



SAR EVALUATION REPORT

Applicant Name:

Samsung Electronics Co., Ltd.
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Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:

05/25/17 - 06/19/17

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

1M1705250180-01.A3L

FCC ID:

A3LSMT385

APPLICANT:

SAMSUNG ELECTRONICS CO., LTD.

DUT Type:

Portable Tablet

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model:

SM-T385

Equipment Class	Band & Mode	Tx Frequency	SAR	
			1 gm Head (W/kg)	1 gm Body W/kg
PCB	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.58	1.05
PCB	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.55	0.91
PCB	UMTS 850	826.40 - 846.60 MHz	0.36	1.09
PCB	UMTS 1750	1712.4 - 1752.6 MHz	0.44	0.77
PCB	UMTS 1900	1852.4 - 1907.6 MHz	0.39	0.91
PCB	LTE Band 17	706.5 - 713.5 MHz	0.29	0.50
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.38	0.94
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.58	1.00
PCB	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.55	1.09
PCB	LTE Band 7	2502.5 - 2567.5 MHz	0.62	1.08
PCB	LTE Band 38	2572.5 - 2617.5 MHz	0.39	1.07
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.92	0.39
NII	U-NII-1	5180 - 5240 MHz	N/A	
NII	U-NII-2A	5260 - 5320 MHz	0.67	1.04
NII	U-NII-2C	5500 - 5720 MHz	0.48	0.53
NII	U-NII-3	5745 - 5825 MHz	0.52	0.80
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.15	0.41
Simultaneous SAR per KDB 690783 D01v01r03:			1.54	1.53

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



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 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 PCB and WLAN SAR compliance. The power reduction mechanisms are activated when the device is used in close proximity to the user's body. FCC KDB Publication 616217 D04 Section 6 was used as a guideline for selecting SAR test distances for this device.

The PCB power reduction mechanism is additionally used for Head SAR compliance, and is activated when the device is used for all voice or VoIP calls on the main antenna. The held-to-ear RF exposure conditions were evaluated at reduced power for the main antenna modes according to the Head SAR test positions described in IEEE 1528-2013.

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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 D01v06.

Maximum Output Powers

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)					Burst Average 8-PSK (dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	
GSM/GPRS/EDGE 850	Maximum	33.5	33.5	31.5	29.0	28.0	27.5	26.0	24.0	23.0	
	Nominal	33.0	33.0	31.0	28.5	27.5	27.0	25.5	23.5	22.5	
GSM/GPRS/EDGE 1900	Maximum	30.5	30.5	29.0	26.5	24.5	26.0	24.5	22.5	21.0	
	Nominal	30.0	30.0	28.5	26.0	24.0	25.5	24.0	22.0	20.5	

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
UMTS Band 5 (850 MHz)	Maximum	24.5	24.0	23.5	23.5
	Nominal	24.0	23.5	23.0	23.0
UMTS Band 4 (1750 MHz)	Maximum	23.5	23.5	23.0	22.5
	Nominal	23.0	23.0	22.5	22.0
UMTS Band 2 (1900 MHz)	Maximum	24.0	24.0	23.5	23.0
	Nominal	23.5	23.5	23.0	22.5
Mode / Band		Modulated Average (dBm)			
LTE Band 17	Maximum	24.5			
	Nominal	24.0			
LTE Band 5 (Cell)	Maximum	24.5			
	Nominal	24.0			
LTE Band 4 (AWS)	Maximum	24.0			
	Nominal	23.5			
LTE Band 2 (PCS)	Maximum	24.0			
	Nominal	23.5			
LTE Band 7	Maximum	24.8			
	Nominal	24.3			
LTE Band 38	Maximum	24.5			
	Nominal	24.0			
Mode / Band		Modulated Average - Single Tx Chain (dBm)			
IEEE 802.11b (2.4 GHz)	Maximum	18.5			
	Nominal	18.0			
IEEE 802.11g (2.4 GHz)	Maximum	15.5			
	Nominal	15.0			
IEEE 802.11n (2.4 GHz)	Maximum	13.5			
	Nominal	13.0			
Bluetooth	Maximum	11.0			
	Nominal	10.5			
Bluetooth LE	Maximum	1.5			
	Nominal	1.0			

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Mode / Band		Modulated Average - Single Tx Chain (dBm)	
		20 MHz Bandwidth	40 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	14.5	
	Nominal	14.0	
IEEE 802.11n (5 GHz)	Maximum	13.5	13.5
	Nominal	13.0	13.0

Reduced Output Powers

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)					Burst Average 8-PSK (dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	
GSM/GPRS/EDGE 850	Maximum	28.5	28.5	24.5	23.0	21.0	23.0	21.5	20.0	18.0	
	Nominal	28.0	28.0	24.0	22.5	20.5	22.5	21.0	19.5	17.5	
GSM/GPRS/EDGE 1900	Maximum	22.0	22.0	18.0	16.0	14.5	18.5	17.0	15.5	14.0	
	Nominal	21.5	21.5	17.5	15.5	14.0	18.0	16.5	15.0	13.5	

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
UMTS Band 5 (850 MHz)	Maximum	17.0	16.5	16.5	16.5
	Nominal	16.5	16.0	16.0	16.0
UMTS Band 4 (1750 MHz)	Maximum	13.0	12.5	12.5	12.5
	Nominal	12.5	12.0	12.0	12.0
UMTS Band 2 (1900 MHz)	Maximum	12.0	11.5	11.5	11.5
	Nominal	11.5	11.0	11.0	11.0
Mode / Band		Modulated Average (dBm)			
LTE Band 17	Maximum	18.0			
	Nominal	17.5			
LTE Band 5 (Cell)	Maximum	17.0			
	Nominal	16.5			
LTE Band 4 (AWS)	Maximum	13.5			
	Nominal	13.0			
LTE Band 2 (PCS)	Maximum	12.5			
	Nominal	12.0			
LTE Band 7	Maximum	15.0			
	Nominal	14.5			
LTE Band 38	Maximum	16.0			
	Nominal	15.5			
Mode / Band		Modulated Average - Single Tx Chain (dBm)			
IEEE 802.11b (2.4 GHz)	Maximum	13.5			
	Nominal	13.0			
IEEE 802.11g (2.4 GHz)	Maximum	13.5			
	Nominal	13.0			
IEEE 802.11n (2.4 GHz)	Maximum	13.5			
	Nominal	13.0			
Mode / Band		Modulated Average - Single Tx Chain (dBm)			
IEEE 802.11a (5 GHz)		20 MHz Bandwidth	40 MHz Bandwidth		
		Maximum	10.5		
IEEE 802.11n (5 GHz)	Maximum	10.5			
	Nominal	10.0			

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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
Device Edges/Sides for SAR Testing

Mode	Back	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes
LTE Band 17	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 2 (PCS)	Yes	Yes	No	Yes	Yes
LTE Band 7	Yes	Yes	No	Yes	Yes
LTE Band 38	Yes	Yes	No	Yes	Yes
2.4 GHz WLAN	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	No	No	Yes

Note: Per FCC KDB 616217 D04v01, particular DUT edges were not required to be evaluated for SAR based on the SAR exclusion threshold in KDB 447498 D01v05.

1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, 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.

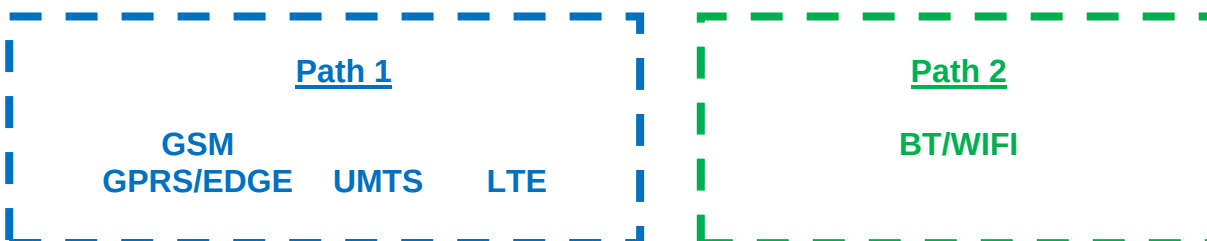


Figure 1-1
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

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Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body	Notes
1	GSM + 2.4 GHz Wi-Fi	Yes	Yes	
2	GSM + 5 GHz Wi-Fi	Yes	Yes	
3	GSM + 2.4 GHz Bluetooth	Yes^	Yes	^BT Tethering applications are considered
4	UMTS + 2.4 GHz Wi-Fi	Yes	Yes	
5	UMTS + 5 GHz Wi-Fi	Yes	Yes	
6	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	^BT Tethering applications are considered
7	LTE + 2.4 GHz Wi-Fi	Yes	Yes	
8	LTE + 5 GHz Wi-Fi	Yes	Yes	
9	LTE + 2.4 GHz Bluetooth	Yes^	Yes	^BT Tethering applications are considered
10	GPRS/EDGE + 2.4 GHz Wi-Fi	Yes	Yes	
11	GPRS/EDGE + 5 GHz Wi-Fi	Yes	Yes	
12	GPRS/EDGE + 2.4 GHz Bluetooth	Yes^	Yes	^BT Tethering applications are considered

- 2.4 GHz WLAN, 5 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
- This device supports VOLTE and VOWIFI.
- This device supports Bluetooth tethering.

1.6 Miscellaneous SAR Test Considerations

(A) WIFI

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 Publication 248227 D01v02r02.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

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 D05v02r04.

1.7 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04 (2G/3G/4G)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- FCC KDB Publication 616217D04v01r02 (Tablet SAR Considerations)

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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.

	Head Serial Number	Body Serial Number
GSM/GPRS/EDGE 850	06350	06350
GSM/GPRS/EDGE 1900	06350	06350 and 04250
UMTS 850	06350	04520
UMTS 1750	04520	06350
UMTS 1900	04520	06350 and 04250
LTE Band 17	04645	06350 and 04250
LTE Band 5 (Cell)	06350	04520
LTE Band 4 (AWS)	04520	04520
LTE Band 2 (PCS)	04520	06350
LTE Band 7	04520	06350
LTE Band 38	06350	06350
2.4 GHz WLAN	29196	29113
5 GHz WLAN	29196	29113
Bluetooth	29196	29113

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2 LTE INFORMATION

LTE Information			
FCC ID	A3LSMT385		
Form Factor	Portable Tablet		
Frequency Range of each LTE transmission band	LTE Band 17 (706.5 - 713.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
	LTE Band 7 (2502.5 - 2567.5 MHz)		
	LTE Band 38 (2572.5 - 2617.5 MHz)		
Channel Bandwidths	LTE Band 17: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 38: 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 17: 5 MHz	706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)	1732.5 (20175)	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	1732.5 (20175)	1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	1732.5 (20175)	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)	1732.5 (20175)	1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)	1732.5 (20175)	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)	1732.5 (20175)	1745 (20300)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)	1880 (18900)	1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)	1880 (18900)	1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)	1880 (18900)	1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)	1880 (18900)	1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)	1880 (18900)	1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)	1880 (18900)	1900 (19100)
LTE Band 7: 5 MHz	2502.5 (20775)	2535 (21100)	2567.5 (21425)
LTE Band 7: 10 MHz	2505 (20800)	2535 (21100)	2565 (21400)
LTE Band 7: 15 MHz	2507.5 (20825)	2535 (21100)	2562.5 (21375)
LTE Band 7: 20 MHz	2510 (20850)	2535 (21100)	2560 (21350)
LTE Band 38: 5 MHz	2572.5 (37775)	2595 (38000)	2617.5 (38225)
LTE Band 38: 10 MHz	2575.0 (37800)	2595 (38000)	2615.0 (38200)
LTE Band 38: 15 MHz	2577.5 (37825)	2595 (38000)	2612.5 (38175)
LTE Band 38: 20 MHz	2580 (37850)	2595 (38000)	2610 (38150)
UE Category	4		
Modulations Supported in UL	QPSK, 16QAM		
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES		
A-MPR (Additional MPR) disabled for SAR Testing?	YES		
LTE Release 10 Additional Information	<p>This device does not support full CA features on 3GPP Release 10. All uplink communications are identical to the Release 8 Specifications. The following LTE Release 10 Features are not supported: Carrier Aggregation, Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.</p>		

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3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

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

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (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 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

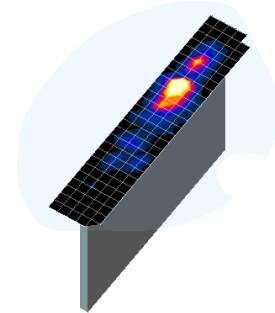


Figure 4-1
Sample SAR Area Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

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

*Also compliant to IEEE 1528-2013 Table 6

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5 SAR TESTING PROCEDURES

5.1 SAR Testing for Tablet per KDB Publication 616217 D04v01

Per FCC KDB Publication 616217 D04, 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 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

5.2 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in head (held-to-ear) and body (hand-held) use conditions when the device is used close the user's body.

When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. 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, additional evaluation 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 Publication 616217 D04 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. 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.

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6.1 EAR REFERENCE POINT

Figure 6-2 shows the front, back and side views of the SAM Twin Phantom. The point “M” is the reference point for the center of the mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 6-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 6-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

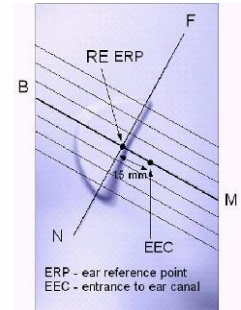


Figure 6-1
Close-Up Side view
of ERP

6.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 6-3). The acoustic output was then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



Figure 6-2
Front, back and side view of SAM Twin Phantom

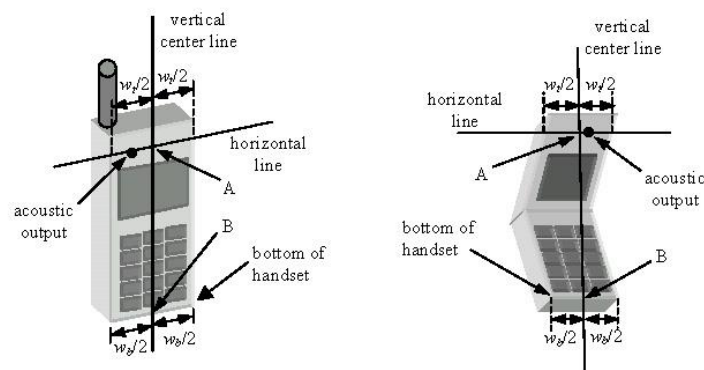


Figure 6-3
Handset Vertical Center & Horizontal Line Reference Points

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7 TEST CONFIGURATION POSITIONS

7.1 Device Holder

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

7.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 7-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

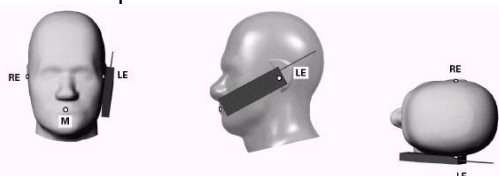


Figure 7-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 7-2).

7.3 Positioning for Ear / 15° Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 7-2).



Figure 7-2 Front, Side and Top View of Ear/15° Tilt Position

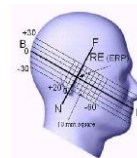


Figure 7-3 Side view w/ relevant markings

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8 RF EXPOSURE LIMITS

8.1 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.

8.2 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 8-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

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

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

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Power measurements for licensed transmitters are performed using a base station simulator under digital average power.

9.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, 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 D01v01r03.

9.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

9.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 “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.

9.4 SAR Measurement Conditions for UMTS

9.4.1 Output Power Verification

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

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9.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

9.4.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCH_n configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCH_n, for the highest reported SAR configuration in 12.2 kbps RMC.

9.4.4 SAR Measurements with Rel 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

9.4.5 SAR Measurements with Rel 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

9.4.6 SAR Measurement Conditions for DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

9.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 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).

9.5.1 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.

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9.5.2 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.

9.5.3 A-MPR

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

9.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

- a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - i. The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
 - iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to $\frac{1}{2}$ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

9.5.5 TDD

LTE TDD testing is performed using the SAR test guidance provided in FCC KDB 941225 D05v02r04. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05v02r04. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

9.6 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 D01v02r02 for more details.

9.6.1 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.

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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.

9.6.2 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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

9.6.3 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. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

9.6.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

9.6.5 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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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9.6.6 OFDM Transmission Mode and SAR Test Channel Selection

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.

9.6.7 Initial Test Configuration Procedure

For OFDM, 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, lowest data rate and lowest order IEEE 802.11 mode. 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 9.6.6). When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

9.6.8 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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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10 RF CONDUCTED POWERS

10.1 GSM Conducted Powers

Max										
Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	31.79	32.02	30.58	28.96	26.65	26.14	24.62	22.38	22.23
	190	31.93	32.20	30.60	28.85	26.58	26.12	24.51	22.29	22.18
	251	31.85	32.09	30.47	28.75	26.57	25.98	24.32	22.12	21.92
GSM 1900	512	28.67	28.72	27.13	24.94	23.14	24.48	22.66	21.06	19.36
	661	28.87	28.94	27.21	24.63	22.76	24.23	22.61	20.80	19.09
	810	29.26	29.32	27.78	25.37	23.30	24.63	23.04	21.31	19.48
Calculated Maximum Frame-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	22.76	22.99	24.56	24.70	23.64	17.11	18.60	18.12	19.22
	190	22.90	23.17	24.58	24.59	23.57	17.09	18.49	18.03	19.17
	251	22.82	23.06	24.45	24.49	23.56	16.95	18.30	17.86	18.91
GSM 1900	512	19.64	19.69	21.11	20.68	20.13	15.45	16.64	16.80	16.35
	661	19.84	19.91	21.19	20.37	19.75	15.20	16.59	16.54	16.08
	810	20.23	20.29	21.76	21.11	20.29	15.60	17.02	17.05	16.47
GSM 850	Frame Avg.Targets:	23.97	23.97	24.98	24.24	24.49	17.97	19.48	19.24	19.49
GSM 1900		20.97	20.97	22.48	21.74	20.99	16.47	17.98	17.74	17.49

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Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	27.14	27.16	23.23	21.86	19.44	22.71	20.60	18.55	16.57
	190	26.98	27.00	22.93	21.44	19.03	22.74	20.63	18.40	16.52
	251	27.06	27.05	23.03	21.56	19.15	22.68	20.48	18.26	16.38
GSM 1900	512	21.53	21.52	17.26	14.83	13.86	17.03	15.18	13.53	12.41
	661	21.47	21.47	16.99	15.12	13.63	16.82	15.21	13.50	12.36
	810	21.93	21.98	17.59	15.53	14.16	17.21	15.71	13.96	12.95
Calculated Maximum Frame-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	18.11	18.13	17.21	17.60	16.43	13.68	14.58	14.29	13.56
	190	17.95	17.97	16.91	17.18	16.02	13.71	14.61	14.14	13.51
	251	18.03	18.02	17.01	17.30	16.14	13.65	14.46	14.00	13.37
GSM 1900	512	12.50	12.49	11.24	10.57	10.85	8.00	9.16	9.27	9.40
	661	12.44	12.44	10.97	10.86	10.62	7.79	9.19	9.24	9.35
	810	12.90	12.95	11.57	11.27	11.15	8.18	9.69	9.70	9.94
GSM 850	Frame	18.97	18.97	17.98	18.24	17.49	13.47	14.98	15.24	14.49
GSM 1900	Avg. Targets:	12.47	12.47	11.48	11.24	10.99	8.97	10.48	10.74	10.49

Note:

- Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
- EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: B
GPRS Multislot class: 33 (Max 4 Tx uplink slots)
EDGE Multislot class: 33 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A



Figure 10-1
Power Measurement Setup

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10.2 UMTS Conducted Powers

Max

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.07	23.12	22.72	22.48	22.62	22.47	22.70	22.49	22.85	-
99		12.2 kbps AMR	23.06	23.12	22.83	22.49	22.60	22.48	22.71	22.50	22.91	-
6	HSDPA	Subtest 1	23.06	23.12	22.91	22.80	23.18	22.87	23.42	23.24	23.39	0
6		Subtest 2	23.32	23.18	22.92	22.79	23.25	22.94	23.39	23.21	23.46	0
6		Subtest 3	23.28	23.14	22.91	22.77	22.99	22.91	23.40	23.29	23.35	0.5
6		Subtest 4	23.26	23.12	22.97	22.86	23.00	22.90	23.45	23.28	23.49	0.5
6	HSUPA	Subtest 1	22.25	22.33	22.36	21.42	21.74	21.58	22.31	21.71	22.21	0
6		Subtest 2	20.52	20.78	20.75	20.37	20.56	20.31	20.94	20.92	21.08	2
6		Subtest 3	20.61	20.62	20.50	20.72	20.92	20.00	21.17	21.01	20.94	1
6		Subtest 4	21.39	21.40	21.49	20.86	21.00	20.48	21.29	21.46	21.43	2
6		Subtest 5	22.71	22.69	22.49	21.78	22.20	21.84	22.38	22.29	22.52	0
8	DC-HSDPA	Subtest 1	22.93	22.96	22.71	21.81	21.91	21.80	22.11	21.91	22.23	0
8		Subtest 2	22.92	23.00	22.70	21.76	21.87	21.72	22.02	21.86	22.26	0
8		Subtest 3	22.91	22.94	22.73	21.26	21.27	21.11	21.53	21.39	21.66	0.5
8		Subtest 4	22.90	22.93	22.63	21.24	21.32	21.18	21.57	21.35	21.70	0.5

Reduced

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	16.10	16.16	15.99	12.15	12.53	11.13	11.87	11.46	11.22	-
99		12.2 kbps AMR	16.09	16.24	15.92	12.17	12.56	11.18	11.83	11.47	11.24	-
6	HSDPA	Subtest 1	15.60	15.72	15.43	11.39	11.63	10.50	10.85	10.41	10.09	0
6		Subtest 2	15.61	15.73	15.48	11.51	11.76	10.53	10.82	10.34	10.06	0
6		Subtest 3	15.69	15.73	15.46	11.02	11.27	10.05	10.32	9.85	9.59	0.5
6		Subtest 4	15.68	15.70	15.45	11.02	11.25	10.03	10.33	9.86	9.56	0.5
6	HSUPA	Subtest 1	15.13	15.36	15.26	11.03	11.49	10.58	10.84	10.49	10.17	0
6		Subtest 2	13.56	13.64	13.34	10.62	10.30	9.40	9.45	9.27	9.02	2
6		Subtest 3	13.52	14.10	13.48	10.55	10.81	9.61	9.18	9.47	9.21	1
6		Subtest 4	14.12	14.32	14.18	10.89	11.40	9.72	9.74	9.48	9.22	2
6		Subtest 5	15.58	15.69	15.49	11.60	11.88	10.67	11.03	10.53	10.28	0
8	DC-HSDPA	Subtest 1	15.93	15.95	15.66	11.60	11.86	10.66	11.19	10.64	10.23	0
8		Subtest 2	15.90	15.94	15.64	11.57	11.83	10.61	10.99	10.55	10.27	0
8		Subtest 3	15.91	15.93	15.64	11.08	11.33	10.22	10.51	10.01	9.71	0.5
8		Subtest 4	15.90	16.00	15.73	11.09	11.35	10.20	10.45	10.02	9.74	0.5

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- The DUT supports UE category 24 for HSDPA

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.



Figure 10-2
Power Measurement Setup

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10.3 LTE Conducted Powers

10.3.1 Max LTE Band 17

Table 10-1
LTE Band 17 Conducted Powers - 10 MHz Bandwidth

LTE Band 17 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23790 (710.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.30	0	0
	1	25	23.24		0
	1	49	23.34		0
	25	0	22.18	0-1	1
	25	12	22.28		1
	25	25	22.22		1
16QAM	50	0	22.22	0-1	1
	1	0	22.26		1
	1	25	22.16		1
	1	49	22.01	0-2	1
	25	0	21.14		2
	25	12	21.15		2
	25	25	21.22		2
	50	0	21.12		2

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

Table 10-2
LTE Band 17 Conducted Powers - 5 MHz Bandwidth

LTE Band 17 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23790 (710.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.95	0	0
	1	12	23.18		0
	1	24	23.28		0
	12	0	22.10	0-1	1
	12	6	22.11		1
	12	13	22.21		1
16QAM	25	0	22.15	0-1	1
	1	0	21.74		1
	1	12	21.65		1
	1	24	21.72	0-2	1
	12	0	20.90		2
	12	6	20.91		2
	12	13	21.18		2
	25	0	21.06		2

Note: LTE Band 17 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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Reduced LTE Band 17

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

LTE Band 17 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23790 (710.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	17.09	0	0
	1	25	17.13		0
	1	49	17.03		0
	25	0	16.98	0-1	0
	25	12	17.01		0
	25	25	17.07		0
	50	0	17.00		0
16QAM	1	0	16.99	0-1	0
	1	25	16.72		0
	1	49	16.76		0
	25	0	16.97	0-2	0
	25	12	16.98		0
	25	25	17.08		0
	50	0	16.93		0

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

Table 10-4
LTE Band 17 Conducted Powers - 5 MHz Bandwidth

LTE Band 17 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23790 (710.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	16.70	0	0
	1	12	16.84		0
	1	24	16.93		0
	12	0	16.82	0-1	0
	12	6	16.82		0
	12	13	16.84		0
	25	0	16.73		0
16QAM	1	0	16.43	0-1	0
	1	12	16.38		0
	1	24	16.40		0
	12	0	16.90	0-2	0
	12	6	16.94		0
	12	13	16.86		0
	25	0	16.85		0

Note: LTE Band 17 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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Max LTE Band 5 (Cell)

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

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20525 (836.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.33	0	0
	1	25	23.27		0
	1	49	23.11		0
	25	0	22.39	0-1	1
	25	12	22.42		1
	25	25	22.44		1
	50	0	22.41		1
16QAM	1	0	22.53	0-1	1
	1	25	22.26		1
	1	49	22.48		1
	25	0	21.50	0-2	2
	25	12	21.23		2
	25	25	21.18		2
	50	0	21.26		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 10-6
LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20425 (826.5 MHz)	20525 (836.5 MHz)	20625 (846.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.59	23.53	23.50	0	0
	1	12	23.73	23.54	23.59		0
	1	24	23.51	23.42	23.48		0
	12	0	22.56	22.40	22.30	0-1	1
	12	6	22.54	22.39	22.29		1
	12	13	22.50	22.33	22.28		1
	25	0	22.54	22.33	22.33		1
16QAM	1	0	22.01	22.33	22.11	0-1	1
	1	12	22.19	22.69	22.32		1
	1	24	21.98	22.30	22.16		1
	12	0	21.60	21.16	21.15	0-2	2
	12	6	21.69	21.30	21.13		2
	12	13	21.46	21.22	21.23		2
	25	0	21.61	21.28	21.29		2

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Table 10-7
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.39	23.50	23.52	0	0
	1	7	23.67	23.76	23.68		0
	1	14	23.78	23.41	23.31		0
	8	0	22.60	22.32	22.23	0-1	1
	8	4	22.59	22.39	22.32		1
	8	7	22.61	22.35	22.28		1
	15	0	22.58	22.34	22.28		1
16QAM	1	0	22.95	22.37	22.71	0-1	1
	1	7	22.98	22.60	23.16		1
	1	14	22.87	22.44	23.05		1
	8	0	21.54	21.18	21.21	0-2	2
	8	4	21.52	21.13	21.29		2
	8	7	21.62	21.20	21.30		2
	15	0	21.55	21.39	21.29		2

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

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.81	23.60	23.03	0	0
	1	2	23.78	23.78	23.12		0
	1	5	23.72	23.64	22.82		0
	3	0	23.86	23.50	23.36		0
	3	2	23.88	23.38	23.31		0
	3	3	23.63	23.35	23.42		0
	6	0	22.52	22.34	22.33	0-1	1
16QAM	1	0	22.76	21.89	22.58	0-1	1
	1	2	22.71	22.02	22.67		1
	1	5	22.75	21.90	22.72		1
	3	0	22.52	22.56	22.07		1
	3	2	22.64	22.63	21.90		1
	3	3	22.70	22.44	22.15		1
	6	0	21.54	21.56	21.32	0-2	2

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Reduced LTE Band 5 (Cell)

Table 10-9
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20525 (836.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	16.02	0	0
	1	25	15.88		0
	1	49	15.78		0
	25	0	15.94	0-1	0
	25	12	16.06		0
	25	25	16.01		0
	50	0	15.98		0
16QAM	1	0	16.15	0-1	0
	1	25	16.00		0
	1	49	15.97		0
	25	0	16.07	0-2	0
	25	12	16.13		0
	25	25	16.08		0
	50	0	16.08		0

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20425 (826.5 MHz)	20525 (836.5 MHz)	20625 (846.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	16.12	16.16	15.73	0	0
	1	12	16.36	15.85	15.82		0
	1	24	16.16	15.70	15.63		0
	12	0	16.10	15.89	15.75	0-1	0
	12	6	16.05	15.85	15.77		0
	12	13	15.99	15.88	15.81		0
	25	0	16.12	15.88	15.85		0
16QAM	1	0	15.98	15.54	15.80	0-1	0
	1	12	16.23	16.00	15.46		0
	1	24	15.96	15.54	15.17		0
	12	0	16.08	15.79	15.68	0-2	0
	12	6	15.95	15.47	15.93		0
	12	13	15.96	15.46	15.71		0
	25	0	16.01	15.89	15.86		0

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Table 10-11
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	16.06	15.88	15.99	0	0
	1	7	16.05	15.99	15.94		0
	1	14	16.17	15.80	15.92		0
	8	0	16.13	15.84	15.82	0-1	0
	8	4	16.09	15.78	15.77		0
	8	7	16.07	15.88	15.82		0
	15	0	16.07	15.87	15.73		0
16QAM	1	0	16.29	16.29	15.89	0-1	0
	1	7	16.47	16.22	15.83		0
	1	14	16.23	16.08	15.80		0
	8	0	16.12	15.90	15.38	0-2	0
	8	4	16.17	15.86	15.51		0
	8	7	16.09	15.93	15.65		0
	15	0	16.15	15.80	15.86		0

Table 10-12
LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	16.29	15.80	15.43	0	0
	1	2	16.42	15.92	15.50		0
	1	5	16.28	15.83	15.47		0
	3	0	16.12	15.89	15.82		0
	3	2	16.14	16.02	15.76		0
	3	3	16.27	15.91	15.75		0
	6	0	16.11	15.84	15.84	0-1	0
16QAM	1	0	16.19	15.63	16.08	0-1	0
	1	2	16.32	15.59	16.11		0
	1	5	16.21	15.49	16.10		0
	3	0	16.06	16.04	15.44		0
	3	2	16.19	15.99	15.57		0
	3	3	16.03	15.71	15.63		0
	6	0	16.09	16.03	15.84	0-2	0

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Max LTE Band 4 (AWS)

Table 10-13
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.95	0	0
	1	50	23.46		0
	1	99	22.88		0
	50	0	22.18	0-1	1
	50	25	22.14		1
	50	50	21.92		1
	100	0	22.10		1
16QAM	1	0	22.25	0-1	1
	1	50	22.44		1
	1	99	22.10		1
	50	0	21.16	0-2	2
	50	25	21.25		2
	50	50	21.04		2
	100	0	21.01		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 10-14
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.89	22.96	23.31	0	0
	1	36	22.92	23.28	23.27		0
	1	74	22.74	23.25	23.31		0
	36	0	22.14	22.40	22.21	0-1	1
	36	18	22.08	22.33	22.13		1
	36	37	22.13	22.25	22.02		1
	75	0	22.12	22.22	22.08		1
16QAM	1	0	21.99	22.26	22.78	0-1	1
	1	36	22.51	22.61	22.42		1
	1	74	21.91	22.32	22.95		1
	36	0	21.08	21.30	21.13	0-2	2
	36	18	21.05	21.41	21.06		2
	36	37	21.11	21.33	21.03		2
	75	0	21.03	21.32	21.21		2

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

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.99	23.06	23.47	0	0
	1	25	23.32	23.69	23.45		0
	1	49	23.06	23.50	23.24		0
	25	0	22.21	22.31	22.14	0-1	1
	25	12	22.12	22.42	22.09		1
	25	25	22.20	22.46	22.01		1
	50	0	22.28	22.34	22.14		1
16QAM	1	0	22.12	22.03	22.95	0-1	1
	1	25	22.29	22.17	22.76		1
	1	49	22.23	22.21	22.73		1
	25	0	21.00	21.34	21.26	0-2	2
	25	12	21.11	21.44	21.18		2
	25	25	21.21	21.40	21.10		2
	50	0	21.13	21.24	21.20		2

Table 10-16
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.27	23.41	22.75	0	0
	1	12	23.32	23.64	22.94		0
	1	24	23.02	23.62	22.97		0
	12	0	22.27	22.30	22.08	0-1	1
	12	6	22.06	22.29	22.06		1
	12	13	22.00	22.32	22.04		1
	25	0	22.07	22.32	22.07		1
16QAM	1	0	22.16	21.86	21.36	0-1	1
	1	12	22.33	21.73	21.68		1
	1	24	22.04	22.02	21.62		1
	12	0	21.07	21.21	21.13	0-2	2
	12	6	20.78	21.20	21.12		2
	12	13	20.91	21.24	21.01		2
	25	0	20.95	21.27	21.04		2

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Table 10-17
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.27	23.34	22.93	0	0
	1	7	23.46	23.39	23.06		0
	1	14	23.24	23.57	23.12		0
	8	0	22.21	22.41	21.93	0-1	1
	8	4	22.16	22.38	21.98		1
	8	7	22.19	22.46	22.06		1
	15	0	22.20	22.42	22.05		1
16QAM	1	0	22.25	22.95	22.23	0-1	1
	1	7	22.42	22.70	22.34		1
	1	14	22.19	23.00	22.39		1
	8	0	21.00	21.24	20.91	0-2	2
	8	4	20.98	21.26	20.96		2
	8	7	20.93	21.46	20.89		2
	15	0	21.12	21.43	20.85		2

Table 10-18
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.41	23.62	23.08	0	0
	1	2	23.51	23.57	23.15		0
	1	5	23.39	23.48	23.00		0
	3	0	23.32	23.34	23.10		0
	3	2	23.45	23.47	23.06		0
	3	3	23.39	23.35	23.22		0
	6	0	22.29	22.34	22.13	0-1	1
16QAM	1	0	21.74	21.87	22.56	0-1	1
	1	2	22.11	21.98	22.47		1
	1	5	21.97	22.03	22.41		1
	3	0	22.36	22.52	21.95		1
	3	2	22.31	22.61	21.84		1
	3	3	22.19	22.40	21.77		1
	6	0	21.41	21.82	21.22	0-2	2

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Reduced LTE Band 4 (AWS)

Table 10-19
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	12.41	0	0
	1	50	12.40		0
	1	99	11.63		0
	50	0	11.79	0-1	0
	50	25	12.35		0
	50	50	12.06		0
	100	0	11.84		0
16QAM	1	0	11.84	0-1	0
	1	50	12.54		0
	1	99	11.86		0
	50	0	11.92	0-2	0
	50	25	12.37		0
	50	50	11.89		0
	100	0	11.84		0

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

Table 10-20
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.94	12.31	12.42	0	0
	1	36	12.02	12.83	12.31		0
	1	74	12.25	12.44	11.77		0
	36	0	11.87	12.64	12.20	0-1	0
	36	18	12.02	12.87	11.91		0
	36	37	12.16	12.73	11.65		0
	75	0	11.95	12.72	11.78		0
16QAM	1	0	11.95	12.71	12.56	0-1	0
	1	36	12.17	12.91	12.55		0
	1	74	12.29	12.86	11.93		0
	36	0	11.90	12.54	12.18	0-2	0
	36	18	12.02	12.71	12.18		0
	36	37	12.07	12.63	11.83		0
	75	0	12.01	12.61	11.95		0

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Table 10-21
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.88	12.29	11.93	0	0
	1	25	11.95	12.67	11.91		0
	1	49	11.94	12.41	11.68		0
	25	0	12.08	12.46	12.03	0-1	0
	25	12	11.90	12.65	11.78		0
	25	25	12.04	12.48	11.79		0
	50	0	12.03	12.52	11.86		0
16QAM	1	0	12.44	12.53	12.17	0-1	0
	1	25	12.58	12.90	12.10		0
	1	49	12.30	12.39	11.86		0
	25	0	11.89	12.50	11.97	0-2	0
	25	12	11.99	12.66	11.84		0
	25	25	11.86	12.51	11.86		0
	50	0	11.83	12.54	11.91		0

Table 10-22
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	12.29	12.78	12.26	0	0
	1	12	12.11	12.59	11.86		0
	1	24	12.42	12.78	12.22		0
	12	0	12.27	12.59	11.94	0-1	0
	12	6	12.09	12.58	11.96		0
	12	13	12.13	12.53	12.03		0
	25	0	12.24	12.55	12.09		0
16QAM	1	0	12.59	12.90	12.50	0-1	0
	1	12	12.42	12.81	12.07		0
	1	24	12.47	12.90	12.42		0
	12	0	12.23	12.59	12.00	0-2	0
	12	6	12.11	12.58	12.00		0
	12	13	11.88	12.54	12.08		0
	25	0	11.99	12.56	12.13		0

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Table 10-23
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	12.10	12.65	12.07	0	0
	1	7	12.24	12.55	11.86		0
	1	14	12.32	12.58	12.05		0
	8	0	12.26	12.51	11.85	0-1	0
	8	4	12.25	12.57	11.91		0
	8	7	12.15	12.58	11.90		0
	15	0	12.20	12.55	11.88		0
16QAM	1	0	12.25	12.90	12.66	0-1	0
	1	7	12.37	12.81	12.45		0
	1	14	12.22	12.85	12.67		0
	8	0	12.22	12.54	11.98	0-2	0
	8	4	12.21	12.59	12.02		0
	8	7	12.11	12.61	12.03		0
	15	0	12.21	12.57	11.95		0

Table 10-24
LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.88	12.51	11.72	0	0
	1	2	12.16	12.66	11.88		0
	1	5	12.05	12.56	11.74		0
	3	0	12.08	12.55	11.85		0
	3	2	12.24	12.61	11.91		0
	3	3	12.13	12.56	11.88		0
	6	0	12.18	12.53	11.84	0-1	0
16QAM	1	0	12.16	12.32	11.87	0-1	0
	1	2	12.41	12.49	12.05		0
	1	5	12.36	12.39	11.90		0
	3	0	12.00	12.57	11.91		0
	3	2	12.18	12.66	11.94		0
	3	3	12.09	12.63	11.88		0
	6	0	12.24	12.70	11.97	0-2	0

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Max LTE Band 2 (PCS)

Table 10-25
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.26	23.00	23.57	c	0
	1	50	23.19	23.03	23.64		0
	1	99	22.76	23.07	23.55		0
	50	0	22.12	21.95	22.34	0-1	1
	50	25	22.09	22.00	22.42		1
	50	50	22.11	21.95	22.29		1
	100	0	22.07	22.09	22.34		1
16QAM	1	0	22.55	21.93	22.22	0-1	1
	1	50	22.48	22.18	21.74		1
	1	99	22.36	22.19	22.54		1
	50	0	20.94	20.78	21.34	0-2	2
	50	25	21.05	20.94	21.32		2
	50	50	20.91	20.99	21.37		2
	100	0	21.06	20.74	21.33		2

Table 10-26
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 2 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18675 (1857.5 MHz)	18900 (1880.0 MHz)	19125 (1902.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.54	23.11	23.45	0	0
	1	36	23.32	23.35	23.40		0
	1	74	23.24	23.60	23.48		0
	36	0	22.42	22.17	22.55	0-1	1
	36	18	22.32	22.14	22.53		1
	36	37	22.26	22.26	22.46		1
	75	0	22.29	22.24	22.42		1
16QAM	1	0	22.78	22.59	22.57	0-1	1
	1	36	22.60	22.95	22.64		1
	1	74	22.18	22.54	22.70		1
	36	0	21.51	20.99	21.45	0-2	2
	36	18	21.27	21.18	21.50		2
	36	37	21.04	21.06	21.44		2
	75	0	21.25	21.19	21.37		2

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Table 10-27
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 2 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18650 (1855.0 MHz)	18900 (1880.0 MHz)	19150 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.56	23.33	23.56	0	0
	1	25	23.60	23.26	23.61		0
	1	49	23.36	23.52	23.29		0
	25	0	22.39	22.21	22.60	0-1	1
	25	12	22.34	22.15	22.43		1
	25	25	22.41	22.24	22.39		1
	50	0	22.36	22.18	22.46		1
16QAM	1	0	22.66	22.98	22.73	0-1	1
	1	25	22.35	22.84	22.68		1
	1	49	22.52	22.62	22.91		1
	25	0	21.50	21.27	21.66	0-2	2
	25	12	21.34	21.24	21.50		2
	25	25	21.54	21.17	21.27		2
	50	0	21.48	21.20	21.43		2

Table 10-28
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 2 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18625 (1852.5 MHz)	18900 (1880.0 MHz)	19175 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.14	22.93	23.11	0	0
	1	12	23.44	22.96	23.22		0
	1	24	23.16	23.14	23.16		0
	12	0	22.28	22.05	22.23	0-1	1
	12	6	22.19	21.94	22.15		1
	12	13	22.17	22.07	22.19		1
	25	0	22.20	22.04	22.13		1
16QAM	1	0	22.05	21.88	21.93	0-1	1
	1	12	22.22	22.21	21.78		1
	1	24	22.14	22.03	21.61		1
	12	0	20.94	20.73	21.11	0-2	2
	12	6	20.87	20.71	21.08		2
	12	13	21.00	20.95	20.90		2
	25	0	21.07	20.96	21.16		2

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Table 10-29
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 2 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18615 (1851.5 MHz)	18900 (1880.0 MHz)	19185 (1908.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.31	22.75	23.28	0	0
	1	7	23.30	22.92	23.22		0
	1	14	23.07	23.18	23.18		0
	8	0	22.18	21.91	22.13	0-1	1
	8	4	22.19	21.93	22.19		1
	8	7	22.20	21.94	22.16		1
	15	0	22.13	21.91	22.06		1
16QAM	1	0	22.83	22.39	22.33	0-1	1
	1	7	22.82	22.31	22.07		1
	1	14	22.80	22.46	22.48		1
	8	0	21.10	21.04	20.83	0-2	2
	8	4	21.12	20.94	20.93		2
	8	7	21.17	21.01	20.87		2
	15	0	21.05	20.97	21.16		2

Table 10-30
LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 2 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18607 (1850.7 MHz)	18900 (1880.0 MHz)	19193 (1909.3 MHz)		
QPSK	1	0	23.25	22.66	23.33	0	0
	1	2	23.39	22.91	23.49		0
	1	5	23.37	22.65	23.54		0
	3	0	23.15	22.93	23.28		0
	3	2	23.23	22.92	23.25		0
	3	3	23.20	22.86	23.13		0
	6	0	22.15	21.90	22.11	0-1	1
16QAM	1	0	21.78	22.21	22.30	0-1	1
	1	2	21.96	22.15	22.35		1
	1	5	22.09	22.09	22.29		1
	3	0	22.44	21.68	22.14		1
	3	2	22.05	21.67	22.23		1
	3	3	22.25	21.58	22.13		1
	6	0	21.50	21.06	21.17	0-2	2

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Reduced LTE Band 2 (PCS)

Table 10-31
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.34	11.74	11.88	0	0
	1	50	12.07	11.81	12.18		0
	1	99	11.60	11.29	11.62		0
	50	0	11.99	11.52	12.00	0-1	0
	50	25	11.93	11.60	12.13		0
	50	50	11.61	11.52	12.26		0
	100	0	11.74	11.75	12.10		0
16QAM	1	0	11.48	12.20	11.91	0-1	0
	1	50	11.95	12.22	12.50		0
	1	99	12.00	11.54	12.08		0
	50	0	11.59	11.68	11.63	0-2	0
	50	25	11.64	11.70	12.05		0
	50	50	11.76	11.37	11.87		0
	100	0	11.64	11.35	11.66		0

Table 10-32
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 2 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18675 (1857.5 MHz)	18900 (1880.0 MHz)	19125 (1902.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.72	12.05	12.05	0	0
	1	36	11.93	11.98	12.40		0
	1	74	11.91	11.59	11.94		0
	36	0	12.14	11.77	12.14	0-1	0
	36	18	11.96	11.80	12.33		0
	36	37	11.89	11.81	12.50		0
	75	0	12.09	11.87	12.25		0
16QAM	1	0	11.87	12.34	12.24	0-1	0
	1	36	12.16	12.20	12.63		0
	1	74	12.21	11.78	12.54		0
	36	0	11.78	11.94	12.27	0-2	0
	36	18	12.05	11.92	12.32		0
	36	37	12.06	11.45	12.18		0
	75	0	11.79	11.52	11.96		0

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Table 10-33
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 2 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18650 (1855.0 MHz)	18900 (1880.0 MHz)	19150 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	11.56	11.66	12.02	0	0
	1	25	11.90	11.70	12.32		0
	1	49	11.77	11.67	11.78		0
	25	0	12.12	11.78	12.43	0-1	0
	25	12	11.89	11.73	12.31		0
	25	25	12.11	11.82	12.23		0
	50	0	12.13	11.92	12.30		0
16QAM	1	0	11.75	12.05	12.55	0-1	0
	1	25	12.14	12.02	12.64		0
	1	49	11.65	11.51	12.27		0
	25	0	11.77	11.55	12.55	0-2	0
	25	12	12.01	11.80	12.29		0
	25	25	11.77	11.47	11.90		0
	50	0	11.75	11.53	11.95		0

Table 10-34
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 2 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18625 (1852.5 MHz)	18900 (1880.0 MHz)	19175 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	12.17	12.47	12.52	0	0
	1	12	12.12	11.88	12.03		0
	1	24	12.57	12.37	12.18		0
	12	0	12.05	12.16	12.58	0-1	0
	12	6	12.20	11.90	12.17		0
	12	13	12.30	12.13	12.08		0
	25	0	11.94	12.20	12.45		0
16QAM	1	0	12.45	12.33	12.44	0-1	0
	1	12	12.41	12.18	12.25		0
	1	24	12.46	12.24	12.39		0
	12	0	12.04	11.78	12.23	0-2	0
	12	6	12.22	11.96	12.22		0
	12	13	11.91	11.76	12.11		0
	25	0	11.96	11.83	12.09		0

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Table 10-35
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 2 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18615 (1851.5 MHz)	18900 (1880.0 MHz)	19185 (1908.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	12.07	12.29	12.41	0	0
	1	7	12.14	11.90	12.09		0
	1	14	12.03	12.19	12.00		0
	8	0	12.14	11.90	12.04	0-1	0
	8	4	12.15	11.92	12.21		0
	8	7	12.12	11.81	12.25		0
	15	0	12.14	11.91	12.05		0
16QAM	1	0	12.22	12.18	12.58	0-1	0
	1	7	12.27	12.23	12.67		0
	1	14	12.19	12.08	12.61		0
	8	0	12.13	11.98	12.12	0-2	0
	8	4	12.14	11.97	12.28		0
	8	7	12.11	11.87	12.34		0
	15	0	12.17	11.95	12.09		0

Table 10-36
LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 2 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18607 (1850.7 MHz)	18900 (1880.0 MHz)	19193 (1909.3 MHz)		
QPSK	1	0	12.10	11.86	12.11	0	0
	1	2	12.25	12.04	12.27		0
	1	5	12.07	11.81	11.98		0
	3	0	12.16	12.01	12.20		0
	3	2	12.20	12.02	12.25		0
	3	3	12.17	11.97	12.15		0
	6	0	12.15	11.98	12.23	0-1	0
16QAM	1	0	11.95	12.00	12.38	0-1	0
	1	2	12.12	12.22	12.52		0
	1	5	11.94	11.99	12.27		0
	3	0	12.21	12.08	12.13		0
	3	2	12.29	12.07	12.19		0
	3	3	12.28	11.97	12.12		0
	6	0	12.34	12.11	12.30	0-2	0

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Max LTE Band 7

Table 10-37
LTE Band 7 Conducted Powers - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.36	23.90	23.97	0	0
	1	50	23.88	24.56	23.86		0
	1	99	23.84	23.94	23.48		0
	50	0	22.82	23.22	23.03	0-1	1
	50	25	22.81	23.25	23.00		1
	50	50	22.82	23.20	22.85		1
16QAM	100	0	22.82	23.19	22.85	0-1	1
	1	0	22.83	22.84	22.88		1
	1	50	23.11	23.11	22.58		1
	1	99	23.34	23.00	22.65	0-2	1
	50	0	21.83	22.38	22.10		2
	50	25	21.74	22.39	22.02		2
	50	50	21.82	22.35	21.81		2
	100	0	21.82	22.33	21.97		2

Table 10-38
LTE Band 7 Conducted Powers - 15 MHz Bandwidth

LTE Band 7 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20825 (2507.5 MHz)	21100 (2535.0 MHz)	21375 (2562.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.31	23.68	24.15	0	0
	1	36	23.43	23.86	24.20		0
	1	74	23.59	23.73	23.61		0
	36	0	22.66	23.15	22.94	0-1	1
	36	18	22.63	23.13	22.96		1
	36	37	22.74	23.03	22.71		1
16QAM	75	0	22.72	23.11	22.89	0-1	1
	1	0	22.76	23.14	22.83		1
	1	36	22.74	23.02	22.69		1
	1	74	22.66	22.97	22.61	0-2	1
	36	0	21.57	22.32	22.10		2
	36	18	21.56	22.29	22.11		2
	36	37	21.58	22.27	21.95		2
	75	0	21.66	22.19	21.84		2

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Table 10-39
LTE Band 7 Conducted Powers - 10 MHz Bandwidth

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20800 (2505.0 MHz)	21100 (2535.0 MHz)	21400 (2565.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.26	24.19	23.87	0	0
	1	25	23.41	24.44	23.89		0
	1	49	23.56	24.05	23.62		0
	25	0	22.51	23.17	22.87	0-1	1
	25	12	22.54	23.13	22.77		1
	25	25	22.69	23.19	22.69		1
	50	0	22.57	23.20	22.83		1
16QAM	1	0	22.56	23.08	22.95	0-1	1
	1	25	22.82	23.06	22.78		1
	1	49	22.82	23.13	22.75		1
	25	0	21.46	22.27	22.01	0-2	2
	25	12	21.59	22.26	21.84		2
	25	25	21.69	22.23	21.86		2
	50	0	21.53	22.25	21.82		2

Table 10-40
LTE Band 7 Conducted Powers - 5 MHz Bandwidth

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20775 (2502.5 MHz)	21100 (2535.0 MHz)	21425 (2567.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.25	24.25	23.64	0	0
	1	12	23.51	24.44	23.97		0
	1	24	23.41	24.28	23.50		0
	12	0	22.54	23.13	22.72	0-1	1
	12	6	22.55	23.16	22.78		1
	12	13	22.61	23.15	22.69		1
	25	0	22.52	23.10	22.70		1
16QAM	1	0	22.33	23.32	22.40	0-1	1
	1	12	22.53	23.58	22.99		1
	1	24	22.34	22.97	22.49		1
	12	0	21.45	22.08	21.90	0-2	2
	12	6	21.41	22.13	21.91		2
	12	13	21.47	22.09	21.80		2
	25	0	21.50	22.20	21.74		2

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Table 10-41
LTE Band 7 Conducted Powers - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	13.75	14.13	14.46	0	0
	1	50	14.00	14.52	14.54		0
	1	99	14.35	14.33	13.97		0
	50	0	14.14	14.42	14.37	0-1	0
	50	25	14.15	14.50	14.41		0
	50	50	14.40	14.51	14.17		0
	100	0	13.96	14.48	14.24		0
16QAM	1	0	14.05	14.20	14.92	0-1	0
	1	50	14.41	14.62	14.94		0
	1	99	14.40	14.35	14.56		0
	50	0	13.88	14.45	14.48	0-2	0
	50	25	13.97	14.64	14.50		0
	50	50	14.00	14.43	14.24		0
	100	0	14.01	14.57	14.26		0

Table 10-42
LTE Band 7 Conducted Powers - 15 MHz Bandwidth

LTE Band 7							
15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20825 (2507.5 MHz)	21100 (2535.0 MHz)	21375 (2562.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	13.81	14.42	13.98	0	0
	1	36	13.95	14.46	13.92		0
	1	74	14.18	14.47	13.81		0
	36	0	13.99	14.49	14.15	0-1	0
	36	18	14.00	14.57	14.20		0
	36	37	14.03	14.57	14.00		0
	75	0	13.98	14.56	14.16		0
16QAM	1	0	13.80	14.18	14.19	0-1	0
	1	36	13.98	14.38	14.13		0
	1	74	14.38	14.40	14.03		0
	36	0	13.84	14.61	14.19	0-2	0
	36	18	13.83	14.32	14.19		0
	36	37	13.97	14.34	13.98		0
	75	0	13.99	14.57	14.20		0

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Table 10-43
LTE Band 7 Conducted Powers - 10 MHz Bandwidth

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20800 (2505.0 MHz)	21100 (2535.0 MHz)	21400 (2565.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	13.92	14.54	14.32	0	0
	1	25	14.10	14.74	14.33		0
	1	49	13.91	14.75	14.14		0
	25	0	13.97	14.62	14.20	0-1	0
	25	12	14.06	14.69	14.09		0
	25	25	14.20	14.68	14.07		0
	50	0	14.00	14.67	14.05		0
16QAM	1	0	13.91	14.61	14.35	0-1	0
	1	25	14.17	14.49	14.28		0
	1	49	14.32	14.55	14.16		0
	25	0	14.02	14.67	14.24	0-2	0
	25	12	14.05	14.70	14.17		0
	25	25	14.13	14.65	14.14		0
	50	0	14.04	14.45	14.09		0

Table 10-44
LTE Band 7 Conducted Powers - 5 MHz Bandwidth

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20775 (2502.5 MHz)	21100 (2535.0 MHz)	21425 (2567.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	13.85	14.58	13.97	0	0
	1	12	13.97	14.68	13.92		0
	1	24	14.02	14.67	13.91		0
	12	0	14.02	14.64	14.00	0-1	0
	12	6	14.04	14.65	14.17		0
	12	13	14.01	14.56	14.05		0
	25	0	13.97	14.56	14.12		0
16QAM	1	0	13.42	14.57	14.25	0-1	0
	1	12	13.53	14.83	13.82		0
	1	24	13.63	14.64	13.71		0
	12	0	13.17	14.32	13.67	0-2	0
	12	6	13.20	14.46	13.53		0
	12	13	13.14	14.45	13.42		0
	25	0	13.16	14.75	13.54		0

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Table 10-45
LTE Band 38 Conducted Powers - 20 MHz Bandwidth

LTE Band 38 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			38000 (2595.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.50	0	0
	1	50	23.50		0
	1	99	23.46		0
	50	0	22.63	0-1	1
	50	25	22.54		1
	50	50	22.48		1
	100	0	22.51		1
16QAM	1	0	22.80	0-1	1
	1	50	22.54		1
	1	99	22.34		1
	50	0	21.89	0-2	2
	50	25	21.84		2
	50	50	21.61		2
	100	0	21.70		2

Note: LTE Band 38 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 10-46
LTE Band 38 Conducted Powers - 15 MHz Bandwidth

LTE Band 38 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37825 (2577.5 MHz)	38000 (2595.0 MHz)	38175 (2612.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.66	23.46	23.35	0	0
	1	36	23.46	23.25	23.17		0
	1	74	23.42	23.13	23.16		0
	36	0	22.46	22.42	22.26	0-1	1
	36	18	22.41	22.40	22.18		1
	36	37	22.48	22.28	22.11		1
	75	0	22.39	22.36	22.14		1
16QAM	1	0	22.21	22.31	21.98	0-1	1
	1	36	22.15	22.23	21.87		1
	1	74	22.10	22.13	21.77		1
	36	0	21.57	21.46	21.21	0-2	2
	36	18	21.50	21.39	21.20		2
	36	37	21.46	21.26	21.12		2
	75	0	21.25	21.30	20.94		2

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Table 10-47
LTE Band 38 Conducted Powers - 10 MHz Bandwidth

LTE Band 38 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37800 (2575.0 MHz)	38000 (2595.0 MHz)	38200 (2615.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.56	23.58	23.36	0	0
	1	25	23.47	23.61	23.32		0
	1	49	23.37	23.50	23.34		0
	25	0	22.43	22.40	22.13	0-1	1
	25	12	22.47	22.33	22.20		1
	25	25	22.41	22.33	22.21		1
	50	0	22.50	22.37	22.16		1
16QAM	1	0	22.52	22.07	21.96	0-1	1
	1	25	22.38	22.04	21.87		1
	1	49	22.05	21.97	21.73		1
	25	0	21.47	21.29	21.12	0-2	2
	25	12	21.43	21.28	21.04		2
	25	25	21.37	21.22	21.06		2
	50	0	21.41	21.32	21.13		2

Table 10-48
LTE Band 38 Conducted Powers - 5 MHz Bandwidth

LTE Band 38 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37775 (2572.5 MHz)	38000 (2595.0 MHz)	38225 (2617.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.51	23.21	23.18	0	0
	1	12	23.63	23.33	23.35		0
	1	24	23.38	23.15	23.14		0
	12	0	22.42	22.37	22.13	0-1	1
	12	6	22.51	22.34	22.13		1
	12	13	22.40	22.32	22.15		1
	25	0	22.42	22.38	22.17		1
16QAM	1	0	22.79	22.70	22.39	0-1	1
	1	12	22.99	22.87	22.41		1
	1	24	22.83	22.64	22.83		1
	12	0	21.30	21.19	21.11	0-2	2
	12	6	21.26	21.17	21.14		2
	12	13	21.18	21.12	21.28		2
	25	0	21.41	21.24	21.19		2

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10.3.1

Reduced LTE Band 38

Table 10-49
LTE Band 38 Conducted Powers - 20 MHz Bandwidth

LTE Band 38 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			38000 (2595.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	14.86	0	0
	1	50	14.98		0
	1	99	14.55		0
	50	0	15.13	0-1	0
	50	25	15.00		0
	50	50	14.78		0
	100	0	14.82		0
16QAM	1	0	14.92	0-1	0
	1	50	15.03		0
	1	99	14.56		0
	50	0	15.12	0-2	0
	50	25	15.20		0
	50	50	14.97		0
	100	0	14.95		0

Note: LTE Band 38 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 10-50
LTE Band 38 Conducted Powers - 15 MHz Bandwidth

LTE Band 38 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37825 (2577.5 MHz)	38000 (2595.0 MHz)	38175 (2612.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	14.82	14.77	14.80	0	0
	1	36	14.69	14.80	14.60		0
	1	74	14.71	14.64	14.44		0
	36	0	14.91	14.80	14.64	0-1	0
	36	18	14.78	14.86	14.57		0
	36	37	14.87	14.73	14.54		0
	75	0	14.86	14.75	14.53		0
16QAM	1	0	14.77	14.74	14.38	0-1	0
	1	36	14.70	14.81	14.30		0
	1	74	14.68	14.74	14.30		0
	36	0	14.87	14.96	14.72	0-2	0
	36	18	14.81	14.88	14.56		0
	36	37	14.95	14.88	14.57		0
	75	0	14.82	14.84	14.57		0

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Table 10-51
LTE Band 38 Conducted Powers - 10 MHz Bandwidth

LTE Band 38 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37800 (2575.0 MHz)	38000 (2595.0 MHz)	38200 (2615.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	15.09	14.98	14.64	0	0
	1	25	15.10	15.05	14.73		0
	1	49	15.16	14.85	14.55		0
	25	0	14.98	14.73	14.64	0-1	0
	25	12	14.86	14.76	14.56		0
	25	25	14.89	14.84	14.59		0
	50	0	14.93	14.74	14.58		0
16QAM	1	0	14.73	14.39	14.51	0-1	0
	1	25	14.59	14.50	14.54		0
	1	49	14.69	14.48	14.53		0
	25	0	14.79	14.82	14.66	0-2	0
	25	12	14.86	14.77	14.63		0
	25	25	14.84	14.83	14.61		0
	50	0	14.89	14.85	14.54		0

Table 10-52
LTE Band 38 Conducted Powers - 5 MHz Bandwidth

LTE Band 38 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37775 (2572.5 MHz)	38000 (2595.0 MHz)	38225 (2617.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	14.93	14.85	14.60	0	0
	1	12	15.04	14.88	14.63		0
	1	24	14.80	14.77	14.63		0
	12	0	14.90	14.75	14.57	0-1	0
	12	6	14.82	14.79	14.54		0
	12	13	14.86	14.74	14.58		0
	25	0	14.89	14.75	14.59		0
16QAM	1	0	15.11	14.85	14.51	0-1	0
	1	12	15.26	15.29	14.55		0
	1	24	15.25	15.14	14.40		0
	12	0	14.87	15.12	14.48	0-2	0
	12	6	14.83	15.04	14.64		0
	12	13	14.80	15.00	14.58		0
	25	0	14.77	14.82	14.57		0

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10.4 WLAN Conducted Powers

Table 10-53
2.4 GHz Average RF Maximum Output Power

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	18.24	14.61	12.76
2437	6	18.36	15.05	13.21
2462	11	17.95	14.73	12.74

Table 10-54
5 GHz Average RF Maximum Output Power

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]
		IEEE Transmission Mode
		802.11a
5180	36	14.04
5200	40	13.68
5220	44	14.24
5240	48	14.24
5260	52	14.34
5280	56	14.44
5300	60	14.45
5320	64	14.16
5500	100	13.87
5600	120	13.84
5620	124	14.30
5720	144	14.30
5745	149	13.94
5785	157	13.77
5825	165	14.14

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Table 10-55
2.4 GHz Average RF Reduced Output Power

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	13.11	12.84	12.76
2437	6	13.05	13.24	13.21
2462	11	13.17	13.16	12.74

Table 10-56
5 GHz Average RF Reduced Output Power

Freq [MHz]	Channel	5GHz (40MHz) Conducted Power [dBm]
		IEEE Transmission Mode
		802.11n
5190	38	10.40
5230	46	9.57
5270	54	9.76
5310	62	10.49
5510	102	10.28
5590	118	9.90
5630	126	9.81
5710	142	10.24
5755	151	9.96
5795	159	9.79

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- 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.

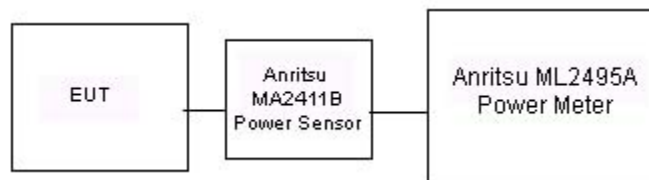


Figure 10-3
Power Measurement Setup

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10.1 Bluetooth Conducted Powers

Table 10-57
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.48	11.180
2441	1.0	39	10.33	10.789
2480	1.0	78	10.91	12.329
2402	2.0	0	8.18	6.576
2441	2.0	39	8.07	6.406
2480	2.0	78	8.59	7.236
2402	3.0	0	8.24	6.672
2441	3.0	39	8.13	6.504
2480	3.0	78	8.66	7.353

Note: The bolded data rates and channel above were tested for SAR.

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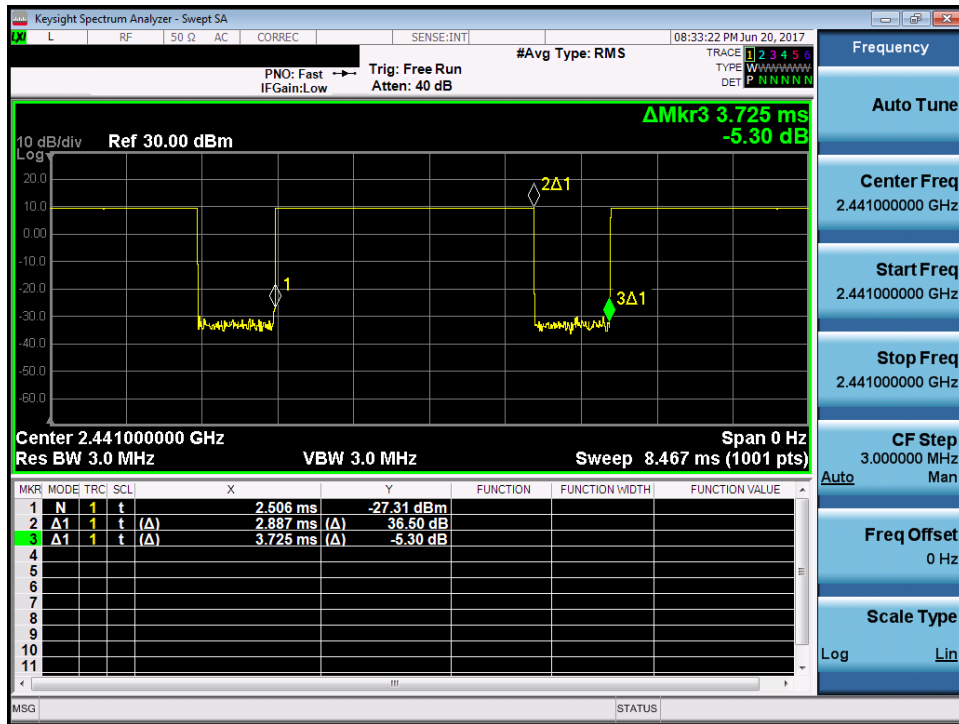


Figure 10-4
Bluetooth Transmission Plot

Equation 2 Bluetooth Duty Cycle Calculation

$$\text{Duty Cycle} = \text{Pulse} \frac{\text{Width}}{\text{Period}} * 100\% = \frac{2.887\text{ms}}{3.725\text{ms}} * 100\% = 77.5\%$$

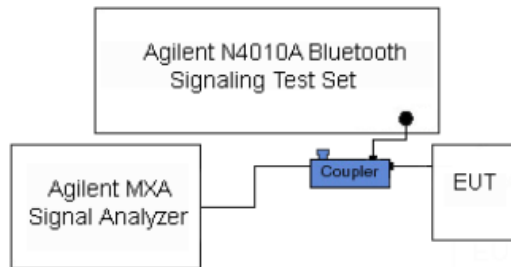


Figure 10-5
Power Measurement Setup

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11 SYSTEM VERIFICATION

11.1 Tissue Verification

Table 11-1
Head 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
6/3/2017	750H	20.6	700	0.853	42.789	0.889	42.201	-4.05%	1.39%
			710	0.864	42.691	0.890	42.149	-2.92%	1.29%
			740	0.894	42.333	0.893	41.994	0.11%	0.81%
			755	0.907	42.118	0.894	41.916	1.45%	0.48%
5/30/2017	835H	19.9	820	0.872	40.114	0.899	41.578	-3.00%	-3.52%
			835	0.886	39.901	0.900	41.500	-1.56%	-3.85%
			850	0.900	39.692	0.916	41.500	-1.75%	-4.36%
5/30/2017	1750H	21.8	1710	1.378	39.860	1.348	40.142	2.23%	-0.70%
			1750	1.414	39.626	1.371	40.079	3.14%	-1.13%
			1790	1.460	39.444	1.394	40.016	4.73%	-1.43%
6/1/2017	1900H	22.0	1850	1.381	39.648	1.400	40.000	-1.36%	-0.88%
			1880	1.411	39.509	1.400	40.000	0.79%	-1.23%
			1910	1.443	39.364	1.400	40.000	3.07%	-1.59%
6/7/2017	2450H	21.2	2400	1.816	38.159	1.756	39.289	3.42%	-2.88%
			2450	1.864	37.928	1.800	39.200	3.56%	-3.24%
			2500	1.918	37.705	1.855	39.136	3.40%	-3.66%
6/12/2017	2450H-2600H	23.8	2400	1.820	38.441	1.756	39.289	3.64%	-2.16%
			2450	1.876	38.255	1.800	39.200	4.22%	-2.41%
			2500	1.931	38.053	1.855	39.136	4.10%	-2.77%
			2550	1.992	37.865	1.909	39.073	4.35%	-3.09%
			2600	2.044	37.646	1.964	39.009	4.07%	-3.49%
6/19/2017	2450H	24.0	2400	1.750	38.524	1.756	39.289	-0.34%	-1.95%
			2450	1.803	38.360	1.800	39.200	0.17%	-2.14%
			2500	1.858	38.152	1.855	39.136	0.16%	-2.51%
06/10/2017	5200H-5800H	21.6	5180	4.503	35.130	4.635	36.009	-2.85%	-2.44%
			5200	4.525	35.103	4.655	35.986	-2.79%	-2.45%
			5220	4.550	35.064	4.676	35.963	-2.69%	-2.50%
			5240	4.573	35.051	4.696	35.940	-2.62%	-2.47%
			5260	4.587	35.008	4.717	35.917	-2.76%	-2.53%
			5280	4.600	34.970	4.737	35.894	-2.89%	-2.57%
			5300	4.622	34.927	4.758	35.871	-2.86%	-2.63%
			5320	4.647	34.917	4.778	35.849	-2.74%	-2.60%
			5500	4.828	34.670	4.963	35.643	-2.72%	-2.73%
			5520	4.842	34.647	4.983	35.620	-2.83%	-2.73%
			5540	4.868	34.595	5.004	35.597	-2.72%	-2.81%
			5560	4.875	34.592	5.024	35.574	-2.97%	-2.76%
			5580	4.906	34.548	5.045	35.551	-2.76%	-2.82%
			5600	4.940	34.501	5.065	35.529	-2.47%	-2.89%
			5620	4.966	34.473	5.086	35.506	-2.36%	-2.91%
			5640	4.990	34.432	5.106	35.483	-2.27%	-2.96%
			5660	4.983	34.451	5.127	35.460	-2.81%	-2.85%
			5680	5.008	34.377	5.147	35.437	-2.70%	-2.99%
			5700	5.039	34.346	5.168	35.414	-2.50%	-3.02%
			5745	5.097	34.312	5.214	35.363	-2.24%	-2.97%
			5765	5.120	34.263	5.234	35.340	-2.18%	-3.05%
			5785	5.122	34.259	5.255	35.317	-2.53%	-3.00%
			5800	5.132	34.211	5.270	35.300	-2.62%	-3.08%
			5805	5.138	34.193	5.275	35.294	-2.60%	-3.12%
			5825	5.167	34.154	5.296	35.271	-2.44%	-3.17%

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Table 11-2
Body 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
6/5/2017	750B	21.8	700	0.925	57.466	0.959	55.726	-3.55%	3.12%
			710	0.935	57.351	0.960	55.687	-2.60%	2.99%
			740	0.966	57.032	0.963	55.570	0.31%	2.63%
			755	0.981	56.891	0.964	55.512	1.76%	2.48%
5/25/2017	835B	21.8	820	0.961	53.435	0.969	55.258	-0.83%	-3.30%
			835	0.976	53.279	0.970	55.200	0.62%	-3.48%
			850	0.991	53.111	0.988	55.154	0.30%	-3.70%
5/30/2017	835B	22.2	820	0.981	54.385	0.969	55.258	1.24%	-1.58%
			835	0.995	54.237	0.970	55.200	2.58%	-1.74%
			850	1.010	54.097	0.988	55.154	2.23%	-1.92%
5/26/2017	1750B	22.0	1710	1.463	51.663	1.463	53.537	0.00%	-3.50%
			1750	1.506	51.537	1.488	53.432	1.21%	-3.55%
			1790	1.549	51.368	1.514	53.326	2.31%	-3.67%
6/1/2017	1750B	21.6	1710	1.424	52.751	1.463	53.537	-2.67%	-1.47%
			1750	1.465	52.605	1.488	53.432	-1.55%	-1.55%
			1790	1.512	52.496	1.514	53.326	-0.13%	-1.56%
5/30/2017	1900B	24.5	1850	1.478	52.500	1.520	53.300	-2.76%	-1.50%
			1880	1.513	52.417	1.520	53.300	-0.46%	-1.66%
			1910	1.547	52.330	1.520	53.300	1.78%	-1.82%
6/6/2017	1900B	22.0	1850	1.523	51.945	1.520	53.300	0.20%	-2.54%
			1880	1.555	51.859	1.520	53.300	2.30%	-2.70%
			1910	1.589	51.764	1.520	53.300	4.54%	-2.88%
6/7/2017	2450B	23.4	2400	1.862	51.112	1.902	52.767	-2.10%	-3.14%
			2450	1.937	50.961	1.950	52.700	-0.67%	-3.30%
			2500	1.992	50.759	2.021	52.636	-1.43%	-3.57%
6/14/2017	2450B-2600B	22.7	2400	1.965	51.708	1.902	52.767	3.31%	-2.01%
			2450	2.032	51.551	1.950	52.700	4.21%	-2.18%
			2500	2.101	51.336	2.021	52.636	3.96%	-2.47%
			2550	2.172	51.178	2.092	52.573	3.82%	-2.65%
6/19/2017	2450B-2600B	23.1	2600	2.244	50.971	2.163	52.509	3.74%	-2.93%
			2400	1.959	51.489	1.902	52.767	3.00%	-2.42%
			2450	2.018	51.288	1.950	52.700	3.49%	-2.68%
			2500	2.093	51.068	2.021	52.636	3.56%	-2.98%
06/05/2017	5200B-5800B	21.9	2550	2.161	50.909	2.092	52.573	3.30%	-3.17%
			2600	2.226	50.648	2.163	52.509	2.91%	-3.54%
			5180	5.319	49.031	5.276	49.041	0.82%	-0.02%
			5200	5.353	48.966	5.299	49.014	1.02%	-0.10%
			5220	5.379	48.910	5.323	48.987	1.05%	-0.16%
			5240	5.411	48.902	5.346	48.960	1.22%	-0.12%
			5260	5.422	48.864	5.369	48.933	0.99%	-0.14%
			5280	5.464	48.874	5.393	48.906	1.32%	-0.07%
			5300	5.487	48.830	5.416	48.879	1.31%	-0.10%
			5320	5.512	48.776	5.439	48.851	1.34%	-0.15%
			5500	5.753	48.495	5.650	48.607	1.82%	-0.23%
			5520	5.776	48.435	5.673	48.580	1.82%	-0.30%
			5540	5.805	48.388	5.696	48.553	1.91%	-0.34%
			5560	5.830	48.367	5.720	48.526	1.92%	-0.33%
			5580	5.856	48.339	5.743	48.499	1.97%	-0.33%
			5600	5.889	48.319	5.766	48.471	2.13%	-0.31%
			5620	5.919	48.284	5.790	48.444	2.23%	-0.33%
			5640	5.944	48.222	5.813	48.417	2.25%	-0.40%
			5660	5.968	48.226	5.837	48.390	2.24%	-0.34%
			5680	5.993	48.197	5.860	48.363	2.27%	-0.34%
			5700	6.027	48.150	5.883	48.336	2.45%	-0.38%
			5745	6.083	48.081	5.936	48.275	2.48%	-0.40%
			5765	6.121	47.987	5.959	48.248	2.72%	-0.54%
			5785	6.141	47.998	5.982	48.220	2.66%	-0.46%
			5800	6.169	47.977	6.000	48.200	2.82%	-0.46%
			5805	6.175	47.973	6.006	48.193	2.81%	-0.46%
06/12/2017	5200B	21.5	5825	6.208	47.938	6.029	48.166	2.97%	-0.47%
			5240	5.487	47.929	5.346	48.960	2.64%	-2.11%
			5260	5.518	47.906	5.369	48.933	2.78%	-2.10%
			5300	5.556	47.800	5.416	48.879	2.58%	-2.21%
			5320	5.587	47.818	5.439	48.851	2.72%	-2.11%

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 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

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11.2 Test System Verification

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

Table 11-3
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
I	750	HEAD	06/03/2017	20.5	20.6	0.200	1003	3213	1.720	8.390	8.600	2.50%
I	835	HEAD	05/30/2017	19.7	19.9	0.200	4d180	3213	1.910	9.260	9.550	3.13%
H	1750	HEAD	05/30/2017	20.5	21.3	0.100	1092	3318	3.720	36.400	37.200	2.20%
D	1900	HEAD	06/01/2017	22.7	22.1	0.100	5d149	3288	3.950	40.100	39.500	-1.50%
I	2450	HEAD	06/07/2017	19.3	21.2	0.100	797	3213	5.230	52.100	52.300	0.38%
I	2450	HEAD	06/12/2017	22.2	22.0	0.100	797	3213	5.230	52.100	52.300	0.38%
I	2600	HEAD	06/12/2017	22.2	22.0	0.100	1126	3213	5.430	56.300	54.300	-3.55%
I	2450	HEAD	06/19/2017	23.0	23.0	0.100	797	3213	5.330	52.100	53.300	2.30%
H	5250	HEAD	06/10/2017	19.9	19.8	0.050	1191	3914	3.870	78.900	77.400	-1.90%
H	5600	HEAD	06/10/2017	19.9	19.8	0.050	1191	3914	4.150	83.600	83.000	-0.72%
H	5750	HEAD	06/10/2017	19.9	19.8	0.050	1191	3914	3.800	79.100	76.000	-3.92%
K	750	BODY	06/05/2017	21.7	21.8	0.200	1054	7406	1.830	8.610	9.150	6.27%
K	835	BODY	05/25/2017	22.8	22.2	0.200	4d047	7406	2.040	9.570	10.200	6.58%
K	835	BODY	05/30/2017	20.8	22.1	0.200	4d047	7406	1.900	9.570	9.500	-0.73%
G	1750	BODY	05/26/2017	21.5	21.1	0.100	1008	3287	3.880	37.500	38.800	3.47%
G	1750	BODY	06/01/2017	21.1	21.6	0.100	1092	3287	3.730	37.000	37.300	0.81%
E	1900	BODY	05/30/2017	23.7	24.5	0.100	5d141	3319	3.950	40.300	39.500	-1.99%
H	1900	BODY	06/06/2017	20.8	21.5	0.100	5d026	3318	3.960	40.300	39.600	-1.74%
G	2450	BODY	06/07/2017	22.5	23.4	0.100	981	3287	5.370	50.800	53.700	5.71%
K	2450	BODY	06/14/2017	22.4	21.3	0.100	981	7406	4.960	50.800	49.600	-2.36%
K	2600	BODY	06/14/2017	22.4	21.3	0.100	1071	7406	5.630	54.200	56.300	3.87%
K	2450	BODY	06/19/2017	22.1	22.6	0.100	981	7406	5.100	50.800	51.000	0.39%
K	2600	BODY	06/19/2017	22.1	22.6	0.100	1071	7406	5.620	54.200	56.200	3.69%
D	5250	BODY	06/05/2017	22.6	21.2	0.050	1237	3589	3.590	74.800	71.800	-4.01%
D	5600	BODY	06/05/2017	22.6	21.2	0.050	1237	3589	3.880	77.000	77.600	0.78%
D	5750	BODY	06/05/2017	22.6	21.2	0.050	1237	3589	3.490	75.400	69.800	-7.43%
D	5250	BODY	06/12/2017	22.1	21.3	0.050	1237	3589	3.780	74.800	75.600	1.07%

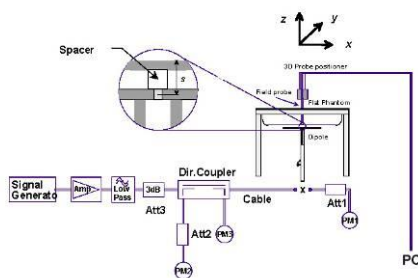


Figure 11-1
System Verification Setup Diagram



Figure 11-2
System Verification Setup Photo

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12 SAR DATA SUMMARY

12.1 Standalone Head SAR Data

Table 12-1
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	28.5	26.98	0.06	Right	Cheek	06350	1:8.3	0.237	1.419	0.336	
836.60	190	GSM 850	GSM	28.5	26.98	0.03	Right	Tilt	06350	1:8.3	0.191	1.419	0.271	
836.60	190	GSM 850	GSM	28.5	26.98	0.08	Left	Cheek	06350	1:8.3	0.409	1.419	0.580	A1
836.60	190	GSM 850	GSM	28.5	26.98	0.02	Left	Tilt	06350	1:8.3	0.296	1.419	0.420	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 12-2
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	22.0	21.47	-0.02	Right	Cheek	06350	1:8.3	0.184	1.130	0.208	
1880.00	661	GSM 1900	GSM	22.0	21.47	-0.03	Right	Tilt	06350	1:8.3	0.163	1.130	0.184	
1880.00	661	GSM 1900	GSM	22.0	21.47	0.17	Left	Cheek	06350	1:8.3	0.490	1.130	0.554	A2
1880.00	661	GSM 1900	GSM	22.0	21.47	0.05	Left	Tilt	06350	1:8.3	0.401	1.130	0.453	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 12-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	17.0	16.16	0.02	Right	Cheek	06350	1:1	0.182	1.213	0.221	
836.60	4183	UMTS 850	RMC	17.0	16.16	0.01	Right	Tilt	06350	1:1	0.137	1.213	0.166	
836.60	4183	UMTS 850	RMC	17.0	16.16	0.04	Left	Cheek	06350	1:1	0.294	1.213	0.357	A3
836.60	4183	UMTS 850	RMC	17.0	16.16	0.04	Left	Tilt	06350	1:1	0.204	1.213	0.247	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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Table 12-4
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	13.0	12.53	0.01	Right	Cheek	04520	1:1	0.118	1.114	0.131	
1732.40	1412	UMTS 1750	RMC	13.0	12.53	-0.01	Right	Tilt	04520	1:1	0.102	1.114	0.114	
1732.40	1412	UMTS 1750	RMC	13.0	12.53	0.02	Left	Cheek	04520	1:1	0.396	1.114	0.441	A4
1732.40	1412	UMTS 1750	RMC	13.0	12.53	-0.01	Left	Tilt	04520	1:1	0.286	1.114	0.319	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 12-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	0.00	Right	Cheek	04520	1:1	0.104	1.030	0.107	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	0.01	Right	Tilt	04520	1:1	0.086	1.030	0.089	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	0.09	Left	Cheek	04520	1:1	0.374	1.030	0.385	A5
1852.40	9262	UMTS 1900	RMC	12.0	11.87	-0.01	Left	Tilt	04520	1:1	0.294	1.030	0.303	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 12-6
LTE Band 17 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	0.12	0	Right	Cheek	QPSK	1	25	04645	1:1	0.093	1.222	0.114	
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	0.03	0	Right	Cheek	QPSK	25	25	04645	1:1	0.094	1.239	0.116	
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	0.11	0	Right	Tilt	QPSK	1	25	04645	1:1	0.081	1.222	0.099	
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	0.01	0	Right	Tilt	QPSK	25	25	04645	1:1	0.079	1.239	0.098	
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	-0.01	0	Left	Cheek	QPSK	1	25	04645	1:1	0.237	1.222	0.290	A6
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	0.03	0	Left	Cheek	QPSK	25	25	04645	1:1	0.229	1.239	0.284	
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	-0.04	0	Left	Tilt	QPSK	1	25	04645	1:1	0.193	1.222	0.236	
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	0.05	0	Left	Tilt	QPSK	25	25	04645	1:1	0.177	1.239	0.219	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 12-7
LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	-0.09	0	Right	Cheek	QPSK	1	0	06350	1.1	0.177	1.253	0.222
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.00	0	Right	Cheek	QPSK	25	12	06350	1.1	0.166	1.242	0.206
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	0.02	0	Right	Tilt	QPSK	1	0	06350	1.1	0.139	1.253	0.174
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	-0.01	0	Right	Tilt	QPSK	25	12	06350	1.1	0.128	1.242	0.159
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	0.09	0	Left	Cheek	QPSK	1	0	06350	1.1	0.300	1.253	0.376
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.10	0	Left	Cheek	QPSK	25	12	06350	1.1	0.281	1.242	0.349
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	-0.08	0	Left	Tilt	QPSK	1	0	06350	1.1	0.219	1.253	0.274
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.03	0	Left	Tilt	QPSK	25	12	06350	1.1	0.207	1.242	0.257
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 12-8
LTE Band 4 (AWS) Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	0.12	0	Right	Cheek	QPSK	1	0	04520	1.1	0.132	1.285	0.170
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	0.01	0	Right	Cheek	QPSK	50	25	04520	1.1	0.135	1.303	0.176
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	0.10	0	Right	Tilt	QPSK	1	0	04520	1.1	0.108	1.285	0.139
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	-0.08	0	Right	Tilt	QPSK	50	25	04520	1.1	0.112	1.303	0.146
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	-0.08	0	Left	Cheek	QPSK	1	0	04520	1.1	0.428	1.285	0.550
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	-0.01	0	Left	Cheek	QPSK	50	25	04520	1.1	0.443	1.303	0.577
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	-0.10	0	Left	Tilt	QPSK	1	0	04520	1.1	0.323	1.285	0.415
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	-0.01	0	Left	Tilt	QPSK	50	25	04520	1.1	0.336	1.303	0.438
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 12-9
LTE Band 2 (PCS) Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)		(W/kg)	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	0.00	0	Right	Cheek	QPSK	1	50	04520	1.1	0.141	1.076	0.152
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	0.01	0	Right	Cheek	QPSK	50	50	04520	1.1	0.109	1.057	0.115
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	0.03	0	Right	Tilt	QPSK	1	50	04520	1.1	0.123	1.076	0.132
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	-0.02	0	Right	Tilt	QPSK	50	50	04520	1.1	0.095	1.057	0.100
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	-0.01	0	Left	Cheek	QPSK	1	50	04520	1.1	0.511	1.076	0.550
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	-0.03	0	Left	Cheek	QPSK	50	50	04520	1.1	0.408	1.057	0.431
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	0.10	0	Left	Tilt	QPSK	1	50	04520	1.1	0.384	1.076	0.413
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	0.10	0	Left	Tilt	QPSK	50	50	04520	1.1	0.311	1.057	0.329
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 12-10
LTE Band 7 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2560.00	21350	High	LTE Band 7	20	15.0	14.54	-0.14	0	Right	Cheek	QPSK	1	50	04520	1.1	0.446	1.112	0.496	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	0.01	0	Right	Cheek	QPSK	50	50	04520	1.1	0.463	1.119	0.518	
2560.00	21350	High	LTE Band 7	20	15.0	14.54	0.02	0	Right	Tilt	QPSK	1	50	04520	1.1	0.354	1.112	0.394	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	0.02	0	Right	Tilt	QPSK	50	50	04520	1.1	0.368	1.119	0.412	
2560.00	21350	High	LTE Band 7	20	15.0	14.54	0.02	0	Left	Cheek	QPSK	1	50	04520	1.1	0.534	1.112	0.594	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	0.01	0	Left	Cheek	QPSK	50	50	04520	1.1	0.558	1.119	0.624	A10
2560.00	21350	High	LTE Band 7	20	15.0	14.54	0.02	0	Left	Tilt	QPSK	1	50	04520	1.1	0.377	1.112	0.419	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	0.01	0	Left	Tilt	QPSK	50	50	04520	1.1	0.383	1.119	0.429	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 12-11
LTE Band 38 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)														(W/kg)			
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	0.12	0	Right	Cheek	QPSK	1	50	06350	1:1.58	0.296	1.265	0.374	
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	0.09	0	Right	Cheek	QPSK	50	0	06350	1:1.58	0.293	1.222	0.358	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	-0.08	0	Right	Tilt	QPSK	1	50	06350	1:1.58	0.232	1.265	0.293	
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	0.03	0	Right	Tilt	QPSK	50	0	06350	1:1.58	0.227	1.222	0.277	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	0.13	0	Left	Cheek	QPSK	1	50	06350	1:1.58	0.307	1.265	0.388	A11
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	0.02	0	Left	Cheek	QPSK	50	0	06350	1:1.58	0.298	1.222	0.364	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	0.13	0	Left	Tilt	QPSK	1	50	06350	1:1.58	0.245	1.265	0.310	
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	0.02	0	Left	Tilt	QPSK	50	0	06350	1:1.58	0.243	1.222	0.297	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 12-12
DTS Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	18.5	18.24	0.13	Right	Cheek	29196	1	99.7	0.772	0.631	1.062	1.003	0.672	
2437	6	802.11b	DSSS	22	18.5	18.36	0.07	Right	Cheek	29196	1	99.7	1.138	0.887	1.033	1.003	0.919	A12
2437	6	802.11b	DSSS	22	18.5	18.36	-0.15	Right	Tilt	29196	1	99.7	0.481	0.458	1.033	1.003	0.475	
2437	6	802.11b	DSSS	22	18.5	18.36	-0.07	Left	Cheek	29196	1	99.7	0.212	-	1.033	1.003	-	
2437	6	802.11b	DSSS	22	18.5	18.36	-0.09	Left	Tilt	29196	1	99.7	0.166	-	1.033	1.003	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 12-13
NII Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5300	60	802.11a	OFDM	20	14.5	14.45	-0.09	Right	Cheek	29196	6	99.6	1.126	0.656	1.012	1.004	0.667	A13
5300	60	802.11a	OFDM	20	14.5	14.45	0.13	Right	Tilt	29196	6	99.6	0.978	0.512	1.012	1.004	0.520	
5300	60	802.11a	OFDM	20	14.5	14.45	0.00	Left	Cheek	29196	6	99.6	0.268	-	1.012	1.004	-	
5300	60	802.11a	OFDM	20	14.5	14.45	0.02	Left	Tilt	29196	6	99.6	0.302	-	1.012	1.004	-	
5620	124	802.11a	OFDM	20	14.5	14.30	0.07	Right	Cheek	29196	6	99.6	0.849	0.457	1.047	1.004	0.480	
5620	124	802.11a	OFDM	20	14.5	14.30	0.04	Right	Tilt	29196	6	99.6	0.728	0.363	1.047	1.004	0.382	
5620	124	802.11a	OFDM	20	14.5	14.30	0.03	Left	Cheek	29196	6	99.6	0.213	-	1.047	1.004	-	
5620	124	802.11a	OFDM	20	14.5	14.30	0.19	Left	Tilt	29196	6	99.6	0.230	-	1.047	1.004	-	
5825	165	802.11a	OFDM	20	14.5	14.14	0.04	Right	Cheek	29196	6	99.6	1.128	0.477	1.086	1.004	0.520	
5825	165	802.11a	OFDM	20	14.5	14.14	0.06	Right	Tilt	29196	6	99.6	0.999	0.446	1.086	1.004	0.486	
5825	165	802.11a	OFDM	20	14.5	14.14	0.15	Left	Cheek	29196	6	99.6	0.245	-	1.086	1.004	-	
5825	165	802.11a	OFDM	20	14.5	14.14	0.13	Left	Tilt	29196	6	99.6	0.291	-	1.086	1.004	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Head									
Spatial Peak									1.6 W/kg (mW/g)									
Uncontrolled Exposure/General Population									averaged over 1 gram									

Table 12-14
Bluetooth Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Data Rate	Device Serial Number	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Factor)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.											(W/kg)				
2480.00	78	Bluetooth	FHSS	11.0	10.91	0.14	Right	Cheek	1	29196	77.5	0.113	1.021	1.290	0.149	A14
2480.00	78	Bluetooth	FHSS	11.0	10.91	0.16	Right	Tilt	1	29196	77.5	0.089	1.021	1.290	0.117	
2480.00	78	Bluetooth	FHSS	11.0	10.91	0.11	Left	Cheek	1	29196	77.5	0.023	1.021	1.290	0.030	
2480.00	78	Bluetooth	FHSS	11.0	10.91	0.13	Left	Tilt	1	29196	77.5	0.019	1.021	1.290	0.025	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram							

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12.2 Standalone Body SAR Data

Table 12-15
GSM Body SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	31.5	30.60	-0.07	14 mm	06350	2	1:4.15	back	0.537	1.230	0.661	
836.60	190	GSM 850	GPRS	31.5	30.60	0.07	14 mm	06350	2	1:4.15	top	0.315	1.230	0.387	
824.20	128	GSM 850	GPRS	31.5	30.58	-0.14	1 mm	06350	2	1:4.15	right	0.850	1.236	1.051	A15
836.60	190	GSM 850	GPRS	31.5	30.60	-0.10	1 mm	06350	2	1:4.15	right	0.784	1.230	0.964	
848.80	251	GSM 850	GPRS	31.5	30.47	-0.05	1 mm	06350	2	1:4.15	right	0.619	1.268	0.785	
836.60	190	GSM 850	GPRS	31.5	30.60	-0.03	0 mm	06350	2	1:4.15	left	0.195	1.230	0.240	
836.60	190	GSM 850	GPRS	28.5	27.00	0.07	0 mm	06350	1	1:8.3	back	0.530	1.413	0.749	
836.60	190	GSM 850	GPRS	28.5	27.00	0.13	0 mm	06350	1	1:8.3	top	0.170	1.413	0.240	
836.60	190	GSM 850	GPRS	28.5	27.00	-0.03	0 mm	06350	1	1:8.3	right	0.245	1.413	0.346	
824.20	128	GSM 850	GPRS	31.5	30.58	0.09	1 mm	06350	2	1:4.15	right	0.737	1.236	0.911	
1909.80	810	GSM 1900	GPRS	29.0	27.78	0.01	14 mm	06350	2	1:4.15	back	0.257	1.324	0.340	
1909.80	810	GSM 1900	GPRS	29.0	27.78	-0.02	14 mm	06350	2	1:4.15	top	0.286	1.324	0.379	
1909.80	810	GSM 1900	GPRS	29.0	27.78	-0.02	1 mm	06350	2	1:4.15	right	0.305	1.324	0.404	
1909.80	810	GSM 1900	GPRS	29.0	27.78	-0.07	0 mm	06350	2	1:4.15	left	0.169	1.324	0.224	
1850.20	512	GSM 1900	GPRS	22.0	21.52	0.06	0 mm	04250	1	1:8.3	back	0.709	1.117	0.792	
1880.00	661	GSM 1900	GPRS	22.0	21.47	0.04	0 mm	04250	1	1:8.3	back	0.807	1.130	0.912	
1909.80	810	GSM 1900	GPRS	22.0	21.98	-0.01	0 mm	04250	1	1:8.3	back	0.865	1.005	0.869	A16
1909.80	810	GSM 1900	GPRS	22.0	21.98	-0.03	0 mm	04250	1	1:8.3	top	0.436	1.005	0.438	
1909.80	810	GSM 1900	GPRS	22.0	21.98	-0.01	0 mm	04250	1	1:8.3	right	0.061	1.005	0.061	
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Note: Blue entry represents variability measurement.

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Table 12-16
UMTS Body SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.5	23.12	0.04	14 mm	04520	N/A	1:1	back	0.439	1.374	0.603	
836.60	4183	UMTS 850	RMC	24.5	23.12	0.01	14 mm	04520	N/A	1:1	top	0.320	1.374	0.440	
826.40	4132	UMTS 850	RMC	24.5	23.07	0.05	1 mm	04520	N/A	1:1	right	0.762	1.390	1.059	A17
836.60	4183	UMTS 850	RMC	24.5	23.12	-0.04	1 mm	04520	N/A	1:1	right	0.715	1.374	0.982	
846.60	4233	UMTS 850	RMC	24.5	22.72	-0.02	1 mm	04520	N/A	1:1	right	0.723	1.507	1.090	
836.60	4183	UMTS 850	RMC	24.5	23.12	0.13	0 mm	04520	N/A	1:1	left	0.183	1.374	0.251	
836.60	4183	UMTS 850	RMC	17.0	16.16	0.07	0 mm	04520	N/A	1:1	back	0.405	1.213	0.491	
836.60	4183	UMTS 850	RMC	17.0	16.16	0.00	0 mm	04520	N/A	1:1	top	0.139	1.213	0.169	
836.60	4183	UMTS 850	RMC	17.0	16.16	-0.13	0 mm	04520	N/A	1:1	right	0.150	1.213	0.182	
1732.40	1412	UMTS 1750	RMC	23.5	22.62	0.08	14 mm	06350	N/A	1:1	back	0.626	1.225	0.767	
1732.40	1412	UMTS 1750	RMC	23.5	22.62	0.02	14 mm	06350	N/A	1:1	top	0.510	1.225	0.625	
1732.40	1412	UMTS 1750	RMC	23.5	22.62	0.01	1 mm	06350	N/A	1:1	right	0.545	1.225	0.668	
1732.40	1412	UMTS 1750	RMC	23.5	22.62	0.05	0 mm	06350	N/A	1:1	left	0.225	1.225	0.276	
1732.40	1412	UMTS 1750	RMC	13.0	12.53	0.00	0 mm	06350	N/A	1:1	back	0.680	1.114	0.758	A18
1732.40	1412	UMTS 1750	RMC	13.0	12.53	-0.04	0 mm	06350	N/A	1:1	top	0.327	1.114	0.364	
1732.40	1412	UMTS 1750	RMC	13.0	12.53	0.02	0 mm	06350	N/A	1:1	right	0.085	1.114	0.095	
1880.00	9400	UMTS 1900	RMC	24.0	22.49	0.04	14 mm	06350	N/A	1:1	back	0.502	1.416	0.711	
1880.00	9400	UMTS 1900	RMC	24.0	22.49	-0.02	14 mm	06350	N/A	1:1	top	0.441	1.416	0.624	
1852.40	9262	UMTS 1900	RMC	24.0	22.70	-0.11	1 mm	06350	N/A	1:1	right	0.661	1.349	0.892	
1880.00	9400	UMTS 1900	RMC	24.0	22.49	-0.01	1 mm	06350	N/A	1:1	right	0.589	1.416	0.834	
1907.60	9538	UMTS 1900	RMC	24.0	22.85	0.11	1 mm	06350	N/A	1:1	right	0.625	1.303	0.814	
1880.00	9400	UMTS 1900	RMC	24.0	22.49	0.08	0 mm	06350	N/A	1:1	left	0.271	1.416	0.384	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	-0.01	0 mm	04520	N/A	1:1	back	0.882	1.030	0.908	A19
1880.00	9400	UMTS 1900	RMC	12.0	11.46	-0.05	0 mm	04520	N/A	1:1	back	0.722	1.132	0.817	
1907.60	9538	UMTS 1900	RMC	12.0	11.22	-0.02	0 mm	04520	N/A	1:1	back	0.745	1.197	0.892	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	-0.02	0 mm	04520	N/A	1:1	top	0.334	1.030	0.344	
1852.40	9262	UMTS 1900	RMC	12.0	11.87	0.07	0 mm	04520	N/A	1:1	right	0.049	1.030	0.050	
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Table 12-17
LTE Band 17 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	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	0.04	0	06350	QPSK	1	25	0 mm	back	1:1	0.405	1.222	0.495	A20
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	0.14	0	06350	QPSK	25	25	0 mm	back	1:1	0.383	1.239	0.475	
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	-0.13	0	06350	QPSK	1	25	0 mm	top	1:1	0.177	1.222	0.216	
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	-0.11	0	06350	QPSK	25	25	0 mm	top	1:1	0.165	1.239	0.204	
710.00	23790	Mid	LTE Band 17	10	18.0	17.13	-0.14	0	06350	QPSK	1	25	0 mm	right	1:1	0.109	1.222	0.133	
710.00	23790	Mid	LTE Band 17	10	18.0	17.07	-0.12	0	06350	QPSK	25	25	0 mm	right	1:1	0.103	1.239	0.128	
710.00	23790	Mid	LTE Band 17	10	24.5	23.34	-0.03	0	04520	QPSK	1	49	14 mm	back	1:1	0.255	1.306	0.333	
710.00	23790	Mid	LTE Band 17	10	23.5	22.28	-0.03	1	04520	QPSK	25	12	14 mm	back	1:1	0.211	1.324	0.279	
710.00	23790	Mid	LTE Band 17	10	24.5	23.34	0.02	0	04520	QPSK	1	49	14 mm	top	1:1	0.165	1.306	0.215	
710.00	23790	Mid	LTE Band 17	10	23.5	22.28	-0.02	1	04520	QPSK	25	12	14 mm	top	1:1	0.127	1.324	0.168	
710.00	23790	Mid	LTE Band 17	10	24.5	23.34	-0.03	0	04520	QPSK	1	49	1 mm	right	1:1	0.287	1.306	0.375	
710.00	23790	Mid	LTE Band 17	10	23.5	22.28	-0.05	1	04520	QPSK	25	12	1 mm	right	1:1	0.248	1.324	0.328	
710.00	23790	Mid	LTE Band 17	10	24.5	23.34	-0.06	0	04520	QPSK	1	49	0 mm	left	1:1	0.115	1.306	0.150	
710.00	23790	Mid	LTE Band 17	10	23.5	22.28	0.08	1	04520	QPSK	25	12	0 mm	left	1:1	0.098	1.324	0.130	
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 12-18
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	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	0.15	0	04520	QPSK	1	0	0 mm	back	1:1	0.459	1.253	0.575	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.09	0	04520	QPSK	25	12	0 mm	back	1:1	0.423	1.242	0.525	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	0.02	0	04520	QPSK	1	0	0 mm	top	1:1	0.158	1.253	0.198	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.00	0	04520	QPSK	25	12	0 mm	top	1:1	0.146	1.242	0.181	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.02	0.03	0	04520	QPSK	1	0	0 mm	right	1:1	0.180	1.253	0.226	
836.50	20525	Mid	LTE Band 5 (Cell)	10	17.0	16.06	0.02	0	04520	QPSK	25	12	0 mm	right	1:1	0.162	1.242	0.201	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.33	-0.16	0	04520	QPSK	1	0	14 mm	back	1:1	0.559	1.309	0.732	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.44	-0.03	1	04520	QPSK	25	25	14 mm	back	1:1	0.402	1.276	0.513	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.33	0.12	0	04520	QPSK	1	0	14 mm	top	1:1	0.375	1.309	0.491	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.44	-0.11	1	04520	QPSK	25	25	14 mm	top	1:1	0.262	1.276	0.334	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.33	0.04	0	04520	QPSK	1	0	1 mm	right	1:1	0.717	1.309	0.939	A21
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.44	0.01	1	04520	QPSK	25	25	1 mm	right	1:1	0.541	1.276	0.690	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.41	-0.10	1	04520	QPSK	50	0	1 mm	right	1:1	0.563	1.285	0.723	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.33	-0.05	0	04520	QPSK	1	0	0 mm	left	1:1	0.207	1.309	0.271	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	22.44	0.02	1	04520	QPSK	25	25	0 mm	left	1:1	0.128	1.276	0.163	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

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Table 12-19
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	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	-0.12	0	04520	QPSK	1	0	0 mm	back	1:1	0.706	1.285	0.907	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	-0.14	0	04520	QPSK	50	25	0 mm	back	1:1	0.694	1.303	0.904	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	11.84	0.20	0	04520	QPSK	100	0	0 mm	back	1:1	0.681	1.466	0.998	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	0.03	0	04520	QPSK	1	0	0 mm	top	1:1	0.375	1.285	0.482	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	-0.05	0	04520	QPSK	50	25	0 mm	top	1:1	0.391	1.303	0.509	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.41	0.03	0	04520	QPSK	1	0	0 mm	right	1:1	0.052	1.285	0.067	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	13.5	12.35	0.02	0	04520	QPSK	50	25	0 mm	right	1:1	0.070	1.303	0.091	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.46	0.05	0	04520	QPSK	1	50	14 mm	back	1:1	0.782	1.132	0.885	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.18	-0.04	1	04520	QPSK	50	0	14 mm	back	1:1	0.567	1.208	0.685	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.10	-0.18	1	04520	QPSK	100	0	14 mm	back	1:1	0.598	1.230	0.736	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.46	-0.02	0	04520	QPSK	1	50	14 mm	top	1:1	0.661	1.132	0.748	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.18	0.01	1	04520	QPSK	50	0	14 mm	top	1:1	0.504	1.208	0.609	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.46	-0.01	0	04520	QPSK	1	50	1 mm	right	1:1	0.860	1.132	0.974	A22
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.18	0.05	1	04520	QPSK	50	0	1 mm	right	1:1	0.605	1.208	0.731	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.10	-0.01	1	04520	QPSK	100	0	1 mm	right	1:1	0.640	1.230	0.787	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.46	0.01	0	04520	QPSK	1	50	0 mm	left	1:1	0.259	1.132	0.293	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	22.18	0.01	1	04520	QPSK	50	0	0 mm	left	1:1	0.199	1.208	0.240	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.46	-0.02	0	04520	QPSK	1	50	1 mm	right	1:1	0.803	1.132	0.909	
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 12-20
LTE Band 2 (PCS) Body SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	18700	Low	LTE Band 2 (PCS)	20	12.5	12.07	0.02	0	06350	QPSK	1	50	0 mm	back	1:1	0.991	1.104	1.094	A23
1880.00	18900	Mid	LTE Band 2 (PCS)	20	12.5	11.81	-0.15	0	06350	QPSK	1	50	0 mm	back	1:1	0.733	1.172	0.859	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	0.01	0	06350	QPSK	1	50	0 mm	back	1:1	0.983	1.076	1.058	
1860.00	18700	Low	LTE Band 2 (PCS)	20	12.5	11.99	0.03	0	06350	QPSK	50	0	0 mm	back	1:1	0.955	1.125	1.074	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	12.5	11.60	0.05	0	06350	QPSK	50	25	0 mm	back	1:1	0.600	1.230	0.738	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	0.01	0	06350	QPSK	50	50	0 mm	back	1:1	0.821	1.057	0.868	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.10	0.01	0	06350	QPSK	100	0	0 mm	back	1:1	0.899	1.096	0.985	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	-0.02	0	06350	QPSK	1	50	0 mm	top	1:1	0.420	1.076	0.452	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	-0.03	0	06350	QPSK	50	50	0 mm	top	1:1	0.382	1.057	0.404	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.18	0.00	0	06350	QPSK	1	50	0 mm	right	1:1	0.068	1.076	0.073	
1900.00	19100	High	LTE Band 2 (PCS)	20	12.5	12.26	0.07	0	06350	QPSK	50	50	0 mm	right	1:1	0.050	1.057	0.053	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.64	-0.16	0	06350	QPSK	1	50	14 mm	back	1:1	0.562	1.086	0.610	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.42	-0.11	1	06350	QPSK	50	25	14 mm	back	1:1	0.503	1.143	0.575	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.64	0.13	0	06350	QPSK	1	50	14 mm	top	1:1	0.460	1.086	0.500	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.42	-0.01	1	06350	QPSK	50	25	14 mm	top	1:1	0.406	1.143	0.464	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.64	-0.14	0	06350	QPSK	1	50	1 mm	right	1:1	0.420	1.086	0.456	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.42	0.01	1	06350	QPSK	50	25	1 mm	right	1:1	0.361	1.143	0.413	
1900.00	19100	High	LTE Band 2 (PCS)	20	24.0	23.64	0.07	0	06350	QPSK	1	50	0 mm	left	1:1	0.233	1.086	0.253	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	22.42	0.11	1	06350	QPSK	50	25	0 mm	left	1:1	0.206	1.143	0.235	
1860.00	18700	Low	LTE Band 2 (PCS)	20	12.5	12.07	0.01	0	06350	QPSK	1	50	0 mm	back	1:1	0.912	1.104	1.007	
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.

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Table 12-21
LTE Band 7 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	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2510.00	20850	Low	LTE Band 7	20	15.0	14.35	-0.19	0	06350	QPSK	1	99	0 mm	back	1:1	0.895	1.161	1.039	A24
2535.00	21100	Mid	LTE Band 7	20	15.0	14.52	0.06	0	06350	QPSK	1	50	0 mm	back	1:1	0.950	1.117	1.061	
2560.00	21350	High	LTE Band 7	20	15.0	14.54	-0.18	0	06350	QPSK	1	50	0 mm	back	1:1	0.772	1.112	0.858	
2510.00	20850	Low	LTE Band 7	20	15.0	14.40	-0.17	0	06350	QPSK	50	50	0 mm	back	1:1	0.908	1.148	1.042	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	-0.15	0	06350	QPSK	50	50	0 mm	back	1:1	0.938	1.119	1.050	
2560.00	21350	High	LTE Band 7	20	15.0	14.41	-0.13	0	06350	QPSK	50	25	0 mm	back	1:1	0.852	1.146	0.976	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.48	-0.13	0	06350	QPSK	100	0	0 mm	back	1:1	0.908	1.127	1.023	
2560.00	21350	High	LTE Band 7	20	15.0	14.54	-0.08	0	06350	QPSK	1	50	0 mm	top	1:1	0.379	1.112	0.421	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	-0.04	0	06350	QPSK	50	50	0 mm	top	1:1	0.331	1.119	0.370	
2560.00	21350	High	LTE Band 7	20	15.0	14.54	0.00	0	06350	QPSK	1	50	0 mm	right	1:1	0.084	1.112	0.093	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.51	0.05	0	06350	QPSK	50	50	0 mm	right	1:1	0.081	1.119	0.091	
2535.00	21100	Mid	LTE Band 7	20	24.8	24.56	0.15	0	06350	QPSK	1	50	14 mm	back	1:1	0.632	1.057	0.668	
2535.00	21100	Mid	LTE Band 7	20	23.8	23.25	-0.07	1	06350	QPSK	50	25	14 mm	back	1:1	0.494	1.135	0.561	
2535.00	21100	Mid	LTE Band 7	20	24.8	24.56	-0.10	0	06350	QPSK	1	50	14 mm	top	1:1	0.523	1.057	0.553	
2535.00	21100	Mid	LTE Band 7	20	23.8	23.25	0.02	1	06350	QPSK	50	25	14 mm	top	1:1	0.400	1.135	0.454	
2535.00	21100	Mid	LTE Band 7	20	24.8	24.56	0.17	0	06350	QPSK	1	50	1 mm	right	1:1	0.733	1.057	0.775	
2535.00	21100	Mid	LTE Band 7	20	23.8	23.25	0.05	1	06350	QPSK	50	25	1 mm	right	1:1	0.566	1.135	0.642	
2535.00	21100	Mid	LTE Band 7	20	24.8	24.56	-0.19	0	06350	QPSK	1	50	0 mm	left	1:1	0.163	1.057	0.172	
2535.00	21100	Mid	LTE Band 7	20	23.8	23.25	-0.13	1	06350	QPSK	50	25	0 mm	left	1:1	0.124	1.135	0.141	
2510.00	20850	Low	LTE Band 7	20	15.0	14.40	-0.11	0	06350	QPSK	50	50	0 mm	back	1:1	0.936	1.148	1.075	
2535.00	21100	Mid	LTE Band 7	20	15.0	14.52	-0.03	0	06350	QPSK	1	50	0 mm	back	1:1	0.948	1.117	1.059	
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 12-22
LTE Band 38 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	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)														(W/kg)			
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	-0.14	0	06350	QPSK	1	50	0 mm	back	1:1.58	0.835	1.265	1.056	A25
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	-0.12	0	06350	QPSK	50	0	0 mm	back	1:1.58	0.806	1.222	0.985	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.82	-0.16	0	06350	QPSK	100	0	0 mm	back	1:1.58	0.812	1.312	1.065	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	-0.13	0	06350	QPSK	1	50	0 mm	top	1:1.58	0.321	1.265	0.406	
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	-0.17	0	06350	QPSK	50	0	0 mm	top	1:1.58	0.312	1.222	0.381	
2595.00	38000	Mid	LTE Band 38	20	16.0	14.98	0.14	0	06350	QPSK	1	50	0 mm	right	1:1.58	0.067	1.265	0.085	
2595.00	38000	Mid	LTE Band 38	20	16.0	15.13	-0.13	0	06350	QPSK	50	0	0 mm	right	1:1.58	0.066	1.222	0.081	
2595.00	38000	Mid	LTE Band 38	20	24.5	23.50	0.14	0	06350	QPSK	1	0	14 mm	back	1:1.58	0.284	1.259	0.358	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.63	0.02	1	06350	QPSK	50	0	14 mm	back	1:1.58	0.249	1.222	0.304	
2595.00	38000	Mid	LTE Band 38	20	24.5	23.50	-0.01	0	06350	QPSK	1	0	14 mm	top	1:1.58	0.294	1.259	0.370	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.63	0.03	1	06350	QPSK	50	0	14 mm	top	1:1.58	0.254	1.222	0.310	
2595.00	38000	Mid	LTE Band 38	20	24.5	23.50	0.14	0	06350	QPSK	1	0	1 mm	right	1:1.58	0.361	1.259	0.454	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.63	0.05	1	06350	QPSK	50	0	1 mm	right	1:1.58	0.315	1.222	0.385	
2595.00	38000	Mid	LTE Band 38	20	24.5	23.50	-0.12	0	06350	QPSK	1	0	0 mm	left	1:1.58	0.056	1.259	0.071	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.63	-0.13	1	06350	QPSK	50	0	0 mm	left	1:1.58	0.056	1.222	0.068	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak								Body 1.6 W/kg (mW/g) averaged over 1 gram											
Uncontrolled Exposure/General Population																			

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Table 12-23
2.4GHz WLAN Body SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	13.5	13.17	0.02	0 mm	29113	1	back	99.7	0.448	0.364	1.079	1.003	0.394	A26
2462	11	802.11b	DSSS	22	13.5	13.17	-0.03	0 mm	29113	1	top	99.7	0.187	0.104	1.079	1.003	0.113	
2462	11	802.11b	DSSS	22	13.5	13.17	0.11	0 mm	29113	1	left	99.7	0.131	0.078	1.079	1.003	0.084	
2437	6	802.11b	DSSS	22	18.5	18.36	-0.07	11 mm	29113	1	back	99.7	0.368	0.286	1.033	1.003	0.296	
2437	6	802.11b	DSSS	22	18.5	18.36	-0.04	9 mm	29113	1	top	99.7	0.183	0.155	1.033	1.003	0.161	
2437	6	802.11b	DSSS	22	18.5	18.36	-0.04	3 mm	29113	1	left	99.7	0.373	0.285	1.033	1.003	0.295	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body										
Spatial Peak								1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population								averaged over 1 gram										

Table 12-24
5GHz WLAN Body SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5310	62	802.11n	OFDM	40	10.5	10.49	0.08	0 mm	29113	13.5	back	98.3	1.875	1.020	1.002	1.017	1.039	A27
5270	54	802.11n	OFDM	40	10.5	9.76	0.07	0 mm	29113	13.5	back	98.3	1.450	0.811	1.186	1.017	0.978	
5310	62	802.11n	OFDM	40	10.5	10.49	0.17	0 mm	29113	13.5	top	98.3	1.475	0.618	1.002	1.017	0.630	
5310	62	802.11n	OFDM	40	10.5	10.49	0.18	0 mm	29113	13.5	left	98.3	0.417	0.166	1.002	1.017	0.169	
5300	60	802.11a	OFDM	20	14.5	14.45	0.18	11 mm	29113	6	back	99.6	0.223	0.106	1.012	1.004	0.108	
5300	60	802.11a	OFDM	20	14.5	14.45	0.14	9 mm	29113	6	top	99.6	0.601	0.256	1.012	1.004	0.260	
5300	60	802.11a	OFDM	20	14.5	14.45	-0.10	3 mm	29113	6	left	99.6	0.390	0.179	1.012	1.004	0.182	
5510	102	802.11n	OFDM	40	10.5	10.28	0.05	0 mm	29113	13.5	back	98.3	1.134	0.493	1.052	1.017	0.527	
5510	102	802.11n	OFDM	40	10.5	10.28	0.18	0 mm	29113	13.5	top	98.3	0.836	0.357	1.052	1.017	0.382	
5510	102	802.11n	OFDM	40	10.5	10.28	0.12	0 mm	29113	13.5	left	98.3	0.166	0.054	1.052	1.017	0.058	
5620	124	802.11a	OFDM	20	14.5	14.30	0.06	11 mm	29113	6	back	99.6	0.323	0.153	1.047	1.004	0.161	
5620	124	802.11a	OFDM	20	14.5	14.30	-0.04	9 mm	29113	6	top	99.6	0.613	0.278	1.047	1.004	0.292	
5620	124	802.11a	OFDM	20	14.5	14.30	0.20	3 mm	29113	6	left	99.6	0.407	0.177	1.047	1.004	0.186	
5755	151	802.11n	OFDM	40	10.5	9.96	-0.20	0 mm	29113	13.5	back	98.3	1.679	0.692	1.132	1.017	0.797	
5755	151	802.11n	OFDM	40	10.5	9.96	0.15	0 mm	29113	13.5	top	98.3	0.969	0.420	1.132	1.017	0.484	
5755	151	802.11n	OFDM	40	10.5	9.96	-0.16	0 mm	29113	13.5	left	98.3	0.232	0.086	1.132	1.017	0.099	
5825	165	802.11a	OFDM	20	14.5	14.14	0.20	11 mm	29113	6	back	99.6	0.276	0.107	1.086	1.004	0.117	
5825	165	802.11a	OFDM	20	14.5	14.14	0.13	9 mm	29113	6	top	99.6	0.628	0.265	1.086	1.004	0.289	
5825	165	802.11a	OFDM	20	14.5	14.14	0.15	3 mm	29113	6	left	99.6	0.356	0.144	1.086	1.004	0.157	
5310	62	802.11n	OFDM	40	10.5	10.49	0.07	0 mm	29113	13.5	back	98.3	1.818	0.911	1.002	1.017	0.928	
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.

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Table 12-25
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 (Cond Power)	Scaling Factor (Duty Factor)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	11.0	10.91	-0.20	0 mm	29113	1	back	77.5	0.308	1.021	1.290	0.406	A28
2480	78	Bluetooth	FHSS	11.0	10.91	0.04	0 mm	29113	1	top	77.5	0.085	1.021	1.290	0.112	
2480	78	Bluetooth	FHSS	11.0	10.91	-0.05	0 mm	29113	1	left	77.5	0.063	1.021	1.290	0.083	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body									
Spatial Peak							1.6 W/kg (mW/g)									
Uncontrolled Exposure/General Population							averaged over 1 gram									

12.3 SAR Test Notes

General Notes:

- The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 616217 D04v01r02 and FCC KDB Publication 447498 D01v06.
- Batteries are fully charged at the beginning of the SAR measurements.
- Liquid tissue depth was at least 15.0 cm for all frequencies.
- 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.
- SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
- Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 14 for variability analysis.
- FCC KDB Publication 616217 D04v01r02 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 D01v06 was applied to determine SAR test exclusion for adjacent edge configurations.
- Head SAR testing was required for this tablet because it has a speaker/receiver and microphone positioning that allows for a held-to-ear configuration usage. Head SAR tests were performed at reduced power levels for all licensed modes.

GSM Test Notes:

- Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
- Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

- UMTS mode in was tested under RMC 12.2 kbps with HSDPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
- Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other

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channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 9.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported (scaled) for LTE Band 38 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.

WLAN Notes:

1. For held-to-ear and body operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 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 9.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 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 9.6.6 for more information.
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.

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13 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

13.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

13.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 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.

13.3 Head SAR Simultaneous Transmission Analysis

Table 13-1
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.580	0.919	1.499
	GSM 1900	0.554	0.919	1.473
	UMTS 850	0.357	0.919	1.276
	UMTS 1750	0.441	0.919	1.360
	UMTS 1900	0.385	0.919	1.304
	LTE Band 17	0.290	0.919	1.209
	LTE Band 5 (Cell)	0.376	0.919	1.295
	LTE Band 4 (AWS)	0.577	0.919	1.496
	LTE Band 2 (PCS)	0.550	0.919	1.469
	LTE Band 7	0.624	0.919	1.543
	LTE Band 38	0.388	0.919	1.307

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Table 13-2
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.580	0.667	1.247
	GSM 1900	0.554	0.667	1.221
	UMTS 850	0.357	0.667	1.024
	UMTS 1750	0.441	0.667	1.108
	UMTS 1900	0.385	0.667	1.052
	LTE Band 17	0.290	0.667	0.957
	LTE Band 5 (Cell)	0.376	0.667	1.043
	LTE Band 4 (AWS)	0.577	0.667	1.244
	LTE Band 2 (PCS)	0.550	0.667	1.217
	LTE Band 7	0.624	0.667	1.291
	LTE Band 38	0.388	0.667	1.055

Table 13-3
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.580	0.149	0.729
	GSM 1900	0.554	0.149	0.703
	UMTS 850	0.357	0.149	0.506
	UMTS 1750	0.441	0.149	0.590
	UMTS 1900	0.385	0.149	0.534
	LTE Band 17	0.290	0.149	0.439
	LTE Band 5 (Cell)	0.376	0.149	0.525
	LTE Band 4 (AWS)	0.577	0.149	0.726
	LTE Band 2 (PCS)	0.550	0.149	0.699
	LTE Band 7	0.624	0.149	0.773
	LTE Band 38	0.388	0.149	0.537

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13.4 Body SAR Simultaneous Transmission Analysis

Table 13-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN Body SAR

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.749	0.394	1.143	Body SAR	Back	0.912	0.394	1.306
	Top	0.387	0.161	0.548		Top	0.438	0.161	0.599
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	1.051	0.400	1.451		Right	0.404	0.400	0.804
	Left	0.240	0.295	0.535		Left	0.224	0.295	0.519
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.603	0.394	0.997	Body SAR	Back	0.767	0.394	1.161
	Top	0.440	0.161	0.601		Top	0.625	0.161	0.786
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	1.090	0.400	1.490		Right	0.668	0.400	1.068
	Left	0.251	0.295	0.546		Left	0.276	0.295	0.571
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.908	0.394	1.302	Body SAR	Back	0.495	0.394	0.889
	Top	0.624	0.161	0.785		Top	0.216	0.161	0.377
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.892	0.400	1.292		Right	0.375	0.400	0.775
	Left	0.384	0.295	0.679		Left	0.150	0.295	0.445
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.732	0.394	1.126	Body SAR	Back	0.998	0.394	1.392
	Top	0.491	0.161	0.652		Top	0.748	0.161	0.909
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.939	0.400	1.339		Right	0.974	0.400	1.374
	Left	0.271	0.295	0.566		Left	0.293	0.295	0.588
Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	1.094	0.394	1.488	Body SAR	Back	1.075	0.394	1.469
	Top	0.500	0.161	0.661		Top	0.553	0.161	0.714
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.456	0.400	0.856		Right	0.775	0.400	1.175
	Left	0.253	0.295	0.548		Left	0.172	0.295	0.467
Simult Tx	Configuration	LTE Band 38 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)					
		1	2	1+2					
Body SAR	Back	1.065	0.394	1.459					
	Top	0.406	0.161	0.567					
	Bottom	0.400	0.400	0.800					
	Right	0.454	0.400	0.854					
	Left	0.071	0.295	0.366					

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Table 13-5
Simultaneous Transmission Scenario with 5 GHz WLAN Body SAR

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.749	1.039	See Note 1	0.02
	Top	0.387	0.630	1.017	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	1.051	0.400	1.451	N/A
	Left	0.240	0.186	0.426	N/A

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.912	1.039	See Note 1	0.03
	Top	0.438	0.630	1.068	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.404	0.400	0.804	N/A
	Left	0.224	0.186	0.410	N/A

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.603	1.039	See Note 1	0.02
	Top	0.440	0.630	1.070	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	1.090	0.400	1.490	N/A
	Left	0.251	0.186	0.437	N/A

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.767	1.039	See Note 1	0.02
	Top	0.625	0.630	1.255	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.668	0.400	1.068	N/A
	Left	0.276	0.186	0.462	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.908	1.039	See Note 1	0.02
	Top	0.624	0.630	1.254	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.892	0.400	1.292	N/A
	Left	0.384	0.186	0.570	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.732	1.039	See Note 1	0.02
	Top	0.491	0.630	1.121	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.939	0.400	1.339	N/A
	Left	0.271	0.186	0.457	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	0.998	1.039	See Note 1	0.03
	Top	0.748	0.630	1.378	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.974	0.400	1.374	N/A
	Left	0.293	0.186	0.479	N/A

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	1.094	1.039	See Note 1	0.03
	Top	0.500	0.630	1.130	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.456	0.400	0.856	N/A
	Left	0.253	0.186	0.439	N/A

Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	1.075	1.039	See Note 1	0.04
	Top	0.553	0.630	1.183	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.775	0.400	1.175	N/A
	Left	0.172	0.186	0.358	N/A

Simult Tx	Configuration	LTE Band 38 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body SAR	Back	1.065	1.039	See Note 1	0.04
	Top	0.406	0.630	1.036	N/A
	Bottom	0.400	0.400	0.800	N/A
	Right	0.454	0.400	0.854	N/A
	Left	0.071	0.186	0.257	N/A

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Table 13-6
Simultaneous Transmission Scenario with 2.4 GHz Bluetooth Body SAR

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.749	0.406	1.155	Body SAR	Back	0.912	0.406	1.318
	Top	0.387	0.112	0.499		Top	0.438	0.112	0.550
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	1.051	0.400	1.451		Right	0.404	0.400	0.804
	Left	0.240	0.083	0.323		Left	0.224	0.083	0.307
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.603	0.406	1.009	Body SAR	Back	0.767	0.406	1.173
	Top	0.440	0.112	0.552		Top	0.625	0.112	0.737
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	1.090	0.400	1.490		Right	0.668	0.400	1.068
	Left	0.251	0.083	0.334		Left	0.276	0.083	0.359
Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.908	0.406	1.314	Body SAR	Back	0.495	0.406	0.901
	Top	0.624	0.112	0.736		Top	0.216	0.112	0.328
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.892	0.400	1.292		Right	0.375	0.400	0.775
	Left	0.384	0.083	0.467		Left	0.150	0.083	0.233
Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	0.732	0.406	1.138	Body SAR	Back	0.998	0.406	1.404
	Top	0.491	0.112	0.603		Top	0.748	0.112	0.860
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.939	0.400	1.339		Right	0.974	0.400	1.374
	Left	0.271	0.083	0.354		Left	0.293	0.083	0.376
Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Body SAR	Back	1.094	0.406	1.500	Body SAR	Back	1.075	0.406	1.481
	Top	0.500	0.112	0.612		Top	0.553	0.112	0.665
	Bottom	0.400	0.400	0.800		Bottom	0.400	0.400	0.800
	Right	0.456	0.400	0.856		Right	0.775	0.400	1.175
	Left	0.253	0.083	0.336		Left	0.172	0.083	0.255
Simult Tx	Configuration	LTE Band 38 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)					
		1	2	1+2					
Body SAR	Back	1.065	0.406	1.471					
	Top	0.406	0.112	0.518					
	Bottom	0.400	0.400	0.800					
	Right	0.454	0.400	0.854					
	Left	0.071	0.083	0.154					

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Notes:

1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v05. See Section 13.5 for detailed SPLS ratio analysis.
2. For SAR summation the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.
3. When the antenna separation distance was > 50 mm, an estimated SAR of 0.4 W/kg was used to determine the simultaneous transmission SAR exclusion, for configurations excluded per FCC KDB Publication 447498 D01v06.

13.5 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.

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

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

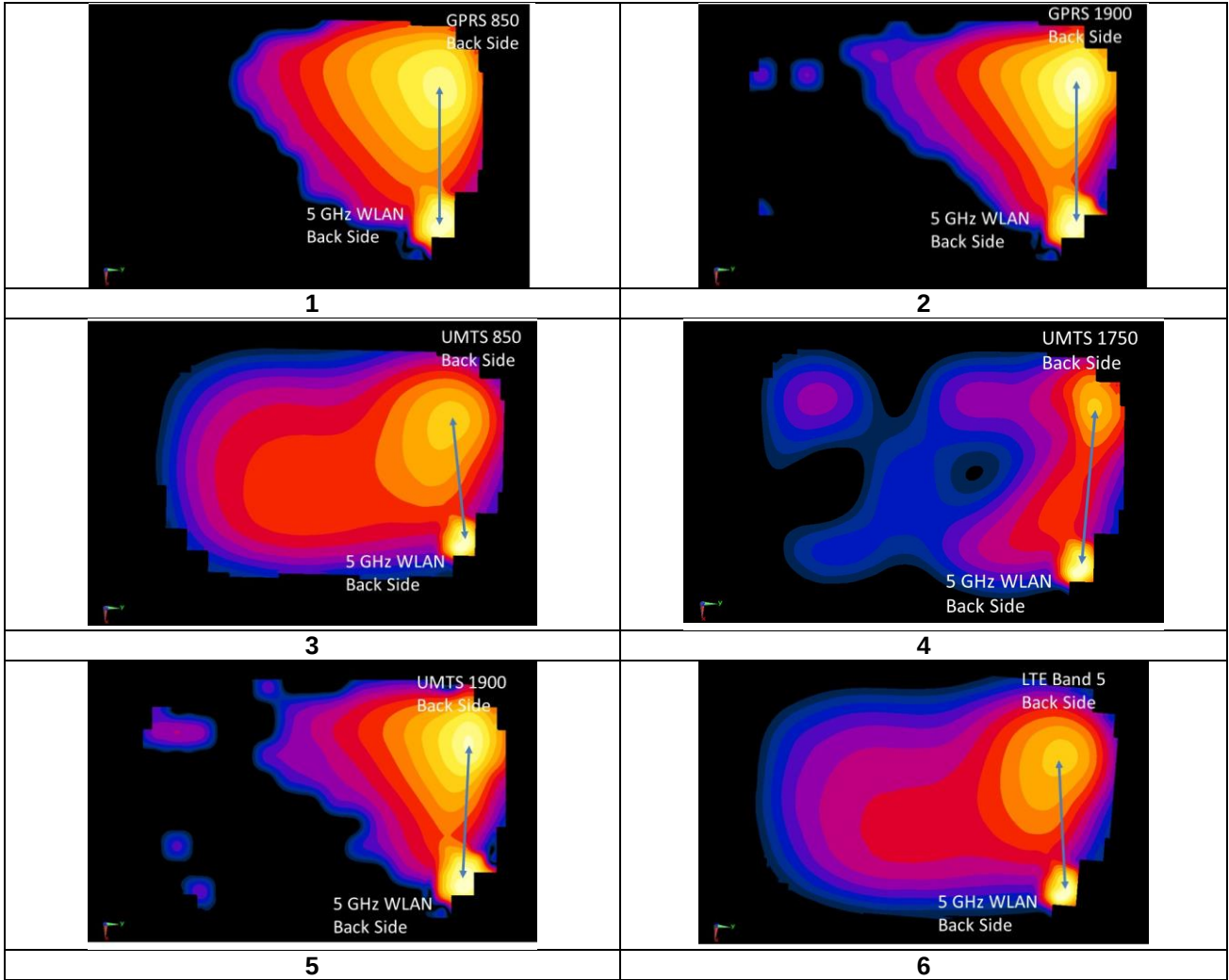
Table 13-7
Peak SAR Locations for Body Back Side

Mode/Band	x (mm)	y (mm)	Reported SAR (W/kg)
5 GHz WLAN	56.00	93.00	1.039
GPRS 850	-58.00	95.50	0.749
GPRS 1900	-51.50	104.00	0.912
UMTS 850	-47.00	82.00	0.603
UMTS 1750	-62.00	101.50	0.767
UMTS 1900	-53.00	96.00	0.908
LTE Band 5	-53.00	88.00	0.732
LTE Band 4	-55.50	98.50	0.998
LTE Band 2	-50.00	97.00	1.094
LTE Band 7	-27.80	94.80	1.075
LTE Band 38	-24.20	93.60	1.065

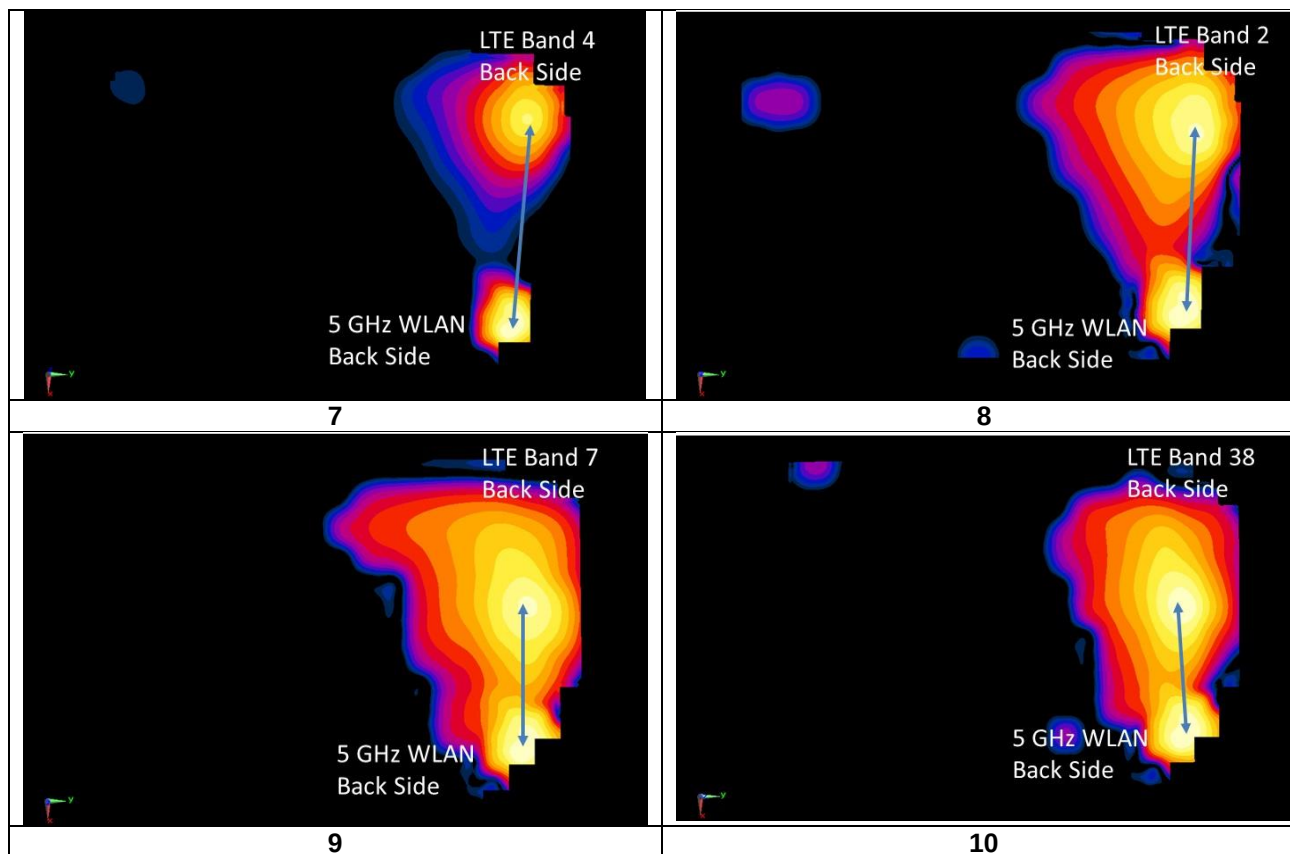
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Table 13-8
SAR Sum to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D _{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN	GPRS 850	1.039	0.749	1.788	114.03	0.02	1
5 GHz WLAN	GPRS 1900	1.039	0.912	1.951	108.06	0.03	2
5 GHz WLAN	UMTS 850	1.039	0.603	1.642	103.59	0.02	3
5 GHz WLAN	UMTS 1750	1.039	0.767	1.806	118.31	0.02	4
5 GHz WLAN	UMTS 1900	1.039	0.908	1.947	109.04	0.02	5
5 GHz WLAN	LTE Band 5	1.039	0.732	1.771	109.11	0.02	6
5 GHz WLAN	LTE Band 4	1.039	0.998	2.037	111.64	0.03	7
5 GHz WLAN	LTE Band 2	1.039	1.094	2.133	106.08	0.03	8
5 GHz WLAN	LTE Band 7	1.039	1.075	2.114	83.82	0.04	9
5 GHz WLAN	LTE Band 38	1.039	1.065	2.104	80.20	0.04	10



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13.6 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 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

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14 SAR MEASUREMENT VARIABILITY

14.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, 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 performed 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 ($\sim 10\%$ 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 14-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	# of Time Slots	Data Rate (Mbps)	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	3rd Repeated SAR (1g)
	MHz	Ch.							(W/kg)	(W/kg)		(W/kg)	(W/kg)
835	824.20	128	GSM850	GPRS	2	N/A	right	1 mm	0.850	0.737	1.15	N/A	N/A
1750	1732.50	20175	LTE Band 4 (AWS), 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	N/A	N/A	right	1 mm	0.860	0.803	1.07	N/A	N/A
1900	1860.00	18700	LTE Band 2 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	N/A	N/A	back	0 mm	0.991	0.912	1.09	N/A	N/A
2450	2510.00	20850	LTE Band 7, 20 MHz Bandwidth	QPSK, 50 RB, 50 RB Offset	N/A	N/A	back	0 mm	0.908	0.936	1.03	N/A	N/A
2600	2535.00	21100	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	N/A	N/A	back	0 mm	0.950	0.948	1.00	N/A	N/A
5250	5310.00	62	802.11n, 40 MHz Bandwidth	OFDM	N/A	13.5	back	0 mm	1.020	0.911	1.12	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				

14.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

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15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	6/28/2016	Annual	6/28/2017	MY40000670
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/19/2016	Annual	8/19/2017	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	3/24/2017	Annual	3/24/2018	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/24/2017	Biennial	3/24/2019	MY42082385
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	10/5/2016	Annual	10/5/2017	GB42230325
Agilent	E5515C	Wireless Communications Test Set	10/23/2015	Biennial	10/23/2017	GB43193563
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/22/2017	Annual	3/22/2018	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	CBT	N/A	CBT	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Agilent	N9200A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1344545
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1344559
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1126066
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1207470
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	1039008
Anritsu	ML2496A	Power Meter	3/28/2017	Annual	3/28/2018	1351001
Anritsu	ML2496A	Power Meter	4/20/2017	Annual	4/20/2018	1306009
Anritsu	MT8820C	Radio Communication Analyzer	5/23/2017	Annual	5/23/2018	6201240328
COMTECH	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M155A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261729
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
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+	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	3/2/2016	Biennial	3/2/2018	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	4/11/2017	Annual	4/11/2018	836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester	6/28/2016	Annual	6/28/2017	106578
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/20/2016	Annual	7/20/2017	132885
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Seekonk	NC-100	Torque Wrench (8" lb)	9/1/2016	Biennial	9/1/2018	21053
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	1092
SPEAG	D1765V2	1765 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/15/2016	Annual	7/15/2017	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	5/10/2017	Annual	5/10/2018	5d026
SPEAG	D1900V2	1900 MHz SAR Dipole	4/17/2017	Annual	4/17/2018	5d141
SPEAG	D2450V2	2450 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	981
SPEAG	D2450V2	2450 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	797
SPEAG	D2600V2	2600 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	1126
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/2/2016	Annual	8/2/2017	1237
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/21/2016	Annual	9/21/2017	1191
SPEAG	D750V3	750 MHz Dipole	3/7/2017	Annual	3/7/2018	1054
SPEAG	D750V3	750 MHz SAR Dipole	1/11/2017	Annual	1/11/2018	1003
SPEAG	D835V2	835 MHz SAR Dipole	7/13/2016	Annual	7/13/2017	4d047
SPEAG	D835V2	835 MHz SAR Dipole	7/14/2016	Annual	7/14/2017	4d133
SPEAG	D835V2	850 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	4d180
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2017	Annual	4/11/2018	1407
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	3/16/2017	Annual	3/16/2018	1102
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/13/2016	Annual	9/13/2017	1091
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/19/2016	Annual	7/19/2017	1039
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	ES3DV3	SAR Probe	1/13/2017	Annual	1/13/2018	3288
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3318
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	EX3DV4	SAR Probe	4/18/2017	Annual	4/18/2018	7406

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

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16 MEASUREMENT UNCERTAINTIES

a	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	Tol. (± %)	Prob. Dist.	Div.	c _i 1gm	c _i 10 gms	1gm u _i (± %)	10gms u _i (± %)	v _i
Measurement System								
Probe Calibration	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	2.0	R	1.73	1.0	1.0	1.2	1.2	∞
Linearity	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	0.25	R	1.73	1.0	1.0	0.1	0.1	∞
Readout Electronics	0.3	N	1	1.0	1.0	0.3	0.3	∞
Response Time	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	6.7	R	1.73	1.0	1.0	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	2.7	N	1	1.0	1.0	2.7	2.7	35
Device Holder Uncertainty	1.67	N	1	1.0	1.0	1.7	1.7	5
Output Power Variation - SAR drift measurement	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
SAR Scaling	0.0	R	1.73	1.0	1.0	0.0	0.0	∞
Phantom & Tissue Parameters								
Phantom Uncertainty (Shape & Thickness tolerances)	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	4.2	N	1	0.78	0.71	3.3	3.0	10
Liquid Permittivity - measurement uncertainty	4.1	N	1	0.23	0.26	1.0	1.1	10
Liquid Conductivity - Temperature Uncertainty	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Uncertainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)	RSS					11.5	11.3	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)	k=2					23.0	22.6	

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17 CONCLUSION

17.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

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

Medium: 835 Head Medium parameters used:

$f = 836.6 \text{ MHz}$; $\sigma = 0.887 \text{ S/m}$; $\epsilon_r = 39.879$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 05-30-2017; Ambient Temp: 19.7°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

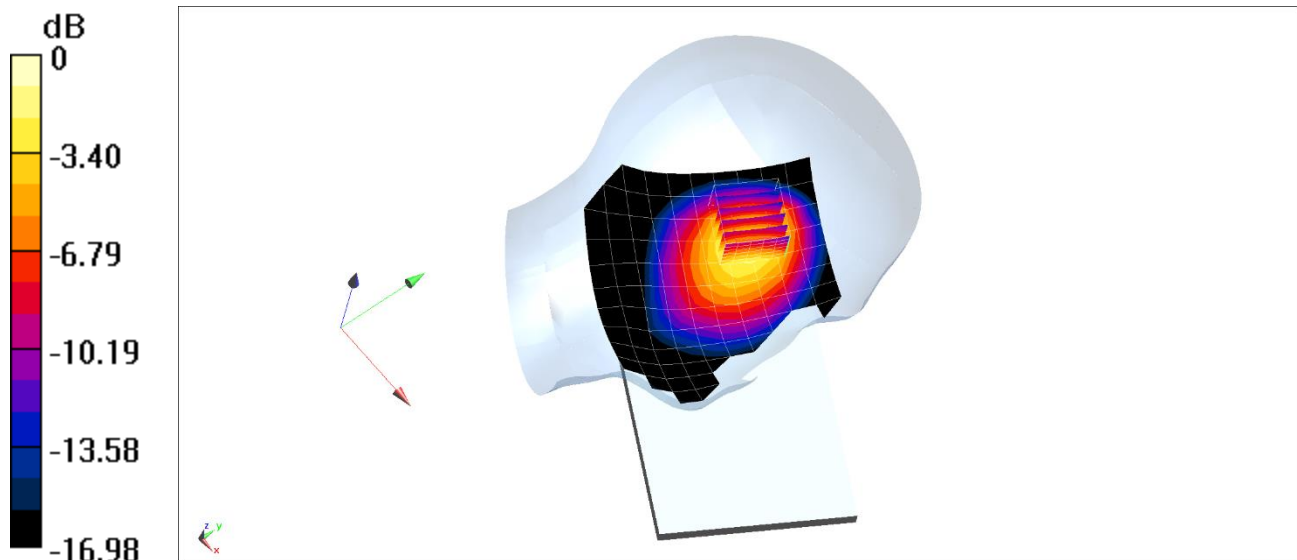
Area Scan (11x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 21.93 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.691 W/kg

SAR(1 g) = 0.409 W/kg



0 dB = 0.472 W/kg = -3.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

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

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.411 \text{ S/m}$; $\epsilon_r = 39.509$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-01-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(5.31, 5.31, 5.31); Calibrated: 1/13/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

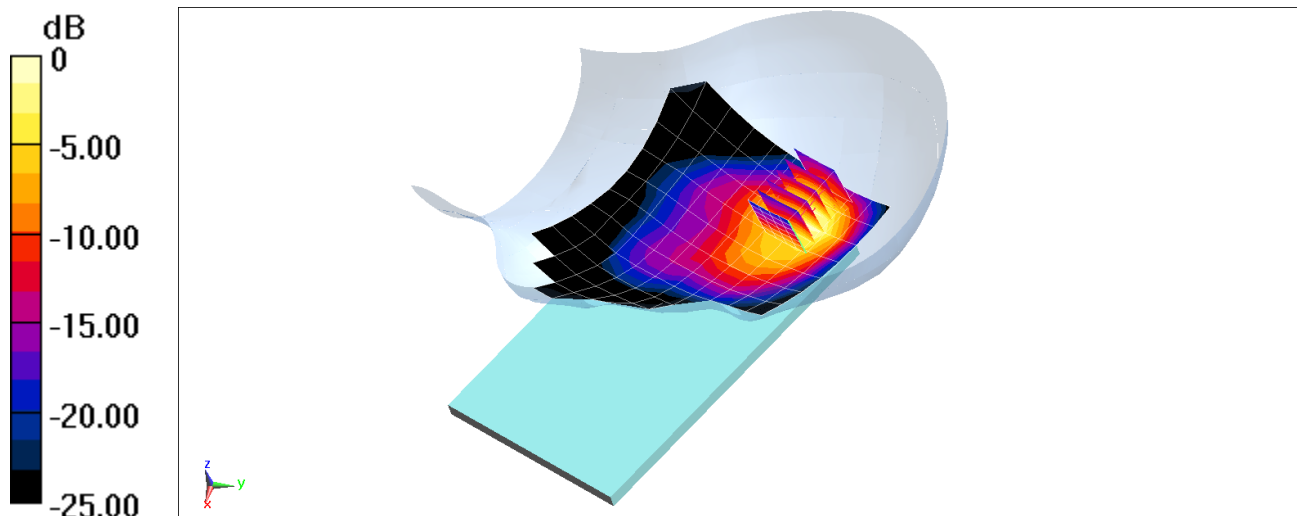
Area Scan (11x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.85 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.941 W/kg

SAR(1 g) = 0.490 W/kg



0 dB = 0.616 W/kg = -2.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

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

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.887 \text{ S/m}$; $\epsilon_r = 39.879$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 05-30-2017; Ambient Temp: 19.7°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

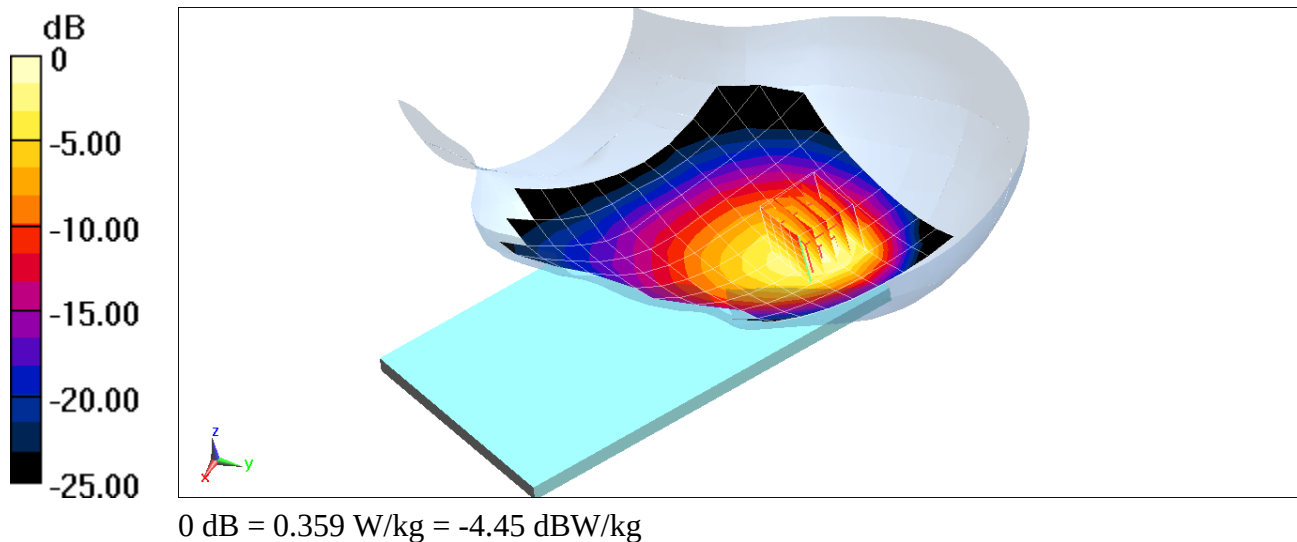
Area Scan (11x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 18.75 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.522 W/kg

SAR(1 g) = 0.294 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.398 \text{ S/m}$; $\epsilon_r = 39.729$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 05-30-2017; Ambient Temp: 20.5°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Left Head, Cheek, Mid.ch

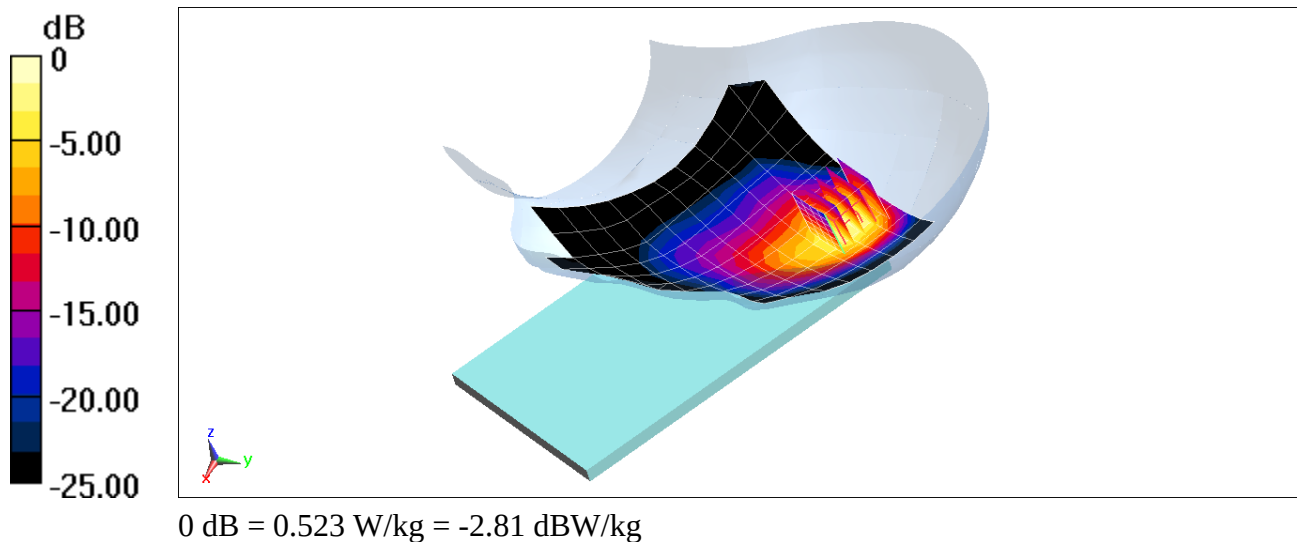
Area Scan (12x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.45 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.745 W/kg

SAR(1 g) = 0.396 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1852.4 \text{ MHz}$; $\sigma = 1.383 \text{ S/m}$; $\epsilon_r = 39.637$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-01-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(5.31, 5.31, 5.31); Calibrated: 1/13/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

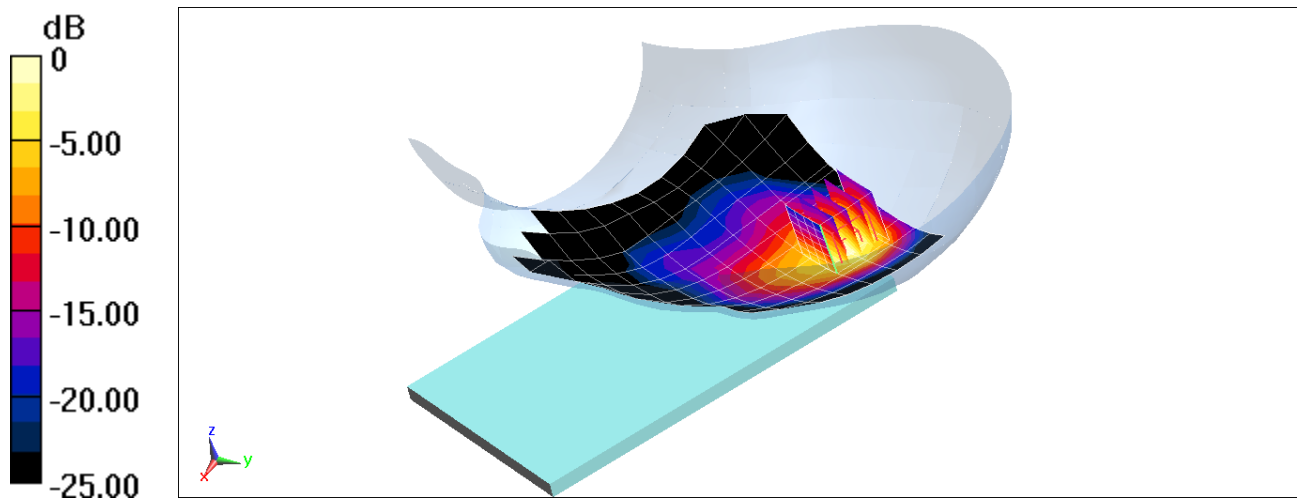
Area Scan (12x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.53 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.718 W/kg

SAR(1 g) = 0.374 W/kg



0 dB = 0.466 W/kg = -3.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04645

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

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.864 \text{ S/m}$; $\epsilon_r = 42.691$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-03-2017; Ambient Temp: 20.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3213; ConvF(6.85, 6.85, 6.85); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 17, Left Head, Cheek, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

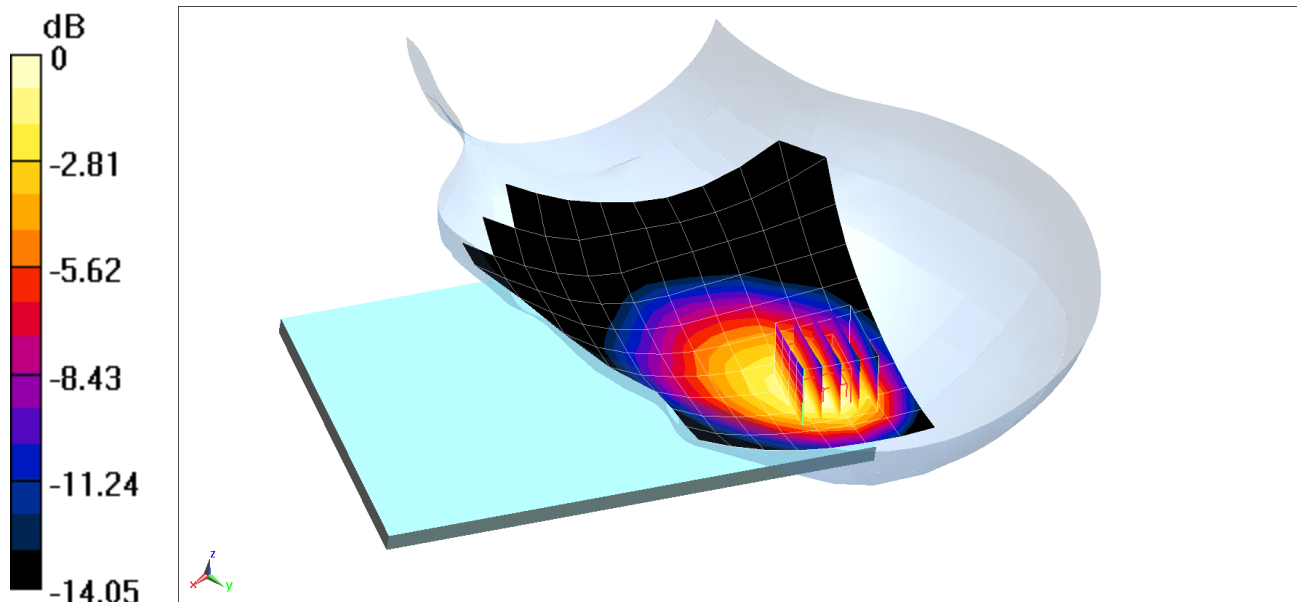
Area Scan (11x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 18.08 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.390 W/kg

SAR(1 g) = 0.237 W/kg



0 dB = 0.269 W/kg = -5.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

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

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.887 \text{ S/m}$; $\epsilon_r = 39.88$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 05-30-2017; Ambient Temp: 19.7°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

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

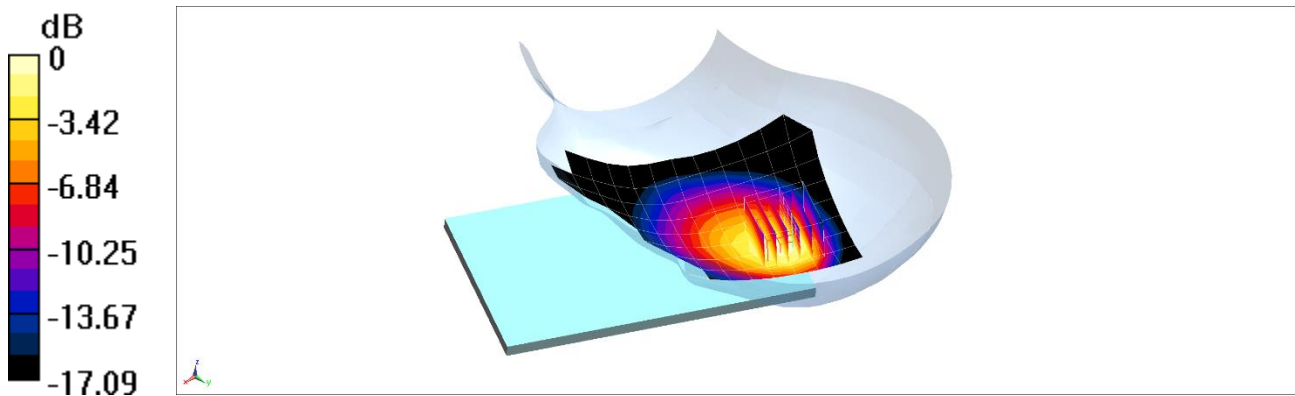
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.45 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.514 W/kg

SAR(1 g) = 0.300 W/kg



0 dB = 0.341 W/kg = -4.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

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

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.398 \text{ S/m}$; $\epsilon_r = 39.728$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 05-30-2017; Ambient Temp: 20.5°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch
20 MHz Bandwidth, QPSK, 50 RB, 25 RB Offset

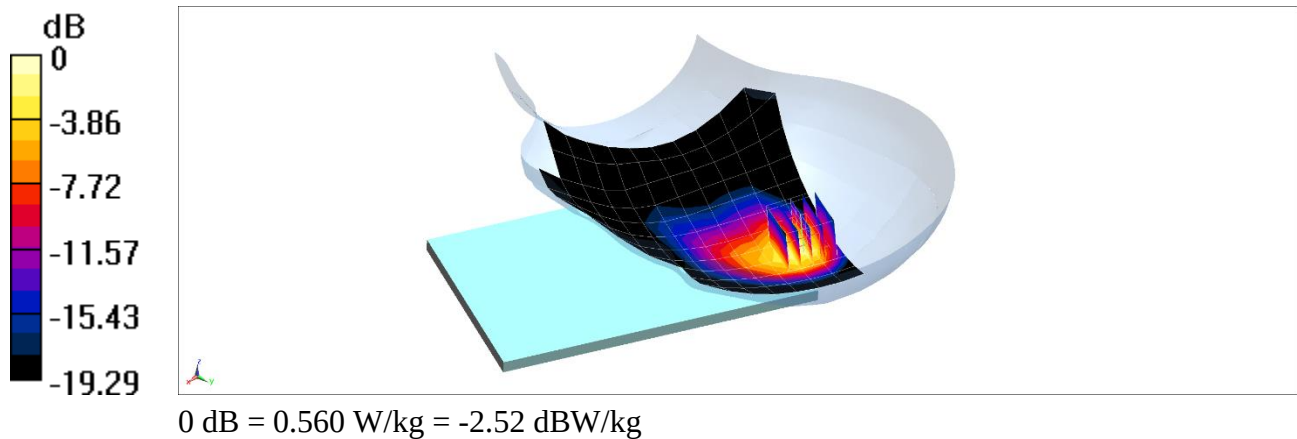
Area Scan (12x18x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 20.63 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.824 W/kg

SAR(1 g) = 0.443 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.432 \text{ S/m}$; $\epsilon_r = 39.412$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-01-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(5.31, 5.31, 5.31); Calibrated: 1/13/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 2 (PCS), Left Head, Cheek, High.ch
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

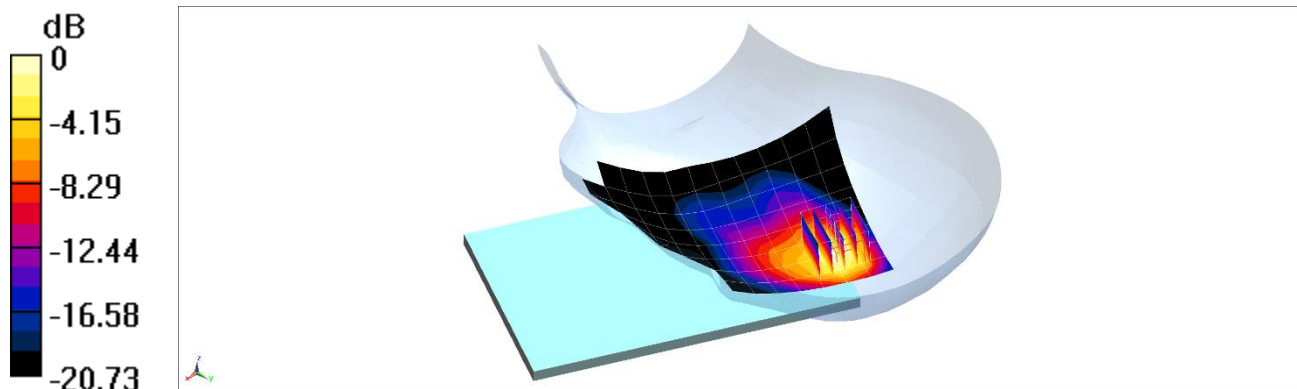
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 20.74 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.985 W/kg

SAR(1 g) = 0.511 W/kg



0 dB = 0.581 W/kg = -2.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, LTE Band 7; Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2535 \text{ MHz}$; $\sigma = 1.974 \text{ S/m}$; $\epsilon_r = 37.921$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-12-2017; Ambient Temp: 22.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.52, 4.52, 4.52); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Left Head, Cheek, Mid.ch
20 MHz Bandwidth, QPSK, 50 RB, 50 RB Offset

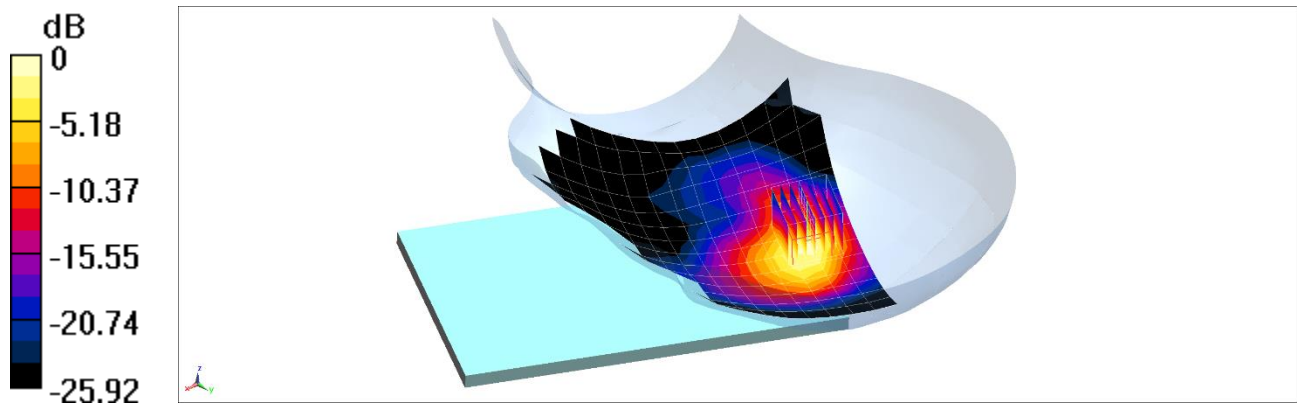
Area Scan (15x22x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 19.83 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.558 W/kg



0 dB = 0.720 W/kg = -1.43 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, _LTE Band 38; Frequency: 2595 MHz; Duty Cycle: 1:1.58

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2595 \text{ MHz}$; $\sigma = 2.039 \text{ S/m}$; $\epsilon_r = 37.668$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 06-12-2017; Ambient Temp: 22.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.52, 4.52, 4.52); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 38, Left Head, Cheek, Mid.ch
20 MHz Bandwidth, QPSK 1 RB, 50 RB Offset

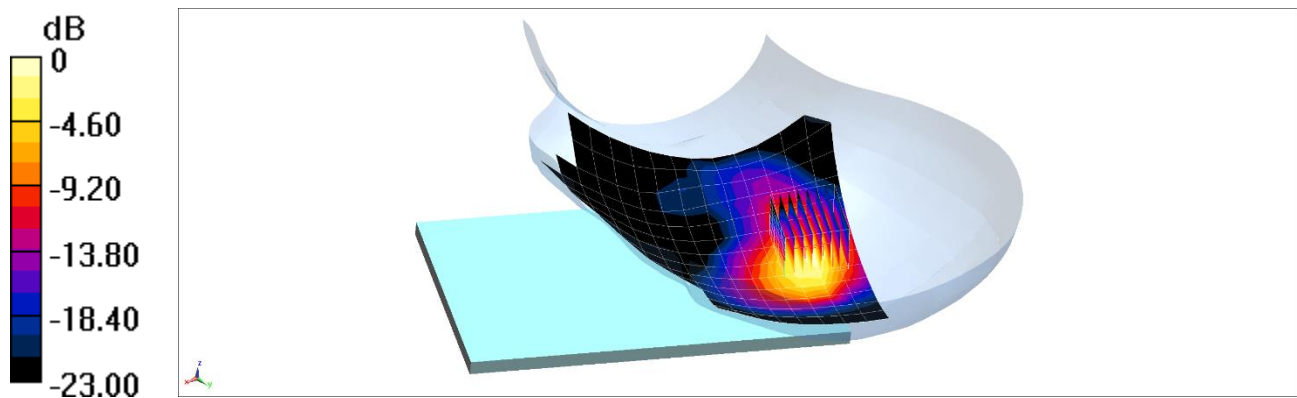
Area Scan (14x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.22 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.656 W/kg

SAR(1 g) = 0.307 W/kg



0 dB = 0.404 W/kg = -3.94 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29196

Communication System: UID 0, 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.789 \text{ S/m}$; $\epsilon_r = 38.403$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 06-19-2017; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

**Mode: IEEE 802.11b, 22 MHz Bandwidth, Right Head, Cheek,
Ch 06, 1 Mbps**

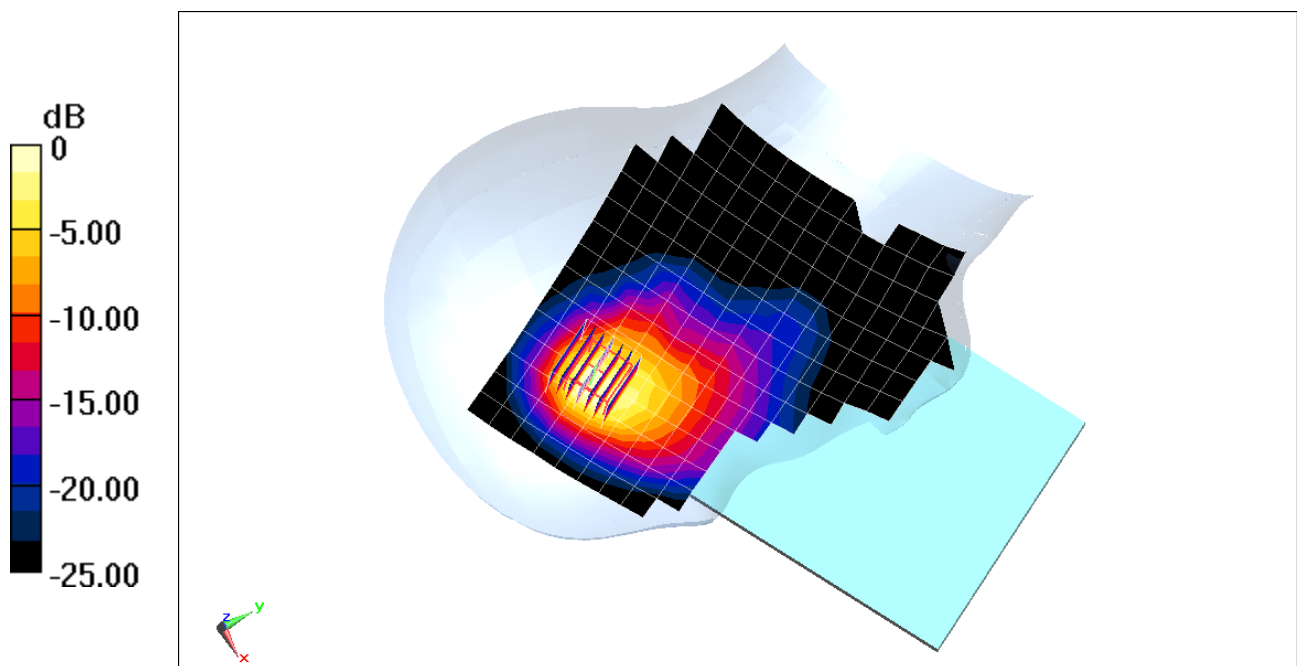
Area Scan (14x10x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 5.395 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.88 W/kg

SAR(1 g) = 0.887 W/kg



0 dB = 1.16 W/kg = 0.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29196

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: 5GHz Head Medium parameters used:

$f = 5300 \text{ MHz}$; $\sigma = 4.622 \text{ S/m}$; $\epsilon_r = 34.927$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 06-10-2017; Ambient Temp: 19.9°C; Tissue Temp: 19.8°C

Probe: EX3DV4 - SN3914; ConvF(5.49, 5.49, 5.49); Calibrated: 2/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

**Mode: IEEE 802.11a, U-NII-2A, 20 MHz Bandwidth, Right Head, Cheek,
Ch 60, 6 Mbps**

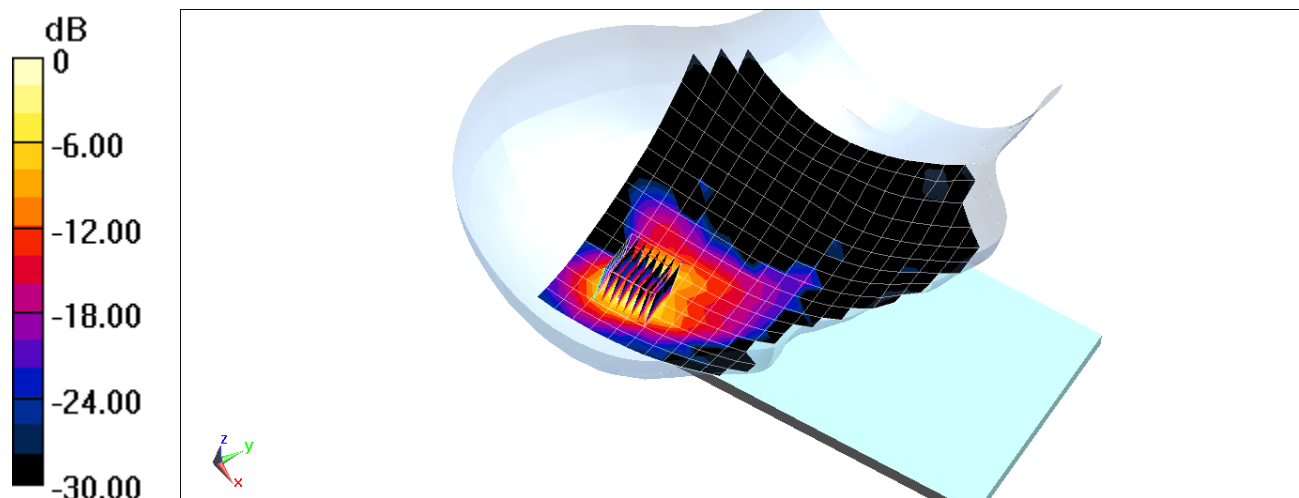
Area Scan (18x27x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 2.190 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.56 W/kg

SAR(1 g) = 0.656 W/kg



0 dB = 1.63 W/kg = 2.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29196

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.290

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2480 \text{ MHz}$; $\sigma = 1.896 \text{ S/m}$; $\epsilon_r = 37.794$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 06-07-2017; Ambient Temp: 19.3°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Bluetooth, Right Head, Cheek, Ch 78, 1 Mbps

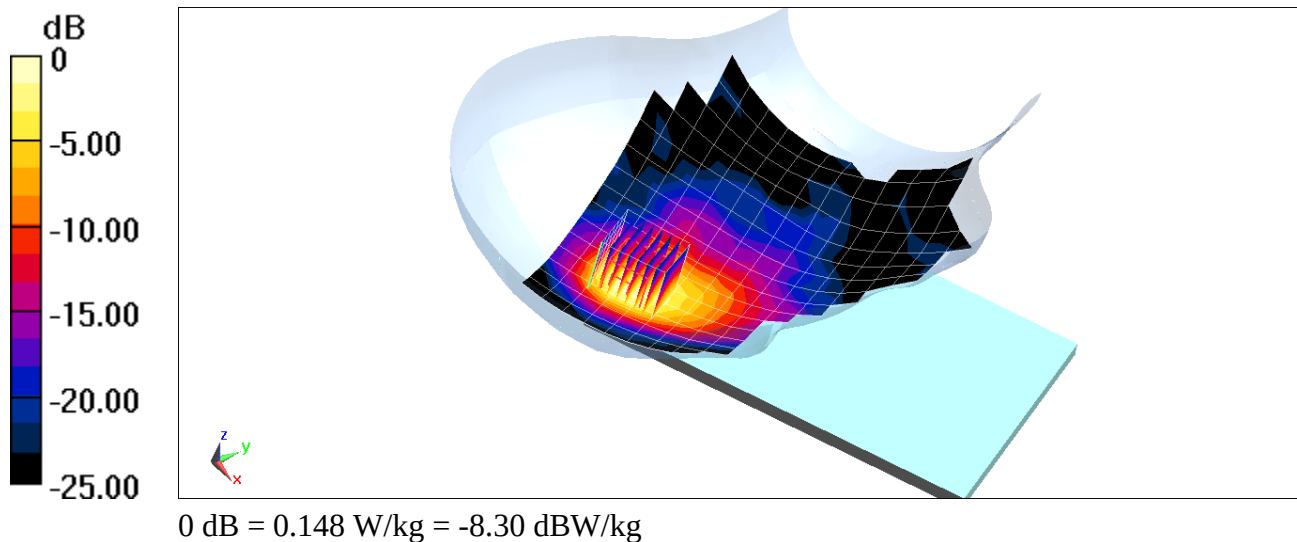
Area Scan (16x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x8x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.686 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.241 W/kg

SAR(1 g) = 0.113 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 824.2 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 824.2 \text{ MHz}$; $\sigma = 0.965 \text{ S/m}$; $\epsilon_r = 53.391$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.1 cm

Test Date: 05-25-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7406; ConvF(9.77, 9.77, 9.77); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 850, Body SAR, Right Edge, Low.ch, 2 Tx Slots

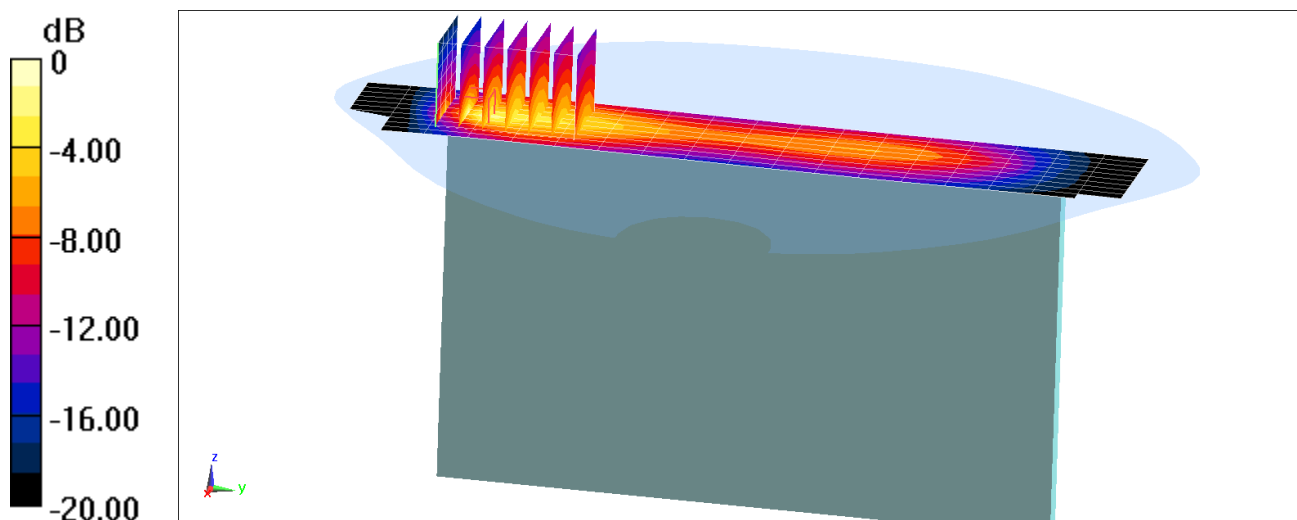
Area Scan (11x19x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (5x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.40 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.49 W/kg

SAR(1 g) = 0.850 W/kg



0 dB = 1.84 W/kg = 2.65 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, GSM GPRS; 1 Tx slot; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: 1900 Body Medium parameters used:

$f = 1910$ MHz; $\sigma = 1.589$ S/m; $\epsilon_r = 51.764$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-06-2017; Ambient Temp: 20.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3318; ConvF(4.96, 4.96, 4.96); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 1900, Body SAR, Back side, High.ch, 1 Tx Slots

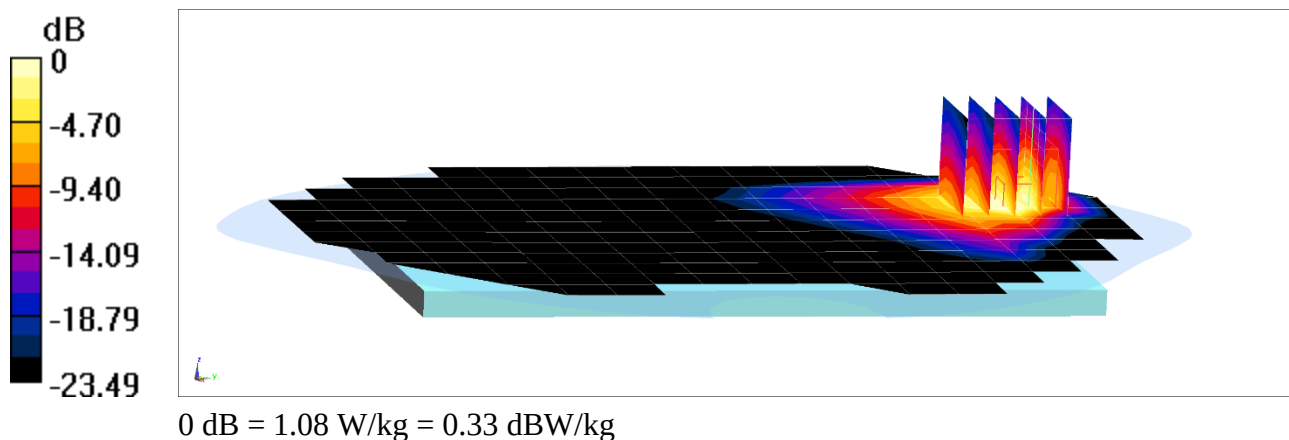
Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 21.87 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.865 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, UMTS; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 826.4 \text{ MHz}$; $\sigma = 0.987 \text{ S/m}$; $\epsilon_r = 54.322$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.1 cm

Test Date: 05-30-2017; Ambient Temp: 20.8°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(9.77, 9.77, 9.77); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 850, Body SAR, Right Edge, Low.ch

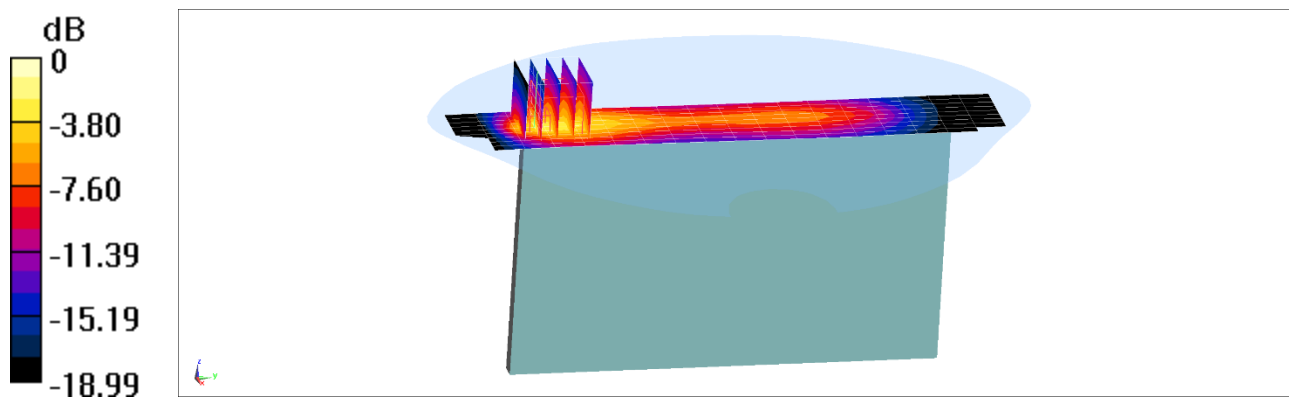
Area Scan (10x19x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 26.64 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.56 W/kg

SAR(1 g) = 0.762 W/kg



0 dB = 1.88 W/kg = 2.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.487 \text{ S/m}$; $\epsilon_r = 51.592$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-26-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3287; ConvF(5.11, 5.11, 5.11); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

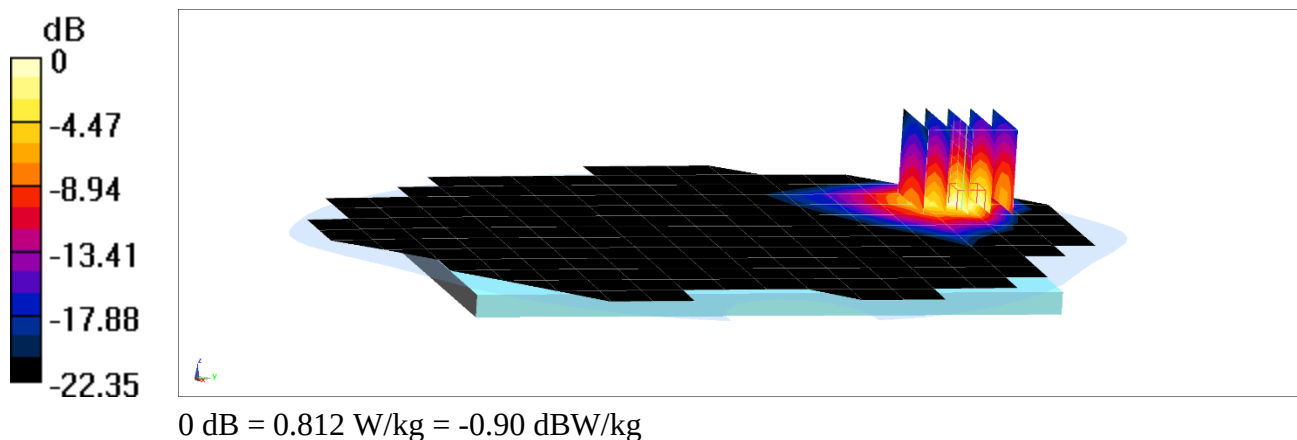
Area Scan (15x19x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 25.14 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 0.680 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1852.4 \text{ MHz}$; $\sigma = 1.526 \text{ S/m}$; $\epsilon_r = 51.938$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-06-2017; Ambient Temp: 20.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3318; ConvF(4.96, 4.96, 4.96); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

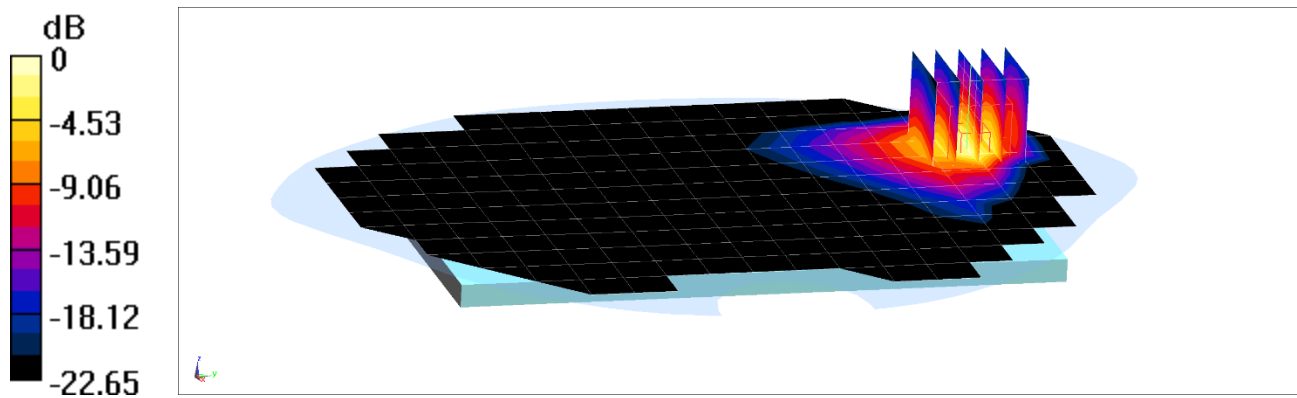
Area Scan (13x18x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 26.56 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.96 W/kg

SAR(1 g) = 0.882 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

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

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.935 \text{ S/m}$; $\epsilon_r = 57.351$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-05-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(9.9, 9.9, 9.9); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 17, Body SAR, Back side, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

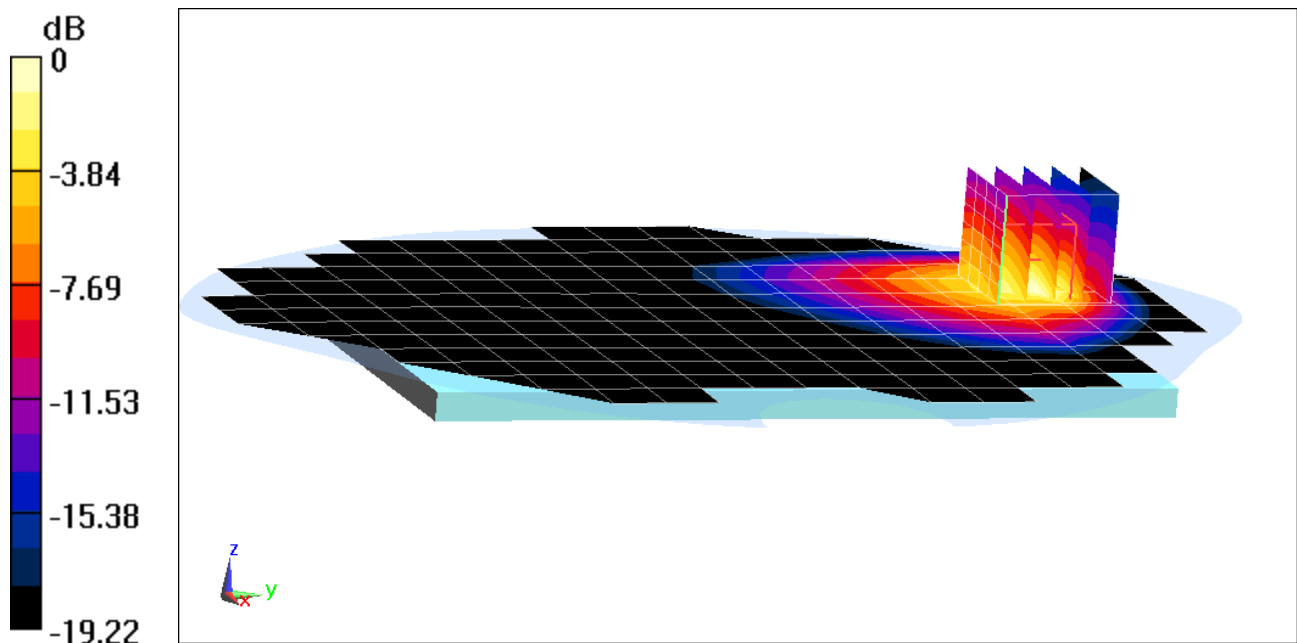
Area Scan (15x19x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 21.57 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.879 W/kg

SAR(1 g) = 0.405 W/kg



0 dB = 0.649 W/kg = -1.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

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

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.997 \text{ S/m}$; $\epsilon_r = 54.223$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.1 cm

Test Date: 05-30-2017; Ambient Temp: 20.8°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(9.77, 9.77, 9.77); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

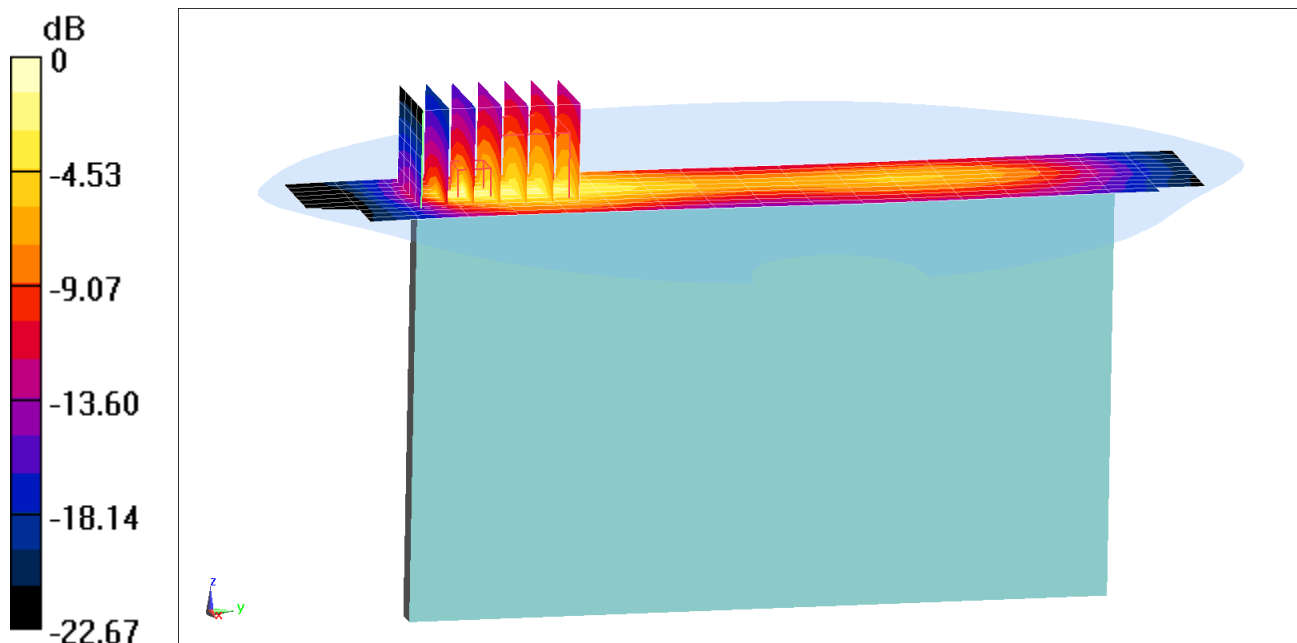
Area Scan (11x19x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (5x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.96 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.35 W/kg

SAR(1 g) = 0.717 W/kg



0 dB = 1.71 W/kg = 2.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 04520

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; $\sigma = 1.487$ S/m; $\epsilon_r = 51.592$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 0.1 cm

Test Date: 05-26-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3287; ConvF(5.11, 5.11, 5.11); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 4 (AWS), Body SAR, Right Edge, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

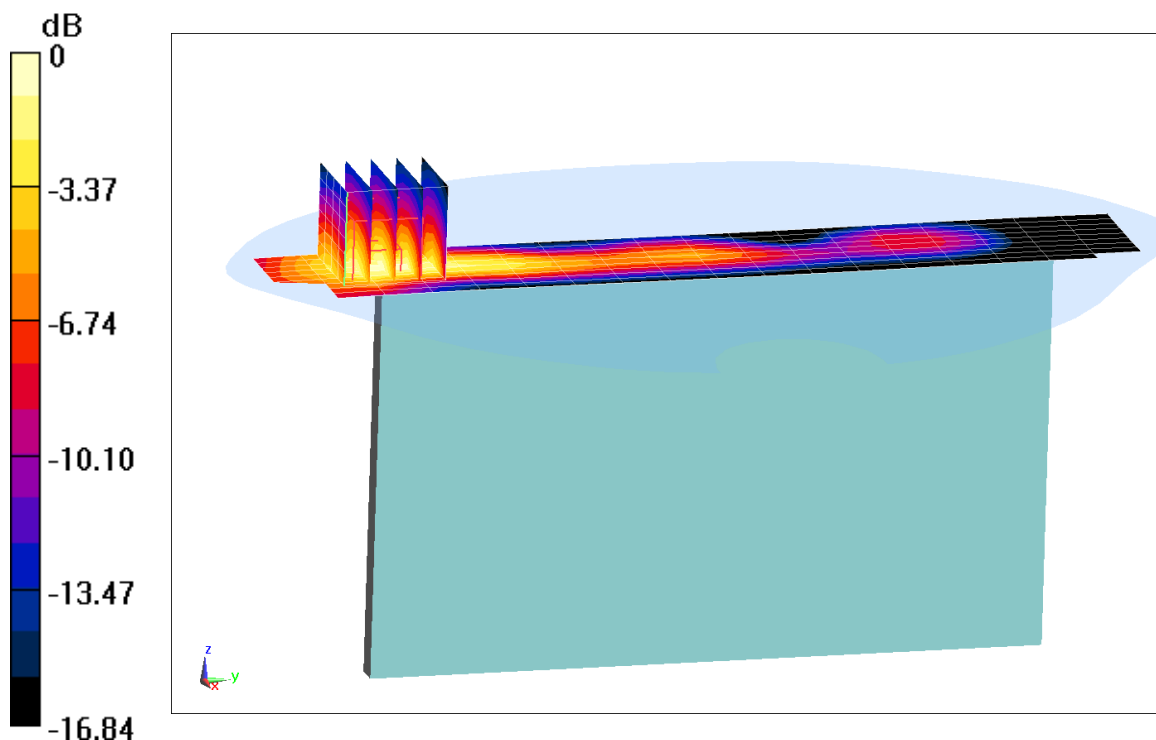
Area Scan (10x19x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 26.17 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.50 W/kg

SAR(1 g) = 0.860 W/kg



0 dB = 1.10 W/kg = 0.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Body, Medium parameters used (interpolated):

$f = 1860 \text{ MHz}$; $\sigma = 1.490 \text{ S/m}$; $\epsilon_r = 52.472$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-30-2017; Ambient Temp: 23.7°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3319; ConvF(4.88, 4.88, 4.88); Calibrated: 3/14/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/8/2017

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

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

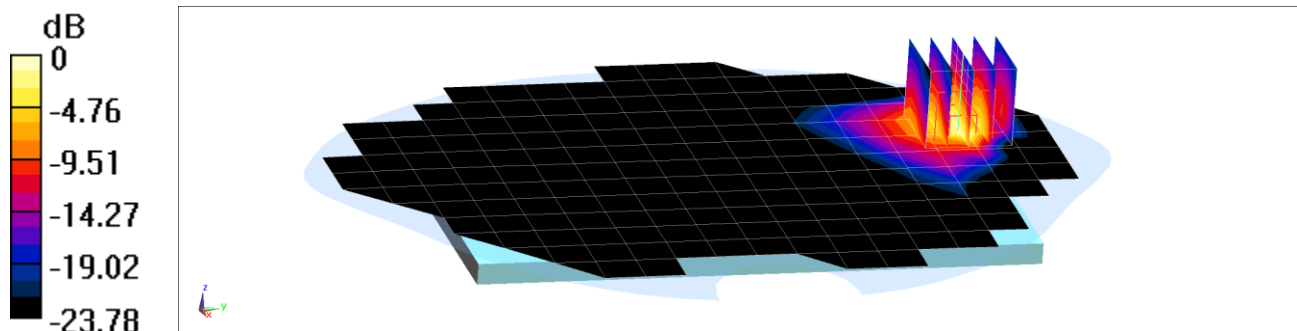
Area Scan (10x10x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 29.33 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 2.27 W/kg

SAR(1 g) = 0.991 W/kg



0 dB = 1.46 W/kg = 1.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, LTE Band 7; Frequency: 2535 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2535 \text{ MHz}$; $\sigma = 2.151 \text{ S/m}$; $\epsilon_r = 51.225$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-14-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

**Mode: LTE Band 7, Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset**

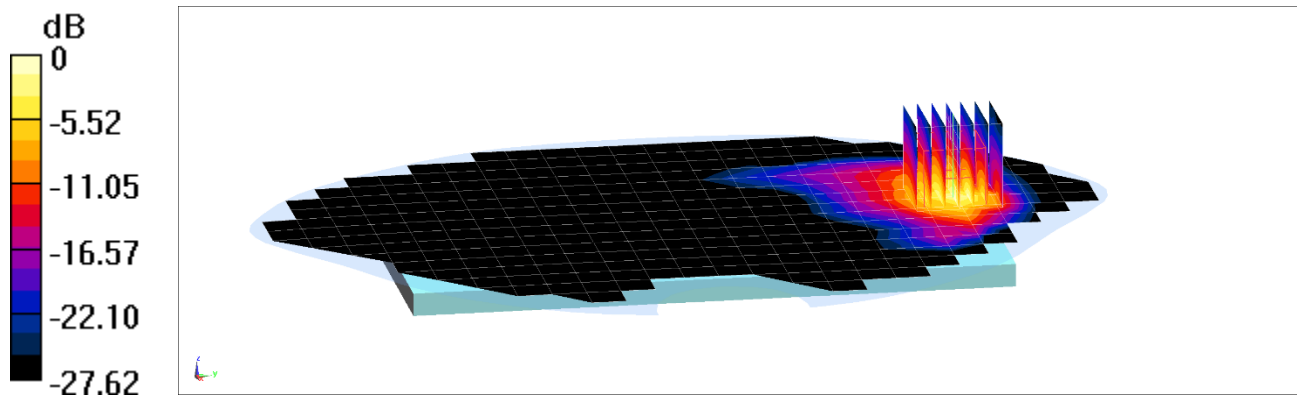
Area Scan (19x25x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 21.61 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 2.94 W/kg

SAR(1 g) = 0.950 W/kg



0 dB = 1.93 W/kg = 2.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 06350

Communication System: UID 0, LTE Band 38; Frequency: 2595 MHz; Duty Cycle: 1:1.58

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2595 \text{ MHz}$; $\sigma = 2.237 \text{ S/m}$; $\epsilon_r = 50.992$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-14-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 38, Body SAR, Back side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

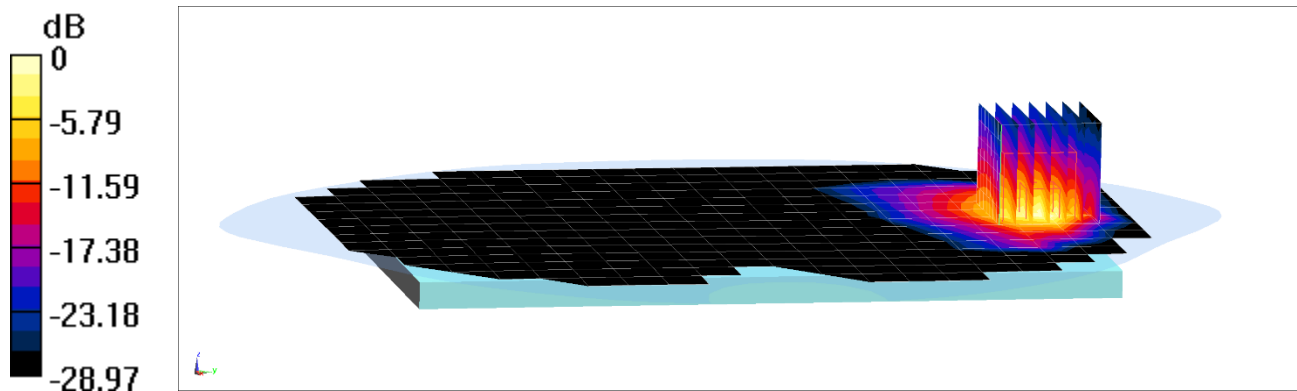
Area Scan (16x21x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.31 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.79 W/kg

SAR(1 g) = 0.835 W/kg



0 dB = 1.94 W/kg = 2.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29113

Communication System: UID 0, IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2462 \text{ MHz}$; $\sigma = 2.036 \text{ S/m}$; $\epsilon_r = 51.235$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-19-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

**Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR,
Back Side, Ch 11, 1 Mbps**

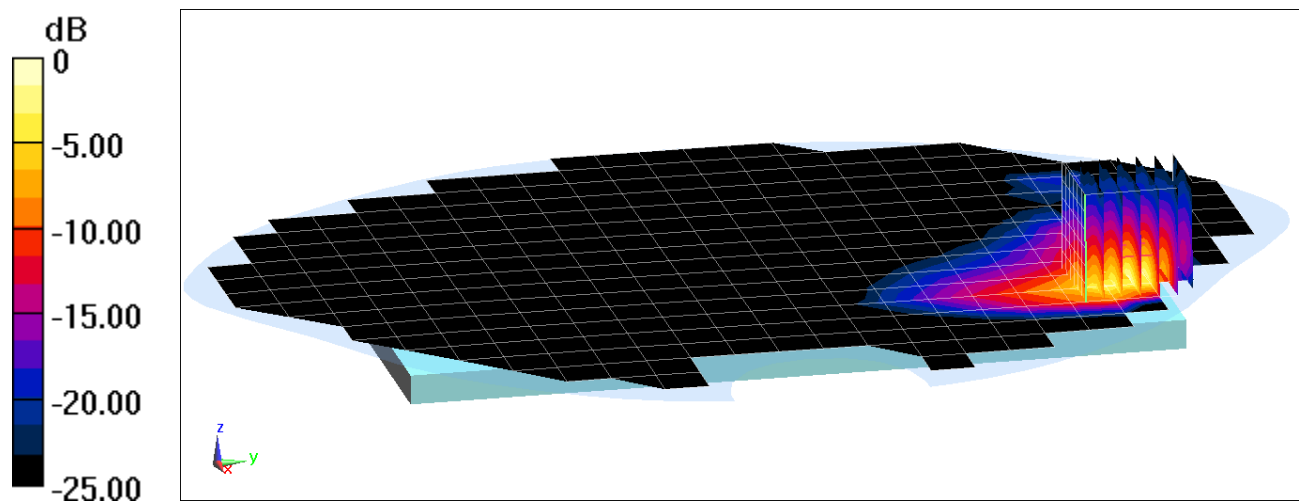
Area Scan (18x24x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 14.86 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.364 W/kg



0 dB = 0.849 W/kg = -0.71 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29113

Communication System: UID 0, IEEE 802.11n; Frequency: 5310 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used (interpolated):

$f = 5310 \text{ MHz}$; $\sigma = 5.5 \text{ S/m}$; $\epsilon_r = 48.803$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-05-2017; Ambient Temp: 22.6°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(4.19, 4.19, 4.19); Calibrated: 1/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

**Mode: IEEE 802.11n, 40 MHz Bandwidth, Body SAR,
Back Side, Ch 62, 13.5 Mbps**

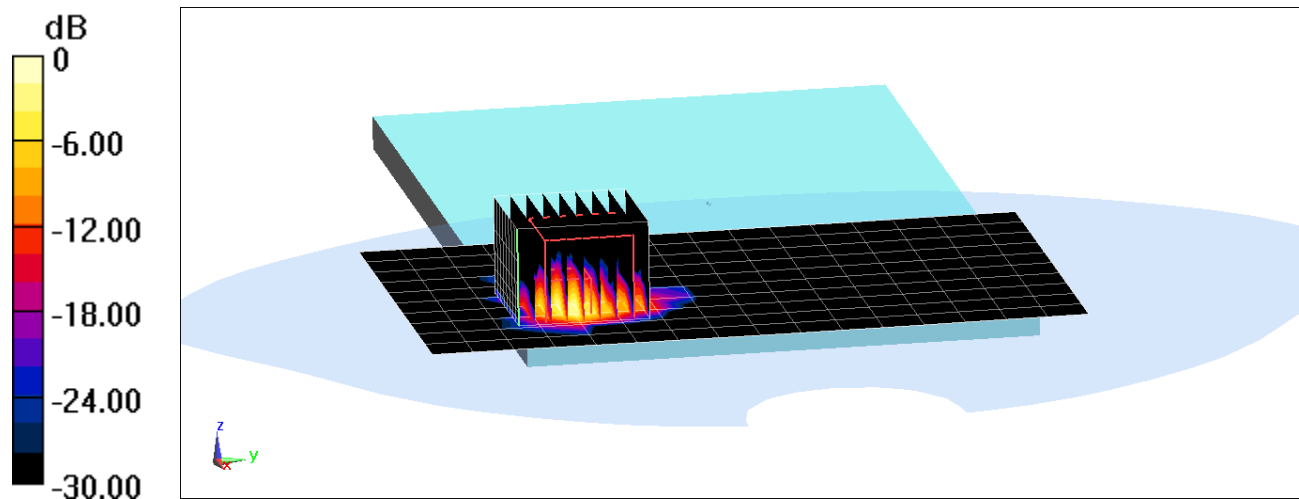
Area Scan (11x17x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 12.53 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 6.17 W/kg

SAR(1 g) = 1.02 W/kg



0 dB = 3.04 W/kg = 4.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMT385; Type: Portable Tablet; Serial: 29113

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.290

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2480 \text{ MHz}$; $\sigma = 1.97 \text{ S/m}$; $\epsilon_r = 50.84$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-07-2017; Ambient Temp: 22.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Bluetooth, Body SAR, Back Side, Ch 78, 1 Mbps

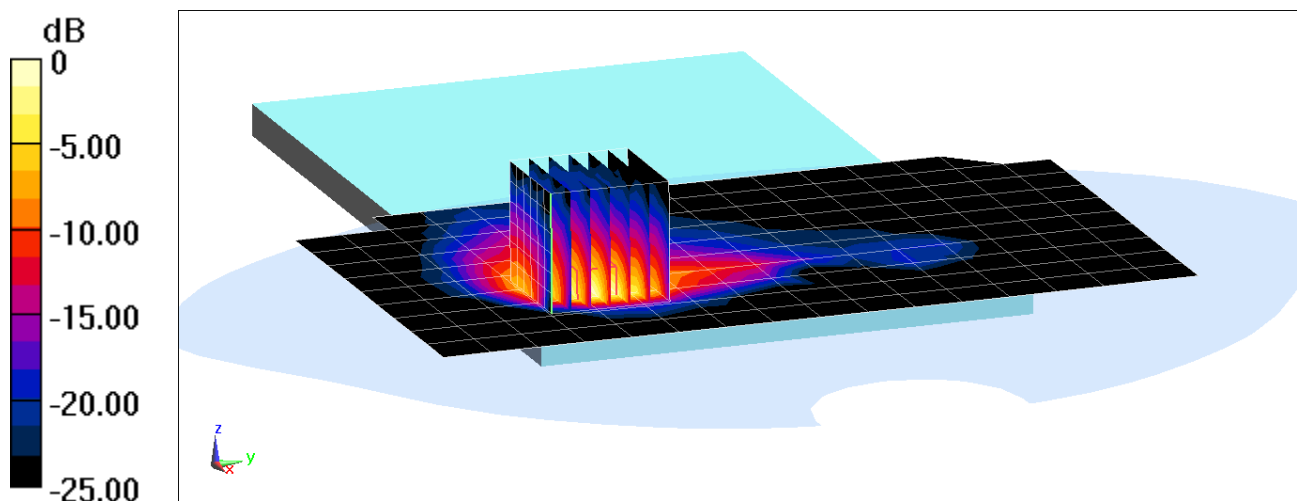
Area Scan (11x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 11.57 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.308 W/kg



0 dB = 0.481 W/kg = -3.18 dBW/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 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.903 \text{ S/m}$; $\epsilon_r = 42.19$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-03-2017; Ambient Temp: 20.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3213; ConvF(6.85, 6.85, 6.85); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

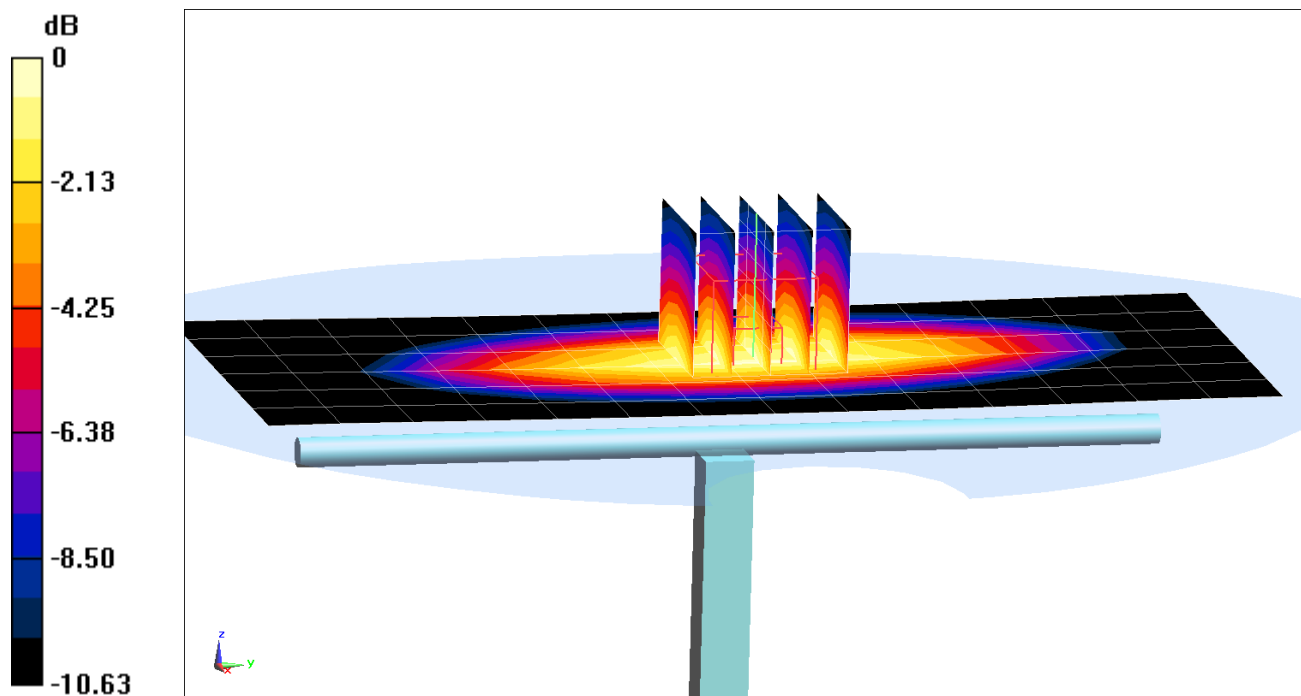
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.58 W/kg

SAR(1 g) = 1.72 W/kg

Deviation(1 g) = 2.50%



0 dB = 2.03 W/kg = 3.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d180

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.886 \text{ S/m}$; $\epsilon_r = 39.901$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2017; Ambient Temp: 19.7°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

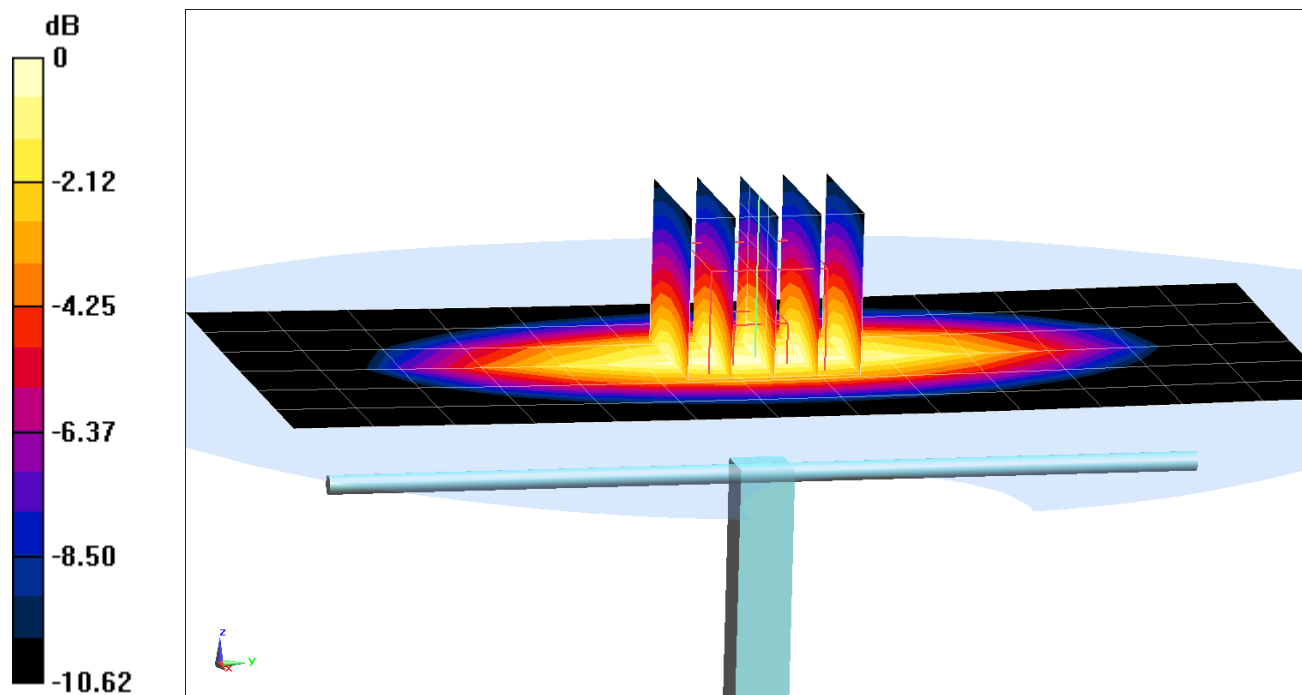
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.81 W/kg

SAR(1 g) = 1.91 W/kg

Deviation(1 g) = 3.13%



0 dB = 2.22 W/kg = 3.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1092

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.414 \text{ S/m}$; $\epsilon_r = 39.626$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2017; Ambient Temp: 20.5°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

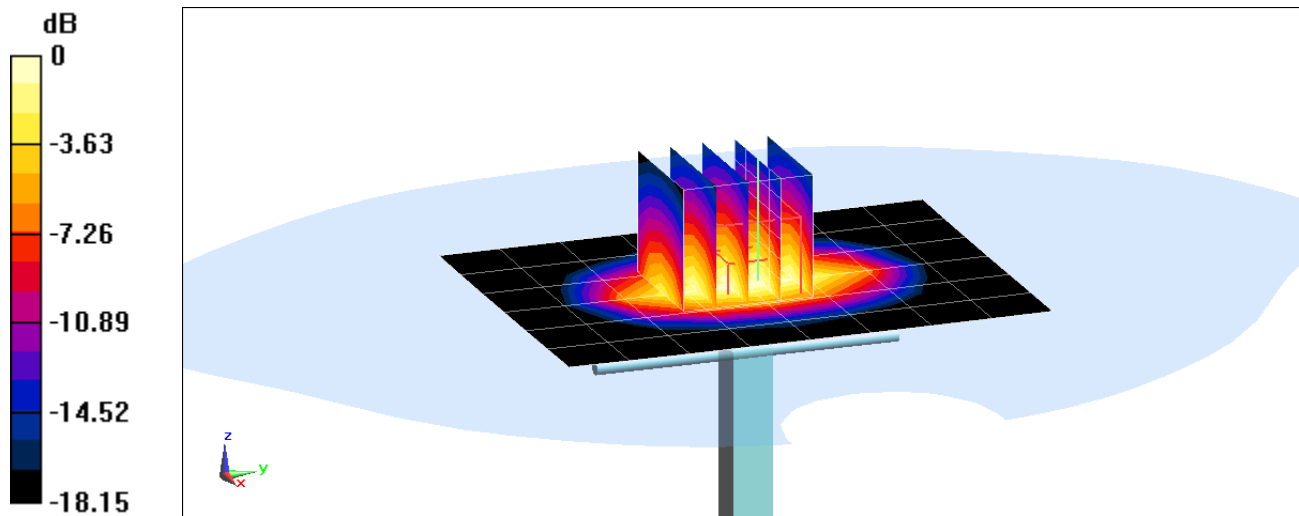
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.84 W/kg

SAR(1 g) = 3.72 W/kg

Deviation(1 g) = 2.20%



0 dB = 4.61 W/kg = 6.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.432 \text{ S/m}$; $\epsilon_r = 39.412$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-01-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3288; ConvF(5.31, 5.31, 5.31); Calibrated: 1/13/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

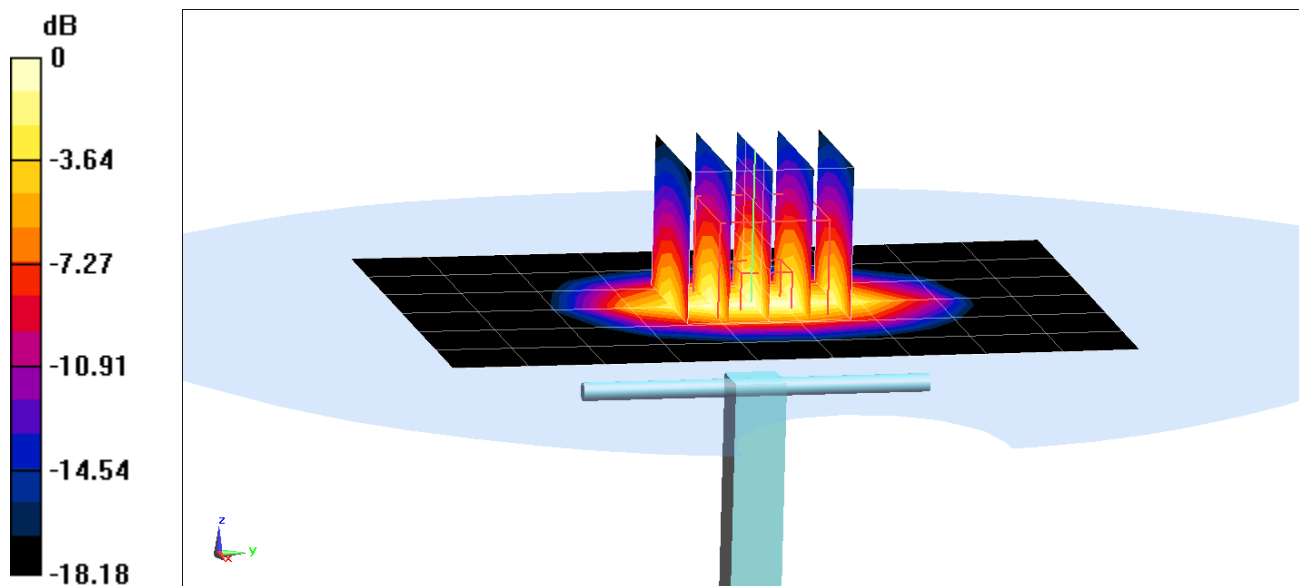
Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.24 W/kg

SAR(1 g) = 3.95 W/kg

Deviation(1 g) = -1.50%



0 dB = 5.02 W/kg = 7.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.876 \text{ S/m}$; $\epsilon_r = 38.255$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-12-2017; Ambient Temp: 22.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

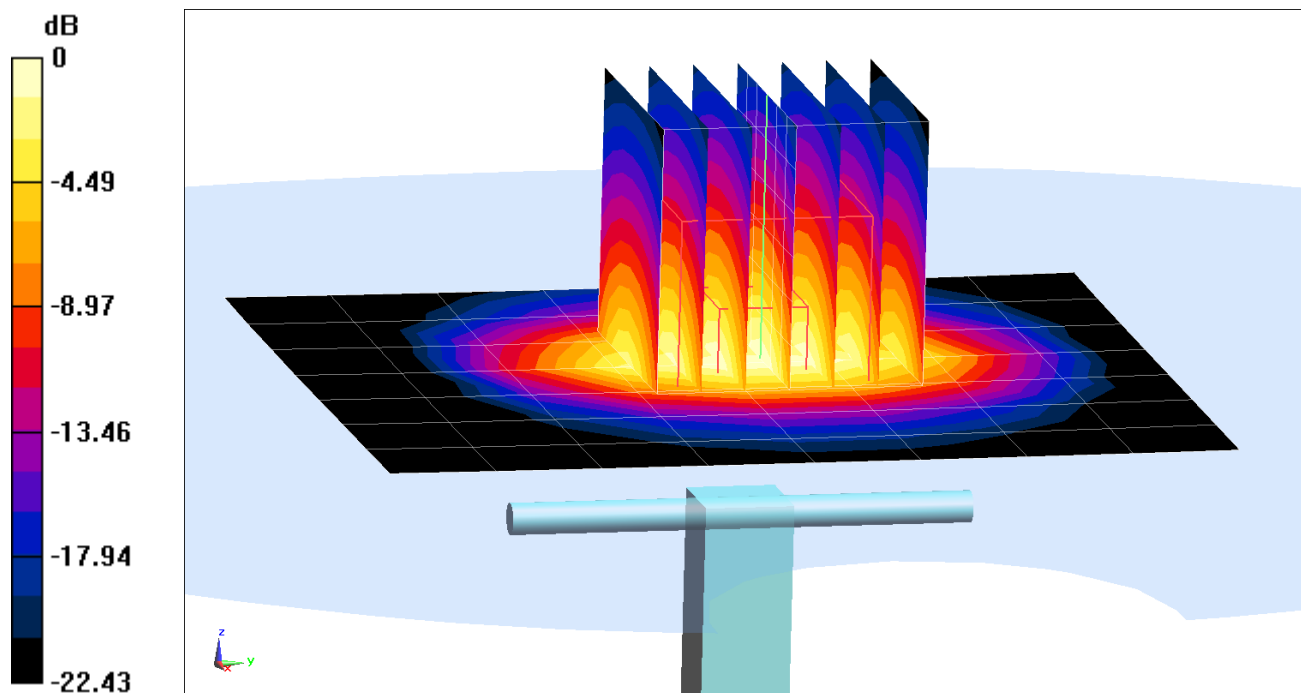
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.23 W/kg

Deviation(1 g) = 0.38%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1126

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.044 \text{ S/m}$; $\epsilon_r = 37.646$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-12-2017; Ambient Temp: 22.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.52, 4.52, 4.52); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

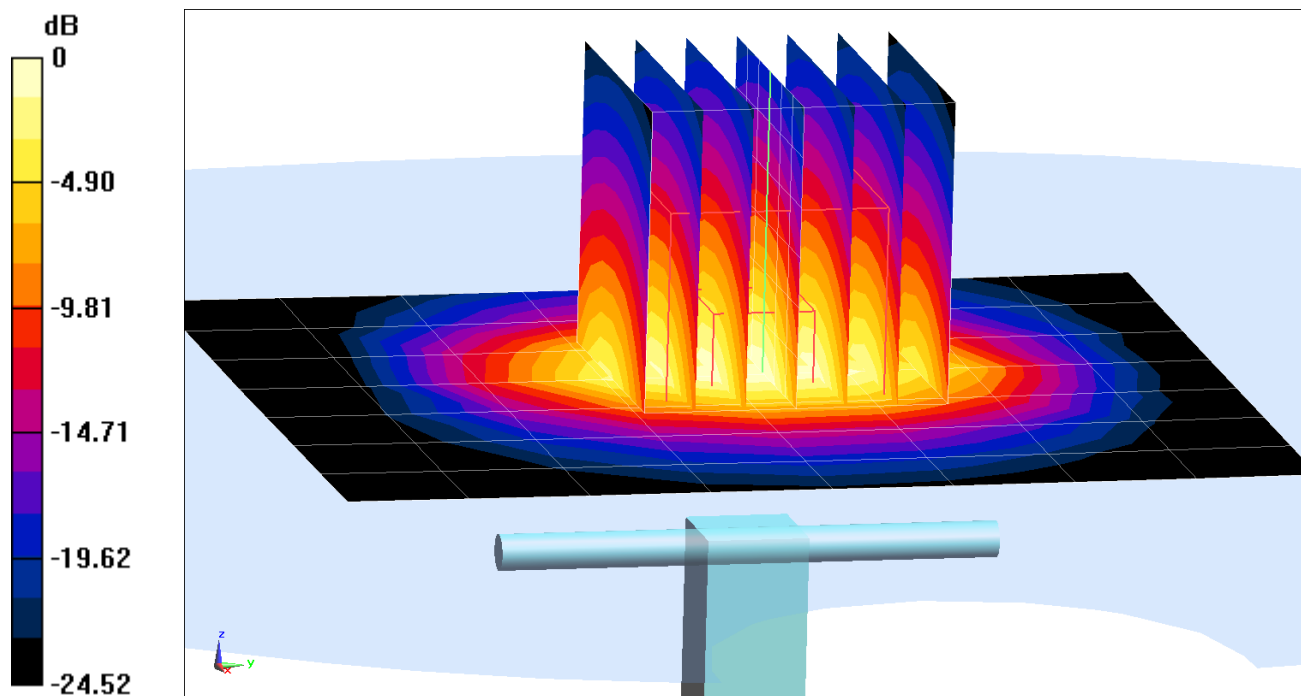
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 12.1 W/kg

SAR(1 g) = 5.43 W/kg

Deviation(1 g) = -3.55%



0 dB = 7.26 W/kg = 8.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.803 \text{ S/m}$; $\epsilon_r = 38.36$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-19-2017; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2017

Phantom: SAM Right; Type: SAM; Serial: 1757

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

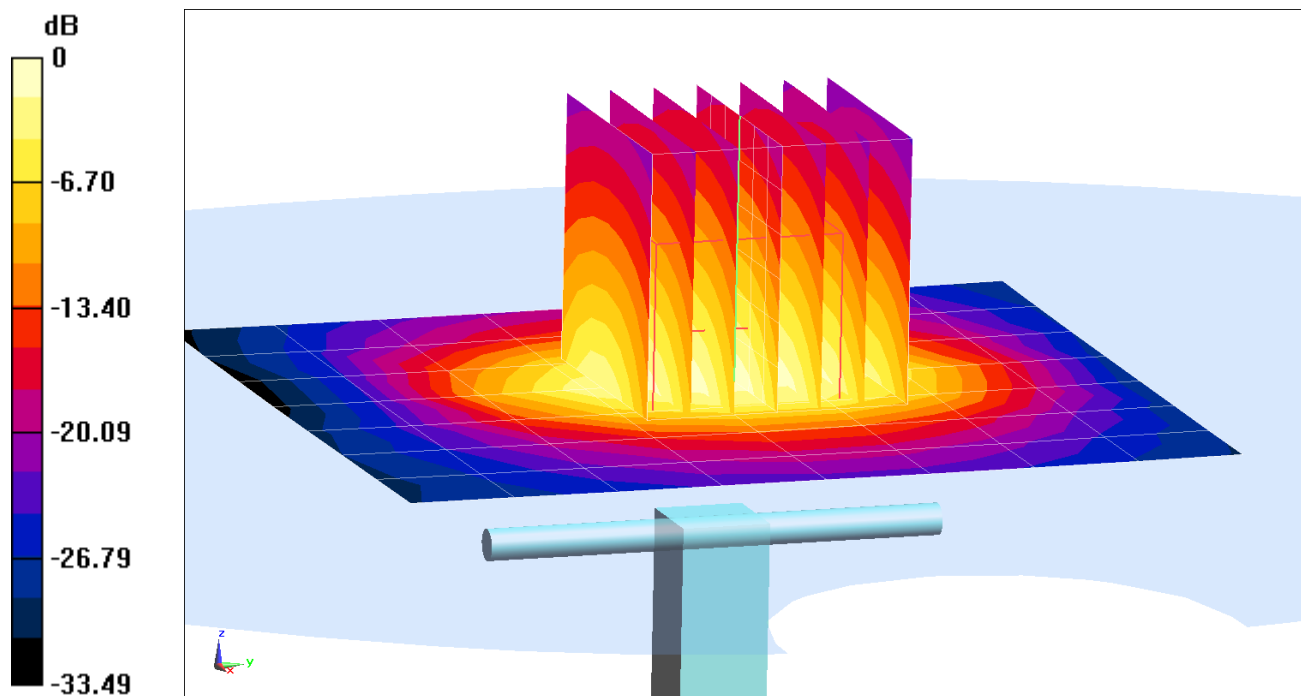
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.33 W/kg

Deviation(1 g) = 2.30%



0 dB = 7.26 W/kg = 8.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5GHz Head Medium parameters used (interpolated):

$f = 5250 \text{ MHz}$; $\sigma = 4.58 \text{ S/m}$; $\epsilon_r = 35.029$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2017; Ambient Temp: 19.9°C; Tissue Temp: 19.8°C

Probe: EX3DV4 - SN3914; ConvF(5.49, 5.49, 5.49); Calibrated: 2/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

5250 MHz System Verification at 17dBm (50 mW)

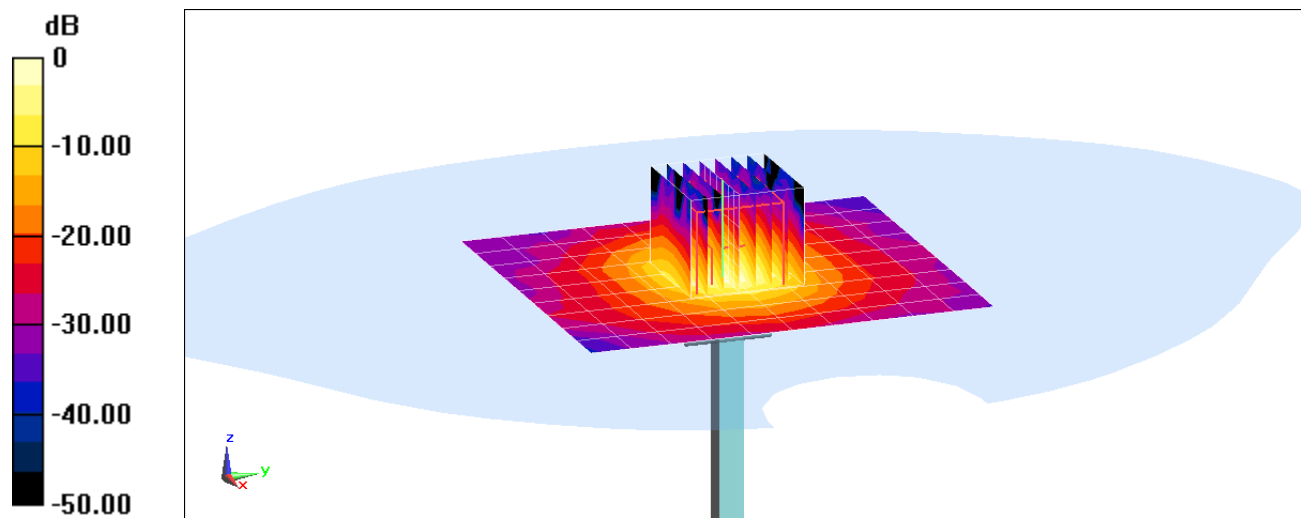
Area Scan (10x11x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 3.87 W/kg

Deviation(1 g) = -1.90%



0 dB = 9.52 W/kg = 9.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5GHz Head Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 4.94 \text{ S/m}$; $\epsilon_r = 34.501$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2017; Ambient Temp: 19.9°C; Tissue Temp: 19.8°C

Probe: EX3DV4 - SN3914; ConvF(4.94, 4.94, 4.94); Calibrated: 2/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

5600 MHz System Verification at 17dBm (50 mW)

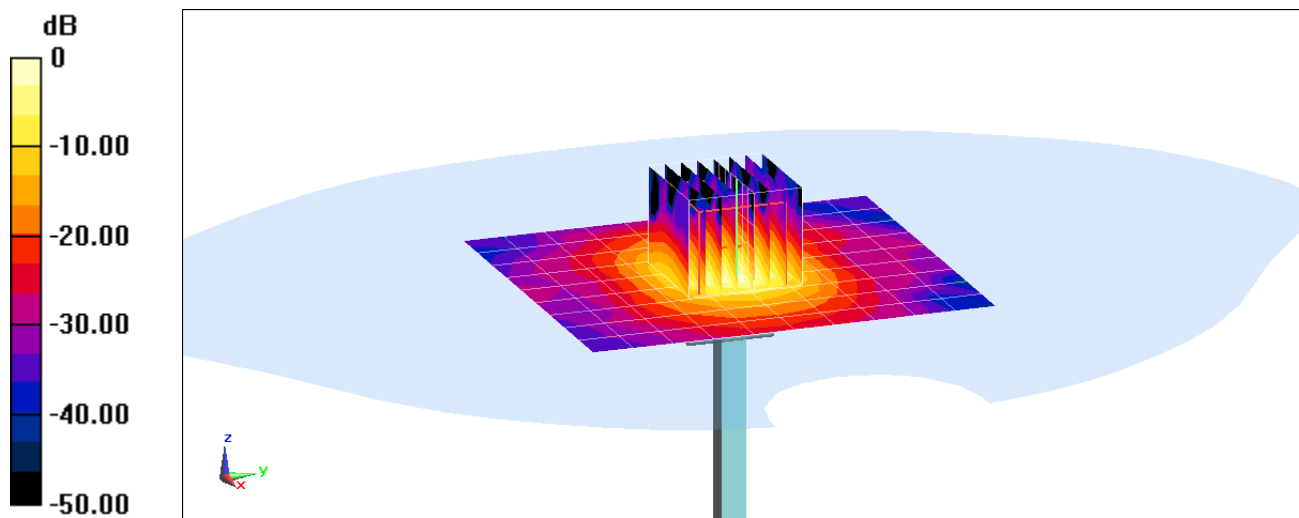
Area Scan (10x11x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 4.15 W/kg

Deviation(1 g) = -0.72%



0 dB = 10.0 W/kg = 10.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5GHz Head Medium parameters used (interpolated):

$f = 5750 \text{ MHz}$; $\sigma = 5.103 \text{ S/m}$; $\epsilon_r = 34.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-10-2017; Ambient Temp: 19.9°C; Tissue Temp: 19.8°C

Probe: EX3DV4 - SN3914; ConvF(4.91, 4.91, 4.91); Calibrated: 2/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/9/2017

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

5750 MHz System Verification at 17.0 dBm (50 mW)

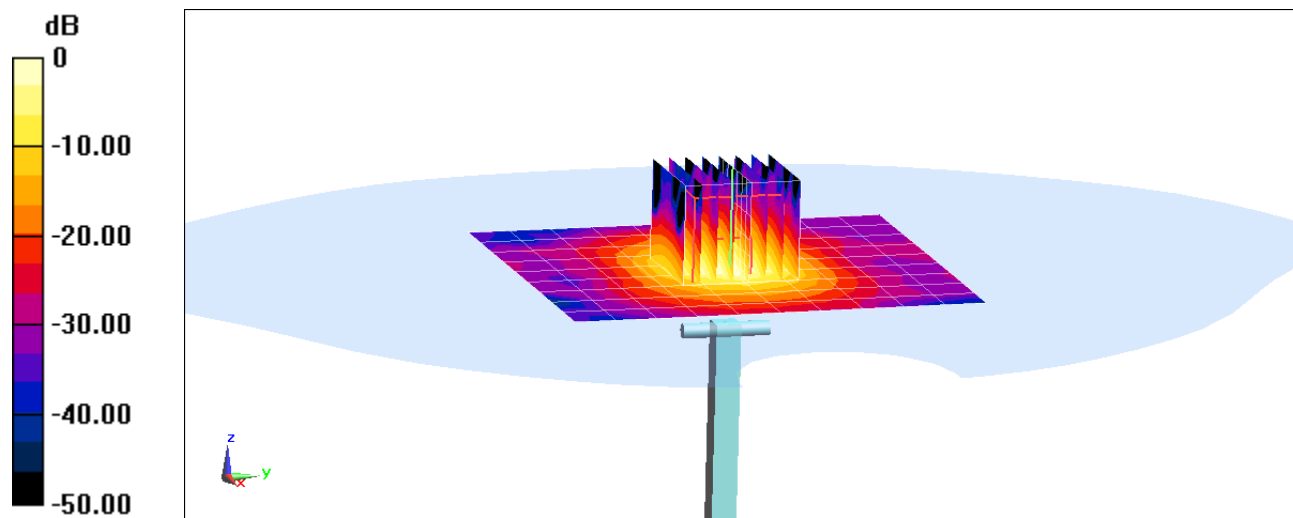
Area Scan (10x11x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 3.80 W/kg

Deviation(1 g) = -3.92%



0 dB = 9.24 W/kg = 9.66 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.976 \text{ S/m}$; $\epsilon_r = 56.938$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-05-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(9.9, 9.9, 9.9); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

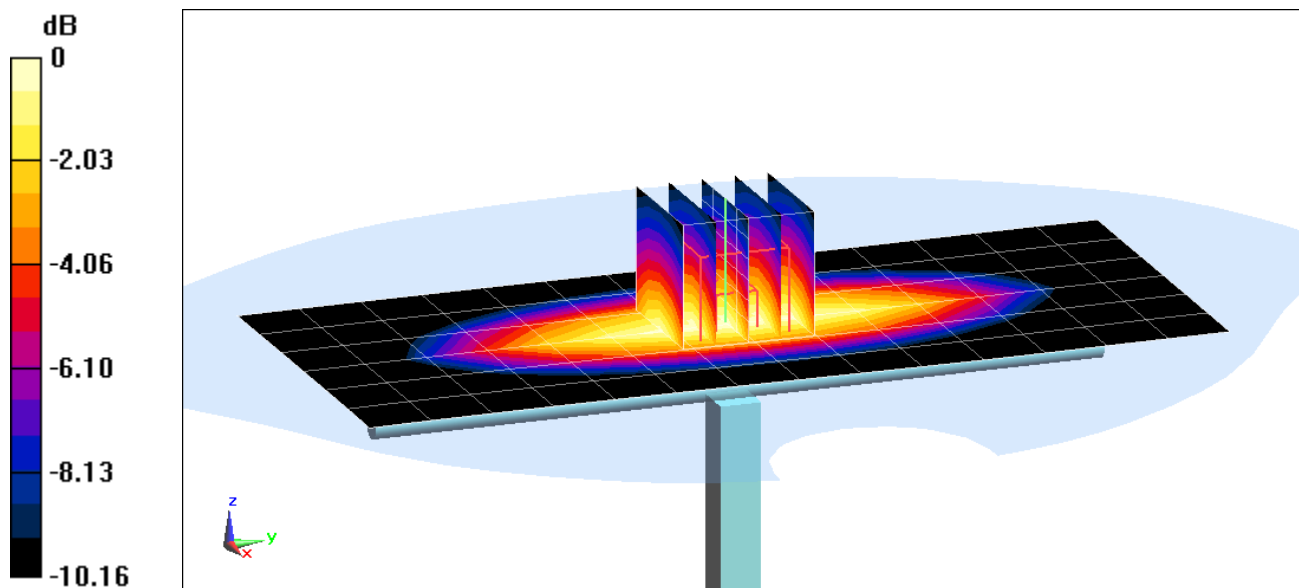
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.73 W/kg

SAR(1 g) = 1.83 W/kg

Deviation(1 g) = 6.27%



0 dB = 2.44 W/kg = 3.87 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.976 \text{ S/m}$; $\epsilon_r = 53.279$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-25-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7406; ConvF(9.77, 9.77, 9.77); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

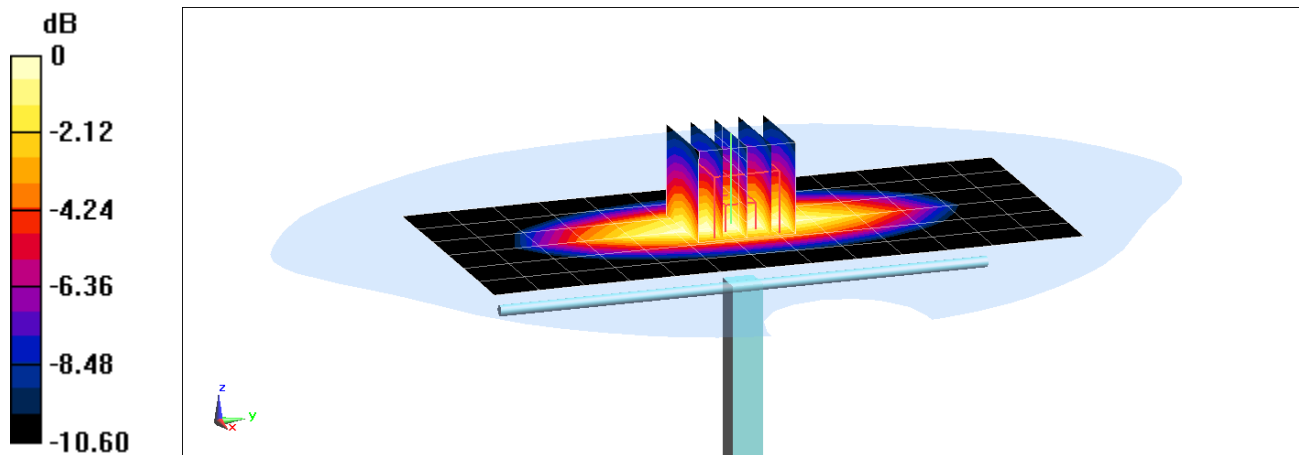
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 3.12 W/kg

SAR(1 g) = 2.04 W/kg

Deviation(1 g) = 6.58%



0 dB = 2.72 W/kg = 4.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.506 \text{ S/m}$; $\epsilon_r = 51.537$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-26-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3287; ConvF(5.11, 5.11, 5.11); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

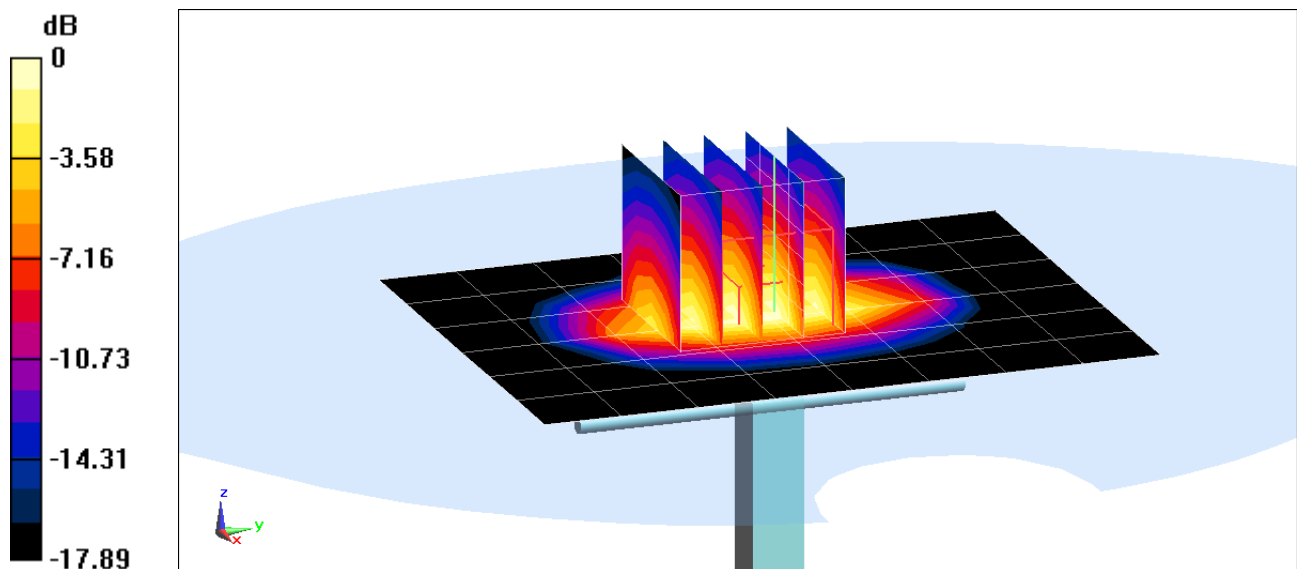
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.84 W/kg

SAR(1 g) = 3.88 W/kg

Deviation(1 g) = 3.47%



0 dB = 4.76 W/kg = 6.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1092

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.465 \text{ S/m}$; $\epsilon_r = 52.605$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-01-2017; Ambient Temp: 21.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3287; ConvF(5.11, 5.11, 5.11); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

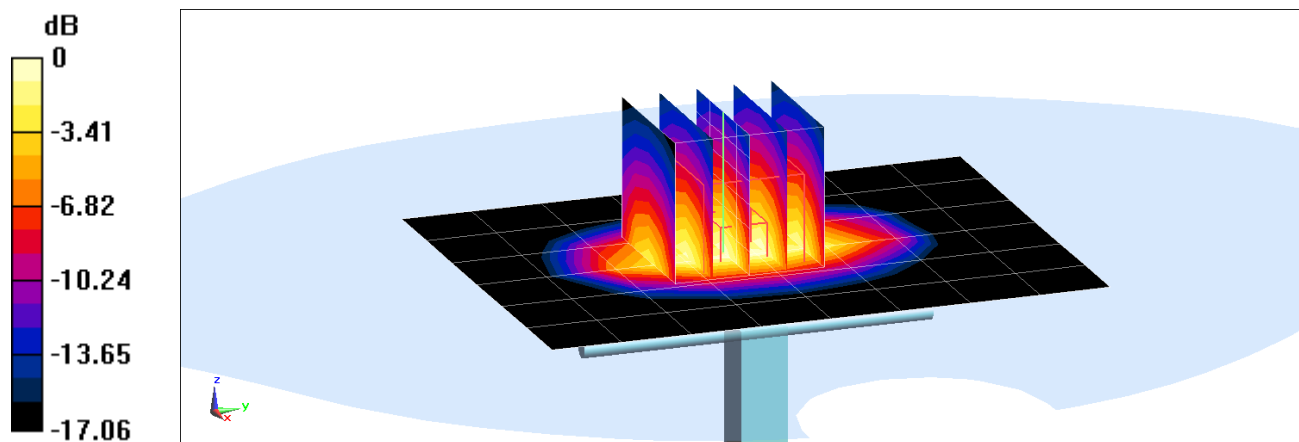
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.47 W/kg

SAR(1 g) = 3.73 W/kg

Deviation(1 g) = 0.81%



0 dB = 4.64 W/kg = 6.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.536 \text{ S/m}$; $\epsilon_r = 52.359$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2017; Ambient Temp: 23.7°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3319; ConvF(4.88, 4.88, 4.88); Calibrated: 3/14/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/08/2017

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

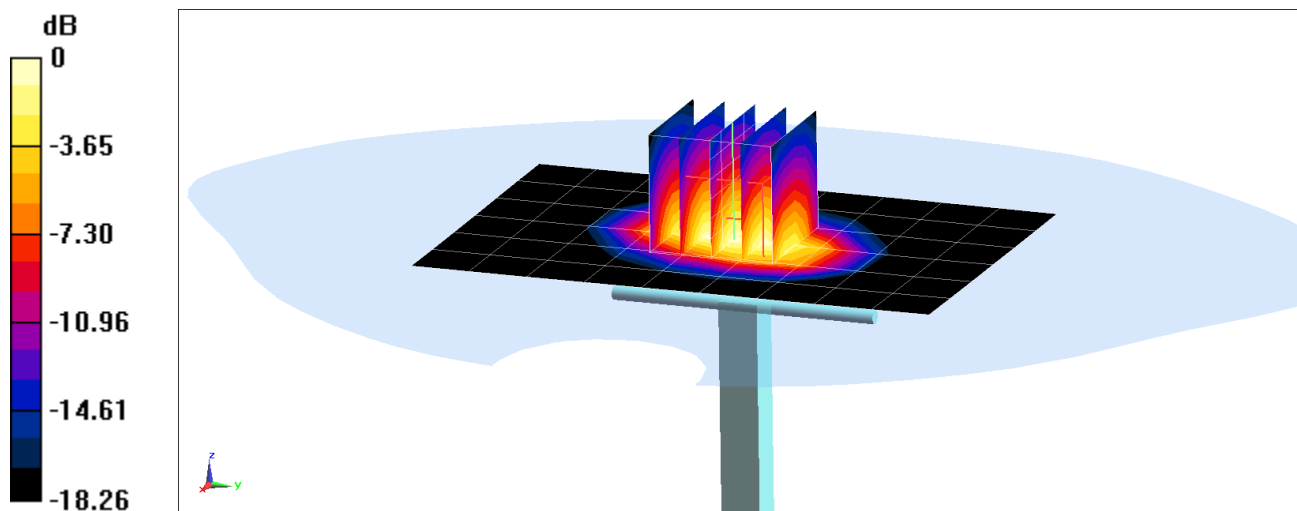
Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.13 W/kg

SAR(1 g) = 3.95 W/kg

Deviation(1 g) = -1.99%



0 dB = 5.03 W/kg = 7.02 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

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

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.937 \text{ S/m}$; $\epsilon_r = 50.961$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-07-2017; Ambient Temp: 22.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 9/14/2016

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

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

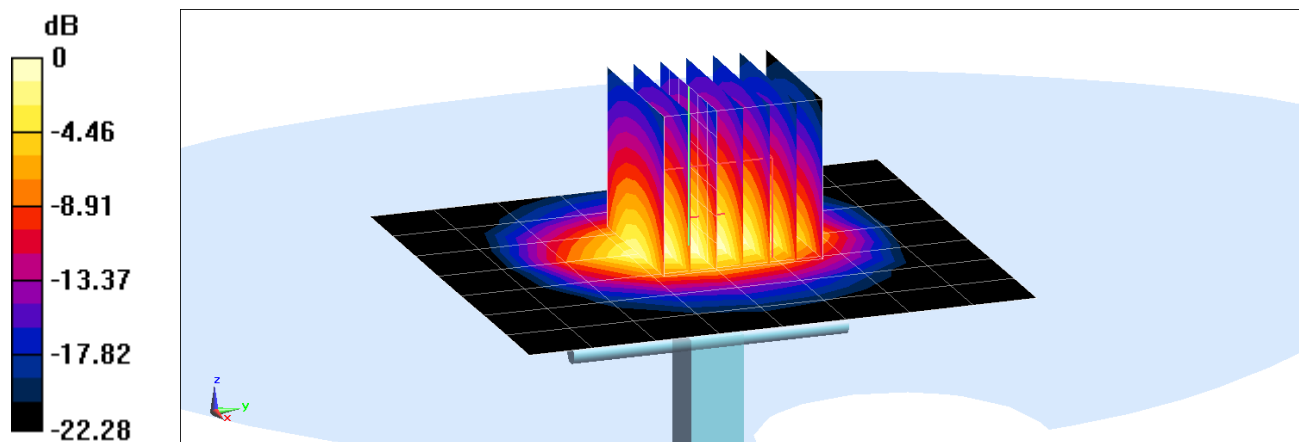
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.0 W/kg

SAR(1 g) = 5.37 W/kg

Deviation(1 g) = 5.71%



0 dB = 7.01 W/kg = 8.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

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

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.032 \text{ S/m}$; $\epsilon_r = 51.551$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-14-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

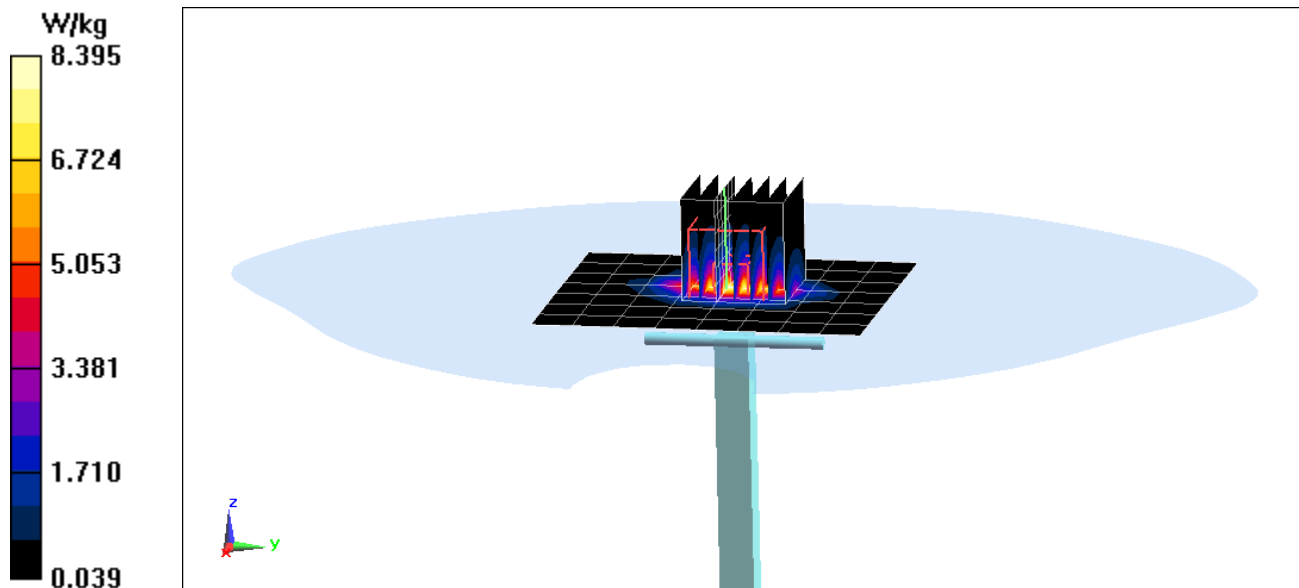
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.6 W/kg

SAR(1 g) = 4.96 W/kg

Deviation(1 g) = -2.36%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2600$ MHz; $\sigma = 2.244$ S/m; $\epsilon_r = 50.971$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-14-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/11/2017

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

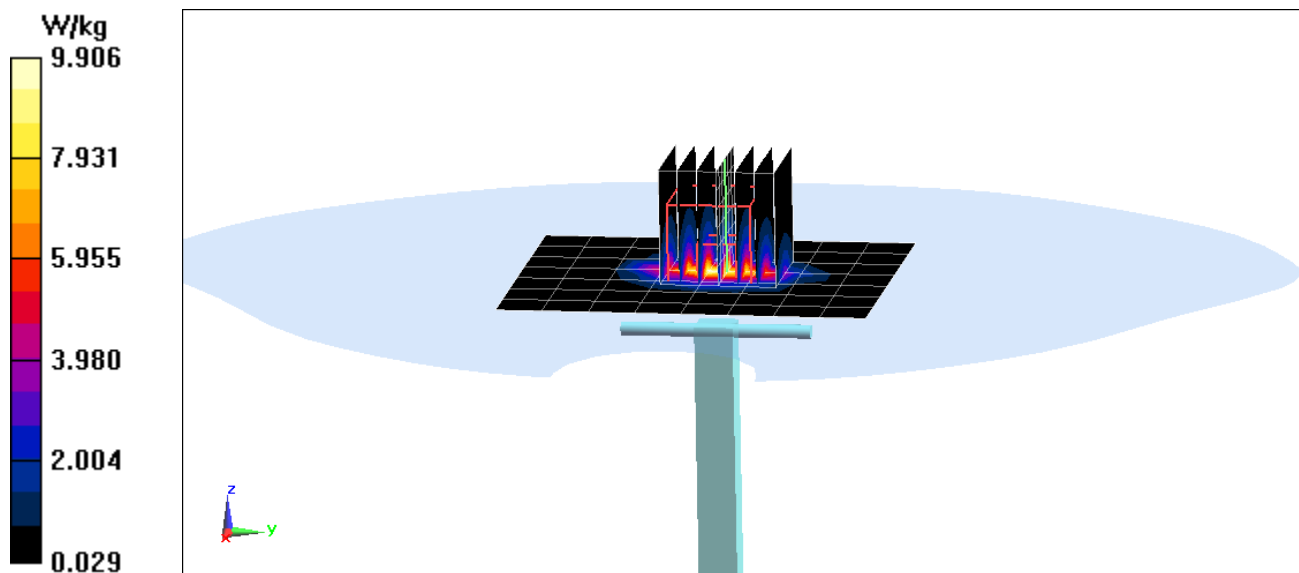
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.8 W/kg

SAR(1 g) = 5.63 W/kg

Deviation(1 g) = 3.87%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used (interpolated):

$f = 5250 \text{ MHz}$; $\sigma = 5.417 \text{ S/m}$; $\epsilon_r = 48.883$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2017; Ambient Temp: 22.6°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(4.19, 4.19, 4.19); Calibrated: 1/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

5250 MHz System Verification at 17.0 dBm (50 mW)

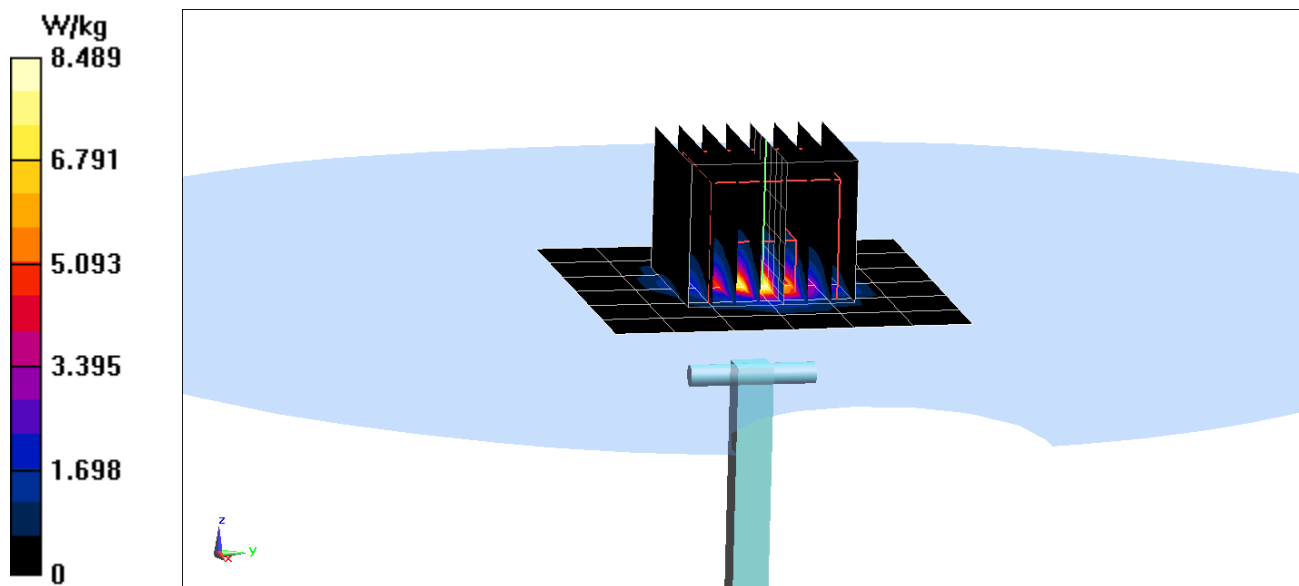
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.2 W/kg

SAR(1 g) = 3.59 W/kg

Deviation(1 g) = -4.01%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 5.889 \text{ S/m}$; $\epsilon_r = 48.319$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2017; Ambient Temp: 22.6°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(3.82, 3.82, 3.82); Calibrated: 1/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5600 MHz System Verification at 17.0 dBm (50 mW)

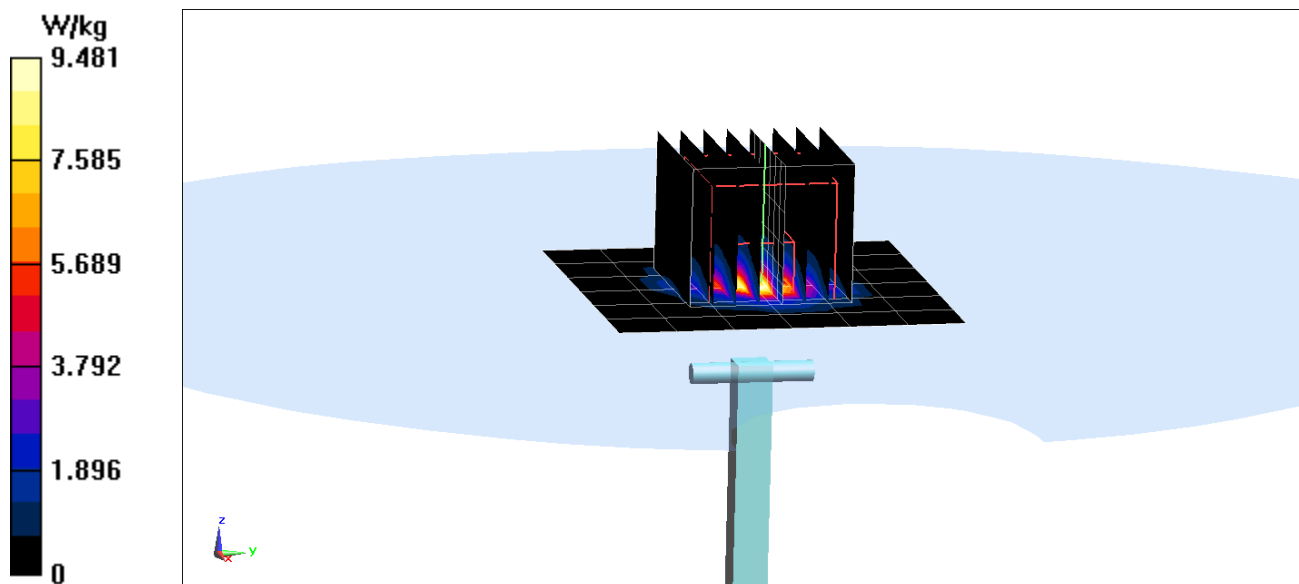
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 3.88 W/kg

Deviation(1 g) = 0.78%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used (interpolated):

$f = 5750 \text{ MHz}$; $\sigma = 6.093 \text{ S/m}$; $\epsilon_r = 48.058$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-05-2017; Ambient Temp: 22.6°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(3.83, 3.83, 3.83); Calibrated: 1/13/2017;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1466; Calibrated: 1/16/2017

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

5750 MHz System Verification at 17.0 dBm (50 mW)

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

Peak SAR (extrapolated) = 15.8 W/kg

SAR(1 g) = 3.49 W/kg

Deviation(1 g) = -7.43%

