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SAR EVALUATION REPORT

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

Date of Testing:
04/27/15 - 05/16/15
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1505150896-R1.A3L

FCC ID:	**A3LSMT817R4**
APPLICANT:	**SAMSUNG ELECTRONICS, CO. LTD.**

DUT Type:	Portable Tablet
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093
Model(s):	SM-T817R4

Equipment Class	Band & Mode	Tx Frequency	SAR 1 gm Body (W/kg)
PCB	LTE Band 12	701.5 - 713.5 MHz	1.07
PCB	LTE Band 13	779.5 - 784.5 MHz	1.07
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	1.04
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	1.04
PCB	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	1.04
DTS	2.4 GHz WLAN	2412 - 2462 MHz	1.07
NII	U-NII-1	5180 - 5240 MHz	
NII	U-NII-2A	5260 - 5320 MHz	1.01
NII	U-NII-2C	5500 - 5720 MHz	0.94
NII	U-NII-3	5745 - 5825 MHz	0.88
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.11
Simultaneous SAR per KDB 690783 D01v01r03:			1.55

Note: This revised Test Report (S/N: 0Y1505150896-R1.A3L) 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.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.7 of this report; for North American frequency bands only.

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

Randy Ortanez
President

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 17	Data	706.5 - 713.5 MHz
LTE Band 12	Data	701.5 - 713.5 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
LTE Band 25 (PCS)	Data	1850.7 - 1914.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
U-NII-1	Data	5180 - 5240 MHz
U-NII-2A	Data	5260 - 5320 MHz
U-NII-2C	Data	5500 - 5720 MHz
U-NII-3	Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
ANT+	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device uses independent power reduction mechanisms for WLAN and PCB SAR compliance. The power reduction mechanisms are activated when the device is used in close proximity to the user's body. 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	**23.5**
	Nominal	**23.0**
LTE Band 17	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 13	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 5 (Cell)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 4 (AWS)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 25 (PCS)	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 2 (PCS)	Maximum	**23.5**
	Nominal	**23.0**

Main Antenna Reduced Power – Body at 0.0 mm

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**18.5**
	Nominal	**18.0**
LTE Band 17	Maximum	**18.5**
	Nominal	**18.0**
LTE Band 13	Maximum	**18.5**
	Nominal	**18.0**
LTE Band 5 (Cell)	Maximum	**17.5**
	Nominal	**17.0**
LTE Band 4 (AWS)	Maximum	**14.5**
	Nominal	**14.0**
LTE Band 25 (PCS)	Maximum	**14.5**
	Nominal	**14.0**
LTE Band 2 (PCS)	Maximum	**14.5**
	Nominal	**14.0**

WLAN/BT Maximum Power

Mode / Band		Modulated Average (dBm)		
		ANT 1	ANT 2	MIMO
IEEE 802.11b (2.4 GHz)	Maximum	**17.5**	**17.5**	
	Nominal	**17.0**	**17.0**	
IEEE 802.11g (2.4 GHz)	Maximum	**15.5**	**15.5**	
	Nominal	**15.0**	**15.0**	
IEEE 802.11n (2.4 GHz)	Maximum	**14.5**	**14.5**	**17.5**
	Nominal	**14.0**	**14.0**	**17.0**
Bluetooth	Maximum	**10.0**		
	Nominal	**9.5**		
Bluetooth LE	Maximum	**5.5**		
	Nominal	**5.0**		

Mode / Band		Modulated Average (dBm)								
		20 MHz Bandwidth			40 MHz Bandwidth			80 MHz Bandwidth		
		ANT 1	ANT 2	MIMO	ANT 1	ANT 2	MIMO	ANT 1	ANT 2	MIMO
IEEE 802.11a (5 GHz)	Maximum	**13.5**	**13.5**							
	Nominal	**13.0**	**13.0**							
IEEE 802.11n (5 GHz)	Maximum	**13.5**	**13.5**	**16.5**	**12.5**	**12.5**	**15.5**			
	Nominal	**13.0**	**13.0**	**16.0**	**12.0**	**12.0**	**15.0**			
IEEE 802.11ac (5 GHz)	Maximum	**13.5**	**13.5**	**16.5**	**12.5**	**12.5**	**15.5**	**11.5**	**11.5**	**14.5**
	Nominal	**13.0**	**13.0**	**16.0**	**12.0**	**12.0**	**15.0**	**11.0**	**11.0**	**14.0**

WLAN Reduced Power at 0.0 mm

Mode / Band		Modulated Average (dBm)		
		ANT 1	ANT 2	MIMO
IEEE 802.11b (2.4 GHz)	Maximum	**14.5**	**12.5**	
	Nominal	**14.0**	**12.0**	
IEEE 802.11g (2.4 GHz)	Maximum	**14.5**	**12.5**	
	Nominal	**14.0**	**12.0**	
IEEE 802.11n (2.4 GHz)	Maximum	**14.5**	**12.5**	**16.5**
	Nominal	**14.0**	**12.0**	**16.0**

Mode / Band		Modulated Average (dBm)								
		20 MHz Bandwidth			40 MHz Bandwidth			80 MHz Bandwidth		
		ANT 1	ANT 2	MIMO	ANT 1	ANT 2	MIMO	ANT 1	ANT 2	MIMO
IEEE 802.11a (5 GHz)	Maximum	**8.5**	**7.5**							
	Nominal	**8.0**	**7.0**							
IEEE 802.11n (5 GHz)	Maximum	**8.5**	**7.5**	**10.5**	**8.5**	**7.5**	**10.5**			
	Nominal	**8.0**	**7.0**	**10.0**	**8.0**	**7.0**	**10.0**			
IEEE 802.11ac (5 GHz)	Maximum	**8.5**	**7.5**	**10.5**	**8.5**	**7.5**	**10.5**	**8.5**	**7.5**	**10.5**
	Nominal	**8.0**	**7.0**	**10.0**	**8.0**	**7.0**	**10.0**	**8.0**	**7.0**	**10.0**

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	Yes	Yes	Yes
2.4 GHz Bluetooth	Yes	No	Yes	Yes	Yes
5 GHz WLAN	Yes	Yes	Yes	Yes	Yes

Note:
1. 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.
2. Per the manufacturer's request WLAN antenna 1 top and left edge, WLAN antenna 2 top edge and BT left edge were tested for SAR.

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.

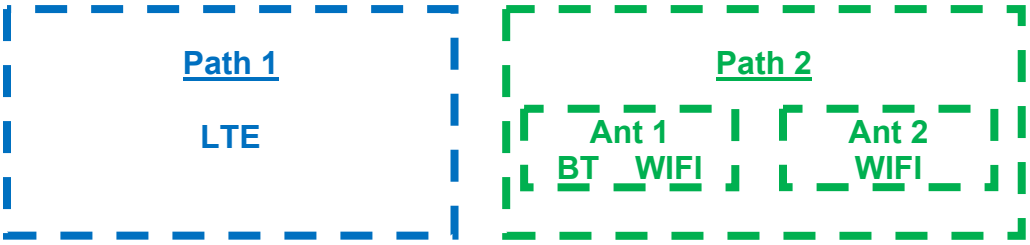


Figure 1-1
Simultaneous Transmission Paths

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.

Table 1-2
Simultaneous Transmission Scenarios

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

1. 2.4 GHz WLAN, 5 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. This device supports 2x2 MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.

1.6 Miscellaneous SAR Test Considerations

(A) WIFI

This device supports IEEE 802.11ac with the following features:

a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 2 Tx antenna output
d) 256 QAM is supported
e) Band gap and TDWR channels are supported

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB 248227 D01 Wi-Fi SAR v02.

(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 D05v02r03.

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 KDB Publication 941225 D05A v01r01, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

1.7 Guidance Applied

- FCC KDB Publication 941225 D05v02r03, D05Av01r01 (4G)
- FCC KDB Publication 248227 D01 Wi-Fi SAR v02 (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 with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

	Max Power Serial Number	Reduced Power Serial Number
LTE Band 12	7318	8134
LTE Band 13	7598	6947
LTE Band 5 (Cell)	7598	8117
LTE Band 4 (AWS)	7598	6947
LTE Band 25 (PCS)	7736	7737
2.4 GHz WLAN	6905	7937
5 GHz WLAN	6905	7937
2.4 GHz Bluetooth	6905	N/A

2 LTE INFORMATION

LTE Information				
FCC ID	**A3LSMT817R4**			
Form Factor	Portable Tablet			
Frequency Range of each LTE transmission band	LTE Band 12 (701.5 - 713.5 MHz)			
	LTE Band 17: (706.5 - 713.5 MHz)			
	LTE Band 13 (779.5 - 784.5 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: 5 MHz, 10 MHz			
	LTE Band 17: 5 MHz, 10 MHz			
	LTE Band 13: 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: 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 17: 5 MHz		706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz		709 (23780)	710 (23790)	711 (23800)
LTE Band 13: 5 MHz		779.5 (23205)	782 (23230)	784.5 (23255)
LTE Band 13: 10 MHz		N/A	782 (23230)	N/A
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 (1909.3)
LTE Band 2 (PCS): 3 MHz		1851.5 (18615)	1880 (18900)	1908.5 (1908.5)
LTE Band 2 (PCS): 5 MHz		1852.5 (18625)	1880 (18900)	1907.5 (1907.5)
LTE Band 2 (PCS): 10 MHz		1855 (18650)	1880 (18900)	1905 (1905)
LTE Band 2 (PCS): 15 MHz		1857.5 (18675)	1880 (18900)	1902.5 (1902.5)
LTE Band 2 (PCS): 20 MHz		1860 (18700)	1880 (18900)	1900 (1900)
UE Category	6			
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 B5 (PCC) + LTE B4 (SCC)	LTE B5 (PCC) + LTE B2 (SCC)	LTE B4 (PCC) + LTE B12 (SCC)	LTE B2 (PCC) + LTE B12 (SCC)
	5MHz (B5)+5MHz (B4)	5MHz (B5)+5MHz (B2)	5MHz (B4)+5MHz (B12)	5MHz (B2)+5MHz (B12)
	5MHz (B5)+10MHz (B4)	5MHz (B5)+10MHz (B2)	5MHz (B4)+10MHz (B12)	5MHz (B2)+10MHz (B12)
	5MHz (B5)+15MHz (B4)	5MHz (B5)+15MHz (B2)	10MHz (B4)+5MHz (B12)	10MHz (B2)+5MHz (B12)
	5MHz (B5)+20MHz (B4)	5MHz (B5)+20MHz (B2)	10MHz (B4)+10MHz (B12)	10MHz (B2)+10MHz (B12)
	10MHz (B5)+5MHz (B4)	10MHz (B5)+5MHz (B2)	15MHz (B4)+5MHz (B12)	15MHz (B2)+5MHz (B12)
	10MHz (B5)+10MHz (B4)	10MHz (B5)+10MHz (B2)	15MHz (B4)+10MHz (B12)	15MHz (B2)+10MHz (B12)
	10MHz (B5)+15MHz (B4)	10MHz (B5)+15MHz (B2)	20MHz (B4)+5MHz (B12)	20MHz (B2)+5MHz (B12)
	10MHz (B5)+20MHz (B4)	10MHz (B5)+20MHz (B2)	20MHz (B4)+10MHz (B12)	20MHz (B2)+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:

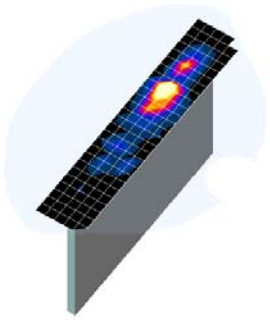


Figure 4-1
Sample SAR Area Scan

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 independent power reduction mechanisms to reduce powers in certain use conditions for both PCB and WLAN operations when the device is used close to the user's body. There are no dependencies on either mechanism (ie: the state of one mechanism does not affect the other).

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 and top edge of the device is 25 mm, a conservative distance of 24 mm was tested for SAR on the back side and top edge at maximum power for LTE. Since the sensor activation distance for the back side of the device is 5 mm, a conservative distance of 4 mm was tested for SAR on the back side at maximum power for WLAN. Sensor triggering distance summary data is included in Appendix G.

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 antennas.

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 for licensed transmitters are 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 D01v03 "3G SAR Measurement Procedures."

The device is 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 are 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 is 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 deviates by more than 5%, the SAR test and drift measurements are repeated.

7.3 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r03 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are 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 D05v02r03:

a. Per Section 4.2.1, 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 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 4.2.1.
c. Per Section 4.2.3, 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 4.2.4 and 4.3, 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 4.2.1 through 4.2.3 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 Downlink Carrier Aggregation

LTE Carrier Aggregation (CA) measurements are 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 are 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 KDB Publication 941225 D05A v01r01, no SAR measurements are required when the average output power with downlink carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink carrier aggregation inactive.

7.4 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. 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 D01 Wi-Fi SAR v02 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.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

7.4.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg.

7.4.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.

Unless band gap channels are permanently disabled, SAR must be considered for these channels. When band gap channels are disabled, each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

7.4.4 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is › 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

7.4.5 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel

bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

7.4.6 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 7.4.5).

7.4.7 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required.

7.4.8 MIMO SAR considerations

Per KDB 248227 D01 Wi-Fi SAR v02, the simultaneous SAR provisions in KDB Publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

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	23.30	0	0
	707.5	23095	10	QPSK	1	25	**23.33**	0	0
	707.5	23095	10	QPSK	1	49	23.26	0	0
	707.5	23095	10	QPSK	25	0	**22.04**	0-1	1
	707.5	23095	10	QPSK	25	12	21.92	0-1	1
	707.5	23095	10	QPSK	25	25	21.85	0-1	1
	707.5	23095	10	QPSK	50	0	21.99	0-1	1
	707.5	23095	10	16QAM	1	0	22.30	0-1	1
	707.5	23095	10	16QAM	1	25	22.45	0-1	1
	707.5	23095	10	16QAM	1	49	22.33	0-1	1
	707.5	23095	10	16QAM	25	0	21.00	0-2	2
	707.5	23095	10	16QAM	25	12	20.89	0-2	2
	707.5	23095	10	16QAM	25	25	20.91	0-2	2
	707.5	23095	10	16QAM	50	0	20.96	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	23.48	0	0
	701.5	23035	5	QPSK	1	12	23.50	0	0
	701.5	23035	5	QPSK	1	24	23.48	0	0
	701.5	23035	5	QPSK	12	0	22.17	0-1	1
	701.5	23035	5	QPSK	12	6	22.18	0-1	1
	701.5	23035	5	QPSK	12	13	22.19	0-1	1
	701.5	23035	5	QPSK	25	0	22.13	0-1	1
	701.5	23035	5	16-QAM	1	0	22.42	0-1	1
	701.5	23035	5	16-QAM	1	12	22.40	0-1	1
	701.5	23035	5	16-QAM	1	24	22.44	0-1	1
	701.5	23035	5	16-QAM	12	0	21.06	0-2	2
	701.5	23035	5	16-QAM	12	6	21.11	0-2	2
	701.5	23035	5	16-QAM	12	13	21.10	0-2	2
	701.5	23035	5	16-QAM	25	0	21.14	0-2	2
Mid	707.5	23095	5	QPSK	1	0	23.08	0	0
	707.5	23095	5	QPSK	1	12	23.04	0	0
	707.5	23095	5	QPSK	1	24	23.03	0	0
	707.5	23095	5	QPSK	12	0	21.98	0-1	1
	707.5	23095	5	QPSK	12	6	21.93	0-1	1
	707.5	23095	5	QPSK	12	13	21.88	0-1	1
	707.5	23095	5	QPSK	25	0	21.91	0-1	1
	707.5	23095	5	16-QAM	1	0	22.24	0-1	1
	707.5	23095	5	16-QAM	1	12	22.26	0-1	1
	707.5	23095	5	16-QAM	1	24	22.31	0-1	1
	707.5	23095	5	16-QAM	12	0	20.89	0-2	2
	707.5	23095	5	16-QAM	12	6	20.85	0-2	2
	707.5	23095	5	16-QAM	12	13	20.89	0-2	2
	707.5	23095	5	16-QAM	25	0	20.92	0-2	2
High	713.5	23155	5	QPSK	1	0	23.38	0	0
	713.5	23155	5	QPSK	1	12	23.21	0	0
	713.5	23155	5	QPSK	1	24	23.31	0	0
	713.5	23155	5	QPSK	12	0	21.96	0-1	1
	713.5	23155	5	QPSK	12	6	21.84	0-1	1
	713.5	23155	5	QPSK	12	13	21.89	0-1	1
	713.5	23155	5	QPSK	25	0	21.90	0-1	1
	713.5	23155	5	16-QAM	1	0	22.38	0-1	1
	713.5	23155	5	16-QAM	1	12	22.37	0-1	1
	713.5	23155	5	16-QAM	1	24	22.34	0-1	1
	713.5	23155	5	16-QAM	12	0	20.84	0-2	2
	713.5	23155	5	16-QAM	12	6	20.81	0-2	2
	713.5	23155	5	16-QAM	12	13	20.77	0-2	2
	713.5	23155	5	16-QAM	25	0	20.79	0-2	2

Table 8-3
LTE Band 12 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	707.5	23095	10	QPSK	1	0	17.61	0	0
	707.5	23095	10	QPSK	1	25	17.60	0	0
	707.5	23095	10	QPSK	1	49	**17.65**	0	0
	707.5	23095	10	QPSK	25	0	16.38	0-1	1
	707.5	23095	10	QPSK	25	12	**16.45**	0-1	1
	707.5	23095	10	QPSK	25	25	16.34	0-1	1
	707.5	23095	10	QPSK	50	0	16.36	0-1	1
	707.5	23095	10	16QAM	1	0	16.77	0-1	1
	707.5	23095	10	16QAM	1	25	16.71	0-1	1
	707.5	23095	10	16QAM	1	49	16.75	0-1	1
	707.5	23095	10	16QAM	25	0	15.34	0-2	2
	707.5	23095	10	16QAM	25	12	15.42	0-2	2
	707.5	23095	10	16QAM	25	25	15.40	0-2	2
	707.5	23095	10	16QAM	50	0	15.45	0-2	2

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

Table 8-4
LTE Band 12 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	701.5	23035	5	QPSK	1	0	17.77	0	0
	701.5	23035	5	QPSK	1	12	17.64	0	0
	701.5	23035	5	QPSK	1	24	17.74	0	0
	701.5	23035	5	QPSK	12	0	16.64	0-1	1
	701.5	23035	5	QPSK	12	6	16.64	0-1	1
	701.5	23035	5	QPSK	12	13	16.69	0-1	1
	701.5	23035	5	QPSK	25	0	16.63	0-1	1
	701.5	23035	5	16-QAM	1	0	16.81	0-1	1
	701.5	23035	5	16-QAM	1	12	16.86	0-1	1
	701.5	23035	5	16-QAM	1	24	16.86	0-1	1
	701.5	23035	5	16-QAM	12	0	15.50	0-2	2
	701.5	23035	5	16-QAM	12	6	15.52	0-2	2
	701.5	23035	5	16-QAM	12	13	15.55	0-2	2
	701.5	23035	5	16-QAM	25	0	15.61	0-2	2
Mid	707.5	23095	5	QPSK	1	0	17.70	0	0
	707.5	23095	5	QPSK	1	12	17.62	0	0
	707.5	23095	5	QPSK	1	24	17.71	0	0
	707.5	23095	5	QPSK	12	0	16.37	0-1	1
	707.5	23095	5	QPSK	12	6	16.35	0-1	1
	707.5	23095	5	QPSK	12	13	16.36	0-1	1
	707.5	23095	5	QPSK	25	0	16.33	0-1	1
	707.5	23095	5	16-QAM	1	0	16.71	0-1	1
	707.5	23095	5	16-QAM	1	12	16.63	0-1	1
	707.5	23095	5	16-QAM	1	24	16.61	0-1	1
	707.5	23095	5	16-QAM	12	0	15.36	0-2	2
	707.5	23095	5	16-QAM	12	6	15.34	0-2	2
	707.5	23095	5	16-QAM	12	13	15.38	0-2	2
	707.5	23095	5	16-QAM	25	0	15.48	0-2	2
High	713.5	23155	5	QPSK	1	0	17.77	0	0
	713.5	23155	5	QPSK	1	12	17.64	0	0
	713.5	23155	5	QPSK	1	24	17.73	0	0
	713.5	23155	5	QPSK	12	0	16.63	0-1	1
	713.5	23155	5	QPSK	12	6	16.54	0-1	1
	713.5	23155	5	QPSK	12	13	16.68	0-1	1
	713.5	23155	5	QPSK	25	0	16.52	0-1	1
	713.5	23155	5	16-QAM	1	0	16.82	0-1	1
	713.5	23155	5	16-QAM	1	12	16.86	0-1	1
	713.5	23155	5	16-QAM	1	24	16.85	0-1	1
	713.5	23155	5	16-QAM	12	0	15.50	0-2	2
	713.5	23155	5	16-QAM	12	6	15.51	0-2	2
	713.5	23155	5	16-QAM	12	13	15.55	0-2	2
	713.5	23155	5	16-QAM	25	0	15.61	0-2	2

8.1.2 LTE Band 13

Table 8-5
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	23.18	0	0
	782.0	23230	10	QPSK	1	25	**23.32**	0	0
	782.0	23230	10	QPSK	1	49	23.29	0	0
	782.0	23230	10	QPSK	25	0	**21.97**	0-1	1
	782.0	23230	10	QPSK	25	12	21.90	0-1	1
	782.0	23230	10	QPSK	25	25	21.83	0-1	1
	782.0	23230	10	QPSK	50	0	21.95	0-1	1
	782.0	23230	10	16QAM	1	0	22.17	0-1	1
	782.0	23230	10	16QAM	1	25	22.32	0-1	1
	782.0	23230	10	16QAM	1	49	22.18	0-1	1
	782.0	23230	10	16QAM	25	0	20.89	0-2	2
	782.0	23230	10	16QAM	25	12	20.90	0-2	2
	782.0	23230	10	16QAM	25	25	20.85	0-2	2
	782.0	23230	10	16QAM	50	0	20.93	0-2	2

Table 8-6
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	23.45	0	0
	782.0	23230	5	QPSK	1	12	23.37	0	0
	782.0	23230	5	QPSK	1	24	23.38	0	0
	782.0	23230	5	QPSK	12	0	21.98	0-1	1
	782.0	23230	5	QPSK	12	6	21.88	0-1	1
	782.0	23230	5	QPSK	12	13	21.84	0-1	1
	782.0	23230	5	QPSK	25	0	21.99	0-1	1
	782.0	23230	5	16-QAM	1	0	22.37	0-1	1
	782.0	23230	5	16-QAM	1	12	22.25	0-1	1
	782.0	23230	5	16-QAM	1	24	22.30	0-1	1
	782.0	23230	5	16-QAM	12	0	20.93	0-2	2
	782.0	23230	5	16-QAM	12	6	20.85	0-2	2
	782.0	23230	5	16-QAM	12	13	20.82	0-2	2
	782.0	23230	5	16-QAM	25	0	20.87	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 8-7
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	17.87	0	0
	782.0	23230	10	QPSK	1	25	**17.88**	0	0
	782.0	23230	10	QPSK	1	49	17.83	0	0
	782.0	23230	10	QPSK	25	0	16.51	0-1	1
	782.0	23230	10	QPSK	25	12	**16.55**	0-1	1
	782.0	23230	10	QPSK	25	25	16.50	0-1	1
	782.0	23230	10	QPSK	50	0	16.52	0-1	1
	782.0	23230	10	16QAM	1	0	16.67	0-1	1
	782.0	23230	10	16QAM	1	25	16.81	0-1	1
	782.0	23230	10	16QAM	1	49	16.66	0-1	1
	782.0	23230	10	16QAM	25	0	15.52	0-2	2
	782.0	23230	10	16QAM	25	12	15.51	0-2	2
	782.0	23230	10	16QAM	25	25	15.50	0-2	2
	782.0	23230	10	16QAM	50	0	16.50	0-2	2

Table 8-8
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	18.04	0	0
	782.0	23230	5	QPSK	1	12	17.98	0	0
	782.0	23230	5	QPSK	1	24	17.96	0	0
	782.0	23230	5	QPSK	12	0	17.09	0-1	1
	782.0	23230	5	QPSK	12	6	16.89	0-1	1
	782.0	23230	5	QPSK	12	13	17.02	0-1	1
	782.0	23230	5	QPSK	25	0	17.03	0-1	1
	782.0	23230	5	16-QAM	1	0	16.93	0-1	1
	782.0	23230	5	16-QAM	1	12	17.01	0-1	1
	782.0	23230	5	16-QAM	1	24	17.03	0-1	1
	782.0	23230	5	16-QAM	12	0	16.18	0-2	2
	782.0	23230	5	16-QAM	12	6	16.21	0-2	2
	782.0	23230	5	16-QAM	12	13	16.11	0-2	2
	782.0	23230	5	16-QAM	25	0	16.04	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.

8.1.3 LTE Band 5 (Cell)

Table 8-9
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	23.11	0	0
	836.5	20525	10	QPSK	1	25	**23.15**	0	0
	836.5	20525	10	QPSK	1	49	22.98	0	0
	836.5	20525	10	QPSK	25	0	**21.66**	0-1	1
	836.5	20525	10	QPSK	25	12	21.65	0-1	1
	836.5	20525	10	QPSK	25	25	21.62	0-1	1
	836.5	20525	10	QPSK	50	0	21.60	0-1	1
	836.5	20525	10	16QAM	1	0	21.83	0-1	1
	836.5	20525	10	16QAM	1	25	21.85	0-1	1
	836.5	20525	10	16QAM	1	49	21.79	0-1	1
	836.5	20525	10	16QAM	25	0	20.57	0-2	2
	836.5	20525	10	16QAM	25	12	20.52	0-2	2
	836.5	20525	10	16QAM	25	25	20.55	0-2	2
	836.5	20525	10	16QAM	50	0	20.51	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 8-10
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	22.99	0	0
	826.5	20425	5	QPSK	1	12	23.01	0	0
	826.5	20425	5	QPSK	1	24	23.05	0	0
	826.5	20425	5	QPSK	12	0	21.62	0-1	1
	826.5	20425	5	QPSK	12	6	21.65	0-1	1
	826.5	20425	5	QPSK	12	13	21.72	0-1	1
	826.5	20425	5	QPSK	25	0	21.63	0-1	1
	826.5	20425	5	16-QAM	1	0	22.15	0-1	1
	826.5	20425	5	16-QAM	1	12	22.19	0-1	1
	826.5	20425	5	16-QAM	1	24	22.20	0-1	1
	826.5	20425	5	16-QAM	12	0	20.55	0-2	2
	826.5	20425	5	16-QAM	12	6	20.63	0-2	2
	826.5	20425	5	16-QAM	12	13	20.70	0-2	2
	826.5	20425	5	16-QAM	25	0	20.70	0-2	2
Mid	836.5	20525	5	QPSK	1	0	23.02	0	0
	836.5	20525	5	QPSK	1	12	23.06	0	0
	836.5	20525	5	QPSK	1	24	23.10	0	0
	836.5	20525	5	QPSK	12	0	21.78	0-1	1
	836.5	20525	5	QPSK	12	6	21.77	0-1	1
	836.5	20525	5	QPSK	12	13	21.80	0-1	1
	836.5	20525	5	QPSK	25	0	21.69	0-1	1
	836.5	20525	5	16-QAM	1	0	22.23	0-1	1
	836.5	20525	5	16-QAM	1	12	22.21	0-1	1
	836.5	20525	5	16-QAM	1	24	22.36	0-1	1
	836.5	20525	5	16-QAM	12	0	20.62	0-2	2
	836.5	20525	5	16-QAM	12	6	20.64	0-2	2
	836.5	20525	5	16-QAM	12	13	20.69	0-2	2
	836.5	20525	5	16-QAM	25	0	20.60	0-2	2
High	846.5	20625	5	QPSK	1	0	23.03	0	0
	846.5	20625	5	QPSK	1	12	23.01	0	0
	846.5	20625	5	QPSK	1	24	23.06	0	0
	846.5	20625	5	QPSK	12	0	21.60	0-1	1
	846.5	20625	5	QPSK	12	6	21.61	0-1	1
	846.5	20625	5	QPSK	12	13	21.55	0-1	1
	846.5	20625	5	QPSK	25	0	21.61	0-1	1
	846.5	20625	5	16-QAM	1	0	22.06	0-1	1
	846.5	20625	5	16-QAM	1	12	22.15	0-1	1
	846.5	20625	5	16-QAM	1	24	22.22	0-1	1
	846.5	20625	5	16-QAM	12	0	20.62	0-2	2
	846.5	20625	5	16-QAM	12	6	20.60	0-2	2
	846.5	20625	5	16-QAM	12	13	20.56	0-2	2
	846.5	20625	5	16-QAM	25	0	20.57	0-2	2

Table 8-11
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	22.97	0	0
	825.5	20415	3	QPSK	1	7	23.05	0	0
	825.5	20415	3	QPSK	1	14	23.08	0	0
	825.5	20415	3	QPSK	8	0	21.62	0-1	1
	825.5	20415	3	QPSK	8	4	21.66	0-1	1
	825.5	20415	3	QPSK	8	7	21.71	0-1	1
	825.5	20415	3	QPSK	15	0	21.64	0-1	1
	825.5	20415	3	16-QAM	1	0	22.19	0-1	1
	825.5	20415	3	16-QAM	1	7	22.21	0-1	1
	825.5	20415	3	16-QAM	1	14	22.20	0-1	1
	825.5	20415	3	16-QAM	8	0	20.54	0-2	2
	825.5	20415	3	16-QAM	8	4	20.66	0-2	2
	825.5	20415	3	16-QAM	8	7	20.69	0-2	2
	825.5	20415	3	16-QAM	15	0	20.67	0-2	2
Mid	836.5	20525	3	QPSK	1	0	23.00	0	0
	836.5	20525	3	QPSK	1	7	23.10	0	0
	836.5	20525	3	QPSK	1	14	23.13	0	0
	836.5	20525	3	QPSK	8	0	21.75	0-1	1
	836.5	20525	3	QPSK	8	4	21.80	0-1	1
	836.5	20525	3	QPSK	8	7	21.78	0-1	1
	836.5	20525	3	QPSK	15	0	21.71	0-1	1
	836.5	20525	3	16-QAM	1	0	22.26	0-1	1
	836.5	20525	3	16-QAM	1	7	22.25	0-1	1
	836.5	20525	3	16-QAM	1	14	22.33	0-1	1
	836.5	20525	3	16-QAM	8	0	20.59	0-2	2
	836.5	20525	3	16-QAM	8	4	20.63	0-2	2
	836.5	20525	3	16-QAM	8	7	20.66	0-2	2
	836.5	20525	3	16-QAM	15	0	20.59	0-2	2
High	847.5	20635	3	QPSK	1	0	22.99	0	0
	847.5	20635	3	QPSK	1	7	23.01	0	0
	847.5	20635	3	QPSK	1	14	23.05	0	0
	847.5	20635	3	QPSK	8	0	21.62	0-1	1
	847.5	20635	3	QPSK	8	4	21.64	0-1	1
	847.5	20635	3	QPSK	8	7	21.59	0-1	1
	847.5	20635	3	QPSK	15	0	21.58	0-1	1
	847.5	20635	3	16-QAM	1	0	22.06	0-1	1
	847.5	20635	3	16-QAM	1	7	22.19	0-1	1
	847.5	20635	3	16-QAM	1	14	22.20	0-1	1
	847.5	20635	3	16-QAM	8	0	20.61	0-2	2
	847.5	20635	3	16-QAM	8	4	20.60	0-2	2
	847.5	20635	3	16-QAM	8	7	20.53	0-2	2
	847.5	20635	3	16-QAM	15	0	20.58	0-2	2

Table 8-12
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	22.96	0	0
	824.7	20407	1.4	QPSK	1	2	23.05	0	0
	824.7	20407	1.4	QPSK	1	5	23.05	0	0
	824.7	20407	1.4	QPSK	3	0	22.59	0	0
	824.7	20407	1.4	QPSK	3	2	22.67	0	0
	824.7	20407	1.4	QPSK	3	3	22.74	0	0
	824.7	20407	1.4	QPSK	6	0	21.60	0-1	1
	824.7	20407	1.4	16-QAM	1	0	22.23	0-1	1
	824.7	20407	1.4	16-QAM	1	2	22.23	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.21	0-1	1
	824.7	20407	1.4	16-QAM	3	0	21.52	0-1	1
	824.7	20407	1.4	16-QAM	3	2	21.69	0-1	1
	824.7	20407	1.4	16-QAM	3	3	21.70	0-1	1
	824.7	20407	1.4	16-QAM	6	0	20.68	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	22.99	0	0
	836.5	20525	1.4	QPSK	1	2	23.06	0	0
	836.5	20525	1.4	QPSK	1	5	23.09	0	0
	836.5	20525	1.4	QPSK	3	0	22.76	0	0
	836.5	20525	1.4	QPSK	3	2	22.79	0	0
	836.5	20525	1.4	QPSK	3	3	22.80	0	0
	836.5	20525	1.4	QPSK	6	0	21.67	0-1	1
	836.5	20525	1.4	16-QAM	1	0	22.24	0-1	1
	836.5	20525	1.4	16-QAM	1	2	22.22	0-1	1
	836.5	20525	1.4	16-QAM	1	5	22.34	0-1	1
	836.5	20525	1.4	16-QAM	3	0	21.60	0-1	1
	836.5	20525	1.4	16-QAM	3	2	21.67	0-1	1
	836.5	20525	1.4	16-QAM	3	3	21.66	0-1	1
	836.5	20525	1.4	16-QAM	6	0	20.55	0-2	2
High	848.3	20643	1.4	QPSK	1	0	23.03	0	0
	848.3	20643	1.4	QPSK	1	2	22.99	0	0
	848.3	20643	1.4	QPSK	1	5	23.08	0	0
	848.3	20643	1.4	QPSK	3	0	22.62	0	0
	848.3	20643	1.4	QPSK	3	2	22.67	0	0
	848.3	20643	1.4	QPSK	3	3	22.63	0	0
	848.3	20643	1.4	QPSK	6	0	21.55	0-1	1
	848.3	20643	1.4	16-QAM	1	0	22.09	0-1	1
	848.3	20643	1.4	16-QAM	1	2	22.22	0-1	1
	848.3	20643	1.4	16-QAM	1	5	22.18	0-1	1
	848.3	20643	1.4	16-QAM	3	0	21.58	0-1	1
	848.3	20643	1.4	16-QAM	3	2	21.64	0-1	1
	848.3	20643	1.4	16-QAM	3	3	21.57	0-1	1
	848.3	20643	1.4	16-QAM	6	0	20.58	0-2	2

Table 8-13
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	16.59	0	0
	836.5	20525	10	QPSK	1	25	**17.15**	0	0
	836.5	20525	10	QPSK	1	49	16.62	0	0
	836.5	20525	10	QPSK	25	0	**15.94**	0-1	1
	836.5	20525	10	QPSK	25	12	15.87	0-1	1
	836.5	20525	10	QPSK	25	25	15.86	0-1	1
	836.5	20525	10	QPSK	50	0	15.93	0-1	1
	836.5	20525	10	16QAM	1	0	16.00	0-1	1
	836.5	20525	10	16QAM	1	25	16.06	0-1	1
	836.5	20525	10	16QAM	1	49	16.04	0-1	1
	836.5	20525	10	16QAM	25	0	14.92	0-2	2
	836.5	20525	10	16QAM	25	12	14.90	0-2	2
	836.5	20525	10	16QAM	25	25	14.85	0-2	2
	836.5	20525	10	16QAM	50	0	14.97	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
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	17.11	0	0
	826.5	20425	5	QPSK	1	12	17.17	0	0
	826.5	20425	5	QPSK	1	24	17.10	0	0
	826.5	20425	5	QPSK	12	0	16.06	0-1	1
	826.5	20425	5	QPSK	12	6	16.04	0-1	1
	826.5	20425	5	QPSK	12	13	16.03	0-1	1
	826.5	20425	5	QPSK	25	0	16.01	0-1	1
	826.5	20425	5	16-QAM	1	0	16.14	0-1	1
	826.5	20425	5	16-QAM	1	12	16.18	0-1	1
	826.5	20425	5	16-QAM	1	24	16.10	0-1	1
	826.5	20425	5	16-QAM	12	0	15.02	0-2	2
	826.5	20425	5	16-QAM	12	6	14.99	0-2	2
	826.5	20425	5	16-QAM	12	13	14.96	0-2	2
	826.5	20425	5	16-QAM	25	0	15.00	0-2	2
Mid	836.5	20525	5	QPSK	1	0	17.13	0	0
	836.5	20525	5	QPSK	1	12	17.15	0	0
	836.5	20525	5	QPSK	1	24	17.11	0	0
	836.5	20525	5	QPSK	12	0	15.97	0-1	1
	836.5	20525	5	QPSK	12	6	15.94	0-1	1
	836.5	20525	5	QPSK	12	13	15.93	0-1	1
	836.5	20525	5	QPSK	25	0	16.10	0-1	1
	836.5	20525	5	16-QAM	1	0	16.11	0-1	1
	836.5	20525	5	16-QAM	1	12	16.18	0-1	1
	836.5	20525	5	16-QAM	1	24	16.10	0-1	1
	836.5	20525	5	16-QAM	12	0	14.92	0-2	2
	836.5	20525	5	16-QAM	12	6	14.90	0-2	2
	836.5	20525	5	16-QAM	12	13	14.92	0-2	2
	836.5	20525	5	16-QAM	25	0	14.94	0-2	2
High	846.5	20625	5	QPSK	1	0	17.18	0	0
	846.5	20625	5	QPSK	1	12	17.19	0	0
	846.5	20625	5	QPSK	1	24	17.11	0	0
	846.5	20625	5	QPSK	12	0	15.89	0-1	1
	846.5	20625	5	QPSK	12	6	15.83	0-1	1
	846.5	20625	5	QPSK	12	13	15.85	0-1	1
	846.5	20625	5	QPSK	25	0	15.92	0-1	1
	846.5	20625	5	16-QAM	1	0	15.86	0-1	1
	846.5	20625	5	16-QAM	1	12	15.96	0-1	1
	846.5	20625	5	16-QAM	1	24	15.88	0-1	1
	846.5	20625	5	16-QAM	12	0	14.89	0-2	2
	846.5	20625	5	16-QAM	12	6	14.81	0-2	2
	846.5	20625	5	16-QAM	12	13	14.85	0-2	2
	846.5	20625	5	16-QAM	25	0	14.87	0-2	2

Table 8-15
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	17.46	0	0
	825.5	20415	3	QPSK	1	7	17.48	0	0
	825.5	20415	3	QPSK	1	14	17.43	0	0
	825.5	20415	3	QPSK	8	0	16.28	0-1	1
	825.5	20415	3	QPSK	8	4	16.20	0-1	1
	825.5	20415	3	QPSK	8	7	16.22	0-1	1
	825.5	20415	3	QPSK	15	0	16.24	0-1	1
	825.5	20415	3	16-QAM	1	0	16.49	0-1	1
	825.5	20415	3	16-QAM	1	7	16.50	0-1	1
	825.5	20415	3	16-QAM	1	14	16.47	0-1	1
	825.5	20415	3	16-QAM	8	0	15.34	0-2	2
	825.5	20415	3	16-QAM	8	4	15.26	0-2	2
	825.5	20415	3	16-QAM	8	7	15.28	0-2	2
	825.5	20415	3	16-QAM	15	0	15.30	0-2	2
Mid	836.5	20525	3	QPSK	1	0	17.49	0	0
	836.5	20525	3	QPSK	1	7	17.44	0	0
	836.5	20525	3	QPSK	1	14	17.43	0	0
	836.5	20525	3	QPSK	8	0	16.26	0-1	1
	836.5	20525	3	QPSK	8	4	16.21	0-1	1
	836.5	20525	3	QPSK	8	7	16.20	0-1	1
	836.5	20525	3	QPSK	15	0	16.20	0-1	1
	836.5	20525	3	16-QAM	1	0	16.49	0-1	1
	836.5	20525	3	16-QAM	1	7	16.47	0-1	1
	836.5	20525	3	16-QAM	1	14	16.48	0-1	1
	836.5	20525	3	16-QAM	8	0	15.28	0-2	2
	836.5	20525	3	16-QAM	8	4	15.22	0-2	2
	836.5	20525	3	16-QAM	8	7	15.21	0-2	2
	836.5	20525	3	16-QAM	15	0	15.15	0-2	2
High	847.5	20635	3	QPSK	1	0	17.30	0	0
	847.5	20635	3	QPSK	1	7	17.21	0	0
	847.5	20635	3	QPSK	1	14	17.28	0	0
	847.5	20635	3	QPSK	8	0	16.08	0-1	1
	847.5	20635	3	QPSK	8	4	16.05	0-1	1
	847.5	20635	3	QPSK	8	7	15.96	0-1	1
	847.5	20635	3	QPSK	15	0	16.12	0-1	1
	847.5	20635	3	16-QAM	1	0	16.44	0-1	1
	847.5	20635	3	16-QAM	1	7	16.16	0-1	1
	847.5	20635	3	16-QAM	1	14	16.26	0-1	1
	847.5	20635	3	16-QAM	8	0	15.02	0-2	2
	847.5	20635	3	16-QAM	8	4	15.03	0-2	2
	847.5	20635	3	16-QAM	8	7	15.03	0-2	2
	847.5	20635	3	16-QAM	15	0	15.09	0-2	2

Table 8-16
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	17.37	0	0
	824.7	20407	1.4	QPSK	1	2	17.38	0	0
	824.7	20407	1.4	QPSK	1	5	17.42	0	0
	824.7	20407	1.4	QPSK	3	0	17.25	0	0
	824.7	20407	1.4	QPSK	3	2	17.21	0	0
	824.7	20407	1.4	QPSK	3	3	17.20	0	0
	824.7	20407	1.4	QPSK	6	0	16.20	0-1	1
	824.7	20407	1.4	16-QAM	1	0	16.45	0-1	1
	824.7	20407	1.4	16-QAM	1	2	16.45	0-1	1
	824.7	20407	1.4	16-QAM	1	5	16.48	0-1	1
	824.7	20407	1.4	16-QAM	3	0	16.18	0-1	1
	824.7	20407	1.4	16-QAM	3	2	16.16	0-1	1
	824.7	20407	1.4	16-QAM	3	3	16.10	0-1	1
	824.7	20407	1.4	16-QAM	6	0	15.25	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	17.39	0	0
	836.5	20525	1.4	QPSK	1	2	17.44	0	0
	836.5	20525	1.4	QPSK	1	5	17.48	0	0
	836.5	20525	1.4	QPSK	3	0	17.25	0	0
	836.5	20525	1.4	QPSK	3	2	17.23	0	0
	836.5	20525	1.4	QPSK	3	3	17.26	0	0
	836.5	20525	1.4	QPSK	6	0	16.22	0-1	1
	836.5	20525	1.4	16-QAM	1	0	16.50	0-1	1
	836.5	20525	1.4	16-QAM	1	2	16.43	0-1	1
	836.5	20525	1.4	16-QAM	1	5	16.45	0-1	1
	836.5	20525	1.4	16-QAM	3	0	16.32	0-1	1
	836.5	20525	1.4	16-QAM	3	2	16.08	0-1	1
	836.5	20525	1.4	16-QAM	3	3	16.10	0-1	1
	836.5	20525	1.4	16-QAM	6	0	15.30	0-2	2
High	848.3	20643	1.4	QPSK	1	0	17.24	0	0
	848.3	20643	1.4	QPSK	1	2	17.16	0	0
	848.3	20643	1.4	QPSK	1	5	17.23	0	0
	848.3	20643	1.4	QPSK	3	0	17.09	0	0
	848.3	20643	1.4	QPSK	3	2	16.99	0	0
	848.3	20643	1.4	QPSK	3	3	17.08	0	0
	848.3	20643	1.4	QPSK	6	0	16.11	0-1	1
	848.3	20643	1.4	16-QAM	1	0	16.45	0-1	1
	848.3	20643	1.4	16-QAM	1	2	16.42	0-1	1
	848.3	20643	1.4	16-QAM	1	5	16.26	0-1	1
	848.3	20643	1.4	16-QAM	3	0	15.93	0-1	1
	848.3	20643	1.4	16-QAM	3	2	15.88	0-1	1
	848.3	20643	1.4	16-QAM	3	3	15.98	0-1	1
	848.3	20643	1.4	16-QAM	6	0	15.04	0-2	2

8.1.4 LTE Band 4 (AWS)

Table 8-17
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	23.44	0	0
	1732.5	20175	20	QPSK	1	50	23.45	0	0
	1732.5	20175	20	QPSK	1	99	**23.47**	0	0
	1732.5	20175	20	QPSK	50	0	21.86	0-1	1
	1732.5	20175	20	QPSK	50	25	21.95	0-1	1
	1732.5	20175	20	QPSK	50	50	**21.96**	0-1	1
	1732.5	20175	20	QPSK	100	0	21.93	0-1	1
	1732.5	20175	20	16QAM	1	0	22.06	0-1	1
	1732.5	20175	20	16QAM	1	50	21.96	0-1	1
	1732.5	20175	20	16QAM	1	99	22.06	0-1	1
	1732.5	20175	20	16QAM	50	0	20.85	0-2	2
	1732.5	20175	20	16QAM	50	25	20.98	0-2	2
	1732.5	20175	20	16QAM	50	50	20.82	0-2	2
	1732.5	20175	20	16QAM	100	0	20.92	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 8-18
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	23.29	0	0
	1717.5	20025	15	QPSK	1	36	23.41	0	0
	1717.5	20025	15	QPSK	1	74	23.41	0	0
	1717.5	20025	15	QPSK	36	0	22.04	0-1	1
	1717.5	20025	15	QPSK	36	18	22.03	0-1	1
	1717.5	20025	15	QPSK	36	37	22.05	0-1	1
	1717.5	20025	15	QPSK	75	0	21.99	0-1	1
	1717.5	20025	15	16QAM	1	0	22.22	0-1	1
	1717.5	20025	15	16QAM	1	36	21.99	0-1	1
	1717.5	20025	15	16QAM	1	74	22.20	0-1	1
	1717.5	20025	15	16QAM	36	0	21.06	0-2	2
	1717.5	20025	15	16QAM	36	18	21.02	0-2	2
	1717.5	20025	15	16QAM	36	37	20.95	0-2	2
	1717.5	20025	15	16QAM	75	0	21.09	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	22.98	0	0
	1732.5	20175	15	QPSK	1	36	23.23	0	0
	1732.5	20175	15	QPSK	1	74	23.11	0	0
	1732.5	20175	15	QPSK	36	0	21.94	0-1	1
	1732.5	20175	15	QPSK	36	18	21.94	0-1	1
	1732.5	20175	15	QPSK	36	37	22.00	0-1	1
	1732.5	20175	15	QPSK	75	0	21.87	0-1	1
	1732.5	20175	15	16QAM	1	0	22.22	0-1	1
	1732.5	20175	15	16QAM	1	36	22.36	0-1	1
	1732.5	20175	15	16QAM	1	74	22.25	0-1	1
	1732.5	20175	15	16QAM	36	0	20.82	0-2	2
	1732.5	20175	15	16QAM	36	18	20.83	0-2	2
	1732.5	20175	15	16QAM	36	37	20.89	0-2	2
	1732.5	20175	15	16QAM	75	0	20.85	0-2	2
High	1747.5	20325	15	QPSK	1	0	23.29	0	0
	1747.5	20325	15	QPSK	1	36	23.19	0	0
	1747.5	20325	15	QPSK	1	74	23.22	0	0
	1747.5	20325	15	QPSK	36	0	21.95	0-1	1
	1747.5	20325	15	QPSK	36	18	21.92	0-1	1
	1747.5	20325	15	QPSK	36	37	21.90	0-1	1
	1747.5	20325	15	QPSK	75	0	21.83	0-1	1
	1747.5	20325	15	16QAM	1	0	22.04	0-1	1
	1747.5	20325	15	16QAM	1	36	22.10	0-1	1
	1747.5	20325	15	16QAM	1	74	22.26	0-1	1
	1747.5	20325	15	16QAM	36	0	20.86	0-2	2
	1747.5	20325	15	16QAM	36	18	20.83	0-2	2
	1747.5	20325	15	16QAM	36	37	21.10	0-2	2
	1747.5	20325	15	16QAM	75	0	20.76	0-2	2

Table 8-19
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	23.33	0	0
	1715	20000	10	QPSK	1	25	23.38	0	0
	1715	20000	10	QPSK	1	49	23.42	0	0
	1715	20000	10	QPSK	25	0	22.08	0-1	1
	1715	20000	10	QPSK	25	12	22.07	0-1	1
	1715	20000	10	QPSK	25	25	22.03	0-1	1
	1715	20000	10	QPSK	50	0	21.96	0-1	1
	1715	20000	10	16QAM	1	0	22.19	0-1	1
	1715	20000	10	16QAM	1	25	22.00	0-1	1
	1715	20000	10	16QAM	1	49	22.21	0-1	1
	1715	20000	10	16QAM	25	0	21.03	0-2	2
	1715	20000	10	16QAM	25	12	21.00	0-2	2
	1715	20000	10	16QAM	25	25	20.95	0-2	2
	1715	20000	10	16QAM	50	0	21.11	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	22.95	0	0
	1732.5	20175	10	QPSK	1	25	23.20	0	0
	1732.5	20175	10	QPSK	1	49	23.11	0	0
	1732.5	20175	10	QPSK	25	0	21.91	0-1	1
	1732.5	20175	10	QPSK	25	12	21.88	0-1	1
	1732.5	20175	10	QPSK	25	25	22.04	0-1	1
	1732.5	20175	10	QPSK	50	0	21.90	0-1	1
	1732.5	20175	10	16QAM	1	0	22.22	0-1	1
	1732.5	20175	10	16QAM	1	25	22.33	0-1	1
	1732.5	20175	10	16QAM	1	49	22.21	0-1	1
	1732.5	20175	10	16QAM	25	0	20.85	0-2	2
	1732.5	20175	10	16QAM	25	12	20.83	0-2	2
	1732.5	20175	10	16QAM	25	25	20.86	0-2	2
	1732.5	20175	10	16QAM	50	0	20.83	0-2	2
High	1750	20350	10	QPSK	1	0	23.30	0	0
	1750	20350	10	QPSK	1	25	23.20	0	0
	1750	20350	10	QPSK	1	49	23.19	0	0
	1750	20350	10	QPSK	25	0	21.93	0-1	1
	1750	20350	10	QPSK	25	12	21.95	0-1	1
	1750	20350	10	QPSK	25	25	21.90	0-1	1
	1750	20350	10	QPSK	50	0	21.81	0-1	1
	1750	20350	10	16QAM	1	0	22.08	0-1	1
	1750	20350	10	16QAM	1	25	22.07	0-1	1
	1750	20350	10	16QAM	1	49	22.29	0-1	1
	1750	20350	10	16QAM	25	0	20.89	0-2	2
	1750	20350	10	16QAM	25	12	20.84	0-2	2
	1750	20350	10	16QAM	25	25	21.08	0-2	2
	1750	20350	10	16QAM	50	0	20.72	0-2	2

Table 8-20
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	23.30	0	0
	1712.5	19975	5	QPSK	1	12	23.36	0	0
	1712.5	19975	5	QPSK	1	24	23.40	0	0
	1712.5	19975	5	QPSK	12	0	22.10	0-1	1
	1712.5	19975	5	QPSK	12	6	22.04	0-1	1
	1712.5	19975	5	QPSK	12	13	22.05	0-1	1
	1712.5	19975	5	QPSK	25	0	21.96	0-1	1
	1712.5	19975	5	16-QAM	1	0	22.17	0-1	1
	1712.5	19975	5	16-QAM	1	12	21.98	0-1	1
	1712.5	19975	5	16-QAM	1	24	22.21	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.03	0-2	2
	1712.5	19975	5	16-QAM	12	6	20.96	0-2	2
	1712.5	19975	5	16-QAM	12	13	20.99	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.11	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	22.99	0	0
	1732.5	20175	5	QPSK	1	12	23.17	0	0
	1732.5	20175	5	QPSK	1	24	23.09	0	0
	1732.5	20175	5	QPSK	12	0	21.89	0-1	1
	1732.5	20175	5	QPSK	12	6	21.93	0-1	1
	1732.5	20175	5	QPSK	12	13	22.03	0-1	1
	1732.5	20175	5	QPSK	25	0	21.90	0-1	1
	1732.5	20175	5	16-QAM	1	0	22.21	0-1	1
	1732.5	20175	5	16-QAM	1	12	22.29	0-1	1
	1732.5	20175	5	16-QAM	1	24	22.25	0-1	1
	1732.5	20175	5	16-QAM	12	0	20.89	0-2	2
	1732.5	20175	5	16-QAM	12	6	20.84	0-2	2
	1732.5	20175	5	16-QAM	12	13	20.85	0-2	2
	1732.5	20175	5	16-QAM	25	0	20.81	0-2	2
High	1752.5	20375	5	QPSK	1	0	23.32	0	0
	1752.5	20375	5	QPSK	1	12	23.24	0	0
	1752.5	20375	5	QPSK	1	24	23.18	0	0
	1752.5	20375	5	QPSK	12	0	21.91	0-1	1
	1752.5	20375	5	QPSK	12	6	21.92	0-1	1
	1752.5	20375	5	QPSK	12	13	21.88	0-1	1
	1752.5	20375	5	QPSK	25	0	21.81	0-1	1
	1752.5	20375	5	16-QAM	1	0	22.09	0-1	1
	1752.5	20375	5	16-QAM	1	12	22.10	0-1	1
	1752.5	20375	5	16-QAM	1	24	22.27	0-1	1
	1752.5	20375	5	16-QAM	12	0	20.93	0-2	2
	1752.5	20375	5	16-QAM	12	6	20.80	0-2	2
	1752.5	20375	5	16-QAM	12	13	21.06	0-2	2
	1752.5	20375	5	16-QAM	25	0	20.76	0-2	2

Table 8-21
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	23.33	0	0
	1711.5	19965	3	QPSK	1	7	23.39	0	0
	1711.5	19965	3	QPSK	1	14	23.40	0	0
	1711.5	19965	3	QPSK	8	0	22.08	0-1	1
	1711.5	19965	3	QPSK	8	4	22.06	0-1	1
	1711.5	19965	3	QPSK	8	7	22.05	0-1	1
	1711.5	19965	3	QPSK	15	0	21.98	0-1	1
	1711.5	19965	3	16-QAM	1	0	22.19	0-1	1
	1711.5	19965	3	16-QAM	1	7	22.01	0-1	1
	1711.5	19965	3	16-QAM	1	14	22.21	0-1	1
	1711.5	19965	3	16-QAM	8	0	21.07	0-2	2
	1711.5	19965	3	16-QAM	8	4	20.97	0-2	2
	1711.5	19965	3	16-QAM	8	7	21.01	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.02	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	23.01	0	0
	1732.5	20175	3	QPSK	1	7	23.20	0	0
	1732.5	20175	3	QPSK	1	14	23.13	0	0
	1732.5	20175	3	QPSK	8	0	21.92	0-1	1
	1732.5	20175	3	QPSK	8	4	21.91	0-1	1
	1732.5	20175	3	QPSK	8	7	22.06	0-1	1
	1732.5	20175	3	QPSK	15	0	21.82	0-1	1
	1732.5	20175	3	16-QAM	1	0	22.25	0-1	1
	1732.5	20175	3	16-QAM	1	7	22.30	0-1	1
	1732.5	20175	3	16-QAM	1	14	22.25	0-1	1
	1732.5	20175	3	16-QAM	8	0	20.88	0-2	2
	1732.5	20175	3	16-QAM	8	4	20.85	0-2	2
	1732.5	20175	3	16-QAM	8	7	20.86	0-2	2
	1732.5	20175	3	16-QAM	15	0	20.83	0-2	2
High	1753.5	20385	3	QPSK	1	0	23.35	0	0
	1753.5	20385	3	QPSK	1	7	23.28	0	0
	1753.5	20385	3	QPSK	1	14	23.20	0	0
	1753.5	20385	3	QPSK	8	0	21.88	0-1	1
	1753.5	20385	3	QPSK	8	4	21.95	0-1	1
	1753.5	20385	3	QPSK	8	7	21.91	0-1	1
	1753.5	20385	3	QPSK	15	0	21.79	0-1	1
	1753.5	20385	3	16-QAM	1	0	22.05	0-1	1
	1753.5	20385	3	16-QAM	1	7	22.10	0-1	1
	1753.5	20385	3	16-QAM	1	14	22.25	0-1	1
	1753.5	20385	3	16-QAM	8	0	20.91	0-2	2
	1753.5	20385	3	16-QAM	8	4	20.77	0-2	2
	1753.5	20385	3	16-QAM	8	7	21.03	0-2	2
	1753.5	20385	3	16-QAM	15	0	20.78	0-2	2

Table 8-22
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	23.33	0	0
	1710.7	19957	1.4	QPSK	1	2	23.43	0	0
	1710.7	19957	1.4	QPSK	1	5	23.42	0	0
	1710.7	19957	1.4	QPSK	3	0	23.12	0	0
	1710.7	19957	1.4	QPSK	3	2	23.04	0	0
	1710.7	19957	1.4	QPSK	3	3	23.07	0	0
	1710.7	19957	1.4	QPSK	6	0	22.01	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	22.23	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	22.04	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.23	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	22.05	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	21.95	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	21.99	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	21.00	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	22.98	0	0
	1732.5	20175	1.4	QPSK	1	2	23.17	0	0
	1732.5	20175	1.4	QPSK	1	5	23.16	0	0
	1732.5	20175	1.4	QPSK	3	0	22.91	0	0
	1732.5	20175	1.4	QPSK	3	2	22.99	0	0
	1732.5	20175	1.4	QPSK	3	3	23.06	0	0
	1732.5	20175	1.4	QPSK	6	0	21.92	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	22.26	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	22.31	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	22.26	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	21.90	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	21.83	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	21.87	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	20.85	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	23.36	0	0
	1754.3	20393	1.4	QPSK	1	2	23.29	0	0
	1754.3	20393	1.4	QPSK	1	5	23.16	0	0
	1754.3	20393	1.4	QPSK	3	0	22.90	0	0
	1754.3	20393	1.4	QPSK	3	2	22.94	0	0
	1754.3	20393	1.4	QPSK	3	3	22.88	0	0
	1754.3	20393	1.4	QPSK	6	0	21.76	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.05	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	22.06	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.28	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	21.87	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	21.81	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.01	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	20.76	0-2	2

Table 8-23
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	**14.39**	0	0
	1732.5	20175	20	QPSK	1	50	14.29	0	0
	1732.5	20175	20	QPSK	1	99	14.34	0	0
	1732.5	20175	20	QPSK	50	0	13.04	0-1	1
	1732.5	20175	20	QPSK	50	25	**13.08**	0-1	1
	1732.5	20175	20	QPSK	50	50	13.07	0-1	1
	1732.5	20175	20	QPSK	100	0	13.06	0-1	1
	1732.5	20175	20	16QAM	1	0	13.00	0-1	1
	1732.5	20175	20	16QAM	1	50	13.12	0-1	1
	1732.5	20175	20	16QAM	1	99	13.19	0-1	1
	1732.5	20175	20	16QAM	50	0	12.12	0-2	2
	1732.5	20175	20	16QAM	50	25	12.17	0-2	2
	1732.5	20175	20	16QAM	50	50	12.06	0-2	2
	1732.5	20175	20	16QAM	100	0	12.05	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 8-24
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	14.43	0	0
	1717.5	20025	15	QPSK	1	36	14.46	0	0
	1717.5	20025	15	QPSK	1	74	14.44	0	0
	1717.5	20025	15	QPSK	36	0	13.27	0-1	1
	1717.5	20025	15	QPSK	36	18	13.34	0-1	1
	1717.5	20025	15	QPSK	36	37	13.31	0-1	1
	1717.5	20025	15	QPSK	75	0	13.27	0-1	1
	1717.5	20025	15	16QAM	1	0	13.44	0-1	1
	1717.5	20025	15	16QAM	1	36	13.50	0-1	1
	1717.5	20025	15	16QAM	1	74	13.42	0-1	1
	1717.5	20025	15	16QAM	36	0	12.29	0-2	2
	1717.5	20025	15	16QAM	36	18	12.35	0-2	2
	1717.5	20025	15	16QAM	36	37	12.35	0-2	2
	1717.5	20025	15	16QAM	75	0	12.35	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	14.29	0	0
	1732.5	20175	15	QPSK	1	36	14.45	0	0
	1732.5	20175	15	QPSK	1	74	14.31	0	0
	1732.5	20175	15	QPSK	36	0	13.29	0-1	1
	1732.5	20175	15	QPSK	36	18	13.28	0-1	1
	1732.5	20175	15	QPSK	36	37	13.34	0-1	1
	1732.5	20175	15	QPSK	75	0	13.27	0-1	1
	1732.5	20175	15	16QAM	1	0	13.48	0-1	1
	1732.5	20175	15	16QAM	1	36	13.43	0-1	1
	1732.5	20175	15	16QAM	1	74	13.50	0-1	1
	1732.5	20175	15	16QAM	36	0	12.30	0-2	2
	1732.5	20175	15	16QAM	36	18	12.31	0-2	2
	1732.5	20175	15	16QAM	36	37	12.36	0-2	2
	1732.5	20175	15	16QAM	75	0	12.28	0-2	2
High	1747.5	20325	15	QPSK	1	0	14.15	0	0
	1747.5	20325	15	QPSK	1	36	14.19	0	0
	1747.5	20325	15	QPSK	1	74	14.28	0	0
	1747.5	20325	15	QPSK	36	0	13.07	0-1	1
	1747.5	20325	15	QPSK	36	18	13.03	0-1	1
	1747.5	20325	15	QPSK	36	37	13.04	0-1	1
	1747.5	20325	15	QPSK	75	0	13.01	0-1	1
	1747.5	20325	15	16QAM	1	0	13.24	0-1	1
	1747.5	20325	15	16QAM	1	36	13.33	0-1	1
	1747.5	20325	15	16QAM	1	74	13.34	0-1	1
	1747.5	20325	15	16QAM	36	0	12.09	0-2	2
	1747.5	20325	15	16QAM	36	18	12.06	0-2	2
	1747.5	20325	15	16QAM	36	37	12.07	0-2	2
	1747.5	20325	15	16QAM	75	0	12.09	0-2	2

Table 8-25
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	14.43	0	0
	1715	20000	10	QPSK	1	25	14.30	0	0
	1715	20000	10	QPSK	1	49	14.33	0	0
	1715	20000	10	QPSK	25	0	13.38	0-1	1
	1715	20000	10	QPSK	25	12	13.44	0-1	1
	1715	20000	10	QPSK	25	25	13.39	0-1	1
	1715	20000	10	QPSK	50	0	13.47	0-1	1
	1715	20000	10	16QAM	1	0	13.50	0-1	1
	1715	20000	10	16QAM	1	25	13.42	0-1	1
	1715	20000	10	16QAM	1	49	13.44	0-1	1
	1715	20000	10	16QAM	25	0	12.47	0-2	2
	1715	20000	10	16QAM	25	12	12.46	0-2	2
	1715	20000	10	16QAM	25	25	12.50	0-2	2
	1715	20000	10	16QAM	50	0	12.48	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	14.37	0	0
	1732.5	20175	10	QPSK	1	25	14.43	0	0
	1732.5	20175	10	QPSK	1	49	14.00	0	0
	1732.5	20175	10	QPSK	25	0	13.24	0-1	1
	1732.5	20175	10	QPSK	25	12	13.31	0-1	1
	1732.5	20175	10	QPSK	25	25	13.25	0-1	1
	1732.5	20175	10	QPSK	50	0	13.28	0-1	1
	1732.5	20175	10	16QAM	1	0	13.50	0-1	1
	1732.5	20175	10	16QAM	1	25	13.41	0-1	1
	1732.5	20175	10	16QAM	1	49	13.28	0-1	1
	1732.5	20175	10	16QAM	25	0	12.27	0-2	2
	1732.5	20175	10	16QAM	25	12	12.34	0-2	2
	1732.5	20175	10	16QAM	25	25	12.32	0-2	2
	1732.5	20175	10	16QAM	50	0	12.27	0-2	2
High	1750	20350	10	QPSK	1	0	14.20	0	0
	1750	20350	10	QPSK	1	25	14.21	0	0
	1750	20350	10	QPSK	1	49	14.33	0	0
	1750	20350	10	QPSK	25	0	13.11	0-1	1
	1750	20350	10	QPSK	25	12	13.10	0-1	1
	1750	20350	10	QPSK	25	25	13.12	0-1	1
	1750	20350	10	QPSK	50	0	13.14	0-1	1
	1750	20350	10	16QAM	1	0	13.47	0-1	1
	1750	20350	10	16QAM	1	25	13.42	0-1	1
	1750	20350	10	16QAM	1	49	13.38	0-1	1
	1750	20350	10	16QAM	25	0	12.17	0-2	2
	1750	20350	10	16QAM	25	12	12.20	0-2	2
	1750	20350	10	16QAM	25	25	12.16	0-2	2
	1750	20350	10	16QAM	50	0	12.14	0-2	2

Table 8-26
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	14.46	0	0
	1712.5	19975	5	QPSK	1	12	14.33	0	0
	1712.5	19975	5	QPSK	1	24	14.36	0	0
	1712.5	19975	5	QPSK	12	0	13.41	0-1	1
	1712.5	19975	5	QPSK	12	6	13.47	0-1	1
	1712.5	19975	5	QPSK	12	13	13.42	0-1	1
	1712.5	19975	5	QPSK	25	0	13.44	0-1	1
	1712.5	19975	5	16-QAM	1	0	13.47	0-1	1
	1712.5	19975	5	16-QAM	1	12	13.45	0-1	1
	1712.5	19975	5	16-QAM	1	24	13.47	0-1	1
	1712.5	19975	5	16-QAM	12	0	12.29	0-2	2
	1712.5	19975	5	16-QAM	12	6	12.43	0-2	2
	1712.5	19975	5	16-QAM	12	13	12.24	0-2	2
	1712.5	19975	5	16-QAM	25	0	12.21	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	14.40	0	0
	1732.5	20175	5	QPSK	1	12	14.31	0	0
	1732.5	20175	5	QPSK	1	24	14.03	0	0
	1732.5	20175	5	QPSK	12	0	13.27	0-1	1
	1732.5	20175	5	QPSK	12	6	13.34	0-1	1
	1732.5	20175	5	QPSK	12	13	13.28	0-1	1
	1732.5	20175	5	QPSK	25	0	13.31	0-1	1
	1732.5	20175	5	16-QAM	1	0	13.24	0-1	1
	1732.5	20175	5	16-QAM	1	12	13.20	0-1	1
	1732.5	20175	5	16-QAM	1	24	13.42	0-1	1
	1732.5	20175	5	16-QAM	12	0	12.30	0-2	2
	1732.5	20175	5	16-QAM	12	6	12.37	0-2	2
	1732.5	20175	5	16-QAM	12	13	12.35	0-2	2
	1732.5	20175	5	16-QAM	25	0	12.30	0-2	2
High	1752.5	20375	5	QPSK	1	0	14.23	0	0
	1752.5	20375	5	QPSK	1	12	14.24	0	0
	1752.5	20375	5	QPSK	1	24	14.36	0	0
	1752.5	20375	5	QPSK	12	0	13.14	0-1	1
	1752.5	20375	5	QPSK	12	6	13.13	0-1	1
	1752.5	20375	5	QPSK	12	13	13.15	0-1	1
	1752.5	20375	5	QPSK	25	0	13.17	0-1	1
	1752.5	20375	5	16-QAM	1	0	13.50	0-1	1
	1752.5	20375	5	16-QAM	1	12	13.45	0-1	1
	1752.5	20375	5	16-QAM	1	24	13.41	0-1	1
	1752.5	20375	5	16-QAM	12	0	12.20	0-2	2
	1752.5	20375	5	16-QAM	12	6	12.23	0-2	2
	1752.5	20375	5	16-QAM	12	13	12.19	0-2	2
	1752.5	20375	5	16-QAM	25	0	12.17	0-2	2

Table 8-27
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	14.36	0	0
	1711.5	19965	3	QPSK	1	7	14.39	0	0
	1711.5	19965	3	QPSK	1	14	14.37	0	0
	1711.5	19965	3	QPSK	8	0	13.20	0-1	1
	1711.5	19965	3	QPSK	8	4	13.27	0-1	1
	1711.5	19965	3	QPSK	8	7	13.24	0-1	1
	1711.5	19965	3	QPSK	15	0	13.20	0-1	1
	1711.5	19965	3	16-QAM	1	0	13.37	0-1	1
	1711.5	19965	3	16-QAM	1	7	13.43	0-1	1
	1711.5	19965	3	16-QAM	1	14	13.35	0-1	1
	1711.5	19965	3	16-QAM	8	0	12.22	0-2	2
	1711.5	19965	3	16-QAM	8	4	12.32	0-2	2
	1711.5	19965	3	16-QAM	8	7	12.28	0-2	2
	1711.5	19965	3	16-QAM	15	0	12.28	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	14.22	0	0
	1732.5	20175	3	QPSK	1	7	14.38	0	0
	1732.5	20175	3	QPSK	1	14	14.24	0	0
	1732.5	20175	3	QPSK	8	0	13.22	0-1	1
	1732.5	20175	3	QPSK	8	4	13.21	0-1	1
	1732.5	20175	3	QPSK	8	7	13.27	0-1	1
	1732.5	20175	3	QPSK	15	0	13.20	0-1	1
	1732.5	20175	3	16-QAM	1	0	13.41	0-1	1
	1732.5	20175	3	16-QAM	1	7	13.36	0-1	1
	1732.5	20175	3	16-QAM	1	14	13.43	0-1	1
	1732.5	20175	3	16-QAM	8	0	12.23	0-2	2
	1732.5	20175	3	16-QAM	8	4	12.24	0-2	2
	1732.5	20175	3	16-QAM	8	7	12.29	0-2	2
	1732.5	20175	3	16-QAM	15	0	12.31	0-2	2
High	1753.5	20385	3	QPSK	1	0	14.08	0	0
	1753.5	20385	3	QPSK	1	7	14.12	0	0
	1753.5	20385	3	QPSK	1	14	14.29	0	0
	1753.5	20385	3	QPSK	8	0	13.22	0-1	1
	1753.5	20385	3	QPSK	8	4	13.31	0-1	1
	1753.5	20385	3	QPSK	8	7	13.22	0-1	1
	1753.5	20385	3	QPSK	15	0	13.41	0-1	1
	1753.5	20385	3	16-QAM	1	0	13.17	0-1	1
	1753.5	20385	3	16-QAM	1	7	13.26	0-1	1
	1753.5	20385	3	16-QAM	1	14	13.27	0-1	1
	1753.5	20385	3	16-QAM	8	0	12.02	0-2	2
	1753.5	20385	3	16-QAM	8	4	12.34	0-2	2
	1753.5	20385	3	16-QAM	8	7	12.33	0-2	2
	1753.5	20385	3	16-QAM	15	0	12.02	0-2	2

Table 8-28
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	14.35	0	0
	1710.7	19957	1.4	QPSK	1	2	14.22	0	0
	1710.7	19957	1.4	QPSK	1	5	14.25	0	0
	1710.7	19957	1.4	QPSK	3	0	14.22	0	0
	1710.7	19957	1.4	QPSK	3	2	14.03	0	0
	1710.7	19957	1.4	QPSK	3	3	14.11	0	0
	1710.7	19957	1.4	QPSK	6	0	13.39	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	13.42	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	13.34	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	13.36	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	13.33	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	13.18	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	13.20	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	12.21	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	14.29	0	0
	1732.5	20175	1.4	QPSK	1	2	14.35	0	0
	1732.5	20175	1.4	QPSK	1	5	14.03	0	0
	1732.5	20175	1.4	QPSK	3	0	14.31	0	0
	1732.5	20175	1.4	QPSK	3	2	14.12	0	0
	1732.5	20175	1.4	QPSK	3	3	14.11	0	0
	1732.5	20175	1.4	QPSK	6	0	13.20	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	13.42	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	13.33	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	13.20	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	13.03	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	13.15	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	13.48	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	12.19	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	14.12	0	0
	1754.3	20393	1.4	QPSK	1	2	14.13	0	0
	1754.3	20393	1.4	QPSK	1	5	14.25	0	0
	1754.3	20393	1.4	QPSK	3	0	14.03	0	0
	1754.3	20393	1.4	QPSK	3	2	14.28	0	0
	1754.3	20393	1.4	QPSK	3	3	14.31	0	0
	1754.3	20393	1.4	QPSK	6	0	13.06	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	13.39	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	13.34	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	13.30	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	13.01	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	13.16	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	13.11	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	12.06	0-2	2

8.1.5 LTE Band 25 (PCS)

Table 8-29
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	22.94	0	0
	1860	26140	20	QPSK	1	50	22.98	0	0
	1860	26140	20	QPSK	1	99	23.08	0	0
	1860	26140	20	QPSK	50	0	21.56	0-1	1
	1860	26140	20	QPSK	50	25	21.56	0-1	1
	1860	26140	20	QPSK	50	50	21.57	0-1	1
	1860	26140	20	QPSK	100	0	21.54	0-1	1
	1860	26140	20	16QAM	1	0	21.78	0-1	1
	1860	26140	20	16QAM	1	50	21.94	0-1	1
	1860	26140	20	16QAM	1	99	21.67	0-1	1
	1860	26140	20	16QAM	50	0	20.51	0-2	2
	1860	26140	20	16QAM	50	25	20.60	0-2	2
	1860	26140	20	16QAM	50	50	20.51	0-2	2
	1860	26140	20	16QAM	100	0	20.41	0-2	2
Mid	1882.5	26365	20	QPSK	1	0	23.08	0	0
	1882.5	26365	20	QPSK	1	50	23.23	0	0
	1882.5	26365	20	QPSK	1	99	22.90	0	0
	1882.5	26365	20	QPSK	50	0	21.62	0-1	1
	1882.5	26365	20	QPSK	50	25	21.66	0-1	1
	1882.5	26365	20	QPSK	50	50	21.55	0-1	1
	1882.5	26365	20	QPSK	100	0	21.54	0-1	1
	1882.5	26365	20	16QAM	1	0	22.30	0-1	1
	1882.5	26365	20	16QAM	1	50	22.18	0-1	1
	1882.5	26365	20	16QAM	1	99	21.82	0-1	1
	1882.5	26365	20	16QAM	50	0	20.72	0-2	2
	1882.5	26365	20	16QAM	50	25	20.62	0-2	2
	1882.5	26365	20	16QAM	50	50	20.58	0-2	2
	1882.5	26365	20	16QAM	100	0	20.52	0-2	2
High	1905	26590	20	QPSK	1	0	23.12	0	0
	1905	26590	20	QPSK	1	50	**23.24**	0	0
	1905	26590	20	QPSK	1	99	23.13	0	0
	1905	26590	20	QPSK	50	0	**22.02**	0-1	1
	1905	26590	20	QPSK	50	25	21.68	0-1	1
	1905	26590	20	QPSK	50	50	21.63	0-1	1
	1905	26590	20	QPSK	100	0	21.64	0-1	1
	1905	26590	20	16QAM	1	0	21.81	0-1	1
	1905	26590	20	16QAM	1	50	21.74	0-1	1
	1905	26590	20	16QAM	1	99	21.97	0-1	1
	1905	26590	20	16QAM	50	0	20.58	0-2	2
	1905	26590	20	16QAM	50	25	20.61	0-2	2
	1905	26590	20	16QAM	50	50	20.65	0-2	2
	1905	26590	20	16QAM	100	0	20.58	0-2	2

Table 8-30
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	22.76	0	0
	1857.5	26115	15	QPSK	1	36	22.77	0	0
	1857.5	26115	15	QPSK	1	74	22.73	0	0
	1857.5	26115	15	QPSK	36	0	21.39	0-1	1
	1857.5	26115	15	QPSK	36	18	21.36	0-1	1
	1857.5	26115	15	QPSK	36	37	21.35	0-1	1
	1857.5	26115	15	QPSK	75	0	21.38	0-1	1
	1857.5	26115	15	16QAM	1	0	21.87	0-1	1
	1857.5	26115	15	16QAM	1	36	21.86	0-1	1
	1857.5	26115	15	16QAM	1	74	21.89	0-1	1
	1857.5	26115	15	16QAM	36	0	20.30	0-2	2
	1857.5	26115	15	16QAM	36	18	20.35	0-2	2
	1857.5	26115	15	16QAM	36	37	20.36	0-2	2
	1857.5	26115	15	16QAM	75	0	20.30	0-2	2
Mid	1882.5	26365	15	QPSK	1	0	22.74	0	0
	1882.5	26365	15	QPSK	1	36	22.86	0	0
	1882.5	26365	15	QPSK	1	74	22.86	0	0
	1882.5	26365	15	QPSK	36	0	21.51	0-1	1
	1882.5	26365	15	QPSK	36	18	21.55	0-1	1
	1882.5	26365	15	QPSK	36	37	21.51	0-1	1
	1882.5	26365	15	QPSK	75	0	21.47	0-1	1
	1882.5	26365	15	16QAM	1	0	21.83	0-1	1
	1882.5	26365	15	16QAM	1	36	21.83	0-1	1
	1882.5	26365	15	16QAM	1	74	21.80	0-1	1
	1882.5	26365	15	16QAM	36	0	20.43	0-2	2
	1882.5	26365	15	16QAM	36	18	20.37	0-2	2
	1882.5	26365	15	16QAM	36	37	20.42	0-2	2
	1882.5	26365	15	16QAM	75	0	20.40	0-2	2
High	1907.5	26615	15	QPSK	1	0	23.12	0	0
	1907.5	26615	15	QPSK	1	36	23.17	0	0
	1907.5	26615	15	QPSK	1	74	23.15	0	0
	1907.5	26615	15	QPSK	36	0	21.66	0-1	1
	1907.5	26615	15	QPSK	36	18	21.63	0-1	1
	1907.5	26615	15	QPSK	36	37	21.65	0-1	1
	1907.5	26615	15	QPSK	75	0	21.65	0-1	1
	1907.5	26615	15	16QAM	1	0	22.12	0-1	1
	1907.5	26615	15	16QAM	1	36	22.11	0-1	1
	1907.5	26615	15	16QAM	1	74	22.14	0-1	1
	1907.5	26615	15	16QAM	36	0	20.53	0-2	2
	1907.5	26615	15	16QAM	36	18	20.53	0-2	2
	1907.5	26615	15	16QAM	36	37	20.49	0-2	2
	1907.5	26615	15	16QAM	75	0	20.49	0-2	2

Table 8-31
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	22.75	0	0
	1855	26090	10	QPSK	1	25	22.82	0	0
	1855	26090	10	QPSK	1	49	22.73	0	0
	1855	26090	10	QPSK	25	0	21.46	0-1	1
	1855	26090	10	QPSK	25	12	21.44	0-1	1
	1855	26090	10	QPSK	25	25	21.37	0-1	1
	1855	26090	10	QPSK	50	0	21.35	0-1	1
	1855	26090	10	16QAM	1	0	21.61	0-1	1
	1855	26090	10	16QAM	1	25	21.70	0-1	1
	1855	26090	10	16QAM	1	49	21.75	0-1	1
	1855	26090	10	16QAM	25	0	20.36	0-2	2
	1855	26090	10	16QAM	25	12	20.40	0-2	2
	1855	26090	10	16QAM	25	25	20.39	0-2	2
	1855	26090	10	16QAM	50	0	20.37	0-2	2
Mid	1882.5	26365	10	QPSK	1	0	22.77	0	0
	1882.5	26365	10	QPSK	1	25	22.89	0	0
	1882.5	26365	10	QPSK	1	49	22.87	0	0
	1882.5	26365	10	QPSK	25	0	21.49	0-1	1
	1882.5	26365	10	QPSK	25	12	21.51	0-1	1
	1882.5	26365	10	QPSK	25	25	21.46	0-1	1
	1882.5	26365	10	QPSK	50	0	21.52	0-1	1
	1882.5	26365	10	16QAM	1	0	21.89	0-1	1
	1882.5	26365	10	16QAM	1	25	21.95	0-1	1
	1882.5	26365	10	16QAM	1	49	21.94	0-1	1
	1882.5	26365	10	16QAM	25	0	20.43	0-2	2
	1882.5	26365	10	16QAM	25	12	20.47	0-2	2
	1882.5	26365	10	16QAM	25	25	20.42	0-2	2
	1882.5	26365	10	16QAM	50	0	20.49	0-2	2
High	1910	26640	10	QPSK	1	0	23.16	0	0
	1910	26640	10	QPSK	1	25	23.13	0	0
	1910	26640	10	QPSK	1	49	23.17	0	0
	1910	26640	10	QPSK	25	0	21.65	0-1	1
	1910	26640	10	QPSK	25	12	21.60	0-1	1
	1910	26640	10	QPSK	25	25	21.58	0-1	1
	1910	26640	10	QPSK	50	0	21.55	0-1	1
	1910	26640	10	16QAM	1	0	21.97	0-1	1
	1910	26640	10	16QAM	1	25	21.95	0-1	1
	1910	26640	10	16QAM	1	49	21.93	0-1	1
	1910	26640	10	16QAM	25	0	20.61	0-2	2
	1910	26640	10	16QAM	25	12	20.62	0-2	2
	1910	26640	10	16QAM	25	25	20.69	0-2	2
	1910	26640	10	16QAM	50	0	20.58	0-2	2

Table 8-32
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	22.63	0	0
	1852.5	26065	5	QPSK	1	12	22.75	0	0
	1852.5	26065	5	QPSK	1	24	22.77	0	0
	1852.5	26065	5	QPSK	12	0	21.38	0-1	1
	1852.5	26065	5	QPSK	12	6	21.42	0-1	1
	1852.5	26065	5	QPSK	12	13	21.43	0-1	1
	1852.5	26065	5	QPSK	25	0	21.41	0-1	1
	1852.5	26065	5	16-QAM	1	0	21.99	0-1	1
	1852.5	26065	5	16-QAM	1	12	22.02	0-1	1
	1852.5	26065	5	16-QAM	1	24	22.01	0-1	1
	1852.5	26065	5	16-QAM	12	0	20.35	0-2	2
	1852.5	26065	5	16-QAM	12	6	20.36	0-2	2
	1852.5	26065	5	16-QAM	12	13	20.40	0-2	2
	1852.5	26065	5	16-QAM	25	0	20.38	0-2	2
Mid	1882.5	26365	5	QPSK	1	0	22.65	0	0
	1882.5	26365	5	QPSK	1	12	22.68	0	0
	1882.5	26365	5	QPSK	1	24	22.63	0	0
	1882.5	26365	5	QPSK	12	0	21.49	0-1	1
	1882.5	26365	5	QPSK	12	6	21.51	0-1	1
	1882.5	26365	5	QPSK	12	13	21.57	0-1	1
	1882.5	26365	5	QPSK	25	0	21.40	0-1	1
	1882.5	26365	5	16-QAM	1	0	22.18	0-1	1
	1882.5	26365	5	16-QAM	1	12	22.20	0-1	1
	1882.5	26365	5	16-QAM	1	24	22.11	0-1	1
	1882.5	26365	5	16-QAM	12	0	20.40	0-2	2
	1882.5	26365	5	16-QAM	12	6	20.37	0-2	2
	1882.5	26365	5	16-QAM	12	13	20.36	0-2	2
	1882.5	26365	5	16-QAM	25	0	20.35	0-2	2
High	1912.5	26665	5	QPSK	1	0	23.14	0	0
	1912.5	26665	5	QPSK	1	12	23.12	0	0
	1912.5	26665	5	QPSK	1	24	23.08	0	0
	1912.5	26665	5	QPSK	12	0	21.65	0-1	1
	1912.5	26665	5	QPSK	12	6	21.56	0-1	1
	1912.5	26665	5	QPSK	12	13	21.59	0-1	1
	1912.5	26665	5	QPSK	25	0	21.61	0-1	1
	1912.5	26665	5	16-QAM	1	0	21.83	0-1	1
	1912.5	26665	5	16-QAM	1	12	21.85	0-1	1
	1912.5	26665	5	16-QAM	1	24	21.85	0-1	1
	1912.5	26665	5	16-QAM	12	0	20.64	0-2	2
	1912.5	26665	5	16-QAM	12	6	20.54	0-2	2
	1912.5	26665	5	16-QAM	12	13	20.59	0-2	2
	1912.5	26665	5	16-QAM	25	0	20.69	0-2	2

Table 8-33
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	22.84	0	0
	1851.5	26055	3	QPSK	1	7	22.76	0	0
	1851.5	26055	3	QPSK	1	14	22.90	0	0
	1851.5	26055	3	QPSK	8	0	21.42	0-1	1
	1851.5	26055	3	QPSK	8	4	21.40	0-1	1
	1851.5	26055	3	QPSK	8	7	21.38	0-1	1
	1851.5	26055	3	QPSK	15	0	21.42	0-1	1
	1851.5	26055	3	16-QAM	1	0	21.56	0-1	1
	1851.5	26055	3	16-QAM	1	7	21.58	0-1	1
	1851.5	26055	3	16-QAM	1	14	21.55	0-1	1
	1851.5	26055	3	16-QAM	8	0	20.37	0-2	2
	1851.5	26055	3	16-QAM	8	4	20.35	0-2	2
	1851.5	26055	3	16-QAM	8	7	20.38	0-2	2
	1851.5	26055	3	16-QAM	15	0	20.32	0-2	2
Mid	1882.5	26365	3	QPSK	1	0	22.91	0	0
	1882.5	26365	3	QPSK	1	7	22.93	0	0
	1882.5	26365	3	QPSK	1	14	22.88	0	0
	1882.5	26365	3	QPSK	8	0	21.48	0-1	1
	1882.5	26365	3	QPSK	8	4	21.47	0-1	1
	1882.5	26365	3	QPSK	8	7	21.47	0-1	1
	1882.5	26365	3	QPSK	15	0	21.42	0-1	1
	1882.5	26365	3	16-QAM	1	0	22.07	0-1	1
	1882.5	26365	3	16-QAM	1	7	22.18	0-1	1
	1882.5	26365	3	16-QAM	1	14	22.05	0-1	1
	1882.5	26365	3	16-QAM	8	0	20.38	0-2	2
	1882.5	26365	3	16-QAM	8	4	20.39	0-2	2
	1882.5	26365	3	16-QAM	8	7	20.38	0-2	2
	1882.5	26365	3	16-QAM	15	0	20.33	0-2	2
High	1913.5	26675	3	QPSK	1	0	23.07	0	0
	1913.5	26675	3	QPSK	1	7	23.03	0	0
	1913.5	26675	3	QPSK	1	14	23.00	0	0
	1913.5	26675	3	QPSK	8	0	21.74	0-1	1
	1913.5	26675	3	QPSK	8	4	21.64	0-1	1
	1913.5	26675	3	QPSK	8	7	21.62	0-1	1
	1913.5	26675	3	QPSK	15	0	21.65	0-1	1
	1913.5	26675	3	16-QAM	1	0	22.13	0-1	1
	1913.5	26675	3	16-QAM	1	7	21.99	0-1	1
	1913.5	26675	3	16-QAM	1	14	22.16	0-1	1
	1913.5	26675	3	16-QAM	8	0	20.41	0-2	2
	1913.5	26675	3	16-QAM	8	4	20.37	0-2	2
	1913.5	26675	3	16-QAM	8	7	20.31	0-2	2
	1913.5	26675	3	16-QAM	15	0	20.48	0-2	2

Table 8-34
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	22.30	0	0
	1850.7	26047	1.4	QPSK	1	2	22.40	0	0
	1850.7	26047	1.4	QPSK	1	5	22.41	0	0
	1850.7	26047	1.4	QPSK	3	0	22.30	0	0
	1850.7	26047	1.4	QPSK	3	2	22.31	0	0
	1850.7	26047	1.4	QPSK	3	3	22.31	0	0
	1850.7	26047	1.4	QPSK	6	0	21.30	0-1	1
	1850.7	26047	1.4	16-QAM	1	0	21.34	0-1	1
	1850.7	26047	1.4	16-QAM	1	2	21.35	0-1	1
	1850.7	26047	1.4	16-QAM	1	5	21.33	0-1	1
	1850.7	26047	1.4	16-QAM	3	0	21.32	0-1	1
	1850.7	26047	1.4	16-QAM	3	2	21.30	0-1	1
	1850.7	26047	1.4	16-QAM	3	3	21.32	0-1	1
	1850.7	26047	1.4	16-QAM	6	0	20.30	0-2	2
Mid	1882.5	26365	1.4	QPSK	1	0	22.60	0	0
	1882.5	26365	1.4	QPSK	1	2	22.59	0	0
	1882.5	26365	1.4	QPSK	1	5	22.53	0	0
	1882.5	26365	1.4	QPSK	3	0	22.53	0	0
	1882.5	26365	1.4	QPSK	3	2	22.51	0	0
	1882.5	26365	1.4	QPSK	3	3	22.50	0	0
	1882.5	26365	1.4	QPSK	6	0	21.50	0-1	1
	1882.5	26365	1.4	16-QAM	1	0	21.53	0-1	1
	1882.5	26365	1.4	16-QAM	1	2	21.51	0-1	1
	1882.5	26365	1.4	16-QAM	1	5	21.53	0-1	1
	1882.5	26365	1.4	16-QAM	3	0	21.44	0-1	1
	1882.5	26365	1.4	16-QAM	3	2	21.34	0-1	1
	1882.5	26365	1.4	16-QAM	3	3	21.44	0-1	1
	1882.5	26365	1.4	16-QAM	6	0	20.35	0-2	2
High	1914.3	26683	1.4	QPSK	1	0	22.71	0	0
	1914.3	26683	1.4	QPSK	1	2	22.90	0	0
	1914.3	26683	1.4	QPSK	1	5	22.74	0	0
	1914.3	26683	1.4	QPSK	3	0	22.56	0	0
	1914.3	26683	1.4	QPSK	3	2	22.58	0	0
	1914.3	26683	1.4	QPSK	3	3	22.51	0	0
	1914.3	26683	1.4	QPSK	6	0	21.45	0-1	1
	1914.3	26683	1.4	16-QAM	1	0	21.80	0-1	1
	1914.3	26683	1.4	16-QAM	1	2	21.65	0-1	1
	1914.3	26683	1.4	16-QAM	1	5	21.64	0-1	1
	1914.3	26683	1.4	16-QAM	3	0	21.54	0-1	1
	1914.3	26683	1.4	16-QAM	3	2	21.47	0-1	1
	1914.3	26683	1.4	16-QAM	3	3	21.49	0-1	1
	1914.3	26683	1.4	16-QAM	6	0	20.34	0-2	2

Table 8-35
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	13.94	0	0
	1860	26140	20	QPSK	1	50	14.03	0	0
	1860	26140	20	QPSK	1	99	14.04	0	0
	1860	26140	20	QPSK	50	0	13.00	0-1	1
	1860	26140	20	QPSK	50	25	12.99	0-1	1
	1860	26140	20	QPSK	50	50	12.96	0-1	1
	1860	26140	20	QPSK	100	0	12.92	0-1	1
	1860	26140	20	16QAM	1	0	13.25	0-1	1
	1860	26140	20	16QAM	1	50	13.42	0-1	1
	1860	26140	20	16QAM	1	99	13.39	0-1	1
	1860	26140	20	16QAM	50	0	11.85	0-2	2
	1860	26140	20	16QAM	50	25	11.98	0-2	2
	1860	26140	20	16QAM	50	50	11.99	0-2	2
	1860	26140	20	16QAM	100	0	11.98	0-2	2
Mid	1882.5	26365	20	QPSK	1	0	14.04	0	0
	1882.5	26365	20	QPSK	1	50	14.09	0	0
	1882.5	26365	20	QPSK	1	99	14.17	0	0
	1882.5	26365	20	QPSK	50	0	13.04	0-1	1
	1882.5	26365	20	QPSK	50	25	13.04	0-1	1
	1882.5	26365	20	QPSK	50	50	12.96	0-1	1
	1882.5	26365	20	QPSK	100	0	12.96	0-1	1
	1882.5	26365	20	16QAM	1	0	13.24	0-1	1
	1882.5	26365	20	16QAM	1	50	13.26	0-1	1
	1882.5	26365	20	16QAM	1	99	13.22	0-1	1
	1882.5	26365	20	16QAM	50	0	12.13	0-2	2
	1882.5	26365	20	16QAM	50	25	12.07	0-2	2
	1882.5	26365	20	16QAM	50	50	12.07	0-2	2
	1882.5	26365	20	16QAM	100	0	12.05	0-2	2
High	1905	26590	20	QPSK	1	0	14.17	0	0
	1905	26590	20	QPSK	1	50	14.22	0	0
	1905	26590	20	QPSK	1	99	**14.35**	0	0
	1905	26590	20	QPSK	50	0	13.16	0-1	1
	1905	26590	20	QPSK	50	25	**13.17**	0-1	1
	1905	26590	20	QPSK	50	50	13.12	0-1	1
	1905	26590	20	QPSK	100	0	13.14	0-1	1
	1905	26590	20	16QAM	1	0	13.41	0-1	1
	1905	26590	20	16QAM	1	50	13.37	0-1	1
	1905	26590	20	16QAM	1	99	13.38	0-1	1
	1905	26590	20	16QAM	50	0	12.26	0-2	2
	1905	26590	20	16QAM	50	25	12.10	0-2	2
	1905	26590	20	16QAM	50	50	12.15	0-2	2
	1905	26590	20	16QAM	100	0	12.14	0-2	2

Table 8-36
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	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	26115	15	QPSK	1	0	13.59	0	0
	1857.5	26115	15	QPSK	1	36	13.76	0	0
	1857.5	26115	15	QPSK	1	74	13.74	0	0
	1857.5	26115	15	QPSK	36	0	12.50	0-1	1
	1857.5	26115	15	QPSK	36	18	12.52	0-1	1
	1857.5	26115	15	QPSK	36	37	12.57	0-1	1
	1857.5	26115	15	QPSK	75	0	12.51	0-1	1
	1857.5	26115	15	16QAM	1	0	12.77	0-1	1
	1857.5	26115	15	16QAM	1	36	12.75	0-1	1
	1857.5	26115	15	16QAM	1	74	12.81	0-1	1
	1857.5	26115	15	16QAM	36	0	11.54	0-2	2
	1857.5	26115	15	16QAM	36	18	11.54	0-2	2
	1857.5	26115	15	16QAM	36	37	11.54	0-2	2
	1857.5	26115	15	16QAM	75	0	11.52	0-2	2
Mid	1882.5	26365	15	QPSK	1	0	13.87	0	0
	1882.5	26365	15	QPSK	1	36	13.91	0	0
	1882.5	26365	15	QPSK	1	74	13.84	0	0
	1882.5	26365	15	QPSK	36	0	12.54	0-1	1
	1882.5	26365	15	QPSK	36	18	12.55	0-1	1
	1882.5	26365	15	QPSK	36	37	12.52	0-1	1
	1882.5	26365	15	QPSK	75	0	12.51	0-1	1
	1882.5	26365	15	16QAM	1	0	12.85	0-1	1
	1882.5	26365	15	16QAM	1	36	12.78	0-1	1
	1882.5	26365	15	16QAM	1	74	12.94	0-1	1
	1882.5	26365	15	16QAM	36	0	11.55	0-2	2
	1882.5	26365	15	16QAM	36	18	11.62	0-2	2
	1882.5	26365	15	16QAM	36	37	11.55	0-2	2
	1882.5	26365	15	16QAM	75	0	11.57	0-2	2
High	1907.5	26615	15	QPSK	1	0	13.92	0	0
	1907.5	26615	15	QPSK	1	36	13.98	0	0
	1907.5	26615	15	QPSK	1	74	14.14	0	0
	1907.5	26615	15	QPSK	36	0	12.70	0-1	1
	1907.5	26615	15	QPSK	36	18	12.72	0-1	1
	1907.5	26615	15	QPSK	36	37	12.71	0-1	1
	1907.5	26615	15	QPSK	75	0	12.70	0-1	1
	1907.5	26615	15	16QAM	1	0	13.28	0-1	1
	1907.5	26615	15	16QAM	1	36	13.36	0-1	1
	1907.5	26615	15	16QAM	1	74	13.34	0-1	1
	1907.5	26615	15	16QAM	36	0	11.79	0-2	2
	1907.5	26615	15	16QAM	36	18	11.81	0-2	2
	1907.5	26615	15	16QAM	36	37	11.76	0-2	2
	1907.5	26615	15	16QAM	75	0	11.74	0-2	2

Table 8-37
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	13.67	0	0
	1855	26090	10	QPSK	1	25	13.64	0	0
	1855	26090	10	QPSK	1	49	13.73	0	0
	1855	26090	10	QPSK	25	0	12.51	0-1	1
	1855	26090	10	QPSK	25	12	12.57	0-1	1
	1855	26090	10	QPSK	25	25	12.50	0-1	1
	1855	26090	10	QPSK	50	0	12.53	0-1	1
	1855	26090	10	16QAM	1	0	12.83	0-1	1
	1855	26090	10	16QAM	1	25	12.90	0-1	1
	1855	26090	10	16QAM	1	49	12.89	0-1	1
	1855	26090	10	16QAM	25	0	11.53	0-2	2
	1855	26090	10	16QAM	25	12	11.55	0-2	2
	1855	26090	10	16QAM	25	25	11.52	0-2	2
	1855	26090	10	16QAM	50	0	11.55	0-2	2
Mid	1882.5	26365	10	QPSK	1	0	13.83	0	0
	1882.5	26365	10	QPSK	1	25	13.80	0	0
	1882.5	26365	10	QPSK	1	49	13.82	0	0
	1882.5	26365	10	QPSK	25	0	12.54	0-1	1
	1882.5	26365	10	QPSK	25	12	12.53	0-1	1
	1882.5	26365	10	QPSK	25	25	12.55	0-1	1
	1882.5	26365	10	QPSK	50	0	12.51	0-1	1
	1882.5	26365	10	16QAM	1	0	12.69	0-1	1
	1882.5	26365	10	16QAM	1	25	12.76	0-1	1
	1882.5	26365	10	16QAM	1	49	12.89	0-1	1
	1882.5	26365	10	16QAM	25	0	11.52	0-2	2
	1882.5	26365	10	16QAM	25	12	11.54	0-2	2
	1882.5	26365	10	16QAM	25	25	11.63	0-2	2
	1882.5	26365	10	16QAM	50	0	11.57	0-2	2
High	1910	26640	10	QPSK	1	0	14.02	0	0
	1910	26640	10	QPSK	1	25	14.06	0	0
	1910	26640	10	QPSK	1	49	14.02	0	0
	1910	26640	10	QPSK	25	0	12.72	0-1	1
	1910	26640	10	QPSK	25	12	12.63	0-1	1
	1910	26640	10	QPSK	25	25	12.70	0-1	1
	1910	26640	10	QPSK	50	0	12.69	0-1	1
	1910	26640	10	16QAM	1	0	12.84	0-1	1
	1910	26640	10	16QAM	1	25	12.94	0-1	1
	1910	26640	10	16QAM	1	49	13.03	0-1	1
	1910	26640	10	16QAM	25	0	11.78	0-2	2
	1910	26640	10	16QAM	25	12	11.72	0-2	2
	1910	26640	10	16QAM	25	25	11.73	0-2	2
	1910	26640	10	16QAM	50	0	11.78	0-2	2

Table 8-38
LTE Band 2 (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	13.86	0	0
	1852.5	26065	5	QPSK	1	12	13.98	0	0
	1852.5	26065	5	QPSK	1	24	13.81	0	0
	1852.5	26065	5	QPSK	12	0	12.68	0-1	1
	1852.5	26065	5	QPSK	12	6	12.68	0-1	1
	1852.5	26065	5	QPSK	12	13	12.63	0-1	1
	1852.5	26065	5	QPSK	25	0	12.67	0-1	1
	1852.5	26065	5	16-QAM	1	0	12.84	0-1	1
	1852.5	26065	5	16-QAM	1	12	12.86	0-1	1
	1852.5	26065	5	16-QAM	1	24	12.75	0-1	1
	1852.5	26065	5	16-QAM	12	0	11.57	0-2	2
	1852.5	26065	5	16-QAM	12	6	11.57	0-2	2
	1852.5	26065	5	16-QAM	12	13	11.63	0-2	2
	1852.5	26065	5	16-QAM	25	0	11.70	0-2	2
Mid	1882.5	26365	5	QPSK	1	0	13.98	0	0
	1882.5	26365	5	QPSK	1	12	13.96	0	0
	1882.5	26365	5	QPSK	1	24	13.98	0	0
	1882.5	26365	5	QPSK	12	0	12.70	0-1	1
	1882.5	26365	5	QPSK	12	6	12.72	0-1	1
	1882.5	26365	5	QPSK	12	13	12.69	0-1	1
	1882.5	26365	5	QPSK	25	0	12.73	0-1	1
	1882.5	26365	5	16-QAM	1	0	12.81	0-1	1
	1882.5	26365	5	16-QAM	1	12	12.98	0-1	1
	1882.5	26365	5	16-QAM	1	24	12.80	0-1	1
	1882.5	26365	5	16-QAM	12	0	11.62	0-2	2
	1882.5	26365	5	16-QAM	12	6	11.65	0-2	2
	1882.5	26365	5	16-QAM	12	13	11.62	0-2	2
	1882.5	26365	5	16-QAM	25	0	11.65	0-2	2
High	1912.5	26665	5	QPSK	1	0	14.06	0	0
	1912.5	26665	5	QPSK	1	12	14.13	0	0
	1912.5	26665	5	QPSK	1	24	14.16	0	0
	1912.5	26665	5	QPSK	12	0	12.89	0-1	1
	1912.5	26665	5	QPSK	12	6	12.81	0-1	1
	1912.5	26665	5	QPSK	12	13	12.91	0-1	1
	1912.5	26665	5	QPSK	25	0	12.96	0-1	1
	1912.5	26665	5	16-QAM	1	0	13.04	0-1	1
	1912.5	26665	5	16-QAM	1	12	13.09	0-1	1
	1912.5	26665	5	16-QAM	1	24	12.95	0-1	1
	1912.5	26665	5	16-QAM	12	0	11.81	0-2	2
	1912.5	26665	5	16-QAM	12	6	11.81	0-2	2
	1912.5	26665	5	16-QAM	12	13	11.80	0-2	2
	1912.5	26665	5	16-QAM	25	0	11.93	0-2	2

Table 8-39
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	13.80	0	0
	1851.5	26055	3	QPSK	1	7	13.88	0	0
	1851.5	26055	3	QPSK	1	14	13.80	0	0
	1851.5	26055	3	QPSK	8	0	12.61	0-1	1
	1851.5	26055	3	QPSK	8	4	12.67	0-1	1
	1851.5	26055	3	QPSK	8	7	12.70	0-1	1
	1851.5	26055	3	QPSK	15	0	12.54	0-1	1
	1851.5	26055	3	16-QAM	1	0	12.56	0-1	1
	1851.5	26055	3	16-QAM	1	7	12.61	0-1	1
	1851.5	26055	3	16-QAM	1	14	12.58	0-1	1
	1851.5	26055	3	16-QAM	8	0	11.62	0-2	2
	1851.5	26055	3	16-QAM	8	4	11.58	0-2	2
	1851.5	26055	3	16-QAM	8	7	11.62	0-2	2
	1851.5	26055	3	16-QAM	15	0	11.57	0-2	2
Mid	1882.5	26365	3	QPSK	1	0	13.88	0	0
	1882.5	26365	3	QPSK	1	7	13.88	0	0
	1882.5	26365	3	QPSK	1	14	13.89	0	0
	1882.5	26365	3	QPSK	8	0	12.70	0-1	1
	1882.5	26365	3	QPSK	8	4	12.69	0-1	1
	1882.5	26365	3	QPSK	8	7	12.70	0-1	1
	1882.5	26365	3	QPSK	15	0	12.60	0-1	1
	1882.5	26365	3	16-QAM	1	0	12.79	0-1	1
	1882.5	26365	3	16-QAM	1	7	12.80	0-1	1
	1882.5	26365	3	16-QAM	1	14	12.77	0-1	1
	1882.5	26365	3	16-QAM	8	0	11.67	0-2	2
	1882.5	26365	3	16-QAM	8	4	11.66	0-2	2
	1882.5	26365	3	16-QAM	8	7	11.65	0-2	2
	1882.5	26365	3	16-QAM	15	0	11.66	0-2	2
High	1913.5	26675	3	QPSK	1	0	14.15	0	0
	1913.5	26675	3	QPSK	1	7	14.10	0	0
	1913.5	26675	3	QPSK	1	14	14.06	0	0
	1913.5	26675	3	QPSK	8	0	12.92	0-1	1
	1913.5	26675	3	QPSK	8	4	12.91	0-1	1
	1913.5	26675	3	QPSK	8	7	12.95	0-1	1
	1913.5	26675	3	QPSK	15	0	12.84	0-1	1
	1913.5	26675	3	16-QAM	1	0	13.03	0-1	1
	1913.5	26675	3	16-QAM	1	7	12.90	0-1	1
	1913.5	26675	3	16-QAM	1	14	12.93	0-1	1
	1913.5	26675	3	16-QAM	8	0	11.92	0-2	2
	1913.5	26675	3	16-QAM	8	4	11.93	0-2	2
	1913.5	26675	3	16-QAM	8	7	11.96	0-2	2
	1913.5	26675	3	16-QAM	15	0	11.90	0-2	2

Table 8-40
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	13.78	0	0
	1850.7	26047	1.4	QPSK	1	2	13.80	0	0
	1850.7	26047	1.4	QPSK	1	5	13.81	0	0
	1850.7	26047	1.4	QPSK	3	0	13.61	0	0
	1850.7	26047	1.4	QPSK	3	2	13.59	0	0
	1850.7	26047	1.4	QPSK	3	3	13.60	0	0
	1850.7	26047	1.4	QPSK	6	0	12.57	0-1	1
	1850.7	26047	1.4	16-QAM	1	0	12.59	0-1	1
	1850.7	26047	1.4	16-QAM	1	2	12.58	0-1	1
	1850.7	26047	1.4	16-QAM	1	5	12.55	0-1	1
	1850.7	26047	1.4	16-QAM	3	0	12.50	0-1	1
	1850.7	26047	1.4	16-QAM	3	2	12.58	0-1	1
	1850.7	26047	1.4	16-QAM	3	3	12.54	0-1	1
	1850.7	26047	1.4	16-QAM	6	0	11.59	0-2	2
Mid	1882.5	26365	1.4	QPSK	1	0	13.92	0	0
	1882.5	26365	1.4	QPSK	1	2	13.97	0	0
	1882.5	26365	1.4	QPSK	1	5	13.86	0	0
	1882.5	26365	1.4	QPSK	3	0	13.72	0	0
	1882.5	26365	1.4	QPSK	3	2	13.72	0	0
	1882.5	26365	1.4	QPSK	3	3	13.73	0	0
	1882.5	26365	1.4	QPSK	6	0	12.65	0-1	1
	1882.5	26365	1.4	16-QAM	1	0	12.68	0-1	1
	1882.5	26365	1.4	16-QAM	1	2	12.72	0-1	1
	1882.5	26365	1.4	16-QAM	1	5	12.68	0-1	1
	1882.5	26365	1.4	16-QAM	3	0	12.65	0-1	1
	1882.5	26365	1.4	16-QAM	3	2	12.55	0-1	1
	1882.5	26365	1.4	16-QAM	3	3	12.59	0-1	1
	1882.5	26365	1.4	16-QAM	6	0	11.67	0-2	2
High	1914.3	26683	1.4	QPSK	1	0	14.40	0	0
	1914.3	26683	1.4	QPSK	1	2	14.36	0	0
	1914.3	26683	1.4	QPSK	1	5	14.40	0	0
	1914.3	26683	1.4	QPSK	3	0	14.28	0	0
	1914.3	26683	1.4	QPSK	3	2	14.27	0	0
	1914.3	26683	1.4	QPSK	3	3	14.12	0	0
	1914.3	26683	1.4	QPSK	6	0	13.20	0-1	1
	1914.3	26683	1.4	16-QAM	1	0	13.31	0-1	1
	1914.3	26683	1.4	16-QAM	1	2	13.18	0-1	1
	1914.3	26683	1.4	16-QAM	1	5	13.18	0-1	1
	1914.3	26683	1.4	16-QAM	3	0	13.03	0-1	1
	1914.3	26683	1.4	16-QAM	3	2	13.03	0-1	1
	1914.3	26683	1.4	16-QAM	3	3	12.92	0-1	1
	1914.3	26683	1.4	16-QAM	6	0	12.27	0-2	2

8.1.6 LTE Carrier Aggregation Conducted Powers

Table 8-41
LTE Carrier Aggregation Conducted Powers

PCC						SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	PCC (UL) Channel	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Frequency [MHz]	SCC (DL) Channel	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B4	20	1732.5	20175	1	99	LTE B12	10	737.5	5095	23.46	23.47
LTE B2	20	1882.5	18925	1	50	LTE B12	10	737.5	5095	22.70	23.23
LTE B5	10	836.5	20525	1	25	LTE B4	20	2132.5	2175	23.20	23.15
LTE B5	10	836.5	20525	1	25	LTE B2	20	1960	900	23.14	23.15

Table 8-42
LTE Carrier Aggregation Conducted Powers
Reduced Power – Body at 0.0 cm

PCC						SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	PCC (UL) Channel	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Frequency [MHz]	SCC (DL) Channel	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B4	15	1717.5	20025	1	36	LTE B12	10	737.5	5095	14.14	14.46
LTE B2	20	1882.5	18925	1	99	LTE B12	10	737.5	5095	14.25	14.17
LTE B5	5	846.5	20625	1	12	LTE B4	20	2132.5	2175	16.68	17.19
LTE B5	5	846.5	20625	1	12	LTE B2	20	1960	900	16.61	17.19

Notes:

1. The device does not support all Rel. 10 Carrier Aggregation features due to modem chipset limitation.
2. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest output power (across all bandwidths, channels and RB Configurations) for each band
3. This device only supports inter-band CA with 2 carriers (LTE B4 (PCC)+ LTE B12 (SCC), LTE B5(PCC) + LTE B4(SCC), LTE 5(PCC) + LTE B2(SCC), LTE B2(PCC) + LTE B12(SCC)).
4. All control and acknowledge data is sent on uplink channels that operate identical to release 8 specifications.
5. For LTE CA combinations with a PCC of LTE B2, LTE B25 LTE Rel.8 power was used to compare to LTE B2 LTE Rel. 10 measured power.

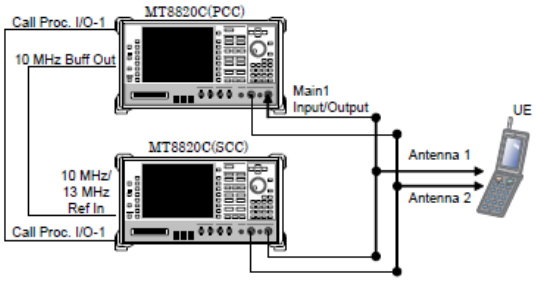


Figure 8-1
Power Measurement Setup

8.2 WLAN Conducted Powers

Table 8-43
2.4 GHz Average RF Power Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]	
		IEEE Transmission Mode	
		802.11b	802.11g
2412	1	17.42	15.25
2437	6	16.85	15.15
2462	11	**17.49**	15.05

Table 8-44
2.4 GHz Average RF Power Antenna 1
Reduced Power – Body at 0.0 cm

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	13.92	13.98	13.89
2437	6	**14.30**	14.14	13.28
2462	11	14.26	14.20	14.25

Table 8-45
2.4 GHz Average RF Power Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]	
		IEEE Transmission Mode	
		802.11b	802.11g
2412	1	**17.11**	14.96
2437	6	16.49	14.67
2462	11	16.38	15.31

Table 8-46
2.4 GHz Average RF Power Antenna 2
Reduced Power – Body at 0.0 cm

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**12.18**	11.54	11.60
2437	6	12.13	11.45	11.55
2462	11	11.73	11.87	11.87

Table 8-47
5 GHz (20 MHz Bandwidth) Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	12.66	12.22	12.64
5200	40	12.85	12.51	12.40
5220	44	12.90	12.64	12.43
5240	48	13.06	12.88	12.56
5260	52	13.30	13.17	13.11
5280	56	13.33	13.09	13.23
5300	60	13.19	13.00	**13.34**
5320	64	13.01	12.99	13.33
5500	100	**13.30**	13.24	13.01
5600	120	12.69	12.56	12.64
5620	124	12.69	12.60	12.56
5720	144	12.84	12.76	12.50
5745	149	13.31	13.16	12.90
5785	157	**13.33**	13.25	12.97
5825	165	13.33	13.25	13.10

Table 8-48
5 GHz (80 MHz Bandwidth) Average RF Power – Antenna 1
Reduced Power – Body at 0.0 cm

5GHz (80MHz) Conducted Power		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	8.23
5290	58	**8.24**
5530	106	**7.87**
5610	122	7.63
5690	138	**7.64**
5775	155	**7.83**

Table 8-49
5 GHz (20 MHz Bandwidth) Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	12.74	12.63	12.57
5200	40	12.60	12.55	12.64
5220	44	12.65	12.47	12.47
5240	48	12.56	12.46	12.37
5260	52	**12.98**	12.88	12.88
5280	56	12.89	12.79	12.73
5300	60	12.84	12.80	12.76
5320	64	12.84	12.75	12.86
5500	100	12.99	12.92	12.97
5600	120	12.91	12.82	12.81
5620	124	12.84	12.72	12.78
5720	144	**13.19**	13.07	13.05
5745	149	**12.49**	12.34	12.42
5785	157	12.45	12.33	12.33
5825	165	12.43	12.37	12.36

Table 8-50
5 GHz (80 MHz Bandwidth) Average RF Power – Antenna 2
Reduced Power – Body at 0.0 cm

5GHz (80MHz) Conducted Power		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	7.06
5290	58	**7.02**
5530	106	**6.77**
5610	122	6.52
5690	138	**6.73**
5775	155	**7.03**

Justification for test configurations for WLAN per KDB Publication 248227 D01Wi-Fi SAR v02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.
- The bolded data rate and channel above were tested for SAR.

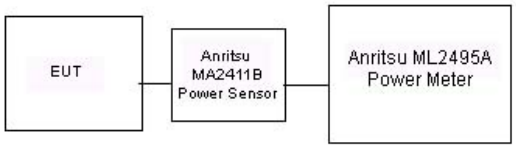


Figure 8-2
Power Measurement Setup for Bandwidths < 50 MHz

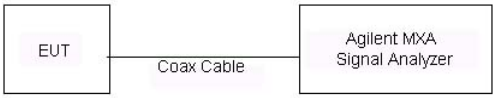


Figure 8-3
Power Measurement Setup for Bandwidths > 50 MHz

8.3 Bluetooth Conducted Powers

Table 8-51
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	9.18	8.271
2441	1.0	39	**9.45**	8.819
2480	1.0	78	8.97	7.888
2402	2.0	0	4.63	2.904
2441	2.0	39	5.45	3.511
2480	2.0	78	4.89	3.080
2402	3.0	0	4.69	2.947
2441	3.0	39	5.51	3.552
2480	3.0	78	4.95	3.123

Note: The bolded data rate and channel above was tested for SAR.

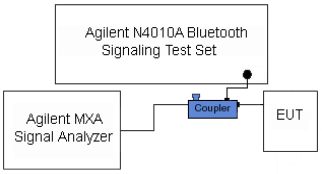


Figure 8-4
Power Measurement Setup

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
4/28/2015	750B	22.6	740	0.941	53.421	0.963	55.570	-2.28%	-3.87%
			755	0.955	53.230	0.964	55.512	-0.93%	-4.11%
			770	0.970	53.053	0.965	55.453	0.52%	-4.33%
			785	0.984	52.899	0.966	55.395	1.86%	-4.51%
5/4/2015	750B	22.0	695	0.915	54.994	0.959	55.745	-4.59%	-1.35%
			710	0.929	54.841	0.960	55.687	-3.23%	-1.52%
			725	0.943	54.708	0.961	55.629	-1.87%	-1.66%
			740	0.956	54.543	0.963	55.570	-0.73%	-1.85%
			755	0.969	54.393	0.964	55.512	0.52%	-2.02%
4/27/2015	835B	21.5	820	0.978	54.362	0.969	55.258	0.93%	-1.62%
			835	0.992	54.192	0.970	55.200	2.27%	-1.83%
			850	1.007	54.064	0.988	55.154	1.92%	-1.98%
4/27/2015	1750B	21.4	1710	1.408	53.031	1.463	53.537	-3.76%	-0.95%
			1750	1.451	52.881	1.488	53.432	-2.49%	-1.03%
			1790	1.497	52.760	1.514	53.326	-1.12%	-1.06%
5/16/2015	1900B	23.0	1850	1.449	51.215	1.520	53.300	-4.67%	-3.91%
			1880	1.481	51.106	1.520	53.300	-2.57%	-4.12%
			1910	1.515	51.001	1.520	53.300	-0.33%	-4.31%
4/29/2015	2450B	22.2	2401	1.903	51.513	1.903	52.765	0.00%	-2.37%
			2450	1.962	51.310	1.950	52.700	0.62%	-2.64%
			2499	2.028	51.126	2.019	52.638	0.45%	-2.87%
04/27/2015	5200B-5800B	21.0	5260	5.344	48.108	5.369	48.933	-0.47%	-1.69%
			5280	5.374	48.052	5.393	48.906	-0.35%	-1.75%
			5300	5.409	48.022	5.416	48.879	-0.13%	-1.75%
			5500	5.652	47.731	5.650	48.607	0.04%	-1.80%
			5520	5.681	47.670	5.673	48.580	0.14%	-1.87%
			5540	5.713	47.612	5.696	48.553	0.30%	-1.94%
			5600	5.803	47.570	5.766	48.471	0.64%	-1.86%
			5680	5.920	47.400	5.860	48.363	1.02%	-1.99%
			5700	5.951	47.399	5.883	48.336	1.16%	-1.94%
			5745	5.999	47.334	5.936	48.275	1.06%	-1.95%
			5765	6.018	47.310	5.959	48.248	0.99%	-1.94%
			5785	6.058	47.224	5.982	48.220	1.27%	-2.07%
			5800	6.073	47.223	6.000	48.200	1.22%	-2.03%

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)	$Deviation_{1g}$ (%)
G	750	BODY	04/28/2015	20.3	21.4	0.100	1003	3318	0.879	8.460	8.790	3.90%
A	750	BODY	05/04/2015	24.2	22.0	0.100	1046	3331	0.890	8.290	8.900	7.36%
J	835	BODY	04/27/2015	20.9	21.9	0.100	4d133	3022	0.940	9.350	9.400	0.53%
G	1750	BODY	04/27/2015	22.3	21.4	0.100	1008	3318	3.580	37.600	35.800	-4.79%
H	1900	BODY	05/16/2015	23.7	24.0	0.100	5d141	3258	3.770	40.000	37.700	-5.75%
J	2450	BODY	04/29/2015	21.4	21.7	0.100	719	3319	5.560	51.800	55.600	7.34%
E	5300	BODY	04/27/2015	20.9	20.6	0.050	1057	3589	3.840	74.200	76.800	3.50%
E	5500	BODY	04/27/2015	20.9	20.6	0.050	1057	3589	3.780	79.200	75.600	-4.55%
E	5600	BODY	04/27/2015	21.0	20.7	0.050	1057	3589	3.910	77.700	78.200	0.64%
E	5800	BODY	04/27/2015	21.1	20.7	0.050	1057	3589	3.450	75.100	69.000	-8.12%

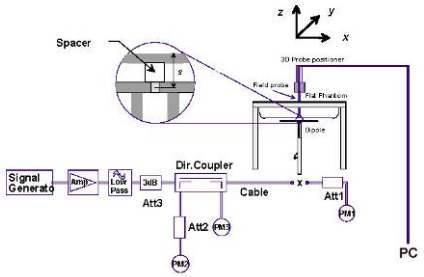


Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Wireless Router 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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	23.5	23.33	0.04	0	7318	QPSK	1	25	24 mm	back	1:1	0.077	1.040	0.080	
707.50	23095	Mid	LTE Band 12	10	22.5	22.04	-0.04	1	7318	QPSK	25	0	24 mm	back	1:1	0.057	1.112	0.063	
707.50	23095	Mid	LTE Band 12	10	23.5	23.33	0.01	0	7318	QPSK	1	25	24 mm	top	1:1	0.095	1.040	0.099	
707.50	23095	Mid	LTE Band 12	10	22.5	22.04	0.08	1	7318	QPSK	25	0	24 mm	top	1:1	0.072	1.112	0.080	
707.50	23095	Mid	LTE Band 12	10	23.5	23.33	-0.09	0	7318	QPSK	1	25	0 mm	right	1:1	0.108	1.040	0.112	
707.50	23095	Mid	LTE Band 12	10	22.5	22.04	0.15	1	7318	QPSK	25	0	0 mm	right	1:1	0.090	1.112	0.100	
707.50	23095	Mid	LTE Band 12	10	23.5	23.33	0.05	0	7318	QPSK	1	25	0 mm	left	1:1	0.082	1.040	0.085	
707.50	23095	Mid	LTE Band 12	10	22.5	22.04	0.08	1	7318	QPSK	25	0	0 mm	left	1:1	0.063	1.112	0.070	
707.50	23095	Mid	LTE Band 12	10	18.5	17.65	-0.01	0	8134	QPSK	1	49	0 mm	back	1:1	0.588	1.216	0.715	
707.50	23095	Mid	LTE Band 12	10	17.5	16.45	-0.02	1	8134	QPSK	25	12	0 mm	back	1:1	0.428	1.274	0.545	
707.50	23095	Mid	LTE Band 12	10	18.5	17.65	-0.09	0	8134	QPSK	1	49	0 mm	top	1:1	0.877	1.216	**1.066**	A1
707.50	23095	Mid	LTE Band 12	10	17.5	16.45	-0.06	1	8134	QPSK	25	12	0 mm	top	1:1	0.641	1.274	0.817	
707.50	23095	Mid	LTE Band 12	10	17.5	16.36	-0.20	1	8134	QPSK	50	0	0 mm	top	1:1	0.646	1.300	0.840	
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	23.5	23.32	0.10	0	7598	QPSK	1	25	24 mm	back	1:1	0.184	1.042	0.192	
782.00	23230	Mid	LTE Band 13	10	22.5	21.97	0.02	1	7598	QPSK	25	0	24 mm	back	1:1	0.137	1.130	0.155	
782.00	23230	Mid	LTE Band 13	10	23.5	23.32	-0.06	0	7598	QPSK	1	25	24 mm	top	1:1	0.215	1.042	0.224	
782.00	23230	Mid	LTE Band 13	10	22.5	21.97	0.10	1	7598	QPSK	25	0	24 mm	top	1:1	0.156	1.130	0.176	
782.00	23230	Mid	LTE Band 13	10	23.5	23.32	0.20	0	7598	QPSK	1	25	0 mm	right	1:1	0.065	1.042	0.068	
782.00	23230	Mid	LTE Band 13	10	22.5	21.97	0.09	1	7598	QPSK	25	0	0 mm	right	1:1	0.043	1.130	0.049	
782.00	23230	Mid	LTE Band 13	10	23.5	23.32	-0.11	0	7598	QPSK	1	25	0 mm	left	1:1	0.098	1.042	0.102	
782.00	23230	Mid	LTE Band 13	10	22.5	21.97	0.11	1	7598	QPSK	25	0	0 mm	left	1:1	0.067	1.130	0.076	
782.00	23230	Mid	LTE Band 13	10	18.5	17.88	-0.02	0	6947	QPSK	1	25	0 mm	back	1:1	0.834	1.153	0.962	
782.00	23230	Mid	LTE Band 13	10	17.5	16.55	-0.06	1	6947	QPSK	25	12	0 mm	back	1:1	0.603	1.245	0.751	
782.00	23230	Mid	LTE Band 13	10	17.5	16.52	-0.01	1	6947	QPSK	50	0	0 mm	back	1:1	0.602	1.253	0.754	
782.00	23230	Mid	LTE Band 13	10	18.5	17.88	0.09	0	6947	QPSK	1	25	0 mm	top	1:1	0.931	1.153	**1.073**	A2
782.00	23230	Mid	LTE Band 13	10	17.5	16.55	0.07	1	6947	QPSK	25	12	0 mm	top	1:1	0.705	1.245	0.878	
782.00	23230	Mid	LTE Band 13	10	17.5	16.52	-0.17	1	6947	QPSK	50	0	0 mm	top	1:1	0.706	1.253	0.885	
782.00	23230	Mid	LTE Band 13	10	18.5	17.88	0.03	0	6947	QPSK	1	25	0 mm	top	1:1	0.916	1.153	1.056	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Blue entry represents variability measurement.

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

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.15	-0.02	0	7598	QPSK	1	25	24 mm	back	1:1	0.278	1.084	0.301	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.66	-0.11	1	7598	QPSK	25	0	24 mm	back	1:1	0.197	1.213	0.239	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.15	0.02	0	7598	QPSK	1	25	24 mm	top	1:1	0.329	1.084	0.357	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.66	-0.04	1	7598	QPSK	25	0	24 mm	top	1:1	0.230	1.213	0.279	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.15	0.06	0	7598	QPSK	1	25	0 mm	right	1:1	0.179	1.084	0.194	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.66	0.06	1	7598	QPSK	25	0	0 mm	right	1:1	0.141	1.213	0.171	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.15	0.01	0	7598	QPSK	1	25	0 mm	left	1:1	0.249	1.084	0.270	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.5	21.66	0.00	1	7598	QPSK	25	0	0 mm	left	1:1	0.200	1.213	0.243	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.5	17.15	0.06	0	8117	QPSK	1	25	0 mm	back	1:1	0.957	1.084	1.037	A3
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.5	15.94	0.04	1	8117	QPSK	25	0	0 mm	back	1:1	0.708	1.138	0.806	
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.5	15.93	0.02	1	8117	QPSK	50	0	0 mm	back	1:1	0.698	1.140	0.796	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.5	17.15	0.01	0	8117	QPSK	1	25	0 mm	top	1:1	0.759	1.084	0.823	
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.5	15.94	0.07	1	8117	QPSK	25	0	0 mm	top	1:1	0.586	1.138	0.667	
836.50	20525	Mid	LTE Band 5 (Cell)	10	16.5	15.93	0.04	1	8117	QPSK	50	0	0 mm	top	1:1	0.571	1.140	0.651	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.5	17.15	0.06	0	8117	QPSK	1	25	0 mm	back	1:1	0.956	1.084	1.036	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram					

Note: Blue entry represents variability measurement.

Table 10-4
LTE Band 4 (AWS) Body SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.11	0	7598	QPSK	1	99	24 mm	back	1:1	0.227	1.007	0.229	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.96	0.05	1	7598	QPSK	50	50	24 mm	back	1:1	0.163	1.132	0.185	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	-0.01	0	7598	QPSK	1	99	24 mm	top	1:1	0.252	1.007	0.254	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.96	0.11	1	7598	QPSK	50	50	24 mm	top	1:1	0.192	1.132	0.217	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.04	0	7598	QPSK	1	99	0 mm	right	1:1	0.273	1.007	0.275	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.96	0.10	1	7598	QPSK	50	50	0 mm	right	1:1	0.204	1.132	0.231	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	-0.05	0	7598	QPSK	1	99	0 mm	left	1:1	1.010	1.007	1.017	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.96	-0.06	1	7598	QPSK	50	50	0 mm	left	1:1	0.758	1.132	0.858	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.93	-0.20	1	7598	QPSK	100	0	0 mm	left	1:1	0.720	1.140	0.821	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	14.5	14.39	-0.07	0	6947	QPSK	1	0	0 mm	back	1:1	0.604	1.026	0.620	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	13.08	-0.14	1	6947	QPSK	50	25	0 mm	back	1:1	0.494	1.102	0.544	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	14.5	14.39	-0.04	0	6947	QPSK	1	0	0 mm	top	1:1	0.199	1.026	0.204	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	13.08	0.03	1	6947	QPSK	50	25	0 mm	top	1:1	0.187	1.102	0.206	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.02	0	7598	QPSK	1	99	0 mm	left	1:1	1.030	1.007	1.037	A4
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram					

Note: Blue entry represents variability measurement.

Table 10-5
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)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.5	23.24	0.01	0	7736	QPSK	1	50	24 mm	back	1:1	0.152	1.062	0.161	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.5	22.02	0.08	1	7736	QPSK	50	0	24 mm	back	1:1	0.108	1.117	0.121	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.5	23.24	-0.06	0	7736	QPSK	1	50	24 mm	top	1:1	0.178	1.062	0.189	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.5	22.02	0.07	1	7736	QPSK	50	0	24 mm	top	1:1	0.134	1.117	0.150	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.5	23.24	0.10	0	7736	QPSK	1	50	0 mm	right	1:1	0.075	1.062	0.080	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.5	22.02	0.02	1	7736	QPSK	50	0	0 mm	right	1:1	0.053	1.117	0.059	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.5	23.24	-0.10	0	7736	QPSK	1	50	0 mm	left	1:1	0.727	1.062	0.772	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.5	22.02	0.02	1	7736	QPSK	50	0	0 mm	left	1:1	0.553	1.117	0.618	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.5	14.04	0.01	0	7737	QPSK	1	99	0 mm	back	1:1	0.939	1.112	1.044	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.5	14.17	-0.03	0	7737	QPSK	1	99	0 mm	back	1:1	0.958	1.079	1.034	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.5	14.35	0.00	0	7737	QPSK	1	99	0 mm	back	1:1	0.977	1.035	1.011	A5
1860.00	26140	Low	LTE Band 25 (PCS)	20	13.5	13.00	-0.01	1	7737	QPSK	50	0	0 mm	back	1:1	0.711	1.122	0.798	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	13.5	13.04	0.00	1	7737	QPSK	50	0	0 mm	back	1:1	0.725	1.112	0.806	
1905.00	26590	High	LTE Band 25 (PCS)	20	13.5	13.17	0.01	1	7737	QPSK	50	25	0 mm	back	1:1	0.764	1.079	0.824	
1905.00	26590	High	LTE Band 25 (PCS)	20	13.5	13.14	-0.01	1	7737	QPSK	100	0	0 mm	back	1:1	0.771	1.086	0.837	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.5	14.35	0.05	0	7737	QPSK	1	99	0 mm	top	1:1	0.470	1.035	0.486	
1905.00	26590	High	LTE Band 25 (PCS)	20	13.5	13.17	-0.06	1	7737	QPSK	50	25	0 mm	top	1:1	0.349	1.079	0.377	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.5	14.35	-0.03	0	7737	QPSK	1	99	0 mm	back	1:1	0.869	1.035	0.899	

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

Note: Blue entry represents variability measurement

Table 10-6
DTS Body SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Scaled SAR (1g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	17.5	17.42	0.02	4 mm	1	6905	1	back	99.8	0.260	1.019	1.002	0.266	
2462	11	802.11b	DSSS	22	17.5	17.49	-0.01	4 mm	1	6905	1	back	99.8	0.830	1.002	1.002	0.834	
2437	6	802.11b	DSSS	22	14.5	14.30	0.02	0 mm	1	7937	1	back	99.8	1.020	1.047	1.002	**1.070**	A6
2462	11	802.11b	DSSS	22	14.5	14.26	0.04	0 mm	1	7937	1	back	99.8	0.956	1.057	1.002	1.012	
2462	11	802.11b	DSSS	22	17.5	17.49	0.18	0 mm	1	6905	1	top	99.8	0.003	1.002	1.002	0.003	
2462	11	802.11b	DSSS	22	17.5	17.49	-0.05	0 mm	1	6905	1	bottom	99.8	0.220	1.002	1.002	0.220	
2462	11	802.11b	DSSS	22	17.5	17.49	-0.08	0 mm	1	6905	1	right	99.8	0.245	1.002	1.002	0.245	
2462	11	802.11b	DSSS	22	17.5	17.49	0.16	0 mm	1	6905	1	left	99.8	0.027	1.002	1.002	0.027	
2412	1	802.11b	DSSS	22	17.5	17.11	-0.06	4 mm	2	6905	1	back	99.9	0.235	1.094	1.001	0.257	
2412	1	802.11b	DSSS	22	12.5	12.18	0.09	0 mm	2	7937	1	back	99.9	0.430	1.076	1.001	0.463	
2412	1	802.11b	DSSS	22	17.5	17.11	-0.17	0 mm	2	6905	1	top	99.9	0.002	1.094	1.001	0.002	
2412	1	802.11b	DSSS	22	17.5	17.11	-0.15	0 mm	2	6905	1	bottom	99.9	0.116	1.094	1.001	0.127	
2412	1	802.11b	DSSS	22	17.5	17.11	-0.13	0 mm	2	6905	1	right	99.9	0.064	1.094	1.001	0.070	
2412	1	802.11b	DSSS	22	17.5	17.11	-0.09	0 mm	2	6905	1	left	99.9	0.006	1.094	1.001	0.007	
2437	6	802.11b	DSSS	22	14.5	14.30	-0.06	0 mm	1	7937	1	back	99.8	0.907	1.047	1.002	0.952	

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

Note: Blue entries represent variability measurements.

Table 10-7
NII Body SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Scaled SAR (1g) (W/kg)	Plot #
MHz	Ch.																	
5300	60	802.11ac	OFDM	20	13.5	13.34	0.10	4mm	1	6905	6.5	back	98.2	0.399	1.038	1.019	0.422	
5290	58	802.11ac	OFDM	80	8.5	8.24	0.01	0 mm	1	7937	29.3	back	95.5	0.832	1.062	1.047	0.926	
5300	60	802.11ac	OFDM	20	13.5	13.34	0.03	0 mm	1	6905	6.5	top	98.2	0.002	1.038	1.019	0.002	
5300	60	802.11ac	OFDM	20	13.5	13.34	0.00	0 mm	1	6905	6.5	bottom	98.2	0.129	1.038	1.019	0.137	
5300	60	802.11ac	OFDM	20	13.5	13.34	-0.05	0 mm	1	6905	6.5	right	98.2	0.335	1.038	1.019	0.355	
5300	60	802.11ac	OFDM	20	13.5	13.34	-0.09	0 mm	1	6905	6.5	left	98.2	0.005	1.038	1.019	0.005	
5260	52	802.11a	OFDM	20	13.5	12.98	-0.02	4 mm	2	6905	6	back	99.0	0.619	1.127	1.010	0.705	
5290	58	802.11ac	OFDM	80	7.5	7.02	0.05	0 mm	2	7937	29.3	back	95.8	0.864	1.117	1.044	**1.007**	A7
5260	52	802.11a	OFDM	20	13.5	12.98	-0.11	0 mm	2	6905	6	top	99.0	0.002	1.127	1.010	0.002	
5260	52	802.11a	OFDM	20	13.5	12.98	0.19	0 mm	2	6905	6	bottom	99.0	0.220	1.127	1.010	0.250	
5260	52	802.11a	OFDM	20	13.5	12.98	0.07	0 mm	2	6905	6	right	99.0	0.018	1.127	1.010	0.020	
5260	52	802.11a	OFDM	20	13.5	12.98	-0.04	0 mm	2	6905	6	left	99.0	0.028	1.127	1.010	0.032	
5500	100	802.11a	OFDM	20	13.5	13.30	0.04	4 mm	1	6905	6	back	98.4	0.295	1.047	1.017	0.314	
5530	106	802.11ac	OFDM	80	8.5	7.87	0.04	0 mm	1	7937	29.3	back	95.5	0.609	1.156	1.047	0.737	
5500	100	802.11a	OFDM	20	13.5	13.30	-0.03	0 mm	1	6905	6	top	98.4	0.003	1.047	1.017	0.003	
5500	100	802.11a	OFDM	20	13.5	13.30	0.08	0 mm	1	6905	6	bottom	98.4	0.061	1.047	1.017	0.065	
5500	100	802.11a	OFDM	20	13.5	13.30	0.02	0 mm	1	6905	6	right	98.4	0.232	1.047	1.017	0.247	
5500	100	802.11a	OFDM	20	13.5	13.30	-0.06	0 mm	1	6905	6	left	98.4	0.003	1.047	1.017	0.003	
5720	144	802.11a	OFDM	20	13.5	13.19	-0.03	4 mm	2	6905	6	back	99.0	0.411	1.074	1.010	0.445	
5530	106	802.11ac	OFDM	80	7.5	6.77	0.08	0 mm	2	7937	29.3	back	95.8	0.760	1.183	1.044	0.939	
5690	138	802.11ac	OFDM	80	7.5	6.73	-0.07	0 mm	2	7937	29.3	back	95.8	0.663	1.194	1.044	0.827	
5720	144	802.11a	OFDM	20	13.5	13.19	-0.14	0 mm	2	6905	6	top	99.0	0.003	1.074	1.010	0.003	
5720	144	802.11a	OFDM	20	13.5	13.19	0.00	0 mm	2	6905	6	bottom	99.0	0.197	1.074	1.010	0.214	
5720	144	802.11a	OFDM	20	13.5	13.19	-0.15	0 mm	2	6905	6	right	99.0	0.005	1.074	1.010	0.005	
5720	144	802.11a	OFDM	20	13.5	13.19	-0.11	0 mm	2	6905	6	left	99.0	0.017	1.074	1.010	0.018	
5785	157	802.11a	OFDM	20	13.5	13.33	0.16	4 mm	1	6905	6	back	98.4	0.333	1.040	1.017	0.352	
5775	155	802.11ac	OFDM	80	8.5	7.83	0.20	0 mm	1	7937	29.3	back	95.5	0.717	1.167	1.047	0.876	
5785	157	802.11a	OFDM	20	13.5	13.33	-0.02	0 mm	1	6905	6	top	98.4	0.006	1.040	1.017	0.006	
5785	157	802.11a	OFDM	20	13.5	13.33	0.11	0 mm	1	6905	6	bottom	98.4	0.062	1.040	1.017	0.065	
5785	157	802.11a	OFDM	20	13.5	13.33	0.05	0 mm	1	6905	6	right	98.4	0.207	1.040	1.017	0.219	
5785	157	802.11a	OFDM	20	13.5	13.33	0.02	0 mm	1	6905	6	left	98.4	0.005	1.040	1.017	0.005	
5745	149	802.11a	OFDM	20	13.5	12.49	-0.18	4 mm	2	6905	6	back	99.0	0.334	1.262	1.010	0.426	
5775	155	802.11ac	OFDM	80	7.5	7.03	-0.05	0 mm	2	7937	29.3	back	95.8	0.608	1.114	1.044	0.707	
5745	149	802.11a	OFDM	20	13.5	12.49	-0.09	0 mm	2	6905	6	top	99.0	0.005	1.262	1.010	0.006	
5745	149	802.11a	OFDM	20	13.5	12.49	0.15	0 mm	2	6905	6	bottom	99.0	0.166	1.262	1.010	0.211	
5745	149	802.11a	OFDM	20	13.5	12.49	-0.11	0 mm	2	6905	6	right	99.0	0.004	1.262	1.010	0.005	
5745	149	802.11a	OFDM	20	13.5	12.49	0.04	0 mm	2	6905	6	left	99.0	0.015	1.262	1.010	0.019	
5290	58	802.11ac	OFDM	80	7.5	7.02	0.06	0 mm	2	7937	29.3	back	95.8	0.729	1.117	1.044	0.850	

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

Note: Blue entries represent variability measurements.

Table 10-8
Bluetooth 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)	
2441	39	Bluetooth	FHSS	10.0	9.45	-0.07	0 mm	6905	1	back	1:1	0.098	1.135	**0.111**	A8
2441	39	Bluetooth	FHSS	10.0	9.45	0.03	0 mm	6905	1	bottom	1:1	0.009	1.135	0.010	
2441	39	Bluetooth	FHSS	10.0	9.45	0.14	0 mm	6905	1	right	1:1	0.023	1.135	0.026	
2441	39	Bluetooth	FHSS	10.0	9.45	-0.15	0 mm	6905	1	left	1:1	0.000	1.135	0.000	
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 D04v01r01, and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
6. Per FCC KDB 865664 D01 v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
7. Per FCC KDB 616217 D04 Section 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v05 was applied to determine SAR test exclusion for adjacent edge configurations. SAR tests were required for top, right, and left edges for the main antenna, bottom and right edges for BT/WLAN antenna 1 and bottom, right and left for WLAN antenna 2. Additionally, top and left edge was tested for WLAN antenna 1, top edge for WLAN antenna 2 and left edge for BT per the manufactures request.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r03. 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 KDB Publication 941225 D05Av01r01, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

WLAN Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01Wi-Fi SAR v02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.4.4 for more information.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01Wi-Fi SAR v02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg. See Section 7.4.5 for more information.
3. Per KDB Publication 248227 D01Wi-Fi SAR v02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498. Please see Section 11 for complete analysis.
4. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05r02 are applicable to devices with built-in unlicensed transmitters such as 802.11 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. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

11.3 Body Simultaneous Transmission Analysis

Table 11-1
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 Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.715	1.070	0.463	See Note 1	1.178	**1.533**	See Note 1	0.01	0.01	0.03
	Top	1.066	0.003	0.002	1.069	1.068	0.005	1.071	N/A	N/A	N/A
	Bottom	0.400	0.220	0.127	0.620	0.527	0.347	0.747	N/A	N/A	N/A
	Right	0.112	0.245	0.070	0.357	0.182	0.315	0.427	N/A	N/A	N/A
	Left	0.085	0.027	0.007	0.112	0.092	0.034	0.119	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.962	1.070	0.463	See Note 1	1.425	**1.533**	See Note 1	0.01	0.01	0.03
	Top	1.073	0.003	0.002	1.076	1.075	0.005	1.078	N/A	N/A	N/A
	Bottom	0.400	0.220	0.127	0.620	0.527	0.347	0.747	N/A	N/A	N/A
	Right	0.068	0.245	0.070	0.313	0.138	0.315	0.383	N/A	N/A	N/A
	Left	0.102	0.027	0.007	0.129	0.109	0.034	0.136	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	1.037	1.070	0.463	See Note 1	1.500	**1.533**	See Note 1	0.01	0.01	0.03
	Top	0.823	0.003	0.002	0.826	0.825	0.005	0.828	N/A	N/A	N/A
	Bottom	0.400	0.220	0.127	0.620	0.527	0.347	0.747	N/A	N/A	N/A
	Right	0.194	0.245	0.070	0.439	0.264	0.315	0.509	N/A	N/A	N/A
	Left	0.270	0.027	0.007	0.297	0.277	0.034	0.304	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.620	1.070	0.463	See Note 1	1.083	**1.533**	See Note 1	0.01	0.01	0.03
	Top	0.206	0.003	0.002	0.209	0.208	0.005	0.211	N/A	N/A	N/A
	Bottom	0.400	0.220	0.127	0.620	0.527	0.347	0.747	N/A	N/A	N/A
	Right	0.275	0.245	0.070	0.520	0.345	0.315	0.590	N/A	N/A	N/A
	Left	1.037	0.027	0.007	1.064	1.044	0.034	1.071	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	1.044	1.070	0.463	See Note 1	1.507	**1.533**	See Note 1	0.01	0.01	0.03
	Top	0.486	0.003	0.002	0.489	0.488	0.005	0.491	N/A	N/A	N/A
	Bottom	0.400	0.220	0.127	0.620	0.527	0.347	0.747	N/A	N/A	N/A
	Right	0.080	0.245	0.070	0.325	0.150	0.315	0.395	N/A	N/A	N/A
	Left	0.772	0.027	0.007	0.799	0.779	0.034	0.806	N/A	N/A	N/A

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

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.715	0.926	1.007	See Note 1	See Note 1	See Note 1	See Note 1	0.01	0.01	0.04
	Top	1.066	0.006	0.006	1.072	1.072	0.012	**1.078**	N/A	N/A	N/A
	Bottom	0.400	0.137	0.250	0.537	0.650	0.387	0.787	N/A	N/A	N/A
	Right	0.112	0.355	0.020	0.467	0.132	0.375	0.487	N/A	N/A	N/A
	Left	0.085	0.005	0.032	0.090	0.117	0.037	0.122	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.962	0.926	1.007	See Note 1	See Note 1	See Note 1	See Note 1	0.01	0.01	0.04
	Top	1.073	0.006	0.006	1.079	1.079	0.012	**1.085**	N/A	N/A	N/A
	Bottom	0.400	0.137	0.250	0.537	0.650	0.387	0.787	N/A	N/A	N/A
	Right	0.068	0.355	0.020	0.423	0.088	0.375	0.443	N/A	N/A	N/A
	Left	0.102	0.005	0.032	0.107	0.134	0.037	0.139	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	1.037	0.926	1.007	See Note 1	See Note 1	See Note 1	See Note 1	0.01	0.01	0.04
	Top	0.823	0.006	0.006	0.829	0.829	0.012	**0.835**	N/A	N/A	N/A
	Bottom	0.400	0.137	0.250	0.537	0.650	0.387	0.787	N/A	N/A	N/A
	Right	0.194	0.355	0.020	0.549	0.214	0.375	0.569	N/A	N/A	N/A
	Left	0.270	0.005	0.032	0.275	0.302	0.037	0.307	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	0.620	0.926	1.007	**1.546**	See Note 1	See Note 1	See Note 1	0.01	0.01	0.04
	Top	0.206	0.006	0.006	0.212	0.212	0.012	0.218	N/A	N/A	N/A
	Bottom	0.400	0.137	0.250	0.537	0.650	0.387	0.787	N/A	N/A	N/A
	Right	0.275	0.355	0.020	0.630	0.295	0.375	0.650	N/A	N/A	N/A
	Left	1.037	0.005	0.032	1.042	1.069	0.037	1.074	N/A	N/A	N/A
Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
SAR	Back	1.044	0.926	1.007	See Note 1	See Note 1	See Note 1	See Note 1	0.01	0.01	0.04
	Top	0.486	0.006	0.006	0.492	0.492	0.012	0.498	N/A	N/A	N/A
	Bottom	0.400	0.137	0.250	0.537	0.650	0.387	0.787	N/A	N/A	N/A
	Right	0.080	0.355	0.020	0.435	0.100	0.375	0.455	N/A	N/A	N/A
	Left	0.772	0.005	0.032	0.777	0.804	0.037	**0.809**	N/A	N/A	N/A

Table 11-3
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)
SAR	Back	0.715	0.111	0.826
	Top	1.066	0.400	1.466
	Bottom	0.400	0.010	0.410
	Right	0.112	0.026	0.138
	Left	0.085	0.000	0.085

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
SAR	Back	0.962	0.111	1.073
	Top	1.073	0.400	1.473
	Bottom	0.400	0.010	0.410
	Right	0.068	0.026	0.094
	Left	0.102	0.000	0.102

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
SAR	Back	1.037	0.111	1.148
	Top	0.823	0.400	1.223
	Bottom	0.400	0.010	0.410
	Right	0.194	0.026	0.220
	Left	0.270	0.000	0.270

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
SAR	Back	0.620	0.111	0.731
	Top	0.206	0.400	0.606
	Bottom	0.400	0.010	0.410
	Right	0.275	0.026	0.301
	Left	1.037	0.000	1.037

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
SAR	Back	1.044	0.111	**1.155**
	Top	0.486	0.400	0.886
	Bottom	0.400	0.010	0.410
	Right	0.080	0.026	0.106
	Left	0.772	0.000	0.772

Table 11-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 0.4 cm)

Configuration	Mode	LTE SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
Back Side	LTE Band 12	< 0.715	0.834	0.257	**< 1.549**	< 0.972	1.091	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 13	< 0.962	0.834	0.257	See Note 1	< 1.219	1.091	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 5 (Cell)	< 1.037	0.834	0.257	See Note 1	< 1.294	1.091	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 4 (AWS)	< 0.620	0.834	0.257	< 1.454	< 0.877	1.091	See Note 1	< 0.01	< 0.00	0.02
Back Side	LTE Band 25 (PCS)	< 1.044	0.834	0.257	See Note 1	< 1.301	1.091	See Note 1	< 0.01	< 0.01	0.02

Table 11-5
Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 0.4 cm)

Configuration	Mode	LTE SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)				SPLSR		
		1	2	3	1+2	1+3	2+3	1+2+3	1+2	1+3	2+3
Back Side	LTE Band 12	< 0.715	0.422	0.705	< 1.137	< 1.420	1.127	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 13	< 0.962	0.422	0.705	< 1.384	See Note 1	1.127	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 5 (Cell)	< 1.037	0.422	0.705	< 1.459	See Note 1	1.127	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 4 (AWS)	< 0.620	0.422	0.705	< 1.042	< 1.325	1.127	See Note 1	< 0.01	< 0.01	0.02
Back Side	LTE Band 25 (PCS)	< 1.044	0.422	0.705	< 1.466	See Note 1	1.127	See Note 1	< 0.01	< 0.01	0.02

Table 11-6
Simultaneous Transmission Scenario with 2.4 GHz WLAN Back Side (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			
		1	2	3	1+2	1+3	2+3	1+2+3
Back Side	LTE Band 12	0.080	< 0.834	< 0.257	< 0.914	< 0.337	< 1.091	< 1.171
Back Side	LTE Band 13	0.192	< 0.834	< 0.257	< 1.026	< 0.449	< 1.091	< 1.283
Back Side	LTE Band 5 (Cell)	0.301	< 0.834	< 0.257	< 1.135	< 0.558	< 1.091	< 1.392
Back Side	LTE Band 4 (AWS)	0.229	< 0.834	< 0.257	< 1.063	< 0.486	< 1.091	< 1.320
Back Side	LTE Band 25 (PCS)	0.161	< 0.834	< 0.257	< 0.995	< 0.418	< 1.091	< 1.252

Table 11-7
Simultaneous Transmission Scenario with 2.4 GHz WLAN Top Edge (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			
		1	2	3	1+2	1+3	2+3	1+2+3
Top Edge	LTE Band 12	0.099	<0.003	<0.002	< 0.102	< 0.101	< 0.005	< 0.104
Top Edge	LTE Band 13	0.224	<0.003	<0.002	< 0.227	< 0.226	< 0.005	< 0.229
Top Edge	LTE Band 5 (Cell)	0.357	<0.003	<0.002	< 0.360	< 0.359	< 0.005	< 0.362
Top Edge	LTE Band 4 (AWS)	0.254	<0.003	<0.002	< 0.257	< 0.256	< 0.005	< 0.259
Top Edge	LTE Band 25 (PCS)	0.189	<0.003	<0.002	< 0.192	< 0.191	< 0.005	< 0.194

Table 11-8
Simultaneous Transmission Scenario with 5 GHz WLAN Back Side (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			
		1	2	3	1+2	1+3	2+3	1+2+3
Back Side	LTE Band 12	0.080	< 0.422	< 0.705	< 0.502	< 0.785	< 1.127	< 1.207
Back Side	LTE Band 13	0.192	< 0.422	< 0.705	< 0.614	< 0.897	< 1.127	< 1.319
Back Side	LTE Band 5 (Cell)	0.301	< 0.422	< 0.705	< 0.723	< 1.006	< 1.127	< 1.428
Back Side	LTE Band 4 (AWS)	0.229	< 0.422	< 0.705	< 0.651	< 0.934	< 1.127	< 1.356
Back Side	LTE Band 25 (PCS)	0.161	< 0.422	< 0.705	< 0.583	< 0.866	< 1.127	< 1.288

Table 11-9
Simultaneous Transmission Scenario with 5 GHz WLAN Top Edge (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			
		1	2	3	1+2	1+3	2+3	1+2+3
Top Edge	LTE Band 12	0.099	<0.006	<0.006	< 0.105	< 0.105	< 0.012	< 0.111
Top Edge	LTE Band 13	0.224	<0.006	<0.006	< 0.230	< 0.230	< 0.012	< 0.236
Top Edge	LTE Band 5 (Cell)	0.357	<0.006	<0.006	< 0.363	< 0.363	< 0.012	< 0.369
Top Edge	LTE Band 4 (AWS)	0.254	<0.006	<0.006	< 0.260	< 0.260	< 0.012	< 0.266
Top Edge	LTE Band 25 (PCS)	0.189	<0.006	<0.006	< 0.195	< 0.195	< 0.012	< 0.201

Table 11-10
Simultaneous Transmission Scenario with Bluetooth Back Side (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	LTE Band 12	0.080	<0.111	<0.191
Back Side	LTE Band 13	0.192	<0.111	<0.303
Back Side	LTE Band 5 (Cell)	0.301	<0.111	<0.412
Back Side	LTE Band 4 (AWS)	0.229	<0.111	<0.340
Back Side	LTE Band 25 (PCS)	0.161	<0.111	<0.272

Table 11-11
Simultaneous Transmission Scenario with Bluetooth Top Edge (Body at 2.4 cm)

Configuration	Mode	LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Top Edge	LTE Band 12	0.099	0.400	0.499
Top Edge	LTE Band 13	0.224	0.400	0.624
Top Edge	LTE Band 5 (Cell)	0.357	0.400	0.757
Top Edge	LTE Band 4 (AWS)	0.254	0.400	0.654
Top Edge	LTE Band 25 (PCS)	0.189	0.400	0.589

Notes:

1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was ≤ 0.04 per FCC KDB 447498 D01v05. See Section 11.4 for detailed SPLS ratio analysis.
2. When the test separation distance was > 50 mm, an estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR exclusion, for configurations excluded per FCC KDB Publication 447498 D01v05.
3. For SAR summation for body (back side at 4 mm), LTE SAR values for 0 mm were used since the 0 mm test distance for LTE SAR values were more conservative. "<" denotes that the 0 mm LTE SAR values were used for summation purposes.
4. For SAR summation for body (back side at 24 mm), WLAN SAR values for 4 mm (back side) were used since the 4 mm (back side) test distance for WLAN SAR values were more conservative. Bluetooth SAR values for 0 mm were used since the 0 mm test distance for Bluetooth SAR values were more conservative. "<" denotes that the 4 mm WLAN SAR and 0 mm for Bluetooth SAR values were used for summation purposes.
5. For SAR summation for body (top edge at 24 mm), WLAN SAR values for 0 mm were used since the 0 mm test distance for WLAN SAR values were more conservative. "<" denotes that the 0 mm WLAN SAR values were used for summation purposes.
6. MIMO body SAR is determined by the sum of 1g single transmission chain SAR values because the summation represents higher output power and yields more conservative result per KDB 248227 D01Wi-Fi SAR v02.

11.4 SPLSR Evaluation and Analysis

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

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

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

Table 11-12
Peak SAR Locations for Body Back Side at 0 mm

Mode/Band	x (mm)	y (mm)
Reduced 2.4 GHz WLAN Ant 1	16.00	76.00
Reduced 2.4 GHz WLAN Ant 2	-39.00	110.00
Reduced 5 GHz WLAN Ant 1	20.00	68.00
Reduced 5 GHz WLAN Ant 2	-43.00	108.00
Reduced LTE B12	-38.50	-91.00
Reduced LTE B13	-63.00	-129.50
Reduced LTE B5	-62.00	-120.00
Reduced LTE B4	-69.00	-120.50
Reduced LTE B25	-92.00	-122.00

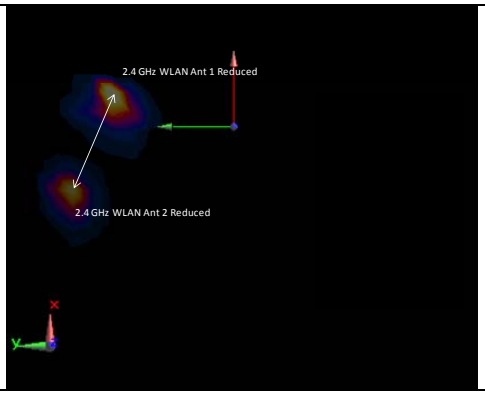
Table 11-13
Peak SAR Locations for Body Back Side at 4 mm

Mode/Band	x (mm)	y (mm)
Max 2.4 GHz WLAN Ant 1	10.80	77.20
Max 2.4 GHz WLAN Ant 2	-44.00	105.00
Max 5 GHz WLAN Ant 1	18.00	78.00
Max 5 GHz WLAN Ant 2	-43.00	114.00

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

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	SPLS Ratio Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
Reduced 2.4 GHz WLAN Ant 1	Reduced 2.4 GHz WLAN Ant 2	1.070	0.463	1.533	64.66	0.03	1
Max 2.4 GHz WLAN Ant 1	Max 2.4 GHz WLAN Ant 2	0.834	0.257	1.091	61.45	0.02	2
Reduced 5 GHz WLAN Ant 1	Reduced 5 GHz WLAN Ant 2	0.926	1.007	1.933	74.63	0.04	3
Max 5 GHz WLAN Ant 1	Max 5 GHz WLAN Ant 2	0.422	0.705	1.127	70.83	0.02	4
Reduced LTE B12	Reduced 2.4 GHz WLAN Ant 1	0.715	1.070	1.785	175.67	0.01	5
Reduced LTE B12	Reduced 2.4 GHz WLAN Ant 2	0.715	0.463	1.178	201.00	0.01	
Reduced LTE B12	Reduced 5 GHz WLAN Ant 1	0.715	0.926	1.641	169.42	0.01	6
Reduced LTE B12	Reduced 5 GHz WLAN Ant 2	0.715	1.007	1.722	199.05	0.01	
Max 2.4 GHz WLAN Ant 1	Reduced LTE B12	0.834	<0.715	<1.549	175.28	<0.01	7
Max 2.4 GHz WLAN Ant 2	Reduced LTE B12	0.257	<0.715	<0.972	196.08	<0.01	
Max 5 GHz WLAN Ant 1	Reduced LTE B12	0.422	<0.715	<1.137	178.19	<0.01	8
Max 5 GHz WLAN Ant 2	Reduced LTE B12	0.705	<0.715	<1.420	205.05	<0.01	
Reduced LTE B13	Reduced 2.4 GHz WLAN Ant 1	0.962	1.070	2.032	220.16	0.01	9
Reduced LTE B13	Reduced 2.4 GHz WLAN Ant 2	0.962	0.463	1.425	240.70	0.01	
Reduced LTE B13	Reduced 5 GHz WLAN Ant 1	0.962	0.926	1.888	214.23	0.01	10
Reduced LTE B13	Reduced 5 GHz WLAN Ant 2	0.962	1.007	1.969	238.34	0.01	
Max 2.4 GHz WLAN Ant 1	Reduced LTE B13	0.834	<0.962	<1.796	219.48	<0.01	11
Max 2.4 GHz WLAN Ant 2	Reduced LTE B13	0.257	<0.962	<1.219	235.27	<0.01	
Max 5 GHz WLAN Ant 1	Reduced LTE B13	0.422	<0.962	<1.384	222.75	<0.01	12
Max 5 GHz WLAN Ant 2	Reduced LTE B13	0.705	<0.962	<1.667	244.32	<0.01	
Reduced LTE B5	Reduced 2.4 GHz WLAN Ant 1	1.037	1.070	2.107	210.95	0.01	13
Reduced LTE B5	Reduced 2.4 GHz WLAN Ant 2	1.037	0.463	1.500	231.15	0.01	
Reduced LTE B5	Reduced 5 GHz WLAN Ant 1	1.037	0.926	1.963	205.11	0.01	14
Reduced LTE B5	Reduced 5 GHz WLAN Ant 2	1.037	1.007	2.044	228.79	0.01	
Max 2.4 GHz WLAN Ant 1	Reduced LTE B5	0.834	<1.037	<1.871	210.21	<0.01	15
Max 2.4 GHz WLAN Ant 2	Reduced LTE B5	0.257	<1.037	<1.294	225.72	<0.01	
Max 5 GHz WLAN Ant 1	Reduced LTE B5	0.422	<1.037	<1.459	213.55	<0.01	16
Max 5 GHz WLAN Ant 2	Reduced LTE B5	0.705	<1.037	<1.742	234.77	<0.01	
Reduced LTE B4	Reduced 2.4 GHz WLAN Ant 1	0.620	1.070	1.690	214.10	0.01	17
Reduced LTE B4	Reduced 2.4 GHz WLAN Ant 2	0.620	0.463	1.083	232.44	0.01	
Reduced LTE B4	Reduced 5 GHz WLAN Ant 1	0.620	0.926	1.546	208.45	0.01	18
Reduced LTE B4	Reduced 5 GHz WLAN Ant 2	0.620	1.007	1.627	229.97	0.01	
Max 2.4 GHz WLAN Ant 1	Reduced LTE B4	0.834	<0.620	<1.454	213.20	<0.01	19
Max 2.4 GHz WLAN Ant 2	Reduced LTE B4	0.257	<0.620	<0.877	226.88	<0.00	
Max 5 GHz WLAN Ant 1	Reduced LTE B4	0.422	<0.620	<1.042	216.73	<0.01	20
Max 5 GHz WLAN Ant 2	Reduced LTE B4	0.705	<0.620	<1.325	235.94	<0.01	
Reduced LTE B25	Reduced 2.4 GHz WLAN Ant 1	1.044	1.070	2.114	225.54	0.01	21
Reduced LTE B25	Reduced 2.4 GHz WLAN Ant 2	1.044	0.463	1.507	237.98	0.01	
Reduced LTE B25	Reduced 5 GHz WLAN Ant 1	1.044	0.926	1.970	220.55	0.01	22
Reduced LTE B25	Reduced 5 GHz WLAN Ant 2	1.044	1.007	2.051	235.16	0.01	
Max 2.4 GHz WLAN Ant 1	Reduced LTE B25	0.834	<1.044	<1.878	224.16	<0.01	23
Max 2.4 GHz WLAN Ant 2	Reduced LTE B25	0.257	<1.044	<1.301	232.02	<0.01	
Max 5 GHz WLAN Ant 1	Reduced LTE B25	0.422	<1.044	<1.466	228.25	<0.01	24
Max 5 GHz WLAN Ant 2	Reduced LTE B25	0.705	<1.044	<1.749	241.03	<0.01	

Table 11-15
SAR Sum to Peak Location Separation Ratio Plots



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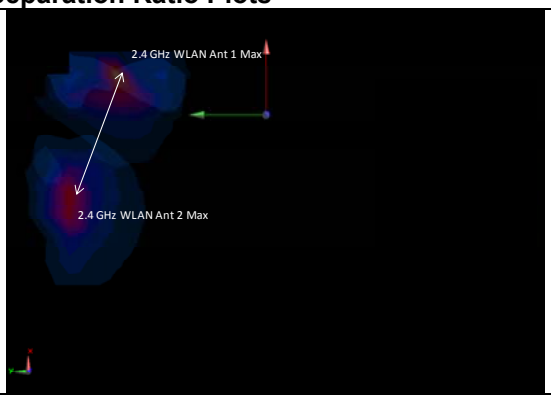

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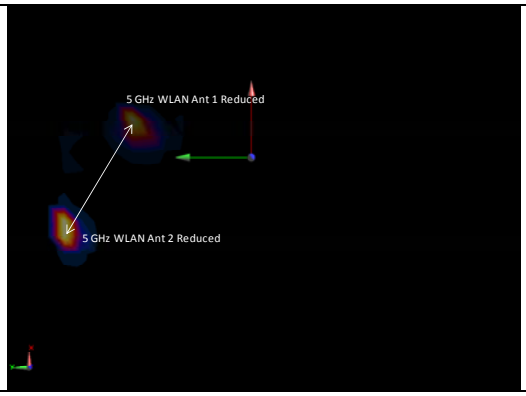

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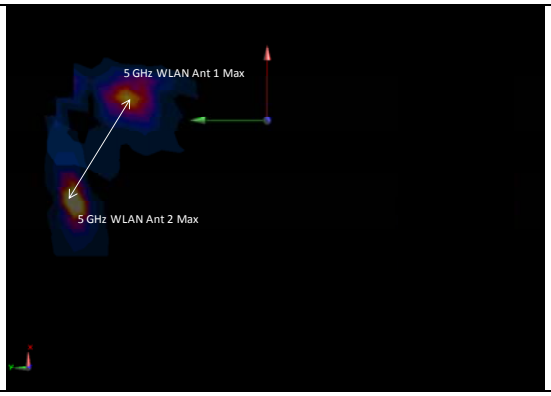

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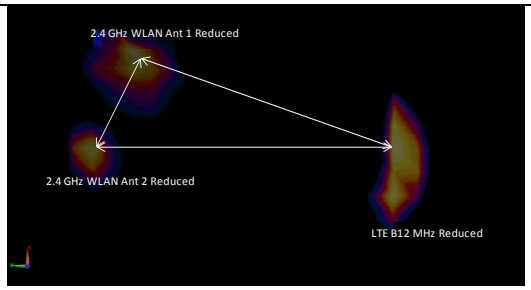

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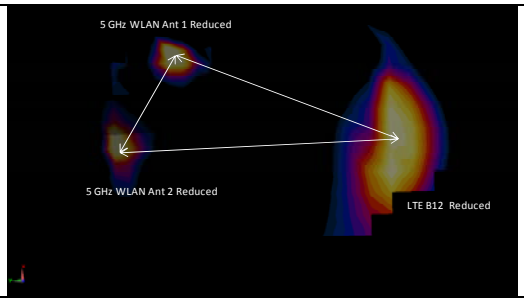

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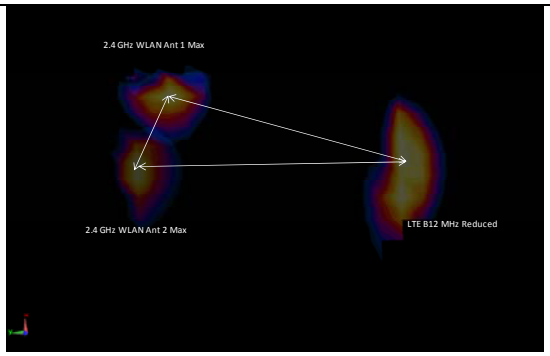

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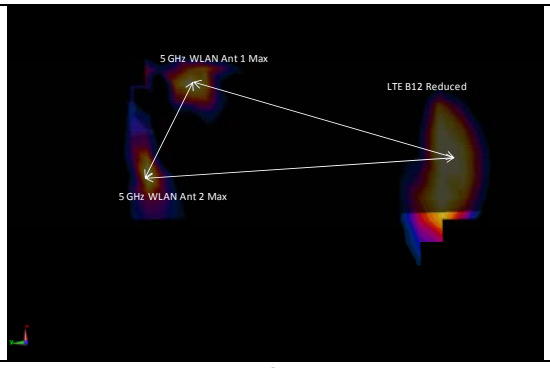

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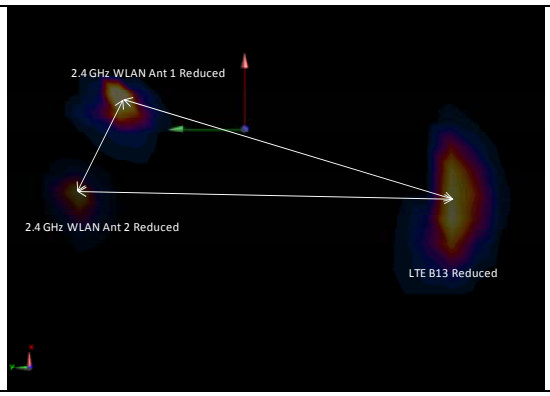

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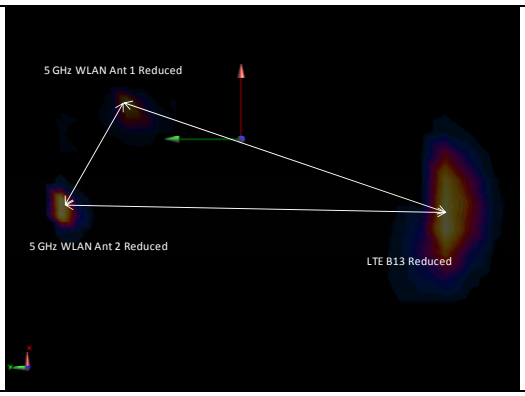

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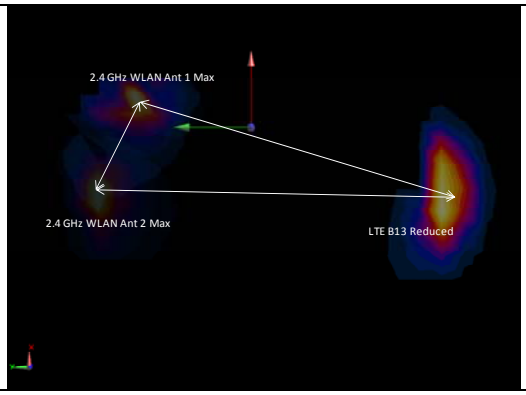

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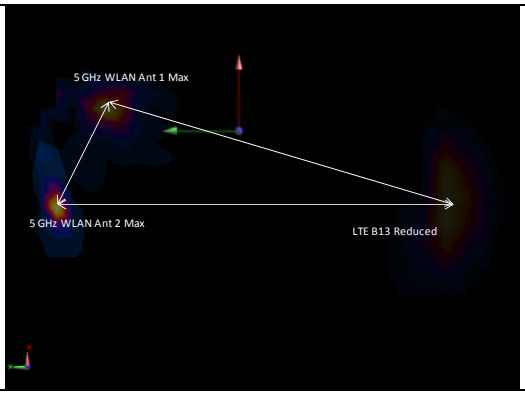

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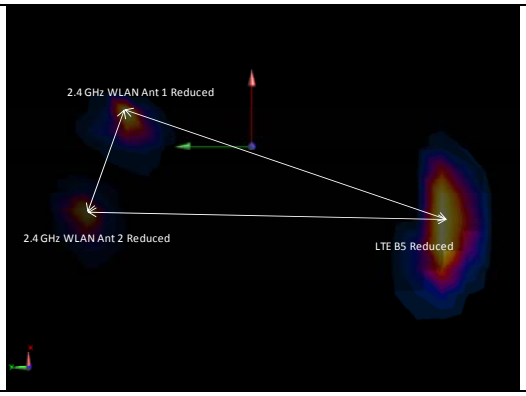

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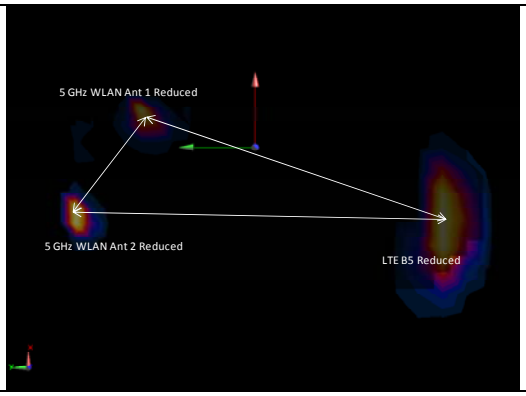

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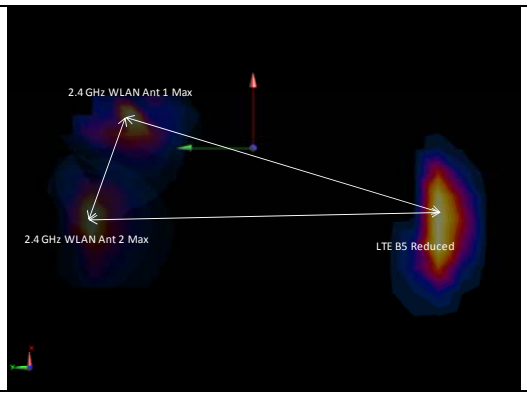

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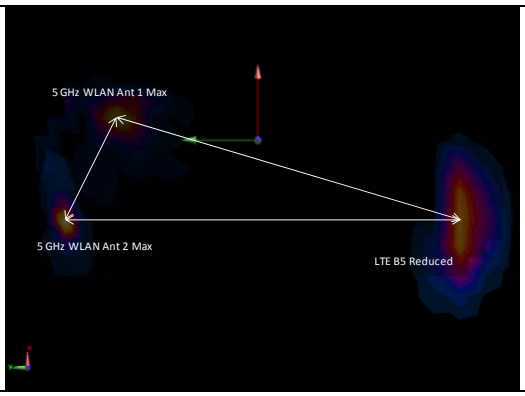

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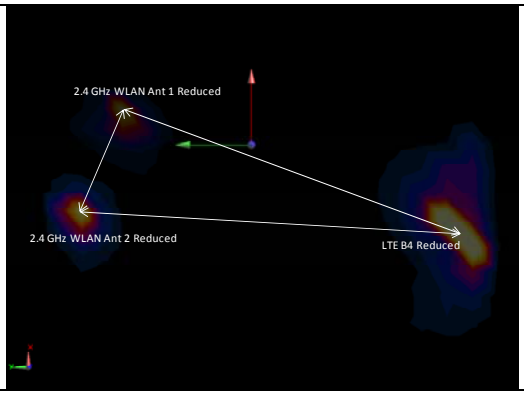

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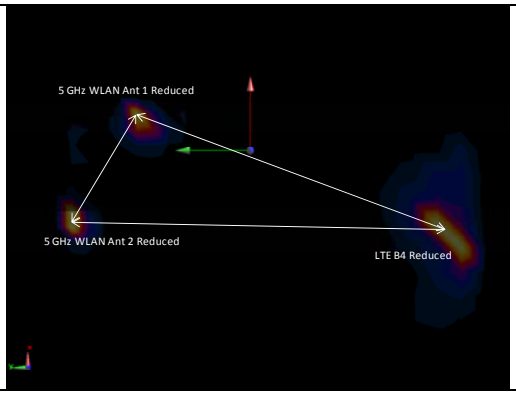

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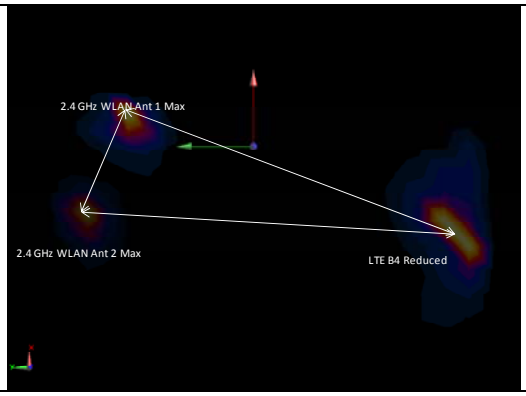

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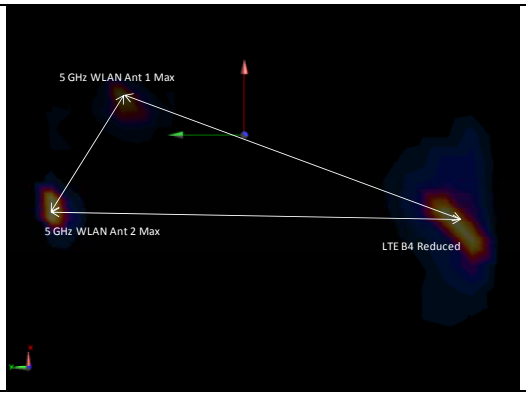

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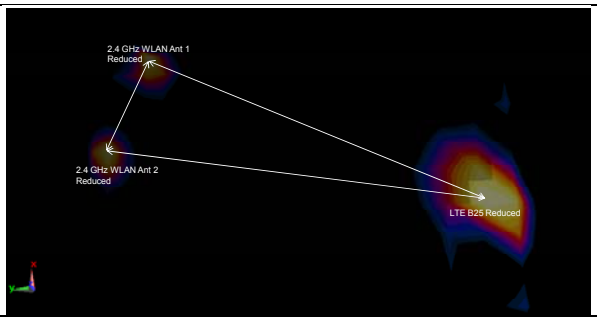

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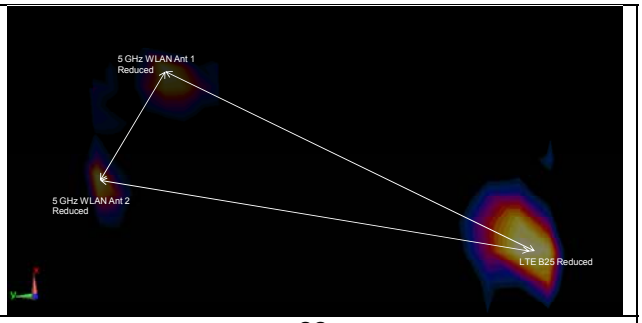

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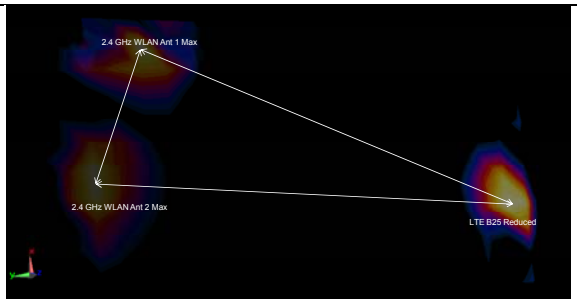

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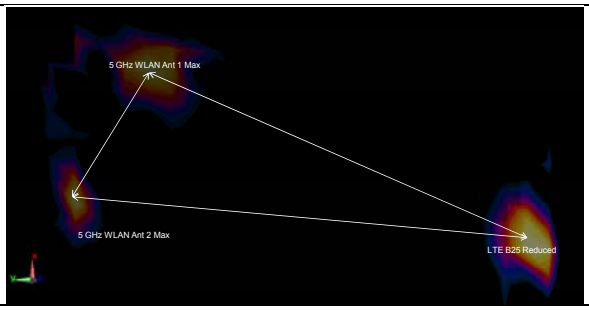

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11.5 Simultaneous Transmission Conclusion

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

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

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

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS															
Band	FREQUENCY		Mode	Service	Data Rate (Mbps)	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
750	782.00	23230	LTE Band 13	QPSK, 1 RB, 25 RB Offset	N/A	top	0 mm	0.931	0.916	1.02	N/A	N/A	N/A	N/A
835	836.50	20525	LTE Band 5 (Cell)	QPSK, 1 RB, 25 RB Offset	N/A	back	0 mm	0.957	0.956	1.00	N/A	N/A	N/A	N/A
1750	1732.50	20175	LTE Band 4 (AWS)	QPSK, 1 RB, 99 RB Offset	N/A	left	0 mm	1.010	1.030	1.02	N/A	N/A	N/A	N/A
1900	1905.00	26590	LTE Band 25 (PCS)	QPSK, 1 RB, 99 RB Offset	N/A	back	0 mm	0.977	0.869	1.12	N/A	N/A	N/A	N/A
2450	2437.00	6	802.11b 22 MHz Bandwidth	DSSS , ANT 1	1	back	0 mm	1.020	0.907	1.12	N/A	N/A	N/A	N/A
5300	5290.00	58	802.11ac 80 MHz Bandwidth	OFDM , ANT 2	29.3	back	0 mm	0.864	0.729	1.19	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram						

12.2 Measurement Uncertainty

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

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8753E	(30kHz-6GHz) Network Analyzer	12/30/2014	Annual	12/30/2015	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	3/12/2015	Annual	3/12/2016	MY40000670
Agilent	E4432B	ESG-D Series Signal Generator	3/16/2015	Annual	3/16/2016	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/13/2015	Annual	3/13/2016	MY42082385
Agilent	E5515C	Wireless Communications Test Set	2/23/2015	Biennial	2/23/2017	GB41450275
Agilent	E5515C	Wireless Communications Test Set	11/20/2014	Annual	11/20/2015	GB42361078
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/15/2015	Annual	3/15/2016	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Agilent	N5182A	MXG Vector Signal Generator	10/27/2014	Annual	10/27/2015	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	3/16/2015	Annual	3/16/2016	MY47420651
Agilent	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	MA24106A	USB Power Sensor	3/2/2015	Annual	3/2/2016	1344545
Anritsu	MA24106A	USB Power Sensor	3/11/2015	Annual	3/11/2016	1344554
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1126066
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1207364
Anritsu	ML2495A	Power Meter	10/31/2013	Biennial	10/31/2015	941001
Anritsu	ML2496A	Power Meter	3/13/2015	Annual	3/13/2016	1351001
Anritsu	MT8820C	Radio Communication Analyzer	3/10/2015	Annual	3/10/2016	6200901190
Anritsu	MT8820C	Radio Communication Analyzer	9/19/2014	Annual	9/19/2015	6201144418
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194895
Control Company	4052	Long Stem Thermometer	9/27/2013	Biennial	9/27/2015	130567447
Control Company	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	122014488
Control Company	61220-416	Long-Stem Thermometer	4/29/2014	Biennial	4/29/2016	111331323
Fisher Scientific	15-077-960	Digital Thermometer	12/4/2013	Biennial	12/4/2015	130764551
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671801
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	6/6/2014	Annual	6/6/2015	109892
Rohde & Schwarz	CMW500	Radio Communication tester	5/5/2015	Annual	5/5/2016	140144
Rohde & Schwarz	CMW500	Radio Communication Tester	4/8/2015	Annual	4/8/2016	140148
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	22313
SPEAG	D1900V2	1900 MHz SAR Dipole	4/14/2015	Annual	4/14/2016	5d141
SPEAG	D2300V2	1750 MHz SAR Dipole	1/27/2015	Annual	1/27/2016	1008
SPEAG	D2450V2	2450 MHz SAR Dipole	8/11/2014	Annual	8/11/2015	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/21/2015	Annual	1/21/2016	1057
SPEAG	D750V3	750 MHz Dipole	1/16/2015	Annual	1/16/2016	1003
SPEAG	D750V3	750 MHz Dipole	2/19/2015	Annual	2/19/2016	1046
SPEAG	D835V2	835 MHz SAR Dipole	7/24/2014	Annual	7/24/2015	4d133
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2015	Annual	2/18/2016	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/14/2015	Annual	1/14/2016	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/12/2014	Annual	8/12/2015	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2014	Annual	9/17/2015	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/31/2014	Annual	10/31/2015	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2015	Annual	3/13/2016	1368
SPEAG	DAK-3.5	Dielectric Assessment Kit	10/21/2014	Annual	10/21/2015	1091
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/15/2014	Annual	7/15/2015	1039
SPEAG	ES3DV2	SAR Probe	8/19/2014	Annual	8/19/2015	3022
SPEAG	ES3DV3	SAR Probe	2/27/2015	Annual	2/27/2016	3258
SPEAG	ES3DV3	SAR Probe	1/23/2015	Annual	1/23/2016	3318
SPEAG	ES3DV3	SAR Probe	3/19/2015	Annual	3/19/2016	3319
SPEAG	ES3DV3	SAR Probe	8/20/2014	Annual	8/20/2015	3331
SPEAG	EX3DV4	SAR Probe	1/22/2015	Annual	1/22/2016	3589
VWR	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	111859323

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

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]

16 REFERENCES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[24] SAR Measurement Guidance for IEEE 802.11 Transmitters, KDB Publication 248227 D01Wi-Fi SAR v02

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D03-D04

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

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

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

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

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

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 8134

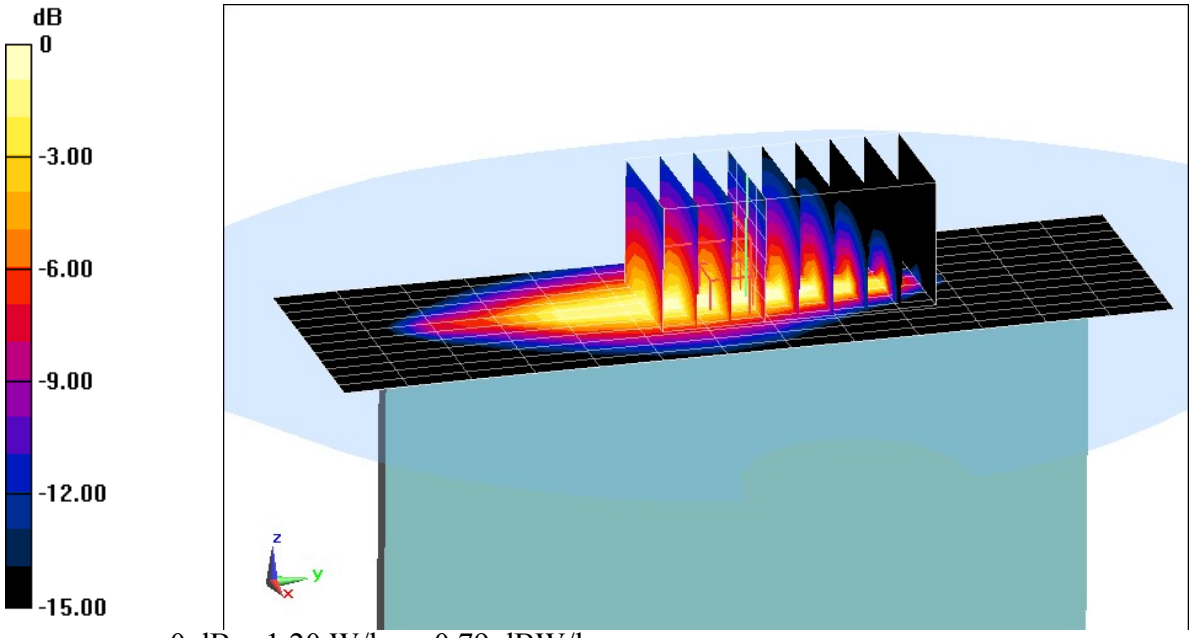
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.927 S/m; ε_r = 54.867; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-04-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3331; ConvF(6.12, 6.12, 6.12); Calibrated: 8/20/2014;
Sensor-Surface: 3mm (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: LTE Band 12, Body SAR, Top Edge, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (13x14x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x9x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.56 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.44 W/kg
SAR(1 g) = 0.877 W/kg



0 dB = 1.20 W/kg = 0.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 6947

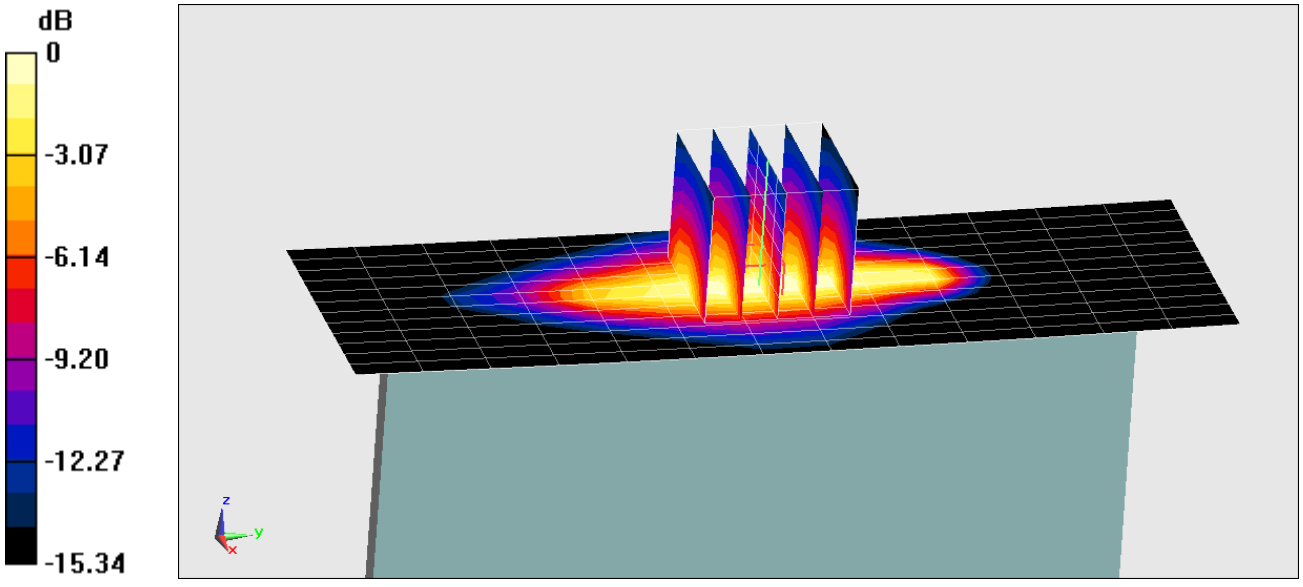
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 782 MHz; σ = 0.981 S/m; ε_r = 52.93; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-28-2015; Ambient Temp: 20.3°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3318; ConvF(6.22, 6.22, 6.22); Calibrated: 1/23/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/14/2015
Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Body SAR, Top Edge, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (13x14x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.08 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 0.931 W/kg



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

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 8117

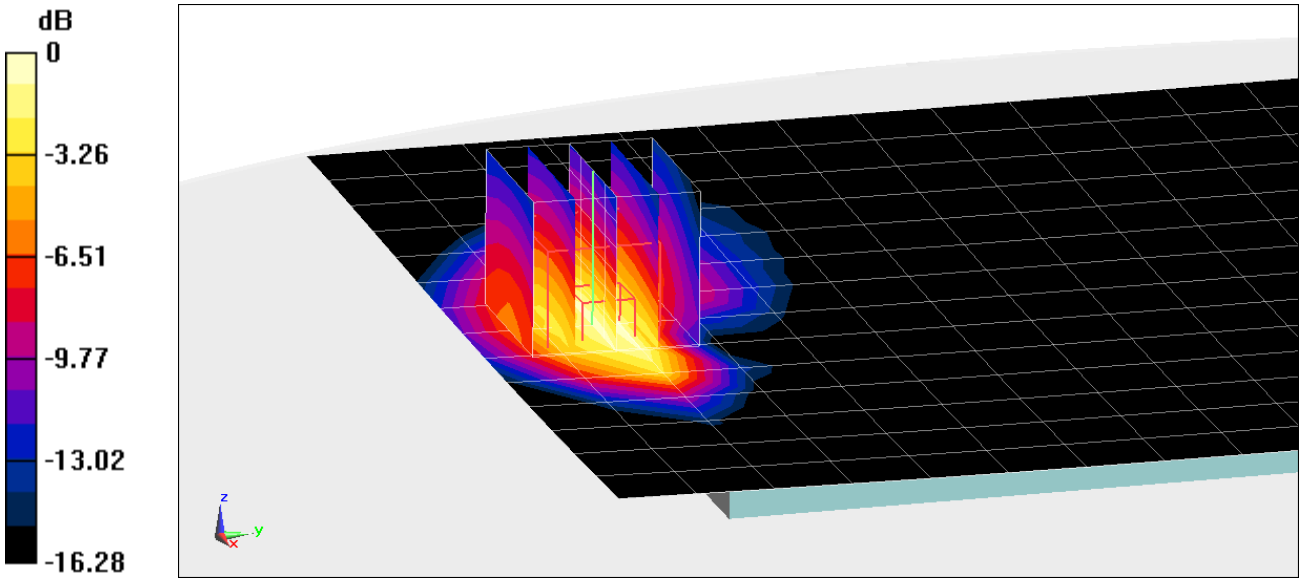
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.994 S/m; ε_r = 54.179; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-27-2015; Ambient Temp: 20.9°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(5.98, 5.98, 5.98); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (15x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.10 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 0.957 W/kg



0 dB = 1.21 W/kg = 0.83 dBW/kg

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 7598

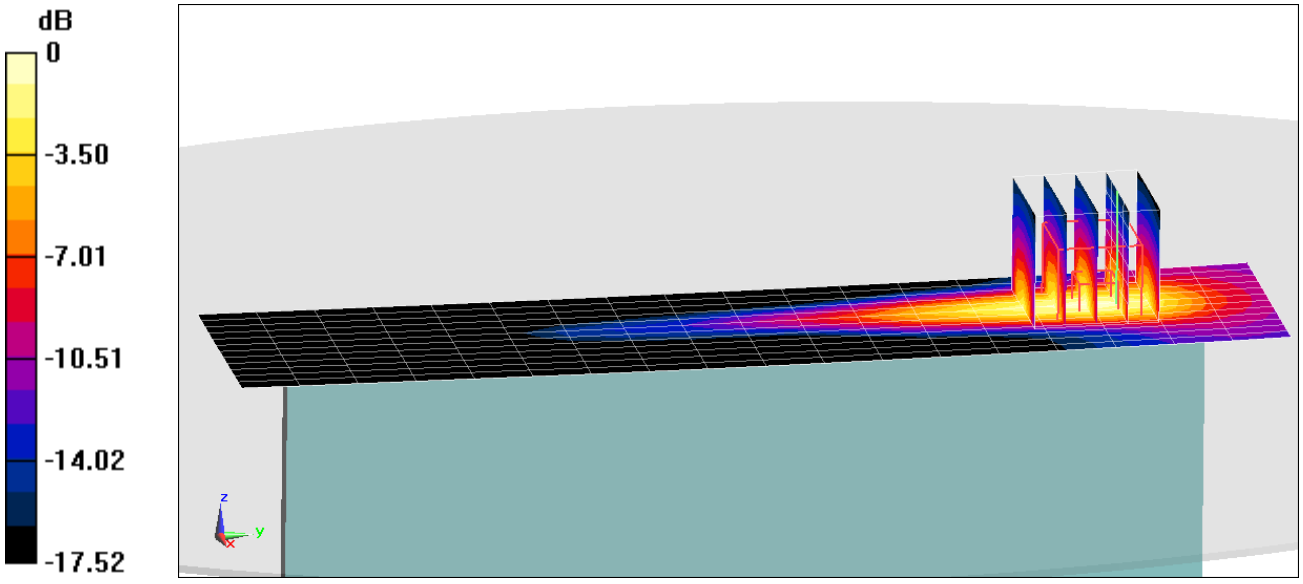
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.432 S/m; ε_r = 52.947; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-27-2015; Ambient Temp: 22.3°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3318; ConvF(4.95, 4.95, 4.95); Calibrated: 1/23/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/14/2015
Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (13x19x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.23 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.03 W/kg



0 dB = 1.40 W/kg = 1.46 dBW/kg

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 7737

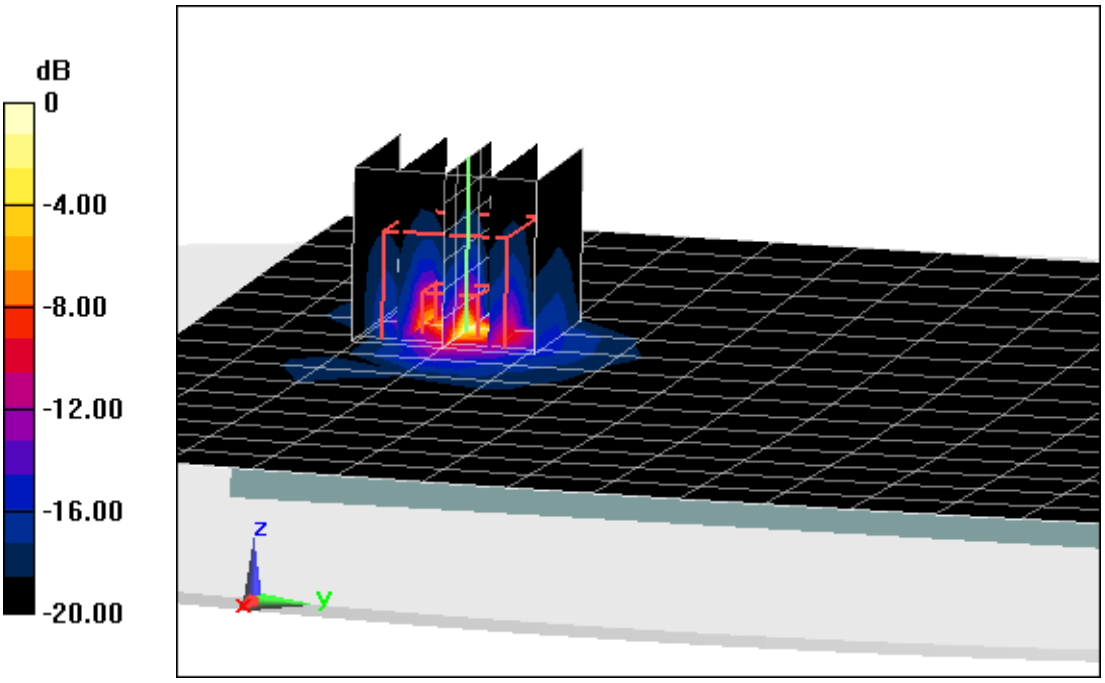
Communication System: LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.509 S/m; ε_r = 51.018; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-16-2015; Ambient Temp: 23.7°C; Tissue Temp: 24.0°C

Probe: ES3DV3 - SN3258; ConvF(4.64, 4.64, 4.64); Calibrated: 2/27/2015
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Back side, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (8x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.509 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.9310W/kg
SAR(1 g) = 0.977 W/kg



0 dB = 1.220mW/g = 1.73 dB mW/g

DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 7937

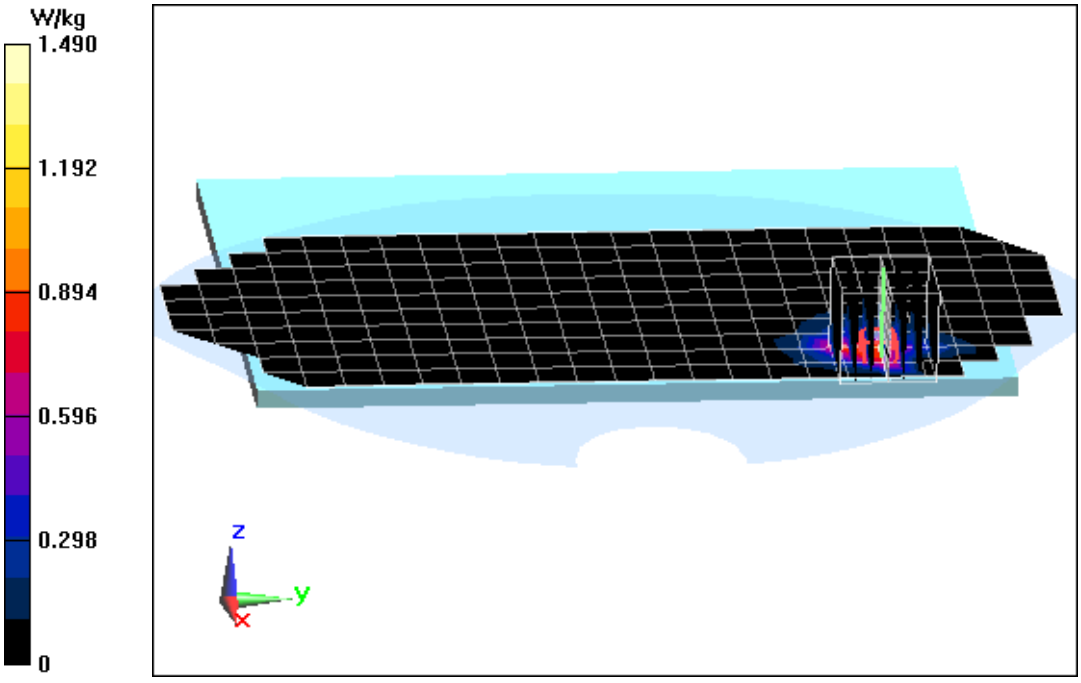
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.946 S/m; ε_r = 51.364; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-29-2015; Ambient Temp: 21.4°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Body SAR, Ch 6, 1 Mbps, Back Side, Antenna 1

Area Scan (11x24x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.06 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 1.02 W/kg



DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 7937

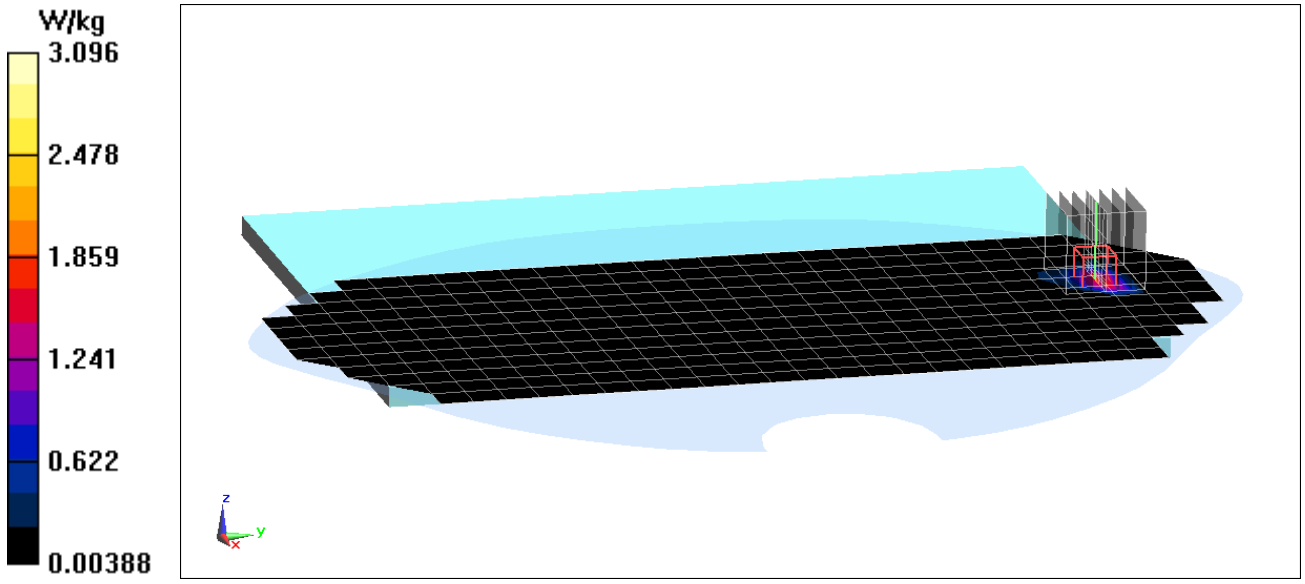
Communication System: UID 0, IEEE 802.11ac; Frequency: 5290 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used (interpolated):
f = 5290 MHz; σ = 5.391 S/m; ε_r = 48.037; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-27-2015; Ambient Temp: 20.9°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3589; ConvF(3.79, 3.79, 3.79); Calibrated: 1/22/2015;
Sensor-Surface: 1.4mm (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: IEEE 802.11ac, 5.3 GHz, 80 MHz Bandwidth,
Body SAR, Ch 58, 29.3 Mbps, Back Side, Antenna 2

Area Scan (13x29x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 11.40 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 8.90 W/kg
SAR(1 g) = 0.864 W/kg



DUT: A3LSMT817R4; Type: Portable Tablet; Serial: 6905

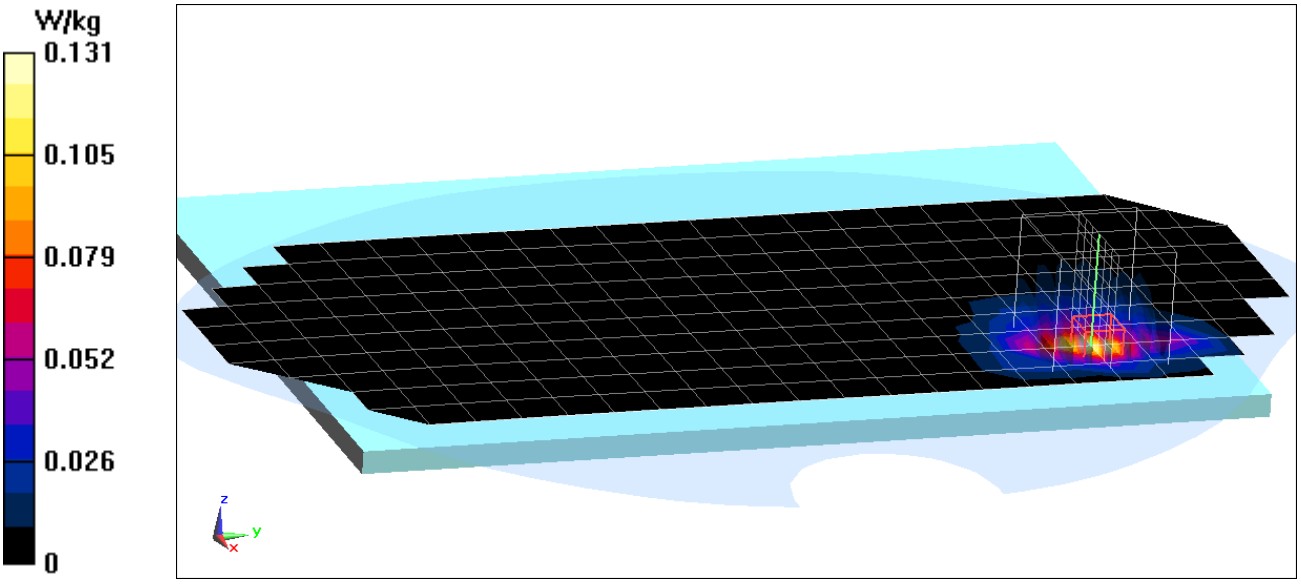
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.951 S/m; ε_r = 51.347; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 04-29-2015; Ambient Temp: 21.4°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (11x24x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.720 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.255 W/kg
SAR(1 g) = 0.098 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

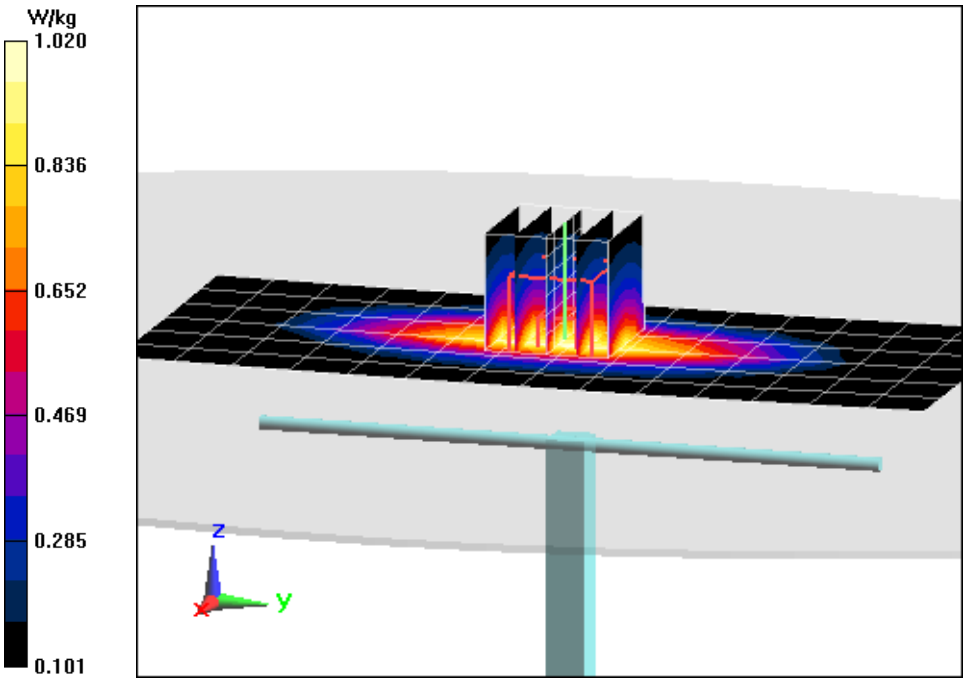
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
f = 750 MHz; σ = 0.95 S/m; ε_r = 53.294; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-28-2015; Ambient Temp: 20.3°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3318; ConvF(6.22, 6.22, 6.22); Calibrated: 1/23/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/14/2015
Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027
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) = 1.28 W/kg
SAR(1 g) = 0.879 W/kg
Deviation = 3.90%



PCTEST ENGINEERING LABORATORY, INC

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

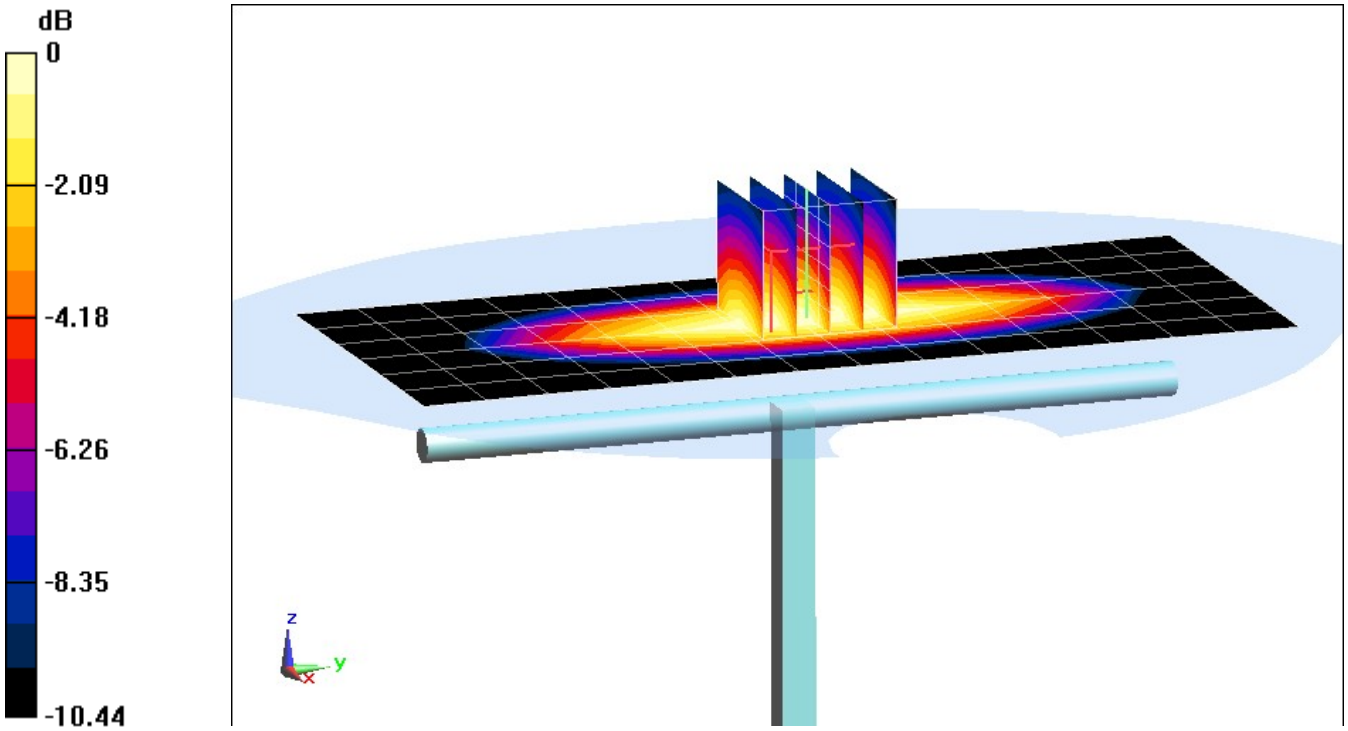
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.965 S/m; ε_r = 54.443; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5

Test Date: 05-04-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3331; ConvF(6.12, 6.12, 6.12); Calibrated: 8/20/2014;
Sensor-Surface: 3mm (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)

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) = 1.31 W/kg
SAR(1 g) = 0.890 W/kg
Deviation = 7.36%



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

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

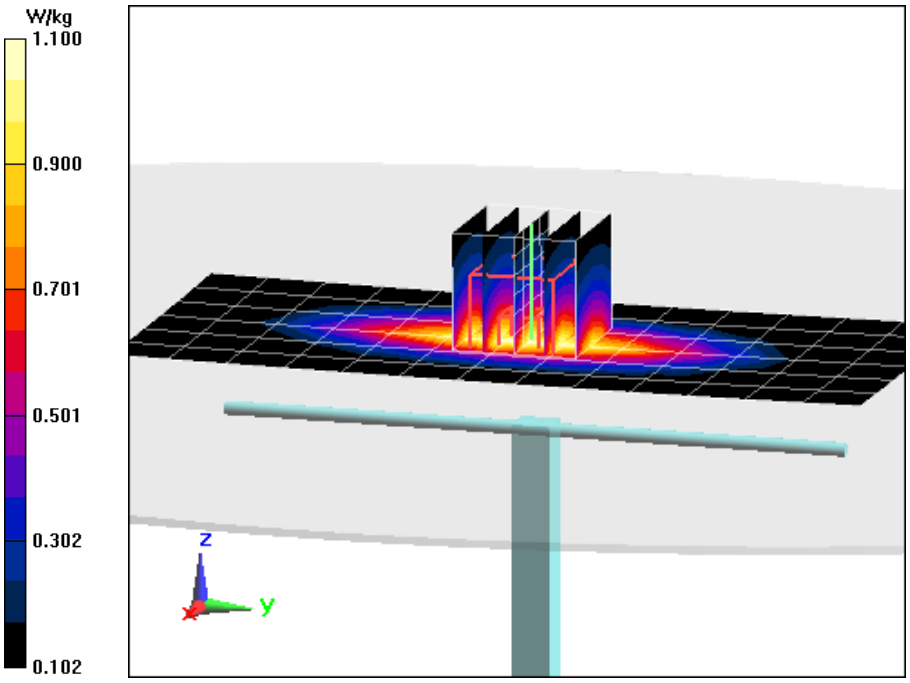
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used:
f = 835 MHz; σ = 0.992 S/m; ε_r = 54.192; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-27-2015; Ambient Temp: 20.9°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(5.98, 5.98, 5.98); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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) = 1.37 W/kg
SAR(1 g) = 0.940 W/kg
Deviation = 0.53%



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

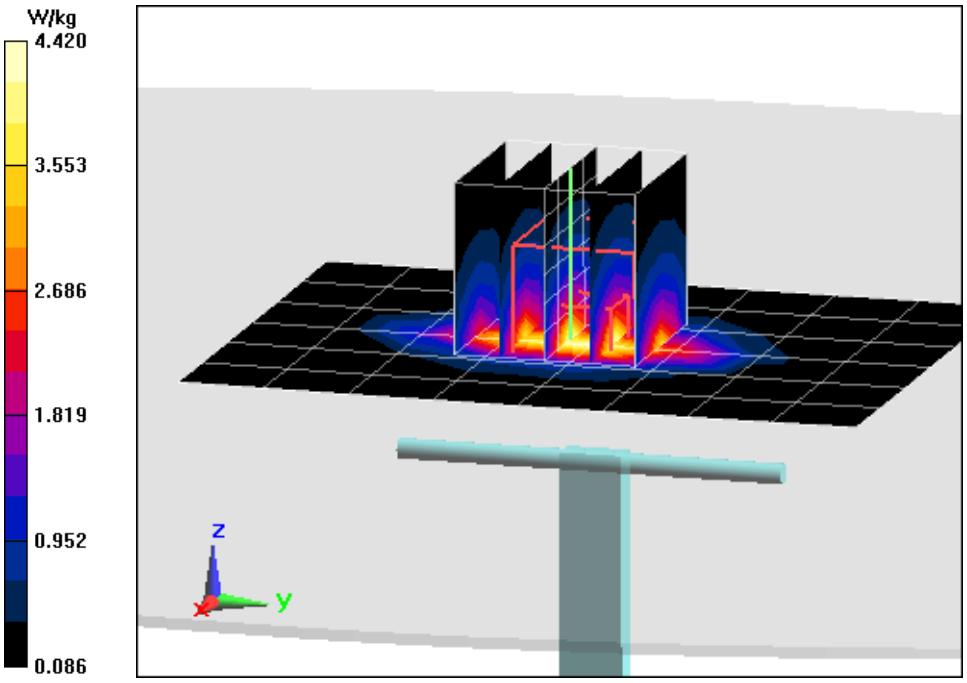
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.451 S/m; ε_r = 52.881; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-27-2015; Ambient Temp: 22.3°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3318; ConvF(4.95, 4.95, 4.95); Calibrated: 1/23/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/14/2015
Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027
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) = 6.29 W/kg
SAR(1 g) = 3.58 W/kg
Deviation = -4.79%



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

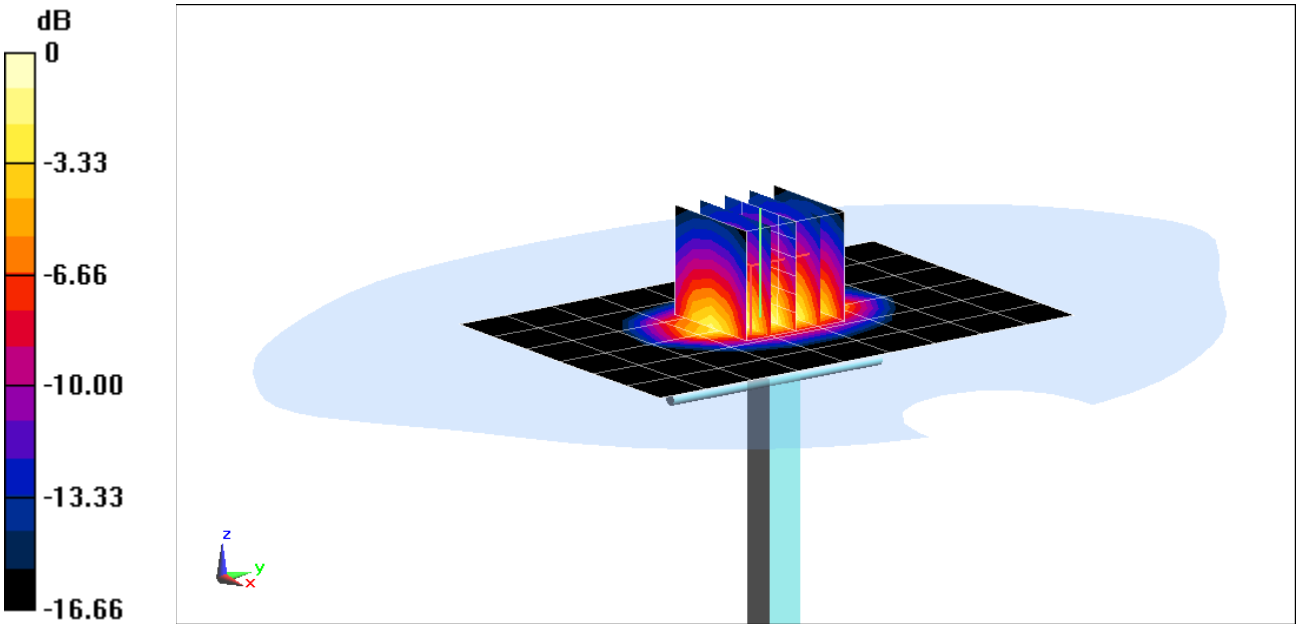
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.504 S/m; ε_r = 51.036; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-16-2015; Ambient Temp: 23.7°C; Tissue Temp: 24.0°C

Probe: ES3DV3 - SN3258; ConvF(4.64, 4.64, 4.64); Calibrated: 2/27/2015
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/18/2015
Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1759
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) = 6.5210 W/kg
SAR(1 g) = 3.77 W/kg
Deviation = -5.75%



0 dB = 4.760mW/g = 13.55 dB mW/g

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

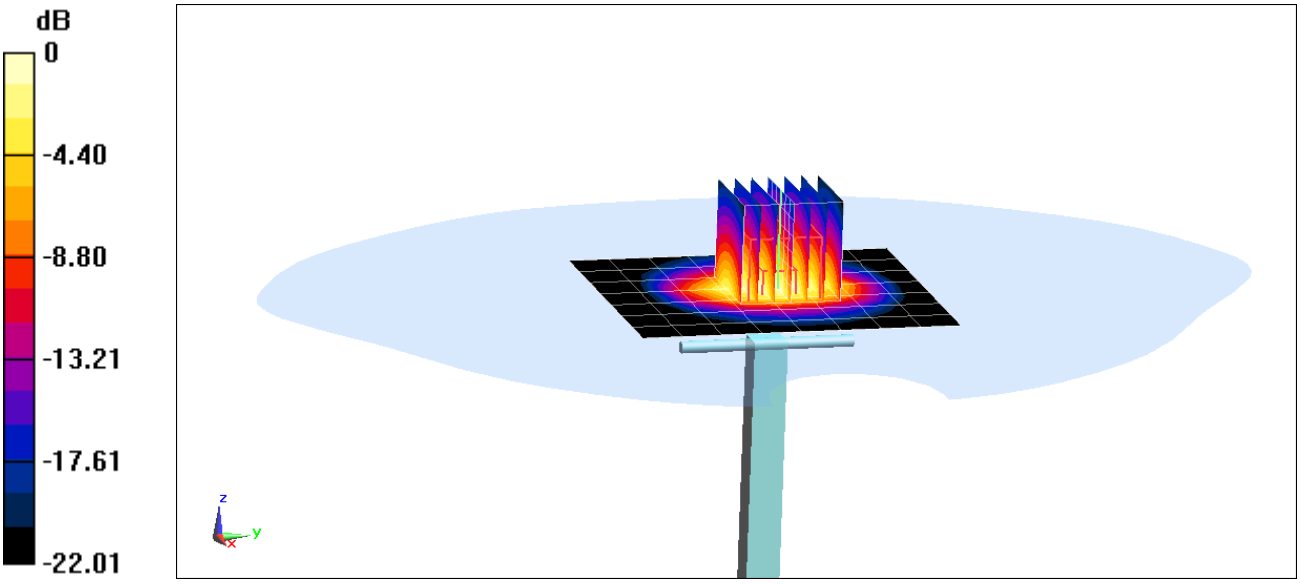
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 1.962 S/m; ε_r = 51.31; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-29-2015; Ambient Temp: 21.4°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/13/2015
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
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) = 11.8 W/kg
SAR(1 g) = 5.56 W/kg
Deviation = 7.34%



0 dB = 7.36 W/kg = 8.67 dBW/kg

DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1057

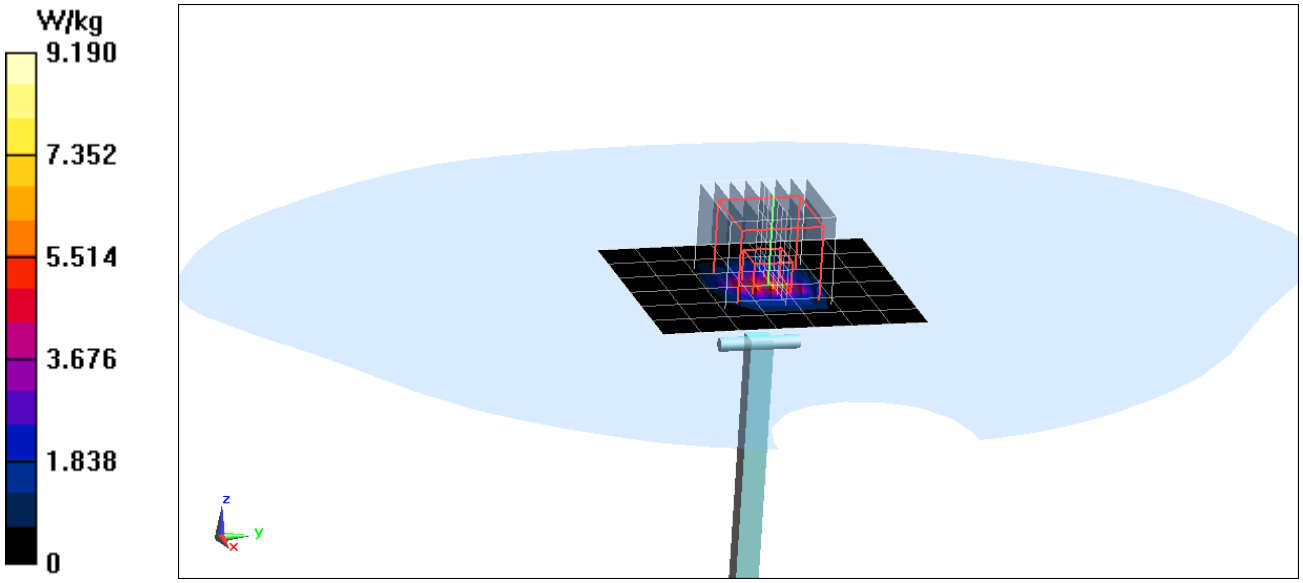
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.409 S/m; ε_r = 48.022; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-27-2015; Ambient Temp: 20.9°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3589; ConvF(3.79, 3.79, 3.79); Calibrated: 1/22/2015;
Sensor-Surface: 1.4mm (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)

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) = 16.0 W/kg
SAR(1 g) = 3.84 W/kg
Deviation = 3.50%



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

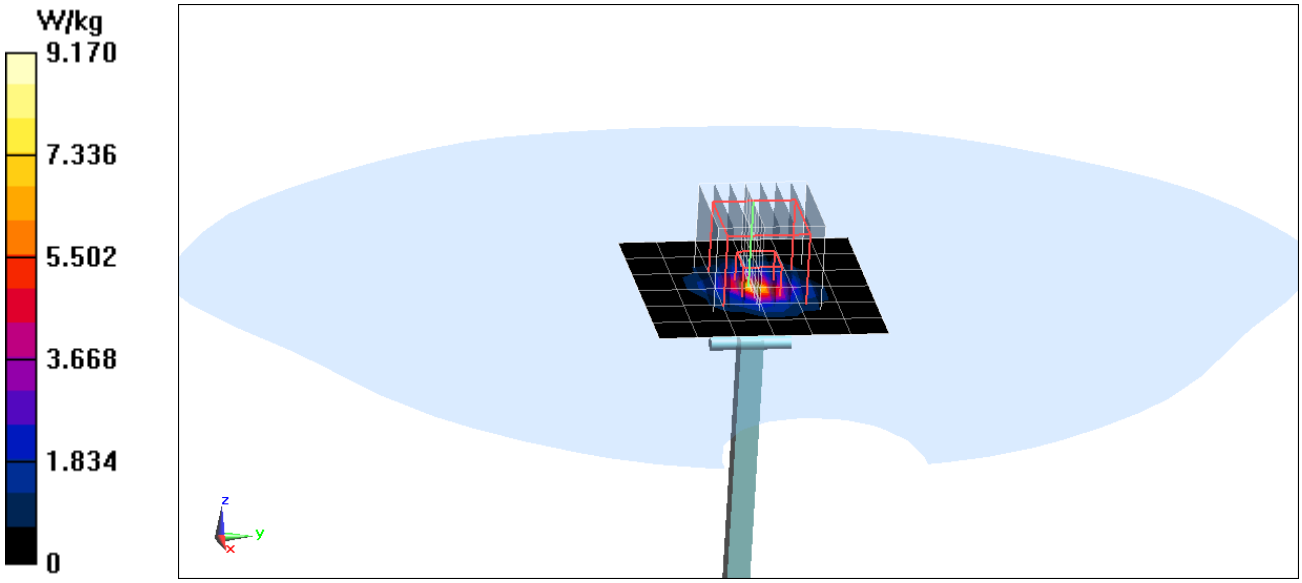
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.652 S/m; ε_r = 47.731; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-27-2015; Ambient Temp: 20.9°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3589; ConvF(3.65, 3.65, 3.65); Calibrated: 1/22/2015;
Sensor-Surface: 1.4mm (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)

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) = 16.5 W/kg
SAR(1 g) = 3.78 W/kg
Deviation = -4.55%



DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1057

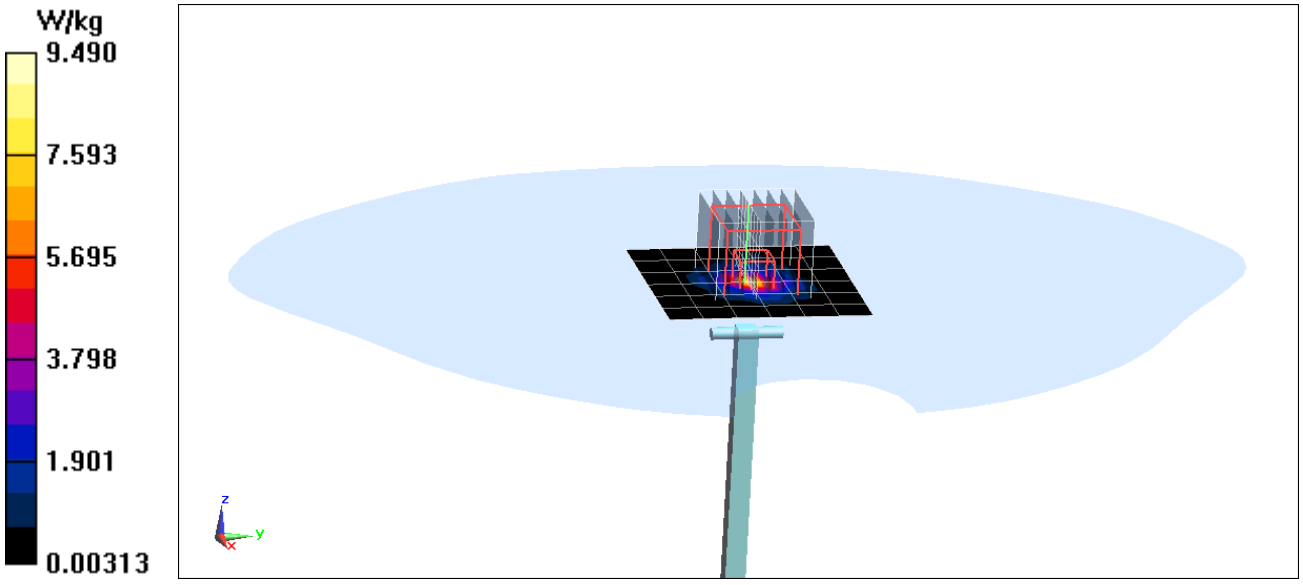
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.803 S/m; ε_r = 47.57; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-27-2015; Ambient Temp: 21.0°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.42, 3.42, 3.42); Calibrated: 1/22/2015;
Sensor-Surface: 1.4mm (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)

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) = 16.9 W/kg
SAR(1 g) = 3.91 W/kg
Deviation = 0.64%



DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1057

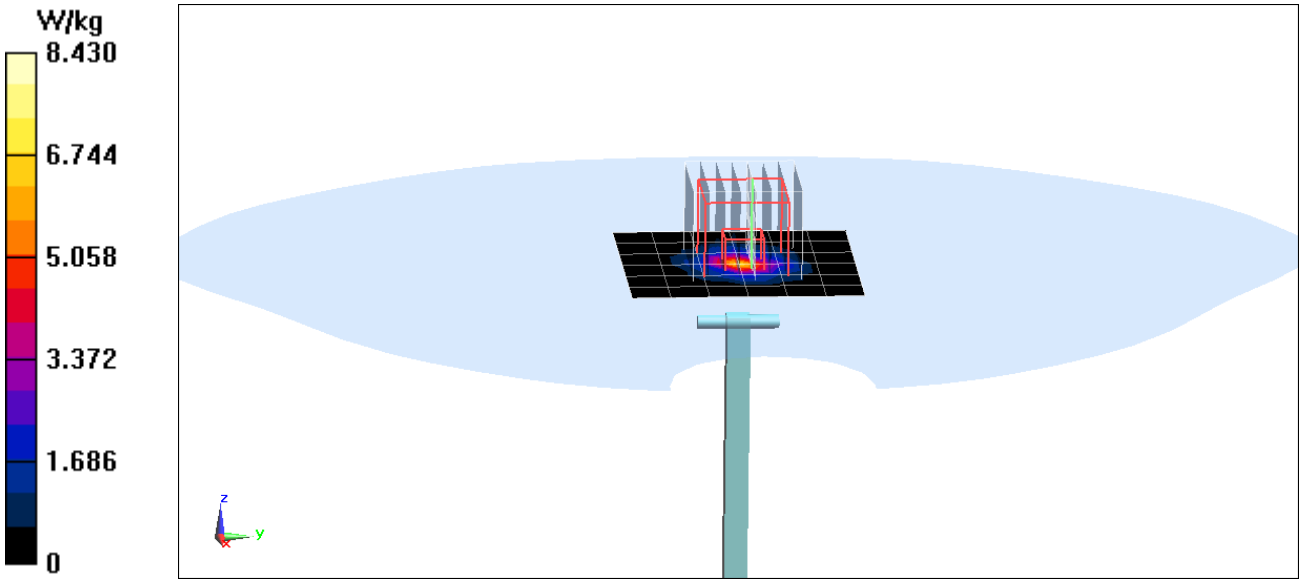
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.073 S/m; ε_r = 47.223; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-27-2015; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.79, 3.79, 3.79); Calibrated: 1/22/2015;
Sensor-Surface: 1.4mm (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)

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) = 15.8 W/kg
SAR(1 g) = 3.45 W/kg
Deviation = -8.12%



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
Calibration date:	January 16, 2015

CC 2/3/15

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	
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)
Accreditation No.: SCS 0108
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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

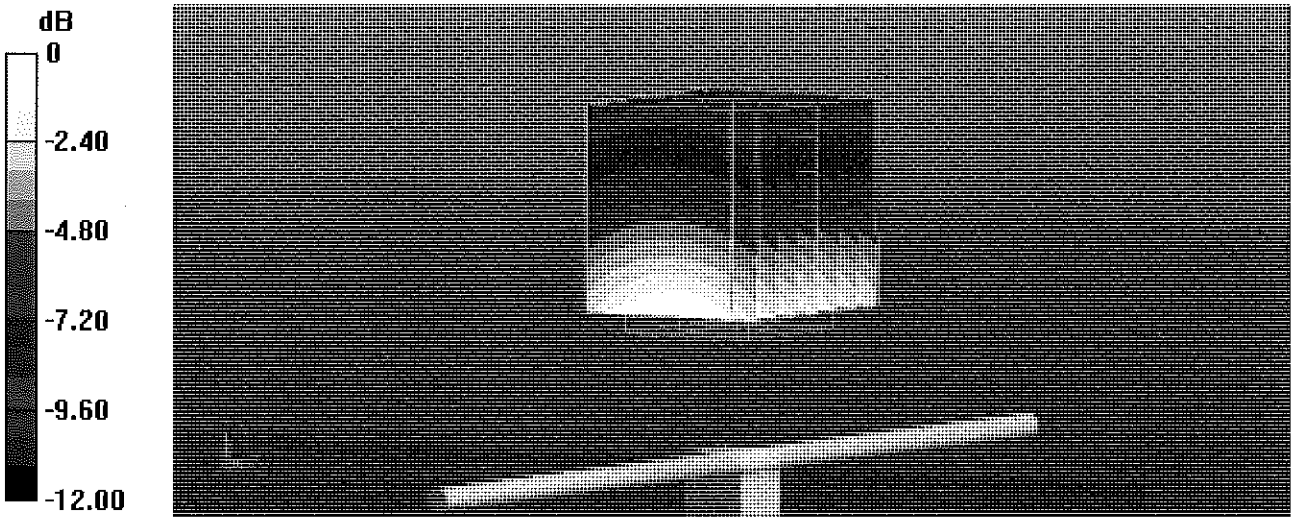
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

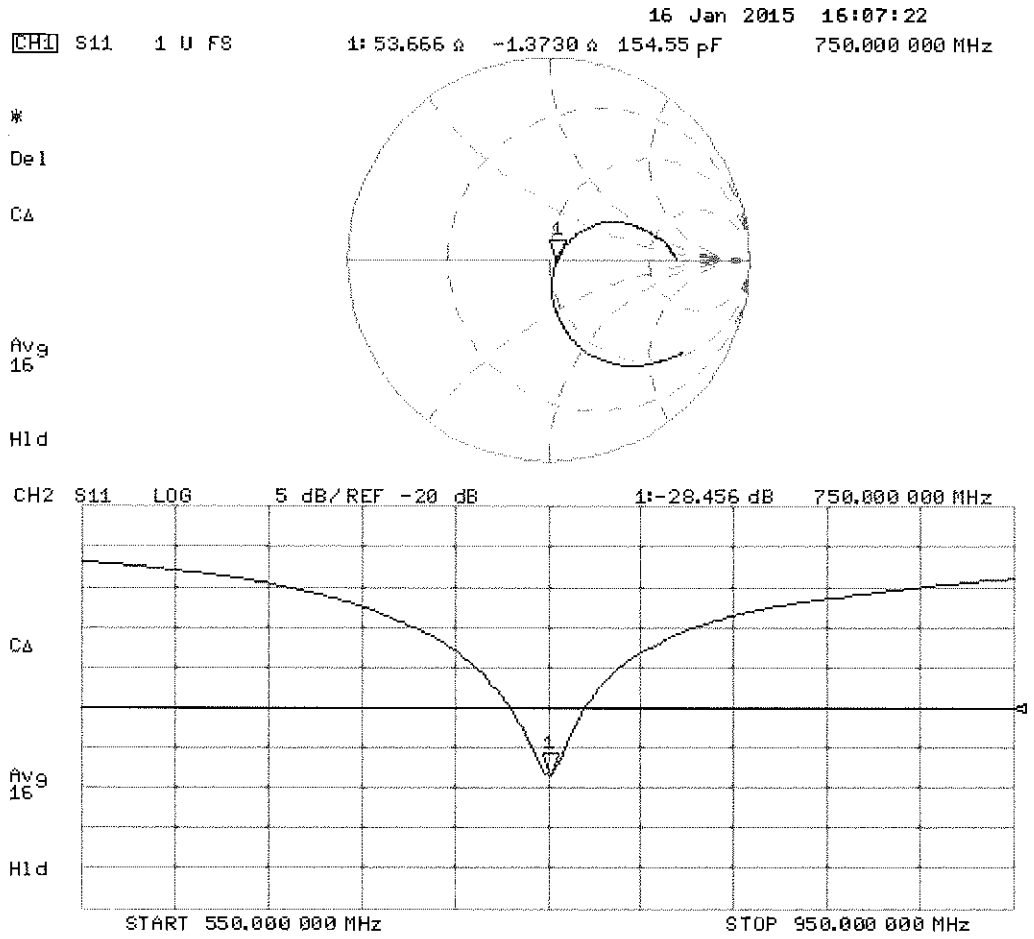
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

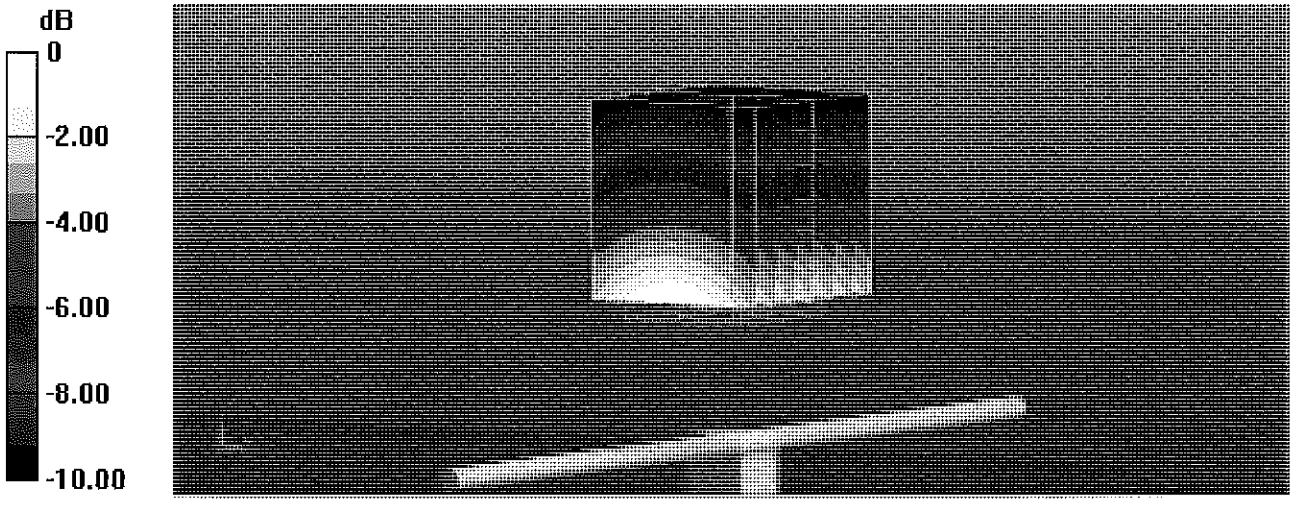
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 56; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

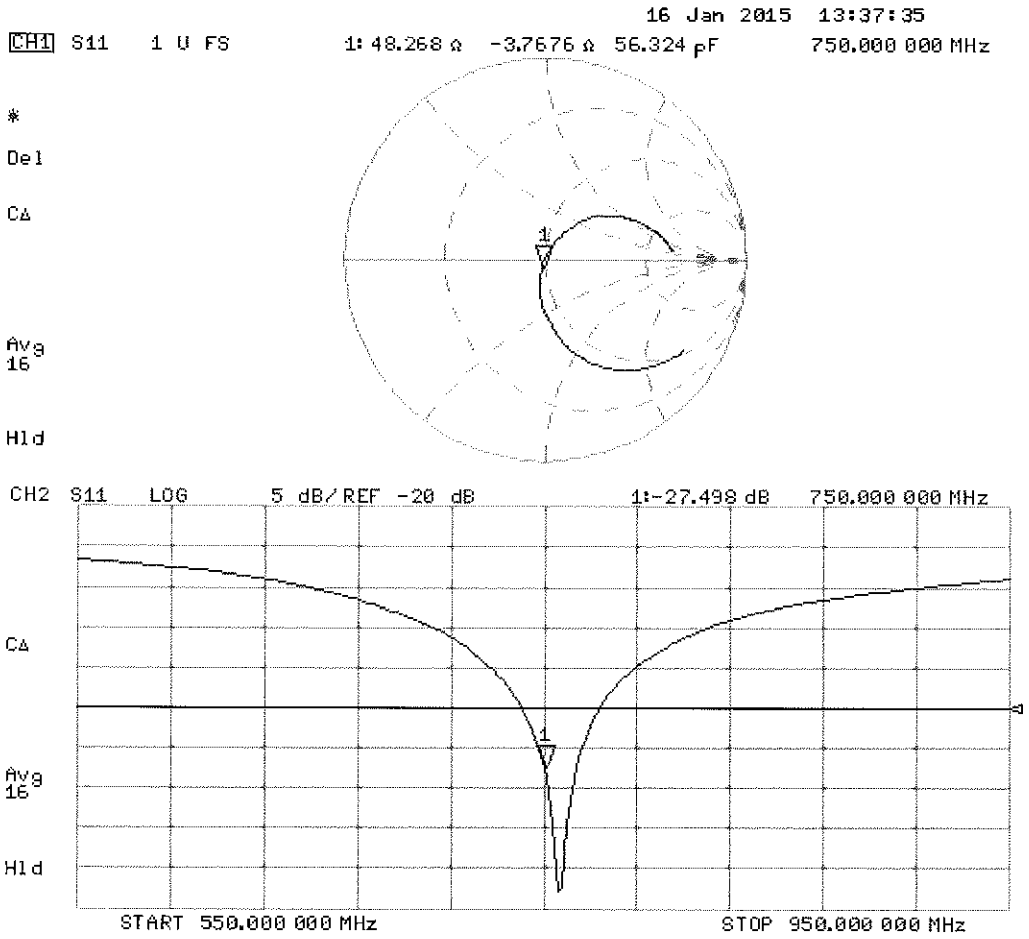
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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 0108

Client **PC Test** **Certificate No: D750V3-1046_Feb15**

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1046
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	February 19, 2015

BN ✓ 3/6/2015

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:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 19, 2015

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	41.6 ± 6 %	0.90 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	2.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.04 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.28 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	53.9 ± 6 %	0.98 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	2.12 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.29 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.39 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.47 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.8 Ω + 1.5 jΩ
Return Loss	- 24.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.4 Ω - 1.3 jΩ
Return Loss	- 34.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.038 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	September 02, 2011

DASY5 Validation Report for Head TSL

Date: 18.02.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

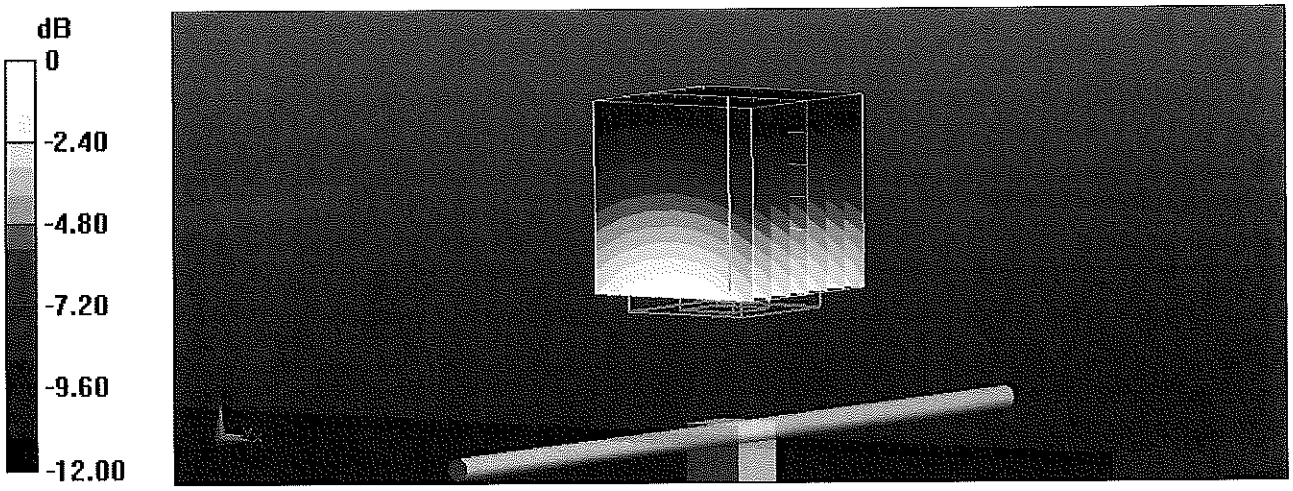
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

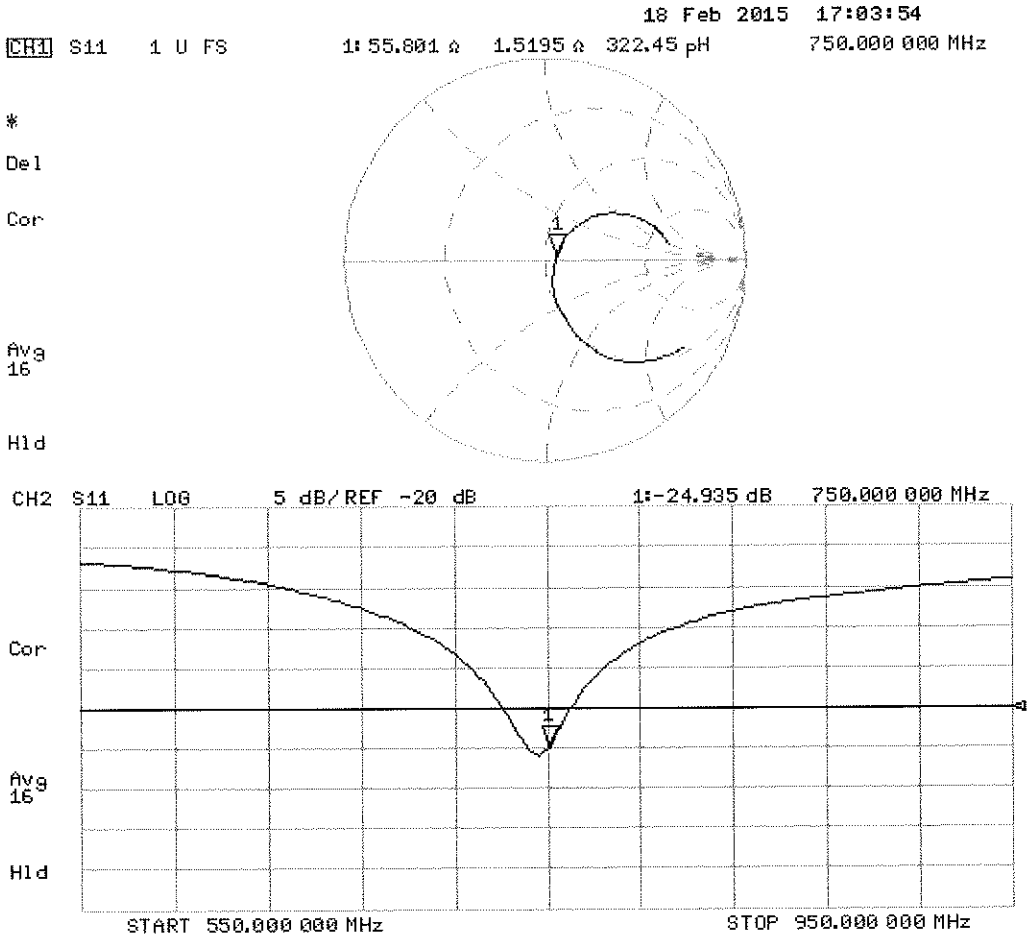
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.99 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.02 W/kg
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.33 W/kg
Maximum value of SAR (measured) = 2.37 W/kg



0 dB = 2.37 W/kg = 3.75 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 19.02.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

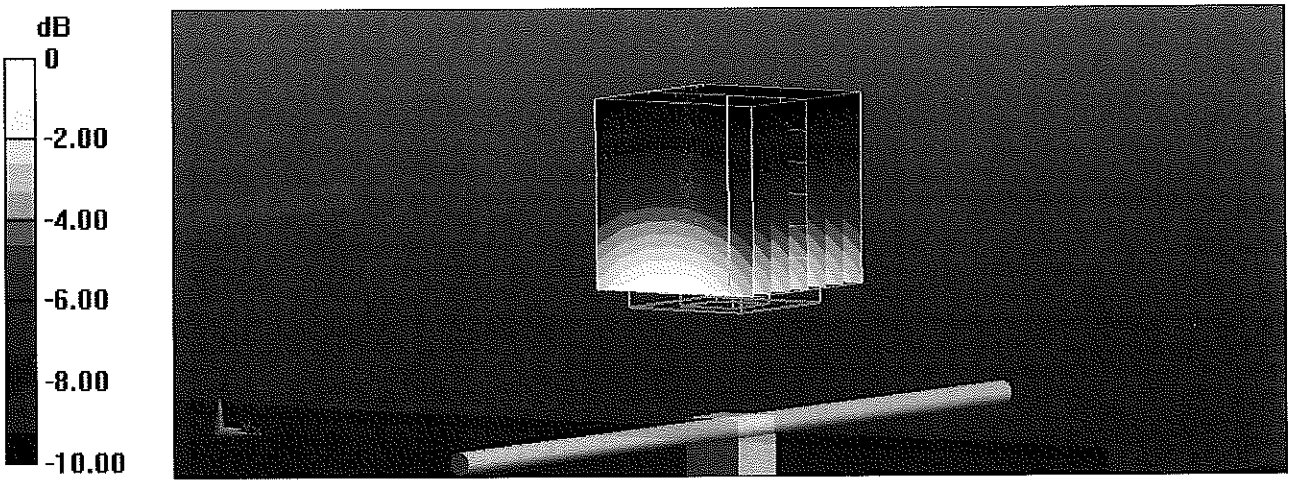
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.98 S/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

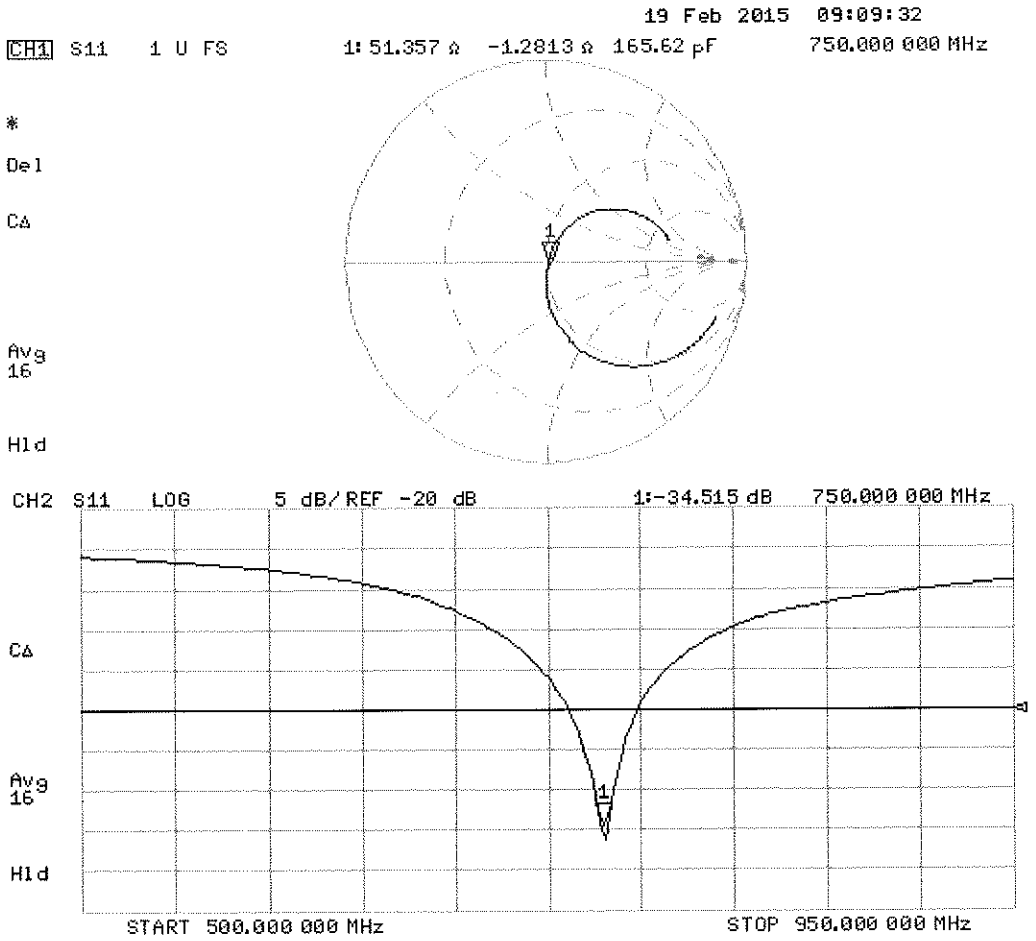
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.00 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.10 W/kg
SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.46 W/kg



0 dB = 2.46 W/kg = 3.91 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 8/6/14

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**

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

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

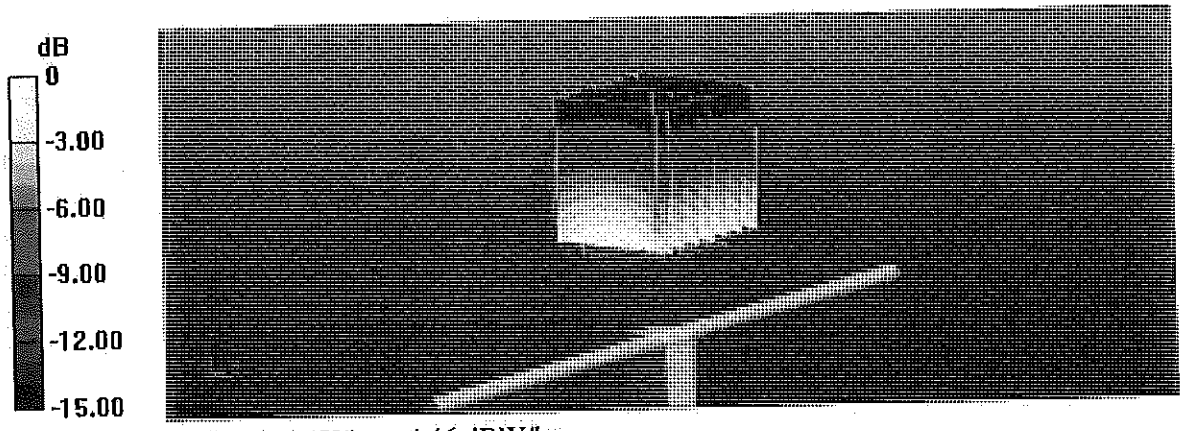
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

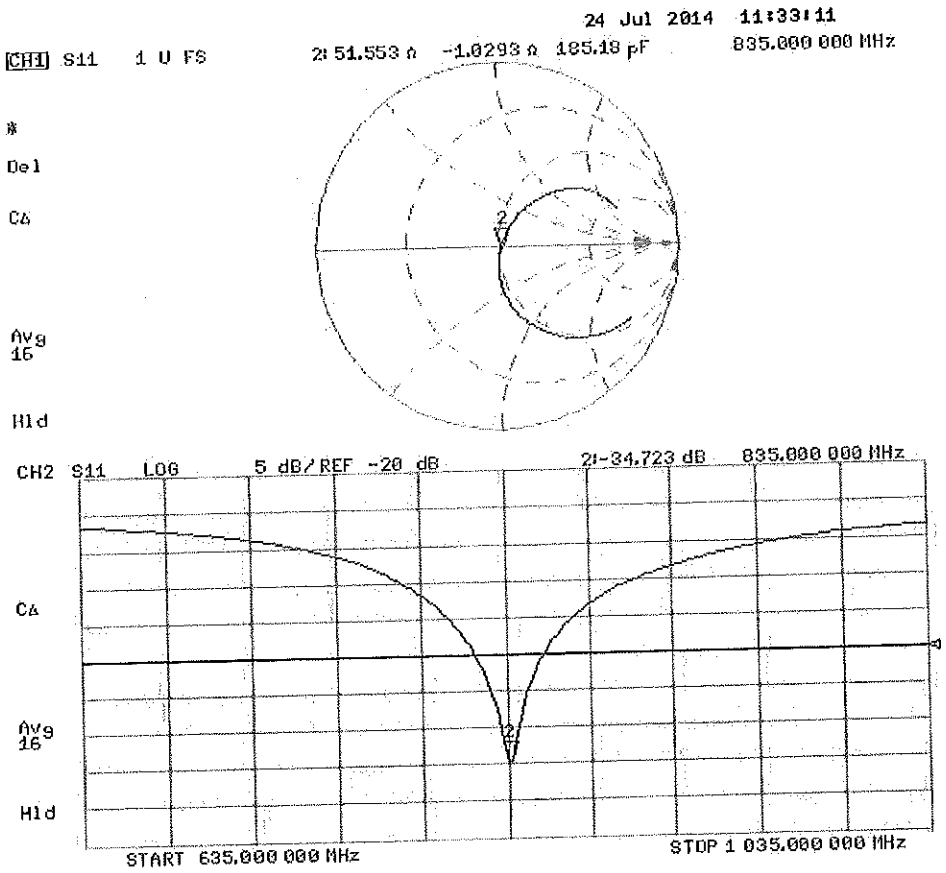
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

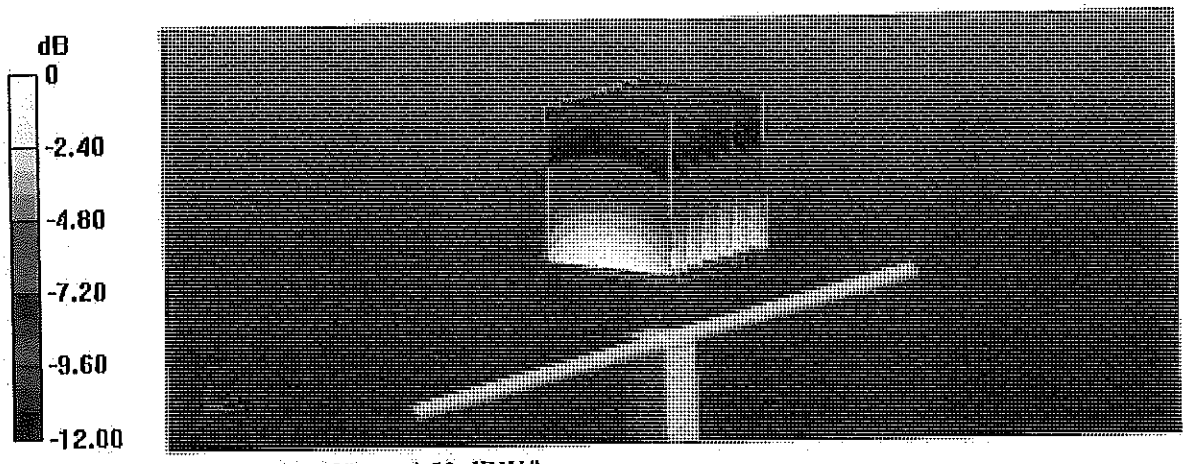
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.02 S/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

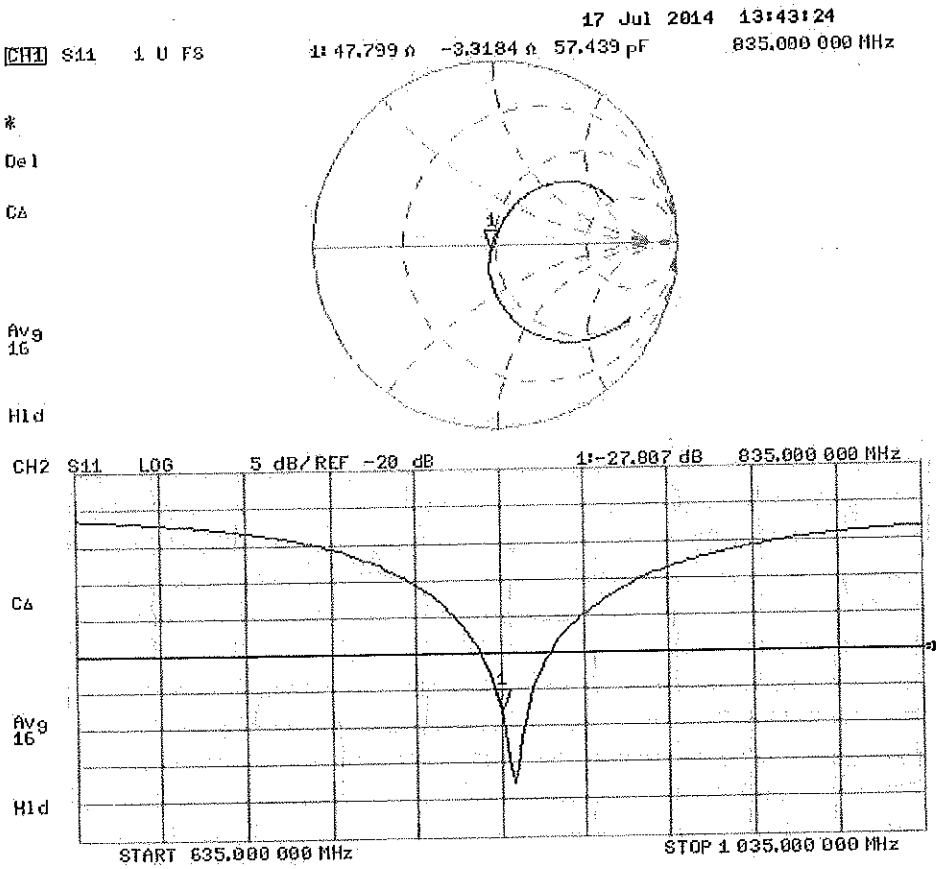
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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
6R/H

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

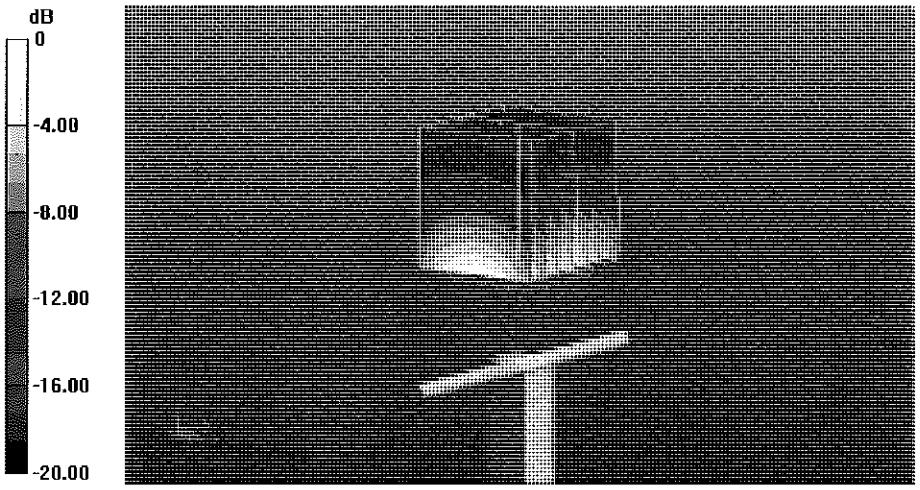
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

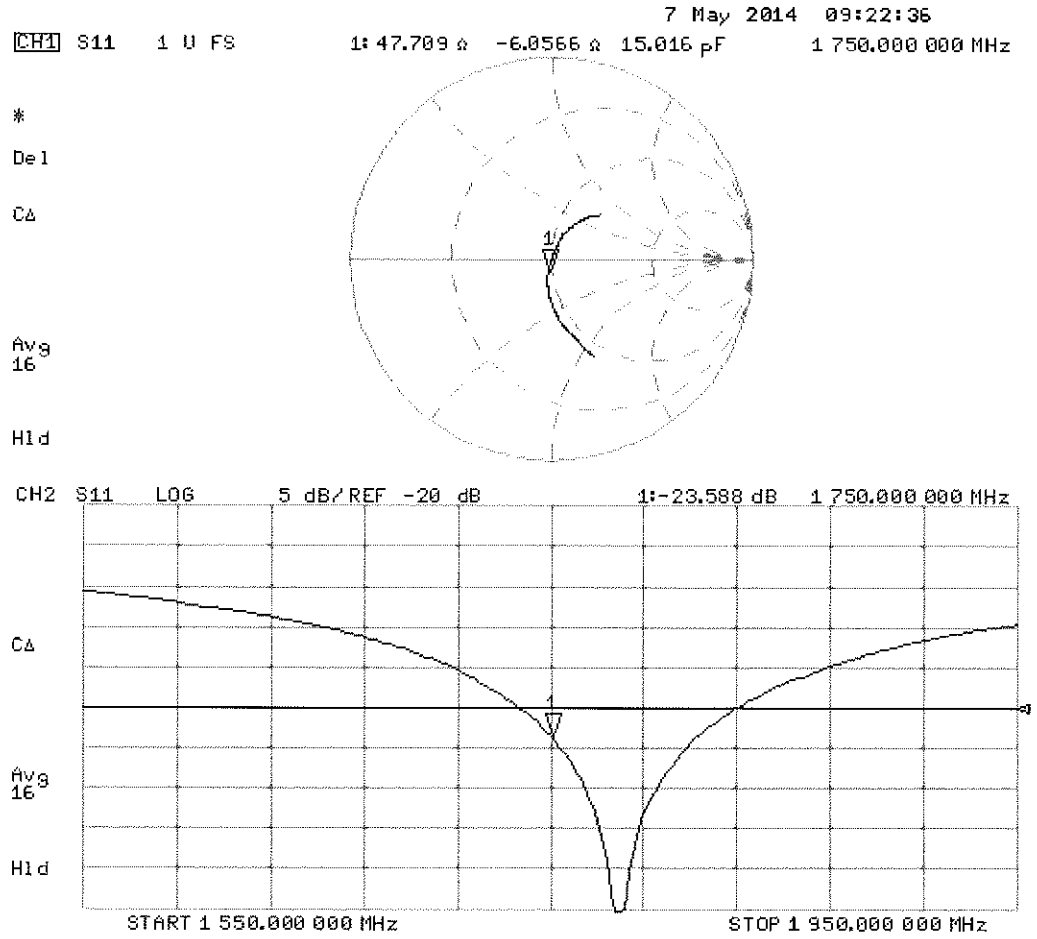
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

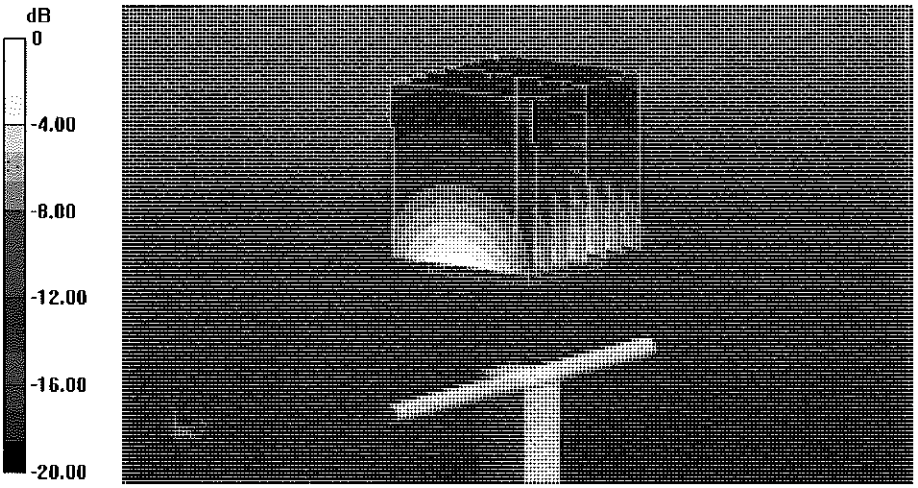
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.48 S/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

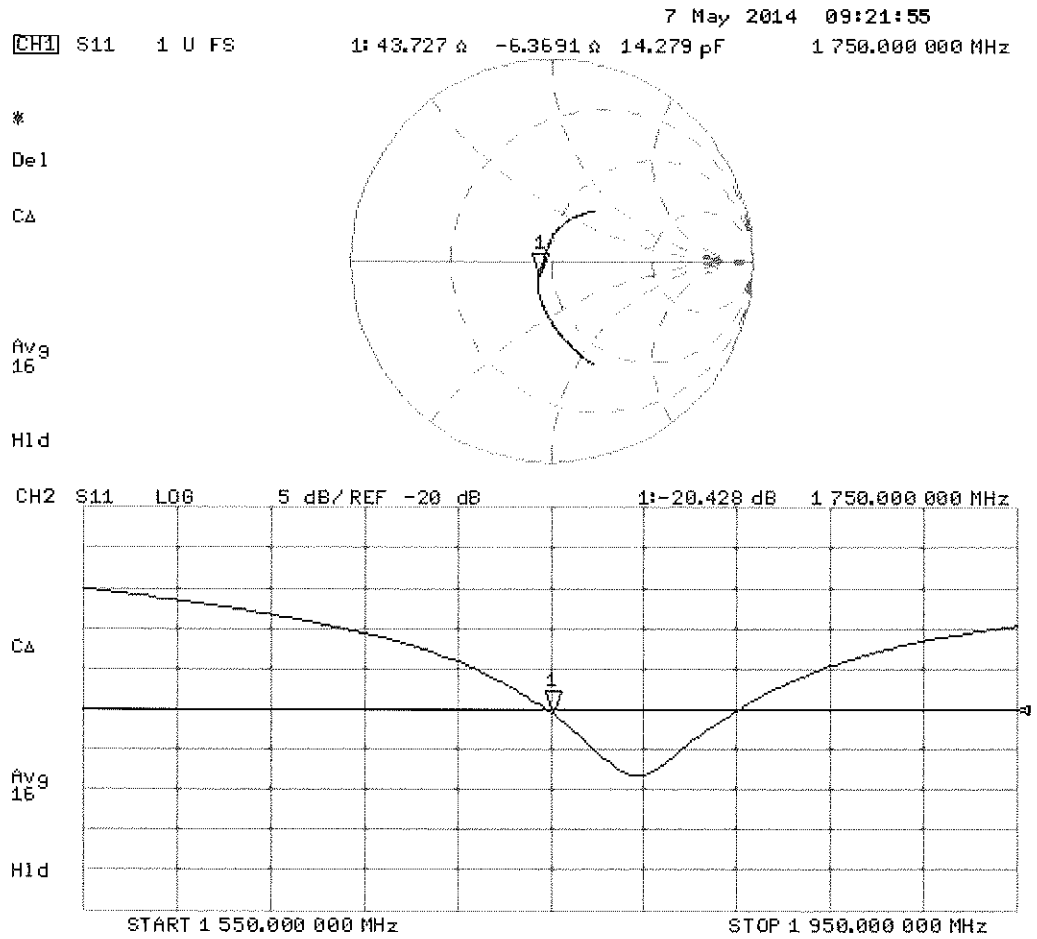
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d141_Apr15

CALIBRATION CERTIFICATE

Object	D1900V2 - SN:5d141
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	April 14, 2015

PM r 4/29/15

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)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
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:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 14, 2015

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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	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	38.6 ± 6 %	1.37 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	9.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.20 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.9 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	52.8 ± 6 %	1.50 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	9.94 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.29 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 Ω + 4.6 jΩ
Return Loss	- 25.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.2 Ω + 5.6 jΩ
Return Loss	- 24.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 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: 14.04.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

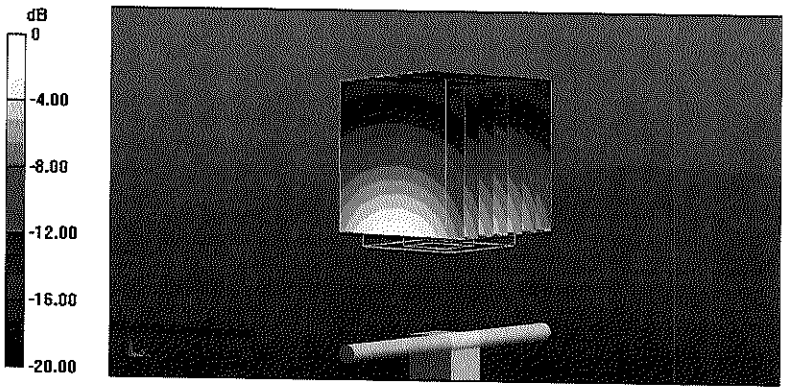
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.37 S/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5, 5, 5); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

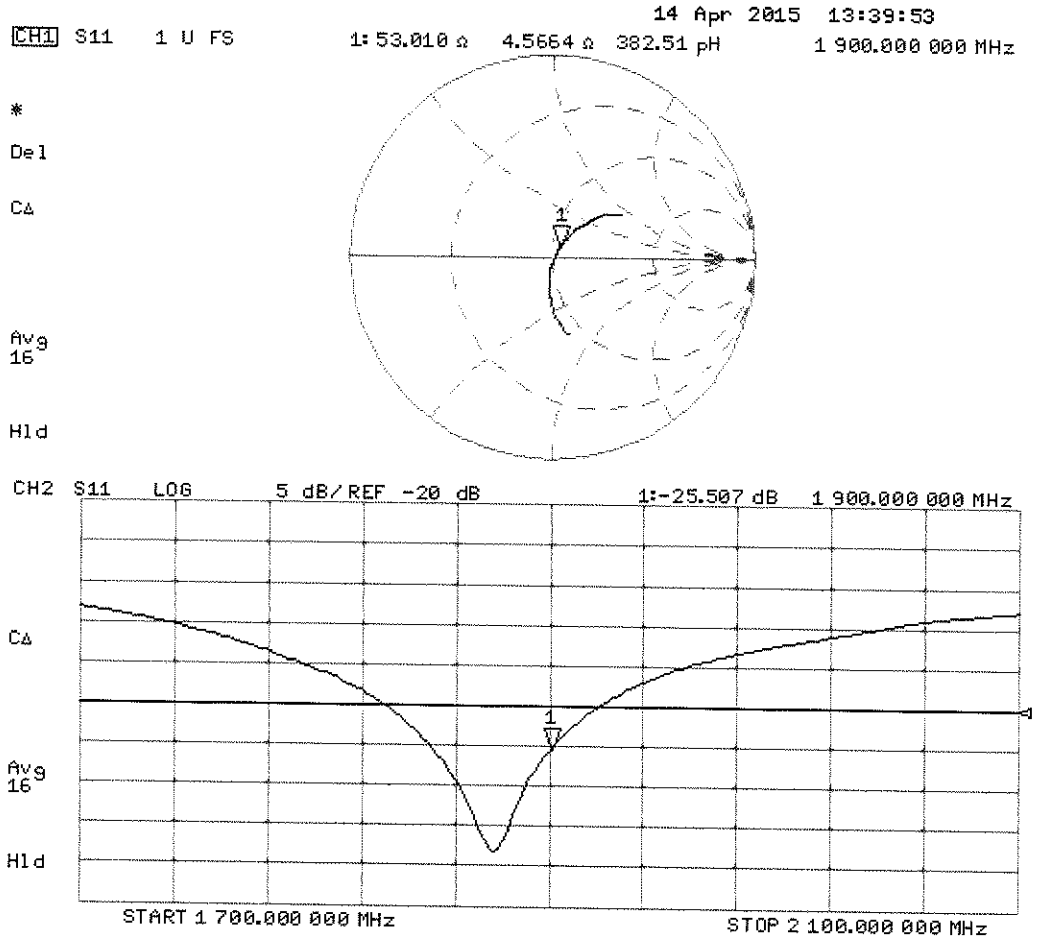
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.18 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.2 W/kg
Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.04.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

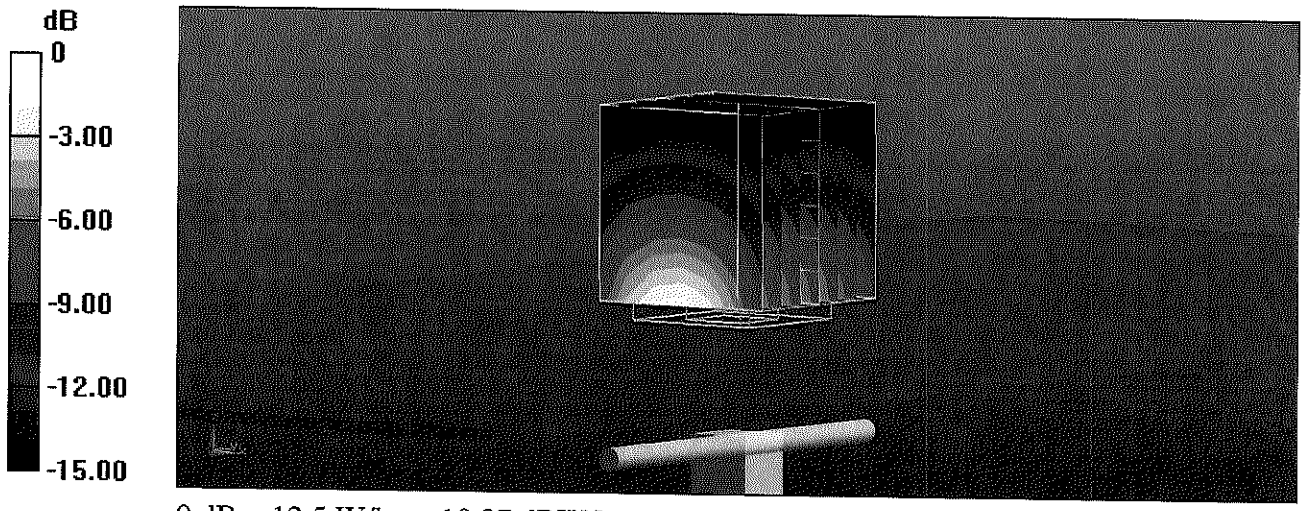
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.5 S/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.65, 4.65, 4.65); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

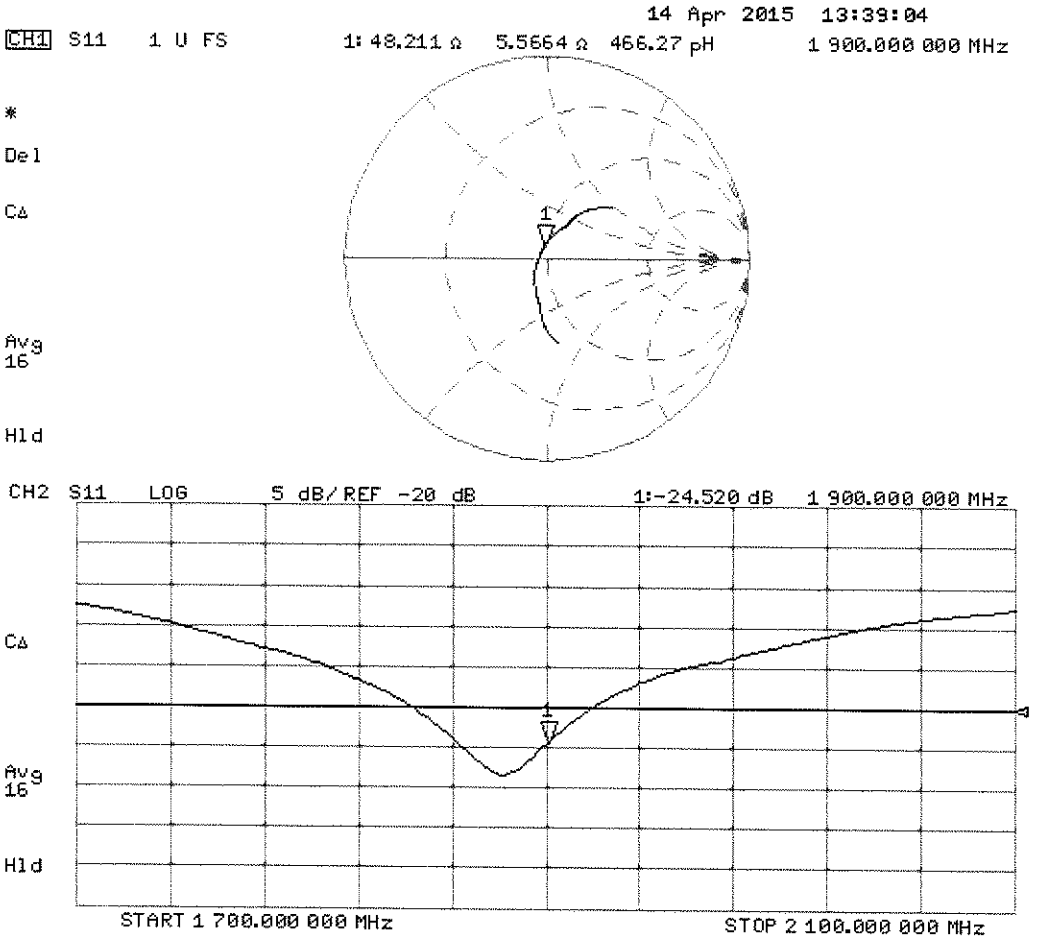
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.73 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.29 W/kg
Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

Impedance Measurement Plot for Body TSL



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

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Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D2450V2-719_Aug14

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 719

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

Calibration date: August 11, 2014

✓ KOK 9/8/14

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:	Michael Weber	Laboratory Technician	M. Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 12, 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	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.0 ± 6 %	1.82 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	13.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.2 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	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	50.5 ± 6 %	2.02 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	13.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**51.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.10 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.0 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.9 Ω + 3.0 jΩ
Return Loss	- 25.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.9 Ω + 5.8 jΩ
Return Loss	- 24.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.149 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	September 10, 2002

DASY5 Validation Report for Head TSL

Date: 11.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

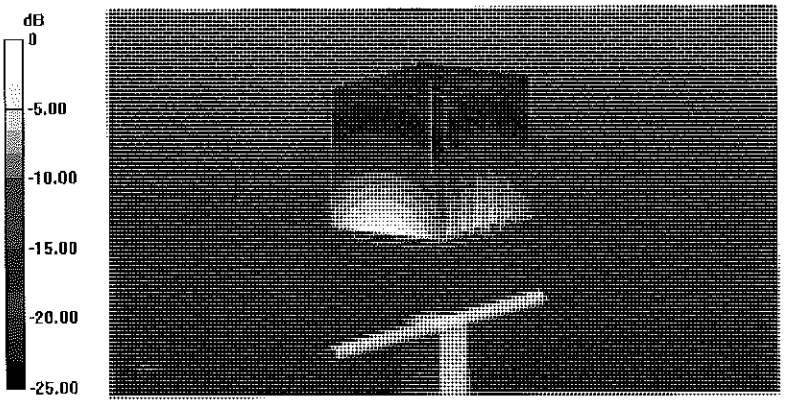
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.82 S/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); 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)

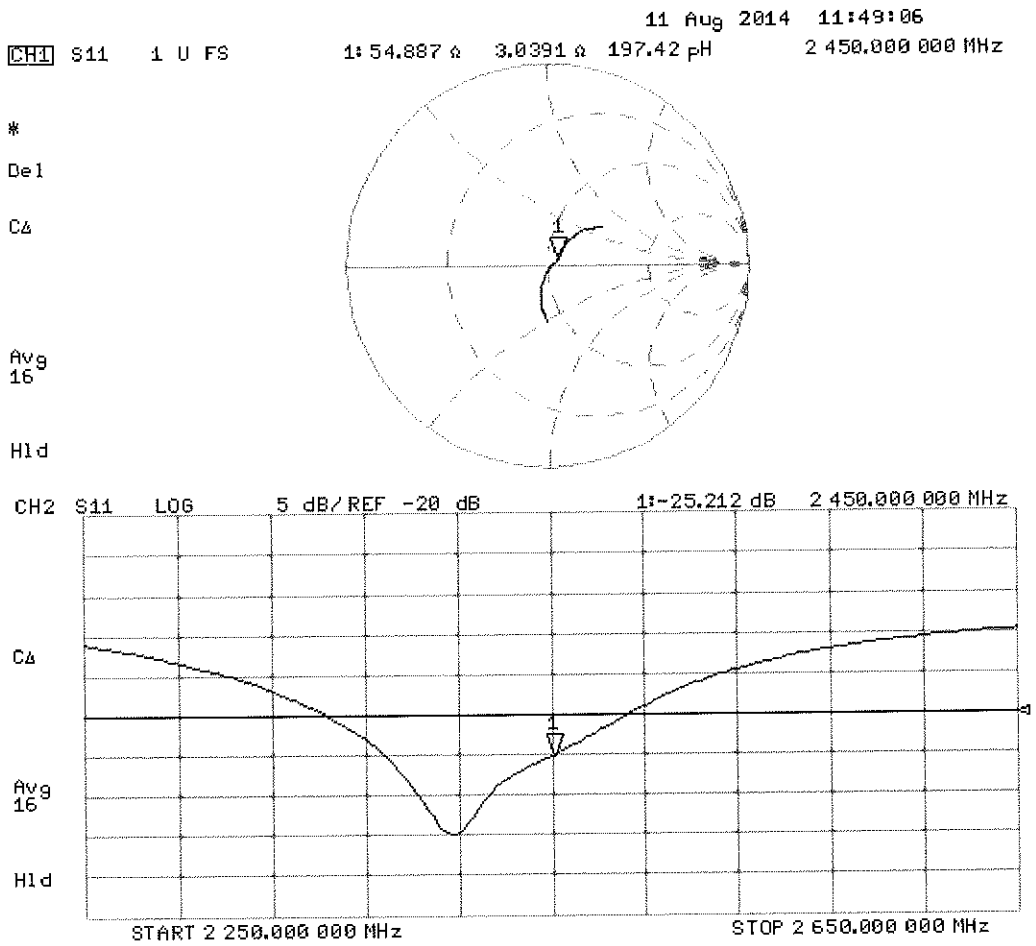
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.6 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (measured) = 17.4 W/kg



0 dB = 17.4 W/kg = 12.41 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.08.2014

Test Laboratory: SPEAG, Zurich, Switzerland

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

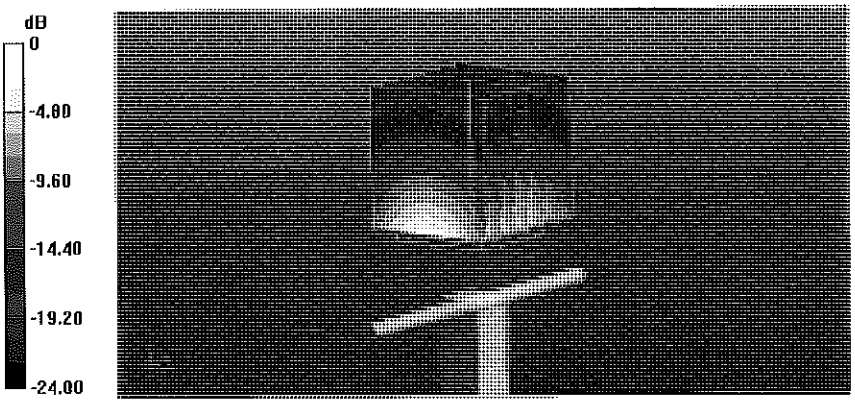
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.02 S/m; ε_r = 50.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.35, 4.35, 4.35); 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 = 96.08 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 27.9 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.1 W/kg
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

Impedance Measurement Plot for Body TSL