5	26365	5	16-QAM	12	6	21.34	0-2	2
	1882.5	26365	5	16-QAM	12	13	21.29	0-2	2
	1882.5	26365	5	16-QAM	25	0	21.28	0-2	2
High	1912.5	26665	5	QPSK	1	0	23.35	0	0
	1912.5	26665	5	QPSK	1	12	23.30	0	0
	1912.5	26665	5	QPSK	1	24	23.29	0	0
	1912.5	26665	5	QPSK	12	0	22.32	0-1	1
	1912.5	26665	5	QPSK	12	6	22.24	0-1	1
	1912.5	26665	5	QPSK	12	13	22.32	0-1	1
	1912.5	26665	5	QPSK	25	0	22.26	0-1	1
	1912.5	26665	5	16-QAM	1	0	22.28	0-1	1
	1912.5	26665	5	16-QAM	1	12	22.08	0-1	1
	1912.5	26665	5	16-QAM	1	24	22.20	0-1	1
	1912.5	26665	5	16-QAM	12	0	21.35	0-2	2
	1912.5	26665	5	16-QAM	12	6	21.31	0-2	2
	1912.5	26665	5	16-QAM	12	13	21.25	0-2	2
	1912.5	26665	5	16-QAM	25	0	21.27	0-2	2

Table 8-37
LTE Band 25 (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	26055	3	QPSK	1	0	23.33	0	0
	1851.5	26055	3	QPSK	1	7	23.28	0	0
	1851.5	26055	3	QPSK	1	14	23.34	0	0
	1851.5	26055	3	QPSK	8	0	22.37	0-1	1
	1851.5	26055	3	QPSK	8	4	22.29	0-1	1
	1851.5	26055	3	QPSK	8	7	22.33	0-1	1
	1851.5	26055	3	QPSK	15	0	22.30	0-1	1
	1851.5	26055	3	16-QAM	1	0	22.28	0-1	1
	1851.5	26055	3	16-QAM	1	7	22.19	0-1	1
	1851.5	26055	3	16-QAM	1	14	22.22	0-1	1
	1851.5	26055	3	16-QAM	8	0	21.24	0-2	2
	1851.5	26055	3	16-QAM	8	4	21.12	0-2	2
	1851.5	26055	3	16-QAM	8	7	21.25	0-2	2
	1851.5	26055	3	16-QAM	15	0	21.20	0-2	2
Mid	1882.5	26365	3	QPSK	1	0	23.38	0	0
	1882.5	26365	3	QPSK	1	7	23.32	0	0
	1882.5	26365	3	QPSK	1	14	23.40	0	0
	1882.5	26365	3	QPSK	8	0	22.40	0-1	1
	1882.5	26365	3	QPSK	8	4	22.28	0-1	1
	1882.5	26365	3	QPSK	8	7	22.29	0-1	1
	1882.5	26365	3	QPSK	15	0	22.31	0-1	1
	1882.5	26365	3	16-QAM	1	0	22.37	0-1	1
	1882.5	26365	3	16-QAM	1	7	22.36	0-1	1
	1882.5	26365	3	16-QAM	1	14	22.24	0-1	1
	1882.5	26365	3	16-QAM	8	0	21.28	0-2	2
	1882.5	26365	3	16-QAM	8	4	21.14	0-2	2
	1882.5	26365	3	16-QAM	8	7	21.24	0-2	2
	1882.5	26365	3	16-QAM	15	0	21.31	0-2	2
High	1913.5	26675	3	QPSK	1	0	23.44	0	0
	1913.5	26675	3	QPSK	1	7	23.37	0	0
	1913.5	26675	3	QPSK	1	14	23.44	0	0
	1913.5	26675	3	QPSK	8	0	22.31	0-1	1
	1913.5	26675	3	QPSK	8	4	22.20	0-1	1
	1913.5	26675	3	QPSK	8	7	22.27	0-1	1
	1913.5	26675	3	QPSK	15	0	22.25	0-1	1
	1913.5	26675	3	16-QAM	1	0	22.03	0-1	1
	1913.5	26675	3	16-QAM	1	7	22.03	0-1	1
	1913.5	26675	3	16-QAM	1	14	22.09	0-1	1
	1913.5	26675	3	16-QAM	8	0	21.27	0-2	2
	1913.5	26675	3	16-QAM	8	4	21.22	0-2	2
	1913.5	26675	3	16-QAM	8	7	21.26	0-2	2
	1913.5	26675	3	16-QAM	15	0	21.38	0-2	2

Table 8-38
LTE Band 25 (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	26047	1.4	QPSK	1	0	23.36	0	0
	1850.7	26047	1.4	QPSK	1	2	23.34	0	0
	1850.7	26047	1.4	QPSK	1	5	23.35	0	0
	1850.7	26047	1.4	QPSK	3	0	23.34	0	0
	1850.7	26047	1.4	QPSK	3	2	23.35	0	0
	1850.7	26047	1.4	QPSK	3	3	23.32	0	0
	1850.7	26047	1.4	QPSK	6	0	22.33	0-1	1
	1850.7	26047	1.4	16-QAM	1	0	22.39	0-1	1
	1850.7	26047	1.4	16-QAM	1	2	22.31	0-1	1
	1850.7	26047	1.4	16-QAM	1	5	22.12	0-1	1
	1850.7	26047	1.4	16-QAM	3	0	22.00	0-1	1
	1850.7	26047	1.4	16-QAM	3	2	22.22	0-1	1
	1850.7	26047	1.4	16-QAM	3	3	21.93	0-1	1
	1850.7	26047	1.4	16-QAM	6	0	21.27	0-2	2
Mid	1882.5	26365	1.4	QPSK	1	0	23.40	0	0
	1882.5	26365	1.4	QPSK	1	2	23.39	0	0
	1882.5	26365	1.4	QPSK	1	5	23.33	0	0
	1882.5	26365	1.4	QPSK	3	0	23.26	0	0
	1882.5	26365	1.4	QPSK	3	2	23.38	0	0
	1882.5	26365	1.4	QPSK	3	3	23.34	0	0
	1882.5	26365	1.4	QPSK	6	0	22.40	0-1	1
	1882.5	26365	1.4	16-QAM	1	0	22.31	0-1	1
	1882.5	26365	1.4	16-QAM	1	2	22.28	0-1	1
	1882.5	26365	1.4	16-QAM	1	5	22.22	0-1	1
	1882.5	26365	1.4	16-QAM	3	0	22.00	0-1	1
	1882.5	26365	1.4	16-QAM	3	2	22.16	0-1	1
	1882.5	26365	1.4	16-QAM	3	3	22.27	0-1	1
	1882.5	26365	1.4	16-QAM	6	0	21.56	0-2	2
High	1914.3	26683	1.4	QPSK	1	0	23.38	0	0
	1914.3	26683	1.4	QPSK	1	2	23.38	0	0
	1914.3	26683	1.4	QPSK	1	5	23.35	0	0
	1914.3	26683	1.4	QPSK	3	0	23.34	0	0
	1914.3	26683	1.4	QPSK	3	2	23.35	0	0
	1914.3	26683	1.4	QPSK	3	3	23.34	0	0
	1914.3	26683	1.4	QPSK	6	0	22.33	0-1	1
	1914.3	26683	1.4	16-QAM	1	0	22.39	0-1	1
	1914.3	26683	1.4	16-QAM	1	2	22.31	0-1	1
	1914.3	26683	1.4	16-QAM	1	5	22.03	0-1	1
	1914.3	26683	1.4	16-QAM	3	0	22.01	0-1	1
	1914.3	26683	1.4	16-QAM	3	2	22.21	0-1	1
	1914.3	26683	1.4	16-QAM	3	3	21.94	0-1	1
	1914.3	26683	1.4	16-QAM	6	0	21.25	0-2	2

Table 8-39
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	26140	20	QPSK	1	0	11.80	0	0
	1860	26140	20	QPSK	1	50	**12.41**	0	0
	1860	26140	20	QPSK	1	99	11.81	0	0
	1860	26140	20	QPSK	50	0	12.11	0-1	0
	1860	26140	20	QPSK	50	25	**12.31**	0-1	0
	1860	26140	20	QPSK	50	50	12.05	0-1	0
	1860	26140	20	QPSK	100	0	12.09	0-1	0
	1860	26140	20	16QAM	1	0	11.63	0-1	0
	1860	26140	20	16QAM	1	50	12.29	0-1	0
	1860	26140	20	16QAM	1	99	11.70	0-1	0
	1860	26140	20	16QAM	50	0	12.08	0-2	0
	1860	26140	20	16QAM	50	25	12.30	0-2	0
	1860	26140	20	16QAM	50	50	12.03	0-2	0
	1860	26140	20	16QAM	100	0	12.06	0-2	0
Mid	1882.5	26365	20	QPSK	1	0	12.05	0	0
	1882.5	26365	20	QPSK	1	50	12.40	0	0
	1882.5	26365	20	QPSK	1	99	11.76	0	0
	1882.5	26365	20	QPSK	50	0	12.19	0-1	0
	1882.5	26365	20	QPSK	50	25	12.30	0-1	0
	1882.5	26365	20	QPSK	50	50	12.00	0-1	0
	1882.5	26365	20	QPSK	100	0	12.07	0-1	0
	1882.5	26365	20	16QAM	1	0	12.00	0-1	0
	1882.5	26365	20	16QAM	1	50	12.31	0-1	0
	1882.5	26365	20	16QAM	1	99	11.64	0-1	0
	1882.5	26365	20	16QAM	50	0	12.13	0-2	0
	1882.5	26365	20	16QAM	50	25	12.29	0-2	0
	1882.5	26365	20	16QAM	50	50	12.01	0-2	0
	1882.5	26365	20	16QAM	100	0	12.07	0-2	0
High	1905	26590	20	QPSK	1	0	11.78	0	0
	1905	26590	20	QPSK	1	50	12.34	0	0
	1905	26590	20	QPSK	1	99	11.89	0	0
	1905	26590	20	QPSK	50	0	12.10	0-1	0
	1905	26590	20	QPSK	50	25	12.27	0-1	0
	1905	26590	20	QPSK	50	50	12.07	0-1	0
	1905	26590	20	QPSK	100	0	12.10	0-1	0
	1905	26590	20	16QAM	1	0	11.69	0-1	0
	1905	26590	20	16QAM	1	50	12.26	0-1	0
	1905	26590	20	16QAM	1	99	11.79	0-1	0
	1905	26590	20	16QAM	50	0	12.09	0-2	0
	1905	26590	20	16QAM	50	25	12.22	0-2	0
	1905	26590	20	16QAM	50	50	12.06	0-2	0
	1905	26590	20	16QAM	100	0	12.09	0-2	0

Table 8-40
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset		MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	26115	15	QPSK	1	0	12.37	0	0
	1857.5	26115	15	QPSK	1	36	12.31	0	0
	1857.5	26115	15	QPSK	1	74	12.27	0	0
	1857.5	26115	15	QPSK	36	0	12.19	0-1	0
	1857.5	26115	15	QPSK	36	18	12.21	0-1	0
	1857.5	26115	15	QPSK	36	37	12.12	0-1	0
	1857.5	26115	15	QPSK	75	0	12.17	0-1	0
	1857.5	26115	15	16QAM	1	0	12.11	0-1	0
	1857.5	26115	15	16QAM	1	36	11.99	0-1	0
	1857.5	26115	15	16QAM	1	74	12.04	0-1	0
	1857.5	26115	15	16QAM	36	0	12.17	0-2	0
	1857.5	26115	15	16QAM	36	18	12.14	0-2	0
	1857.5	26115	15	16QAM	36	37	12.05	0-2	0
	1857.5	26115	15	16QAM	75	0	12.20	0-2	0
Mid	1882.5	26365	15	QPSK	1	0	12.41	0	0
	1882.5	26365	15	QPSK	1	36	12.32	0	0
	1882.5	26365	15	QPSK	1	74	12.23	0	0
	1882.5	26365	15	QPSK	36	0	12.30	0-1	0
	1882.5	26365	15	QPSK	36	18	12.26	0-1	0
	1882.5	26365	15	QPSK	36	37	12.17	0-1	0
	1882.5	26365	15	QPSK	75	0	12.22	0-1	0
	1882.5	26365	15	16QAM	1	0	12.41	0-1	0
	1882.5	26365	15	16QAM	1	36	12.34	0-1	0
	1882.5	26365	15	16QAM	1	74	12.37	0-1	0
	1882.5	26365	15	16QAM	36	0	12.27	0-2	0
	1882.5	26365	15	16QAM	36	18	12.33	0-2	0
	1882.5	26365	15	16QAM	36	37	12.20	0-2	0
	1882.5	26365	15	16QAM	75	0	12.22	0-2	0
High	1907.5	26615	15	QPSK	1	0	12.37	0	0
	1907.5	26615	15	QPSK	1	36	12.34	0	0
	1907.5	26615	15	QPSK	1	74	12.40	0	0
	1907.5	26615	15	QPSK	36	0	12.18	0-1	0
	1907.5	26615	15	QPSK	36	18	12.19	0-1	0
	1907.5	26615	15	QPSK	36	37	12.18	0-1	0
	1907.5	26615	15	QPSK	75	0	12.23	0-1	0
	1907.5	26615	15	16QAM	1	0	12.10	0-1	0
	1907.5	26615	15	16QAM	1	36	12.33	0-1	0
	1907.5	26615	15	16QAM	1	74	12.34	0-1	0
	1907.5	26615	15	16QAM	36	0	12.19	0-2	0
	1907.5	26615	15	16QAM	36	18	12.24	0-2	0
	1907.5	26615	15	16QAM	36	37	12.23	0-2	0
	1907.5	26615	15	16QAM	75	0	12.19	0-2	0

Table 8-41
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	26090	10	QPSK	1	0	12.36	0	0
	1855	26090	10	QPSK	1	25	12.20	0	0
	1855	26090	10	QPSK	1	49	12.34	0	0
	1855	26090	10	QPSK	25	0	12.33	0-1	0
	1855	26090	10	QPSK	25	12	12.31	0-1	0
	1855	26090	10	QPSK	25	25	12.36	0-1	0
	1855	26090	10	QPSK	50	0	12.35	0-1	0
	1855	26090	10	16QAM	1	0	12.41	0-1	0
	1855	26090	10	16QAM	1	25	12.39	0-1	0
	1855	26090	10	16QAM	1	49	12.41	0-1	0
	1855	26090	10	16QAM	25	0	12.38	0-2	0
	1855	26090	10	16QAM	25	12	12.30	0-2	0
	1855	26090	10	16QAM	25	25	12.37	0-2	0
	1855	26090	10	16QAM	50	0	12.37	0-2	0
Mid	1882.5	26365	10	QPSK	1	0	12.41	0	0
	1882.5	26365	10	QPSK	1	25	12.37	0	0
	1882.5	26365	10	QPSK	1	49	12.26	0	0
	1882.5	26365	10	QPSK	25	0	12.37	0-1	0
	1882.5	26365	10	QPSK	25	12	12.36	0-1	0
	1882.5	26365	10	QPSK	25	25	12.39	0-1	0
	1882.5	26365	10	QPSK	50	0	12.33	0-1	0
	1882.5	26365	10	16QAM	1	0	12.31	0-1	0
	1882.5	26365	10	16QAM	1	25	12.22	0-1	0
	1882.5	26365	10	16QAM	1	49	12.39	0-1	0
	1882.5	26365	10	16QAM	25	0	12.35	0-2	0
	1882.5	26365	10	16QAM	25	12	12.31	0-2	0
	1882.5	26365	10	16QAM	25	25	12.35	0-2	0
	1882.5	26365	10	16QAM	50	0	12.32	0-2	0
High	1910	26640	10	QPSK	1	0	12.33	0	0
	1910	26640	10	QPSK	1	25	12.35	0	0
	1910	26640	10	QPSK	1	49	12.39	0	0
	1910	26640	10	QPSK	25	0	12.36	0-1	0
	1910	26640	10	QPSK	25	12	12.33	0-1	0
	1910	26640	10	QPSK	25	25	12.34	0-1	0
	1910	26640	10	QPSK	50	0	12.38	0-1	0
	1910	26640	10	16QAM	1	0	12.38	0-1	0
	1910	26640	10	16QAM	1	25	12.33	0-1	0
	1910	26640	10	16QAM	1	49	12.34	0-1	0
	1910	26640	10	16QAM	25	0	12.37	0-2	0
	1910	26640	10	16QAM	25	12	12.36	0-2	0
	1910	26640	10	16QAM	25	25	12.39	0-2	0
	1910	26640	10	16QAM	50	0	12.33	0-2	0

Table 8-42
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	26065	5	QPSK	1	0	12.31	0	0
	1852.5	26065	5	QPSK	1	12	12.41	0	0
	1852.5	26065	5	QPSK	1	24	12.40	0	0
	1852.5	26065	5	QPSK	12	0	12.37	0-1	0
	1852.5	26065	5	QPSK	12	6	12.36	0-1	0
	1852.5	26065	5	QPSK	12	13	12.34	0-1	0
	1852.5	26065	5	QPSK	25	0	12.38	0-1	0
	1852.5	26065	5	16-QAM	1	0	12.37	0-1	0
	1852.5	26065	5	16-QAM	1	12	12.39	0-1	0
	1852.5	26065	5	16-QAM	1	24	12.37	0-1	0
	1852.5	26065	5	16-QAM	12	0	12.35	0-2	0
	1852.5	26065	5	16-QAM	12	6	12.38	0-2	0
	1852.5	26065	5	16-QAM	12	13	12.34	0-2	0
	1852.5	26065	5	16-QAM	25	0	12.31	0-2	0
Mid	1882.5	26365	5	QPSK	1	0	12.33	0	0
	1882.5	26365	5	QPSK	1	12	12.34	0	0
	1882.5	26365	5	QPSK	1	24	12.35	0	0
	1882.5	26365	5	QPSK	12	0	12.35	0-1	0
	1882.5	26365	5	QPSK	12	6	12.40	0-1	0
	1882.5	26365	5	QPSK	12	13	12.40	0-1	0
	1882.5	26365	5	QPSK	25	0	12.41	0-1	0
	1882.5	26365	5	16-QAM	1	0	12.31	0-1	0
	1882.5	26365	5	16-QAM	1	12	12.38	0-1	0
	1882.5	26365	5	16-QAM	1	24	12.39	0-1	0
	1882.5	26365	5	16-QAM	12	0	12.37	0-2	0
	1882.5	26365	5	16-QAM	12	6	12.35	0-2	0
	1882.5	26365	5	16-QAM	12	13	12.40	0-2	0
	1882.5	26365	5	16-QAM	25	0	12.34	0-2	0
High	1912.5	26665	5	QPSK	1	0	12.38	0	0
	1912.5	26665	5	QPSK	1	12	12.40	0	0
	1912.5	26665	5	QPSK	1	24	12.34	0	0
	1912.5	26665	5	QPSK	12	0	12.33	0-1	0
	1912.5	26665	5	QPSK	12	6	12.31	0-1	0
	1912.5	26665	5	QPSK	12	13	12.28	0-1	0
	1912.5	26665	5	QPSK	25	0	12.32	0-1	0
	1912.5	26665	5	16-QAM	1	0	12.31	0-1	0
	1912.5	26665	5	16-QAM	1	12	12.37	0-1	0
	1912.5	26665	5	16-QAM	1	24	12.40	0-1	0
	1912.5	26665	5	16-QAM	12	0	12.32	0-2	0
	1912.5	26665	5	16-QAM	12	6	12.30	0-2	0
	1912.5	26665	5	16-QAM	12	13	12.31	0-2	0
	1912.5	26665	5	16-QAM	25	0	12.24	0-2	0

Table 8-43
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	26055	3	QPSK	1	0	12.34	0	0
	1851.5	26055	3	QPSK	1	7	12.40	0	0
	1851.5	26055	3	QPSK	1	14	12.41	0	0
	1851.5	26055	3	QPSK	8	0	12.38	0-1	0
	1851.5	26055	3	QPSK	8	4	12.37	0-1	0
	1851.5	26055	3	QPSK	8	7	12.34	0-1	0
	1851.5	26055	3	QPSK	15	0	12.38	0-1	0
	1851.5	26055	3	16-QAM	1	0	12.37	0-1	0
	1851.5	26055	3	16-QAM	1	7	12.39	0-1	0
	1851.5	26055	3	16-QAM	1	14	12.37	0-1	0
	1851.5	26055	3	16-QAM	8	0	12.35	0-2	0
	1851.5	26055	3	16-QAM	8	4	12.38	0-2	0
	1851.5	26055	3	16-QAM	8	7	12.34	0-2	0
	1851.5	26055	3	16-QAM	15	0	12.31	0-2	0
Mid	1882.5	26365	3	QPSK	1	0	12.33	0	0
	1882.5	26365	3	QPSK	1	7	12.34	0	0
	1882.5	26365	3	QPSK	1	14	12.35	0	0
	1882.5	26365	3	QPSK	8	0	12.35	0-1	0
	1882.5	26365	3	QPSK	8	4	12.38	0-1	0
	1882.5	26365	3	QPSK	8	7	12.40	0-1	0
	1882.5	26365	3	QPSK	15	0	12.41	0-1	0
	1882.5	26365	3	16-QAM	1	0	12.31	0-1	0
	1882.5	26365	3	16-QAM	1	7	12.37	0-1	0
	1882.5	26365	3	16-QAM	1	14	12.39	0-1	0
	1882.5	26365	3	16-QAM	8	0	12.36	0-2	0
	1882.5	26365	3	16-QAM	8	4	12.35	0-2	0
	1882.5	26365	3	16-QAM	8	7	12.40	0-2	0
	1882.5	26365	3	16-QAM	15	0	12.32	0-2	0
High	1913.5	26675	3	QPSK	1	0	12.38	0	0
	1913.5	26675	3	QPSK	1	7	12.40	0	0
	1913.5	26675	3	QPSK	1	14	12.33	0	0
	1913.5	26675	3	QPSK	8	0	12.33	0-1	0
	1913.5	26675	3	QPSK	8	4	12.28	0-1	0
	1913.5	26675	3	QPSK	8	7	12.28	0-1	0
	1913.5	26675	3	QPSK	15	0	12.30	0-1	0
	1913.5	26675	3	16-QAM	1	0	12.31	0-1	0
	1913.5	26675	3	16-QAM	1	7	12.37	0-1	0
	1913.5	26675	3	16-QAM	1	14	12.40	0-1	0
	1913.5	26675	3	16-QAM	8	0	12.30	0-2	0
	1913.5	26675	3	16-QAM	8	4	12.30	0-2	0
	1913.5	26675	3	16-QAM	8	7	12.34	0-2	0
	1913.5	26675	3	16-QAM	15	0	12.24	0-2	0

Table 8-44
LTE Band 25 (PCS) Conducted Powers -1.4 MHz Bandwidth
Reduced Power – Body at 0.0 cm

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	26047	1.4	QPSK	1	0	12.36	0	0
	1850.7	26047	1.4	QPSK	1	2	12.40	0	0
	1850.7	26047	1.4	QPSK	1	5	12.41	0	0
	1850.7	26047	1.4	QPSK	3	0	12.33	0	0
	1850.7	26047	1.4	QPSK	3	2	12.37	0	0
	1850.7	26047	1.4	QPSK	3	3	12.34	0	0
	1850.7	26047	1.4	QPSK	6	0	12.40	0-1	0
	1850.7	26047	1.4	16-QAM	1	0	12.37	0-1	0
	1850.7	26047	1.4	16-QAM	1	2	12.38	0-1	0
	1850.7	26047	1.4	16-QAM	1	5	12.37	0-1	0
	1850.7	26047	1.4	16-QAM	3	0	12.40	0-1	0
	1850.7	26047	1.4	16-QAM	3	2	12.38	0-1	0
	1850.7	26047	1.4	16-QAM	3	3	12.33	0-1	0
	1850.7	26047	1.4	16-QAM	6	0	12.31	0-2	0
Mid	1882.5	26365	1.4	QPSK	1	0	12.33	0	0
	1882.5	26365	1.4	QPSK	1	2	12.36	0	0
	1882.5	26365	1.4	QPSK	1	5	12.35	0	0
	1882.5	26365	1.4	QPSK	3	0	12.37	0	0
	1882.5	26365	1.4	QPSK	3	2	12.38	0	0
	1882.5	26365	1.4	QPSK	3	3	12.40	0	0
	1882.5	26365	1.4	QPSK	6	0	12.30	0-1	0
	1882.5	26365	1.4	16-QAM	1	0	12.31	0-1	0
	1882.5	26365	1.4	16-QAM	1	2	12.34	0-1	0
	1882.5	26365	1.4	16-QAM	1	5	12.39	0-1	0
	1882.5	26365	1.4	16-QAM	3	0	12.38	0-1	0
	1882.5	26365	1.4	16-QAM	3	2	12.35	0-1	0
	1882.5	26365	1.4	16-QAM	3	3	12.32	0-1	0
	1882.5	26365	1.4	16-QAM	6	0	12.32	0-2	0
High	1914.3	26683	1.4	QPSK	1	0	12.38	0	0
	1914.3	26683	1.4	QPSK	1	2	12.37	0	0
	1914.3	26683	1.4	QPSK	1	5	12.33	0	0
	1914.3	26683	1.4	QPSK	3	0	12.33	0	0
	1914.3	26683	1.4	QPSK	3	2	12.28	0	0
	1914.3	26683	1.4	QPSK	3	3	12.38	0	0
	1914.3	26683	1.4	QPSK	6	0	12.30	0-1	0
	1914.3	26683	1.4	16-QAM	1	0	12.33	0-1	0
	1914.3	26683	1.4	16-QAM	1	2	12.36	0-1	0
	1914.3	26683	1.4	16-QAM	1	5	12.40	0-1	0
	1914.3	26683	1.4	16-QAM	3	0	12.30	0-1	0
	1914.3	26683	1.4	16-QAM	3	2	12.30	0-1	0
	1914.3	26683	1.4	16-QAM	3	3	12.33	0-1	0
	1914.3	26683	1.4	16-QAM	6	0	12.24	0-2	0

8.1.6 LTE Carrier Aggregation Conducted Powers

Table 8-45
Maximum LTE Carrier Aggregation Conducted Powers
Band 4 (PCC) 10 MHz BW + Band 12 (SCC) 10 MHz BW

PCC		PCC Bandwidth [MHz]		+	SCC		SCC Bandwidth [MHz]	
LTE B4		10			LTE B12		10	
PCC Frequency [MHz]	PCC Channel	SCC Frequency [MHz]	SCC Channel		PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
1732.5	20175	737.5	5095		1	25	24.05	24.20

Table 8-46
Reduced- (Body at 0.0 cm) LTE Carrier Aggregation Conducted Powers
Band 4 (PCC) 10 MHz BW + Band 12 (SCC) 10 MHz BW

PCC		PCC Bandwidth [MHz]		+	SCC		SCC Bandwidth [MHz]	
LTE B4		10			LTE B12		10	
PCC Frequency [MHz]	PCC Channel	SCC Frequency [MHz]	SCC Channel		PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
1750.0	20350	737.5	5095		1	25	13.02	12.89

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 output power (across all bandwidths, channels and RB Configurations) for each band.
3. This device only supports inter-band CA with 2 carriers (B4+B12)
4. All control and acknowledge data is sent on uplink channels that operate identically to release 8 specifications.

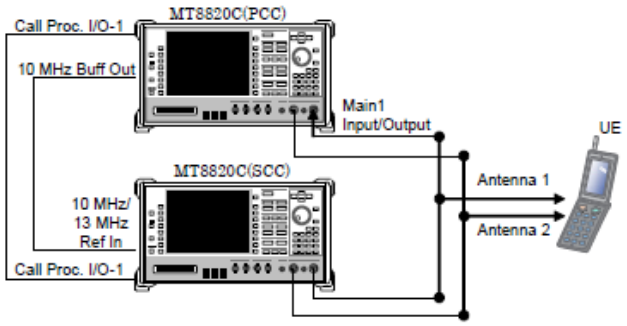

Figure 8-1
Power Measurement Setup

8.2 WLAN Conducted Powers

Table 8-47
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	12.00	11.97	11.92	11.93
802.11b	2437	6*	**12.05**	11.91	12.06	12.03
802.11b	2462	11*	11.93	12.13	12.14	12.07

Table 8-48
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	9.62	9.70	9.79	9.64	9.62	9.73	9.59	9.74
802.11g	2437	6	9.85	9.91	9.81	9.87	9.76	9.86	9.70	9.85
802.11g	2462	11	9.99	10.01	9.93	9.96	9.93	9.82	9.87	9.85

Table 8-49
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	8.87	8.90	8.82	8.85	8.84	8.64	8.66	8.84
802.11n	2437	6	9.03	9.06	9.03	8.98	9.01	9.01	8.94	8.95
802.11n	2462	11	9.03	9.11	9.11	9.01	8.90	8.95	8.93	8.97

Table 8-50
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	**9.26**	9.27	9.22	9.30	9.31	9.25	9.17	9.24
802.11a	5200	40	9.24	9.16	9.16	9.21	9.14	9.12	9.05	8.96
802.11a	5220	44	9.21	9.20	9.14	9.14	9.12	9.25	9.07	9.10
802.11a	5240	48*	9.11	9.01	9.10	9.11	9.01	9.00	8.99	8.97
802.11a	5260	52*	9.16	9.33	9.21	9.31	9.30	9.27	9.20	9.19
802.11a	5280	56	**9.22**	9.20	9.23	9.21	9.26	9.13	9.18	9.17
802.11a	5300	60	9.17	9.18	9.24	9.24	9.26	9.26	9.22	9.33
802.11a	5320	64*	9.11	9.07	9.10	9.06	9.05	9.13	9.05	9.18
802.11a	5500	100	9.11	9.00	9.09	9.17	9.03	9.06	8.99	9.07
802.11a	5520	104*	8.87	8.87	8.91	8.86	8.87	8.92	8.89	9.04
802.11a	5540	108	8.82	8.71	8.77	8.75	8.83	8.90	8.83	8.69
802.11a	5560	112	8.96	9.00	9.02	8.96	9.05	9.00	9.00	8.80
802.11a	5580	116*	**9.13**	9.27	9.33	9.20	9.14	9.13	9.14	9.20
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	8.80	8.76	8.81	8.87	8.85	8.72	8.87	8.83
802.11a	5680	136*	8.83	8.81	8.78	8.77	8.72	8.91	8.79	8.76
802.11a	5700	140	8.87	8.87	8.87	8.91	8.84	8.70	8.84	8.78
802.11a	5745	149*	9.20	9.09	9.17	9.13	9.10	9.20	9.04	9.09
802.11a	5765	153	9.00	8.92	9.05	8.90	8.99	8.91	8.94	8.99
802.11a	5785	157*	**9.24**	9.14	9.14	9.19	9.06	9.11	9.16	9.12
802.11a	5805	161	9.08	9.09	9.06	9.17	9.12	9.05	9.18	9.05
802.11a	5825	165*	9.03	9.00	9.12	9.13	9.07	8.94	9.07	9.01

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

Table 8-51
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	8.38	8.46	8.42	8.37	8.39	8.40	8.45	8.53
802.11n	5200	40	8.34	8.38	8.28	8.23	8.22	8.22	8.36	8.21
802.11n	5220	44	8.26	8.26	8.15	8.20	8.31	8.22	8.17	8.17
802.11n	5240	48	8.18	8.28	8.17	8.02	8.16	8.04	8.17	8.18
802.11n	5260	52	8.38	8.35	8.39	8.33	8.29	8.24	8.33	8.30
802.11n	5280	56	8.40	8.41	8.40	8.37	8.29	8.45	8.34	8.21
802.11n	5300	60	8.36	8.43	8.40	8.33	8.40	8.35	8.33	8.25
802.11n	5320	64	8.27	8.28	8.34	8.39	8.16	8.11	8.06	8.26
802.11n	5500	100	8.24	8.29	8.20	8.25	8.29	8.20	8.19	8.23
802.11n	5520	104	8.11	8.19	8.15	8.09	8.07	8.15	8.16	8.01
802.11n	5540	108	8.08	8.08	8.00	7.95	8.02	8.01	7.98	7.89
802.11n	5560	112	8.18	8.19	8.16	8.14	8.20	8.17	8.17	8.16
802.11n	5580	116	8.10	8.09	7.97	7.99	8.11	7.99	8.00	7.99
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	7.74	7.74	7.73	7.73	7.71	7.68	7.69	7.73
802.11n	5680	136	7.71	7.81	7.69	7.78	7.73	7.69	7.64	7.74
802.11n	5700	140	7.78	7.80	7.60	7.63	7.79	7.78	7.57	7.69
802.11n	5745	149	7.68	7.73	7.79	7.79	7.66	7.77	7.75	7.80
802.11n	5765	153	7.66	7.71	7.66	7.75	7.68	7.54	7.82	7.68
802.11n	5785	157	7.70	7.71	7.80	7.77	7.78	7.75	7.74	7.74
802.11n	5805	161	7.85	7.84	7.84	7.65	7.67	7.73	7.65	7.76
802.11n	5825	165	7.71	7.83	7.85	7.60	7.58	7.69	7.61	7.68

Table 8-52
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	6.88	6.93	6.87	6.84	6.76	6.79	6.70	6.87
802.11n	5230	46	6.64	6.61	6.64	6.69	6.63	6.71	6.64	6.70
802.11n	5270	54	6.87	6.80	6.82	6.87	6.71	6.72	6.78	6.63
802.11n	5310	62	6.71	6.84	6.74	6.81	6.81	6.69	6.70	6.71
802.11n	5510	102	6.54	6.63	6.49	6.49	6.55	6.48	6.64	6.55
802.11n	5550	110	6.54	6.52	6.36	6.54	6.26	6.56	6.47	6.48
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	6.22	6.35	6.42	6.39	6.19	6.33	6.27	6.40
802.11n	5755	151	6.60	6.35	6.43	6.39	6.39	6.33	6.39	6.43
802.11n	5795	159	6.60	6.47	6.47	6.51	6.18	6.33	6.26	6.31

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

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

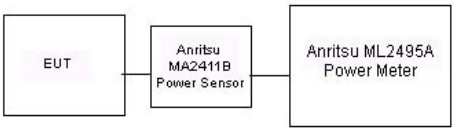

Figure 8-2
Power Measurement Setup

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
03/24/2015	750B	22.1	695	0.924	55.511	0.959	55.745	-3.65%	-0.42%
			710	0.936	55.316	0.960	55.687	-2.50%	-0.67%
			725	0.950	55.208	0.961	55.629	-1.14%	-0.76%
			740	0.965	55.021	0.963	55.570	0.21%	-0.99%
			755	0.977	54.880	0.964	55.512	1.35%	-1.14%
			770	0.994	54.768	0.965	55.453	3.01%	-1.24%
			785	1.012	54.590	0.966	55.395	4.76%	-1.45%
03/16/2015	835B	22.6	820	1.003	54.206	0.969	55.258	3.51%	-1.90%
			835	1.018	54.016	0.970	55.200	4.95%	-2.14%
			850	1.028	53.872	0.988	55.154	4.05%	-2.32%
03/23/2015	1750B	21.8	1710	1.432	52.326	1.463	53.537	-2.12%	-2.26%
			1750	1.477	52.150	1.488	53.432	-0.74%	-2.40%
			1790	1.524	52.001	1.514	53.326	0.66%	-2.48%
03/23/2015	1900B	23.2	1850	1.511	51.390	1.520	53.300	-0.59%	-3.58%
			1880	1.544	51.272	1.520	53.300	1.58%	-3.80%
			1910	1.578	51.167	1.520	53.300	3.82%	-4.00%
03/17/2015	2450B	22.4	2401	1.958	50.991	1.903	52.765	2.89%	-3.36%
			2450	2.028	50.797	1.950	52.700	4.00%	-3.61%
			2499	2.089	50.607	2.019	52.638	3.47%	-3.86%
03/23/2015	5200B-5800B	24.5	5180	5.363	48.127	5.276	49.041	1.65%	-1.86%
			5200	5.395	48.053	5.299	49.014	1.81%	-1.96%
			5280	5.483	47.934	5.393	48.906	1.67%	-1.99%
			5300	5.499	47.886	5.416	48.879	1.53%	-2.03%
			5500	5.716	47.553	5.650	48.607	1.17%	-2.17%
			5580	5.814	47.440	5.743	48.499	1.24%	-2.18%
			5600	5.841	47.378	5.766	48.471	1.30%	-2.25%
			5785	6.110	47.086	5.982	48.220	2.14%	-2.35%
			5800	6.149	47.074	6.000	48.200	2.48%	-2.34%

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.

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)	$Deviation_{1g}$ (%)
D	750	BODY	03/24/2015	23.8	22.3	0.100	1003	3263	0.916	8.460	9.160	8.27%
K	835	BODY	03/16/2015	24.7	22.6	0.100	4d133	3288	0.999	9.350	9.990	6.84%
E	1750	BODY	03/23/2015	22.4	21.8	0.100	1008	3332	3.520	37.600	35.200	-6.38%
D	1900	BODY	03/23/2015	21.9	23.2	0.100	5d149	3263	4.090	40.400	40.900	1.24%
G	2450	BODY	03/17/2015	24.3	22.4	0.100	719	3213	5.290	51.800	52.900	2.12%
A	5200	BODY	03/23/2015	22.4	22.5	0.050	1191	3914	3.860	77.800	77.200	-0.77%
A	5300	BODY	03/23/2015	22.4	22.5	0.050	1191	3914	4.050	79.900	81.000	1.38%
A	5500	BODY	03/23/2015	22.4	22.5	0.050	1191	3914	4.090	83.100	81.800	-1.56%
A	5600	BODY	03/23/2015	22.5	22.5	0.050	1191	3914	4.050	84.100	81.000	-3.69%
A	5800	BODY	03/23/2015	22.4	22.5	0.050	1191	3914	3.800	78.000	76.000	-2.56%

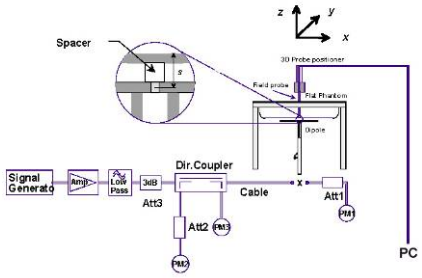

Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Body SAR Data

Table 10-1
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) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
707.50	23095	Mid	LTE Band 12	10	24.7	24.70	0.00	0	1TA9E	QPSK	1	49	22 mm	back	1:1	0.201	1.000	0.201	
707.50	23095	Mid	LTE Band 12	10	23.7	23.47	-0.01	1	1TA9E	QPSK	25	25	22 mm	back	1:1	0.144	1.054	0.152	
707.50	23095	Mid	LTE Band 12	10	24.7	24.70	0.03	0	1TA9E	QPSK	1	49	19 mm	top	1:1	0.135	1.000	0.135	
707.50	23095	Mid	LTE Band 12	10	23.7	23.47	-0.07	1	1TA9E	QPSK	25	25	19 mm	top	1:1	0.095	1.054	0.100	
707.50	23095	Mid	LTE Band 12	10	24.7	24.70	-0.03	0	1TA9E	QPSK	1	49	7 mm	right	1:1	0.187	1.000	0.187	
707.50	23095	Mid	LTE Band 12	10	23.7	23.47	-0.02	1	1TA9E	QPSK	25	25	7 mm	right	1:1	0.132	1.054	0.139	
707.50	23095	Mid	LTE Band 12	10	24.7	24.70	0.00	0	1TA9E	QPSK	1	49	0 mm	left	1:1	0.210	1.000	0.210	
707.50	23095	Mid	LTE Band 12	10	23.7	23.47	-0.03	1	1TA9E	QPSK	25	25	0 mm	left	1:1	0.164	1.054	0.173	
707.50	23095	Mid	LTE Band 12	10	20.7	20.52	0.09	0	1T4BJ	QPSK	1	49	0 mm	back	1:1	0.692	1.042	0.721	
707.50	23095	Mid	LTE Band 12	10	20.7	20.35	0.10	0	1T4BJ	QPSK	25	25	0 mm	back	1:1	0.713	1.084	**0.773**	A1
707.50	23095	Mid	LTE Band 12	10	20.7	20.52	-0.11	0	1T4BJ	QPSK	1	49	0 mm	top	1:1	0.504	1.042	0.525	
707.50	23095	Mid	LTE Band 12	10	20.7	20.35	-0.20	0	1T4BJ	QPSK	25	25	0 mm	top	1:1	0.496	1.084	0.538	
707.50	23095	Mid	LTE Band 12	10	20.7	20.52	-0.03	0	1T4BJ	QPSK	1	49	0 mm	right	1:1	0.194	1.042	0.202	
707.50	23095	Mid	LTE Band 12	10	20.7	20.35	0.02	0	1T4BJ	QPSK	25	25	0 mm	right	1:1	0.186	1.084	0.202	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 10-2
LTE Band 13 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) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
782.00	23230	Mid	LTE Band 13	10	24.2	24.16	-0.04	0	1TA9E	QPSK	1	0	22 mm	back	1:1	0.188	1.009	0.190	
782.00	23230	Mid	LTE Band 13	10	23.2	22.77	0.04	1	1TA9E	QPSK	25	25	22 mm	back	1:1	0.123	1.104	0.136	
782.00	23230	Mid	LTE Band 13	10	24.2	24.16	-0.02	0	1TA9E	QPSK	1	0	19 mm	top	1:1	0.147	1.009	0.148	
782.00	23230	Mid	LTE Band 13	10	23.2	22.77	0.04	1	1TA9E	QPSK	25	25	19 mm	top	1:1	0.093	1.104	0.103	
782.00	23230	Mid	LTE Band 13	10	24.2	24.16	0.03	0	1TA9E	QPSK	1	0	7 mm	right	1:1	0.227	1.009	0.229	
782.00	23230	Mid	LTE Band 13	10	23.2	22.77	-0.01	1	1TA9E	QPSK	25	25	7 mm	right	1:1	0.170	1.104	0.188	
782.00	23230	Mid	LTE Band 13	10	24.2	24.16	0.00	0	1TA9E	QPSK	1	0	0 mm	left	1:1	0.258	1.009	0.260	
782.00	23230	Mid	LTE Band 13	10	23.2	22.77	0.04	1	1TA9E	QPSK	25	25	0 mm	left	1:1	0.163	1.104	0.180	
782.00	23230	Mid	LTE Band 13	10	20.2	19.90	0.00	0	1T4BJ	QPSK	1	49	0 mm	back	1:1	0.541	1.072	0.580	
782.00	23230	Mid	LTE Band 13	10	20.2	19.73	-0.01	0	1T4BJ	QPSK	25	12	0 mm	back	1:1	0.555	1.114	0.618	A2
782.00	23230	Mid	LTE Band 13	10	20.2	19.90	0.20	0	1T4BJ	QPSK	1	49	0 mm	top	1:1	0.377	1.072	0.404	
782.00	23230	Mid	LTE Band 13	10	20.2	19.73	0.19	0	1T4BJ	QPSK	25	12	0 mm	top	1:1	0.359	1.114	0.400	
782.00	23230	Mid	LTE Band 13	10	20.2	19.90	0.00	0	1T4BJ	QPSK	1	49	0 mm	right	1:1	0.301	1.072	0.323	
782.00	23230	Mid	LTE Band 13	10	20.2	19.73	0.02	0	1T4BJ	QPSK	25	12	0 mm	right	1:1	0.286	1.114	0.319	
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 10-3
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) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.2	24.06	0.01	0	1TA9E	QPSK	1	49	22 mm	back	1:1	0.211	1.033	0.218	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.2	22.65	0.03	1	1TA9E	QPSK	25	25	22 mm	back	1:1	0.162	1.135	0.184	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.2	24.06	-0.05	0	1TA9E	QPSK	1	49	19 mm	top	1:1	0.174	1.033	0.180	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.2	22.65	-0.03	1	1TA9E	QPSK	25	25	19 mm	top	1:1	0.129	1.135	0.146	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.2	24.06	0.01	0	1TA9E	QPSK	1	49	7 mm	right	1:1	0.264	1.033	0.273	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.2	22.65	0.02	1	1TA9E	QPSK	25	25	7 mm	right	1:1	0.185	1.135	0.210	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.2	24.06	0.01	0	1TA9E	QPSK	1	49	0 mm	left	1:1	0.228	1.033	0.236	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.2	22.65	-0.15	1	1TA9E	QPSK	25	25	0 mm	left	1:1	0.143	1.135	0.162	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	20.02	0.10	0	1T4BJ	QPSK	1	49	0 mm	back	1:1	0.539	1.042	0.562	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	19.81	0.17	0	1T4BJ	QPSK	25	25	0 mm	back	1:1	0.550	1.094	0.602	A3
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	20.02	-0.03	0	1T4BJ	QPSK	1	49	0 mm	top	1:1	0.250	1.042	0.261	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	19.81	-0.01	0	1T4BJ	QPSK	25	25	0 mm	top	1:1	0.248	1.094	0.271	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	20.02	0.09	0	1T4BJ	QPSK	1	49	0 mm	right	1:1	0.304	1.042	0.317	
836.50	20525	Mid	LTE Band 5 (Cell)	10	20.2	19.81	-0.02	0	1T4BJ	QPSK	25	25	0 mm	right	1:1	0.306	1.094	0.335	
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) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.2	24.07	0.00	0	1TA9E	QPSK	1	99	22 mm	back	1:1	0.231	1.030	0.238	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.2	22.81	0.06	1	1TA9E	QPSK	50	50	22 mm	back	1:1	0.189	1.094	0.207	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.2	24.07	0.05	0	1TA9E	QPSK	1	99	19 mm	top	1:1	0.245	1.030	0.252	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.2	22.81	-0.02	1	1TA9E	QPSK	50	50	19 mm	top	1:1	0.187	1.094	0.205	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.2	24.07	0.11	0	1TA9E	QPSK	1	99	7 mm	right	1:1	0.216	1.030	0.222	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.2	22.81	0.06	1	1TA9E	QPSK	50	50	7 mm	right	1:1	0.150	1.094	0.164	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.2	24.07	-0.05	0	1TA9E	QPSK	1	99	0 mm	left	1:1	0.378	1.030	0.389	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.2	22.81	0.04	1	1TA9E	QPSK	50	50	0 mm	left	1:1	0.282	1.094	0.309	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.94	0.01	0	1T4BJ	QPSK	1	99	0 mm	back	1:1	0.605	1.062	0.643	A4
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.95	-0.03	0	1T4BJ	QPSK	50	50	0 mm	back	1:1	0.590	1.059	0.625	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.94	-0.06	0	1T4BJ	QPSK	1	99	0 mm	top	1:1	0.453	1.062	0.481	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.95	-0.02	0	1T4BJ	QPSK	50	50	0 mm	top	1:1	0.434	1.059	0.460	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.94	0.03	0	1T4BJ	QPSK	1	99	0 mm	right	1:1	0.057	1.062	0.061	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.2	12.95	0.07	0	1T4BJ	QPSK	50	50	0 mm	right	1:1	0.053	1.059	0.056	
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 25 (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) (W/kg)	Scaling Factor	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.44	-0.09	0	1TA9E	QPSK	1	0	22 mm	back	1:1	0.378	1.062	0.401	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.7	22.23	-0.03	1	1TA9E	QPSK	50	25	22 mm	back	1:1	0.280	1.114	0.312	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.44	0.02	0	1TA9E	QPSK	1	0	19 mm	top	1:1	0.343	1.062	0.364	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.7	22.23	-0.03	1	1TA9E	QPSK	50	25	19 mm	top	1:1	0.278	1.114	0.310	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.44	0.02	0	1TA9E	QPSK	1	0	7 mm	right	1:1	0.333	1.062	0.354	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.7	22.23	-0.02	1	1TA9E	QPSK	50	25	7 mm	right	1:1	0.218	1.114	0.243	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.44	0.10	0	1TA9E	QPSK	1	0	0 mm	left	1:1	0.393	1.062	0.417	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.7	22.23	0.16	1	1TA9E	QPSK	50	25	0 mm	left	1:1	0.319	1.114	0.355	
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.41	0.12	0	1T4BJ	QPSK	1	50	0 mm	back	1:1	0.674	1.069	0.721	A5
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.31	0.13	0	1T4BJ	QPSK	50	25	0 mm	back	1:1	0.666	1.094	0.729	
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.41	0.09	0	1T4BJ	QPSK	1	50	0 mm	top	1:1	0.474	1.069	0.507	
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.31	-0.07	0	1T4BJ	QPSK	50	25	0 mm	top	1:1	0.468	1.094	0.512	
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.41	-0.03	0	1T4BJ	QPSK	1	50	0 mm	right	1:1	0.061	1.069	0.065	
1860.00	26140	Low	LTE Band 25 (PCS)	20	12.7	12.31	-0.02	0	1T4BJ	QPSK	50	25	0 mm	right	1:1	0.056	1.094	0.061	
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 10-6
WLAN Body SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	13.0	12.00	0.06	0 mm	1TA9H	1	back	1:1	0.479	1.259	0.603	
2437	6	IEEE 802.11b	DSSS	13.0	12.05	-0.02	0 mm	1TA9H	1	back	1:1	0.521	1.245	**0.649**	A6
2462	11	IEEE 802.11b	DSSS	13.0	11.93	0.03	0 mm	1TA9H	1	back	1:1	0.505	1.279	0.646	
2437	6	IEEE 802.11b	DSSS	13.0	12.05	0.08	0 mm	1TA9H	1	top	1:1	0.213	1.245	0.265	
2437	6	IEEE 802.11b	DSSS	13.0	12.05	0.03	0 mm	1TA9H	1	left	1:1	0.153	1.245	0.190	
5180	36	IEEE 802.11a	OFDM	10.0	9.26	0.04	0 mm	1TA9H	6	back	1:1	0.177	1.186	0.210	
5180	36	IEEE 802.11a	OFDM	10.0	9.26	0.07	0 mm	1TA9H	6	top	1:1	0.187	1.186	**0.222**	A7
5180	36	IEEE 802.11a	OFDM	10.0	9.26	0.03	0 mm	1TA9H	6	left	1:1	0.034	1.186	0.040	
5280	56	IEEE 802.11a	OFDM	10.0	9.22	0.06	0 mm	1TA9H	6	back	1:1	0.177	1.197	0.212	
5280	56	IEEE 802.11a	OFDM	10.0	9.22	0.03	0 mm	1TA9H	6	top	1:1	0.164	1.197	0.196	
5280	56	IEEE 802.11a	OFDM	10.0	9.22	0.17	0 mm	1TA9H	6	left	1:1	0.039	1.197	0.047	
5580	116	IEEE 802.11a	OFDM	10.0	9.13	0.03	0 mm	1TA9H	6	back	1:1	0.172	1.222	0.210	
5580	116	IEEE 802.11a	OFDM	10.0	9.13	0.04	0 mm	1TA9H	6	top	1:1	0.159	1.222	0.194	
5580	116	IEEE 802.11a	OFDM	10.0	9.13	0.02	0 mm	1TA9H	6	left	1:1	0.027	1.222	0.033	
5785	157	IEEE 802.11a	OFDM	10.0	9.24	0.04	0 mm	1TA9H	6	back	1:1	0.119	1.191	0.142	
5785	157	IEEE 802.11a	OFDM	10.0	9.24	-0.05	0 mm	1TA9H	6	top	1:1	0.138	1.191	0.164	
5785	157	IEEE 802.11a	OFDM	10.0	9.24	0.04	0 mm	1TA9H	6	left	1:1	0.024	1.191	0.029	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

10.2 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in KDB 616217 D04, and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. Per FCC KDB 865664 D01 v01, variability SAR tests were not performed since the measured SAR results for a frequency band were less than 0.8 W/kg. Please see Section 12 for variability analysis.
7. Per FCC KDB 616217 D04 Section 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v05 was applied to determine SAR test exclusion for adjacent edge configurations. SAR tests were required for top, right, and left edges for the main antenna and top and left edges for the BT/WLAN antenna.

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 7.3.4.
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 required for testing since the data sent by uplink on the uplink physical channels does not change between Rel. 8 and Rel. 10.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI operations: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI operations: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz bandwidths) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
3. WIFI transmission was verified using an uncalibrated spectrum analyzer.
4. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other default channels was required.
5. There is no sensor power reduction mechanism applied for WIFI/BT modes.

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 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	Configuration	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
		[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	Back Side*	2480	9.50	5	0.378
Bluetooth	Top Edge *	2480	9.50	5	0.378
Bluetooth	Left Edge	2480	9.50	6.1	0.310

Note:

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

11.3 Body SAR Simultaneous Transmission Analysis

Note: for SAR summations for body at 2.2 cm and 1.9 cm 2.4GHz WLAN/BT and 5 GHz WLAN SAR values for 0.0 cm were used since the 0.0 cm test distance for 2.4 GHz WLAN/BT and 5 GHz WLAN were more conservative. “<” denotes that the 0.0 cm 2.4 GHz WLAN/BT and 5 GHz WLAN SAR values were used for summation purposes.

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

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.773	0.649	**1.422**
	Top	0.538	0.265	0.803
	Bottom	0.400	0.400	0.800
	Right	0.202	0.400	0.602
	Left	0.210	0.190	0.400

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.618	0.649	**1.267**
	Top	0.404	0.265	0.669
	Bottom	0.400	0.400	0.800
	Right	0.323	0.400	0.723
	Left	0.260	0.190	0.450

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.602	0.649	**1.251**
	Top	0.271	0.265	0.536
	Bottom	0.400	0.400	0.800
	Right	0.335	0.400	0.735
	Left	0.236	0.190	0.426

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.643	0.649	**1.292**
	Top	0.481	0.265	0.746
	Bottom	0.400	0.400	0.800
	Right	0.061	0.400	0.461
	Left	0.389	0.190	0.579

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.649	**1.378**
	Top	0.512	0.265	0.777
	Bottom	0.400	0.400	0.800
	Right	0.065	0.400	0.465
	Left	0.417	0.190	0.607

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

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.773	0.212	**0.985**
	Top	0.538	0.222	0.760
	Bottom	0.400	0.400	0.800
	Right	0.202	0.400	0.602
	Left	0.210	0.047	0.257

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.618	0.212	**0.830**
	Top	0.404	0.222	0.626
	Bottom	0.400	0.400	0.800
	Right	0.323	0.400	0.723
	Left	0.260	0.047	0.307

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.602	0.212	**0.814**
	Top	0.271	0.222	0.493
	Bottom	0.400	0.400	0.800
	Right	0.335	0.400	0.735
	Left	0.236	0.047	0.283

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.643	0.212	**0.855**
	Top	0.481	0.222	0.703
	Bottom	0.400	0.400	0.800
	Right	0.061	0.400	0.461
	Left	0.389	0.047	0.436

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.212	**0.941**
	Top	0.512	0.222	0.734
	Bottom	0.400	0.400	0.800
	Right	0.065	0.400	0.465
	Left	0.417	0.047	0.464

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

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.773	0.378	**1.151**
	Top	0.538	0.378	0.916
	Bottom	0.400	0.400	0.800
	Right	0.202	0.400	0.602
	Left	0.210	0.310	0.520

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.618	0.378	**0.996**
	Top	0.404	0.378	0.782
	Bottom	0.400	0.400	0.800
	Right	0.323	0.400	0.723
	Left	0.260	0.310	0.570

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.602	0.378	**0.980**
	Top	0.271	0.378	0.649
	Bottom	0.400	0.400	0.800
	Right	0.335	0.400	0.735
	Left	0.236	0.310	0.546

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.643	0.378	**1.021**
	Top	0.481	0.378	0.859
	Bottom	0.400	0.400	0.800
	Right	0.061	0.400	0.461
	Left	0.389	0.310	0.699

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.729	0.378	**1.107**
	Top	0.512	0.378	0.890
	Bottom	0.400	0.400	0.800
	Right	0.065	0.400	0.465
	Left	0.417	0.310	0.727

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

Table 11-5
Simultaneous Transmission Scenario (2.4 GHz Body at 2.2 cm)

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 12	0.201	<0.649	<0.850
Back Side	LTE Band 13	0.190	<0.649	<0.839
Back Side	LTE Band 5 (Cell)	0.218	<0.649	<0.867
Back Side	LTE Band 4 (AWS)	0.238	<0.649	<0.887
Back Side	LTE Band 25 (PCS)	0.401	<0.649	<1.050

Table 11-6
Simultaneous Transmission Scenario (5 GHz Body at 2.2 cm)

Configuration	Mode	4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 12	0.201	<0.212	<0.413
Back Side	LTE Band 13	0.190	<0.212	<0.402
Back Side	LTE Band 5 (Cell)	0.218	<0.212	<0.430
Back Side	LTE Band 4 (AWS)	0.238	<0.212	<0.450
Back Side	LTE Band 25 (PCS)	0.401	<0.212	<0.613

Table 11-7
Simultaneous Transmission Scenario (Bluetooth Body at 2.2 cm)

Configuration	Mode	4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 12	0.201	<0.378	<0.579
Back Side	LTE Band 13	0.190	<0.378	<0.568
Back Side	LTE Band 5 (Cell)	0.218	<0.378	<0.596
Back Side	LTE Band 4 (AWS)	0.238	<0.378	<0.616
Back Side	LTE Band 25 (PCS)	0.401	<0.378	<0.779

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

Table 11-8
Simultaneous Transmission Scenario (2.4 GHz Body at 1.9 cm)

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Top Edge	LTE Band 12	0.135	<0.265	<0.400
Top Edge	LTE Band 13	0.148	<0.265	<0.413
Top Edge	LTE Band 5 (Cell)	0.180	<0.265	<0.445
Top Edge	LTE Band 4 (AWS)	0.252	<0.265	<0.517
Top Edge	LTE Band 25 (PCS)	0.364	<0.265	<0.629

Table 11-9
Simultaneous Transmission Scenario (5 GHz Body at 1.9 cm)

Configuration	Mode	4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Top Edge	LTE Band 12	0.135	<0.222	<0.357
Top Edge	LTE Band 13	0.148	<0.222	<0.370
Top Edge	LTE Band 5 (Cell)	0.180	<0.222	<0.402
Top Edge	LTE Band 4 (AWS)	0.252	<0.222	<0.474
Top Edge	LTE Band 25 (PCS)	0.364	<0.222	<0.586

Table 11-10
Simultaneous Transmission Scenario (Bluetooth Body at 1.9 cm)

Configuration	Mode	4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Top Edge	LTE Band 12	0.135	<0.378	<0.513
Top Edge	LTE Band 13	0.148	<0.378	<0.526
Top Edge	LTE Band 5 (Cell)	0.180	<0.378	<0.558
Top Edge	LTE Band 4 (AWS)	0.252	<0.378	<0.630
Top Edge	LTE Band 25 (PCS)	0.364	<0.378	<0.742

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

Table 11-11
Simultaneous Transmission Scenario (2.4 GHz Body at 0.7 cm)

Configuration	Mode	4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	LTE Band 12	0.187	0.400	0.587
Right Edge	LTE Band 13	0.229	0.400	0.629
Right Edge	LTE Band 5 (Cell)	0.273	0.400	0.673
Right Edge	LTE Band 4 (AWS)	0.222	0.400	0.622
Right Edge	LTE Band 25 (PCS)	0.354	0.400	0.754

Table 11-12
Simultaneous Transmission Scenario (5 GHz Body at 0.7 cm)

Configuration	Mode	4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	LTE Band 12	0.187	0.400	0.587
Right Edge	LTE Band 13	0.229	0.400	0.629
Right Edge	LTE Band 5 (Cell)	0.273	0.400	0.673
Right Edge	LTE Band 4 (AWS)	0.222	0.400	0.622
Right Edge	LTE Band 25 (PCS)	0.354	0.400	0.754

Table 11-13
Simultaneous Transmission Scenario (Bluetooth Body at 0.7 cm)

Configuration	Mode	4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Right Edge	LTE Band 12	0.187	0.400	0.587
Right Edge	LTE Band 13	0.229	0.400	0.629
Right Edge	LTE Band 5 (Cell)	0.273	0.400	0.673
Right Edge	LTE Band 4 (AWS)	0.222	0.400	0.622
Right Edge	LTE Band 25 (PCS)	0.354	0.400	0.754

11.4 Simultaneous Transmission Conclusion

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

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

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

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.

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	8753E	(30kHz-6GHz) Network Analyzer	12/30/2014	Annual	12/30/2015	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/15/2014	Annual	4/15/2015	3629U00687
Agilent	E4407B	ESA Spectrum Analyzer	4/16/2014	Annual	4/16/2015	US39210313
Agilent	E4438C	ESG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY45090700
Agilent	E4438C	ESG Vector Signal Generator	4/25/2014	Annual	4/25/2015	MY42082385
Agilent	E4432B	ESG-D Series Signal Generator	4/15/2014	Annual	4/15/2015	US40053896
Agilent	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420651
Agilent	8753ES	S-Parameter Network Analyzer	5/22/2014	Annual	5/22/2015	US39170118
Agilent	E5515C	Wireless Communications Test Set	11/4/2014	Biennial	11/4/2016	GB43193563
Agilent	E5515C	Wireless Communications Test Set	11/20/2014	Biennial	11/20/2016	GB43163447
Agilent	E5515C	Wireless Communications Test Set	12/24/2014	Annual	12/24/2015	GB44400860
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433975
Anritsu	ML2495A	Power Meter	10/31/2013	Biennial	10/31/2015	941001
Anritsu	MA2411B	Pulse Power Sensor	11/13/2014	Annual	11/13/2015	1339018
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1207364
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1126066
Anritsu	MT8820C	Radio Communication Analyzer	5/6/2014	Annual	5/6/2015	6201144419
Anritsu	MT8820C	Radio Communication Analyzer	8/28/2014	Annual	8/28/2015	6201240328
Anritsu	MA24106A	USB Power Sensor	5/15/2014	Annual	5/15/2015	1244524
Anritsu	MA24106A	USB Power Sensor	5/15/2014	Annual	5/15/2015	1244512
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4052	Long Stem Thermometer	9/27/2013	Biennial	9/27/2015	130567447
Control Company	61220-416	Long-Stem Thermometer	4/29/2014	Biennial	4/29/2016	111331323
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	130764551
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
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	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	6/3/2014	Annual	6/3/2015	108843
Rohde & Schwarz	CMW500	Radio Communication Tester	7/9/2014	Annual	7/9/2015	106578
Rohde & Schwarz	CMW500	Radio Communication Tester	7/22/2014	Annual	7/22/2015	116743
Rohde & Schwarz	CMW500	Radio Communication Tester	9/2/2014	Annual	9/2/2015	111427
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	22313
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
SPEAG	D5GHzV2	5GHz SAR Dipole	9/25/2014	Annual	9/25/2015	1191
SPEAG	D1765V2	1765 MHz SAR Dipole	5/7/2014	Annual	5/7/2015	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/23/2014	Annual	7/23/2015	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/11/2014	Annual	8/11/2015	719
SPEAG	D750V3	750 MHz Dipole	1/16/2015	Annual	1/16/2016	1003
SPEAG	D835V2	835 MHz SAR Dipole	7/24/2014	Annual	7/24/2015	4d133
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/6/2014	Annual	5/6/2015	1070
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/14/2014	Annual	5/14/2015	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/18/2014	Annual	9/18/2015	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/19/2015	Annual	1/19/2016	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/31/2014	Annual	10/31/2015	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2014	Annual	9/17/2015	1323
SPEAG	ES3DV3	SAR Probe	5/15/2014	Annual	5/15/2015	3263
SPEAG	ES3DV3	SAR Probe	9/24/2014	Annual	9/24/2015	3288
SPEAG	ES3DV3	SAR Probe	9/18/2014	Annual	9/18/2015	3332
SPEAG	ES3DV3	SAR Probe	1/20/2015	Annual	1/20/2016	3213
SPEAG	EX3DV4	SAR Probe	2/10/2015	Annual	2/10/2016	3914
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/16/2014	Annual	4/16/2015	130477877
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Biennial	8/8/2015	130477877

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

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

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

15 CONCLUSION

15.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFUK495; Type: Portable Tablet; Serial: 1T4BJ

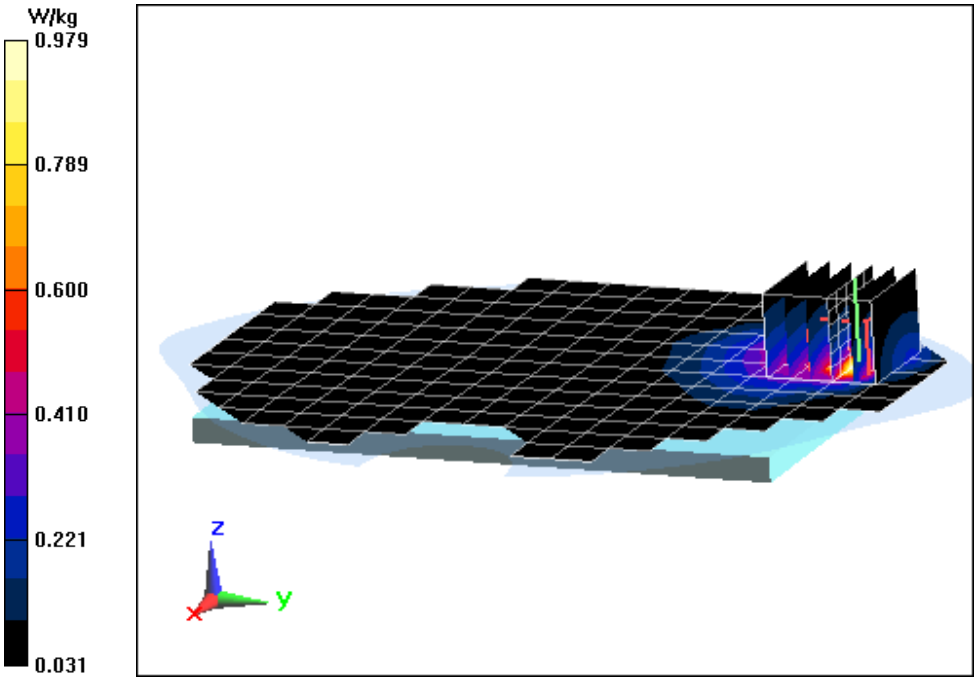
Communication System: UID 0, LTE Band 12 (0); Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.934 S/m; ε_r = 55.349; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-24-2015; Ambient Temp: 23.8°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (14x18x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.94 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.713 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1T4BJ

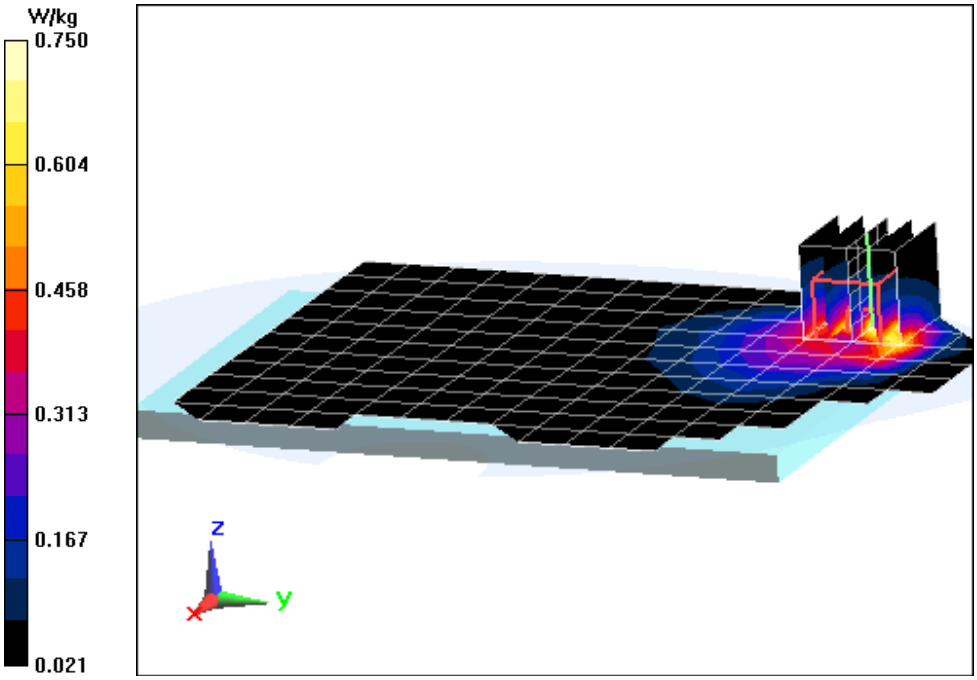
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 782 MHz; σ = 1.008 S/m; ε_r = 54.626; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-24-2015; Ambient Temp: 23.8°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Body SAR, Back side, Mid.ch, 10 MHz Bandwidth, QPSK, 25 RB, 12 RB Offset

Area Scan (12x16x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.46 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.555 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1T4BJ

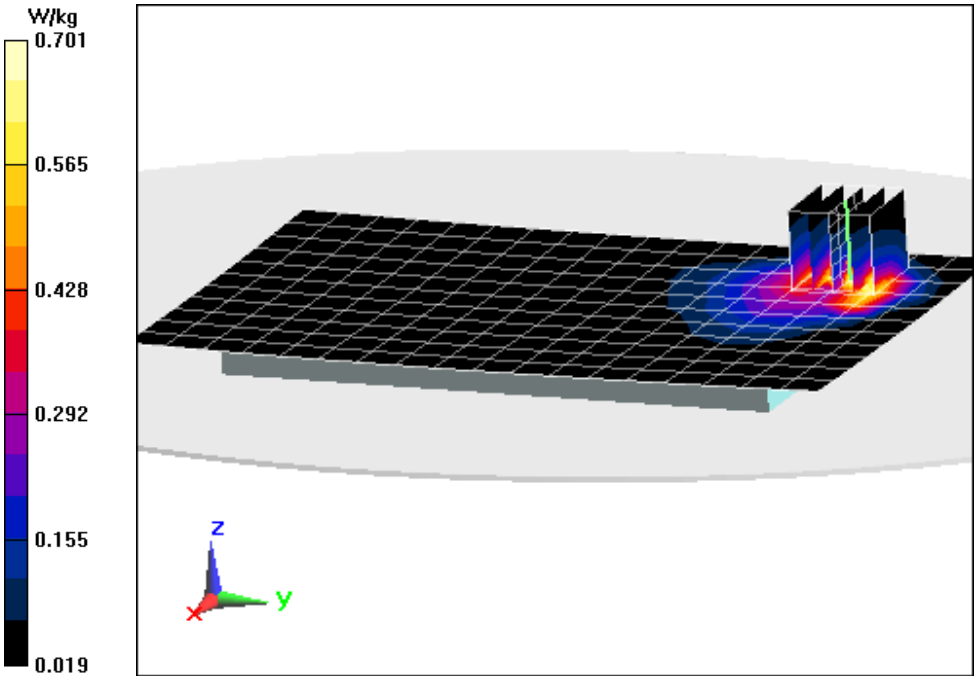
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.019 S/m; ε_r = 54.002; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-16-2015; Ambient Temp: 24.7°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (12x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.40 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.550 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1T4BJ

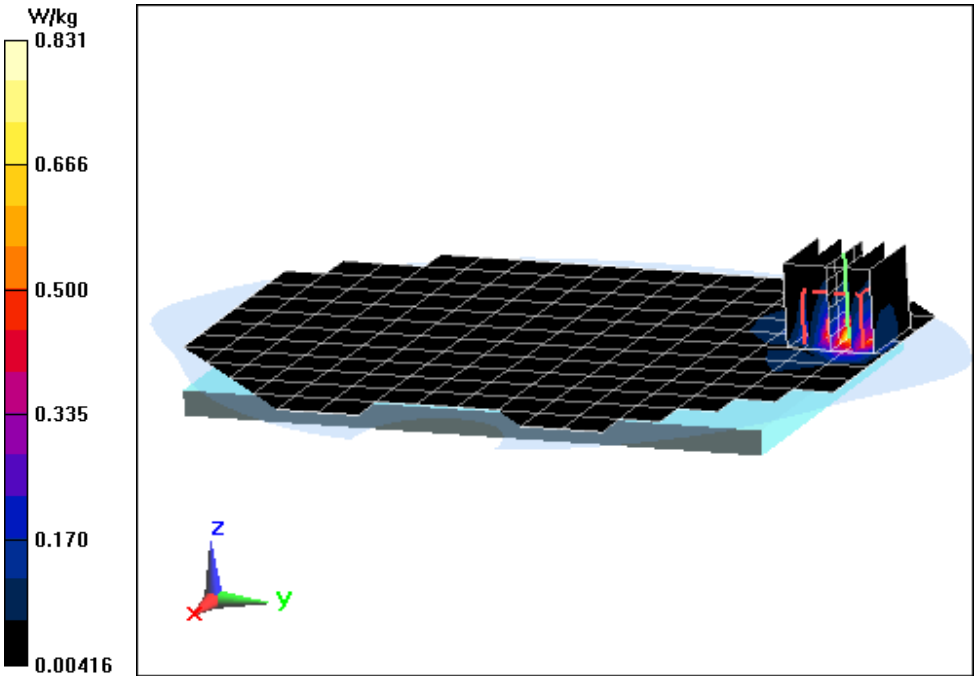
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.457 S/m; ε_r = 52.227; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3332; ConvF(4.88, 4.88, 4.88); Calibrated: 9/18/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
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, 99 RB Offset

Area Scan (13x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.71 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.605 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1T4BJ

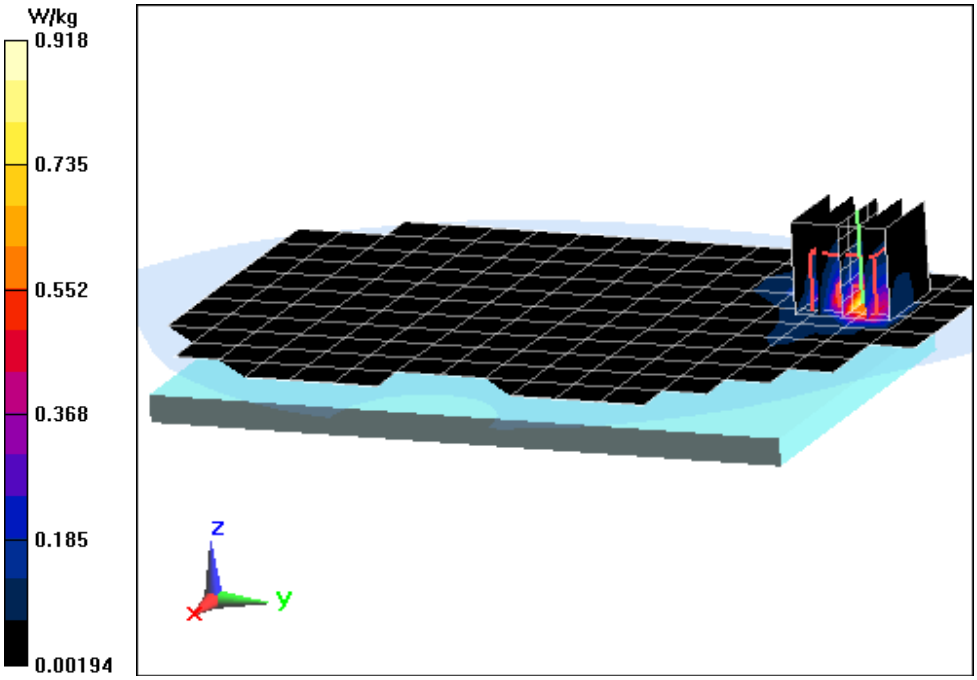
Communication System: UID 0, LTE Band 25 (PCS) (0); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
$f = 1860$ MHz; $\sigma = 1.522$ S/m; $\varepsilon_r = 51.351$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-23-2015; Ambient Temp: 21.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3263; ConvF(4.78, 4.78, 4.78); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Back side, Low.ch, 20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

Area Scan (12x17x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.29 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.674 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1TA9H

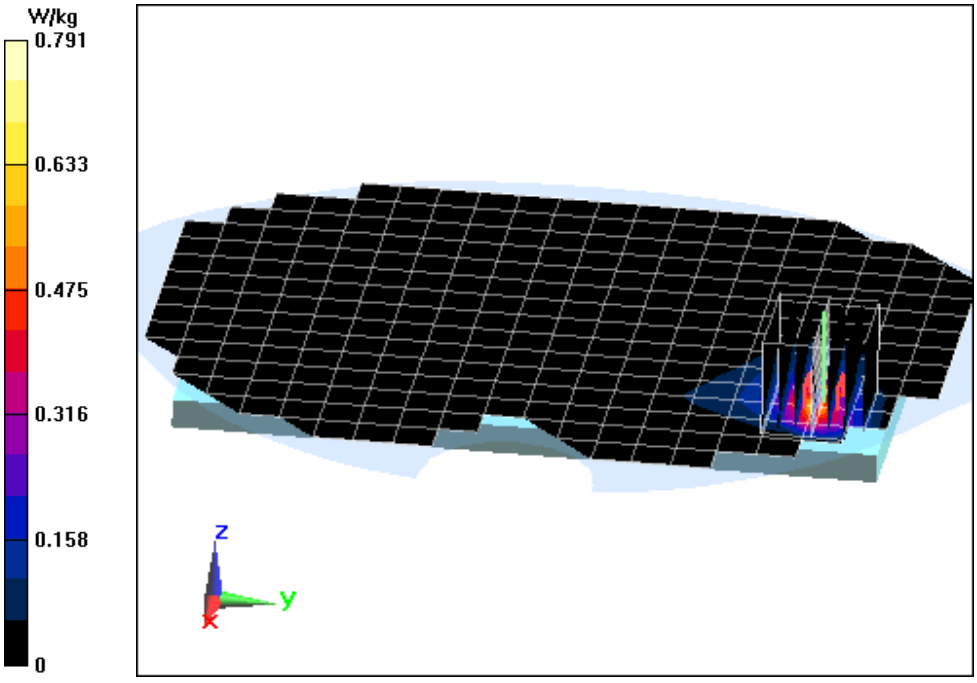
Communication System: UID 0, IEEE 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
$f = 2437$ MHz; $\sigma = 2.009$ S/m; $\varepsilon_r = 50.848$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-17-2015; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3213; ConvF(4.37, 4.37, 4.37); Calibrated: 1/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 1/19/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Back Side

Area Scan (16x21x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.87 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.521 W/kg



DUT: ZNFUK495; Type: Portable Tablet; Serial: 1TA9H

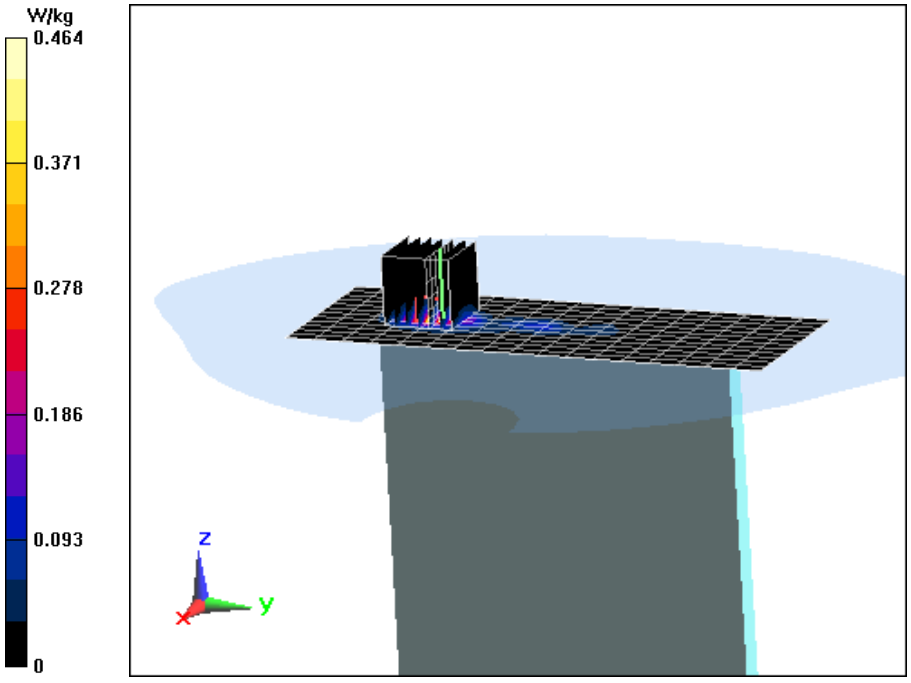
Communication System: UID 0, IEEE 802.11a (0); Frequency: 5180 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5180 MHz; σ = 5.363 S/m; ε_r = 48.127; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(4.5, 4.5, 4.5); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, 5.2 GHz, Body SAR, Ch 36, 6 Mbps, Top Edge

Area Scan (13x18x1): Measurement grid: dx=5mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Reference Value = 6.384 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.783 W/kg
SAR(1 g) = 0.187 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

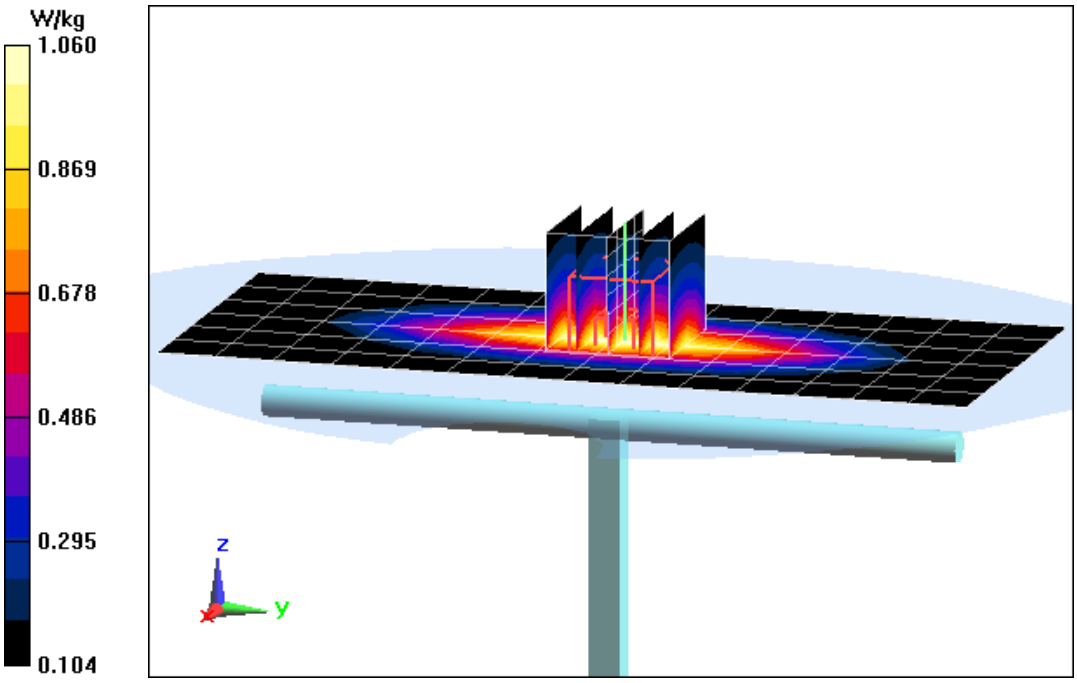
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.973 S/m; ε_r = 54.927; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-24-2015; Ambient Temp: 23.8°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3263; ConvF(6.19, 6.19, 6.19); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=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) = 0.916 W/kg
Deviation = 8.27%



PCTEST ENGINEERING LABORATORY, INC.

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

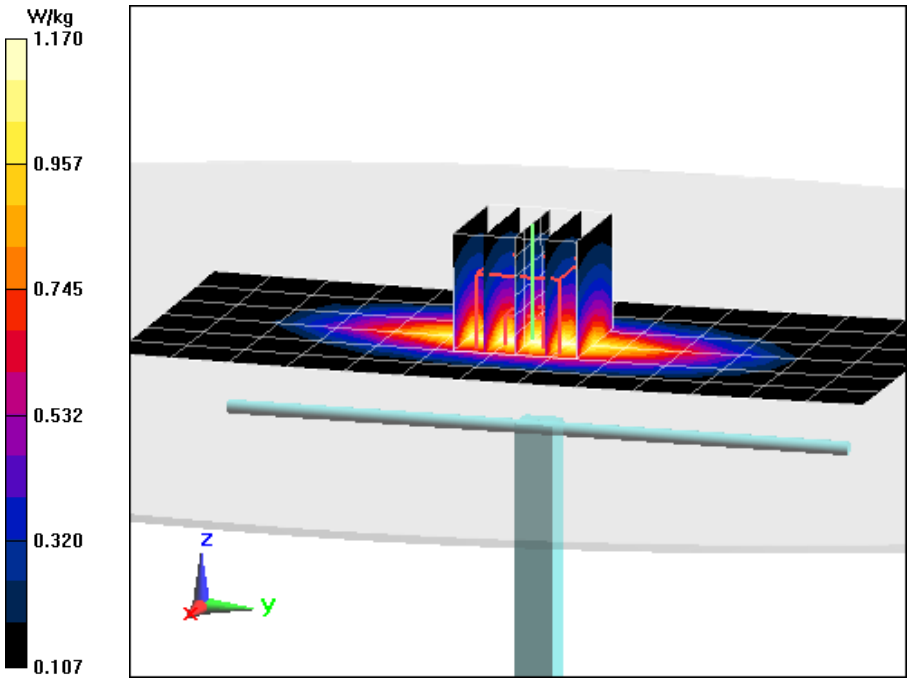
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body,Medium parameters used:
f = 835 MHz; σ = 1.018 S/m; ε_r = 54.016; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-16-2015; Ambient Temp: 24.7°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=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) = 1.47 W/kg
SAR(1 g) = 0.999 W/kg
Deviation = 6.84%



PCTEST ENGINEERING LABORATORY, INC.

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

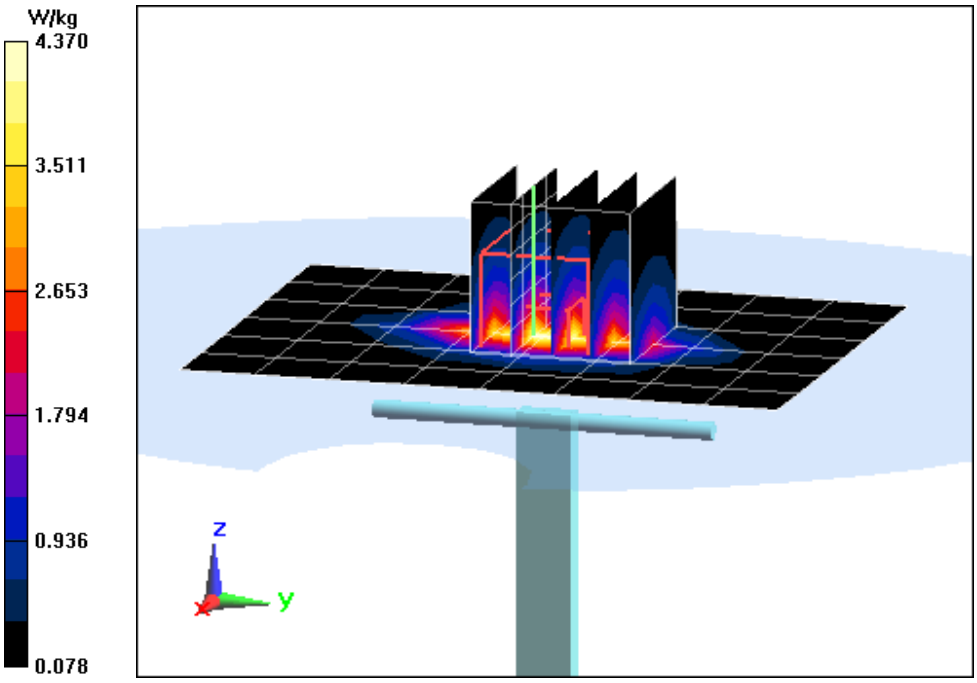
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.477 S/m; ε_r = 52.15; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3332; ConvF(4.88, 4.88, 4.88); Calibrated: 9/18/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
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
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.16 W/kg
SAR(1 g) = 3.52 W/kg
Deviation = -6.38%



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

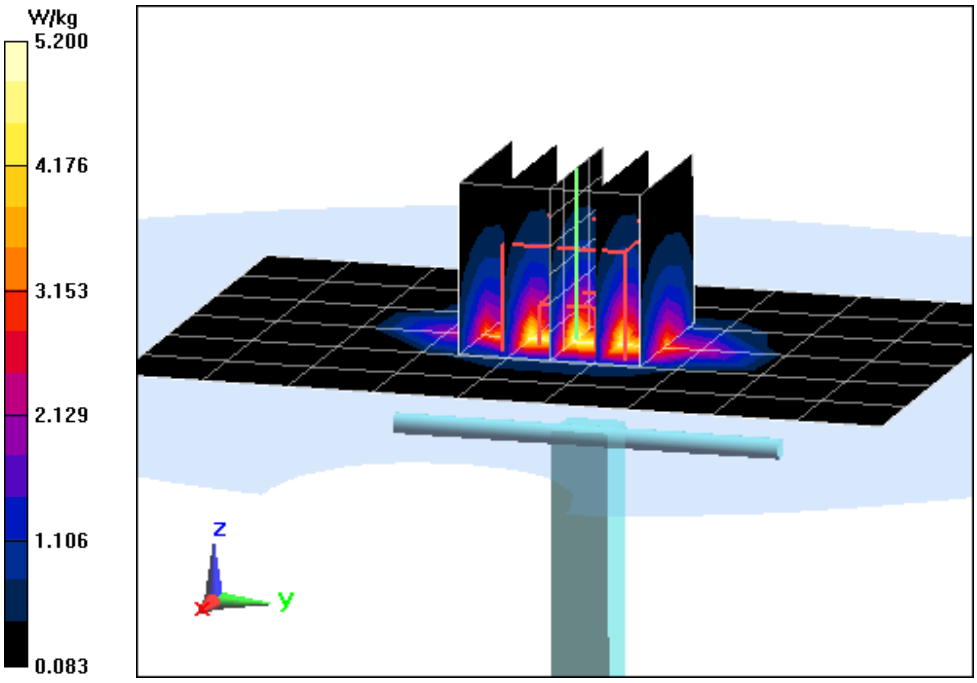
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.567 S/m; ε_r = 51.202; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 21.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3263; ConvF(4.78, 4.78, 4.78); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.45 W/kg
SAR(1 g) = 4.09 W/kg
Deviation = 1.24%



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

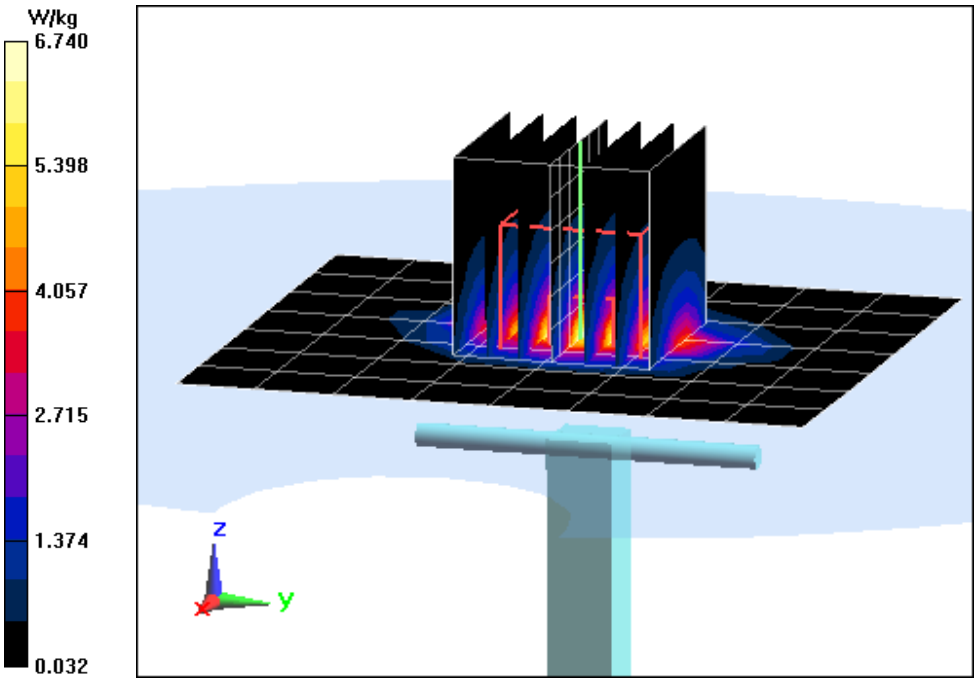
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.028 S/m; ε_r = 50.797; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2015; Ambient Temp: 24.3°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3213; ConvF(4.37, 4.37, 4.37); Calibrated: 1/20/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 1/19/2015
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.5 W/kg
SAR(1 g) = 5.29 W/kg
Deviation = 2.12%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5200 MHz; Type: D5GHzV2; Serial: 1191

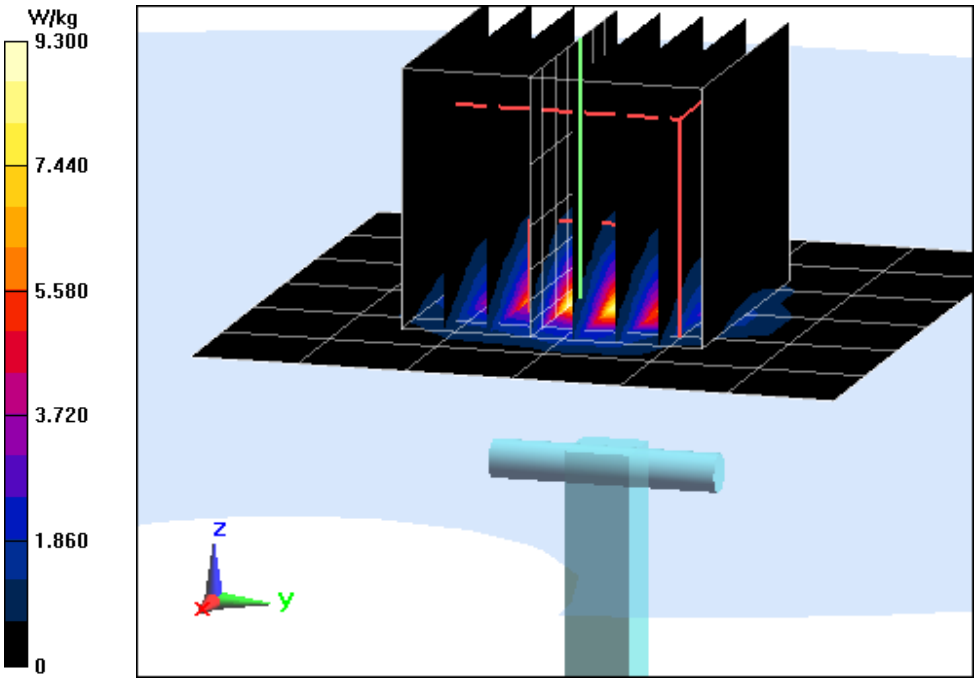
Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.395 S/m; ε_r = 48.053; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(4.5, 4.5, 4.5); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5200 MHz System Verification

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 16.2 W/kg
SAR(1 g) = 3.86 W/kg
Deviation = -0.77%



DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1191

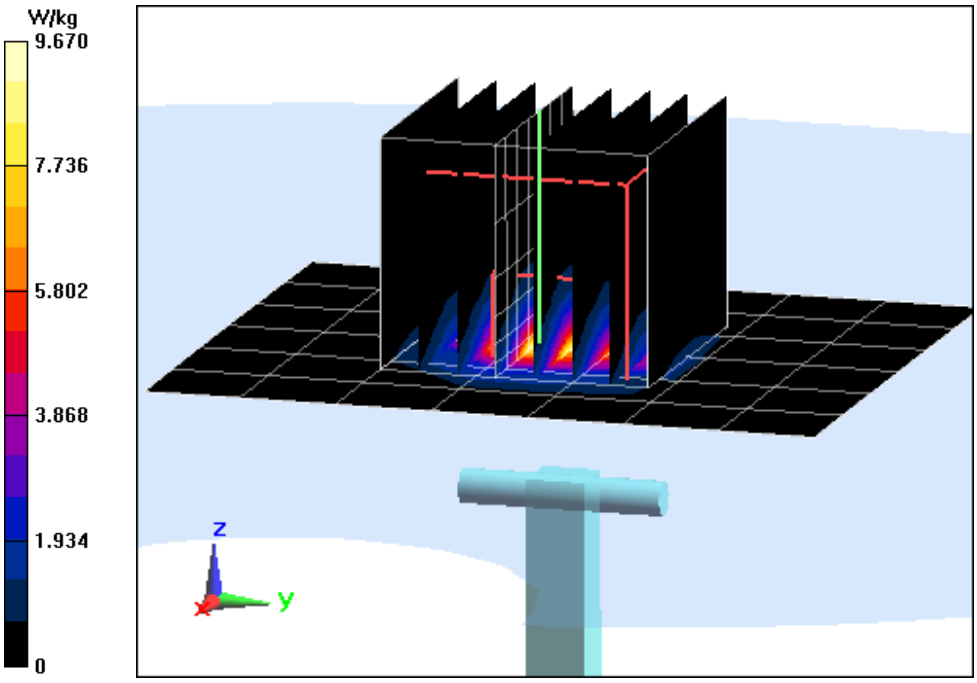
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.499 S/m; ε_r = 47.886; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(4.33, 4.33, 4.33); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 17.5 W/kg
SAR(1 g) = 4.05 W/kg
Deviation = 1.38%



DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1191

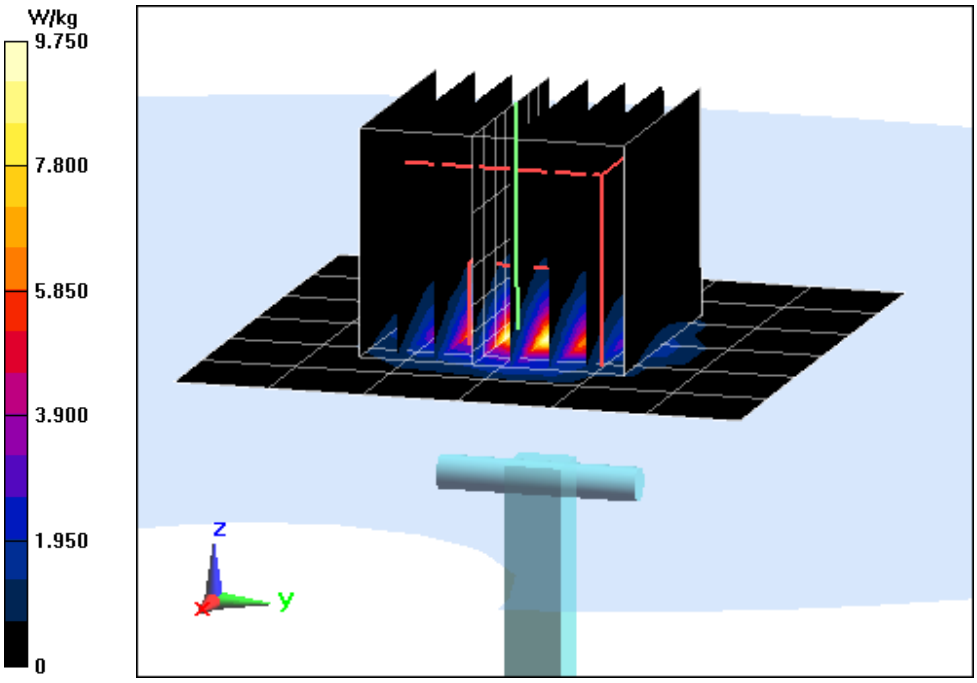
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.716 S/m; ε_r = 47.553; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(3.91, 3.91, 3.91); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5500 MHz System Verification

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 4.09 W/kg
Deviation = -1.56%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1191

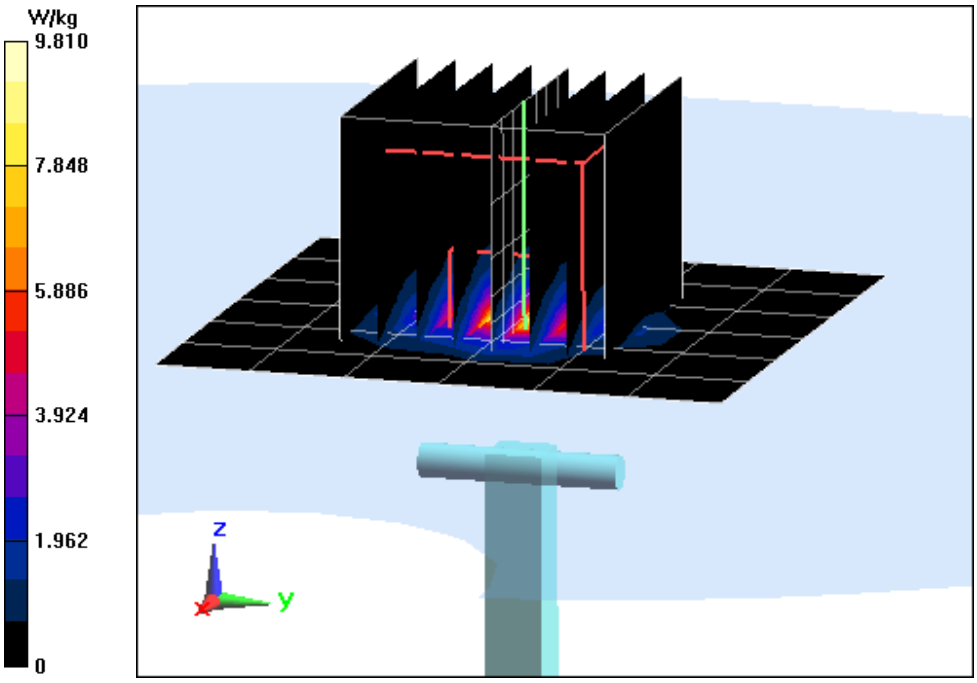
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.841 S/m; ε_r = 47.378; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.5°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(3.89, 3.89, 3.89); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 4.05 W/kg
Deviation = -3.69%



DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1191

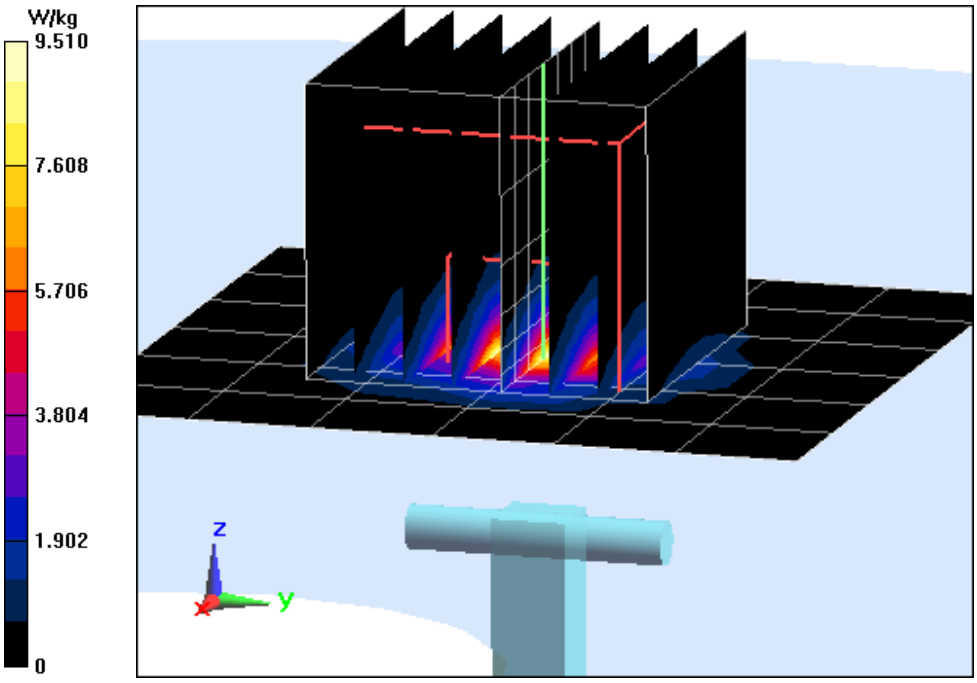
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.149 S/m; ε_r = 47.074; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-23-2015; Ambient Temp: 22.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(4.01, 4.01, 4.01); Calibrated: 2/10/2015;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/31/2014
Phantom: SAM Sub ; Type: QD000P40CC; Serial: TP:1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5800 MHz System Verification

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio = 1.4
Input Power = 17.0 dBm (50 mW)
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 3.8 W/kg
Deviation = -2.56%



APPENDIX C: PROBE CALIBRATION

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D750V3-1003_Jan15

CALIBRATION CERTIFICATE

Object D750V3 - SN: 1003

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

CC 2/3/15

Calibration date: January 16, 2015

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M. Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 19, 2015

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.7 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.09 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.32 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.0 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.46 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.58 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω - 1.4 jΩ
Return Loss	- 28.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 3.8 jΩ
Return Loss	- 27.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.043 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 21, 2009

DASY5 Validation Report for Head TSL

Date: 16.01.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

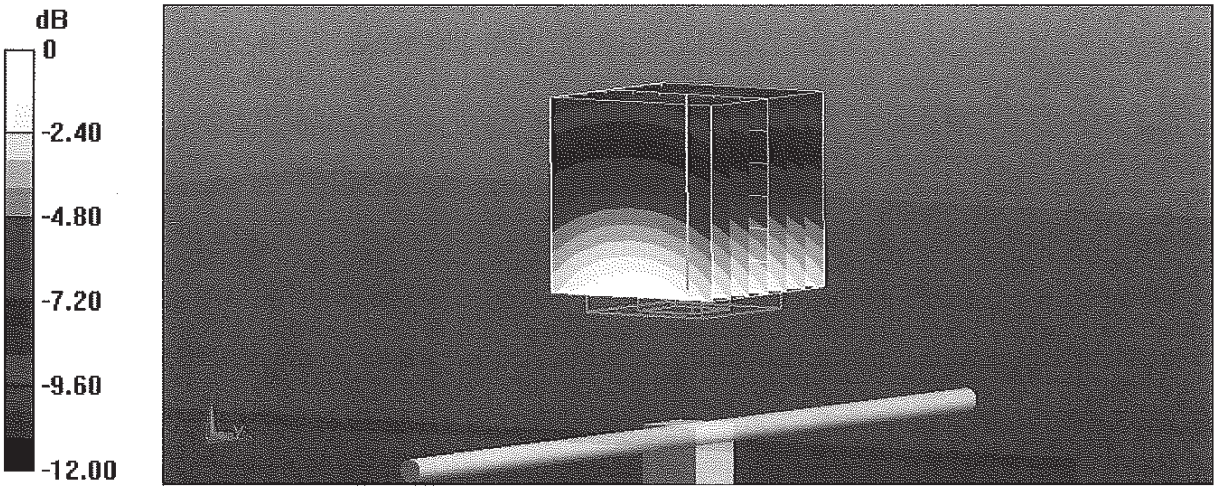
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.44, 6.44, 6.44); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

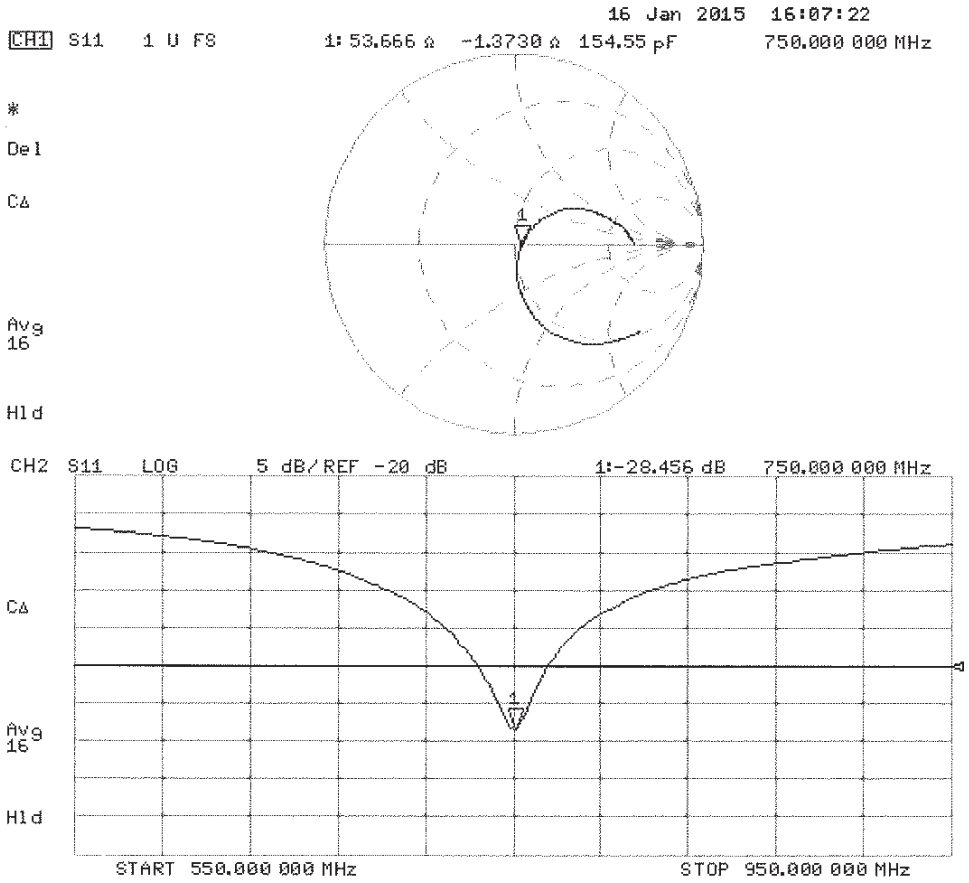
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.08 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 2.06 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.41 W/kg



0 dB = 2.41 W/kg = 3.82 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.01.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

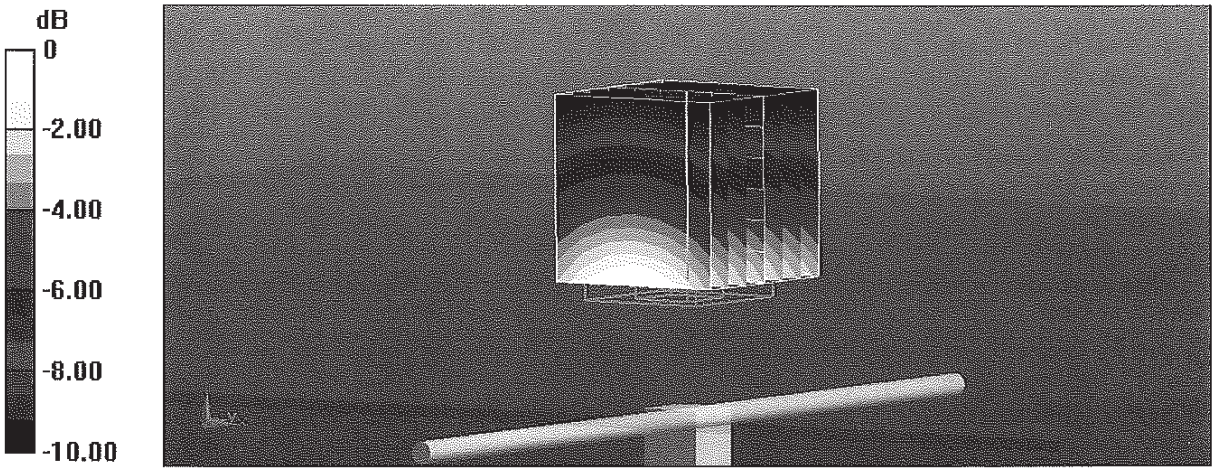
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 56; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.21, 6.21, 6.21); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

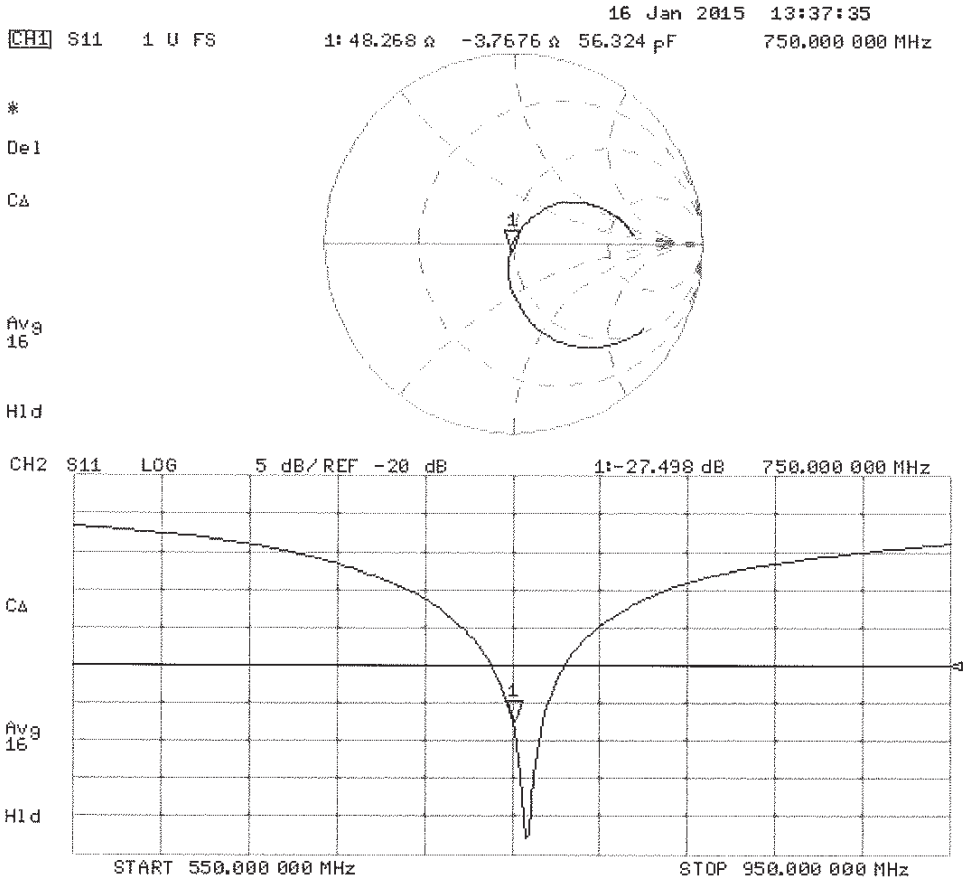
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.21 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (measured) = 2.52 W/kg



0 dB = 2.52 W/kg = 4.01 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **PC Test**

Certificate No: **D835V2-4d133_Jul14**

CALIBRATION CERTIFICATE

Object D835V2 - SN: 4d133

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

CC w/o/m

Calibration date: July 24, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (In house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (In house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 24, 2014

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Accreditation No.: **SCS 108**

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.20 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.96 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	1.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.35 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.15 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.6 Ω - 1.0 jΩ
Return Loss	- 34.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω - 3.3 jΩ
Return Loss	- 27.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.395 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 24.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

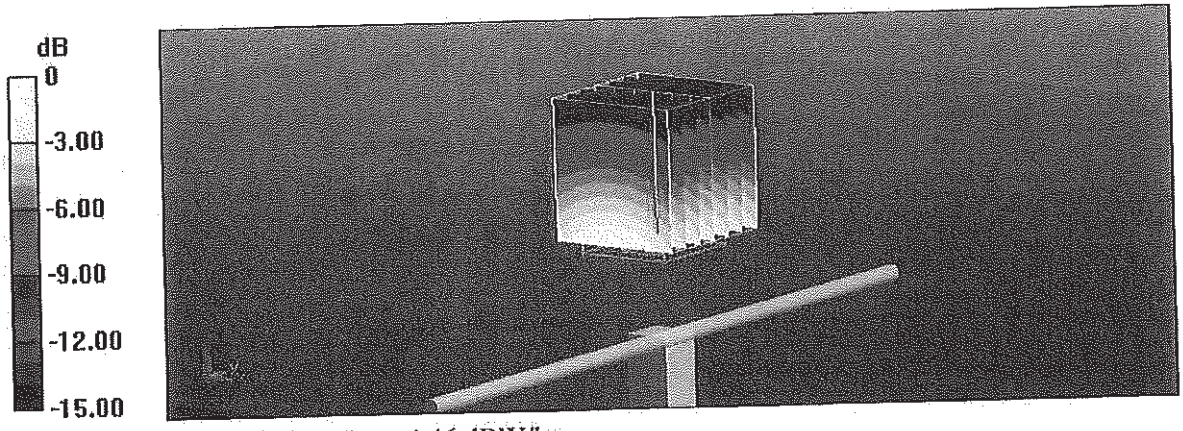
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.22, 6.22, 6.22); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

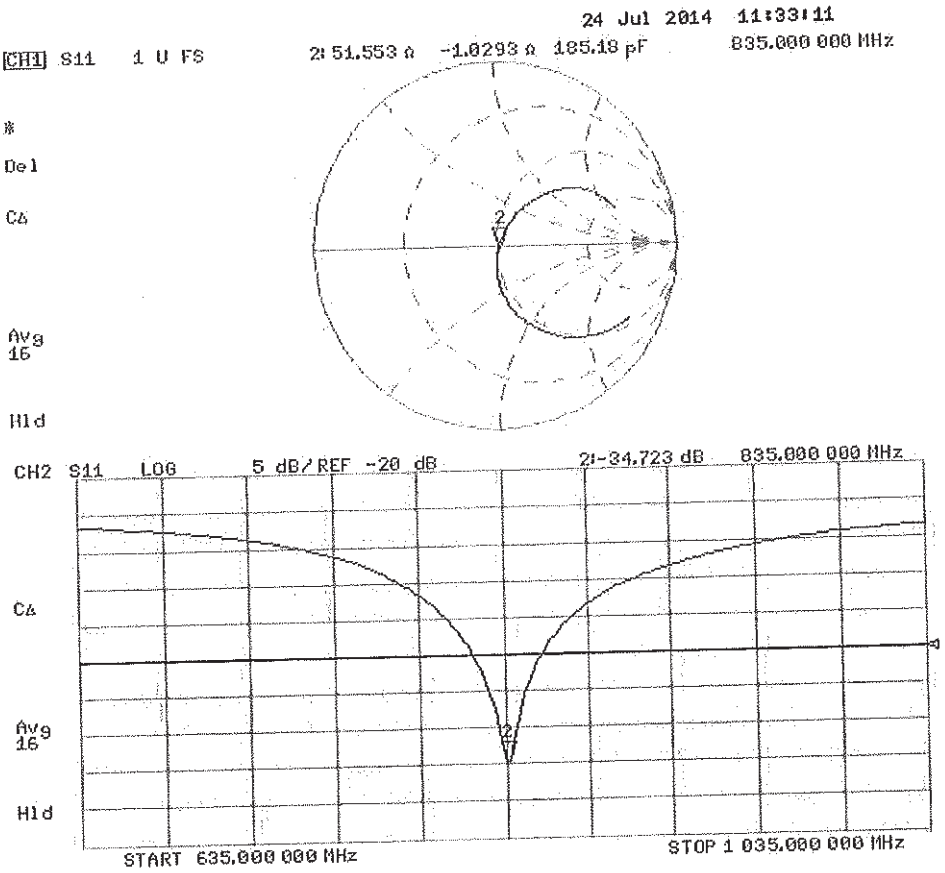
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.07 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 2.79 W/kg



0 dB = 2.79 W/kg = 4.46 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 17.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

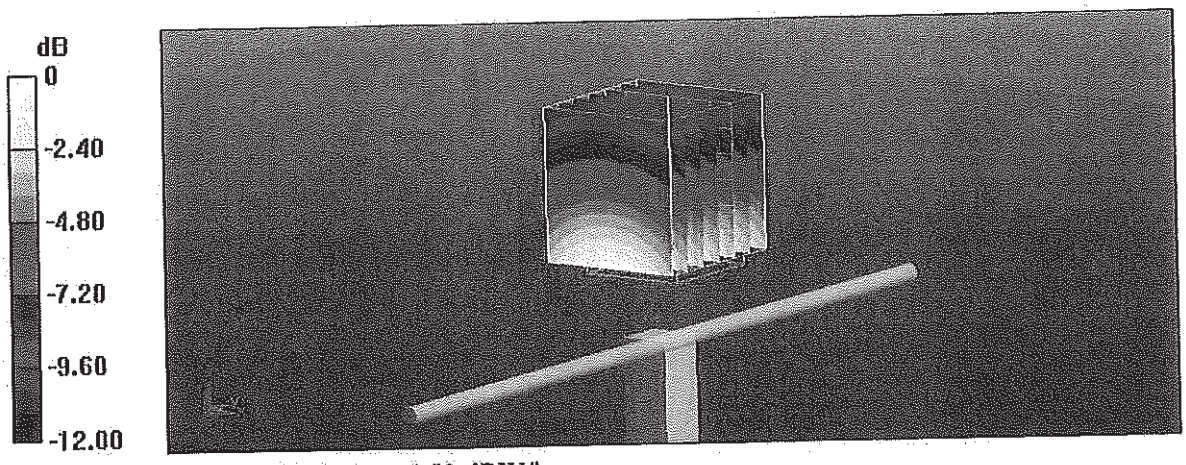
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.02 S/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.09, 6.09, 6.09); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

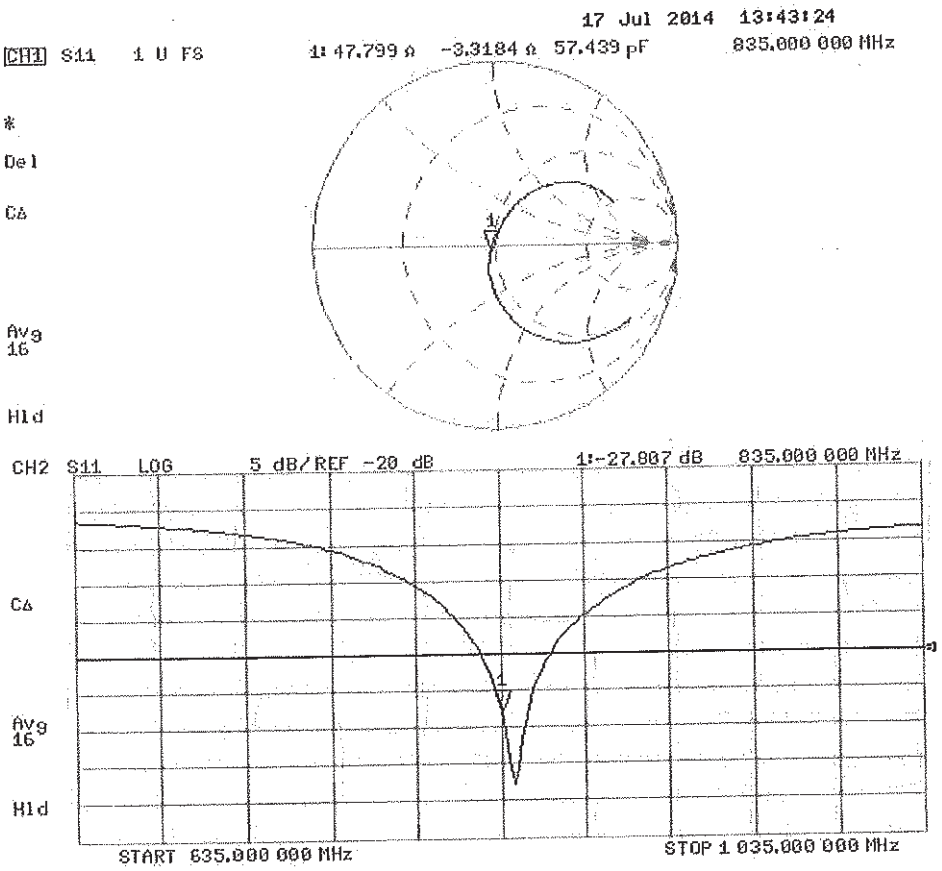
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.61 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.59 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 2.84 W/kg



0 dB = 2.84 W/kg = 4.53 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client PC Test

Certificate No: D1765V2-1008_May14

CALIBRATION CERTIFICATE

Object: D1765V2 - SN: 1008

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

CCV 6/2/14

Calibration date: May 07, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 12, 2014

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.23 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.87 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.2 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.02 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.1 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.7 Ω - 6.1 jΩ
Return Loss	- 23.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.7 Ω - 6.4 jΩ
Return Loss	- 20.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.211 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 06, 2005

DASY5 Validation Report for Head TSL

Date: 07.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN: 1008

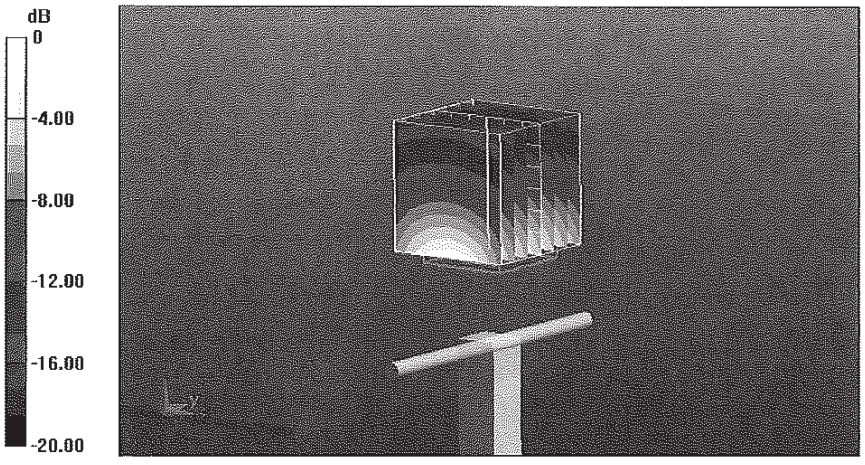
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.23, 5.23, 5.23); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

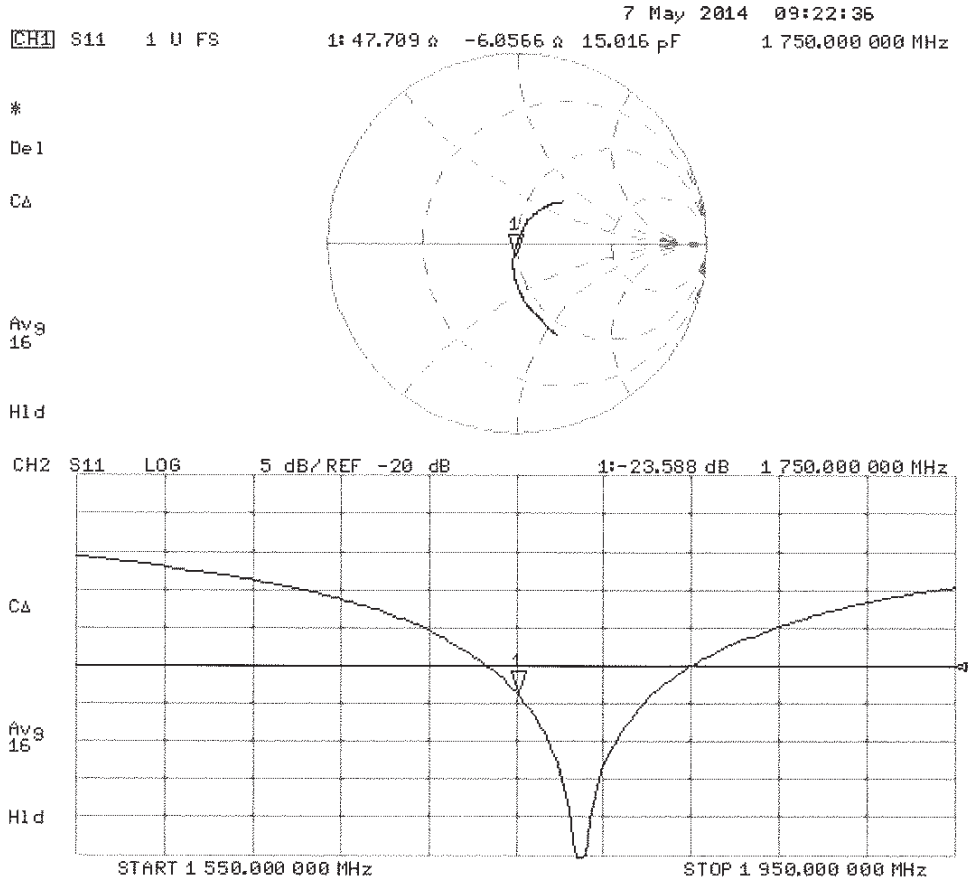
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.06 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.23 W/kg; SAR(10 g) = 4.87 W/kg
Maximum value of SAR (measured) = 11.7 W/kg



0 dB = 11.7 W/kg = 10.68 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN: 1008

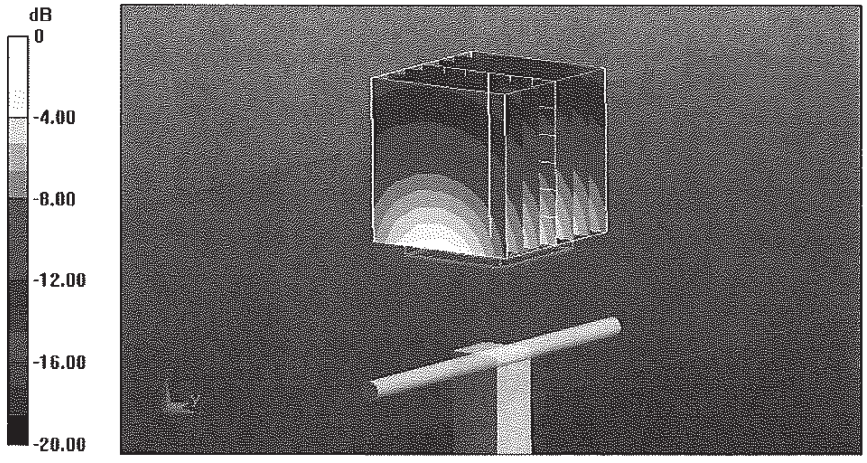
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.48 S/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.89, 4.89, 4.89); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

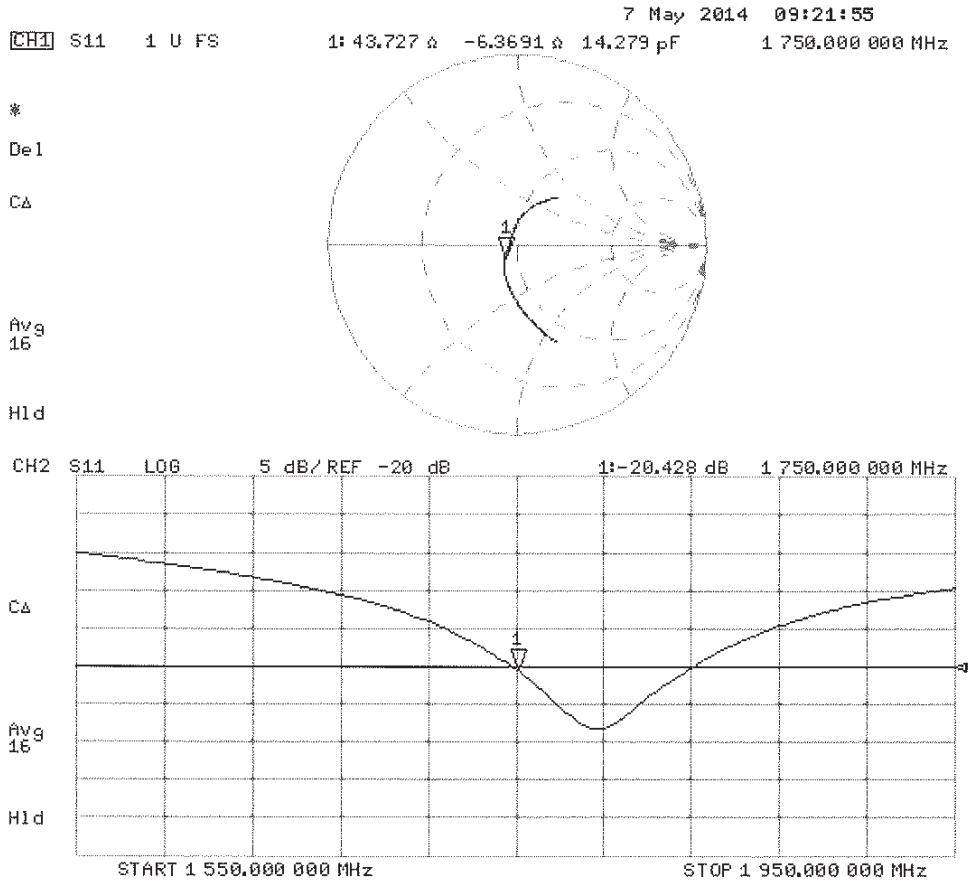
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.01 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.41 W/kg; SAR(10 g) = 5.02 W/kg
Maximum value of SAR (measured) = 11.8 W/kg



0 dB = 11.8 W/kg = 10.72 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
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Accreditation No.: **SCS 108**

Client **PC Test**

Certificate No: **D1900V2-5d149_Jul14**

CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d149

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

CC 11/5/14

Calibration date: July 23, 2014

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (In house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 23, 2014

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.24 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.33 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.3 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6 Ω + 5.5 jΩ
Return Loss	- 24.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.8 Ω + 6.1 jΩ
Return Loss	- 24.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 23.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

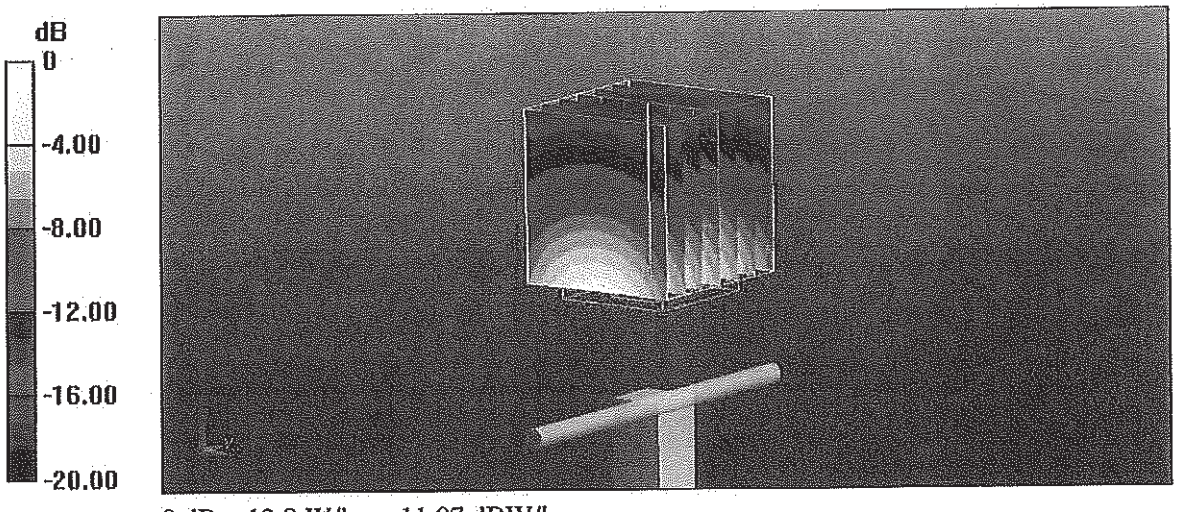
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

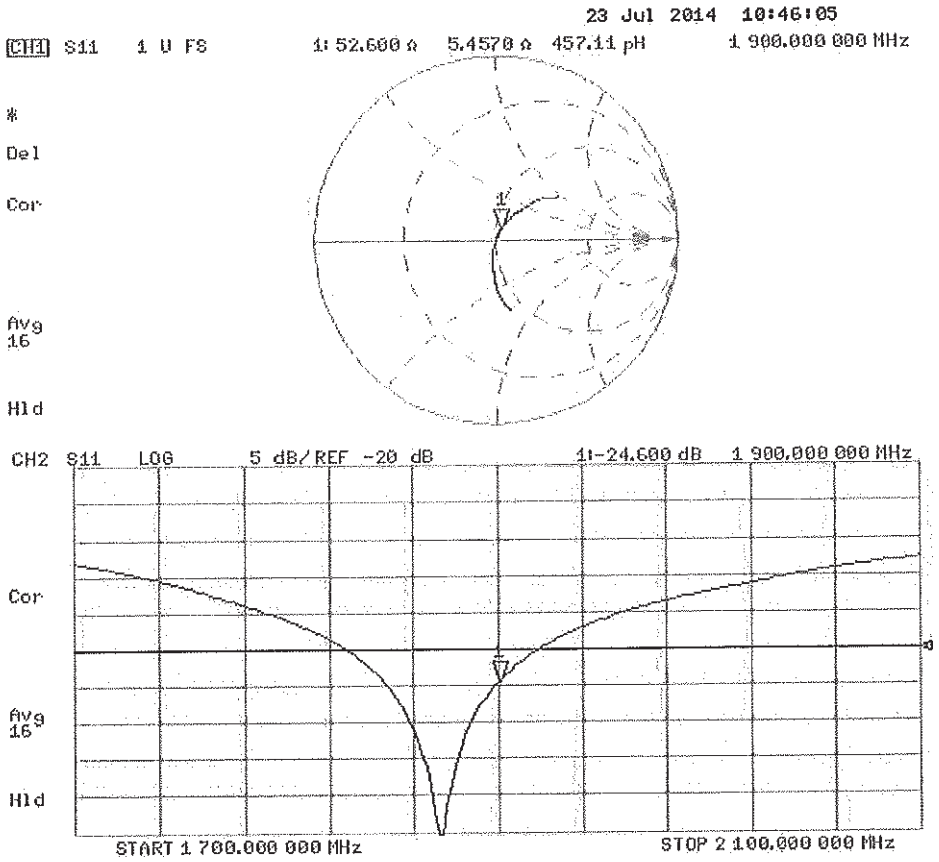
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.92 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.24 W/kg
Maximum value of SAR (measured) = 12.8 W/kg



0 dB = 12.8 W/kg = 11.07 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 23.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

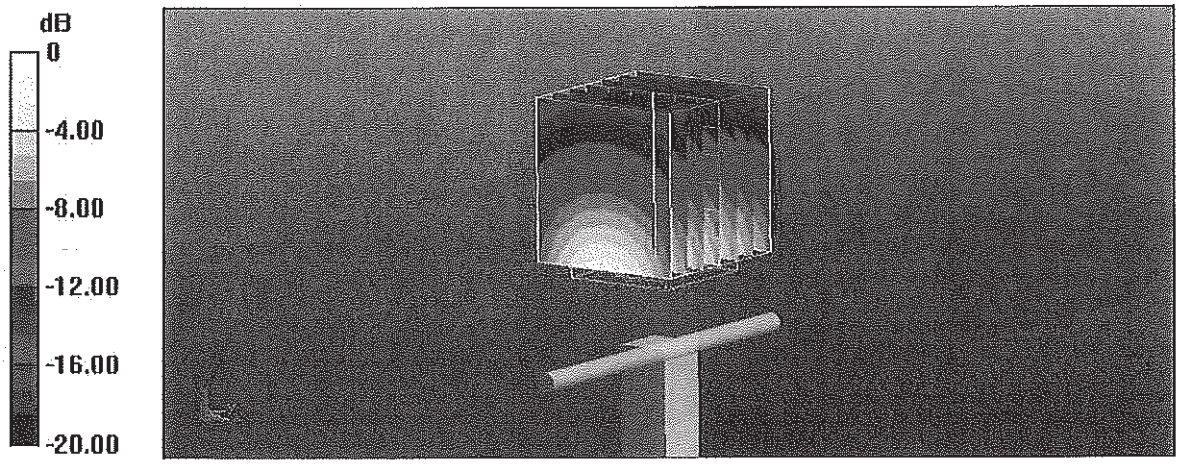
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.51 S/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.83 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 17.6 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.33 W/kg
Maximum value of SAR (measured) = 12.8 W/kg



0 dB = 12.8 W/kg = 11.07 dBW/kg

Impedance Measurement Plot for Body TSL