



SAR EVALUATION REPORT

Applicant Name:

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Date of Testing:

12/20/15 - 01/19/16

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

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FCC ID:

A3LSMG935W8

APPLICANT:

SAMSUNG ELECTRONICS CO., LTD.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SM-G935W8

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.27	0.46	0.90
PCE	UMTS 850	826.40 - 846.60 MHz	0.30	0.38	0.53
PCE	UMTS 1750	1712.4 - 1752.6 MHz	< 0.1	0.45	0.51
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.51	0.50
PCE	UMTS 1900	1852.4 - 1907.6 MHz	< 0.1	0.50	0.52
PCE	LTE Band 12	699.7 - 715.3 MHz	0.17	0.32	0.42
PCE	LTE Band 17	706.5 - 713.5 MHz	0.16	0.26	0.39
PCE	LTE Band 13	779.5 - 784.5 MHz	0.31	0.52	0.69
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.33	0.30	0.72
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz			
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.12	0.73	0.38
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	< 0.1	0.52	0.62
PCE	LTE Band 30	2307.5 - 2312.5 MHz	< 0.1	0.21	0.47
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.23	0.57
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.38	0.15	0.38
NII	U-NII-1	5180 - 5240 MHz			
NII	U-NII-2A	5260 - 5320 MHz	0.21	0.32	
NII	U-NII-2C	5500 - 5720 MHz	0.29	0.34	
NII	U-NII-3	5745 - 5825 MHz	0.56	0.16	0.23
DSS/DTS	Bluetooth	2402 - 2480 MHz		N/A	
Simultaneous SAR per KDB 690783 D01v01r03:			1.23	1.22	1.54

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 1.8 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
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz
MST	Data	1 - 8.3 kHz

1.2 Power Reduction for SAR

This device utilizes a single step power reduction mechanism for SAR compliance under portable hotspot conditions for some wireless modes and bands. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. Detailed descriptions of the power reduction mechanism are included in the operational description.

This device uses an independent fixed level power reduction mechanism for WLAN operations during voice or VoIP held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. The reduced powers for the power reduction mechanisms were confirmed via conducted power measurements at the RF port (See Section 9). Detailed descriptions of the power reduction mechanism are included in the operational description.

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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.

1.3.1 Maximum PCE Power

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	34.0	34.0	31.5	30.5	29.0	27.5	25.5	24.0	23.0
	Nominal	33.5	33.5	31.0	30.0	28.5	27.0	25.0	23.5	22.5
GSM/GPRS/EDGE 1900	Maximum	31.5	31.5	29.0	27.5	26.0	26.5	24.5	23.5	22.0
	Nominal	31.0	31.0	28.5	27.0	25.5	26.0	24.0	23.0	21.5

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
UMTS Band 5 (850 MHz)	Maximum	24.5	24.5	24.5	24.5
	Nominal	24.0	24.0	24.0	24.0
UMTS Band 4 (1750 MHz)	Maximum	24.5	24.5	24.5	24.5
	Nominal	24.0	24.0	24.0	24.0
UMTS Band 2 (1900 MHz)	Maximum	24.5	24.5	24.5	24.5
	Nominal	24.0	24.0	24.0	24.0

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	25.0
	Nominal	24.5
LTE Band 17	Maximum	25.0
	Nominal	24.5
LTE Band 13	Maximum	25.0
	Nominal	24.5
LTE Band 5 (Cell)	Maximum	25.0
	Nominal	24.5
LTE Band 2 (PCS)	Maximum	24.5
	Nominal	24.0
LTE Band 25 (PCS)	Maximum	24.5
	Nominal	24.0
LTE Band 4 (AWS)	Maximum	24.5
	Nominal	24.0
LTE Band 30	Maximum	24.0
	Nominal	23.5
LTE Band 41	Maximum	24.5
	Nominal	24.0

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1.3.2 Maximum WLAN/BT Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	19.5
	Nominal	19.0
IEEE 802.11g (2.4 GHz)	Maximum	17.5
	Nominal	17.0
IEEE 802.11n (2.4 GHz)	Maximum	17.5
	Nominal	17.0
Bluetooth	Maximum	10.5
	Nominal	10.0
Bluetooth LE	Maximum	6.0
	Nominal	5.5

Mode / Band		Modulated Average - Single Tx Chain (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100					
IEEE 802.11a (5 GHz)	Maximum	16.5	15.5					
	Nominal	16.0	15.0					
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100	Ch. 46, 54, 110-159	Ch. 38	Ch. 62, 102		
IEEE 802.11n (5 GHz)	Maximum	16.5	15.5	15.5	13.5	14.5		
	Nominal	16.0	15.0	15.0	13.0	14.0		
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100	Ch. 46, 54, 110-159	Ch. 38	Ch. 62, 102	Ch. 58, 122 - 155	Ch. 42, 106
IEEE 802.11ac (5 GHz)	Maximum	16.5	15.5	15.5	13.5	14.5	13.5	12.5
	Nominal	16.0	15.0	15.0	13.0	14.0	13.0	12.0

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
IEEE 802.11g (2.4 GHz)	Maximum	17.5						
	Nominal	17.0						
IEEE 802.11n (CDD + SDM) (2.4 GHz)	Maximum	17.5						
	Nominal	17.0						
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100					
IEEE 802.11a (CDD) (5 GHz)	Maximum	16.5	15.5					
	Nominal	16.0	15.0					
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100					
IEEE 802.11n (CDD + SDM) (5 GHz)	Maximum	16.5	15.5	15.5	13.5	14.5		
	Nominal	16.0	15.0	15.0	13.0	14.0		
		Ch. 40-48, 52-60, 104-144, 149-165	Ch. 36, 64, 100	Ch. 46, 54, 110-159	Ch. 38	Ch. 62, 102	Ch. 58, 122 - 155	Ch. 42, 106
IEEE 802.11ac (CDD+SDM) (5 GHz)	Maximum	16.5	15.5	15.5	13.5	14.5	13.5	12.5
	Nominal	16.0	15.0	15.0	13.0	14.0	13.0	12.0

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1.3.3 Reduced PCE Power – Hotspot Mode Active

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 1900	Maximum	29.0	29.0	26.5	25.0	23.5	24.0	22.0	21.0	19.5	
	Nominal	28.5	28.5	26.0	24.5	23.0	23.5	21.5	20.5	19.0	

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
UMTS Band 4 (1750 MHz)	Maximum	22.5	22.5	22.5	22.5
	Nominal	22.0	22.0	22.0	22.0
UMTS Band 2 (1900 MHz)	Maximum	21.5	21.5	21.5	21.5
	Nominal	21.0	21.0	21.0	21.0

Mode / Band		Modulated Average (dBm)
LTE Band 2 (PCS)	Maximum	21.5
	Nominal	21.0
LTE Band 25 (PCS)	Maximum	21.5
	Nominal	21.0
LTE Band 4 (AWS)	Maximum	20.5
	Nominal	20.0
LTE Band 30	Maximum	21.0
	Nominal	20.5
LTE Band 41	Maximum	22.5
	Nominal	22.0

1.3.4 Reduced WLAN Power – Proximity Sensor Active (Held to Ear)

Mode / Band		Modulated Average (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

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Mode / Band		Modulated Average (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	10.5		
	Nominal	10.0		
IEEE 802.11n (5 GHz)	Maximum	10.5		
	Nominal	10.0		
IEEE 802.11ac (5 GHz)	Maximum	10.5	10.5	10.5
	Nominal	10.0	10.0	10.0

Mode / Band		Modulated Average - MIMO (dBm)			
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth	
IEEE 802.11g (CDD) (2.4 GHz)	Maximum	16.5			
	Nominal	16.0			
IEEE 802.11n (CDD + SDM) (2.4 GHz)	Maximum	16.5			
	Nominal	16.0			
IEEE 802.11a (CDD) (5 GHz)	Maximum	13.5			
	Nominal	13.0			
IEEE 802.11n (CDD + SDM) (5 GHz)	Maximum	13.5	13.5		
	Nominal	13.0	13.0		
				Ch. 58, 122 - 155	Ch. 42, 106
IEEE 802.11ac (CDD+SDM) (5 GHz)	Maximum	13.5	13.5	13.5	12.5
	Nominal	13.0	13.0	13.0	12.0

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1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. The overall diagonal dimension of the device is ≤160 mm and the diagonal display is ≤150 mm. A diagram showing the location of the device antennas can be found in Appendix F.

Table 1-1
Device Edges/Sides for SAR Testing

Device Sides/Edges for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 17	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 30	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	Yes	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operations are disabled. Therefore, U-NII-1, U-NII-2A, U-NII-2C operations are not considered in this section.

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in Appendix F.

1.6 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.

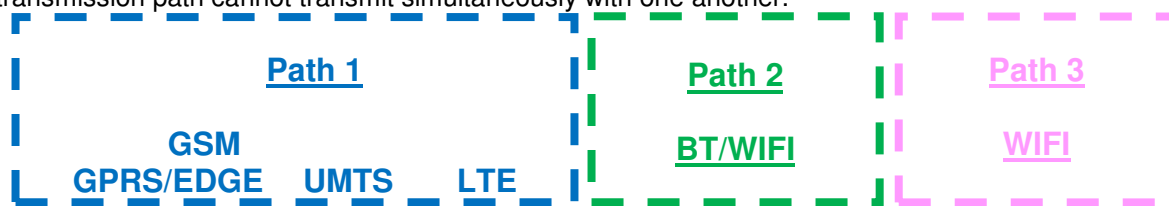


Figure 1-1
Simultaneous Transmission Paths

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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.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	GSM voice + 2.4 GHz W-Fi	Yes	Yes	N/A	
2	GSM voice + 5 GHz W-Fi	Yes	Yes	N/A	
3	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
4	GSM voice + 2.4 GHz W-Fi MIMO	Yes	Yes	N/A	
5	GSM voice + 5 GHz W-Fi MIMO	Yes	Yes	N/A	
6	GSM voice + 2.4 GHz W-Fi + 5 GHz W-Fi	Yes	Yes	N/A	
7	UMTS + 2.4 GHz W-Fi	Yes	Yes	Yes	
8	UMTS + 5 GHz W-Fi	Yes	Yes	Yes	
9	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	
10	UMTS + 2.4 GHz W-Fi MIMO	Yes	Yes	Yes	
11	UMTS + 5 GHz W-Fi MIMO	Yes	Yes	Yes	
12	UMTS + 2.4 GHz W-Fi + 5 GHz W-Fi	Yes	Yes	Yes	
13	LTE + 2.4 GHz W-Fi	Yes	Yes	Yes	
14	LTE + 5 GHz W-Fi	Yes	Yes	Yes	
15	LTE + 2.4 GHz Bluetooth	N/A	Yes	N/A	
16	LTE + 2.4 GHz W-Fi MIMO	Yes	Yes	Yes	
17	LTE + 5 GHz W-Fi MIMO	Yes	Yes	Yes	
18	LTE + 2.4 GHz W-Fi + 5 GHz W-Fi	Yes	Yes	Yes	
19	GPRS/EDGE + 2.4 GHz W-Fi	N/A	N/A	Yes	
20	GPRS/EDGE + 5 GHz W-Fi	N/A	N/A	Yes	
21	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	N/A	
22	GPRS/EDGE + 2.4 GHz W-Fi MIMO	N/A	N/A	Yes	
23	GPRS/EDGE + 5 GHz W-Fi MIMO	N/A	N/A	Yes	
24	GPRS/EDGE + 2.4 GHz W-Fi + 5 GHz W-Fi	N/A	N/A	Yes	

- 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.
- Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
- 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, and U-NII2C were not evaluated for wireless router conditions.
- This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.
- This device supports VOLTE.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A & U-NII-2C WIFI, only 2.4 GHz and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

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Per FCC KDB 447498 D01v06, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; $[(11/15) * \sqrt{2.480}] = 1.2 < 3.0$. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

This device supports IEEE 802.11ac with the following features:

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

(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.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

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.

This device supports LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- 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)

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1.9 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-Worn Serial Number	Hotspot Serial Number
GSM/GPRS/EDGE 850	80B93	80B93	80B93
UMTS 850	0CB4A	0CB4A	0CB4A
UMTS 1750	02BE4	02BE4	04BAD
GSM/GPRS/EDGE 1900	80B93	80B93	813EF
UMTS 1900	02BE4	02BE4	04BF5
LTE Band 12	0CB4A	0CB4A	0CB4A
LTE Band 17	0CB4A	0CB4A	0CB4A
LTE Band 13	0CB4A	0CB4A	0CB4A
LTE Band 5 (Cell)	0CB4A	0CB4A	0CB4A
LTE Band 4 (AWS)	04BE0	04BE0	04BAD
LTE Band 25 (PCS)	04BB3	04BB3	04BF5
LTE Band 30	04BB4	04BB4	04BF5
LTE Band 41	04BB4	04BB4	04BF2
2.4 GHz WLAN	00580	0C6B5	0C6B5
5 GHz WLAN	0C6B5	00580	00580

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LTE INFORMATION

LTE Information					
FCC ID	A3LSMG935W8				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 30 (2307.5 - 2312.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
	Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz			
LTE Band 17: 5 MHz, 10 MHz					
LTE Band 13: 5 MHz, 10 MHz					
LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz					
LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz					
LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz					
LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz					
LTE Band 30: 5 MHz, 10 MHz					
LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz					
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 17: 5 MHz	706.5 (23755)		710 (23790)	713.5 (23825)	
LTE Band 17: 10 MHz	709 (23780)		710 (23790)	711 (23800)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)	848.3 (20643)	
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)	847.5 (20635)	
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)	846.5 (20625)	
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)	844 (20600)	
LTE Band 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 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)	1914.3 (26683)	
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)	1913.5 (26675)	
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)	1912.5 (26665)	
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)	1910 (26640)	
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)	1907.5 (26615)	
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)	1905 (26590)	
LTE Band 30: 5 MHz	2307.5 (27685)		2310 (27710)	2312.5 (27735)	
LTE Band 30: 10 MHz	N/A		2310 (27710)	N/A	
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	9				
Modulations Supported in UL	QPSK, 16QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3-6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Release 10 Additional Information	This device does not support full CA features on 3GPP Release 10. It supports a maximum of 3 carriers in the downlink. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations shown in this report are supported. The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WIFI Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/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.

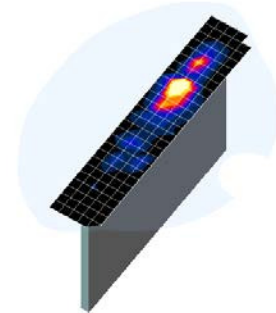


Figure 4-1
Sample SAR Area Scan

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) ($\Delta x_{\text{zoomTV}}, \Delta y_{\text{zoom}}$)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	$\Delta z_{\text{zoom}}(n>1)^*$	
≤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

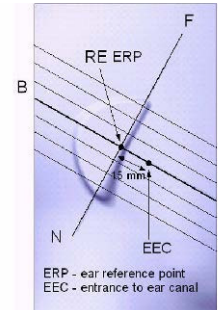
*Also compliant to IEEE 1528-2013 Table 6

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5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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



point
point
the
plane
line
the
N-F

Figure 5-1
Close-Up Side view
of ERP

5.2 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 5-3). 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 5-2
Front, back and side view of SAM Twin Phantom

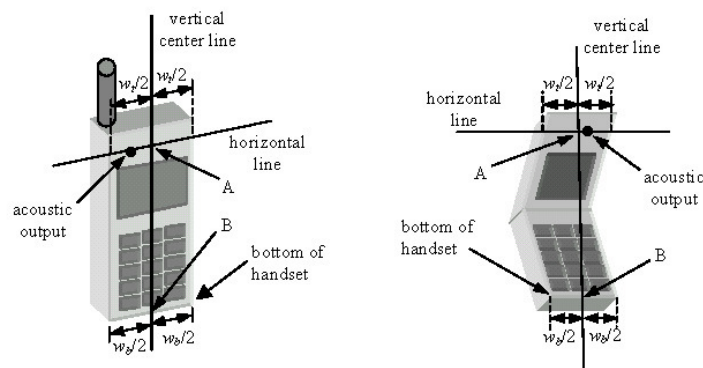


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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6 TEST CONFIGURATION POSITIONS

6.1 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 $\delta = 0.02$.

6.2 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 6-1), 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.

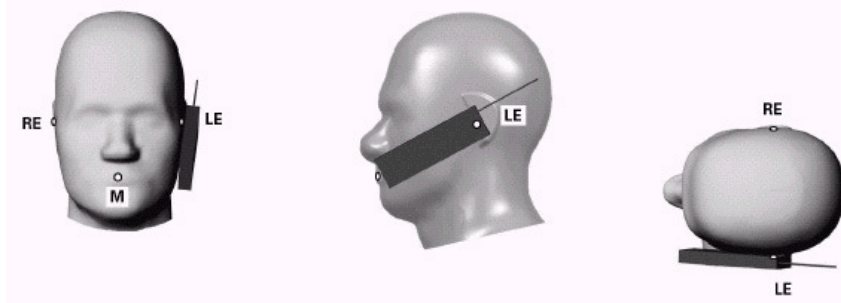


Figure 6-1 Front, Side and Top View of Cheek Position

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 6-2).

6.3 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 6-2).

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contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

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7 RF EXPOSURE LIMITS

7.1 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.

7.2 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 7-1
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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8 FCC MEASUREMENT PROCEDURES

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

8.1 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.

8.2 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.

8.3 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.

8.4 SAR Measurement Conditions for UMTS

8.4.1 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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8.4.2 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.

8.4.3 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.

8.4.4 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.

8.4.5 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.

8.4.6 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.

8.5 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).

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8.5.1 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.

8.5.2 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.

8.5.3 A-MPR

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

8.5.4 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.

8.5.5 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.

8.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink

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carrier aggregation is inactive on the PCC. For every supported combination of downlink only carrier aggregation, additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 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.

8.6.1 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.

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.

8.6.2 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.

8.6.3 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.

8.6.4 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

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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.

8.6.5 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.

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, 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 8.6.6).

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8.6.8 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.

8.6.9 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

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9

RF CONDUCTED POWERS

9.1 GSM Conducted Powers

Table 9-1
Maximum GSM Conducted Powers

		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	33.39	33.31	30.57	29.63	28.09	26.90	24.79	23.44	22.17
	190	33.29	33.36	30.74	29.68	28.21	26.74	24.63	23.48	22.06
	251	33.28	33.25	30.56	29.62	28.06	26.76	24.58	23.46	22.02
GSM 1900	512	30.52	30.59	28.05	26.62	25.10	25.93	23.81	22.77	21.48
	661	30.46	30.53	27.98	26.48	24.94	25.80	23.64	22.59	21.29
	810	30.32	30.38	28.09	26.31	24.77	25.58	23.58	22.29	21.03
		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	24.36	24.28	24.55	25.37	25.08	17.87	18.77	19.18	19.16
	190	24.26	24.33	24.72	25.42	25.20	17.71	18.61	19.22	19.05
	251	24.25	24.22	24.54	25.36	25.05	17.73	18.56	19.20	19.01
GSM 1900	512	21.49	21.56	22.03	22.36	22.09	16.90	17.79	18.51	18.47
	661	21.43	21.50	21.96	22.22	21.93	16.77	17.62	18.33	18.28
	810	21.29	21.35	22.07	22.05	21.76	16.55	17.56	18.03	18.02
GSM 850	Frame Avg. Target	24.47	24.47	24.98	25.74	25.49	17.97	18.98	19.24	19.49
GSM 1900	Frame Avg. Target	21.97	21.97	22.48	22.74	22.49	16.97	17.98	18.74	18.49

Table 9-2
Reduced GSM Conducted Powers – Hotspot Mode Active

		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 1900	512	28.89	28.81	26.44	24.89	23.42	23.66	22.00	20.76	19.50
	661	28.35	28.50	26.07	24.47	22.92	23.50	21.45	20.17	18.96
	810	28.43	28.38	25.92	24.23	22.69	23.28	21.25	20.00	18.81
		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 1900	512	19.86	19.78	20.42	20.63	20.41	14.63	15.98	16.50	16.49
	661	19.32	19.47	20.05	20.21	19.91	14.47	15.43	15.91	15.95
	810	19.40	19.35	19.90	19.97	19.68	14.25	15.23	15.74	15.80
GSM 1900	Frame Avg. Target	19.47	19.47	19.98	20.24	19.99	14.47	15.48	16.24	15.99

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Note:

1. 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.
2. 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.
3. 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 9-1
Power Measurement Setup

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9.2 UMTS Conducted Powers

Table 9-3
Maximum UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.93	23.85	24.00	23.52	23.53	23.67	23.91	23.38	23.21	-
99		12.2 kbps AMR	23.91	23.89	23.95	23.44	23.41	23.49	23.88	23.30	23.31	-
6	HSDPA	Subtest 1	22.96	22.79	23.00	23.25	23.48	23.67	23.50	23.24	23.30	0
6		Subtest 2	22.89	22.80	23.02	22.84	22.99	23.17	22.93	22.76	22.64	0
6		Subtest 3	21.93	21.83	21.91	21.84	21.90	22.13	22.05	21.90	21.88	0.5
6		Subtest 4	21.91	21.78	21.91	21.75	21.91	22.14	22.14	21.89	21.87	0.5
6	HSUPA	Subtest 1	22.74	22.67	22.82	22.19	22.45	22.63	22.53	22.36	22.25	0
6		Subtest 2	21.47	21.21	21.14	18.97	18.94	19.25	19.66	19.51	19.45	2
6		Subtest 3	22.09	22.14	22.10	21.25	21.40	21.71	21.76	21.46	21.53	1
6		Subtest 4	21.10	21.00	20.90	18.90	18.96	19.19	19.62	19.37	19.44	2
6		Subtest 5	23.72	23.58	23.68	23.30	23.44	23.69	23.43	23.21	23.22	0
8	DC-HSDPA	Subtest 1	23.21	23.36	23.24	23.66	23.71	23.81	23.48	23.33	23.22	0
8		Subtest 2	23.16	23.28	23.49	23.21	23.25	23.30	23.03	23.08	22.90	0
8		Subtest 3	22.58	22.64	22.18	22.55	22.16	22.32	22.32	22.10	21.93	0.5
8		Subtest 4	22.16	22.26	22.33	22.08	22.10	22.24	22.02	22.03	21.96	0.5

Table 9-4
Reduced UMTS Conducted Powers – Hotspot Mode Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	21.96	21.91	22.40	21.27	20.85	20.93	-
99		12.2 kbps AMR	21.91	21.86	22.38	21.20	20.95	20.84	-
6	HSDPA	Subtest 1	22.07	22.06	22.48	21.29	20.86	21.05	0
6		Subtest 2	22.06	22.02	22.46	21.30	20.90	20.08	0
6		Subtest 3	22.05	22.08	22.48	21.46	20.93	20.99	0.5
6		Subtest 4	22.12	22.10	22.50	21.44	20.96	21.02	0.5
6	HSUPA	Subtest 1	21.11	21.07	21.74	20.65	20.17	20.31	0
6		Subtest 2	19.11	19.00	19.60	19.80	19.33	19.45	2
6		Subtest 3	20.98	20.90	21.59	20.55	20.06	20.21	1
6		Subtest 4	19.10	19.00	19.61	19.71	19.31	19.47	2
6		Subtest 5	22.00	22.00	22.49	21.38	20.90	21.04	0
8	DC-HSDPA	Subtest 1	22.05	22.20	22.35	21.43	20.90	20.95	0
8		Subtest 2	22.23	22.19	22.35	21.31	21.07	20.91	0
8		Subtest 3	22.19	22.18	22.39	21.27	21.06	20.92	0.5
8		Subtest 4	22.30	22.33	22.41	21.28	20.90	20.95	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 9-2
Power Measurement Setup

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9.3 LTE Conducted Powers

9.3.1

LTE Band 12

Table 9-5
LTE Band 12 Conducted Powers - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23095 (707.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.62	0	0
	1	25	23.63		0
	1	49	23.60		0
	25	0	22.61	0-1	1
	25	12	22.71		1
	25	25	22.62		1
	50	0	22.69		1
16QAM	1	0	22.74	0-1	1
	1	25	23.09		1
	1	49	22.88		1
	25	0	21.77	0-2	2
	25	12	21.86		2
	25	25	21.82		2
	50	0	21.77		2

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

Table 9-6
LTE Band 12 Conducted Powers - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)		
			Conducted Power [dBm]	Conducted Power [dBm]	Conducted Power [dBm]		
QPSK	1	0	24.13	24.13	23.91	0	0
	1	12	24.12	24.10	24.00		0
	1	24	24.08	24.09	24.08		0
	12	0	22.97	22.84	22.76	0-1	1
	12	6	22.96	22.81	22.78		1
	12	13	22.95	22.84	22.71		1
	25	0	22.94	22.83	22.73		1
16QAM	1	0	23.10	22.85	22.85	0-1	1
	1	12	22.98	22.81	22.73		1
	1	24	23.06	22.80	22.77		1
	12	0	22.01	21.83	21.80	0-2	2
	12	6	21.95	21.81	21.81		2
	12	13	21.93	21.84	21.78		2
	25	0	21.97	21.82	21.75		2

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Table 9-7
LTE Band 12 Conducted Powers - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.01	23.90	23.73	0	0
	1	7	24.03	23.97	23.81		0
	1	14	24.12	23.86	23.80		0
	8	0	22.94	22.86	22.70	0-1	1
	8	4	22.93	22.82	22.69		1
	8	7	22.92	22.83	22.67		1
	15	0	22.89	22.76	22.63		1
16QAM	1	0	23.11	23.03	22.72	0-1	1
	1	7	23.11	22.90	22.85		1
	1	14	23.14	22.78	22.75		1
	8	0	21.89	21.76	21.66	0-2	2
	8	4	22.01	21.85	21.67		2
	8	7	21.88	21.81	21.65		2
	15	0	21.89	21.77	21.62		2

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

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.90	23.83	23.62	0	0
	1	2	23.90	23.77	23.65		0
	1	5	23.86	23.79	23.60		0
	3	0	23.97	23.84	23.66		0
	3	2	23.95	24.00	23.65		0
	3	3	23.96	23.86	23.66		0
	6	0	22.92	22.84	22.67	0-1	1
16QAM	1	0	22.84	22.76	22.52	0-1	1
	1	2	22.68	22.65	22.50		1
	1	5	22.86	22.78	22.30		1
	3	0	22.91	22.91	22.74		1
	3	2	22.99	22.81	22.75		1
	3	3	22.91	22.83	22.60		1
	6	0	22.03	21.91	21.69	0-2	2

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LTE Band 17

Table 9-9
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	23.73	0	0
	1	25	23.74		0
	1	49	23.71		0
	25	0	22.68	0-1	1
	25	12	22.57		1
	25	25	22.56		1
	50	0	22.56		1
16QAM	1	0	22.80		1
	1	25	22.86		1
	1	49	22.77		1
	25	0	21.57	0-2	2
	25	12	21.62		2
	25	25	21.66		2
	50	0	21.68		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 9-10
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	23.85	0	0
	1	12	23.83		0
	1	24	23.86		0
	12	0	22.71	0-1	1
	12	6	22.70		1
	12	13	22.69		1
	25	0	22.67		1
16QAM	1	0	22.87		1
	1	12	22.92		1
	1	24	22.85		1
	12	0	21.60	0-2	2
	12	6	21.60		2
	12	13	21.58		2
	25	0	21.62		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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LTE Band 13

Table 9-11
LTE Band 13 Conducted Powers - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23230 (782.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.47	0	0
	1	25	23.59		0
	1	49	23.46		0
	25	0	22.34	0-1	1
	25	12	22.37		1
	25	25	22.33		1
	50	0	22.36		1
16QAM	1	0	22.61	0-1	1
	1	25	22.73		1
	1	49	22.56		1
	25	0	21.55	0-2	2
	25	12	21.57		2
	25	25	21.61		2
	50	0	21.59		2

Table 9-12
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23230 (782.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.66	0	0
	1	12	23.82		0
	1	24	23.68		0
	12	0	22.52	0-1	1
	12	6	22.55		1
	12	13	22.53		1
	25	0	22.51		1
16QAM	1	0	22.76	0-1	1
	1	12	22.52		1
	1	24	22.88		1
	12	0	21.57	0-2	2
	12	6	21.53		2
	12	13	21.64		2
	25	0	21.56		2

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

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LTE Band 5 (Cell)

Table 9-13
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	24.12	0	0
	1	25	24.19		0
	1	49	24.11		0
	25	0	22.97	0-1	1
	25	12	22.88		1
	25	25	22.85		1
	50	0	22.86		1
16QAM	1	0	23.31	0-1	1
	1	25	23.25		1
	1	49	23.17		1
	25	0	21.91	0-2	2
	25	12	21.92		2
	25	25	21.83		2
	50	0	21.88		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 9-14
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	23.81	23.89	23.94	0	0
	1	12	23.80	23.80	23.88		0
	1	24	23.77	23.80	23.92		0
	12	0	22.61	22.66	22.75	0-1	1
	12	6	22.59	22.63	22.73		1
	12	13	22.57	22.64	22.72		1
	25	0	22.58	22.62	22.73		1
16QAM	1	0	22.83	22.66	22.92	0-1	1
	1	12	22.85	22.73	22.96		1
	1	24	22.63	22.81	22.83		1
	12	0	21.53	21.64	21.73	0-2	2
	12	6	21.58	21.57	21.77		2
	12	13	21.52	21.59	21.68		2
	25	0	21.54	21.58	21.72		2

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Table 9-15
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	23.67	23.65	23.81	0	0
	1	7	23.68	23.71	23.83		0
	1	14	23.63	23.77	23.71		0
	8	0	22.63	22.71	22.82	0-1	1
	8	4	22.60	22.71	22.80		1
	8	7	22.59	22.71	22.71		1
16QAM	15	0	22.56	22.64	22.69	0-1	1
	1	0	22.74	22.86	22.81		1
	1	7	22.63	22.81	22.76		1
	1	14	22.65	22.67	22.82	0-2	1
	8	0	21.58	21.66	21.73		2
	8	4	21.60	21.65	21.69		2
	8	7	21.55	21.69	21.75		2
	15	0	21.45	21.68	21.74		2

Table 9-16
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	23.50	23.57	23.71	0	0
	1	2	23.55	23.58	23.70		0
	1	5	23.50	23.62	23.63		0
	3	0	23.53	23.59	23.75		0
	3	2	23.57	23.59	23.83		0
	3	3	23.53	23.58	23.72		0
	6	0	22.51	22.67	22.79	0-1	1
16QAM	1	0	22.50	22.56	22.66	0-1	1
	1	2	22.51	22.43	22.65		1
	1	5	22.50	22.57	22.67		1
	3	0	22.52	22.69	22.78		1
	3	2	22.55	22.60	22.81		1
	3	3	22.65	22.50	22.83		1
	6	0	21.42	21.65	21.77	0-2	2

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LTE Band 4 (AWS)

Table 9-17
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	23.53	0	0
	1	50	23.50		0
	1	99	23.48		0
	50	0	22.65	0-1	1
	50	25	22.62		1
	50	50	22.59		1
	100	0	22.64		1
16QAM	1	0	22.54	1	1
	1	50	22.58		1
	1	99	22.46		1
	50	0	21.60	0-2	2
	50	25	21.58		2
	50	50	21.54		2
	100	0	21.60		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 9-18
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	Frequency [MHz]	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	23.41	23.49	23.91	0	0
	1	36	23.42	23.54	23.88		0
	1	74	23.50	23.51	23.88		0
	36	0	22.49	22.52	22.88	0-1	1
	36	18	22.47	22.50	22.88		1
	36	37	22.46	22.49	22.90		1
	75	0	22.45	22.51	22.92		1
16QAM	1	0	22.56	22.55	22.90	0-1	1
	1	36	22.65	22.70	23.06		1
	1	74	22.49	22.64	23.17		1
	36	0	21.48	21.53	21.88	0-2	2
	36	18	21.47	21.49	21.89		2
	36	37	21.53	21.50	21.91		2
	75	0	21.49	21.49	21.89		2

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Table 9-19
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	23.43	23.52	23.94	0	0
	1	25	23.55	23.54	23.89		0
	1	49	23.56	23.51	23.88		0
	25	0	22.49	22.52	22.92	0-1	1
	25	12	22.47	22.49	22.90		1
	25	25	22.46	22.51	22.92		1
	50	0	22.47	22.47	22.92		1
16QAM	1	0	22.76	22.57	23.01	0-1	1
	1	25	22.65	22.70	23.06		1
	1	49	22.66	22.64	23.17		1
	25	0	21.48	21.53	21.88	0-2	2
	25	12	21.47	21.51	21.89		2
	25	25	21.53	21.54	21.91		2
	50	0	21.49	21.48	21.89		2

Table 9-20
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	23.81	23.83	23.80	0	0
	1	12	23.72	23.64	23.98		0
	1	24	23.80	23.79	24.00		0
	12	0	22.48	22.52	22.90	0-1	1
	12	6	22.49	22.52	22.90		1
	12	13	22.49	22.51	22.89		1
	25	0	22.48	22.50	22.87		1
16QAM	1	0	22.63	22.66	22.98	0-1	1
	1	12	22.60	22.64	23.06		1
	1	24	22.60	22.57	22.82		1
	12	0	21.51	21.55	21.91	0-2	2
	12	6	21.55	21.54	21.90		2
	12	13	21.50	21.53	21.92		2
	25	0	21.48	21.49	21.91		2

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Table 9-21
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Frequency [MHz]	Frequency [MHz]	Frequency [MHz]	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	23.51	23.57	24.01	0	0
	1	7	23.50	23.60	24.00		0
	1	14	23.58	23.57	24.01		0
	8	0	22.48	22.53	22.90	0-1	1
	8	4	22.51	22.53	22.91		1
	8	7	22.48	22.52	22.93		1
	15	0	22.42	22.46	22.87		1
16QAM	1	0	22.68	22.61	23.21	0-1	1
	1	7	22.74	22.58	22.92		1
	1	14	22.69	22.58	22.88		1
	8	0	21.50	21.43	21.97	0-2	2
	8	4	21.53	21.53	21.97		2
	8	7	21.53	21.54	22.02		2
	15	0	21.48	21.47	21.89		2

Table 9-22
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	Frequency [MHz]	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	23.53	23.72	24.01	0	0
	1	2	23.51	23.58	24.03		0
	1	5	23.52	23.60	24.02		0
	3	0	23.85	23.84	24.31		0
	3	2	23.86	23.87	24.22		0
	3	3	23.84	23.83	24.23		0
	6	0	22.74	22.80	23.14	0-1	1
16QAM	1	0	22.18	22.43	22.60	0-1	1
	1	2	22.49	22.40	22.60		1
	1	5	22.40	22.27	22.58		1
	3	0	22.76	22.99	23.03		1
	3	2	22.77	22.80	23.08		1
	3	3	22.79	22.85	23.11		1
	6	0	21.84	21.66	22.09	0-2	2

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Table 9-23
LTE Band 4 (AWS) Conducted Powers – 20 MHz Bandwidth – Hotspot Mode Active

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	19.19	0	0
	1	50	19.83		0
	1	99	19.24		0
	50	0	19.58	0-1	0
	50	25	19.73		0
	50	50	19.61		0
	100	0	19.54		0
16QAM	1	0	19.43	0	0
	1	50	20.00		0
	1	99	19.50		0
	50	0	19.59	0-2	0
	50	25	19.75		0
	50	50	19.63		0
	100	0	19.53		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 9-24
LTE Band 4 (AWS) Conducted Powers – 15 MHz Bandwidth – Hotspot Mode Active

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	Frequency [MHz]	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	19.52	19.62	20.03	0	0
	1	36	19.91	20.01	20.01		0
	1	74	19.75	19.83	19.96		0
	36	0	19.83	19.96	20.00	0-1	0
	36	18	19.93	20.01	19.99		0
	36	37	19.94	20.02	19.97		0
	75	0	19.85	19.96	19.95		0
16QAM	1	0	19.63	20.00	19.98	0-1	0
	1	36	19.97	19.99	19.98		0
	1	74	19.88	20.01	19.93		0
	36	0	19.78	19.95	20.01	0-2	0
	36	18	19.88	20.01	20.03		0
	36	37	19.90	20.03	19.99		0
	75	0	19.82	19.96	19.97		0

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Table 9-25
LTE Band 4 (AWS) Conducted Powers – 10 MHz Bandwidth – Hotspot Mode Active

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	18.95	19.26	19.47	0	0
	1	25	19.34	19.49	19.66		0
	1	49	19.13	19.36	19.32		0
	25	0	19.28	19.43	19.70	0-1	0
	25	12	19.36	19.54	19.72		0
	25	25	19.35	19.52	19.64		0
	50	0	19.30	19.44	19.65		0
16QAM	1	0	18.97	20.02	19.56	0-1	0
	1	25	19.36	20.04	19.74		0
	1	49	19.14	20.01	19.40		0
	25	0	19.29	19.80	19.69	0-2	0
	25	12	19.36	19.70	19.71		0
	25	25	19.36	19.60	19.63		0
	50	0	19.30	19.65	19.63		0

Table 9-26
LTE Band 4 (AWS) Conducted Powers – 5 MHz Bandwidth – Hotspot Mode Active

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	18.87	18.89	19.38	0	0
	1	12	19.05	19.05	19.45		0
	1	24	18.98	19.01	19.37		0
	12	0	18.89	19.10	19.47	0-1	0
	12	6	18.94	19.14	19.46		0
	12	13	18.93	19.15	19.44		0
	25	0	18.91	19.11	19.43		0
16QAM	1	0	19.05	19.30	19.61	0-1	0
	1	12	19.25	19.39	19.70		0
	1	24	19.11	19.33	19.68		0
	12	0	18.96	19.13	19.42	0-2	0
	12	6	18.99	19.16	19.40		0
	12	13	19.00	19.17	19.42		0
	25	0	18.90	19.11	19.46		0

Table 9-27
LTE Band 4 (AWS) Conducted Powers – 3 MHz Bandwidth – Hotspot Mode Active

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Frequency [MHz]	Frequency [MHz]	Frequency [MHz]	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	18.80	18.93	19.27	0	0
	1	7	18.87	19.03	19.32		0
	1	14	18.86	18.97	19.26		0
	8	0	18.88	19.06	19.37	0-1	0
	8	4	18.89	19.09	19.36		0
	8	7	18.89	19.09	19.36		0
	15	0	18.89	19.08	19.37		0
16QAM	1	0	19.20	19.23	19.43	0-1	0
	1	7	19.27	19.30	19.53		0
	1	14	19.25	19.20	19.42		0
	8	0	18.85	19.11	19.32	0-2	0
	8	4	18.86	19.13	19.34		0
	8	7	18.87	19.14	19.32		0
	15	0	18.86	19.10	19.37		0

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Table 9-28
LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth – Hotspot Mode Active

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	Frequency [MHz]	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	18.80	18.87	19.32	0	0
	1	2	18.79	18.88	19.34		0
	1	5	18.79	18.90	19.38		0
	3	0	18.83	18.96	19.46		0
	3	2	18.91	19.05	19.49		0
	3	3	18.86	18.99	19.45		0
	6	0	18.87	19.02	19.48	0-1	0
16QAM	1	0	18.97	19.20	19.78	0-1	0
	1	2	18.79	19.29	19.65		0
	1	5	18.99	19.20	19.82		0
	3	0	18.88	19.11	19.54		0
	3	2	18.94	19.13	19.67		0
	3	3	18.92	19.05	19.62		0
	6	0	18.97	18.96	19.42	0-2	0

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LTE Band 25 (PCS)

Table 9-29
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.80	23.79	23.71	0	0
	1	50	23.74	23.68	23.67		0
	1	99	23.69	23.60	23.60		0
	50	0	22.83	22.71	22.73	0-1	1
	50	25	22.85	22.68	22.68		1
	50	50	22.81	22.66	22.69		1
	100	0	22.80	22.70	22.71		1
16QAM	1	0	22.72	22.94	23.06	0-2	1
	1	50	22.70	22.81	22.99		1
	1	99	22.65	22.74	22.95		1
	50	0	21.93	21.75	21.71	0-2	2
	50	25	21.89	21.72	21.73		2
	50	50	21.84	21.73	21.69		2
	100	0	21.88	21.74	21.70		2

Table 9-30
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26115 (1857.5 MHz)	26365 (1882.5 MHz)	26615 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.61	23.48	23.45	0	0
	1	36	23.57	23.41	23.45		0
	1	74	23.58	23.37	23.35		0
	36	0	22.71	22.48	22.53	0-1	1
	36	18	22.68	22.46	22.50		1
	36	37	22.70	22.44	22.51		1
	75	0	22.67	22.44	22.50		1
16QAM	1	0	22.89	22.48	22.74	0	1
	1	36	22.75	22.52	22.63		1
	1	74	22.96	22.81	22.57		1
	36	0	21.68	21.45	21.51	0-2	2
	36	18	21.70	21.47	21.53		2
	36	37	21.65	21.44	21.51		2
	75	0	21.67	21.44	21.51		2

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Table 9-31
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26090 (1855.0 MHz)	26365 (1882.5 MHz)	26640 (1910.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.61	23.48	23.46	0	0
	1	25	23.68	23.52	23.46		0
	1	49	23.58	23.43	23.37		0
	25	0	22.71	22.48	22.53	0-1	1
	25	12	22.68	22.46	22.50		1
	25	25	22.70	22.47	22.51		1
16QAM	50	0	22.67	22.43	22.50	0-1	1
	1	0	22.89	22.68	22.74		1
	1	25	22.90	22.56	22.63		1
	1	49	22.96	22.81	22.57		1
	25	0	21.65	21.45	21.54	0-2	2
	25	12	21.70	21.44	21.53		2
	25	25	21.65	21.43	21.51		2
	50	0	21.68	21.43	21.51		2

Table 9-32
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26065 (1852.5 MHz)	26365 (1882.5 MHz)	26665 (1912.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.03	23.65	23.81	0	0
	1	12	23.84	23.86	23.72		0
	1	24	23.96	23.82	23.67		0
	12	0	22.71	22.48	22.51	0-1	1
	12	6	22.72	22.48	22.54		1
	12	13	22.73	22.47	22.50		1
16QAM	25	0	22.70	22.46	22.51	0-1	1
	1	0	22.82	22.41	22.64		1
	1	12	22.76	22.55	22.45		1
	1	24	22.89	22.40	22.62	0-2	1
	12	0	21.72	21.43	21.55		2
	12	6	21.72	21.49	21.55		2
	12	13	21.70	21.48	21.51		2
	25	0	21.69	21.43	21.54		2

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Table 9-33
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26055 (1851.5 MHz)	26365 (1882.5 MHz)	26675 (1913.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.71	23.60	23.54	0	0
	1	7	23.83	23.54	23.52		0
	1	14	23.84	23.55	23.52		0
	8	0	22.75	22.51	22.46	0-1	1
	8	4	22.75	22.48	22.44		1
	8	7	22.80	22.54	22.45		1
	15	0	22.71	22.44	22.40		1
16QAM	1	0	22.88	22.61	22.68	0-1	1
	1	7	22.95	22.61	22.61		1
	1	14	22.75	22.69	22.53		1
	8	0	21.79	21.45	21.43	0-2	2
	8	4	21.81	21.42	21.49		2
	8	7	21.83	21.52	21.52		2
	15	0	21.65	21.42	21.42		2

Table 9-34
LTE Band 25 (PCS) Conducted Powers - 1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26047 (1850.7 MHz)	26365 (1882.5 MHz)	26683 (1914.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.15	23.69	23.47	0	0
	1	2	24.16	23.74	23.48		0
	1	5	24.14	23.78	23.46		0
	3	0	24.18	23.83	23.73		0
	3	2	24.20	23.88	23.77		0
	3	3	24.21	23.83	23.74		0
	6	0	23.10	22.78	22.69	0-1	1
16QAM	1	0	22.99	22.30	22.70	0-1	1
	1	2	23.08	22.40	22.71		1
	1	5	22.99	22.41	22.60		1
	3	0	23.00	22.80	22.65		1
	3	2	23.06	22.82	22.70		1
	3	3	23.03	22.82	22.71		1
	6	0	22.05	21.73	21.87	0-2	2

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Table 9-35
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	19.82	19.99	19.62	0	0
	1	50	20.00	19.52	19.89		0
	1	99	19.82	19.64	19.65		0
	50	0	19.76	19.67	19.63	0-1	0
	50	25	19.78	19.70	19.69		0
	50	50	19.77	19.58	19.60		0
16QAM	100	0	19.64	19.65	19.51	0-1	0
	1	0	19.97	19.81	19.63		0
	1	50	19.80	19.71	19.60		0
	1	99	19.73	19.53	19.57	0-2	0
	50	0	19.73	19.61	19.79		0
	50	25	19.97	19.67	19.59		0
	50	50	19.77	19.58	19.64		0
	100	0	19.50	19.60	19.72	0	

Table 9-36
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26115 (1857.5 MHz)	26365 (1882.5 MHz)	26615 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.00	19.61	19.77	0	0
	1	36	20.05	19.50	19.76		0
	1	74	20.03	19.51	19.69		0
	36	0	19.89	19.71	19.68	0-1	0
	36	18	19.94	19.63	19.71		0
	36	37	20.01	19.62	19.67		0
16QAM	75	0	19.88	19.73	19.68	0-1	0
	1	0	19.69	19.63	19.66		0
	1	36	19.84	19.69	19.75		0
	1	74	19.81	19.58	19.62	0-2	0
	36	0	19.92	19.70	19.61		0
	36	18	19.95	19.72	19.64		0
	36	37	20.03	19.65	19.63		0
	75	0	19.91	19.67	19.62		0

Table 9-37
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26090 (1855.0 MHz)	26365 (1882.5 MHz)	26640 (1910.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	19.98	19.73	19.70	0	0
	1	25	20.05	19.76	19.75		0
	1	49	19.94	19.94	19.72		0
	25	0	19.97	19.72	19.76	0-1	0
	25	12	19.97	19.72	19.75		0
	25	25	19.99	19.66	19.76		0
16QAM	50	0	19.97	19.67	19.74	0-1	0
	1	0	19.93	19.89	19.70		0
	1	25	20.02	19.85	19.69		0
	1	49	19.97	19.79	19.62	0-2	0
	25	0	19.99	19.70	19.72		0
	25	12	20.02	19.69	19.74		0
	25	25	20.01	19.65	19.74	0-2	0
	50	0	19.98	19.71	19.75		0

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Table 9-38

LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26065 (1852.5 MHz)	26365 (1882.5 MHz)	26665 (1912.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	19.82	19.78	19.61	0	0
	1	12	19.80	19.80	19.56		0
	1	24	19.78	19.79	19.74		0
	12	0	20.00	19.75	19.69	0-1	0
	12	6	19.99	19.78	19.73		0
	12	13	19.98	19.78	19.74		0
16QAM	25	0	19.99	19.79	19.72	0-1	0
	1	0	20.03	19.79	19.54		0
	1	12	20.04	19.82	19.58		0
	1	24	20.00	19.85	19.53	0-2	0
	12	0	20.03	19.78	19.73		0
	12	6	20.01	19.80	19.74		0
	12	13	20.00	19.74	19.70	0-2	0
	25	0	19.98	19.76	19.80		0

Table 9-39

LTE Band 25 (PCS) Conducted Powers – 3 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26055 (1851.5 MHz)	26365 (1882.5 MHz)	26675 (1913.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	19.97	19.67	19.52	0	0
	1	7	19.98	19.66	19.50		0
	1	14	19.94	19.63	19.51		0
	8	0	19.98	19.79	19.67	0-1	0
	8	4	19.99	19.75	19.68		0
	8	7	20.00	19.70	19.67		0
16QAM	15	0	20.03	19.69	19.69	0-1	0
	1	0	19.78	19.96	19.78		0
	1	7	19.82	19.96	19.60		0
	1	14	19.85	19.94	19.75	0-2	0
	8	0	19.95	19.78	19.68		0
	8	4	19.96	19.77	19.69		0
	8	7	19.93	19.76	19.66		0
		15	0	19.97	19.78	19.66	

Table 9-40

LTE Band 25 (PCS) Conducted Powers – 1.4 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26047 (1850.7 MHz)	26365 (1882.5 MHz)	26683 (1914.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	19.77	19.56	19.56	0	0
	1	2	19.90	19.54	19.54		0
	1	5	19.80	19.63	19.50		0
	3	0	20.04	19.75	19.69		0
	3	2	20.03	19.78	19.73		0
	3	3	20.00	19.75	19.69		0
	6	0	19.99	19.73	19.65	0-1	0
16QAM	1	0	19.68	19.53	19.53	0-1	0
	1	2	19.83	19.51	19.50		0
	1	5	19.67	19.50	19.57		0
	3	0	20.00	19.55	19.63		0
	3	2	20.02	19.55	19.61		0
	3	3	19.95	19.53	19.59		0
	6	0	19.97	19.64	19.65	0-2	0

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LTE Band 30

Table 9-41
LTE Band 30 Conducted Powers - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.42	0	0
		25	22.44		0
		49	22.45		0
	25	0	21.37	0-1	1
		12	21.35		1
		25	21.36		1
	50	0	21.34		1
16QAM	1	0	21.39		1
		25	21.41		1
		49	21.38		1
	25	0	20.28	0-2	2
		12	20.29		2
		25	20.26		2
	50	0	20.22		2

Table 9-42
LTE Band 30 Conducted Powers - 5 MHz Bandwidth

LTE Band 30 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.55	0	0
		12	22.60		0
		24	22.58		0
	12	0	21.55	0-1	1
		6	21.53		1
		13	21.52		1
	25	0	21.49		1
16QAM	1	0	21.38		1
		12	21.38		1
		24	21.46		1
	12	0	20.42	0-2	2
		6	20.44		2
		13	20.43		2
	25	0	20.44		2

Note: LTE Band 30 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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Table 9-43
LTE Band 30 Conducted Powers - 10 MHz Bandwidth – Hotspot Mode Active

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	19.17	0	0
		25	19.31		0
		49	19.11		0
	25	0	19.39	0-1	0
		12	19.29		0
		25	19.22		0
16QAM	1	0	19.28		0
		25	19.38		0
		49	19.17		0
	25	0	19.47		0
		12	19.22		0
		25	19.13		0
	50	0	19.35		0

Table 9-44
LTE Band 30 Conducted Powers - 5 MHz Bandwidth – Hotspot Mode Active

LTE Band 30 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	19.43	0	0
		12	19.47		0
		24	19.45		0
	12	0	19.39	0-1	0
		6	19.43		0
		13	19.39		0
16QAM	25	0	19.41		0
	1	0	19.33		0
		12	19.36		0
		24	19.38		0
	12	0	19.48	0-2	0
		6	19.56		0
		13	19.52		0
	25	0	19.42		0

Note: LTE Band 30 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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LTE Band 41

Table 9-45
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)			
			Conducted Power [dBm]							
QPSK	1	0	23.50	23.32	23.05	22.74	23.28	0	0	
	1	50	23.47	23.36	23.17	23.00	23.29		0	
	1	99	23.38	23.32	23.16	22.74	23.28		0	
	50	0	22.42	22.44	22.10	21.69	22.19	0-1	1	
	50	25	22.36	22.42	22.09	21.66	22.16		1	
	50	50	22.34	22.41	22.09	21.68	22.16		1	
16QAM	100	0	22.37	22.41	22.02	21.53	22.14	0-1	1	
	1	0	22.43	22.05	22.10	21.70	22.42		0-1	1
	1	50	22.36	22.43	22.39	22.07	22.09			1
	1	99	22.30	22.19	22.15	22.06	22.42	0-2		1
	50	0	21.46	21.52	21.11	20.78	21.13		2	
	50	25	21.43	21.53	21.13	20.77	21.21		2	
	50	50	21.39	21.41	21.21	20.72	21.25		2	
	100	0	21.44	21.51	21.18	20.77	21.21		2	

Table 9-46
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.35	23.47	23.04	22.68	23.05	0	0
	1	36	23.28	23.48	23.05	22.67	23.06		0
	1	74	23.21	23.45	23.04	22.69	23.04		0
	36	0	22.55	22.65	22.17	21.81	22.32	0-1	1
	36	18	22.50	22.57	22.18	21.77	22.25		1
	36	37	22.48	22.58	22.16	21.78	22.26		1
	75	0	22.50	22.57	22.17	21.80	22.27		1
16QAM	1	0	22.16	21.91	22.13	21.53	21.80	0-1	1
	1	36	22.06	21.86	22.12	21.52	21.84		1
	1	74	22.01	21.84	22.10	21.50	21.79		1
	36	0	21.48	21.65	21.11	20.76	21.23	0-2	2
	36	18	21.42	21.63	21.09	20.77	21.21		2
	36	37	21.40	21.60	21.14	20.78	21.20		2
	75	0	21.44	21.62	21.17	20.76	21.24		2

Table 9-47
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.49	23.16	22.99	22.61	23.24	0	0
	1	25	23.40	23.07	23.00	22.60	23.26		0
	1	49	23.40	23.10	23.02	22.63	23.28		0
	25	0	22.45	22.18	22.12	21.75	22.27	0-1	1
	25	12	22.43	22.19	22.13	21.74	22.21		1
	25	25	22.42	22.20	22.14	21.74	22.22		1
	50	0	22.45	22.21	22.16	21.77	22.24		1
16QAM	1	0	22.31	21.90	22.10	21.72	22.07	0-1	1
	1	25	22.28	21.90	22.04	21.69	22.09		1
	1	49	22.25	21.89	22.05	21.72	22.11		1
	25	0	21.52	21.22	21.10	20.70	21.32	0-2	2
	25	12	21.52	21.22	21.12	20.68	21.28		2
	25	25	21.51	21.24	21.10	20.72	21.30		2
	50	0	21.50	21.25	21.11	20.73	21.32		2

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Table 9-48
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.27	23.25	23.14	22.80	23.31	0	0
	1	12	23.24	23.20	23.13	22.67	23.30		0
	1	24	23.26	23.11	23.11	22.71	23.33		0
	12	0	22.45	22.20	22.16	21.76	22.23	0-1	1
	12	6	22.43	22.19	22.16	21.75	22.22		1
	12	13	22.45	22.18	22.14	21.77	22.21		1
	25	0	22.46	22.21	22.16	21.53	22.26	0-1	1
1	0	22.02	21.99	21.80	21.52	22.23	1		
1	12	22.00	21.96	21.82	21.50	22.21	1		
1	24	21.97	21.99	21.87	21.55	22.12	1		
12	0	21.47	21.22	21.15	20.69	21.28	0-2		2
12	6	21.51	21.24	21.13	20.72	21.26		2	
12	13	21.45	21.22	21.12	20.73	21.26		2	
25	0	21.53	21.21	21.16	20.81	21.23		2	

Table 9-49
LTE Band 41 Conducted Powers - 20 MHz Bandwidth – Hotspot Mode Active

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.52	21.31	21.12	21.02	21.08	0	0
	1	50	21.44	21.22	20.89	20.92	21.06		0
	1	99	21.36	21.23	21.01	20.94	21.05		0
	50	0	21.53	21.51	21.21	21.05	21.28	0-1	0
	50	25	21.50	21.50	21.27	21.04	21.24		0
	50	50	21.46	21.46	21.15	21.00	21.24		0
	100	0	21.46	21.50	21.11	21.02	21.22		0
16QAM	1	0	21.69	21.13	21.01	21.08	21.39	0-1	0
	1	50	21.58	21.05	21.02	21.10	21.40		0
	1	99	21.53	21.07	21.00	21.09	21.38		0
	50	0	21.59	21.48	21.18	21.07	21.26	0-2	0
	50	25	21.54	21.47	21.16	21.11	21.25		0
	50	50	21.51	21.38	21.16	21.01	21.26		0
	100	0	21.49	21.48	21.15	21.05	21.32		0

Table 9-50
LTE Band 41 Conducted Powers - 15 MHz Bandwidth – Hotspot Mode Active

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.38	21.42	21.10	20.85	21.02	0	0
	1	36	21.31	21.35	21.04	20.83	20.99		0
	1	74	21.23	21.31	20.96	20.84	20.96		0
	36	0	21.41	21.37	21.06	20.91	21.02	0-1	0
	36	18	21.39	21.36	21.04	20.86	21.04		0
	36	37	21.34	21.32	21.03	20.88	21.07		0
	75	0	21.39	21.34	21.01	20.89	21.06		0
16QAM	1	0	21.16	21.31	20.99	20.86	20.84	0-1	0
	1	36	21.15	21.25	20.92	20.84	20.83		0
	1	74	21.17	21.21	20.93	20.87	20.81		0
	36	0	21.31	21.39	21.18	20.82	21.13	0-2	0
	36	18	21.30	21.40	21.06	20.81	21.12		0
	36	37	21.27	21.36	21.08	20.84	21.13		0
	75	0	21.39	21.41	21.07	20.87	21.07		0

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Table 9-51
LTE Band 41 Conducted Powers - 10 MHz Bandwidth – Hotspot Mode Active

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.38	20.97	21.08	20.81	20.60	0	0
	1	25	21.31	20.95	21.07	20.79	20.58		0
	1	49	21.29	20.96	21.10	20.82	20.61		0
	25	0	21.30	21.02	20.99	20.84	20.66	0-1	0
	25	12	21.31	21.00	20.98	20.85	20.63		0
	25	25	21.28	20.98	20.97	20.81	20.62		0
	50	0	21.34	20.99	21.02	20.82	20.67		0
16QAM	1	0	21.15	20.94	20.89	20.62	20.57	0-1	0
	1	25	21.02	20.93	20.91	20.60	20.55		0
	1	49	21.03	20.99	20.79	20.57	20.61		0
	25	0	21.34	21.00	21.00	20.82	20.67	0-2	0
	25	12	21.31	21.01	21.05	20.81	20.64		0
	25	25	21.29	21.03	21.06	20.79	20.68		0
	50	0	21.43	20.98	20.96	20.91	20.67		0

Table 9-52
LTE Band 41 Conducted Powers - 5 MHz Bandwidth – Hotspot Mode Active

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.09	20.98	21.18	20.63	21.06	0	0
	1	12	21.10	20.97	21.15	20.59	21.07		0
	1	24	21.06	21.00	21.14	20.61	21.04		0
	12	0	21.31	20.98	20.91	20.79	21.06	0-1	0
	12	6	21.32	20.94	20.94	20.80	21.04		0
	12	13	21.29	20.97	20.93	20.78	21.05		0
	25	0	21.28	20.99	20.89	20.82	21.02		0
16QAM	1	0	20.72	20.63	20.73	20.50	20.79	0-1	0
	1	12	20.61	20.55	20.75	20.52	20.73		0
	1	24	20.64	20.59	20.78	20.56	20.72		0
	12	0	21.27	20.91	20.97	20.76	20.98	0-2	0
	12	6	21.28	20.94	20.96	20.77	20.95		0
	12	13	21.25	20.92	20.94	20.74	20.91		0
	25	0	21.34	20.95	20.91	20.82	21.01		0

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9.3.9 LTE Carrier Aggregation Conducted Powers

Table 9-53
Two Component Carrier Maximum Conducted Powers

PCC									SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B2	1.4	18607	1850.7	QPSK	3	3	607	1930.7	LTE B4	20	2175	2132.5	23.93	24.21
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B5	10	2525	881.5	23.90	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B12	10	5095	737.5	23.89	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B17	10	5790	740	23.88	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B29	10	9715	722.5	23.87	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B30	10	9820	2355	23.91	24.03
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B2	20	900	1960	24.13	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B4	20	2255	2140.5	24.18	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B5	10	2525	881.5	24.14	24.00
LTE B4	1.4	20354	1754.3	QPSK	3	0	2393	2154.3	LTE B12	10	5095	737.5	24.05	24.31
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B17	10	5790	740	24.13	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B13	10	5230	751	24.14	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B29	10	9715	722.5	24.16	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B30	10	9820	2355	24.18	24.00
LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	23.91	24.19
LTE B17	5	23790	710	QPSK	1	24	5790	740	LTE B2	10	900	1960	24.06	23.86
LTE B30	5	27710	2310	QPSK	1	12	9820	2355	LTE B2	20	900	1960	22.42	22.60
LTE B30	5	27710	2310	QPSK	1	12	9820	2355	LTE B4	20	2175	2132.5	22.51	22.60
LTE B30	5	27710	2310	QPSK	1	12	9820	2355	LTE B29	10	9715	722.5	22.54	22.60

Table 9-54
Three Component Carrier Maximum Conducted Powers

PCC									SCC1				SCC2				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	24.07	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	24.09	24.03
LTE B2	5	18625	1852.5	QPSK	1	0	625	1932.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.03	24.03
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B4	20	2255	2140.5	LTE B29	10	9715	722.5	24.22	24.00
LTE B4	5	20375	1752.5	QPSK	1	24	2375	2152.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.17	24.00

Table 9-55
Two Component Carrier Reduced Conducted Powers – Hotspot Mode Active

PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B4	20	2175	2132.5	20.04	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B5	10	2525	881.5	20.11	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B12	10	5095	737.5	20.08	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B17	10	5790	740	20.04	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B29	10	9715	722.5	20.07	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B30	10	9820	2355	20.13	20.05
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B2	20	900	1960	19.96	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B4	20	2325	2147.5	19.91	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B5	10	2525	881.5	19.78	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B12	10	5095	737.5	19.82	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B17	10	5790	740	19.84	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B13	10	5230	751	19.72	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B29	10	9715	722.5	19.79	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B30	10	9820	2355	19.93	20.04
LTE B30	10	27710	2310	16QAM	25	0	9820	2355	LTE B2	20	900	1960	19.16	19.58
LTE B30	10	27710	2310	16QAM	25	0	9820	2355	LTE B4	20	2175	2132.5	19.18	19.58
LTE B30	10	27710	2310	16QAM	25	0	9820	2355	LTE B29	10	9715	722.5	19.13	19.58

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Table 9-56
Three Component Carrier Reduced Conducted Powers – Hotspot Mode Active

PCC									SCC1				SCC2				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	20.02	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	20.10	20.05
LTE B2	10	18650	1855	QPSK	1	25	650	1935	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	20.12	20.05
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B4	20	2325	2147.5	LTE B29	10	9715	722.5	19.54	20.04
LTE B4	10	20175	1732.5	16QAM	1	25	2175	2132.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	19.49	20.04

Notes:

1. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. Since the supported frequency span for LTE B2 falls completely within the supported frequency span for LTE B25, both LTE bands have the same target power, and both LTE bands share the same transmission path, the configuration with the highest conducted power from LTE B25 was used to assess LTE CA combinations with LTE B2.

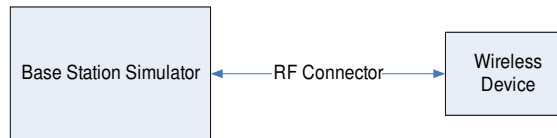


Figure 9-3
Power Measurement Setup

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9.4 WLAN Conducted Powers

Table 9-57

2.4 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	19.41	17.32	17.16
2437	6	18.75	17.23	17.08
2462	11	18.79	17.15	17.00

Table 9-58

2.4 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	18.13	17.28	17.08
2437	6	18.93	16.91	16.80
2462	11	18.92	16.75	16.56

Table 9-59

2.4 GHz WLAN Reduced Average RF Power – Antenna 1 (Held to Ear)

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	12.59	12.42	13.43
2437	6	13.20	12.67	12.91
2462	11	13.06	12.60	12.56

Table 9-60

2.4 GHz WLAN Reduced Average RF Power – Antenna 2 (Held to Ear)

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	12.80	11.63	13.49
2437	6	13.40	12.72	12.75
2462	11	13.34	12.60	12.53

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Table 9-61
5 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5200	40	16.03	15.85	16.10
5220	44	16.01	15.94	16.06
5240	48	15.92	15.87	16.02
5260	52	16.49	16.29	16.47
5280	56	16.48	16.22	16.43
5300	60	16.45	16.32	16.37
5520	104	15.81	15.57	15.70
5620	124	15.57	16.40	15.53
5720	144	16.27	16.10	16.20
5745	149	15.58	16.40	16.45
5785	157	15.50	16.25	16.38
5825	165	16.31	16.22	16.13

Table 9-62
5 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5200	40	16.16	16.13	16.13
5220	44	16.13	16.08	16.18
5240	48	16.28	16.10	16.21
5260	52	16.44	16.28	16.37
5280	56	16.42	16.37	16.30
5300	60	16.43	16.29	16.36
5520	104	16.33	16.25	16.31
5620	124	16.04	16.02	16.04
5720	144	15.85	15.68	15.90
5745	149	16.20	16.11	16.33
5785	157	16.05	16.05	16.31
5825	165	16.15	16.01	16.26

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Table 9-63
5 GHz WLAN Reduced Average RF Power – Antenna 1 (Held to Ear)

5GHz (80MHz) Conducted Power		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	9.57
5290	58	9.53
5530	106	10.49
5610	122	10.37
5690	138	10.20
5775	155	10.00

Table 9-64
5 GHz WLAN Reduced Average RF Power – Antenna 2 (Held to Ear)

5GHz (80MHz) Conducted Power		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	10.01
5290	58	10.49
5530	106	9.70
5610	122	9.60
5690	138	9.54
5775	155	10.44

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.
- The bolded data rate and channel above were tested for SAR.

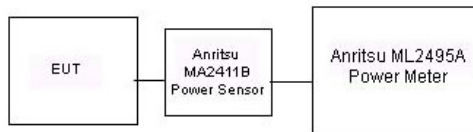


Figure 9-4
Power Measurement Setup for Bandwidths < 50 MHz

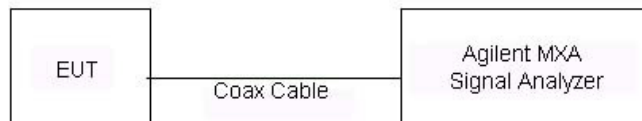


Figure 9-5
Power Measurement Setup for Bandwidths > 50 MHz

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head 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
1/14/2016	750H	21.4	700	0.852	43.510	0.889	42.201	-4.16%	3.10%
			710	0.862	43.339	0.890	42.149	-3.15%	2.82%
			740	0.893	42.796	0.893	41.994	0.00%	1.91%
			755	0.905	42.571	0.894	41.916	1.23%	1.56%
			770	0.918	42.395	0.895	41.838	2.57%	1.33%
12/20/2015	835H	21.0	785	0.933	42.231	0.896	41.760	4.13%	1.13%
			820	0.890	40.571	0.899	41.578	-1.00%	-2.42%
			835	0.901	40.356	0.900	41.500	0.11%	-2.76%
1/6/2016	835H	21.5	850	0.919	40.227	0.916	41.500	0.33%	-3.07%
			820	0.868	40.369	0.899	41.578	-3.45%	-2.91%
			835	0.883	40.136	0.900	41.500	-1.89%	-3.29%
1/10/2016	835H	22.5	850	0.896	39.898	0.916	41.500	-2.18%	-3.86%
			820	0.862	40.243	0.899	41.578	-4.12%	-3.21%
			835	0.880	39.990	0.900	41.500	-2.22%	-3.64%
12/30/2015	1750H	22.7	850	0.895	39.829	0.916	41.500	-2.29%	-4.03%
			1710	1.301	38.668	1.348	40.142	-3.49%	-3.67%
			1750	1.340	38.480	1.371	40.079	-2.26%	-3.99%
12/28/2015	1900H	22.2	1790	1.378	38.306	1.394	40.016	-1.15%	-4.27%
			1850	1.378	39.010	1.400	40.000	-1.57%	-2.48%
			1880	1.411	38.874	1.400	40.000	0.79%	-2.81%
12/22/2015	2300H-2600H	24.5	1910	1.444	38.733	1.400	40.000	3.14%	-3.17%
			2300	1.660	40.686	1.670	39.500	-0.60%	3.00%
			2310	1.674	40.620	1.679	39.480	-0.30%	2.89%
			2400	1.777	40.338	1.756	39.289	1.20%	2.67%
			2450	1.836	40.112	1.800	39.200	2.00%	2.33%
			2500	1.890	39.930	1.855	39.136	1.89%	2.03%
			2550	1.953	39.728	1.909	39.073	2.30%	1.68%
1/15/2016	2450H	22.0	2600	2.013	39.513	1.964	39.009	2.49%	1.29%
			2400	1.763	38.856	1.756	39.289	0.40%	-1.10%
			2450	1.822	38.658	1.800	39.200	1.22%	-1.38%
01/14/2016	5300H-5800H	21.7	2500	1.877	38.465	1.855	39.136	1.19%	-1.71%
			5240	4.674	36.275	4.696	35.940	-0.47%	0.93%
			5260	4.696	36.211	4.717	35.917	-0.45%	0.82%
			5280	4.720	36.215	4.737	35.894	-0.36%	0.89%
			5300	4.737	36.167	4.758	35.871	-0.44%	0.83%
			5500	4.935	35.880	4.963	35.643	-0.56%	0.66%
			5520	4.959	35.886	4.983	35.620	-0.48%	0.75%
			5540	4.989	35.814	5.004	35.597	-0.30%	0.61%
			5600	5.043	35.740	5.065	35.529	-0.43%	0.59%
			5745	5.204	35.504	5.214	35.363	-0.19%	0.40%
			5765	5.224	35.488	5.234	35.340	-0.19%	0.42%
			5785	5.244	35.453	5.255	35.317	-0.21%	0.39%

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Table 10-2
Measured Body 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
1/11/2016	750B	22.0	700	0.913	55.998	0.959	55.726	-4.80%	0.49%
			710	0.923	55.862	0.960	55.687	-3.85%	0.31%
			740	0.953	55.514	0.963	55.570	-1.04%	-0.10%
			755	0.968	55.379	0.964	55.512	0.41%	-0.24%
			770	0.983	55.236	0.965	55.453	1.87%	-0.39%
			785	0.997	55.069	0.966	55.395	3.21%	-0.59%
12/26/2015	835B	23.0	820	0.982	53.406	0.969	55.258	1.34%	-3.35%
			835	0.997	53.237	0.970	55.200	2.78%	-3.56%
			850	1.011	53.099	0.988	55.154	2.33%	-3.73%
1/9/2016	835B	23.2	820	0.991	53.831	0.969	55.258	2.27%	-2.58%
			835	1.005	53.715	0.970	55.200	3.61%	-2.69%
			850	1.020	53.590	0.988	55.154	3.24%	-2.84%
1/19/2016	835B	20.1	820	0.992	56.185	0.969	55.258	2.37%	1.68%
			835	1.005	56.042	0.970	55.200	3.61%	1.53%
			850	1.021	55.874	0.988	55.154	3.34%	1.31%
12/28/2015	1750B	23.1	1710	1.428	51.389	1.463	53.537	-2.39%	-4.01%
			1750	1.473	51.284	1.488	53.432	-1.01%	-4.02%
			1790	1.513	51.147	1.514	53.326	-0.07%	-4.09%
12/28/2015	1900B	22.2	1850	1.462	54.552	1.520	53.300	-3.82%	2.35%
			1880	1.497	54.454	1.520	53.300	-1.51%	2.17%
			1910	1.531	54.322	1.520	53.300	0.72%	1.92%
12/31/2015	1900B	22.8	1850	1.510	52.281	1.520	53.300	-0.66%	-1.91%
			1880	1.547	52.243	1.520	53.300	1.78%	-1.98%
			1910	1.574	52.134	1.520	53.300	3.55%	-2.19%
1/11/2016	1900B	21.5	1850	1.526	53.273	1.520	53.300	0.39%	-0.05%
			1880	1.560	53.175	1.520	53.300	2.63%	-0.23%
			1910	1.594	53.069	1.520	53.300	4.87%	-0.43%
12/31/2015	2300B-2600B	22.3	2300	1.769	51.356	1.809	52.900	-2.21%	-2.92%
			2310	1.786	51.290	1.816	52.887	-1.65%	-3.02%
			2320	1.800	51.280	1.826	52.873	-1.42%	-3.01%
			2400	1.910	50.948	1.902	52.767	0.42%	-3.45%
			2450	1.974	50.772	1.950	52.700	1.23%	-3.66%
			2500	2.042	50.654	2.021	52.636	1.04%	-3.77%
			2550	2.115	50.391	2.092	52.573	1.10%	-4.15%
			2600	2.183	50.192	2.163	52.509	0.92%	-4.41%
1/7/2016	2450B	22.4	2400	1.951	51.042	1.902	52.767	2.58%	-3.27%
			2450	2.022	50.853	1.950	52.700	3.69%	-3.50%
			2500	2.090	50.596	2.021	52.636	3.41%	-3.88%
1/12/2016	2450B	22.5	2400	1.920	52.493	1.902	52.767	0.95%	-0.52%
			2450	1.994	52.299	1.950	52.700	2.26%	-0.76%
			2500	2.062	52.082	2.021	52.636	2.03%	-1.05%
01/12/2016	5300B-5800B	23.8	5260	5.406	48.575	5.369	48.933	0.69%	-0.73%
			5300	5.455	48.493	5.416	48.879	0.72%	-0.79%
			5500	5.711	48.227	5.650	48.607	1.08%	-0.78%
			5520	5.727	48.253	5.673	48.580	0.95%	-0.67%
			5700	5.981	47.920	5.883	48.336	1.67%	-0.86%
			5745	6.039	47.844	5.936	48.275	1.74%	-0.89%
			5800	6.135	47.714	6.000	48.200	2.25%	-1.01%
			5825	6.169	47.626	6.029	48.166	2.32%	-1.12%

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.

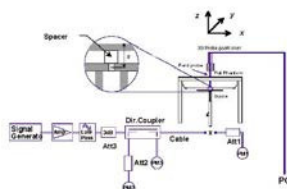
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10.2 Test System Verification

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 10-3
System Verification Results**

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
K	750	HEAD	01/14/2016	24.4	22.7	0.200	1054	3022	1.620	8.280	8.100	-2.17%
J	835	HEAD	12/20/2015	19.3	20.7	0.200	4d133	3319	1.810	9.130	9.050	-0.88%
D	835	HEAD	01/06/2016	23.5	21.5	0.200	4d119	3209	1.990	9.380	9.950	6.08%
D	835	HEAD	01/10/2016	23.6	22.5	0.200	4d133	3209	1.930	9.130	9.650	5.70%
E	1750	HEAD	12/30/2015	24.1	22.2	0.100	1051	3351	3.740	36.200	37.400	3.31%
J	1900	HEAD	12/28/2015	24.2	22.2	0.100	5d149	3319	3.830	40.700	38.300	-5.90%
I	2300	HEAD	12/22/2015	24.5	24.5	0.100	1008	3333	4.580	49.900	45.800	-8.22%
I	2450	HEAD	12/22/2015	24.5	24.5	0.100	719	3333	5.040	54.200	50.400	-7.01%
J	2450	HEAD	01/15/2016	22.7	22.0	0.100	719	3319	5.040	54.200	50.400	-7.01%
I	2600	HEAD	12/22/2015	24.5	24.5	0.100	1004	3333	5.460	55.800	54.600	-2.15%
E	5250	HEAD	01/14/2016	24.2	22.0	0.050	1191	7308	3.940	82.500	78.800	-4.48%
E	5600	HEAD	01/14/2016	24.2	22.0	0.050	1191	7308	4.310	84.500	86.200	2.01%
E	5750	HEAD	01/14/2016	24.2	22.0	0.050	1191	7308	3.850	80.000	77.000	-3.75%
K	750	BODY	01/11/2016	22.1	22.0	0.200	1054	3022	1.720	8.530	8.600	0.82%
H	835	BODY	12/26/2015	24.0	23.0	0.200	4d133	3263	1.960	9.250	9.800	5.95%
H	835	BODY	01/09/2016	24.5	23.2	0.200	4d133	3263	2.010	9.250	10.050	8.65%
H	835	BODY	01/19/2016	22.5	20.8	0.200	4d133	3263	1.950	9.250	9.750	5.41%
G	1750	BODY	12/28/2015	22.4	23.1	0.100	1051	3334	3.530	37.100	35.300	-4.85%
I	1900	BODY	12/28/2015	23.8	22.2	0.100	5d141	3333	4.100	40.000	41.000	2.50%
J	1900	BODY	12/31/2015	23.0	22.8	0.100	5d149	3319	4.030	40.400	40.300	-0.25%
I	1900	BODY	01/11/2016	22.8	21.5	0.100	5d141	3333	3.810	40.000	38.100	-4.75%
G	2300	BODY	12/31/2015	20.5	22.3	0.100	1008	3334	4.800	48.100	48.000	-0.21%
G	2450	BODY	12/31/2015	20.5	22.3	0.100	719	3334	5.160	51.900	51.600	-0.58%
G	2450	BODY	01/07/2016	24.0	22.6	0.100	719	3334	5.590	51.900	55.900	7.71%
J	2450	BODY	01/12/2016	22.1	22.5	0.100	719	3319	5.330	51.900	53.300	2.70%
G	2600	BODY	12/31/2015	20.5	22.3	0.100	1004	3334	5.580	56.200	55.800	-0.71%
D	5300	BODY	01/12/2016	23.8	23.6	0.050	1120	7357	3.770	75.200	75.400	0.27%
D	5500	BODY	01/12/2016	23.8	23.6	0.050	1120	7357	3.820	79.500	76.400	-3.90%
D	5800	BODY	01/12/2016	23.8	23.6	0.050	1120	7357	3.720	76.300	74.400	-2.49%



**Figure 10-1
System Verification Setup Diagram**



**Figure 10-2
System Verification Setup Photo**

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
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	34.0	33.29	0.05	Right	Cheek	80B93	1:8.3	0.227	1.178	0.267	A1
836.60	190	GSM 850	GSM	34.0	33.29	-0.03	Right	Tilt	80B93	1:8.3	0.088	1.178	0.104	
836.60	190	GSM 850	GSM	34.0	33.29	0.13	Left	Cheek	80B93	1:8.3	0.134	1.178	0.158	
836.60	190	GSM 850	GSM	34.0	33.29	0.14	Left	Tilt	80B93	1:8.3	0.077	1.178	0.091	
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 11-2
UMTS 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	State	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	24.5	23.85	-0.04	Right	Cheek	15	0CB4A	1:1	0.257	1.161	0.298	A2
836.60	4183	UMTS 850	RMC	24.5	23.85	-0.08	Right	Tilt	15	0CB4A	1:1	0.127	1.161	0.147	
836.60	4183	UMTS 850	RMC	24.5	23.85	0.04	Left	Cheek	15	0CB4A	1:1	0.178	1.161	0.207	
836.60	4183	UMTS 850	RMC	24.5	23.85	-0.01	Left	Tilt	15	0CB4A	1:1	0.117	1.161	0.136	
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 11-3
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	24.5	23.53	0.00	Right	Cheek	02BE4	1:1	0.052	1.250	0.065	
1732.40	1412	UMTS 1750	RMC	24.5	23.53	0.10	Right	Tilt	02BE4	1:1	0.041	1.250	0.051	
1732.40	1412	UMTS 1750	RMC	24.5	23.53	0.04	Left	Cheek	02BE4	1:1	0.067	1.250	0.084	A3
1732.40	1412	UMTS 1750	RMC	24.5	23.53	0.18	Left	Tilt	02BE4	1:1	0.040	1.250	0.050	
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 11-4
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	31.5	30.46	0.13	Right	Cheek	80B93	1:8.3	0.031	1.271	0.039	
1880.00	661	GSM 1900	GSM	31.5	30.46	0.14	Right	Tilt	80B93	1:8.3	0.013	1.271	0.017	
1880.00	661	GSM 1900	GSM	31.5	30.46	0.06	Left	Cheek	80B93	1:8.3	0.059	1.271	0.075	A4
1880.00	661	GSM 1900	GSM	31.5	30.46	0.14	Left	Tilt	80B93	1:8.3	0.016	1.271	0.020	
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 11-5
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	24.5	23.91	0.05	Right	Cheek	02BE4	1:1	0.054	1.146	0.062	
1852.40	9262	UMTS 1900	RMC	24.5	23.91	0.13	Right	Tilt	02BE4	1:1	0.035	1.146	0.040	
1852.40	9262	UMTS 1900	RMC	24.5	23.91	-0.02	Left	Cheek	02BE4	1:1	0.074	1.146	0.085	A5
1852.40	9262	UMTS 1900	RMC	24.5	23.91	0.14	Left	Tilt	02BE4	1:1	0.028	1.146	0.032	
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 11-6
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR[dB]	Side	Test Position	State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)															(W/kg)			
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.16	0	Right	Cheek	9	QPSK	1	25	0CB4A	1:1	0.126	1.371	0.173	A6
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.12	1	Right	Cheek	9	QPSK	25	12	0CB4A	1:1	0.091	1.346	0.122	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.08	0	Right	Tilt	9	QPSK	1	25	0CB4A	1:1	0.053	1.371	0.073	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.07	1	Right	Tilt	9	QPSK	25	12	0CB4A	1:1	0.039	1.346	0.052	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.14	0	Left	Cheek	9	QPSK	1	25	0CB4A	1:1	0.093	1.371	0.128	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	-0.02	1	Left	Cheek	9	QPSK	25	12	0CB4A	1:1	0.065	1.346	0.087	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.19	0	Left	Tilt	9	QPSK	1	25	0CB4A	1:1	0.054	1.371	0.074	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.11	1	Left	Tilt	9	QPSK	25	12	0CB4A	1:1	0.039	1.346	0.052	
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 11-7
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	State	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	25.0	23.74	-0.13	0	Right	Cheek	25	QPSK	1	25	0CB4A	1:1	0.118	1.337	0.158	A7
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.19	1	Right	Cheek	25	QPSK	25	0	0CB4A	1:1	0.086	1.355	0.117	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	0.05	0	Right	Tilt	25	QPSK	1	25	0CB4A	1:1	0.048	1.337	0.064	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	-0.02	1	Right	Tilt	25	QPSK	25	0	0CB4A	1:1	0.039	1.355	0.053	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	-0.04	0	Left	Cheek	25	QPSK	1	25	0CB4A	1:1	0.084	1.337	0.112	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.13	1	Left	Cheek	25	QPSK	25	0	0CB4A	1:1	0.064	1.355	0.087	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	0.09	0	Left	Tilt	25	QPSK	1	25	0CB4A	1:1	0.053	1.337	0.071	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.18	1	Left	Tilt	25	QPSK	25	0	0CB4A	1:1	0.045	1.355	0.061	
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 11-8
LTE Band 13 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 #
																(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.10	0	Right	Cheek	QPSK	1	25	0CB4A	1:1	0.222	1.384	0.307	A8
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.03	1	Right	Cheek	QPSK	25	12	0CB4A	1:1	0.175	1.455	0.255	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.02	0	Right	Tilt	QPSK	1	25	0CB4A	1:1	0.116	1.384	0.161	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.04	1	Right	Tilt	QPSK	25	12	0CB4A	1:1	0.091	1.455	0.132	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	-0.02	0	Left	Cheek	QPSK	1	25	0CB4A	1:1	0.153	1.384	0.212	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.10	1	Left	Cheek	QPSK	25	12	0CB4A	1:1	0.121	1.455	0.176	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	-0.19	0	Left	Tilt	QPSK	1	25	0CB4A	1:1	0.117	1.384	0.162	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.11	1	Left	Tilt	QPSK	25	12	0CB4A	1:1	0.099	1.455	0.144	
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 11-9
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	State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
																	(W/kg)		(W/kg)	
MHz	Ch.																			
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.11	0	Right	Cheek	8	QPSK	1	25	0CB4A	1:1	0.270	1.205	0.325	A9
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.09	1	Right	Cheek	8	QPSK	25	0	0CB4A	1:1	0.186	1.268	0.236	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.04	0	Right	Tilt	8	QPSK	1	25	0CB4A	1:1	0.117	1.205	0.141	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.13	1	Right	Tilt	8	QPSK	25	0	0CB4A	1:1	0.082	1.268	0.104	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.14	0	Left	Cheek	8	QPSK	1	25	0CB4A	1:1	0.174	1.205	0.210	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.03	1	Left	Cheek	8	QPSK	25	0	0CB4A	1:1	0.125	1.268	0.159	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	-0.07	0	Left	Tilt	8	QPSK	1	25	0CB4A	1:1	0.146	1.205	0.176	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.07	1	Left	Tilt	8	QPSK	25	0	0CB4A	1:1	0.102	1.268	0.129	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Head										
Spatial Peak										1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population										averaged over 1 gram										

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Table 11-10
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	24.5	23.53	0.00	0	Right	Cheek	QPSK	1	0	04BE0	1:1	0.083	1.250	0.104	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.65	-0.02	1	Right	Cheek	QPSK	50	0	04BE0	1:1	0.066	1.216	0.080	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.53	-0.12	0	Right	Tilt	QPSK	1	0	04BE0	1:1	0.072	1.250	0.090	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.65	0.07	1	Right	Tilt	QPSK	50	0	04BE0	1:1	0.056	1.216	0.068	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.53	0.05	0	Left	Cheek	QPSK	1	0	04BE0	1:1	0.099	1.250	0.124	A10
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.65	-0.02	1	Left	Cheek	QPSK	50	0	04BE0	1:1	0.081	1.216	0.098	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.53	0.09	0	Left	Tilt	QPSK	1	0	04BE0	1:1	0.070	1.250	0.088	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.65	0.01	1	Left	Tilt	QPSK	50	0	04BE0	1:1	0.056	1.216	0.068	
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 11-11
LTE Band 25 (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)	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.80	0.12	0	Right	Cheek	QPSK	1	0	04BB3	1:1	0.045	1.175	0.053	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.85	0.05	1	Right	Cheek	QPSK	50	25	04BB3	1:1	0.035	1.161	0.041	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.80	0.19	0	Right	Tilt	QPSK	1	0	04BB3	1:1	0.036	1.175	0.042	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.85	0.13	1	Right	Tilt	QPSK	50	25	04BB3	1:1	0.031	1.161	0.036	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.80	-0.12	0	Left	Cheek	QPSK	1	0	04BB3	1:1	0.067	1.175	0.079	A11
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.85	0.03	1	Left	Cheek	QPSK	50	25	04BB3	1:1	0.048	1.161	0.056	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.80	0.01	0	Left	Tilt	QPSK	1	0	04BB3	1:1	0.033	1.175	0.039	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.85	0.12	1	Left	Tilt	QPSK	50	25	04BB3	1:1	0.024	1.161	0.028	
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 11-12
LTE Band 30 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)		
2310.00	27710	Mid	LTE Band 30	10	24.0	22.45	0.19	0	Right	Cheek	QPSK	1	49	04BB4	1:1	0.033	1.429	0.047	
2310.00	27710	Mid	LTE Band 30	10	23.0	21.37	0.14	1	Right	Cheek	QPSK	25	0	04BB4	1:1	0.021	1.455	0.031	
2310.00	27710	Mid	LTE Band 30	10	24.0	22.45	0.11	0	Right	Tilt	QPSK	1	49	04BB4	1:1	0.025	1.429	0.036	
2310.00	27710	Mid	LTE Band 30	10	23.0	21.37	0.11	1	Right	Tilt	QPSK	25	0	04BB4	1:1	0.019	1.455	0.028	
2310.00	27710	Mid	LTE Band 30	10	24.0	22.45	-0.05	0	Left	Cheek	QPSK	1	49	04BB4	1:1	0.038	1.429	0.054	A12
2310.00	27710	Mid	LTE Band 30	10	23.0	21.37	0.01	1	Left	Cheek	QPSK	25	0	04BB4	1:1	0.030	1.455	0.044	
2310.00	27710	Mid	LTE Band 30	10	24.0	22.45	0.12	0	Left	Tilt	QPSK	1	49	04BB4	1:1	0.015	1.429	0.021	
2310.00	27710	Mid	LTE Band 30	10	23.0	21.37	0.15	1	Left	Tilt	QPSK	25	0	04BB4	1:1	0.011	1.455	0.016	
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 11-13
LTE Band 41 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)		
2506.00	39750	Low	LTE Band 41	20	24.5	23.50	0.19	0	Right	Cheek	QPSK	1	0	04BB4	1:1.58	0.047	1.259	0.059	
2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.44	0.13	1	Right	Cheek	QPSK	50	0	04BB4	1:1.58	0.039	1.276	0.050	
2506.00	39750	Low	LTE Band 41	20	24.5	23.50	0.18	0	Right	Tilt	QPSK	1	0	04BB4	1:1.58	0.044	1.259	0.055	
2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.44	0.06	1	Right	Tilt	QPSK	50	0	04BB4	1:1.58	0.058	1.276	0.074	
2506.00	39750	Low	LTE Band 41	20	24.5	23.50	0.14	0	Left	Cheek	QPSK	1	0	04BB4	1:1.58	0.066	1.259	0.083	
2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.44	0.07	1	Left	Cheek	QPSK	50	0	04BB4	1:1.58	0.071	1.276	0.091	A13
2506.00	39750	Low	LTE Band 41	20	24.5	23.50	0.19	0	Left	Tilt	QPSK	1	0	04BB4	1:1.58	0.027	1.259	0.034	
2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.44	0.07	1	Left	Tilt	QPSK	50	0	04BB4	1:1.58	0.038	1.276	0.048	
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 11-14
DTS Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	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)	
2437	6	802.11b	DSSS	22	13.5	13.20	-0.01	Right	Cheek	1	00580	1	99.8	0.322	0.320	1.072	1.002	0.344	
2437	6	802.11b	DSSS	22	13.5	13.20	-	Right	Tilt	1	00580	1	99.8	0.207	-	1.072	1.002	-	
2437	6	802.11b	DSSS	22	13.5	13.20	-	Left	Cheek	1	00580	1	99.8	0.172	-	1.072	1.002	-	
2437	6	802.11b	DSSS	22	13.5	13.20	-	Left	Tilt	1	00580	1	99.8	0.135	-	1.072	1.002	-	
2437	6	802.11b	DSSS	22	13.5	13.40	-	Right	Cheek	2	00580	1	99.8	0.241	-	1.023	1.002	-	
2437	6	802.11b	DSSS	22	13.5	13.40	-	Right	Tilt	2	00580	1	99.8	0.215	-	1.023	1.002	-	
2437	6	802.11b	DSSS	22	13.5	13.40	0.00	Left	Cheek	2	00580	1	99.8	0.479	0.368	1.023	1.002	0.377	A14
2437	6	802.11b	DSSS	22	13.5	13.40	-	Left	Tilt	2	00580	1	99.8	0.426	-	1.023	1.002	-	
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 11-15
NII Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	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)	
5290	58	802.11ac	OFDM	80	10.5	9.53	0.18	Right	Cheek	1	0C6B5	29.3	97.1	0.325	0.162	1.250	1.030	0.209	
5290	58	802.11ac	OFDM	80	10.5	9.53	-	Right	Tilt	1	0C6B5	29.3	97.1	0.210	-	1.250	1.030	-	
5290	58	802.11ac	OFDM	80	10.5	9.53	-	Left	Cheek	1	0C6B5	29.3	97.1	0.117	-	1.250	1.030	-	
5290	58	802.11ac	OFDM	80	10.5	9.53	-	Left	Tilt	1	0C6B5	29.3	97.1	0.073	-	1.250	1.030	-	
5290	58	802.11ac	OFDM	80	10.5	10.49	0.16	Right	Cheek	2	0C6B5	29.3	93.3	0.289	0.150	1.002	1.072	0.161	
5290	58	802.11ac	OFDM	80	10.5	10.49	-	Right	Tilt	2	0C6B5	29.3	93.3	0.224	-	1.002	1.072	-	
5290	58	802.11ac	OFDM	80	10.5	10.49	-	Left	Cheek	2	0C6B5	29.3	93.3	0.233	-	1.002	1.072	-	
5290	58	802.11ac	OFDM	80	10.5	10.49	-	Left	Tilt	2	0C6B5	29.3	93.3	0.233	-	1.002	1.072	-	
5530	106	802.11ac	OFDM	80	10.5	10.49	-0.19	Right	Cheek	1	0C6B5	29.3	97.1	0.425	0.128	1.002	1.030	0.132	
5530	106	802.11ac	OFDM	80	10.5	10.49	-	Right	Tilt	1	0C6B5	29.3	97.1	0.331	-	1.002	1.030	-	
5530	106	802.11ac	OFDM	80	10.5	10.49	-	Left	Cheek	1	0C6B5	29.3	97.1	0.173	-	1.002	1.030	-	
5530	106	802.11ac	OFDM	80	10.5	10.49	-	Left	Tilt	1	0C6B5	29.3	97.1	0.191	-	1.002	1.030	-	
5530	106	802.11ac	OFDM	80	10.5	9.70	-	Right	Cheek	2	0C6B5	29.3	93.3	0.534	-	1.202	1.072	-	
5530	106	802.11ac	OFDM	80	10.5	9.70	-	Right	Tilt	2	0C6B5	29.3	93.3	0.495	-	1.202	1.072	-	
5530	106	802.11ac	OFDM	80	10.5	9.70	-0.11	Left	Cheek	2	0C6B5	29.3	93.3	0.793	0.224	1.202	1.072	0.288	
5530	106	802.11ac	OFDM	80	10.5	9.70	-	Left	Tilt	2	0C6B5	29.3	93.3	0.779	-	1.202	1.072	-	
5775	155	802.11ac	OFDM	80	10.5	10.00	-	Right	Cheek	1	0C6B5	29.3	97.1	0.238	-	1.122	1.030	-	
5775	155	802.11ac	OFDM	80	10.5	10.00	-0.11	Right	Tilt	1	0C6B5	29.3	97.1	0.241	0.052	1.122	1.030	0.060	
5775	155	802.11ac	OFDM	80	10.5	10.00	-	Left	Cheek	1	0C6B5	29.3	97.1	0.090	-	1.122	1.030	-	
5775	155	802.11ac	OFDM	80	10.5	10.00	-	Left	Tilt	1	0C6B5	29.3	97.1	0.118	-	1.122	1.030	-	
5775	155	802.11ac	OFDM	80	10.5	10.44	-0.14	Right	Cheek	2	0C6B5	29.3	93.3	1.147	0.454	1.014	1.072	0.493	
5775	155	802.11ac	OFDM	80	10.5	10.44	-	Right	Tilt	2	0C6B5	29.3	93.3	0.743	-	1.014	1.072	-	
5775	155	802.11ac	OFDM	80	10.5	10.44	0.18	Left	Cheek	2	0C6B5	29.3	93.3	1.471	0.513	1.014	1.072	0.557	A15
5775	155	802.11ac	OFDM	80	10.5	10.44	-	Left	Tilt	2	0C6B5	29.3	93.3	0.411	-	1.014	1.072	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT																			
Spatial Peak								Head											
Uncontrolled Exposure/General Population								1.6 W/kg (mW/g)											
								averaged over 1 gram											

11.2 Standalone Body-Worn SAR Data

**Table 11-16
GSM/UMTS Body-Worn SAR Data**

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	State	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	34.0	33.29	0.00	15 mm	N/A	80B93	1:8.3	back	0.389	1.178	0.458	A16
836.60	4183	UMTS 850	RMC	24.5	23.85	-0.02	15 mm	15	0CB4A	1:1	back	0.325	1.161	0.377	A18
1732.40	1412	UMTS 1750	RMC	24.5	23.53	-0.01	15 mm	N/A	02BE4	1:1	back	0.361	1.250	0.451	A20
1880.00	661	GSM 1900	GSM	31.5	30.46	0.14	15 mm	N/A	80B93	1:8.3	back	0.399	1.271	0.507	A22
1852.40	9262	UMTS 1900	RMC	24.5	23.91	0.12	15 mm	N/A	02BE4	1:1	back	0.438	1.146	0.502	A24
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-17
LTE Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	State	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)		
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.02	0	9	0CB4A	QPSK	1	25	15 mm	back	1:1	0.231	1.371	0.317	A26
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.05	1	9	0CB4A	QPSK	25	12	15 mm	back	1:1	0.173	1.346	0.233	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	0.14	0	25	0CB4A	QPSK	1	25	15 mm	back	1:1	0.194	1.337	0.259	A28
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.10	1	25	0CB4A	QPSK	25	0	15 mm	back	1:1	0.173	1.355	0.234	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.04	0	N/A	0CB4A	QPSK	1	25	15 mm	back	1:1	0.377	1.384	0.522	A30
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.04	1	N/A	0CB4A	QPSK	25	12	15 mm	back	1:1	0.301	1.455	0.438	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	-0.02	0	8	0CB4A	QPSK	1	25	15 mm	back	1:1	0.252	1.205	0.304	A32
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.03	1	8	0CB4A	QPSK	25	0	15 mm	back	1:1	0.206	1.268	0.261	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.53	-0.01	0	N/A	04BE0	QPSK	1	0	15 mm	back	1:1	0.586	1.250	0.733	A34
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.65	-0.06	1	N/A	04BE0	QPSK	50	0	15 mm	back	1:1	0.460	1.216	0.559	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.80	-0.02	0	N/A	04BB3	QPSK	1	0	15 mm	back	1:1	0.442	1.175	0.519	A36
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.85	-0.10	1	N/A	04BB3	QPSK	50	25	15 mm	back	1:1	0.323	1.161	0.375	
2310.00	27710	Mid	LTE Band 30	10	24.0	22.45	0.05	0	N/A	04BB4	QPSK	1	49	15 mm	back	1:1	0.144	1.429	0.206	A38
2310.00	27710	Mid	LTE Band 30	10	23.0	21.37	0.10	1	N/A	04BB4	QPSK	25	0	15 mm	back	1:1	0.109	1.455	0.159	
2506.00	39750	Low	LTE Band 41	20	24.5	23.50	-0.03	0	N/A	04BB4	QPSK	1	0	15 mm	back	1:1.58	0.181	1.259	0.228	A40
2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.44	-0.05	1	N/A	04BB4	QPSK	50	0	15 mm	back	1:1.58	0.154	1.276	0.197	
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 11-18
DTS Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	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	19.5	19.41	0.09	15 mm	1	0C6B5	1	back	99.8	0.163	0.145	1.021	1.002	0.148	A42
2437	6	802.11b	DSSS	22	19.5	18.93	0.00	15 mm	2	0C6B5	1	back	99.8	0.124	0.107	1.140	1.002	0.122	
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 11-19
NII Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	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)	
5260	52	802.11a	OFDM	20	16.5	16.49	0.09	15 mm	1	00580	6	back	98.7	0.261	0.151	1.002	1.013	0.153	
5260	52	802.11a	OFDM	20	16.5	16.44	0.15	15 mm	2	00580	6	back	98.2	0.573	0.307	1.014	1.018	0.317	
5720	144	802.11a	OFDM	20	16.5	16.27	0.17	15 mm	1	00580	6	back	98.7	0.133	0.082	1.054	1.013	0.087	
5520	104	802.11a	OFDM	20	16.5	16.33	0.18	15 mm	2	00580	6	back	98.2	0.638	0.316	1.040	1.018	0.335	A44
5825	165	802.11a	OFDM	20	16.5	16.31	0.04	15 mm	1	00580	6	back	98.7	0.176	0.100	1.045	1.013	0.106	
5745	149	802.11a	OFDM	20	16.5	16.20	0.11	15 mm	2	00580	6	back	98.2	0.269	0.142	1.072	1.018	0.155	
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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11.3 Standalone Hotspot SAR Data

Table 11-20
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	State	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	30.5	29.68	-0.10	10 mm	N/A	80B93	3	1:2.76	back	0.649	1.208	0.784	
824.20	128	GSM 850	GPRS	30.5	29.63	-0.04	10 mm	N/A	80B93	3	1:2.76	front	0.593	1.222	0.725	
836.60	190	GSM 850	GPRS	30.5	29.68	-0.14	10 mm	N/A	80B93	3	1:2.76	front	0.683	1.208	0.825	
848.80	251	GSM 850	GPRS	30.5	29.62	-0.02	10 mm	N/A	80B93	3	1:2.76	front	0.735	1.225	0.900	A17
836.60	190	GSM 850	GPRS	30.5	29.68	-0.01	10 mm	N/A	80B93	3	1:2.76	bottom	0.317	1.208	0.383	
836.60	190	GSM 850	GPRS	30.5	29.68	0.00	10 mm	N/A	80B93	3	1:2.76	right	0.389	1.208	0.470	
836.60	190	GSM 850	GPRS	30.5	29.68	-0.01	10 mm	N/A	80B93	3	1:2.76	left	0.097	1.208	0.117	
836.60	4183	UMTS 850	RMC	24.5	23.85	0.02	10 mm	15	0CB4A	N/A	1:1	back	0.452	1.161	0.525	
836.60	4183	UMTS 850	RMC	24.5	23.85	0.01	10 mm	15	0CB4A	N/A	1:1	front	0.452	1.161	0.525	A19
836.60	4183	UMTS 850	RMC	24.5	23.85	-0.01	10 mm	15	0CB4A	N/A	1:1	bottom	0.197	1.161	0.229	
836.60	4183	UMTS 850	RMC	24.5	23.85	0.00	10 mm	15	0CB4A	N/A	1:1	right	0.261	1.161	0.303	
836.60	4183	UMTS 850	RMC	24.5	23.85	0.00	10 mm	15	0CB4A	N/A	1:1	left	0.077	1.161	0.089	
1732.40	1412	UMTS 1750	RMC	22.5	21.91	-0.06	10 mm	N/A	04BAD	N/A	1:1	back	0.446	1.146	0.511	A21
1732.40	1412	UMTS 1750	RMC	22.5	21.91	0.00	10 mm	N/A	04BAD	N/A	1:1	front	0.365	1.146	0.418	
1732.40	1412	UMTS 1750	RMC	22.5	21.91	-0.08	10 mm	N/A	04BAD	N/A	1:1	bottom	0.367	1.146	0.421	
1732.40	1412	UMTS 1750	RMC	22.5	21.91	-0.13	10 mm	N/A	04BAD	N/A	1:1	right	0.136	1.146	0.156	
1732.40	1412	UMTS 1750	RMC	22.5	21.91	0.04	10 mm	N/A	04BAD	N/A	1:1	left	0.026	1.146	0.030	
1850.20	512	GSM 1900	GPRS	25.0	24.89	-0.13	10 mm	N/A	813EF	3	1:2.76	back	0.488	1.026	0.501	A23
1850.20	512	GSM 1900	GPRS	25.0	24.89	-0.06	10 mm	N/A	813EF	3	1:2.76	front	0.410	1.026	0.421	
1850.20	512	GSM 1900	GPRS	25.0	24.89	0.07	10 mm	N/A	813EF	3	1:2.76	bottom	0.440	1.026	0.451	
1850.20	512	GSM 1900	GPRS	25.0	24.89	0.12	10 mm	N/A	813EF	3	1:2.76	right	0.115	1.026	0.118	
1850.20	512	GSM 1900	GPRS	25.0	24.89	0.15	10 mm	N/A	813EF	3	1:2.76	left	0.024	1.026	0.025	
1880.00	9400	UMTS 1900	RMC	21.5	20.85	-0.13	10 mm	N/A	04BF5	N/A	1:1	back	0.450	1.161	0.522	A25
1880.00	9400	UMTS 1900	RMC	21.5	20.85	0.12	10 mm	N/A	04BF5	N/A	1:1	front	0.383	1.161	0.445	
1880.00	9400	UMTS 1900	RMC	21.5	20.85	-0.13	10 mm	N/A	04BF5	N/A	1:1	bottom	0.402	1.161	0.467	
1880.00	9400	UMTS 1900	RMC	21.5	20.85	-0.02	10 mm	N/A	04BF5	N/A	1:1	right	0.094	1.161	0.109	
1880.00	9400	UMTS 1900	RMC	21.5	20.85	-0.05	10 mm	N/A	04BF5	N/A	1:1	left	0.015	1.161	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 11-21
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	State	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)			
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.03	0	9	0CB4A	QPSK	1	25	10 mm	back	1:1	0.309	1.371	0.424	A27
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.06	1	9	0CB4A	QPSK	25	12	10 mm	back	1:1	0.235	1.346	0.316	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.03	0	9	0CB4A	QPSK	1	25	10 mm	front	1:1	0.288	1.371	0.395	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.09	1	9	0CB4A	QPSK	25	12	10 mm	front	1:1	0.222	1.346	0.299	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.02	0	9	0CB4A	QPSK	1	25	10 mm	bottom	1:1	0.137	1.371	0.188	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.05	1	9	0CB4A	QPSK	25	12	10 mm	bottom	1:1	0.102	1.346	0.137	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	0.05	0	9	0CB4A	QPSK	1	25	10 mm	right	1:1	0.115	1.371	0.158	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	0.08	1	9	0CB4A	QPSK	25	12	10 mm	right	1:1	0.087	1.346	0.117	
707.50	23095	Mid	LTE Band 12	10	25.0	23.63	-0.05	0	9	0CB4A	QPSK	1	25	10 mm	left	1:1	0.104	1.371	0.143	
707.50	23095	Mid	LTE Band 12	10	24.0	22.71	-0.03	1	9	0CB4A	QPSK	25	12	10 mm	left	1:1	0.077	1.346	0.104	
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 11-22
LTE Band 17 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	State	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	25.0	23.74	0.12	0	25	0CB4A	QPSK	1	25	10 mm	back	1:1	0.295	1.337	0.394	A29
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.02	1	25	0CB4A	QPSK	25	0	10 mm	back	1:1	0.235	1.355	0.318	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	-0.14	0	25	0CB4A	QPSK	1	25	10 mm	front	1:1	0.228	1.337	0.305	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.11	1	25	0CB4A	QPSK	25	0	10 mm	front	1:1	0.218	1.355	0.295	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	-0.18	0	25	0CB4A	QPSK	1	25	10 mm	bottom	1:1	0.126	1.337	0.168	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	0.06	1	25	0CB4A	QPSK	25	0	10 mm	bottom	1:1	0.097	1.355	0.131	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	0.11	0	25	0CB4A	QPSK	1	25	10 mm	right	1:1	0.099	1.337	0.132	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	-0.08	1	25	0CB4A	QPSK	25	0	10 mm	right	1:1	0.087	1.355	0.118	
710.00	23790	Mid	LTE Band 17	10	25.0	23.74	0.19	0	25	0CB4A	QPSK	1	25	10 mm	left	1:1	0.089	1.337	0.119	
710.00	23790	Mid	LTE Band 17	10	24.0	22.68	-0.08	1	25	0CB4A	QPSK	25	0	10 mm	left	1:1	0.076	1.355	0.103	
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 11-23
LTE Band 13 Hotspot 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)		
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.03	0	0CB4A	QPSK	1	25	10 mm	back	1:1	0.495	1.384	0.685	A31
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.03	1	0CB4A	QPSK	25	12	10 mm	back	1:1	0.397	1.455	0.578	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.01	0	0CB4A	QPSK	1	25	10 mm	front	1:1	0.461	1.384	0.638	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	-0.02	1	0CB4A	QPSK	25	12	10 mm	front	1:1	0.372	1.455	0.541	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	-0.08	0	0CB4A	QPSK	1	25	10 mm	bottom	1:1	0.241	1.384	0.334	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	-0.04	1	0CB4A	QPSK	25	12	10 mm	bottom	1:1	0.197	1.455	0.287	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	0.17	0	0CB4A	QPSK	1	25	10 mm	right	1:1	0.362	1.384	0.501	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	-0.07	1	0CB4A	QPSK	25	12	10 mm	right	1:1	0.290	1.455	0.422	
782.00	23230	Mid	LTE Band 13	10	25.0	23.59	-0.10	0	0CB4A	QPSK	1	25	10 mm	left	1:1	0.131	1.384	0.181	
782.00	23230	Mid	LTE Band 13	10	24.0	22.37	0.07	1	0CB4A	QPSK	25	12	10 mm	left	1:1	0.112	1.455	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 11-24
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	State	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	25.0	24.19	0.03	0	8	0CB4A	QPSK	1	25	10 mm	back	1:1	0.363	1.205	0.437	A33
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.01	1	8	0CB4A	QPSK	25	0	10 mm	back	1:1	0.287	1.268	0.364	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	-0.02	0	8	0CB4A	QPSK	1	25	10 mm	front	1:1	0.597	1.205	0.719	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.00	1	8	0CB4A	QPSK	25	0	10 mm	front	1:1	0.341	1.268	0.432	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.03	0	8	0CB4A	QPSK	1	25	10 mm	bottom	1:1	0.180	1.205	0.217	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.08	1	8	0CB4A	QPSK	25	0	10 mm	bottom	1:1	0.144	1.268	0.183	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.11	0	8	0CB4A	QPSK	1	25	10 mm	right	1:1	0.229	1.205	0.276	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	0.02	1	8	0CB4A	QPSK	25	0	10 mm	right	1:1	0.174	1.268	0.221	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.19	0.02	0	8	0CB4A	QPSK	1	25	10 mm	left	1:1	0.071	1.205	0.086	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.97	-0.01	1	8	0CB4A	QPSK	25	0	10 mm	left	1:1	0.060	1.268	0.076	
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 11-25
LTE Band 4 (AWS) Hotspot 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	20.5	19.83	-0.05	0	04BAD	QPSK	1	50	10 mm	back	1:1	0.121	1.167	0.141	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.73	0.09	0	04BAD	QPSK	50	25	10 mm	back	1:1	0.117	1.194	0.140	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.83	0.08	0	04BAD	QPSK	1	50	10 mm	front	1:1	0.100	1.167	0.117	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.73	0.08	0	04BAD	QPSK	50	25	10 mm	front	1:1	0.100	1.194	0.119	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.83	0.04	0	04BAD	QPSK	1	50	10 mm	bottom	1:1	0.328	1.167	0.383	A35
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.73	-0.11	0	04BAD	QPSK	50	25	10 mm	bottom	1:1	0.262	1.194	0.313	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.83	0.00	0	04BAD	QPSK	1	50	10 mm	right	1:1	0.044	1.167	0.051	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.73	0.00	0	04BAD	QPSK	50	25	10 mm	right	1:1	0.045	1.194	0.054	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.83	0.05	0	04BAD	QPSK	1	50	10 mm	left	1:1	0.021	1.167	0.025	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.5	19.73	0.02	0	04BAD	QPSK	50	25	10 mm	left	1:1	0.020	1.194	0.024	
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 11-26
LTE Band 25 (PCS) Hotspot 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	26140	Low	LTE Band 25 (PCS)	20	21.5	20.00	-0.01	0	04BF5	QPSK	1	50	10 mm	back	1:1	0.392	1.413	0.554	A37
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	19.78	-0.05	0	04BF5	QPSK	50	25	10 mm	back	1:1	0.419	1.486	0.623	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	20.00	0.10	0	04BF5	QPSK	1	50	10 mm	front	1:1	0.337	1.413	0.476	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	19.78	0.14	0	04BF5	QPSK	50	25	10 mm	front	1:1	0.329	1.486	0.489	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	20.00	-0.10	0	04BF5	QPSK	1	50	10 mm	bottom	1:1	0.365	1.413	0.516	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	19.78	-0.10	0	04BF5	QPSK	50	25	10 mm	bottom	1:1	0.353	1.486	0.525	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	20.00	-0.05	0	04BF5	QPSK	1	50	10 mm	right	1:1	0.083	1.413	0.117	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	19.78	0.04	0	04BF5	QPSK	50	25	10 mm	right	1:1	0.080	1.486	0.119	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	20.00	0.11	0	04BF5	QPSK	1	50	10 mm	left	1:1	0.014	1.413	0.020	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	19.78	-0.05	0	04BF5	QPSK	50	25	10 mm	left	1:1	0.014	1.486	0.021	
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 11-27
LTE Band 30 Hotspot 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)		
2310.00	27710	Mid	LTE Band 30	10	21.0	19.31	0.00	0	04BF5	QPSK	1	25	10 mm	back	1:1	0.178	1.476	0.263	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.39	0.07	0	04BF5	QPSK	25	0	10 mm	back	1:1	0.197	1.449	0.285	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.31	0.00	0	04BF5	QPSK	1	25	10 mm	front	1:1	0.136	1.476	0.201	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.39	0.02	0	04BF5	QPSK	25	0	10 mm	front	1:1	0.153	1.449	0.222	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.31	-0.06	0	04BF5	QPSK	1	25	10 mm	bottom	1:1	0.293	1.476	0.432	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.39	-0.01	0	04BF5	QPSK	25	0	10 mm	bottom	1:1	0.326	1.449	0.472	A39
2310.00	27710	Mid	LTE Band 30	10	21.0	19.31	0.02	0	04BF5	QPSK	1	25	10 mm	left	1:1	0.052	1.476	0.077	
2310.00	27710	Mid	LTE Band 30	10	21.0	19.39	-0.05	0	04BF5	QPSK	25	0	10 mm	left	1:1	0.058	1.449	0.084	
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 11-28
LTE Band 41 Hotspot 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)		
2506.00	39750	Low	LTE Band 41	20	22.5	21.52	-0.01	0	04BF2	QPSK	1	0	10 mm	back	1:1.58	0.256	1.253	0.321	
2506.00	39750	Low	LTE Band 41	20	22.5	21.53	0.00	0	04BF2	QPSK	50	0	10 mm	back	1:1.58	0.262	1.250	0.328	
2506.00	39750	Low	LTE Band 41	20	22.5	21.52	-0.07	0	04BF2	QPSK	1	0	10 mm	front	1:1.58	0.225	1.253	0.282	
2506.00	39750	Low	LTE Band 41	20	22.5	21.53	-0.07	0	04BF2	QPSK	50	0	10 mm	front	1:1.58	0.230	1.250	0.288	
2506.00	39750	Low	LTE Band 41	20	22.5	21.52	-0.03	0	04BF2	QPSK	1	0	10 mm	bottom	1:1.58	0.426	1.253	0.534	
2506.00	39750	Low	LTE Band 41	20	22.5	21.53	0.04	0	04BF2	QPSK	50	0	10 mm	bottom	1:1.58	0.452	1.250	0.565	A41
2506.00	39750	Low	LTE Band 41	20	22.5	21.52	-0.08	0	04BF2	QPSK	1	0	10 mm	left	1:1.58	0.104	1.253	0.130	
2506.00	39750	Low	LTE Band 41	20	22.5	21.53	-0.02	0	04BF2	QPSK	50	0	10 mm	left	1:1.58	0.105	1.250	0.131	
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 11-29
WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	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	19.5	19.41	0.05	10 mm	1	0C6B5	1	back	99.8	0.448	0.366	1.021	1.002	0.375	A43
2412	1	802.11b	DSSS	22	19.5	19.41	-	10 mm	1	0C6B5	1	front	99.8	0.285	-	1.021	1.002	-	
2412	1	802.11b	DSSS	22	19.5	19.41	-	10 mm	1	0C6B5	1	top	99.8	0.064	-	1.021	1.002	-	
2412	1	802.11b	DSSS	22	19.5	19.41	-	10 mm	1	0C6B5	1	left	99.8	0.090	-	1.021	1.002	-	
2437	6	802.11b	DSSS	22	19.5	18.93	0.18	10 mm	2	0C6B5	1	back	99.8	0.256	0.228	1.140	1.002	0.261	
2437	6	802.11b	DSSS	22	19.5	18.93	-	10 mm	2	0C6B5	1	front	99.8	0.188	-	1.140	1.002	-	
2437	6	802.11b	DSSS	22	19.5	18.93	-	10 mm	2	0C6B5	1	top	99.8	0.204	-	1.140	1.002	-	
2437	6	802.11b	DSSS	22	19.5	18.93	-	10 mm	2	0C6B5	1	right	99.8	0.009	-	1.140	1.002	-	
2437	6	802.11b	DSSS	22	19.5	18.93	-	10 mm	2	0C6B5	1	left	99.8	0.015	-	1.140	1.002	-	
5825	165	802.11a	OFDM	20	16.5	16.31	0.12	10 mm	1	00580	6	back	98.7	0.325	0.144	1.045	1.013	0.152	
5825	165	802.11a	OFDM	20	16.5	16.31	-	10 mm	1	00580	6	front	98.7	0.090	-	1.045	1.013	-	
5825	165	802.11a	OFDM	20	16.5	16.31	-	10 mm	1	00580	6	top	98.7	0.116	-	1.045	1.013	-	
5825	165	802.11a	OFDM	20	16.5	16.31	-	10 mm	1	00580	6	left	98.7	0.104	-	1.045	1.013	-	
5745	149	802.11a	OFDM	20	16.5	16.20	0.13	10 mm	2	00580	6	back	98.2	0.366	0.207	1.072	1.018	0.226	A45
5745	149	802.11a	OFDM	20	16.5	16.20	-	10 mm	2	00580	6	front	98.2	0.301	-	1.072	1.018	-	
5745	149	802.11a	OFDM	20	16.5	16.20	-	10 mm	2	00580	6	top	98.2	0.168	-	1.072	1.018	-	
5745	149	802.11a	OFDM	20	16.5	16.20	-	10 mm	2	00580	6	left	98.2	0.032	-	1.072	1.018	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

11.4 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.
- 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.
- Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
- Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
- 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. Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg. Please see Section 13 for variability analysis.
- During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).

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10. This device supports dynamic antenna tuning for UMTS Band 5 and LTE Band 5/12/17. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with the tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in the tables above. Please see Section 14 for supplemental data.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. 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.
3. 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:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. 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.

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 8.5.4.
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 41 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.
6. Per KDB Publication 941225 D05Av01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not > 0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

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WLAN Notes:

1. For held-to-ear and hotspot 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 8.6.5 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 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06. Please see Section 12 for complete analysis.
5. 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.
6. 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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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 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.

12.2 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 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.

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 b), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

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

Table 12-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2480	10.50	15	0.154

Note: Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

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12.3 Head SAR Simultaneous Transmission Analysis

Table 12-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.267	0.344	0.377	0.611	0.644	0.988
	UMTS 850	0.298	0.344	0.377	0.642	0.675	1.019
	UMTS 1750	0.084	0.344	0.377	0.428	0.461	0.805
	GSM 1900	0.075	0.344	0.377	0.419	0.452	0.796
	UMTS 1900	0.085	0.344	0.377	0.429	0.462	0.806
	LTE Band 12	0.173	0.344	0.377	0.517	0.550	0.894
	LTE Band 17	0.158	0.344	0.377	0.502	0.535	0.879
	LTE Band 13	0.307	0.344	0.377	0.651	0.684	1.028
	LTE Band 5 (Cell)	0.325	0.344	0.377	0.669	0.702	1.046
	LTE Band 4 (AWS)	0.124	0.344	0.377	0.468	0.501	0.845
	LTE Band 25 (PCS)	0.079	0.344	0.377	0.423	0.456	0.800
	LTE Band 30	0.054	0.344	0.377	0.398	0.431	0.775
	LTE Band 41	0.091	0.344	0.377	0.435	0.468	0.812

Table 12-3
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.267	0.209	0.557	0.476	0.824	1.033
	UMTS 850	0.298	0.209	0.557	0.507	0.855	1.064
	UMTS 1750	0.084	0.209	0.557	0.293	0.641	0.850
	GSM 1900	0.075	0.209	0.557	0.284	0.632	0.841
	UMTS 1900	0.085	0.209	0.557	0.294	0.642	0.851
	LTE Band 12	0.173	0.209	0.557	0.382	0.730	0.939
	LTE Band 17	0.158	0.209	0.557	0.367	0.715	0.924
	LTE Band 13	0.307	0.209	0.557	0.516	0.864	1.073
	LTE Band 5 (Cell)	0.325	0.209	0.557	0.534	0.882	1.091
	LTE Band 4 (AWS)	0.124	0.209	0.557	0.333	0.681	0.890
	LTE Band 25 (PCS)	0.079	0.209	0.557	0.288	0.636	0.845
	LTE Band 30	0.054	0.209	0.557	0.263	0.611	0.820
	LTE Band 41	0.091	0.209	0.557	0.300	0.648	0.857

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Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz Ant 1 and 5 GHz Ant 2 WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.267	0.344	0.557	0.611	0.824	1.168
	UMTS 850	0.298	0.344	0.557	0.642	0.855	1.199
	UMTS 1750	0.084	0.344	0.557	0.428	0.641	0.985
	GSM 1900	0.075	0.344	0.557	0.419	0.632	0.976
	UMTS 1900	0.085	0.344	0.557	0.429	0.642	0.986
	LTE Band 12	0.173	0.344	0.557	0.517	0.730	1.074
	LTE Band 17	0.158	0.344	0.557	0.502	0.715	1.059
	LTE Band 13	0.307	0.344	0.557	0.651	0.864	1.208
	LTE Band 5 (Cell)	0.325	0.344	0.557	0.669	0.882	1.226
	LTE Band 4 (AWS)	0.124	0.344	0.557	0.468	0.681	1.025
	LTE Band 25 (PCS)	0.079	0.344	0.557	0.423	0.636	0.980
	LTE Band 30	0.054	0.344	0.557	0.398	0.611	0.955
	LTE Band 41	0.091	0.344	0.557	0.435	0.648	0.992

Table 12-5
Simultaneous Transmission Scenario with 2.4 GHz Ant 2 and 5 GHz Ant 1 WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.267	0.377	0.209	0.644	0.476	0.853
	UMTS 850	0.298	0.377	0.209	0.675	0.507	0.884
	UMTS 1750	0.084	0.377	0.209	0.461	0.293	0.670
	GSM 1900	0.075	0.377	0.209	0.452	0.284	0.661
	UMTS 1900	0.085	0.377	0.209	0.462	0.294	0.671
	LTE Band 12	0.173	0.377	0.209	0.550	0.382	0.759
	LTE Band 17	0.158	0.377	0.209	0.535	0.367	0.744
	LTE Band 13	0.307	0.377	0.209	0.684	0.516	0.893
	LTE Band 5 (Cell)	0.325	0.377	0.209	0.702	0.534	0.911
	LTE Band 4 (AWS)	0.124	0.377	0.209	0.501	0.333	0.710
	LTE Band 25 (PCS)	0.079	0.377	0.209	0.456	0.288	0.665
	LTE Band 30	0.054	0.377	0.209	0.431	0.263	0.640
	LTE Band 41	0.091	0.377	0.209	0.468	0.300	0.677

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12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-6
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.458	0.148	0.122	0.606	0.580	0.728
	UMTS 850	0.377	0.148	0.122	0.525	0.499	0.647
	UMTS 1750	0.451	0.148	0.122	0.599	0.573	0.721
	GSM 1900	0.507	0.148	0.122	0.655	0.629	0.777
	UMTS 1900	0.502	0.148	0.122	0.650	0.624	0.772
	LTE Band 12	0.317	0.148	0.122	0.465	0.439	0.587
	LTE Band 17	0.259	0.148	0.122	0.407	0.381	0.529
	LTE Band 13	0.522	0.148	0.122	0.670	0.644	0.792
	LTE Band 5 (Cell)	0.304	0.148	0.122	0.452	0.426	0.574
	LTE Band 4 (AWS)	0.733	0.148	0.122	0.881	0.855	1.003
	LTE Band 25 (PCS)	0.519	0.148	0.122	0.667	0.641	0.789
	LTE Band 30	0.206	0.148	0.122	0.354	0.328	0.476
	LTE Band 41	0.228	0.148	0.122	0.376	0.350	0.498

Table 12-7
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.458	0.153	0.335	0.611	0.793	0.946
	UMTS 850	0.377	0.153	0.335	0.530	0.712	0.865
	UMTS 1750	0.451	0.153	0.335	0.604	0.786	0.939
	GSM 1900	0.507	0.153	0.335	0.660	0.842	0.995
	UMTS 1900	0.502	0.153	0.335	0.655	0.837	0.990
	LTE Band 12	0.317	0.153	0.335	0.470	0.652	0.805
	LTE Band 17	0.259	0.153	0.335	0.412	0.594	0.747
	LTE Band 13	0.522	0.153	0.335	0.675	0.857	1.010
	LTE Band 5 (Cell)	0.304	0.153	0.335	0.457	0.639	0.792
	LTE Band 4 (AWS)	0.733	0.153	0.335	0.886	1.068	1.221
	LTE Band 25 (PCS)	0.519	0.153	0.335	0.672	0.854	1.007
	LTE Band 30	0.206	0.153	0.335	0.359	0.541	0.694
	LTE Band 41	0.228	0.153	0.335	0.381	0.563	0.716

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Table 12-8

Simultaneous Transmission Scenario with 2.4 GHz Ant 1 and 5 GHz Ant 2 WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.458	0.148	0.335	0.606	0.793	0.941
	UMTS 850	0.377	0.148	0.335	0.525	0.712	0.860
	UMTS 1750	0.451	0.148	0.335	0.599	0.786	0.934
	GSM 1900	0.507	0.148	0.335	0.655	0.842	0.990
	UMTS 1900	0.502	0.148	0.335	0.650	0.837	0.985
	LTE Band 12	0.317	0.148	0.335	0.465	0.652	0.800
	LTE Band 17	0.259	0.148	0.335	0.407	0.594	0.742
	LTE Band 13	0.522	0.148	0.335	0.670	0.857	1.005
	LTE Band 5 (Cell)	0.304	0.148	0.335	0.452	0.639	0.787
	LTE Band 4 (AWS)	0.733	0.148	0.335	0.881	1.068	1.216
	LTE Band 25 (PCS)	0.519	0.148	0.335	0.667	0.854	1.002
	LTE Band 30	0.206	0.148	0.335	0.354	0.541	0.689
	LTE Band 41	0.228	0.148	0.335	0.376	0.563	0.711

Table 12-9

Simultaneous Transmission Scenario with 2.4 GHz Ant 2 and 5 GHz Ant 1 WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.458	0.122	0.153	0.580	0.611	0.733
	UMTS 850	0.377	0.122	0.153	0.499	0.530	0.652
	UMTS 1750	0.451	0.122	0.153	0.573	0.604	0.726
	GSM 1900	0.507	0.122	0.153	0.629	0.660	0.782
	UMTS 1900	0.502	0.122	0.153	0.624	0.655	0.777
	LTE Band 12	0.317	0.122	0.153	0.439	0.470	0.592
	LTE Band 17	0.259	0.122	0.153	0.381	0.412	0.534
	LTE Band 13	0.522	0.122	0.153	0.644	0.675	0.797
	LTE Band 5 (Cell)	0.304	0.122	0.153	0.426	0.457	0.579
	LTE Band 4 (AWS)	0.733	0.122	0.153	0.855	0.886	1.008
	LTE Band 25 (PCS)	0.519	0.122	0.153	0.641	0.672	0.794
	LTE Band 30	0.206	0.122	0.153	0.328	0.359	0.481
	LTE Band 41	0.228	0.122	0.153	0.350	0.381	0.503

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Table 12-10
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	GSM 850	0.458	0.154	0.612
	UMTS 850	0.377	0.154	0.531
	UMTS 1750	0.451	0.154	0.605
	GSM 1900	0.507	0.154	0.661
	UMTS 1900	0.502	0.154	0.656
	LTE Band 12	0.317	0.154	0.471
	LTE Band 17	0.259	0.154	0.413
	LTE Band 13	0.522	0.154	0.676
	LTE Band 5 (Cell)	0.304	0.154	0.458
	LTE Band 4 (AWS)	0.733	0.154	0.887
	LTE Band 25 (PCS)	0.519	0.154	0.673
	LTE Band 30	0.206	0.154	0.360
	LTE Band 41	0.228	0.154	0.382

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

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12.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

Table 12-11
Simultaneous Transmission Scenario 2.4 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.900	0.375	0.261	1.275	1.161	1.536
	UMTS 850	0.525	0.375	0.261	0.900	0.786	1.161
	UMTS 1750	0.511	0.375	0.261	0.886	0.772	1.147
	GPRS 1900	0.501	0.375	0.261	0.876	0.762	1.137
	UMTS 1900	0.522	0.375	0.261	0.897	0.783	1.158
	LTE Band 12	0.424	0.375	0.261	0.799	0.685	1.060
	LTE Band 17	0.394	0.375	0.261	0.769	0.655	1.030
	LTE Band 13	0.685	0.375	0.261	1.060	0.946	1.321
	LTE Band 5 (Cell)	0.719	0.375	0.261	1.094	0.980	1.355
	LTE Band 4 (AWS)	0.383	0.375	0.261	0.758	0.644	1.019
	LTE Band 25 (PCS)	0.623	0.375	0.261	0.998	0.884	1.259
	LTE Band 30	0.472	0.375	0.261	0.847	0.733	1.108
	LTE Band 41	0.565	0.375	0.261	0.940	0.826	1.201

Table 12-12
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.900	0.152	0.226	1.052	1.126	1.278
	UMTS 850	0.525	0.152	0.226	0.677	0.751	0.903
	UMTS 1750	0.511	0.152	0.226	0.663	0.737	0.889
	GPRS 1900	0.501	0.152	0.226	0.653	0.727	0.879
	UMTS 1900	0.522	0.152	0.226	0.674	0.748	0.900
	LTE Band 12	0.424	0.152	0.226	0.576	0.650	0.802
	LTE Band 17	0.394	0.152	0.226	0.546	0.620	0.772
	LTE Band 13	0.685	0.152	0.226	0.837	0.911	1.063
	LTE Band 5 (Cell)	0.719	0.152	0.226	0.871	0.945	1.097
	LTE Band 4 (AWS)	0.383	0.152	0.226	0.535	0.609	0.761
	LTE Band 25 (PCS)	0.623	0.152	0.226	0.775	0.849	1.001
	LTE Band 30	0.472	0.152	0.226	0.624	0.698	0.850
	LTE Band 41	0.565	0.152	0.226	0.717	0.791	0.943

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Table 12-13
Simultaneous Transmission Scenario 2.4 GHz Ant 1 and 5 GHz Ant 2 WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.900	0.375	0.226	1.275	1.126	1.501
	UMTS 850	0.525	0.375	0.226	0.900	0.751	1.126
	UMTS 1750	0.511	0.375	0.226	0.886	0.737	1.112
	GPRS 1900	0.501	0.375	0.226	0.876	0.727	1.102
	UMTS 1900	0.522	0.375	0.226	0.897	0.748	1.123
	LTE Band 12	0.424	0.375	0.226	0.799	0.650	1.025
	LTE Band 17	0.394	0.375	0.226	0.769	0.620	0.995
	LTE Band 13	0.685	0.375	0.226	1.060	0.911	1.286
	LTE Band 5 (Cell)	0.719	0.375	0.226	1.094	0.945	1.320
	LTE Band 4 (AWS)	0.383	0.375	0.226	0.758	0.609	0.984
	LTE Band 25 (PCS)	0.623	0.375	0.226	0.998	0.849	1.224
	LTE Band 30	0.472	0.375	0.226	0.847	0.698	1.073
	LTE Band 41	0.565	0.375	0.226	0.940	0.791	1.166

Table 12-14
Simultaneous Transmission Scenario 2.4 GHz Ant 2 and 5 GHz Ant 1 WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.900	0.261	0.152	1.161	1.052	1.313
	UMTS 850	0.525	0.261	0.152	0.786	0.677	0.938
	UMTS 1750	0.511	0.261	0.152	0.772	0.663	0.924
	GPRS 1900	0.501	0.261	0.152	0.762	0.653	0.914
	UMTS 1900	0.522	0.261	0.152	0.783	0.674	0.935
	LTE Band 12	0.424	0.261	0.152	0.685	0.576	0.837
	LTE Band 17	0.394	0.261	0.152	0.655	0.546	0.807
	LTE Band 13	0.685	0.261	0.152	0.946	0.837	1.098
	LTE Band 5 (Cell)	0.719	0.261	0.152	0.980	0.871	1.132
	LTE Band 4 (AWS)	0.383	0.261	0.152	0.644	0.535	0.796
	LTE Band 25 (PCS)	0.623	0.261	0.152	0.884	0.775	1.036
	LTE Band 30	0.472	0.261	0.152	0.733	0.624	0.885
	LTE Band 41	0.565	0.261	0.152	0.826	0.717	0.978

12.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was not assessed for each frequency band since all measured SAR values are < 0.80 W/kg for 1g SAR.

13.2 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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14 ADDITIONAL TUNER TESTING PER FCC GUIDANCE

The following test procedures were followed to demonstrate that the SAR results in Section 11 represented the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR was measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements were evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence to the antenna characteristics, other than impedance matching.

To evaluate all of the tuner states, the 25 tuner states for each frequency band were divided evenly among the exposure conditions so that at least one single point SAR measurement was measured among the configurations. For the 850 MHz band, the tuner states were additionally divided among the wireless modes that shared identical tuner states. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. While inserting and removing the USB cable between single point SAR measurements, the device was ensured to capture the same physical point SAR that generated the highest SAR.

The operational description contains more information about the design and implementation of the dynamic antenna tuning.

**Table 14-1
Supplemental Head SAR Data**

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)								
									Auto-Tune (State 8)	Default (State 8)	State 1	State 5	State 9	State 13	State 17	State 18	State 22
LTE B5	QPSK	836.5	20525	1	25	Right Cheek	N/A	0.270	0.327	0.324	0.304	0.252	0.331	0.182	0.327	0.270	0.107
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)								
									Auto-Tune (State 15)	Default (State 15)	State 2	State 6	State 10	State 14	State 19	State 23	State 24
UMTS B5	RMC	836.6	4183	N/A	N/A	Right Cheek	N/A	0.257	0.274	0.283	0.262	0.211	0.263	0.217	0.222	0.264	0.274

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)													
									Auto-Tune (State 9)	Default (State 9)	State 1	State 3	State 5	State 7	State 11	State 13	State 15	State 17	State 19	State 21	State 23	State 25
LTE B12	QPSK	707.5	23095	1	25	Right Cheek	N/A	0.126	0.131	0.125	0.128	0.085	0.087	0.094	0.079	0.041	0.091	0.130	0.079	0.047	0.040	0.124

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)													
									Auto-Tune (State 9)	Default (State 25)	State 1	State 3	State 5	State 7	State 9	State 11	State 13	State 15	State 17	State 19	State 21	State 23
LTE B17	QPSK	710	23790	1	25	Right Cheek	N/A	0.118	0.130	0.127	0.125	0.077	0.026	0.081	0.125	0.073	0.036	0.086	0.115	0.068	0.036	0.087

**Table 14-2
Supplemental Body SAR Data**

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)								
									Auto-Tune (State 8)	Default (State 8)	State 3	State 7	State 12	State 15	State 20	State 23	State 24
LTE B5	QPSK	836.5	20525	1	25	Front Side	10 mm	0.597	0.795	0.771	0.637	0.180	0.530	0.615	0.498	0.161	0.586
Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)								
									Auto-Tune (State 15)	Default (State 15)	State 1	State 4	State 8	State 11	State 16	State 21	State 25
UMTS B5	RMC	836.6	4183	N/A	N/A	Front Side	10 mm	0.452	0.551	0.528	0.537	0.482	0.615	0.505	0.644	0.486	0.641

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)													
									Auto-Tune (State 9)	Default (State 9)	State 2	State 4	State 6	State 8	State 10	State 12	State 14	State 16	State 18	State 20	State 22	State 24
LTE B12	QPSK	707.5	23095	1	25	Back Side	10 mm	0.309	0.375	0.373	0.339	0.237	0.216	0.260	0.318	0.219	0.165	0.323	0.339	0.239	0.100	0.151

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)													
									Auto-Tune (State 25)	Default (State 25)	State 2	State 4	State 6	State 8	State 10	State 12	State 14	State 16	State 18	State 20	State 22	State 24
LTE B17	QPSK	710	23790	1	25	Back Side	10 mm	0.295	0.359	0.349	0.290	0.225	0.176	0.272	0.283	0.179	0.166	0.338	0.325	0.233	0.088	0.165

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15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/15/2015	Annual	3/15/2016	MY45470194
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00387
Agilent	8648D	(9kHz-4GHz) Signal Generator	3/15/2015	Annual	3/15/2016	3629U00687
Agilent	E4438C	ESG Vector Signal Generator	3/15/2015	Annual	3/15/2016	MY45091346
Agilent	E4438C	ESG Vector Signal Generator	4/1/2014	Biennial	4/1/2016	MY47270002
Agilent	E4432B	ESG-D Series Signal Generator	3/16/2015	Annual	3/16/2016	US40053896
Agilent	N9020A	MKA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Agilent	N5182A	MKG Vector Signal Generator	3/16/2015	Annual	3/16/2016	MY47420800
Agilent	N5182A	MKG Vector Signal Generator	3/16/2015	Annual	3/16/2016	MY47420651
Agilent	8753ES	Network Analyzer	3/20/2015	Annual	3/20/2016	MY40001472
Agilent	8753ES	S-Parameter Network Analyzer	1/20/2015	Annual	1/20/2016	US39170122
Agilent	8753ES	S-Parameter Network Analyzer	3/12/2015	Annual	3/12/2016	MY40000670
Agilent	E5515C	Wireless Communications Test Set	5/16/2015	Biennial	5/16/2017	GB43304447
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41502275
Agilent	N4010A	Wireless Connectivity Test Set	CBT	N/A	CBT	GB46170464
Agilent	N4010A	Wireless Connectivity Test Set	CBT	N/A	CBT	GB44502773
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433977
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433978
Anritsu	ML2438A	Power Meter	3/13/2015	Annual	3/13/2016	1190313
Anritsu	ML2438A	Power Meter	3/13/2015	Annual	3/13/2016	1070030
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	MA2481A	Power Sensor	3/10/2015	Annual	3/10/2016	5821
Anritsu	MA2481A	Power Sensor	3/10/2015	Annual	3/10/2016	5605
Anritsu	MA2411B	Pulse Power Sensor	3/13/2015	Annual	3/13/2016	1207470
Anritsu	MA2411B	Pulse Power Sensor	8/3/2015	Annual	8/3/2016	1126066
Anritsu	MT8820C	Radio Communication Analyzer	6/12/2015	Annual	6/12/2016	6201240328
Anritsu	MT8820C	Radio Communication Analyzer	7/24/2015	Annual	7/24/2016	6200901190
Anritsu	MA24106A	USB Power Sensor	3/2/2015	Annual	3/2/2016	1344555
Anritsu	MA24106A	USB Power Sensor	3/2/2015	Annual	3/2/2016	1344556
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
COMTECH	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M155A00-009
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194896
Control Company	4353	Long Stem Thermometer	1/22/2015	Biennial	1/22/2017	150053081
Intelligent Weigh	PD-3000	Electronic Balance	CBT	N/A	CBT	11081534
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	R897950903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20-dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6°CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264165
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	NC-100	Torque Wrench	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	3/23/2015	Annual	3/23/2016	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/3/2015	Annual	6/3/2016	109892
Rohde & Schwarz	NRVD	Dual Channel Power Meter	CBT	N/A	CBT	101695
Rohde & Schwarz	NRV-232	Peak Power Sensor	CBT	N/A	CBT	836019/013
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2015	Annual	10/13/2016	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	10/21/2015	Annual	10/21/2016	102060
Rohde & Schwarz	SMQ03B	Signal Generator	CBT	N/A	CBT	DE27259
Rohde & Schwarz	SME06	Signal Generator	CBT	N/A	CBT	832026
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
SPEAG	D1750V2	1750 MHz SAR Dipole	4/15/2015	Annual	4/15/2016	1051
SPEAG	D1900V2	1900 MHz SAR Dipole	4/14/2015	Annual	4/14/2016	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/14/2015	Annual	7/14/2016	5d149
SPEAG	D2300V2	2300 MHz SAR Dipole	1/27/2015	Annual	1/27/2016	1008
SPEAG	D2450V2	2450 MHz SAR Dipole	8/20/2015	Annual	8/20/2016	719
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2015	Annual	4/14/2016	1004
SPEAG	DS6Hv2	5 GHz SAR Dipole	2/17/2015	Annual	2/17/2016	1120
SPEAG	DS6Hv2	5 GHz SAR Dipole	9/16/2015	Annual	9/16/2016	1191
SPEAG	D750V3	750 MHz Dipole	3/11/2015	Annual	3/11/2016	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/13/2015	Annual	4/13/2016	4d119
SPEAG	D835V2	835 MHz SAR Dipole	7/23/2015	Annual	7/23/2016	4d133
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2015	Annual	2/18/2016	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2015	Annual	3/13/2016	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2015	Annual	4/20/2016	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/17/2015	Annual	6/17/2016	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/24/2015	Annual	8/24/2016	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/27/2015	Annual	10/27/2016	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2015	Annual	11/11/2016	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2015	Annual	5/12/2016	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	10/20/2015	Annual	10/20/2016	1091
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/14/2015	Annual	7/14/2016	1039
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/19/2015	Annual	8/19/2016	1041
SPEAG	Planar R140	Reflectometer	8/2/2015	Annual	8/2/2016	50513
SPEAG	ES30V3	SAR Probe	3/19/2015	Annual	3/19/2016	3209
SPEAG	ES30V3	SAR Probe	3/19/2015	Annual	3/19/2016	3319
SPEAG	ES30V4	SAR Probe	4/23/2015	Annual	4/23/2016	7357
SPEAG	ES30V3	SAR Probe	5/20/2015	Annual	5/20/2016	3263
SPEAG	ES30V3	SAR Probe	6/22/2015	Annual	6/22/2016	3351
SPEAG	ES30V4	SAR Probe	7/21/2015	Annual	7/21/2016	7208
SPEAG	ES30V2	SAR Probe	8/26/2015	Annual	8/26/2016	3022
SPEAG	ES30V3	SAR Probe	10/29/2015	Annual	10/29/2016	3333
SPEAG	ES30V3	SAR Probe	11/17/2015	Annual	11/17/2016	3334
SPEAG	DAKS_VNA R140	VNA for Portable DAK	8/16/2015	Annual	8/16/2016	80513

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 80B93

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

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.903 \text{ S/m}$; $\epsilon_r = 40.342$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 12-20-2015; Ambient Temp: 19.3°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3319; ConvF(6.41, 6.41, 6.41); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

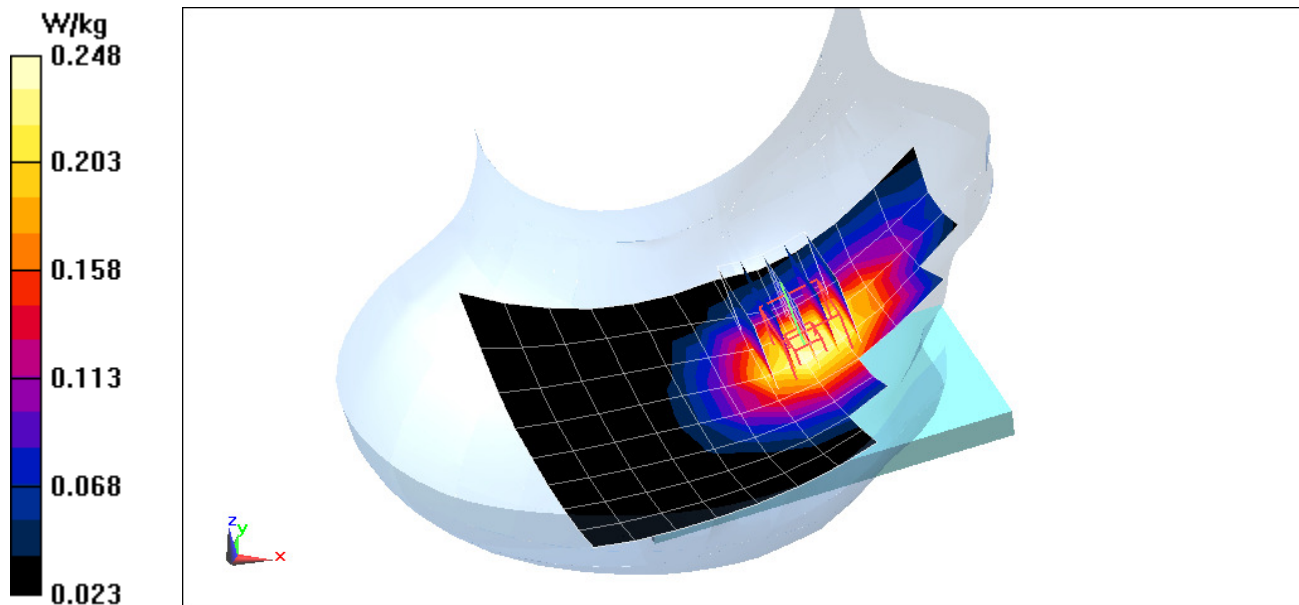
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 16.36 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.294 W/kg

SAR(1 g) = 0.227 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.884 \text{ S/m}$; $\epsilon_r = 40.111$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-06-2016; Ambient Temp: 23.5°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(6.04, 6.04, 6.04); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

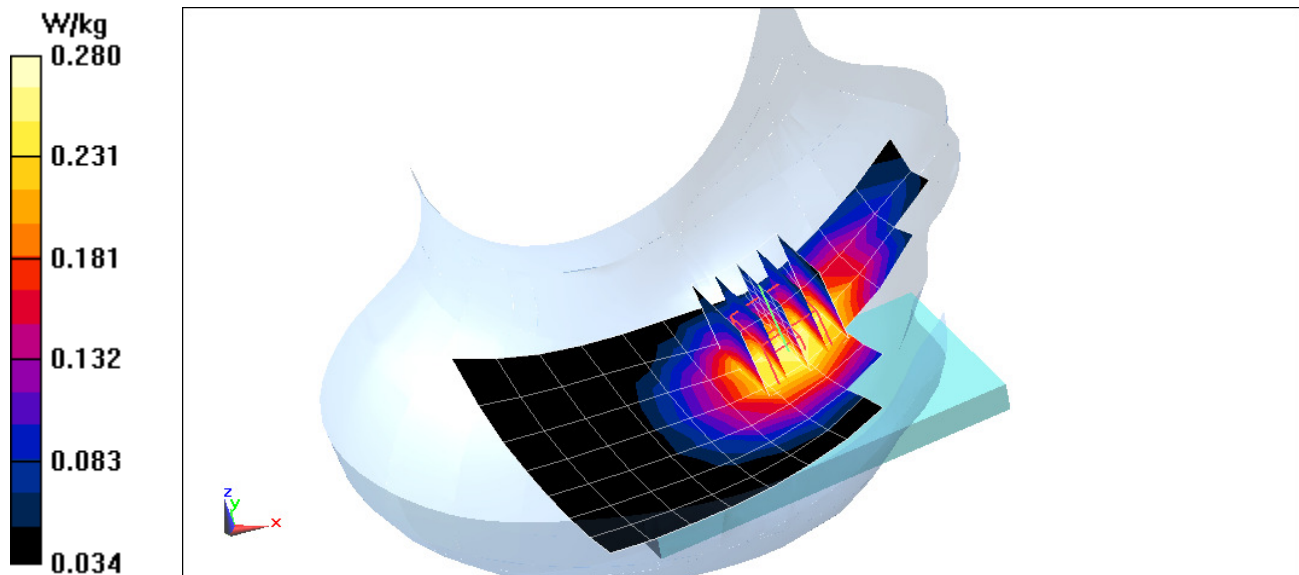
Area Scan (8x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.72 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.322 W/kg

SAR(1 g) = 0.257 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 02BE4

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

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.323 \text{ S/m}$; $\epsilon_r = 38.563$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 12-30-2015; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3351; ConvF(5.24, 5.24, 5.24); Calibrated: 6/22/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

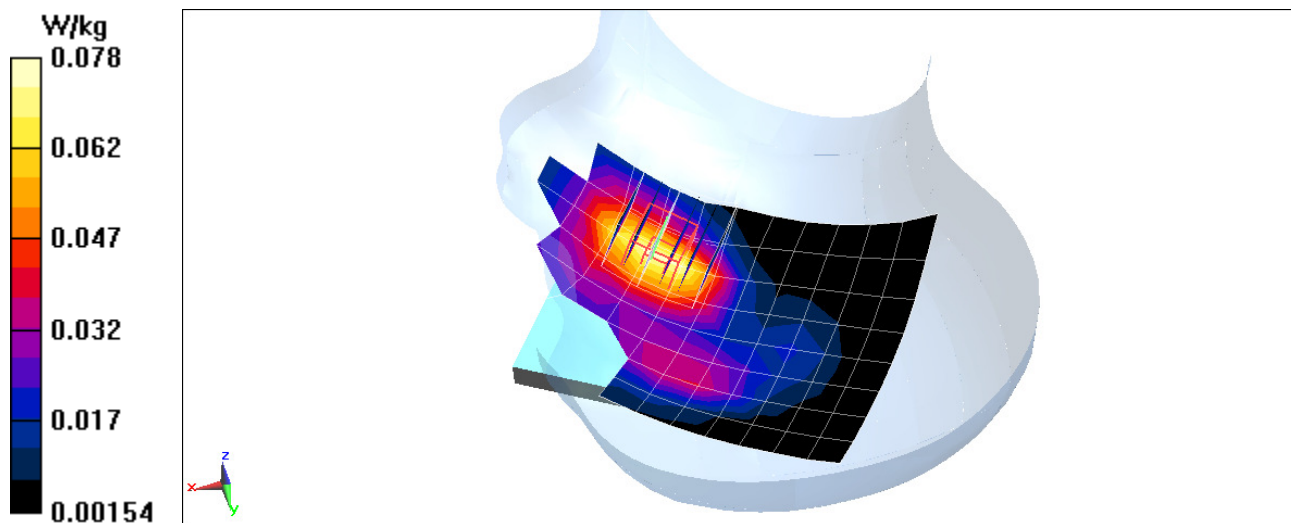
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 7.384 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.0970 W/kg

SAR(1 g) = 0.067 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 80B93

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

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.411 \text{ S/m}$; $\epsilon_r = 38.874$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 12-28-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3319; ConvF(5.1, 5.1, 5.1); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

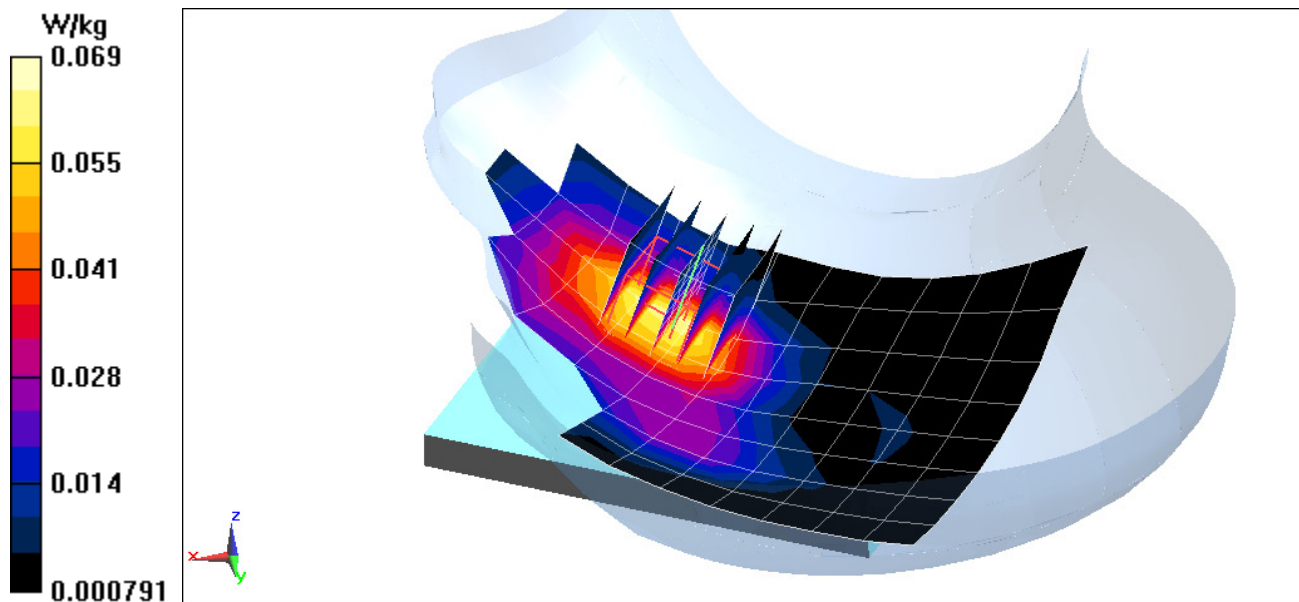
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.629 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.0860 W/kg

SAR(1 g) = 0.059 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 02BE4

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

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1852.4 \text{ MHz}$; $\sigma = 1.381 \text{ S/m}$; $\epsilon_r = 38.999$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 12-28-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3319; ConvF(5.1, 5.1, 5.1); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

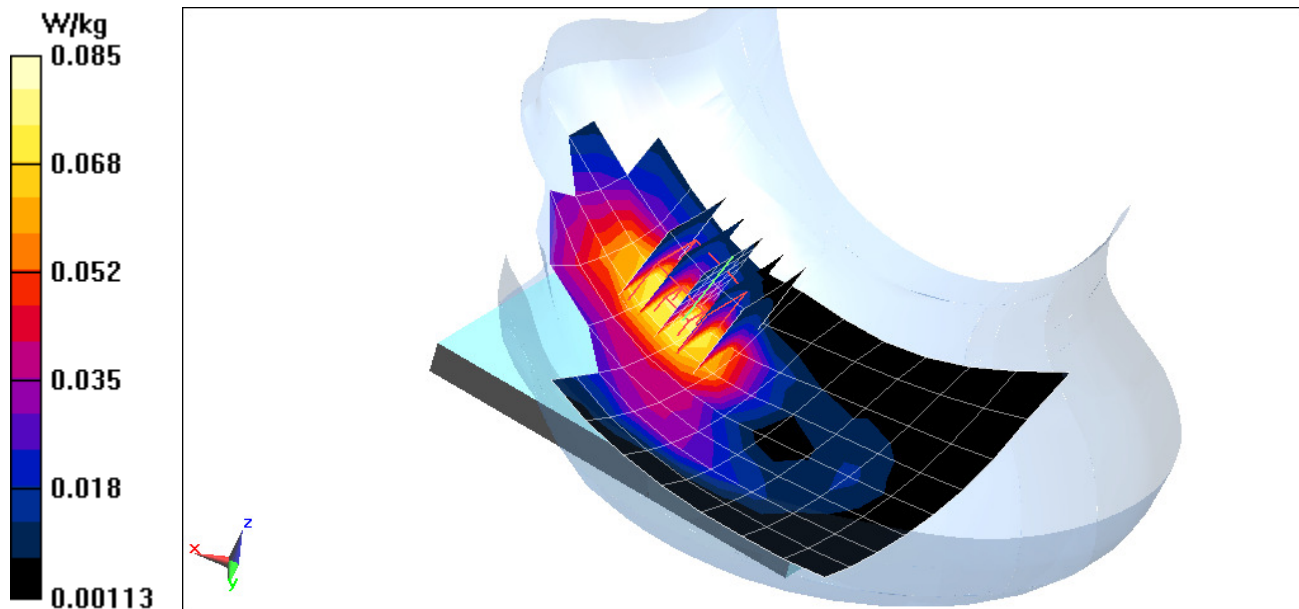
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 7.435 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.108 W/kg

SAR(1 g) = 0.074 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.859 \text{ S/m}$; $\epsilon_r = 43.382$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-14-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 12, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

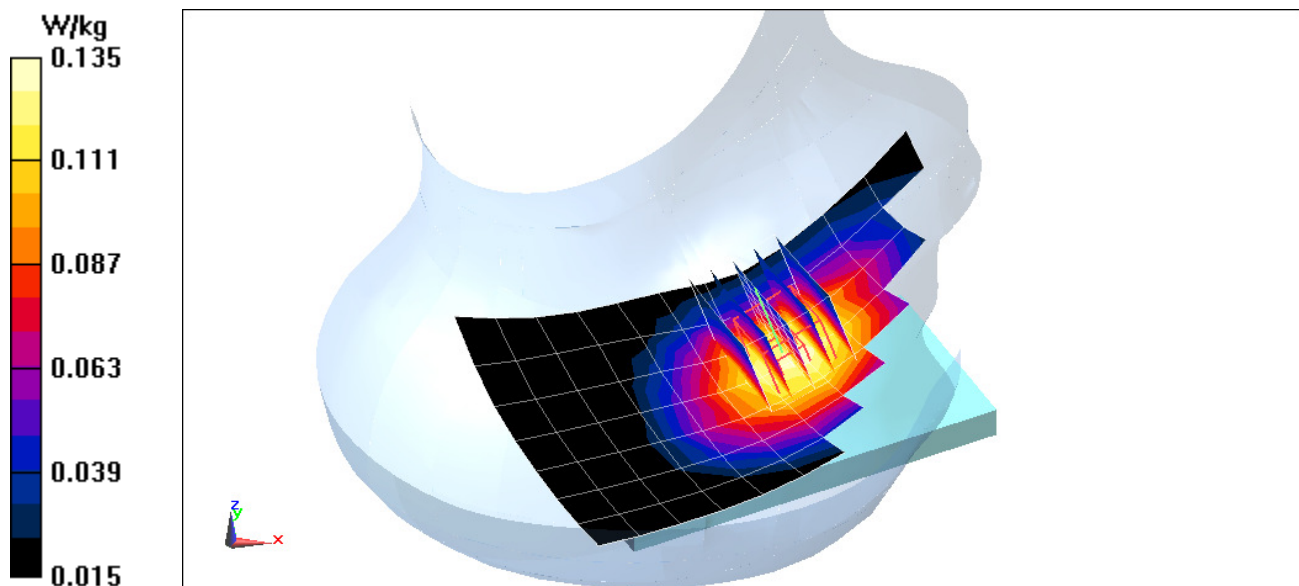
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.75 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.154 W/kg

SAR(1 g) = 0.126 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 750 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.862 \text{ S/m}$; $\epsilon_r = 43.339$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-14-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

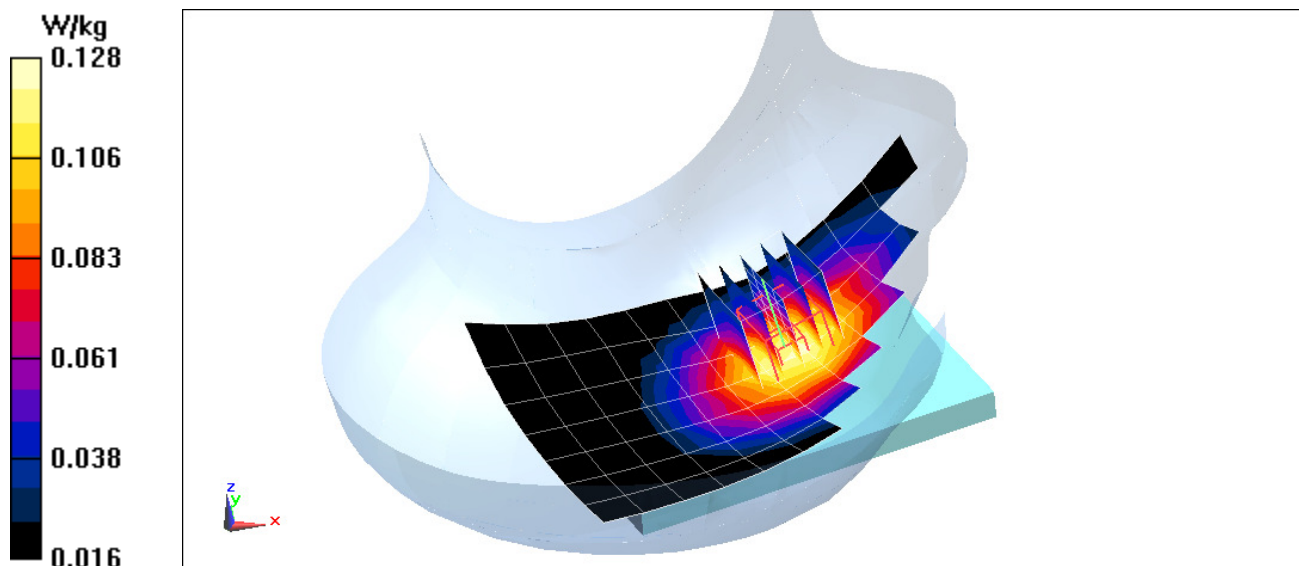
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 12.40 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.144 W/kg

SAR(1 g) = 0.118 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used (interpolated):

$f = 782 \text{ MHz}$; $\sigma = 0.93 \text{ S/m}$; $\epsilon_r = 42.264$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-14-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 13, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

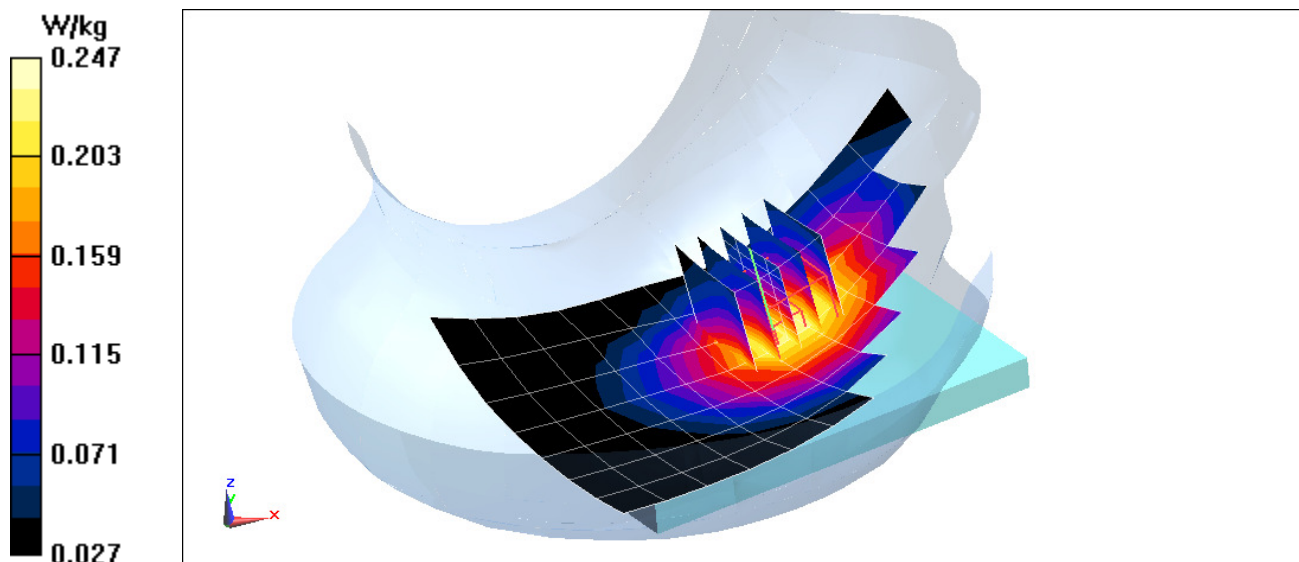
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.99 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.285 W/kg

SAR(1 g) = 0.222 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.882 \text{ S/m}$; $\epsilon_r = 39.974$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 01-10-2016; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3209; ConvF(6.04, 6.04, 6.04); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 5 (Cell.), Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

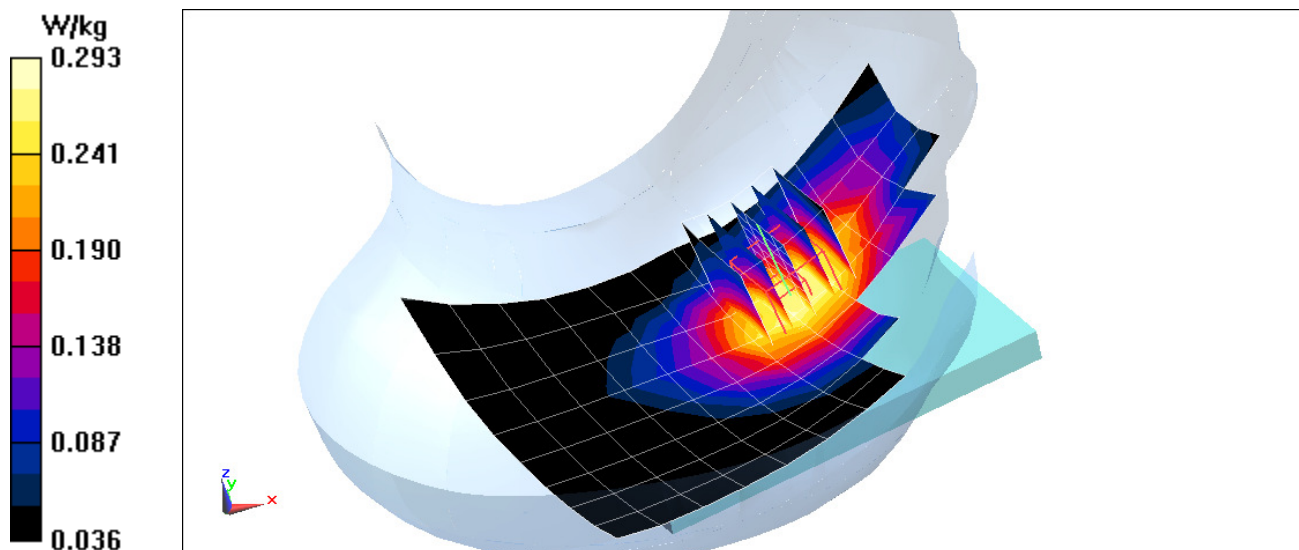
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.36 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.335 W/kg

SAR(1 g) = 0.270 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BE0

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

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.323 \text{ S/m}$; $\epsilon_r = 38.562$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 12-30-2015; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3351; ConvF(5.24, 5.24, 5.24); Calibrated: 6/22/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

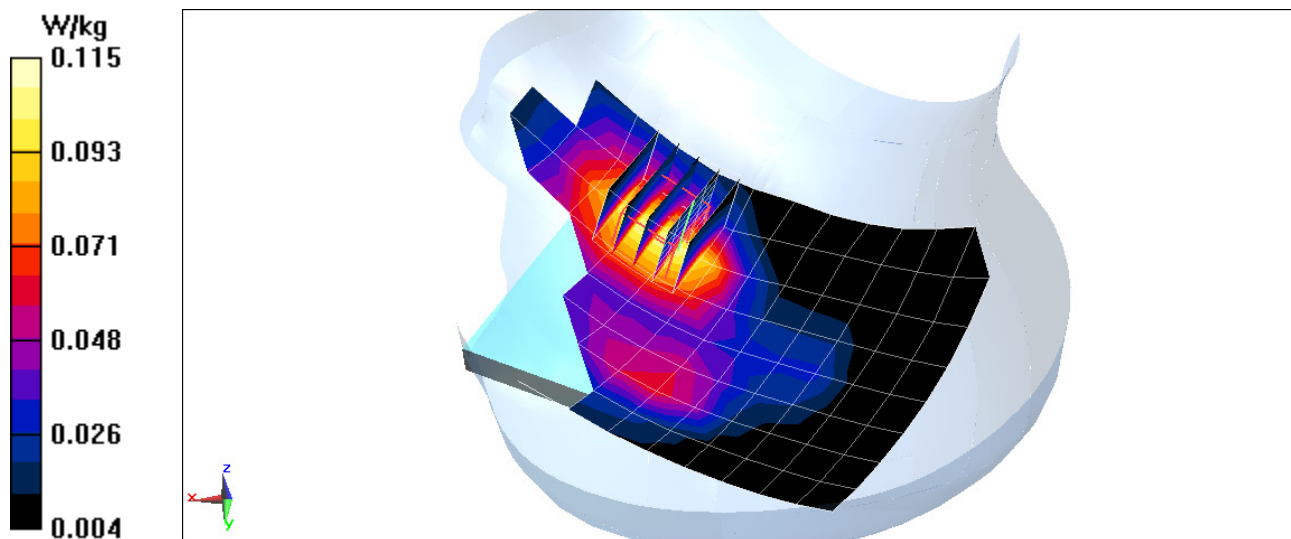
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 9.503 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.099 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB3

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1860$ MHz; $\sigma = 1.389$ S/m; $\epsilon_r = 38.965$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Test Date: 12-28-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3319; ConvF(5.1, 5.1, 5.1); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 25 (PCS), Left Head, Cheek, Low.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

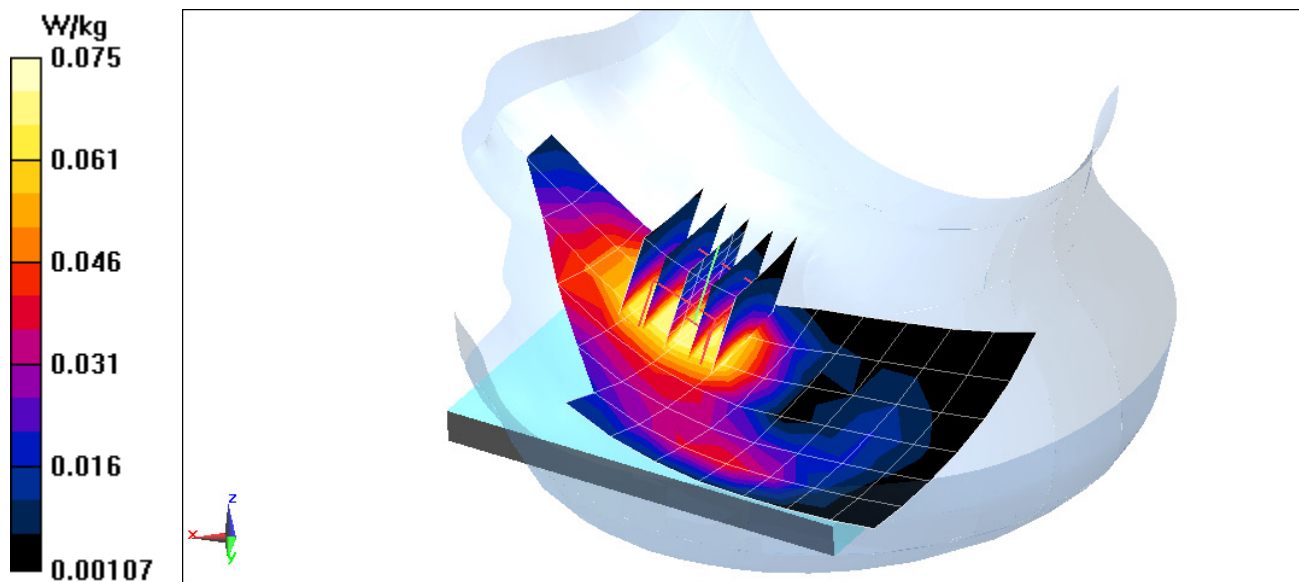
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 7.431 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.0960 W/kg

SAR(1 g) = 0.067 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB4

Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2310 \text{ MHz}$; $\sigma = 1.674 \text{ S/m}$; $\epsilon_r = 40.62$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 12-22-2015; Ambient Temp: 24.5°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(4.73, 4.73, 4.73); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Right; Type: QD000P40CD; Serial: 1757

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 30, Left Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset**

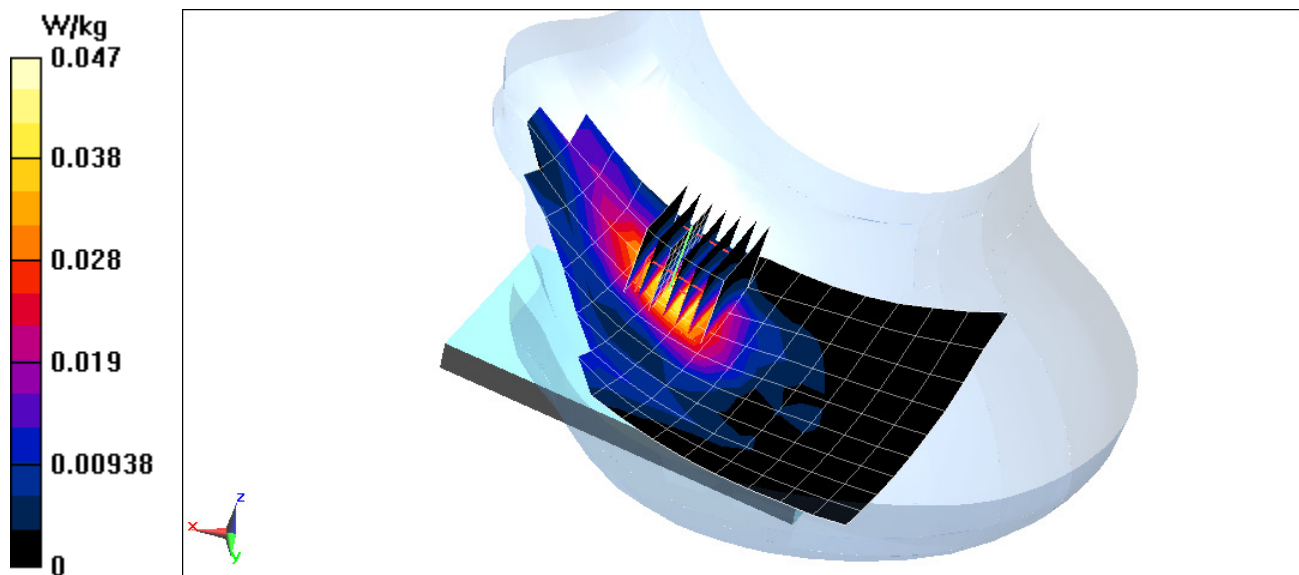
Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 5.338 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.0660 W/kg

SAR(1 g) = 0.038 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB4

Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58

Medium: 2450 Head Medium parameters used:

$f = 2550$ MHz; $\sigma = 1.953$ S/m; $\epsilon_r = 39.728$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Test Date: 12-22-2015; Ambient Temp: 24.5°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(4.39, 4.39, 4.39); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Right; Type: QD000P40CD; Serial: 1757

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 41, Left Head, Cheek, Low-Mid.ch,
QPSK, 20 MHz Bandwidth, 50 RB, 0 RB Offset**

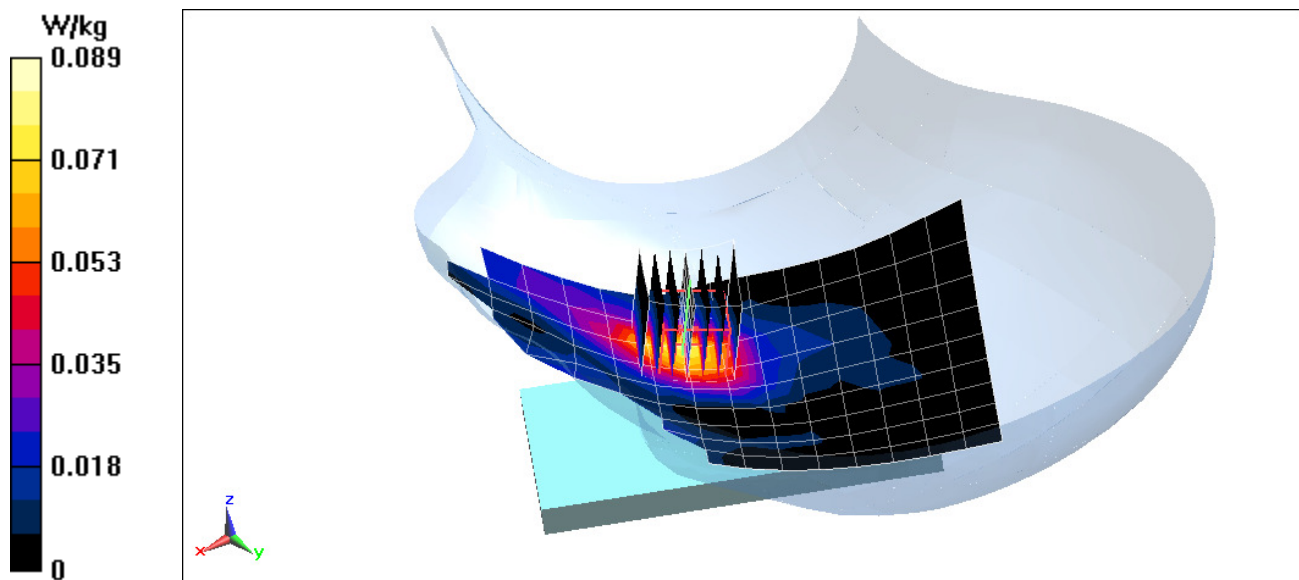
Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 7.012 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.129 W/kg

SAR(1 g) = 0.071 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 00580

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

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.807 \text{ S/m}$; $\epsilon_r = 38.709$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-15-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.55, 4.55, 4.55); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Left Head, Cheek, Ch 6, 1 Mbps, Ant 2

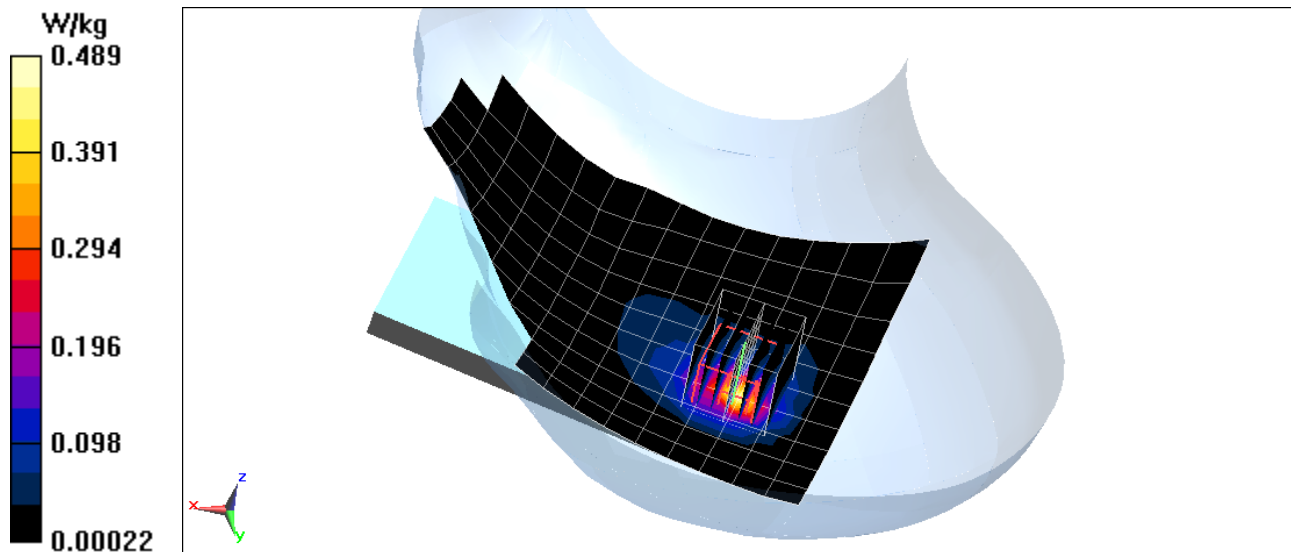
Area Scan (11x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 15.92 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.871 W/kg

SAR(1 g) = 0.368 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0C6B5

Communication System: UID 0, IEEE 802.11ac; Frequency: 5775 MHz; Duty Cycle: 1:1

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

$f = 5775 \text{ MHz}$; $\sigma = 5.234 \text{ S/m}$; $\epsilon_r = 35.471$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 01-14-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7308; ConvF(4.86, 4.86, 4.86); Calibrated: 7/21/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11ac, U-NII-3, 80 MHz Bandwidth,
Left Head, Cheek, Ch 155, 29.3 Mbps, Ant2**

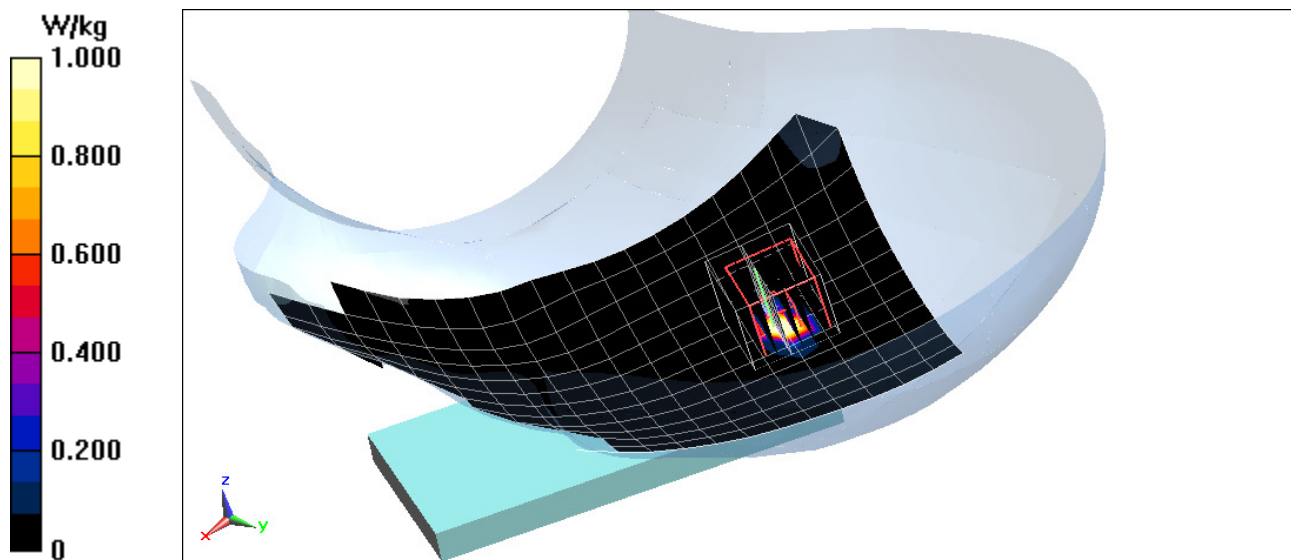
Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm

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

Reference Value = 9.586 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 3.30 W/kg

SAR(1 g) = 0.513 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 80B93

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

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1.007 \text{ S/m}$; $\epsilon_r = 56.024$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-19-2016; Ambient Temp: 22.5°C; Tissue Temp: 20.8°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 850, Body SAR, Back side, Mid.ch

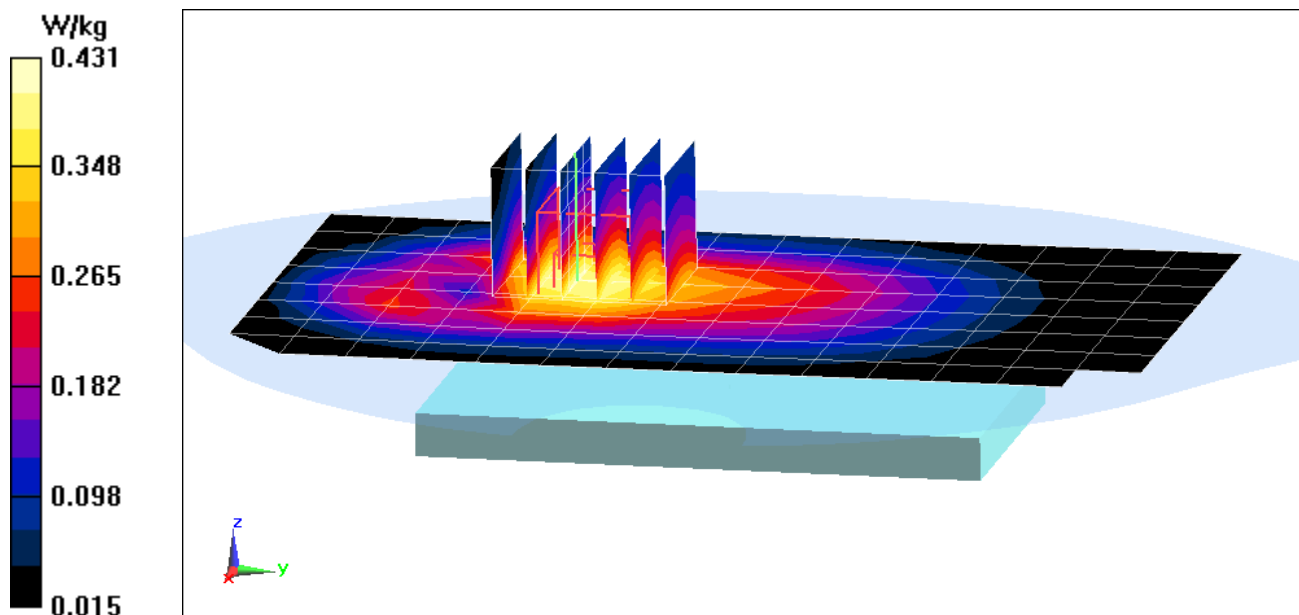
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 19.94 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.504 W/kg

SAR(1 g) = 0.389 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 80B93

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 848.8 MHz; Duty Cycle: 1:2.76

Medium: 835 Body, Medium parameters used (interpolated):

$f = 848.8 \text{ MHz}$; $\sigma = 1.02 \text{ S/m}$; $\epsilon_r = 55.887$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2016; Ambient Temp: 22.5°C; Tissue Temp: 20.8°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Body SAR, Front side, High.ch, 3 Tx Slots

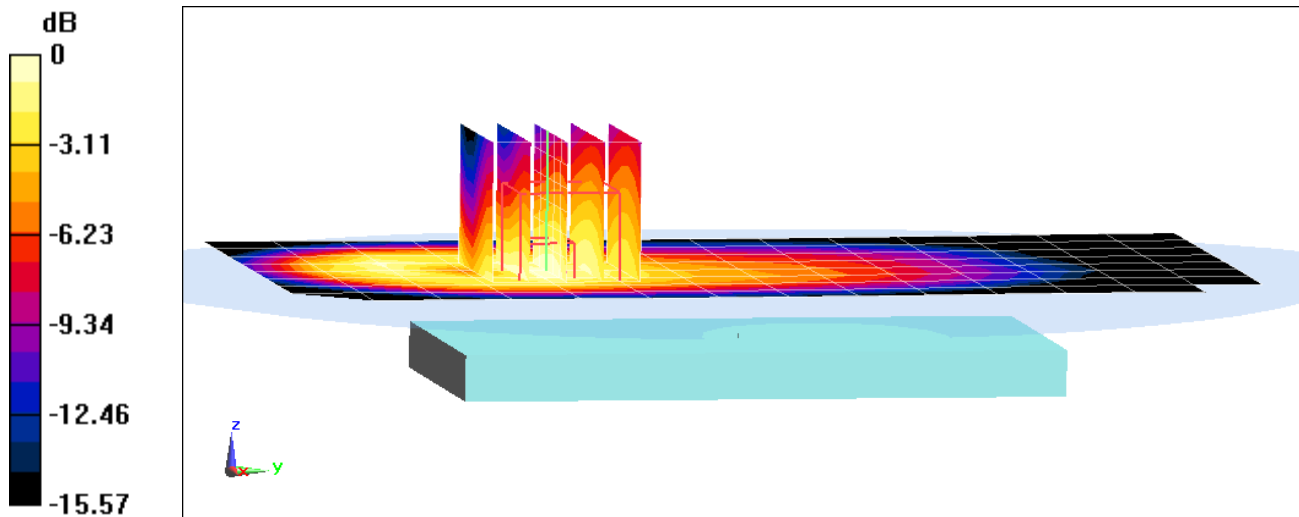
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.10 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.735 W/kg



0 dB = 0.826 W/kg = -0.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 835 Body, Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.998 \text{ S/m}$; $\epsilon_r = 53.222$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-26-2015; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

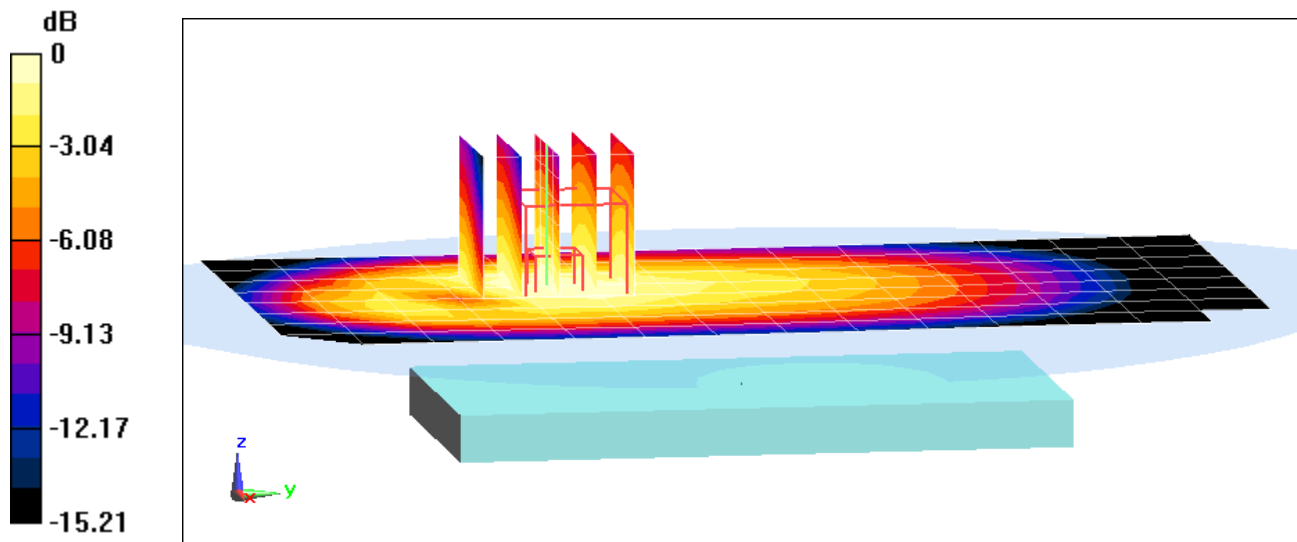
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 18.33 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.427 W/kg

SAR(1 g) = 0.325 W/kg



0 dB = 0.362 W/kg = -4.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: OCB4A

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

Medium: 835 Body, Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.998 \text{ S/m}$; $\epsilon_r = 53.222$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2015; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Body SAR, Front side, Mid.ch

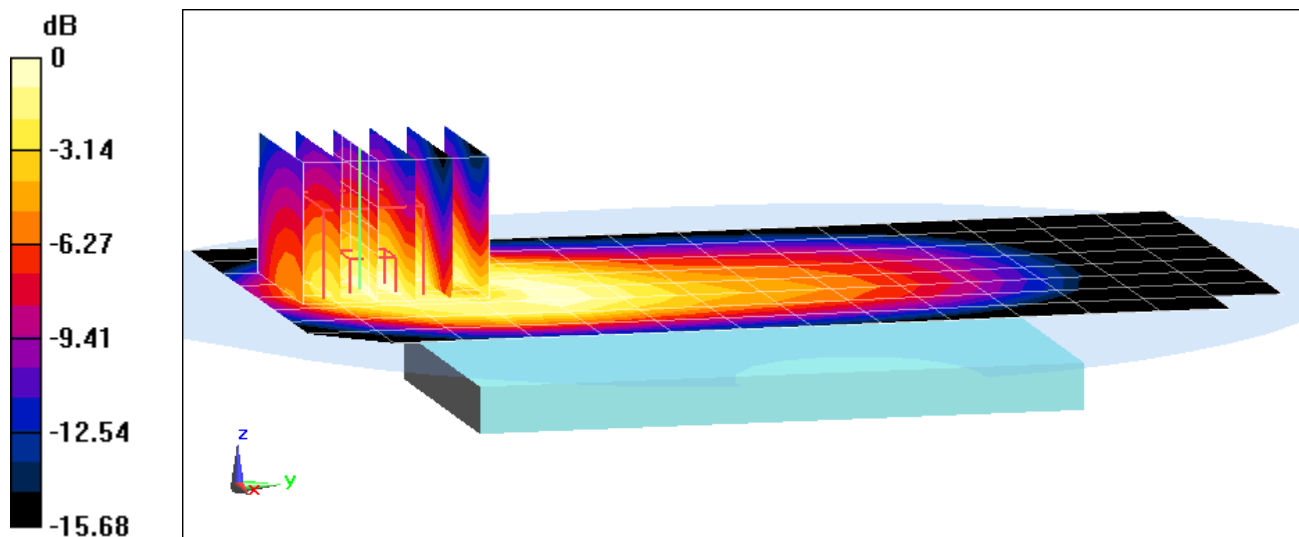
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 22.89 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.754 W/kg

SAR(1 g) = 0.452 W/kg



0 dB = 0.538 W/kg = -2.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 02BE4

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

Medium: 1750 Body, Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.453 \text{ S/m}$; $\epsilon_r = 51.33$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-28-2015; Ambient Temp: 22.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3334; ConvF(5.03, 5.03, 5.03); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

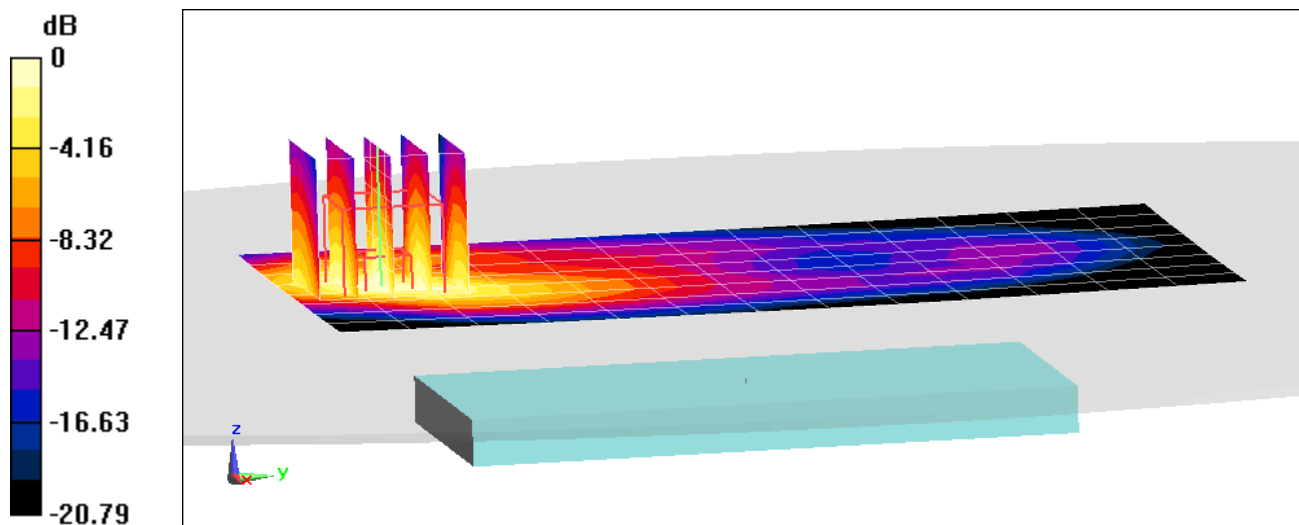
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 16.89 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.580 W/kg

SAR(1 g) = 0.361 W/kg



0 dB = 0.439 W/kg = -3.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BAD

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

Medium: 1750 Body, Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.453 \text{ S/m}$; $\epsilon_r = 51.33$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-28-2015; Ambient Temp: 22.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3334; ConvF(5.03, 5.03, 5.03); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

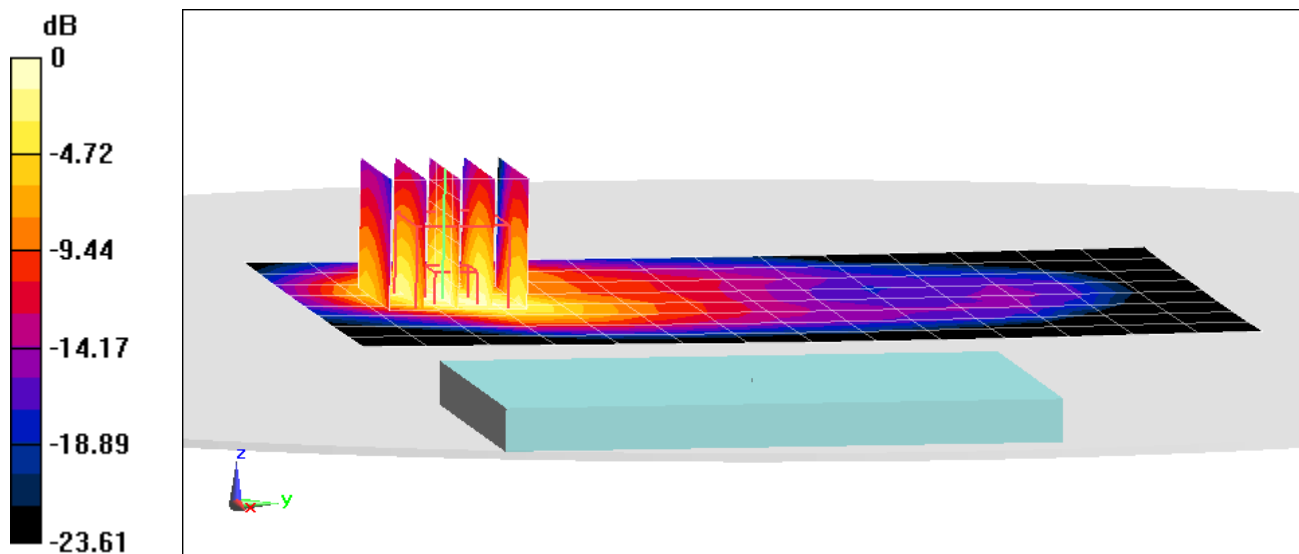
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.77 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.742 W/kg

SAR(1 g) = 0.446 W/kg



0 dB = 0.546 W/kg = -2.63 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 80B93

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

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ S/m}$; $\epsilon_r = 53.175$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

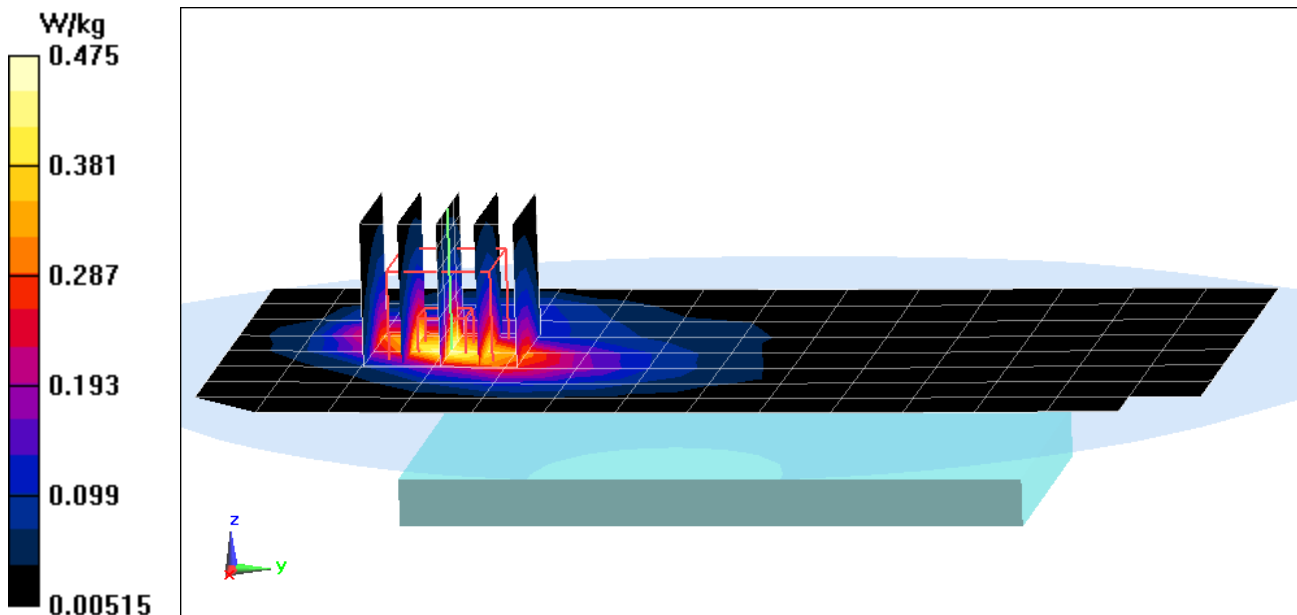
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 16.51 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.657 W/kg

SAR(1 g) = 0.399 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 813EF

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1850.2 MHz; Duty Cycle: 1:2.76

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1850.2 \text{ MHz}$; $\sigma = 1.526 \text{ S/m}$; $\epsilon_r = 53.272$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Body SAR, Back side, Low.ch, 3 Tx Slots

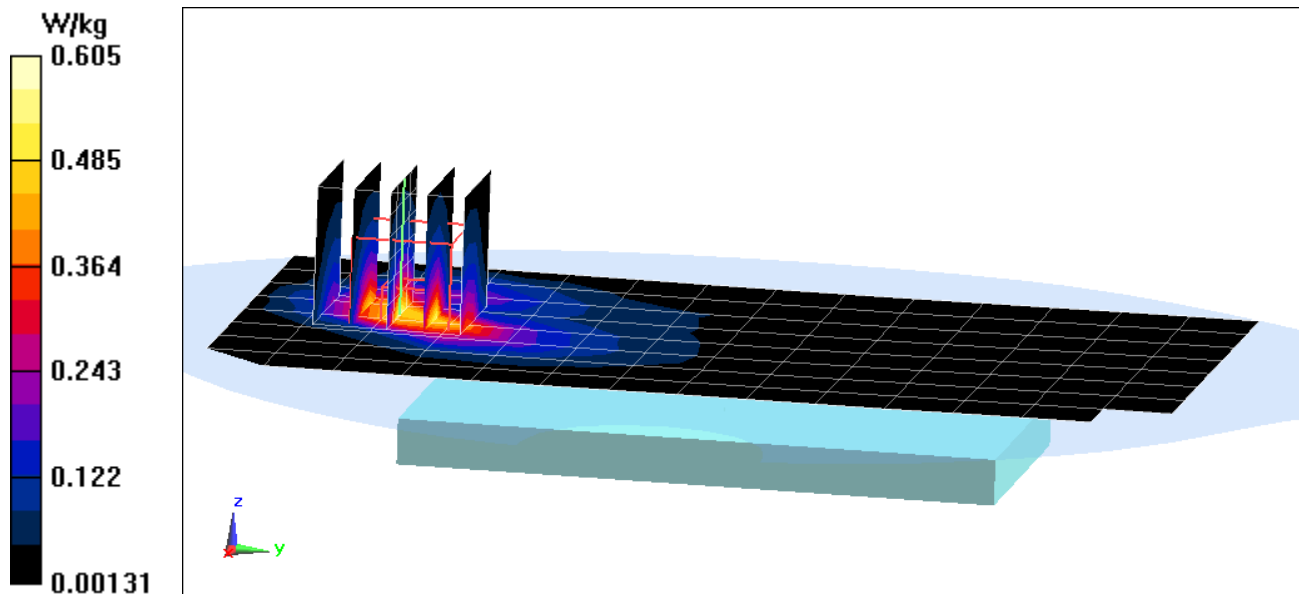
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.53 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.827 W/kg

SAR(1 g) = 0.488 W/kg.



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 02BE4

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

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

$f = 1852.4 \text{ MHz}$; $\sigma = 1.465 \text{ S/m}$; $\epsilon_r = 54.544$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-28-2015; Ambient Temp: 23.8°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

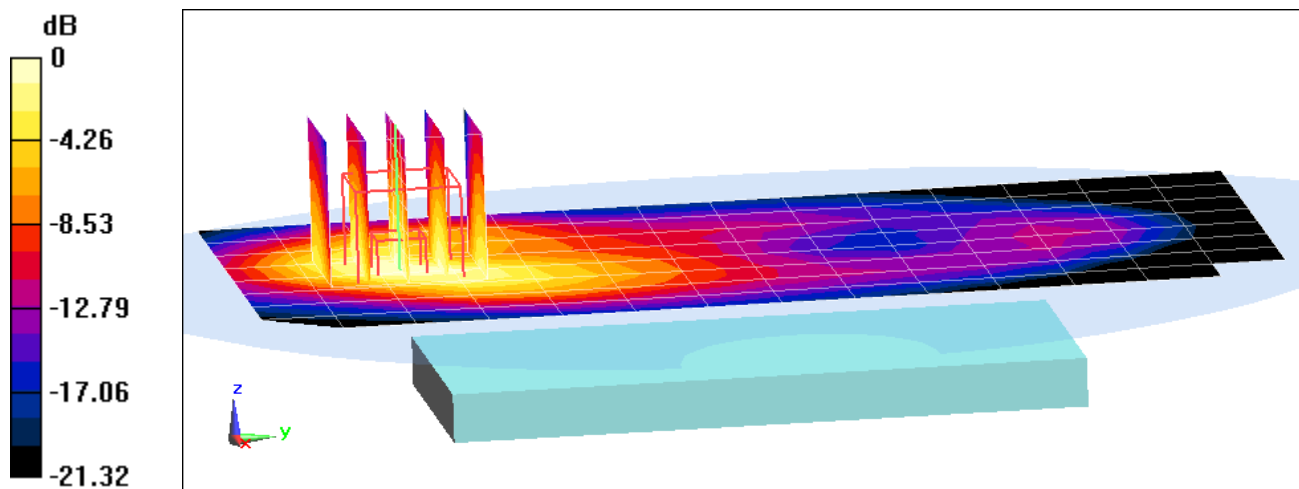
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 16.89 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.693 W/kg

SAR(1 g) = 0.438 W/kg



0 dB = 0.532 W/kg = -2.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BF5

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

Medium: 1900 Body, Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.547 \text{ S/m}$; $\epsilon_r = 52.243$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

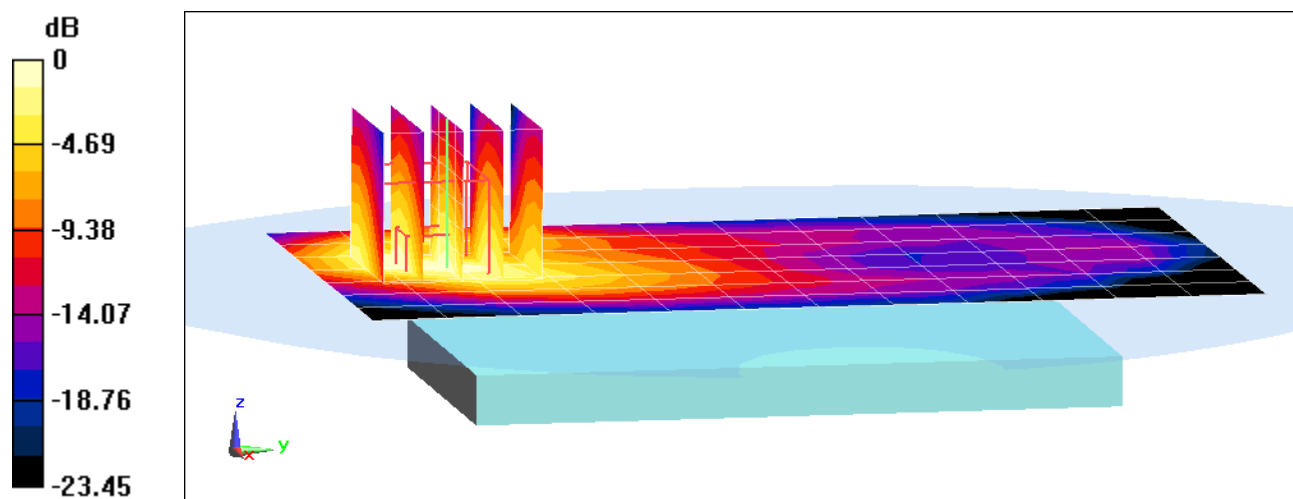
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.76 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.750 W/kg

SAR(1 g) = 0.450 W/kg



0 dB = 0.549 W/kg = -2.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 55.896$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

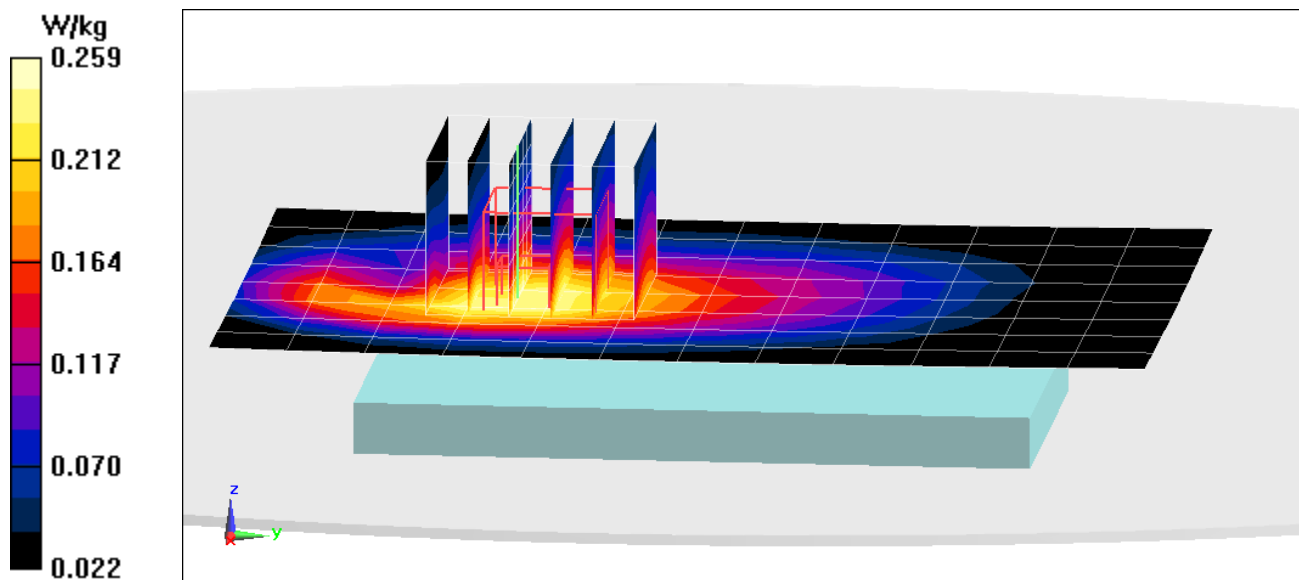
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 16.06 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.310 W/kg

SAR(1 g) = 0.231 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 55.896$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

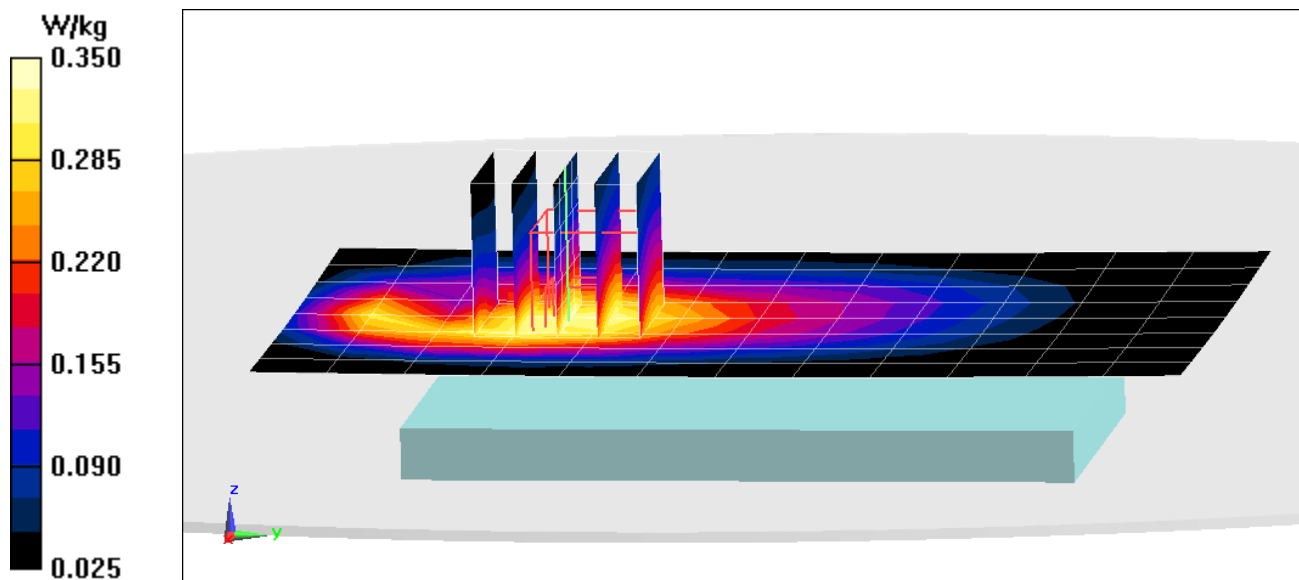
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.76 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.423 W/kg

SAR(1 g) = 0.309 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.923 \text{ S/m}$; $\epsilon_r = 55.862$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

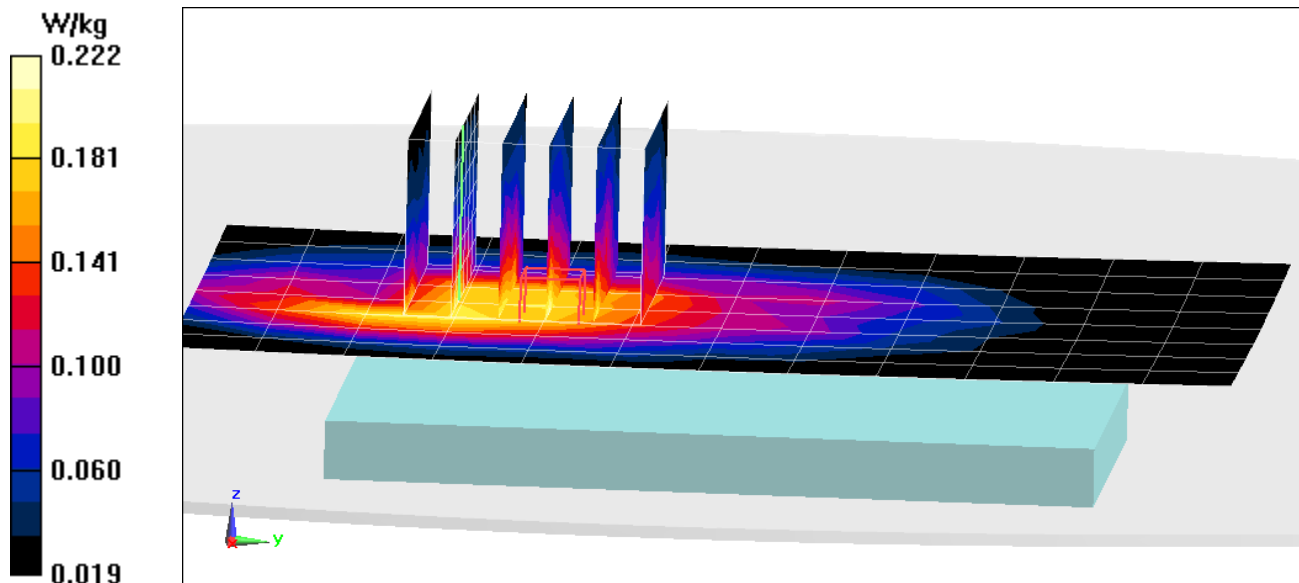
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.05 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.294 W/kg

SAR(1 g) = 0.194 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.923 \text{ S/m}$; $\epsilon_r = 55.862$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

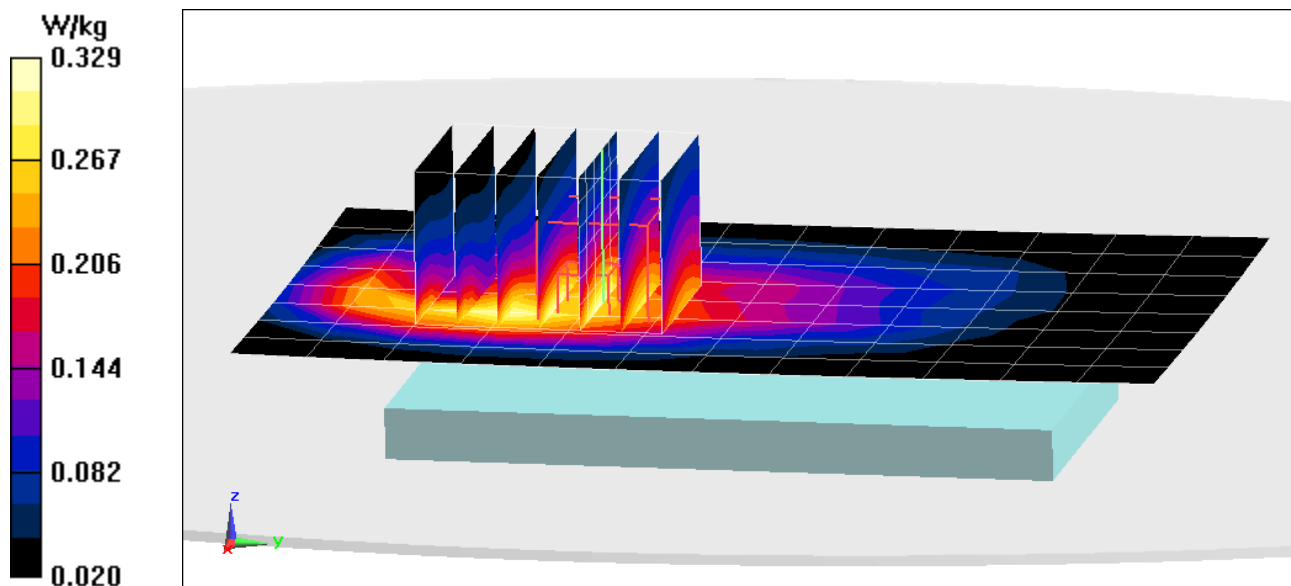
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x7x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.71 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.400 W/kg

SAR(1 g) = 0.295 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 782 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 55.102$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 13, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

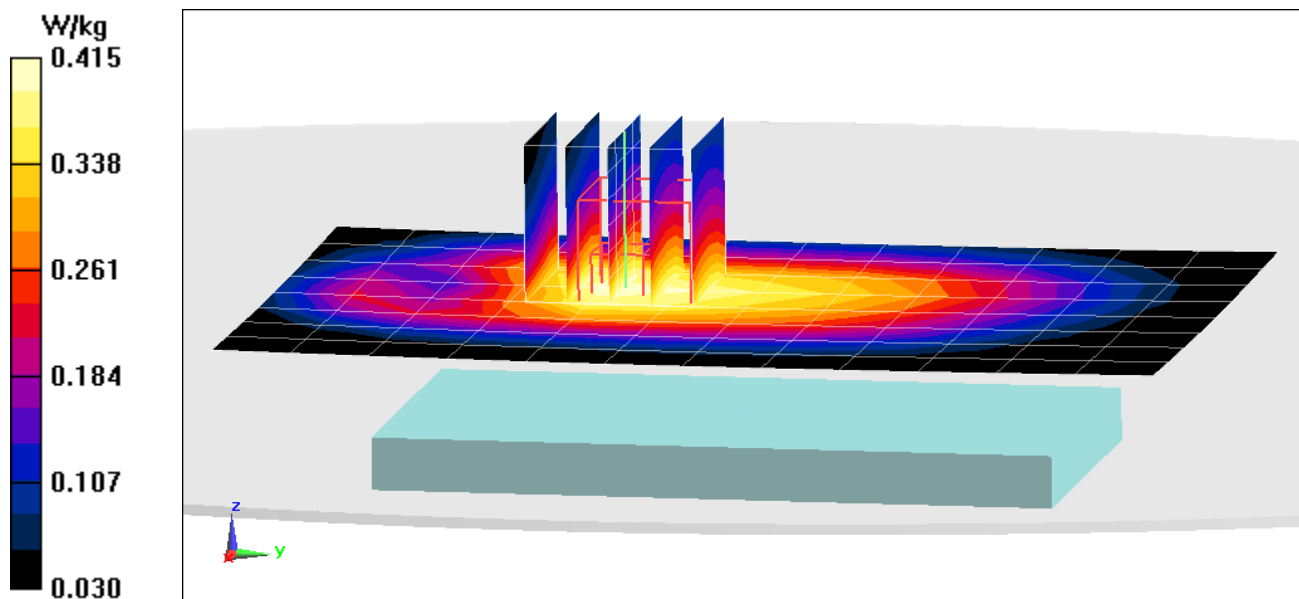
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 20.17 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.484 W/kg

SAR(1 g) = 0.377 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 782 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 55.102$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 13, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset**

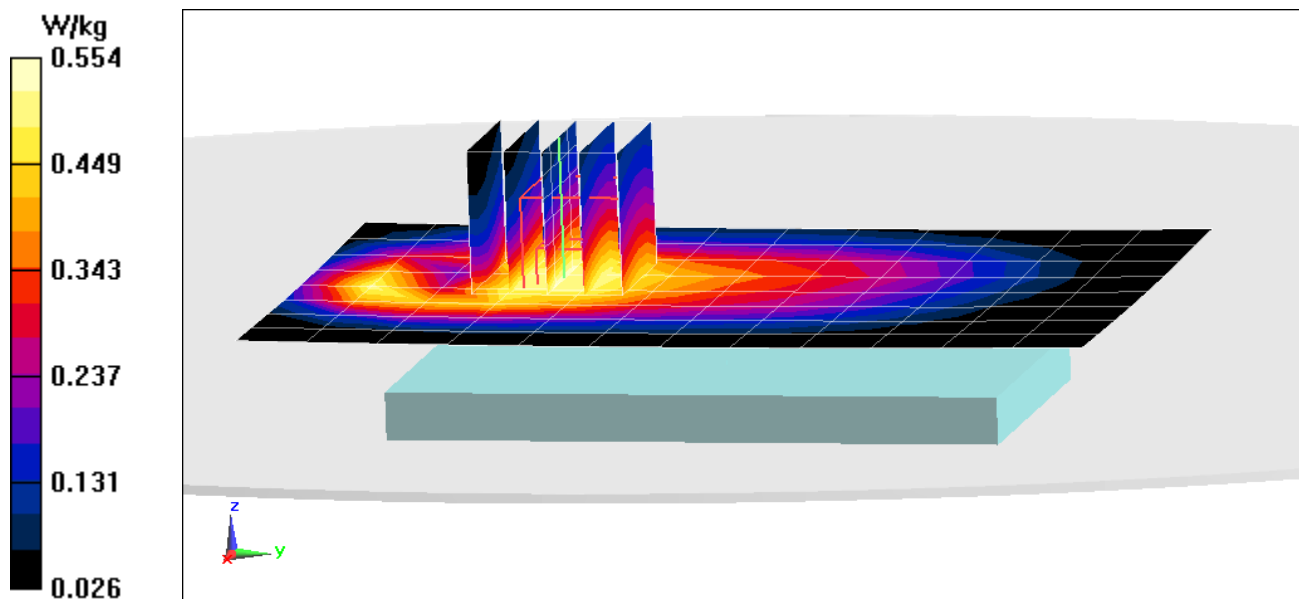
Area Scan (9x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 22.61 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.676 W/kg

SAR(1 g) = 0.495 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 835 Body, Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.998 \text{ S/m}$; $\epsilon_r = 53.223$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-26-2015; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

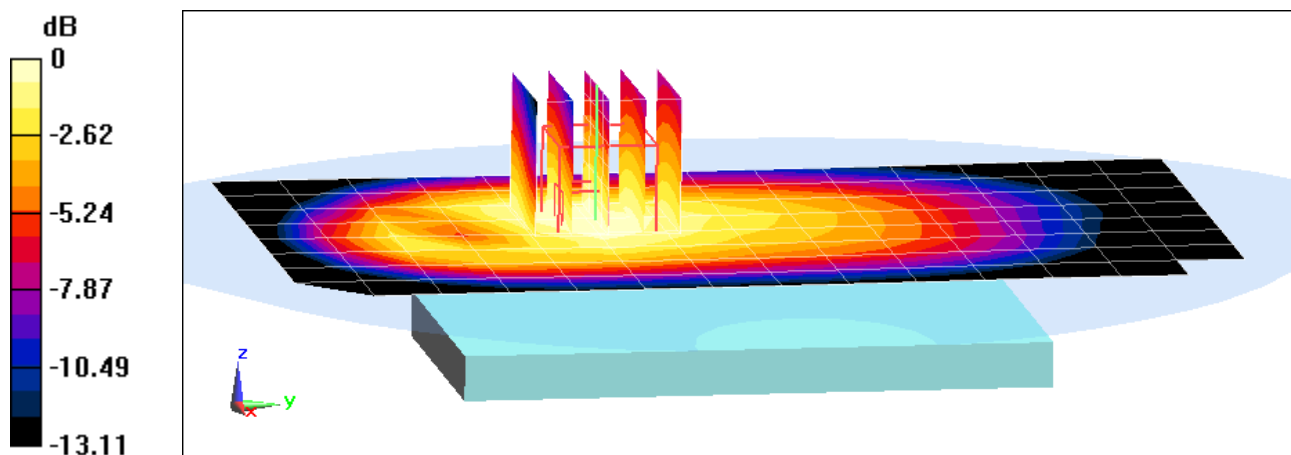
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 16.54 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.327 W/kg

SAR(1 g) = 0.252 W/kg



0 dB = 0.277 W/kg = -5.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0CB4A

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

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 1.007 \text{ S/m}$; $\epsilon_r = 53.703$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-09-2016; Ambient Temp: 24.5°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

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

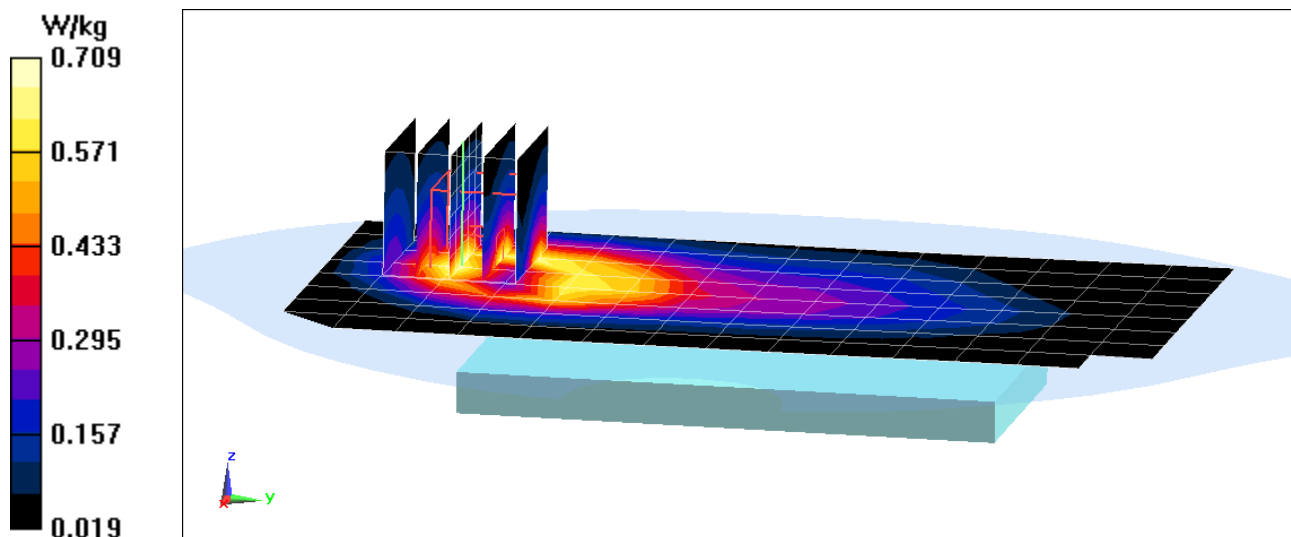
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.91 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.983 W/kg

SAR(1 g) = 0.597 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BE0

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

Medium: 1750 Body, Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.453 \text{ S/m}$; $\epsilon_r = 51.33$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-28-2015; Ambient Temp: 22.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3334; ConvF(5.03, 5.03, 5.03); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

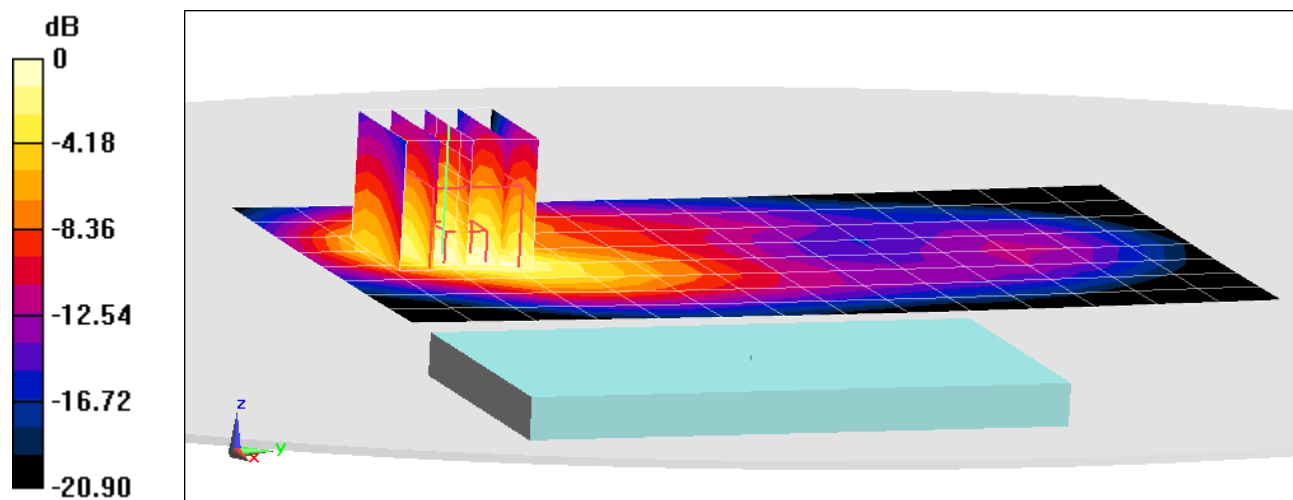
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.40 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.945 W/kg

SAR(1 g) = 0.586 W/kg



0 dB = 0.700 W/kg = -1.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BAD

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

Medium: 1750 Body, Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.453 \text{ S/m}$; $\epsilon_r = 51.33$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-28-2015; Ambient Temp: 22.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3334; ConvF(5.03, 5.03, 5.03); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

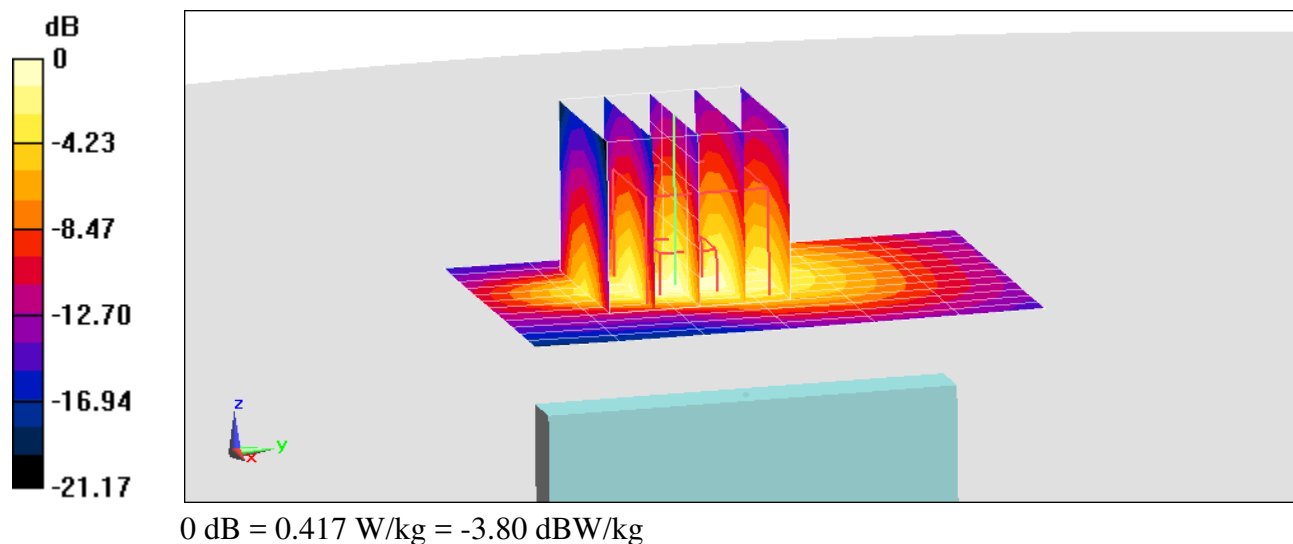
Area Scan (13x7x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 15.75 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.567 W/kg

SAR(1 g) = 0.328 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB3

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

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

$f = 1860 \text{ MHz}$; $\sigma = 1.522 \text{ S/m}$; $\epsilon_r = 52.268$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-31-2015; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 25 (PCS), Body SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

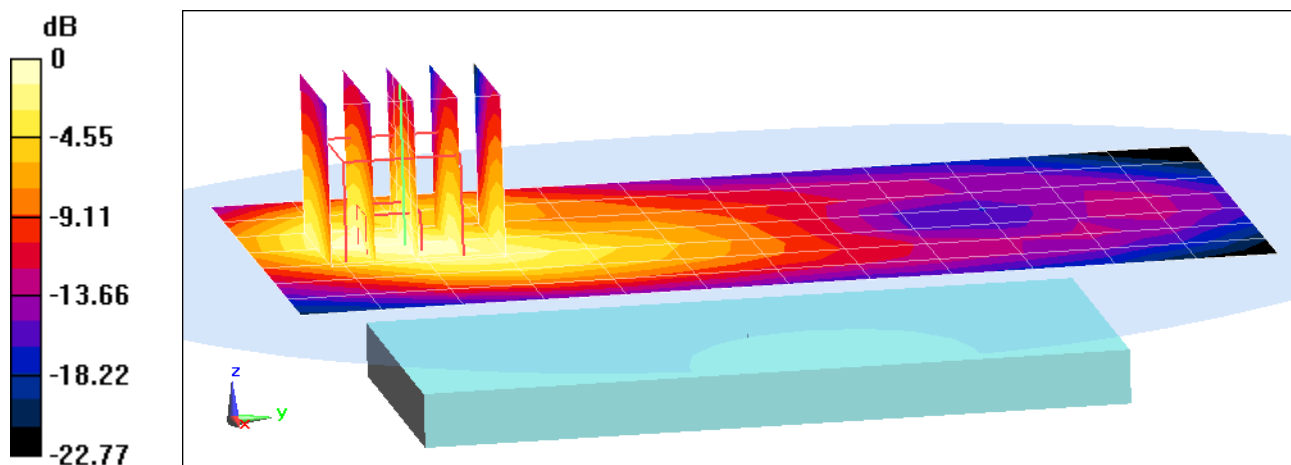
Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 17.72 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.715 W/kg

SAR(1 g) = 0.442 W/kg



0 dB = 0.536 W/kg = -2.71 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BF5

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

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

$f = 1860 \text{ MHz}$; $\sigma = 1.522 \text{ S/m}$; $\epsilon_r = 52.268$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

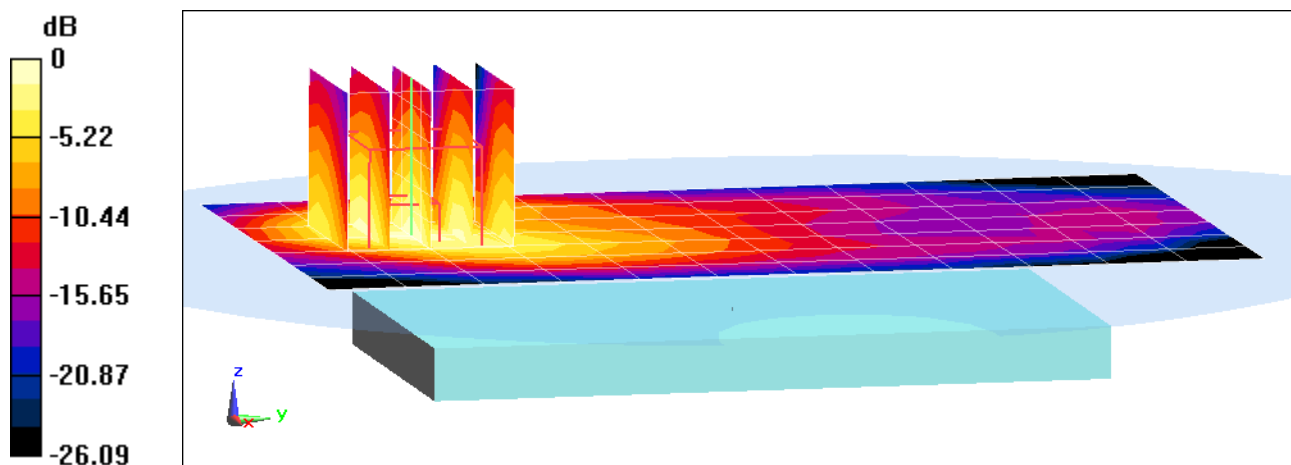
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.16 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.711 W/kg

SAR(1 g) = 0.419 W/kg



0 dB = 0.524 W/kg = -2.81 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB4

Communication System: UID 0, LTE Band 30 (0); Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: 2300 Body, Medium parameters used:

$f = 2310 \text{ MHz}$; $\sigma = 1.786 \text{ S/m}$; $\epsilon_r = 51.29$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-31-2015; Ambient Temp: 20.5°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 30, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset**

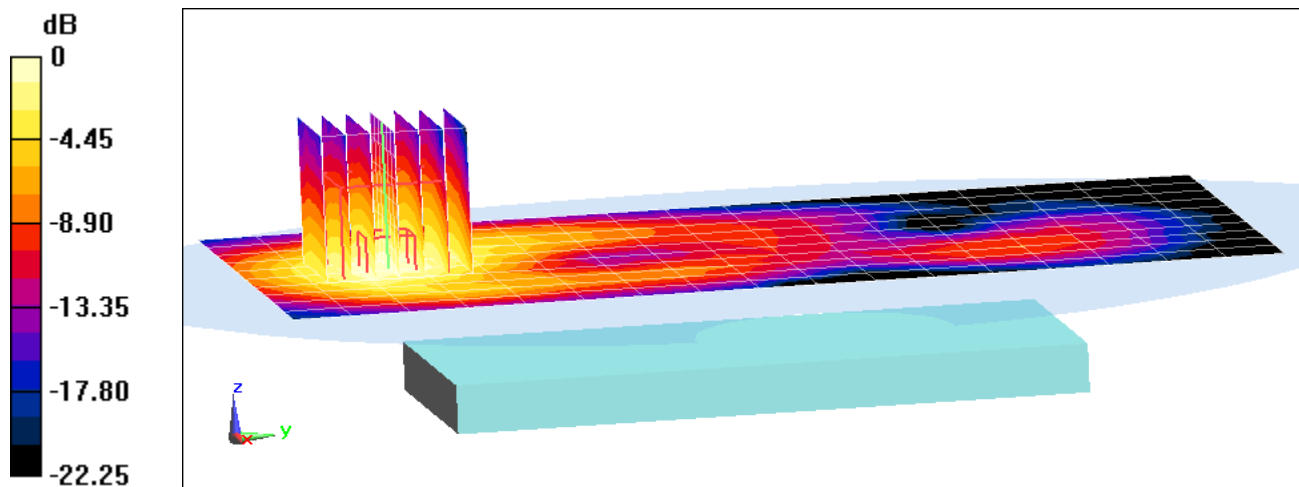
Area Scan (11x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 9.582 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.144 W/kg



0 dB = 0.178 W/kg = -7.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BF5

Communication System: UID 0, LTE Band 30 (0); Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: 2300 Body, Medium parameters used:

$f = 2310 \text{ MHz}$; $\sigma = 1.786 \text{ S/m}$; $\epsilon_r = 51.29$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 20.5°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 30, Body SAR, Bottom Edge, Mid.ch,
10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset**

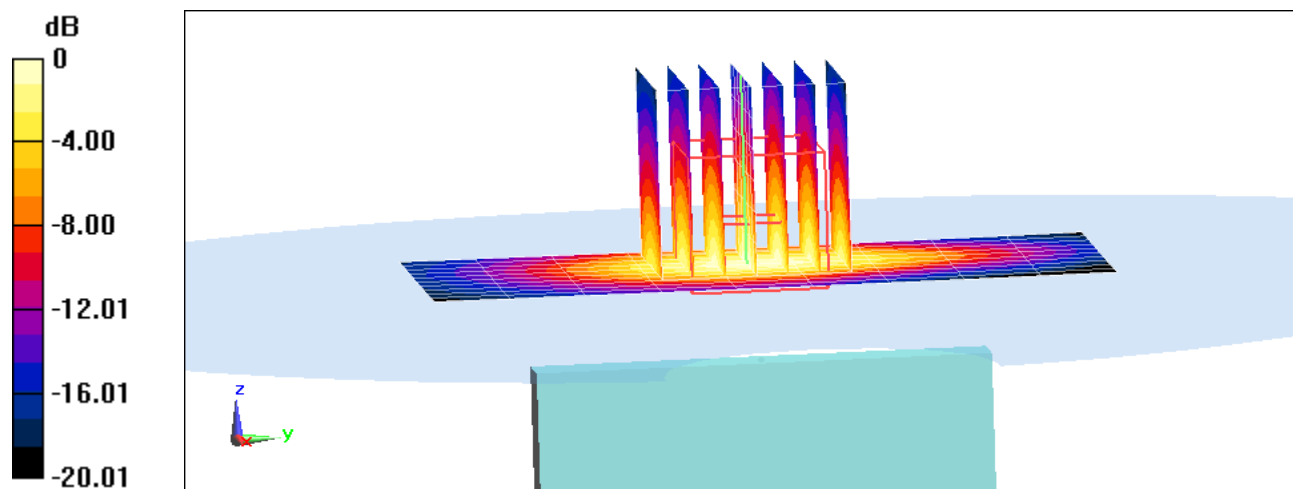
Area Scan (11x10x1): Measurement grid: $dx=5\text{mm}$, $dy=12\text{mm}$

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

Reference Value = 14.54 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.606 W/kg

SAR(1 g) = 0.326 W/kg



0 dB = 0.412 W/kg = -3.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BB4

Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.58

Medium: 2450 Body, Medium parameters used (interpolated):

$f = 2506 \text{ MHz}$; $\sigma = 2.051 \text{ S/m}$; $\epsilon_r = 50.622$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-31-2015; Ambient Temp: 20.5°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 41, Body SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

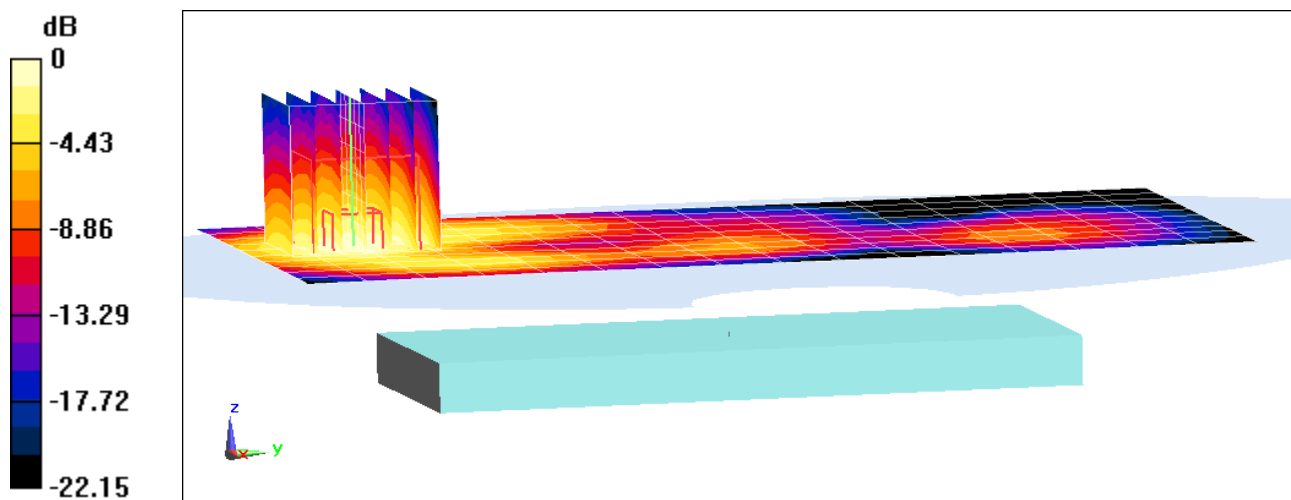
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 9.961 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.336 W/kg

SAR(1 g) = 0.181 W/kg



0 dB = 0.225 W/kg = -6.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 04BF2

Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.58

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2506$ MHz; $\sigma = 2.098$ S/m; $\epsilon_r = 50.574$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-07-2016; Ambient Temp: 24.0°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 41, Body SAR, Bottom Edge, Low.ch,
20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset**

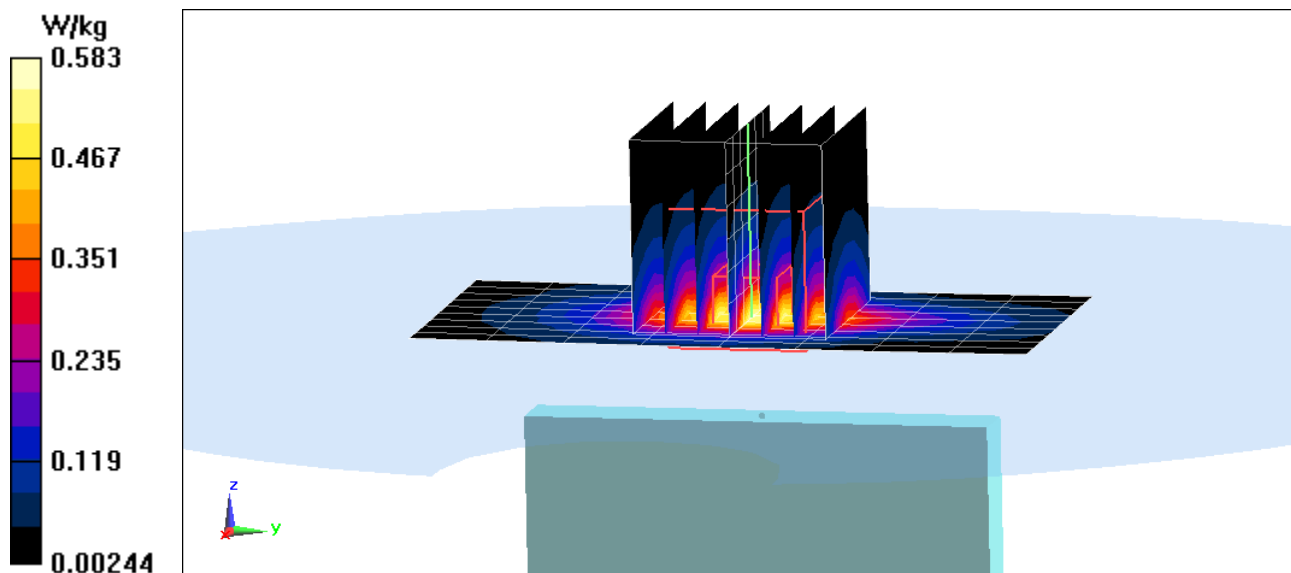
Area Scan (10x9x1): Measurement grid: dx=5mm, dy=12mm

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

Reference Value = 15.79 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.902 W/kg

SAR(1 g) = 0.452 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0C6B5

Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used (interpolated):

$f = 2412 \text{ MHz}$; $\sigma = 1.938 \text{ S/m}$; $\epsilon_r = 52.446$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 01-12-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 01, 1 Mbps, Back Side, Ant 1

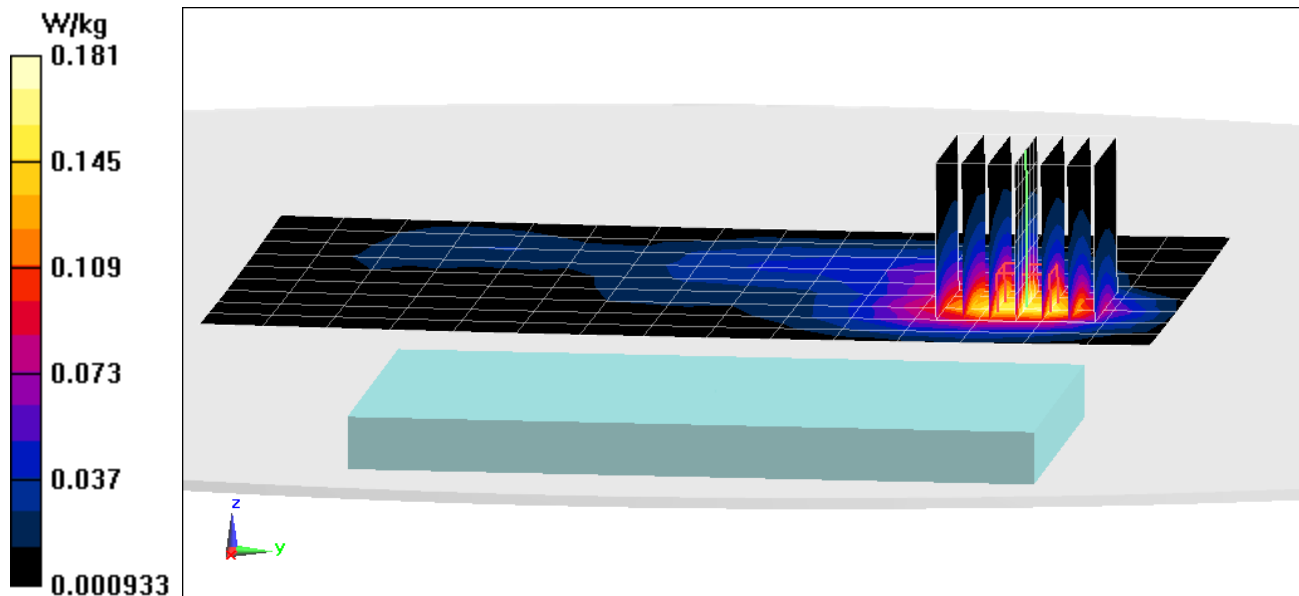
Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 8.738 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.279 W/kg

SAR(1 g) = 0.145 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 0C6B5

Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used (interpolated):

$f = 2412 \text{ MHz}$; $\sigma = 1.938 \text{ S/m}$; $\epsilon_r = 52.446$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 01, 1 Mbps, Back Side, Ant 1

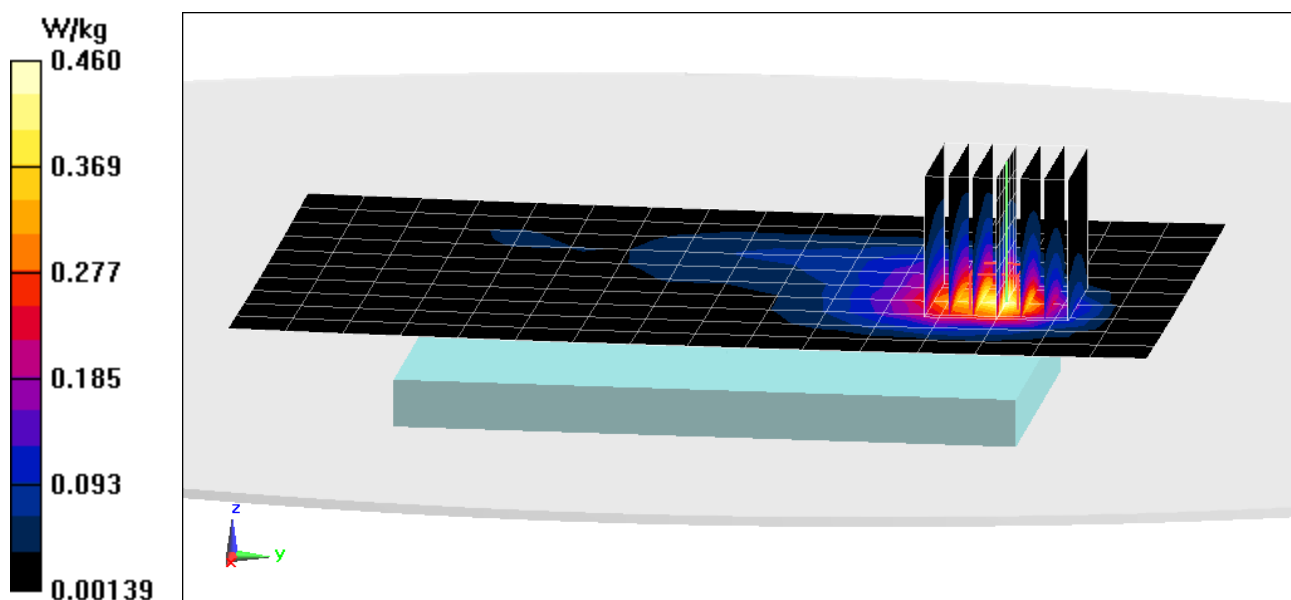
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 14.52 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.728 W/kg

SAR(1 g) = 0.366 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 00580

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5520 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5520 \text{ MHz}$; $\sigma = 5.727 \text{ S/m}$; $\epsilon_r = 48.253$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-12-2016; Ambient Temp: 23.8°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7357; ConvF(3.83, 3.83, 3.83); Calibrated: 4/23/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11a, U-NII-2C, 20 MHz Bandwidth, Body SAR, Ch 104,
6 Mbps, Back Side, Ant 2**

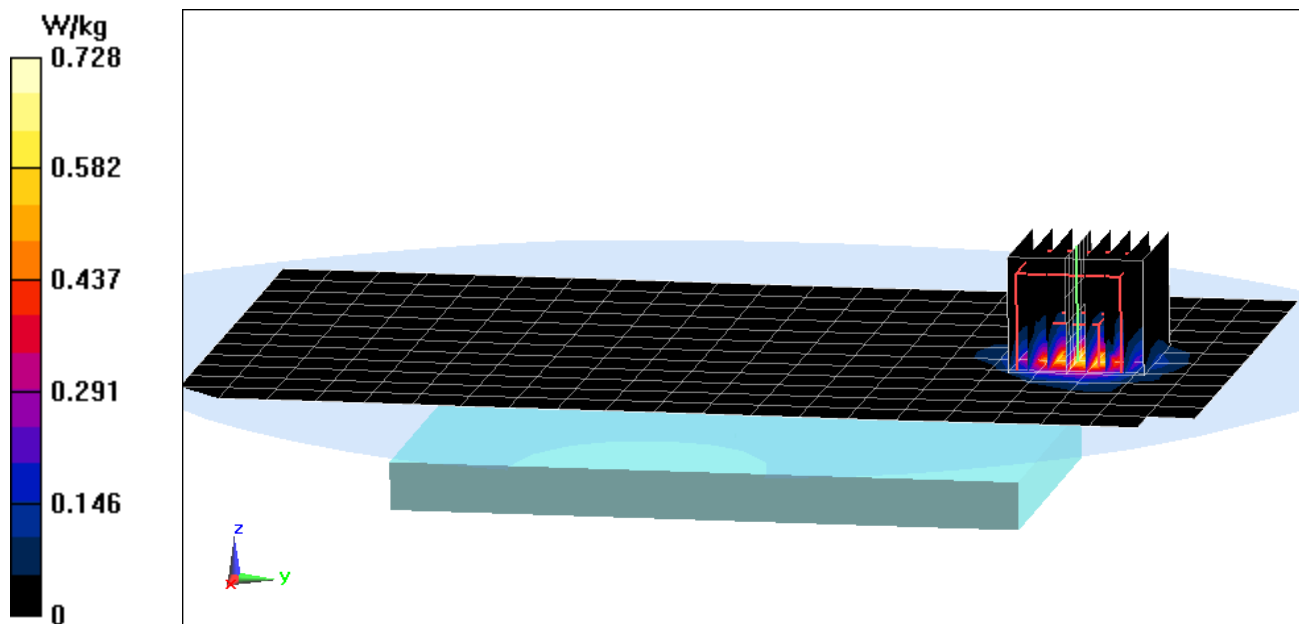
Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm

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

Reference Value = 7.566 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.316 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG935W8; Type: Portable Handset; Serial: 00580

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5745 \text{ MHz}$; $\sigma = 6.039 \text{ S/m}$; $\epsilon_r = 47.844$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 23.8°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7357; ConvF(3.82, 3.82, 3.82); Calibrated: 4/23/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11a, U-NII-3, 20 MHz Bandwidth, Body SAR, Ch 149,
6 Mbps, Back Side, Ant 2**

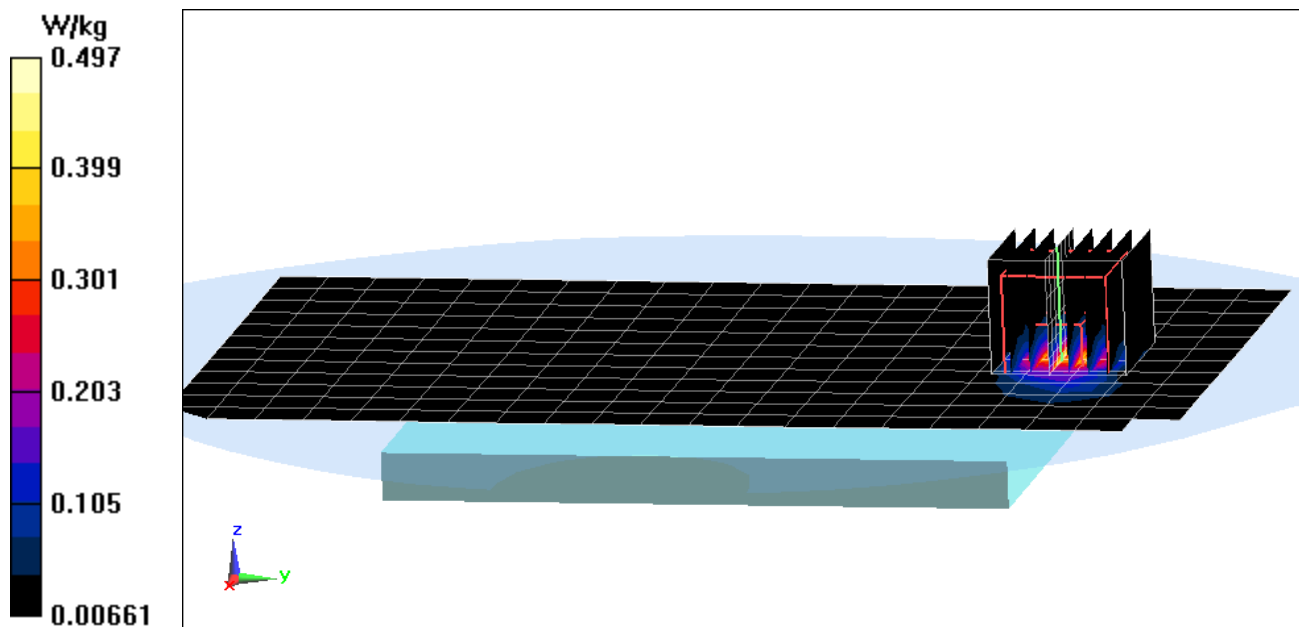
Area Scan (13x22x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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 = 5.462 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.857 W/kg

SAR(1 g) = 0.207 W/kg



APPENDIX B: SYSTEM VERIFICATION

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 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.901 \text{ S/m}$; $\epsilon_r = 42.646$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2016; Ambient Temp: 24.4°C; Tissue Temp: 22.7°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

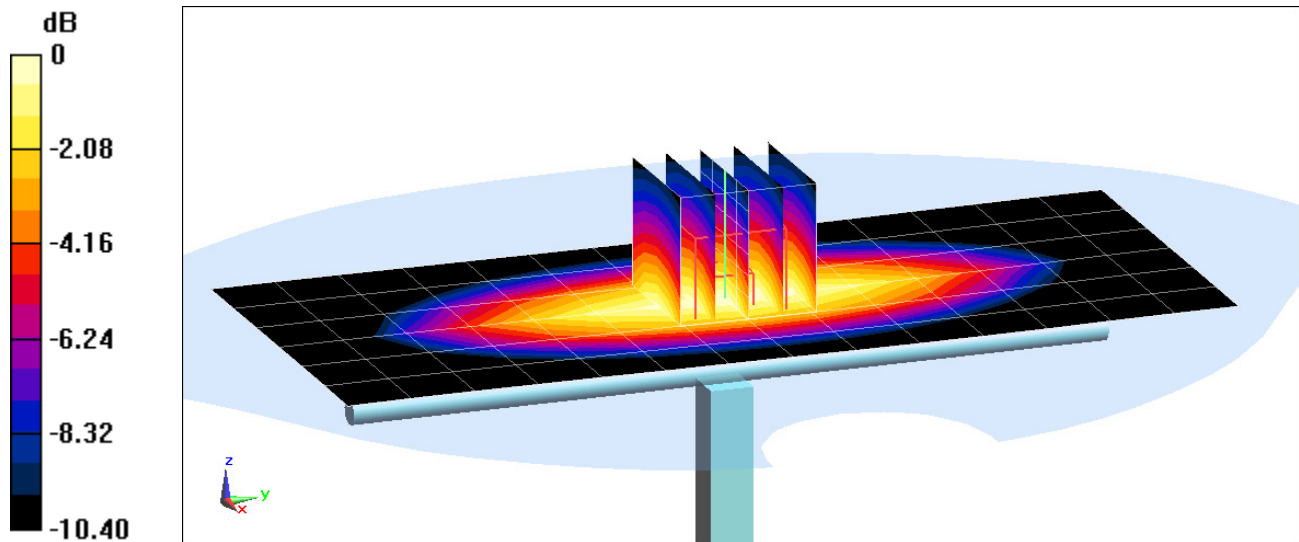
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.43 W/kg

SAR(1 g) = 1.62 W/kg

Deviation(1 g) = -2.17%



0 dB = 1.90 W/kg = 2.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 835 Head, Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.901 \text{ S/m}$; $\epsilon_r = 40.356$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 12-20-2015; Ambient Temp: 19.3°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3319; ConvF(6.41, 6.41, 6.41); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

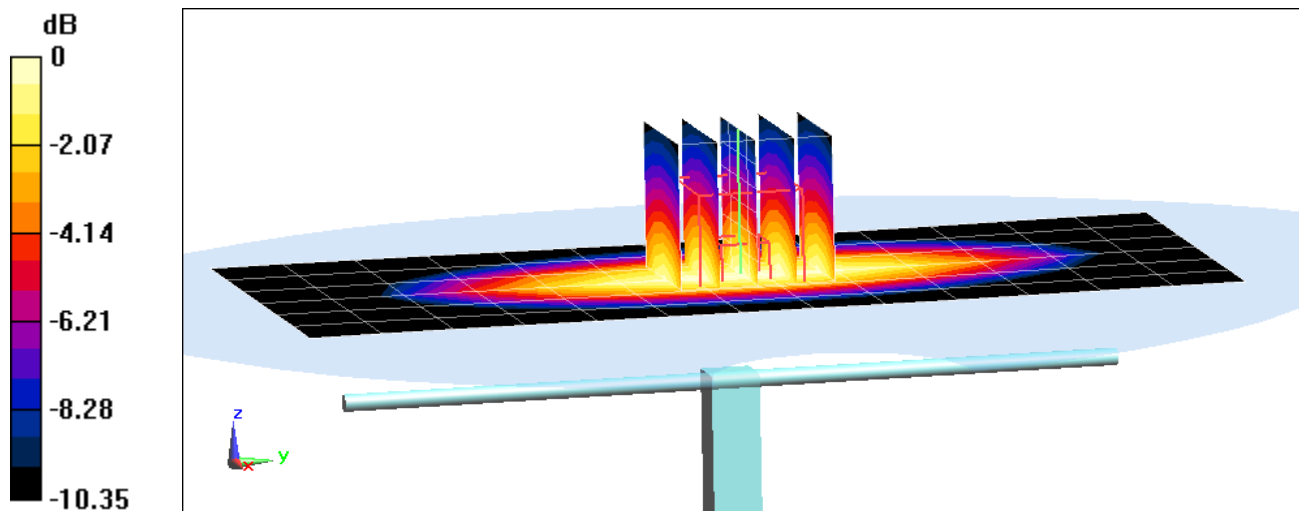
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.57 W/kg

SAR(1 g) = 1.81 W/kg;

Deviation(1 g) = -0.88%



0 dB = 2.11 W/kg = 3.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.883 \text{ S/m}$; $\epsilon_r = 40.136$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-06-2016; Ambient Temp: 23.5°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(6.04, 6.04, 6.04); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

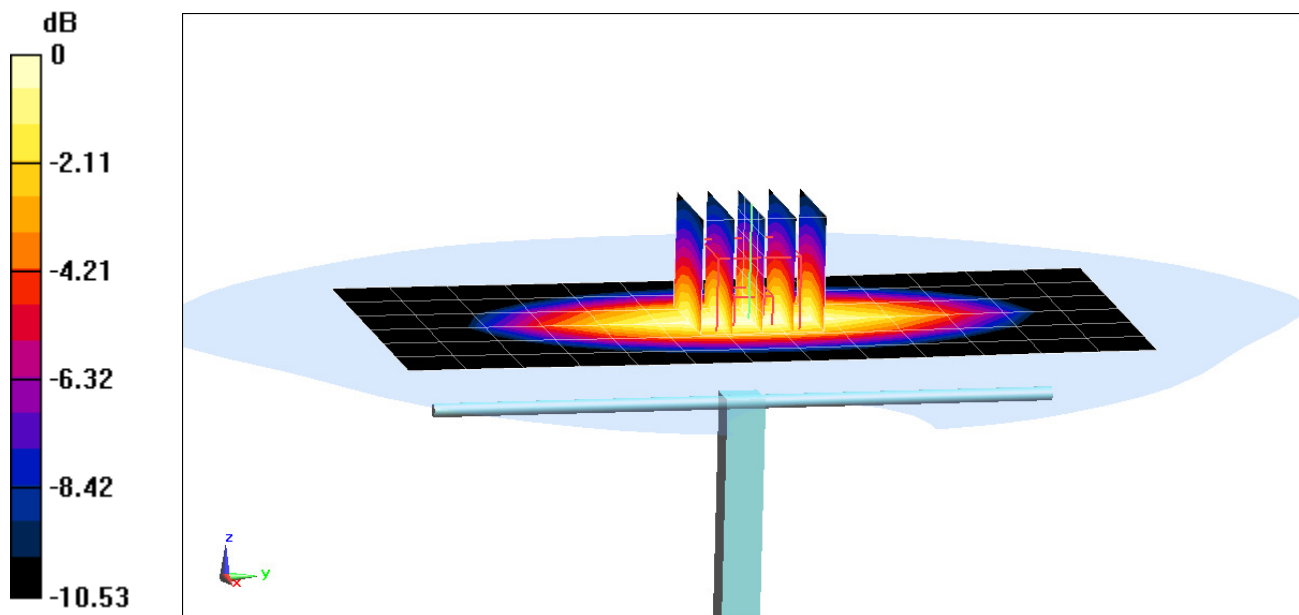
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.91 W/kg

SAR(1 g) = 1.99 W/kg

Deviation(1g) = 6.08%



0 dB = 2.33 W/kg = 3.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.88 \text{ S/m}$; $\epsilon_r = 39.99$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-10-2016; Ambient Temp: 23.6°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3209; ConvF(6.04, 6.04, 6.04); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

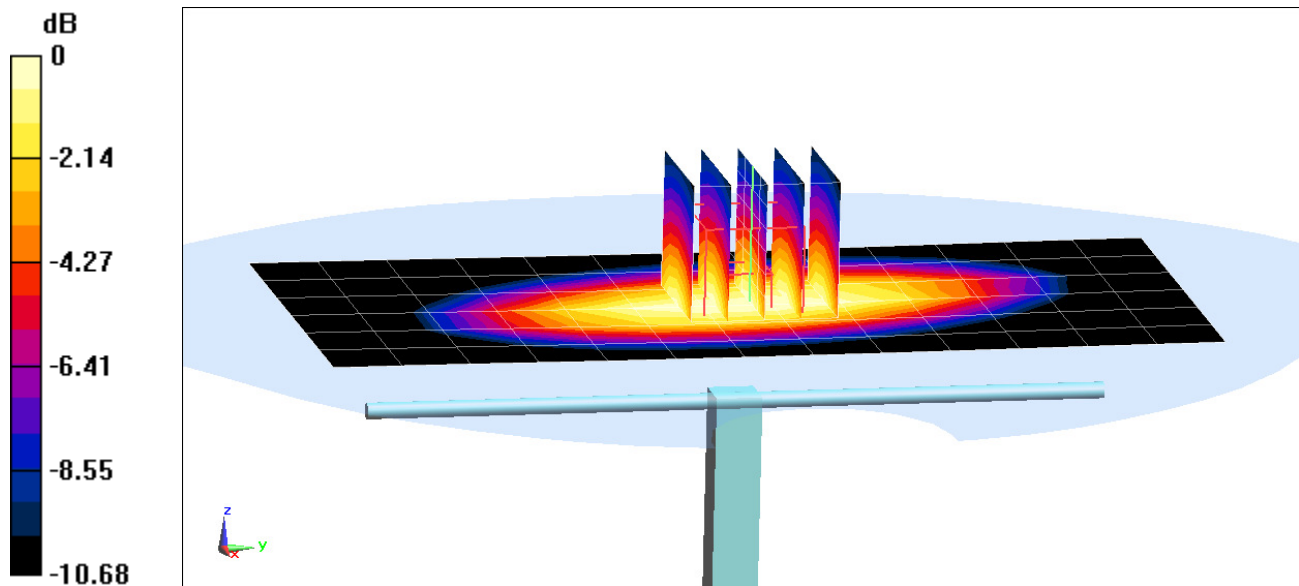
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.83 W/kg

SAR(1 g) = 1.93 W/kg

Deviation(1g) = 5.70%



0 dB = 2.24 W/kg = 3.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.34 \text{ S/m}$; $\epsilon_r = 38.48$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-30-2015; Ambient Temp: 24.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3351; ConvF(5.24, 5.24, 5.24); Calibrated: 6/22/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

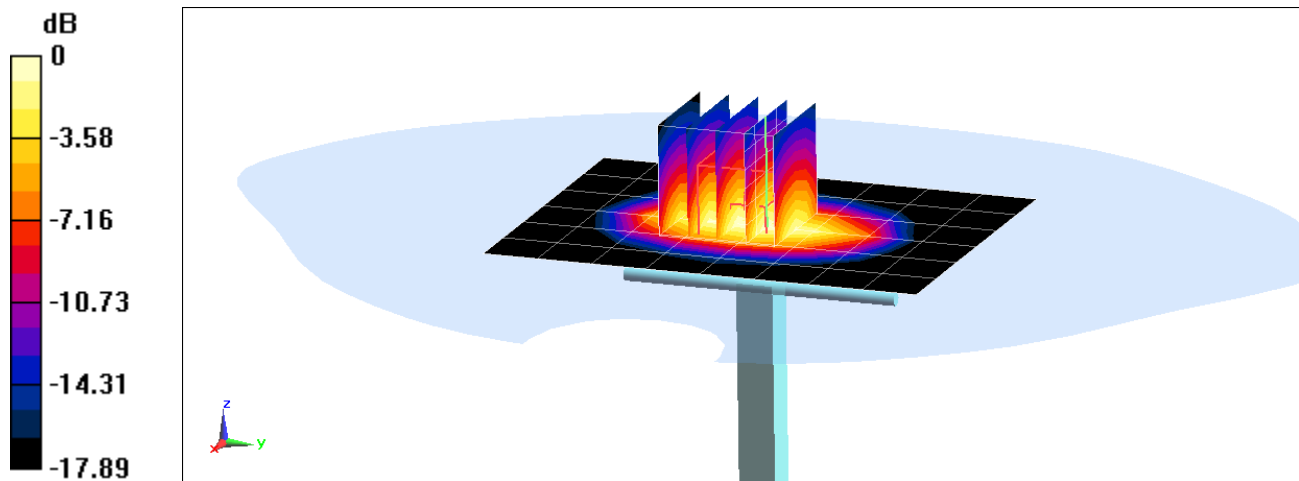
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.76 W/kg

SAR(1 g) = 3.74 W/kg

Deviation(1 g) = 3.31%



0 dB = 4.66 W/kg = 6.68 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):

$f = 1900 \text{ MHz}$; $\sigma = 1.433 \text{ S/m}$; $\epsilon_r = 38.78$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-28-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3319; ConvF(5.1, 5.1, 5.1); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

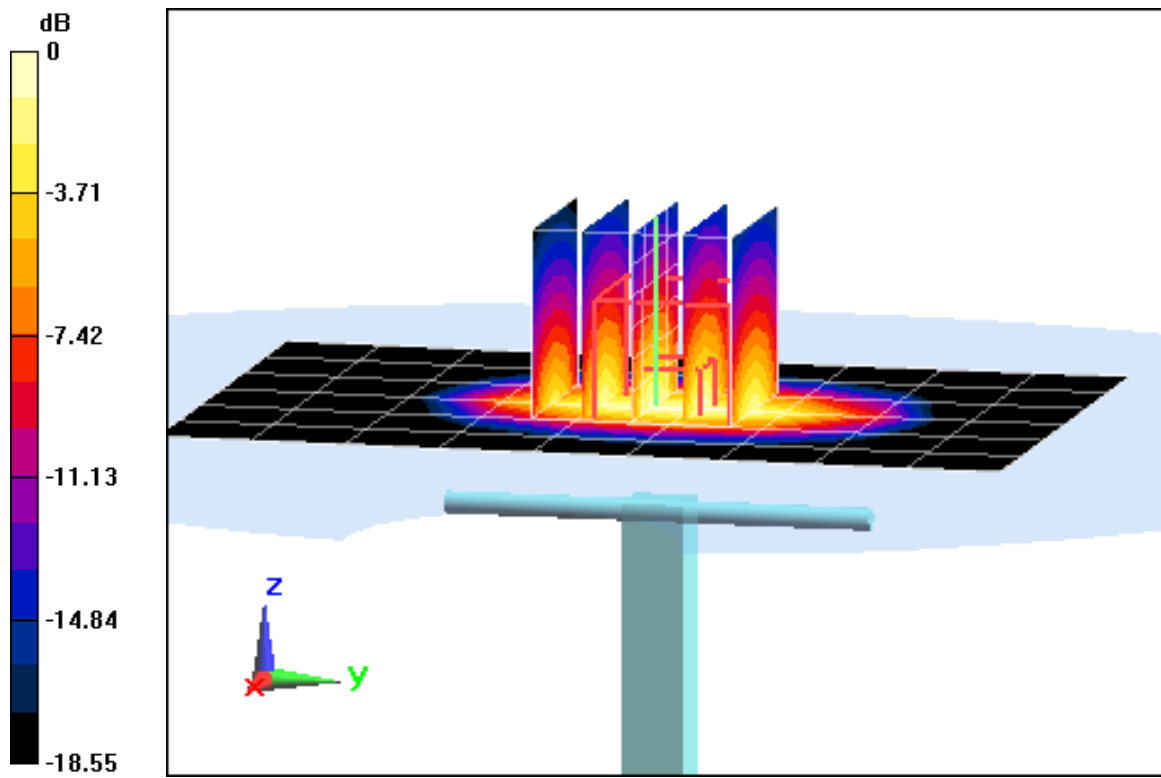
Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.91 W/kg

SAR(1 g) = 3.83 W/kg

Deviation(1 g) = -5.90%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2300$ MHz; $\sigma = 1.66$ S/m; $\epsilon_r = 40.686$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 12-22-2015; Ambient Temp: 24.5°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(4.73, 4.73, 4.73); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Right; Type: QD000P40CD; Serial: 1757

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2300 MHz System Verification at 20.0 dBm (100 mW)

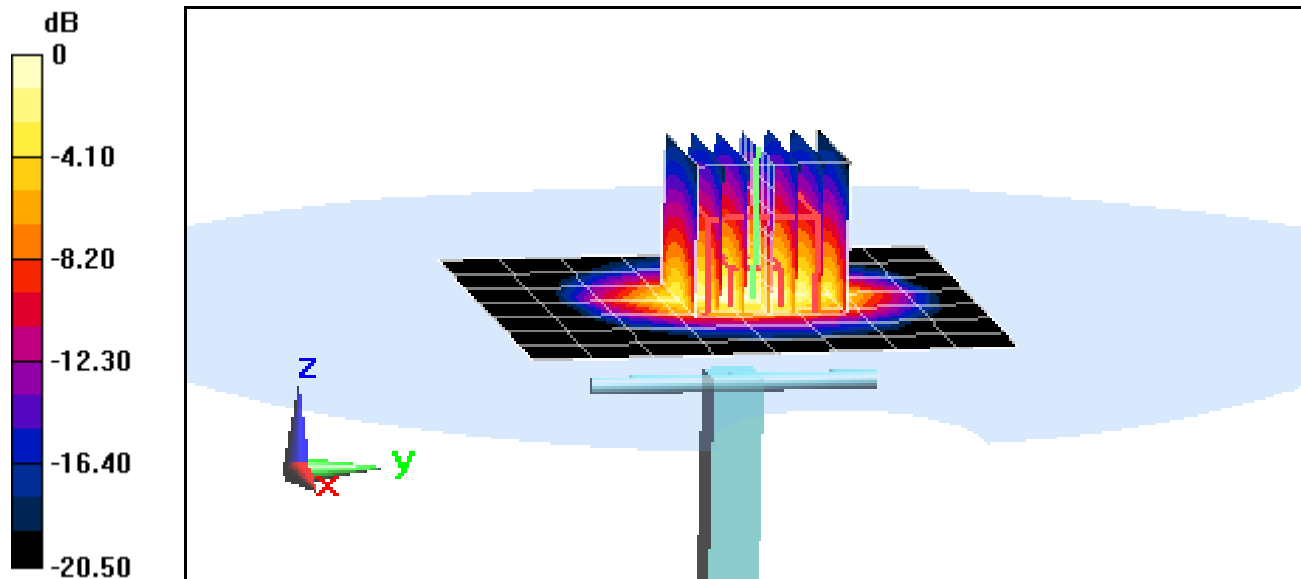
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 9.00 W/kg

SAR(1 g) = 4.58 W/kg

Deviation(1 g) = -8.22%



0 dB = 6.00 W/kg = 7.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.836 \text{ S/m}$; $\epsilon_r = 40.112$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 12-22-2015; Ambient Temp: 24.5°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(4.53, 4.53, 4.53); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Right; Type: QD000P40CD; Serial: 1757

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

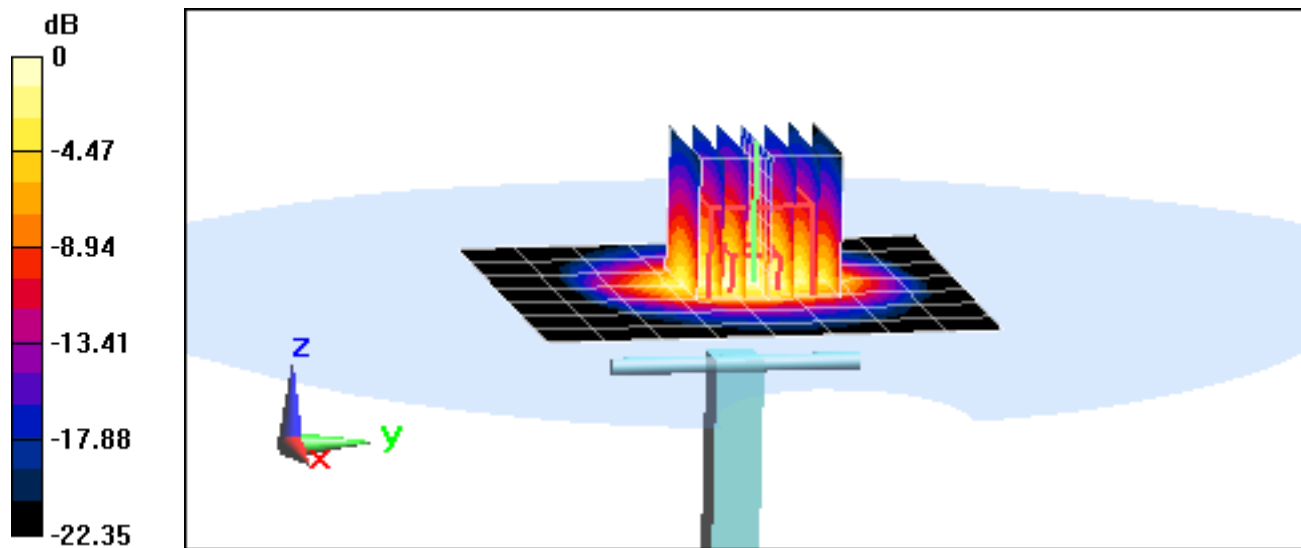
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 5.04 W/kg

Deviation(1 g) = -7.01%



0 dB = 6.65 W/kg = 8.23 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.822 \text{ S/m}$; $\epsilon_r = 38.658$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-15-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.55, 4.55, 4.55); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

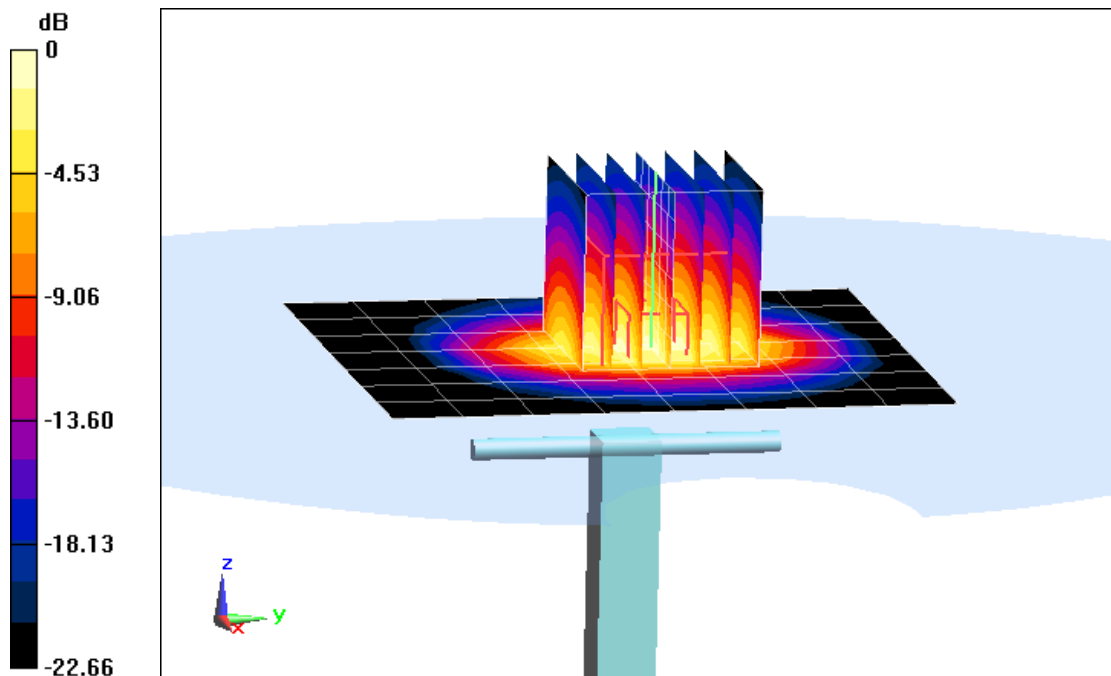
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.6 W/kg

SAR(1 g) = 5.04 W/kg

Deviation(1 g) = -7.01%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

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

Medium: 2450 Head Medium parameters used:

$f = 2600$ MHz; $\sigma = 2.013$ S/m; $\epsilon_r = 39.513$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 12-22-2015; Ambient Temp: 24.5°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(4.39, 4.39, 4.39); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Right; Type: QD000P40CD; Serial: 1757

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

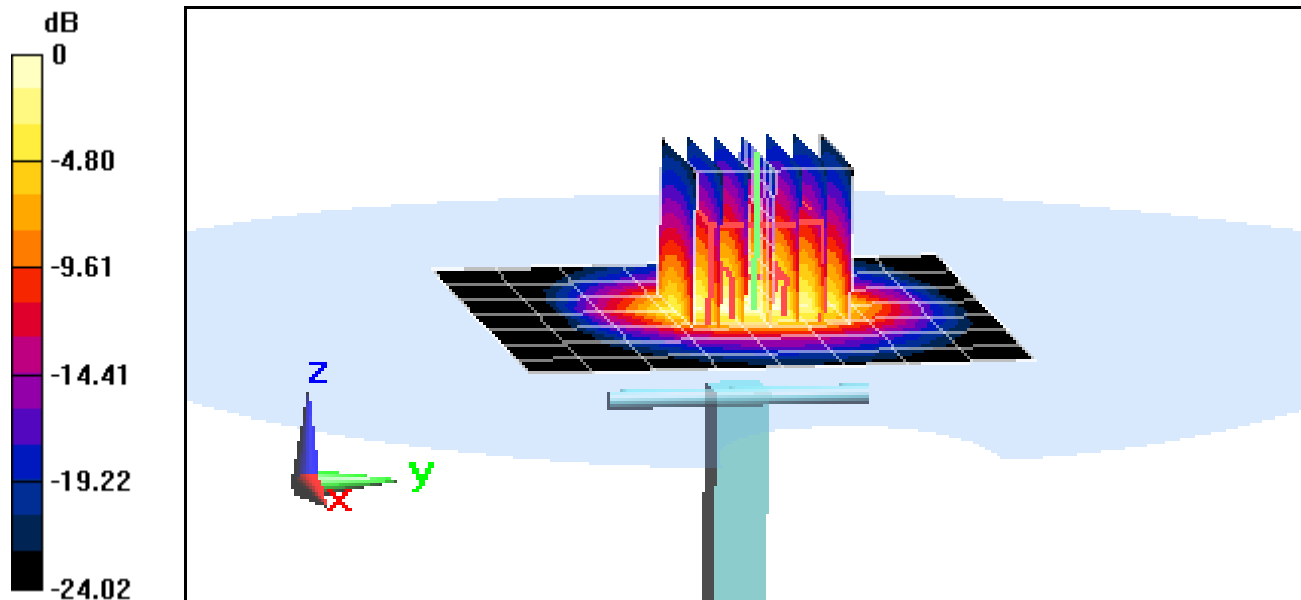
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 5.46 W/kg

Deviation(1 g) = -2.15%



0 dB = 7.33 W/kg = 8.65 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: 5 GHz Head Medium parameters used (interpolated):

$f = 5250 \text{ MHz}$; $\sigma = 4.685 \text{ S/m}$; $\epsilon_r = 36.243$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7308; ConvF(5.2, 5.2, 5.2); Calibrated: 7/21/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5250 MHz System Verification at 17.0 dBm (50 mW)

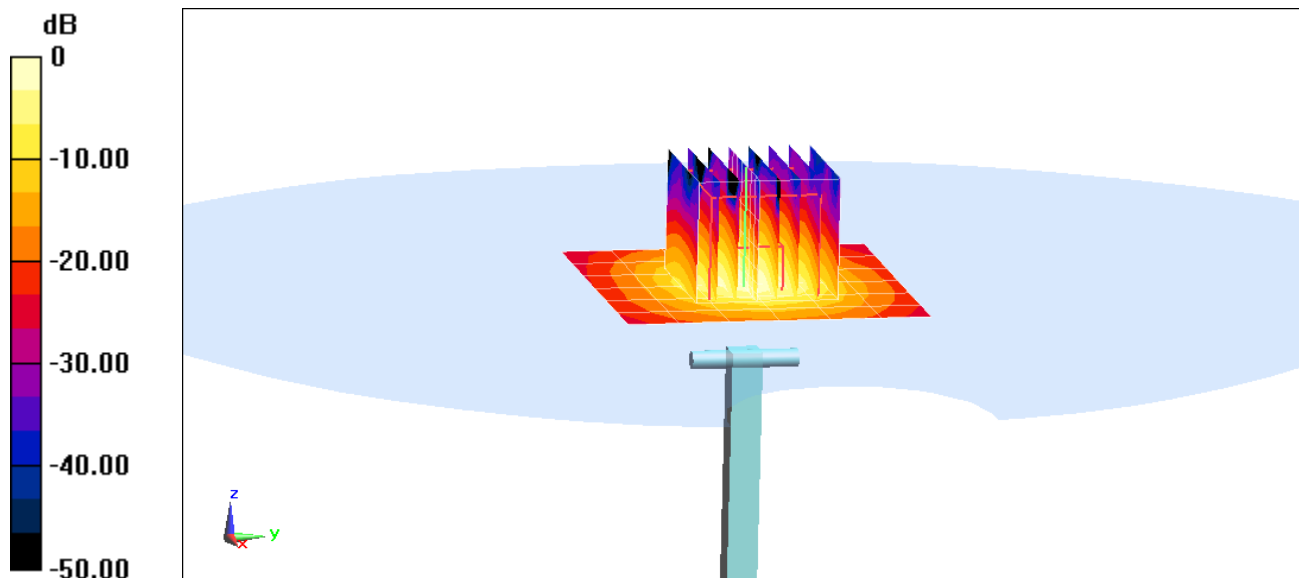
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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) = 3.94 W/kg

Deviation(1 g) = -4.48%



0 dB = 9.17 W/kg = 9.62 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: 5 GHz Head Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 5.043 \text{ S/m}$; $\epsilon_r = 35.74$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7308; ConvF(4.65, 4.65, 4.65); Calibrated: 7/21/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification at 17.0 dBm (50 mW)

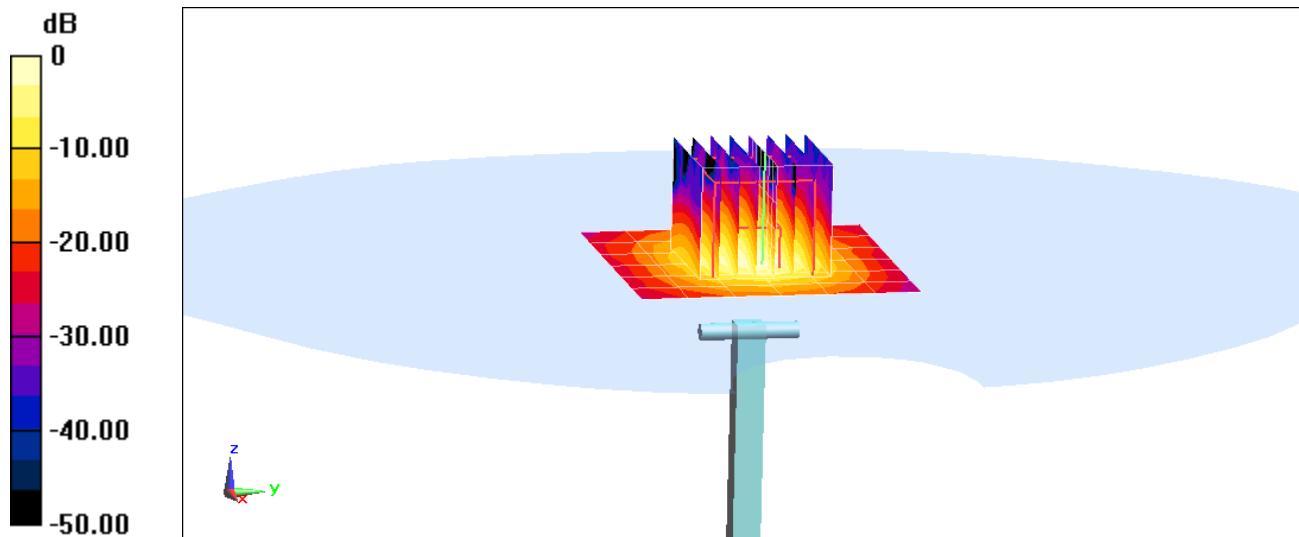
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 4.31 W/kg

Deviation(1 g) = 2.01%



0 dB = 10.2 W/kg = 10.09 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: 5 GHz Head Medium parameters used (interpolated):

$f = 5750 \text{ MHz}$; $\sigma = 5.209 \text{ S/m}$; $\epsilon_r = 35.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2016; Ambient Temp: 24.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7308; ConvF(4.86, 4.86, 4.86); Calibrated: 7/21/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/24/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

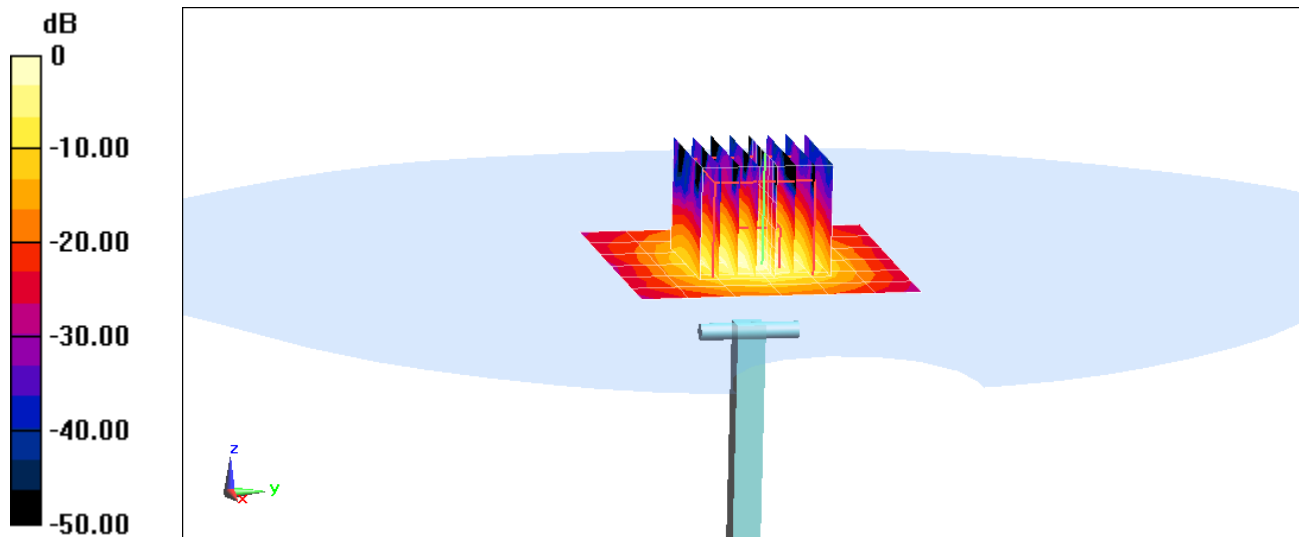
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 3.85 W/kg

Deviation(1 g) = -3.75%



0 dB = 9.30 W/kg = 9.68 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):

$f = 750 \text{ MHz}$; $\sigma = 0.963 \text{ S/m}$; $\epsilon_r = 55.424$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.0°C

Probe: ES3DV2 - SN3022; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/18/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

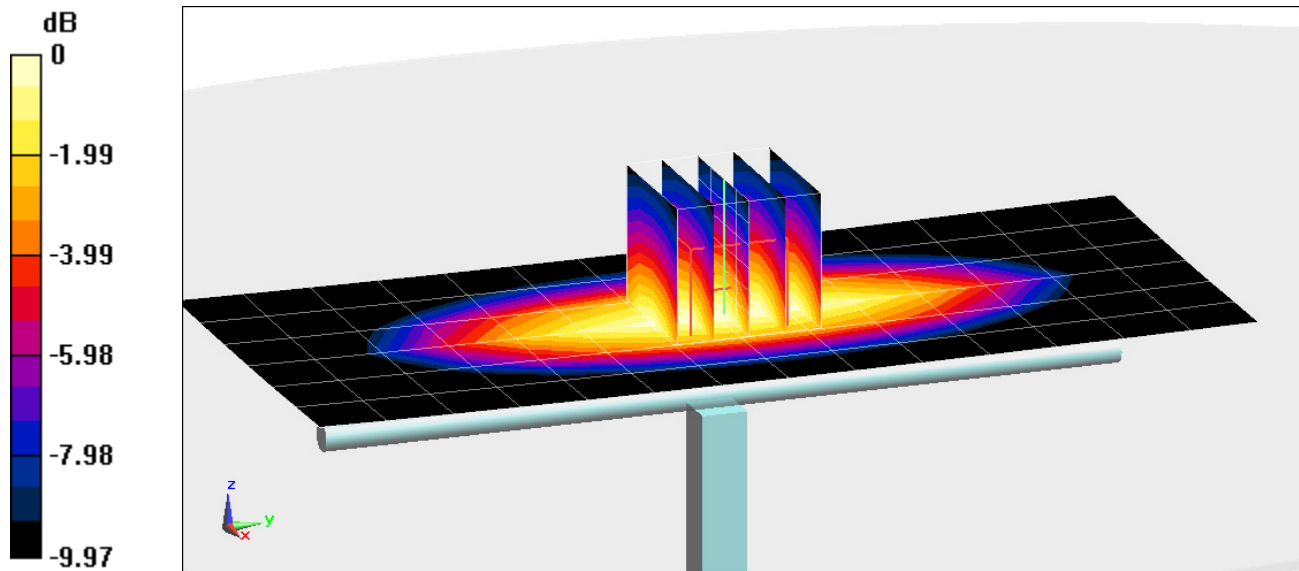
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.51 W/kg

SAR(1 g) = 1.72 W/kg

Deviation(1 g) = 0.82%



0 dB = 2.00 W/kg = 3.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 1.005 \text{ S/m}$; $\epsilon_r = 53.715$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2016; Ambient Temp: 24.5°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3263; ConvF(6.08, 6.08, 6.08); Calibrated: 5/20/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 6/17/2015

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

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

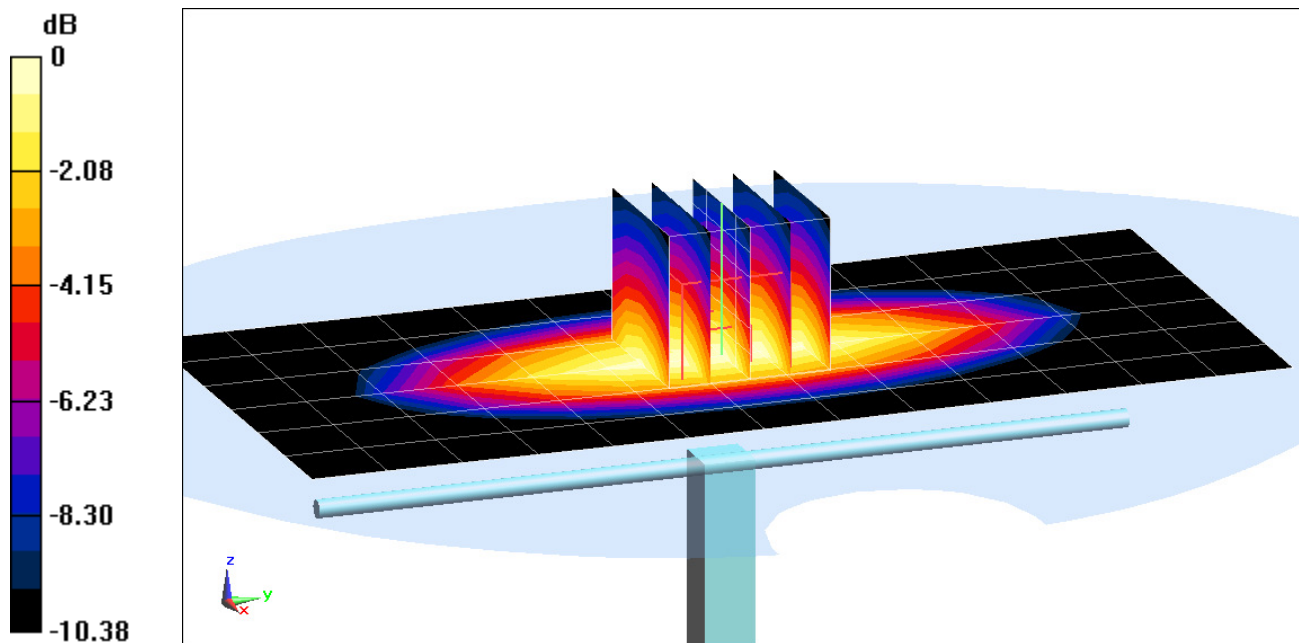
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.92 W/kg

SAR(1 g) = 2.01 W/kg

Deviation(1 g) = 8.65%



0 dB = 2.35 W/kg = 3.71 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1750 Body; Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.473 \text{ S/m}$; $\epsilon_r = 51.284$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-28-2015; Ambient Temp: 22.4°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3334; ConvF(5.03, 5.03, 5.03); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2027

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

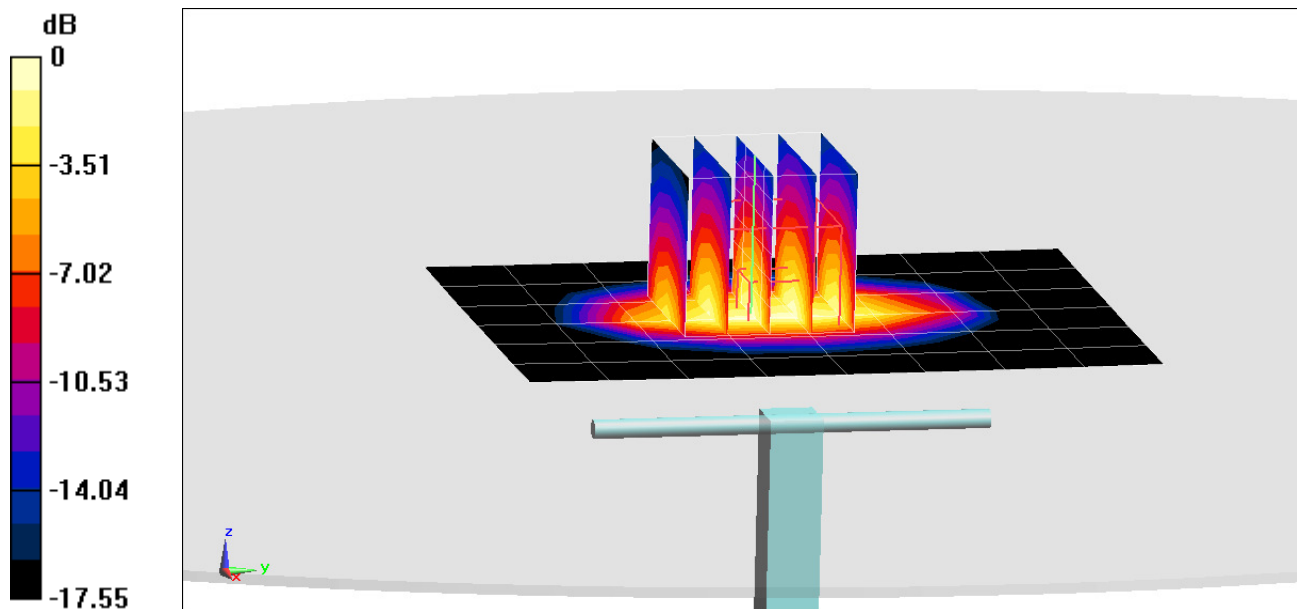
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.17 W/kg

SAR(1 g) = 3.53 W/kg

Deviation(1 g) = -4.85%



0 dB = 4.36 W/kg = 6.39 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 Body Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.565 \text{ S/m}$; $\epsilon_r = 52.17$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.53, 4.53, 4.53); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

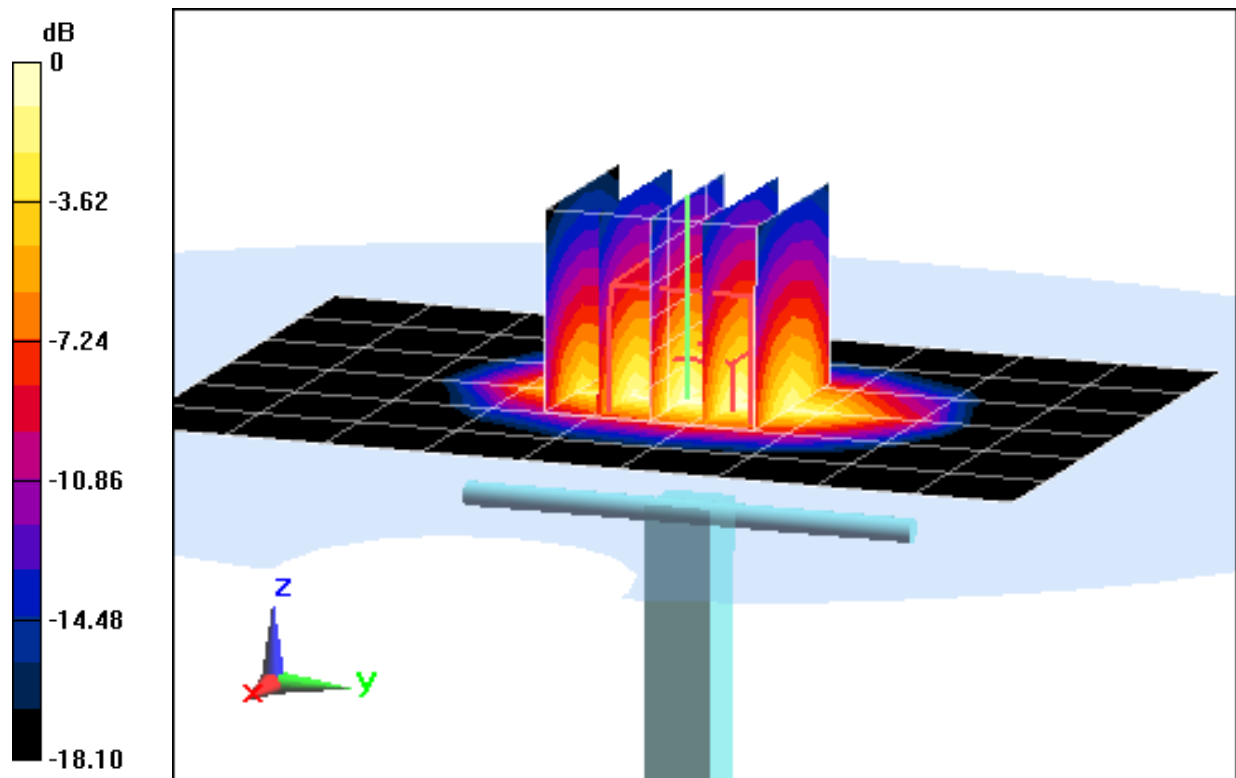
Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.06 W/kg

SAR(1 g) = 4.03 W/kg

Deviation(1 g) = -0.25%



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

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1900$ MHz; $\sigma = 1.583$ S/m; $\epsilon_r = 53.104$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3333; ConvF(4.7, 4.7, 4.7); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

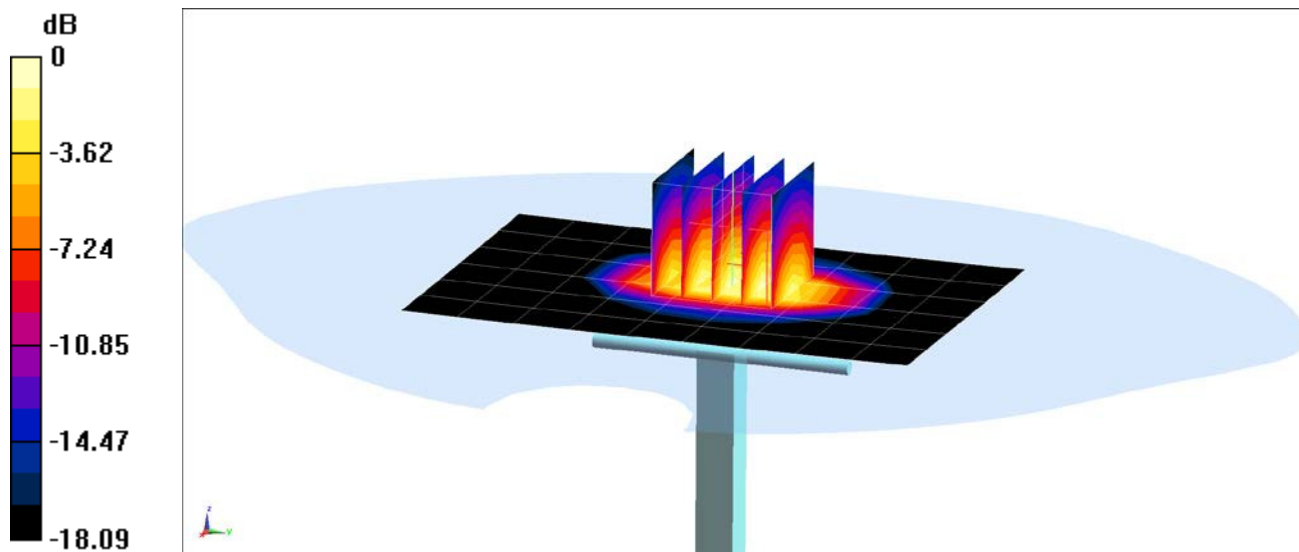
Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.83 W/kg

SAR(1 g) = 3.81 W/kg

Deviation(1 g) = -4.75%



0 dB = 4.79 W/kg = 6.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2300 Body Medium parameters used:

$f = 2300 \text{ MHz}$; $\sigma = 1.769 \text{ S/m}$; $\epsilon_r = 51.356$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 20.5°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3334; ConvF(4.61, 4.61, 4.61); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2300 MHz System Verification at 20.0 dBm (100 mW)

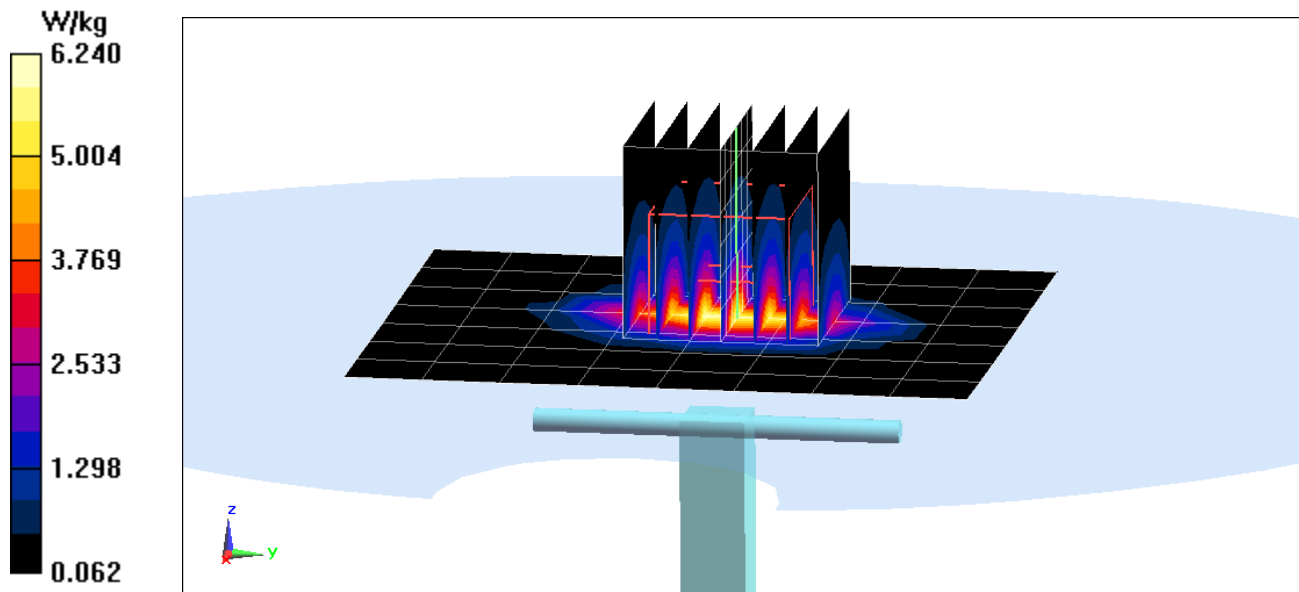
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 9.33 W/kg

SAR(1 g) = 4.8 W/kg

Deviation(1 g) = -0.21%



PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2400 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.022 \text{ S/m}$; $\epsilon_r = 50.853$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 01-07-2016; Ambient Temp: 24.0°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

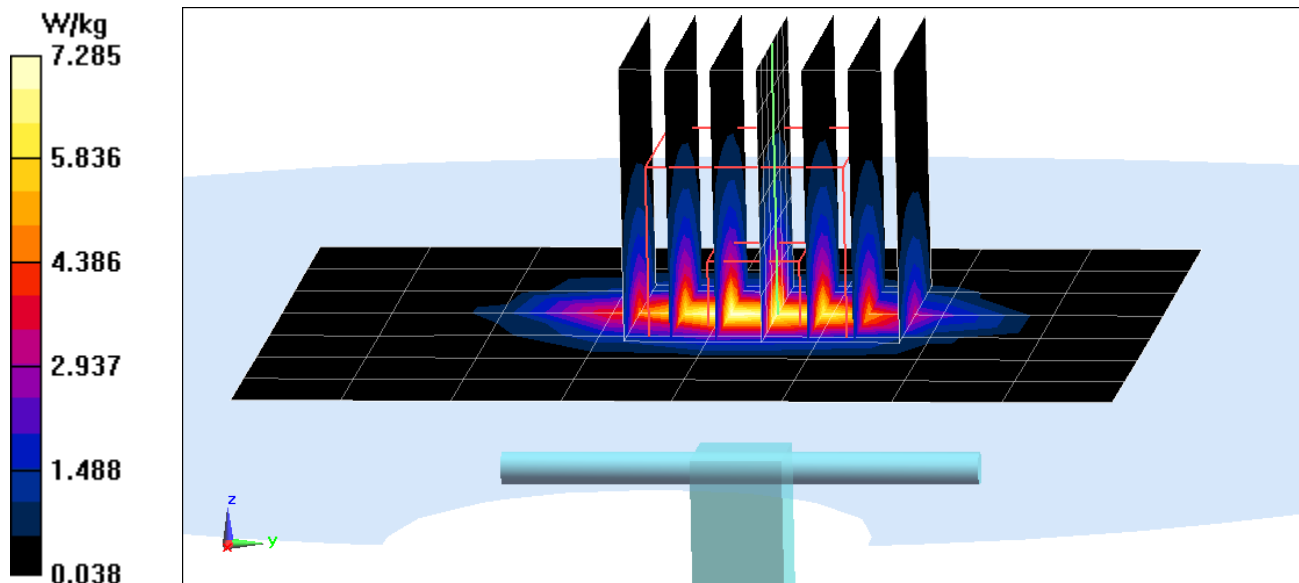
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.8 W/kg

SAR(1 g) = 5.59 W/kg

Deviation(1 g) = 7.71%



PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.994 \text{ S/m}$; $\epsilon_r = 52.299$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 22.1°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.11, 4.11, 4.11); Calibrated: 3/19/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/13/2015

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

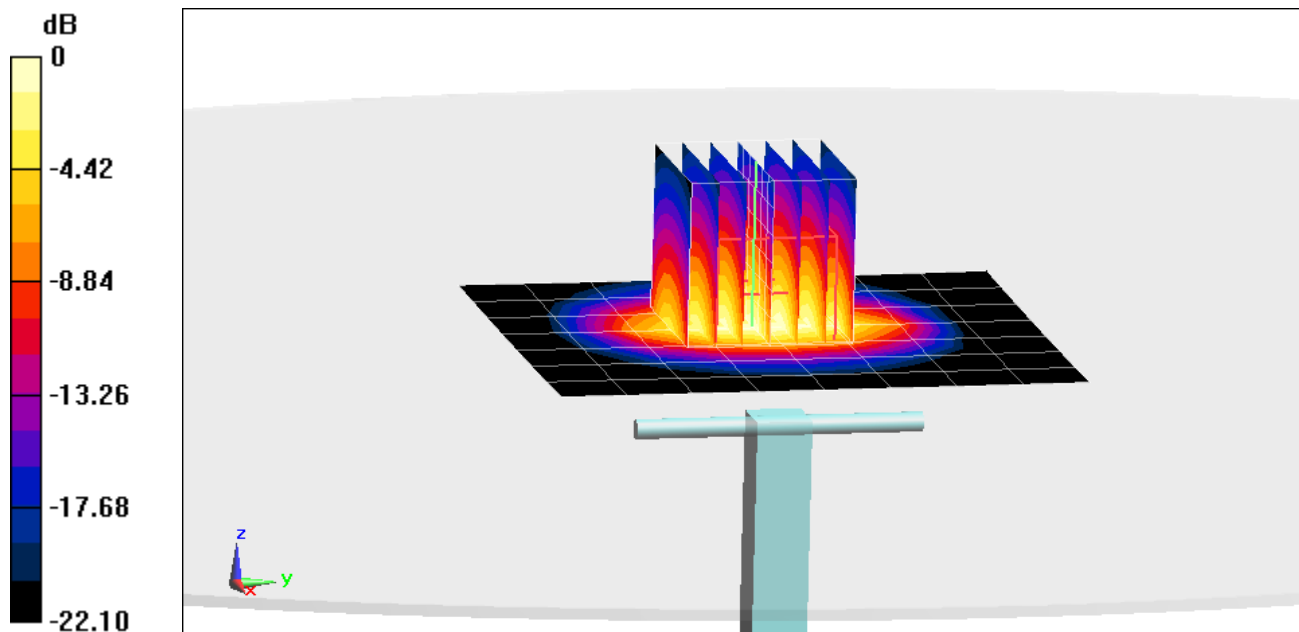
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.3 W/kg

SAR(1 g) = 5.33 W/kg

Deviation(1 g) = 2.70%;



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

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

Medium: 2400 Body Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.183 \text{ S/m}$; $\epsilon_r = 50.192$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 12-31-2015; Ambient Temp: 20.5°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3334; ConvF(4.29, 4.29, 4.29); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

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

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

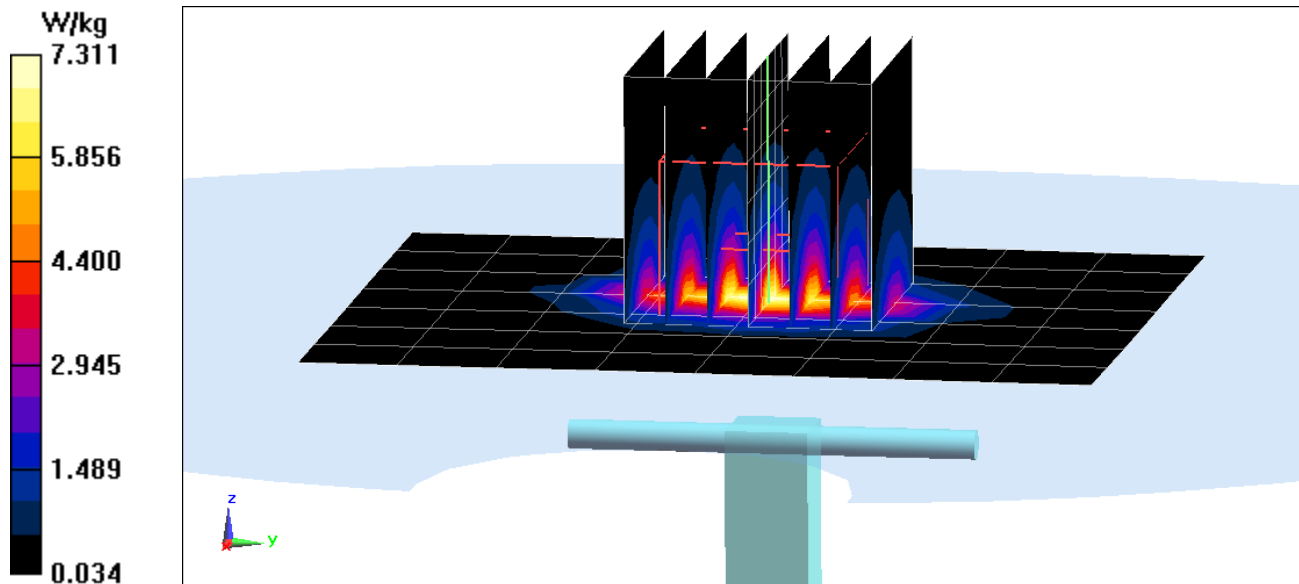
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.1 W/kg

SAR(1 g) = 5.58 W/kg

Deviation(1 g) = -0.71%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5300 \text{ MHz}$; $\sigma = 5.455 \text{ S/m}$; $\epsilon_r = 48.493$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 23.8°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7357; ConvF(4.11, 4.11, 4.11); Calibrated: 4/23/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5300 MHz System Verification at 17.0 dBm (50 mW)

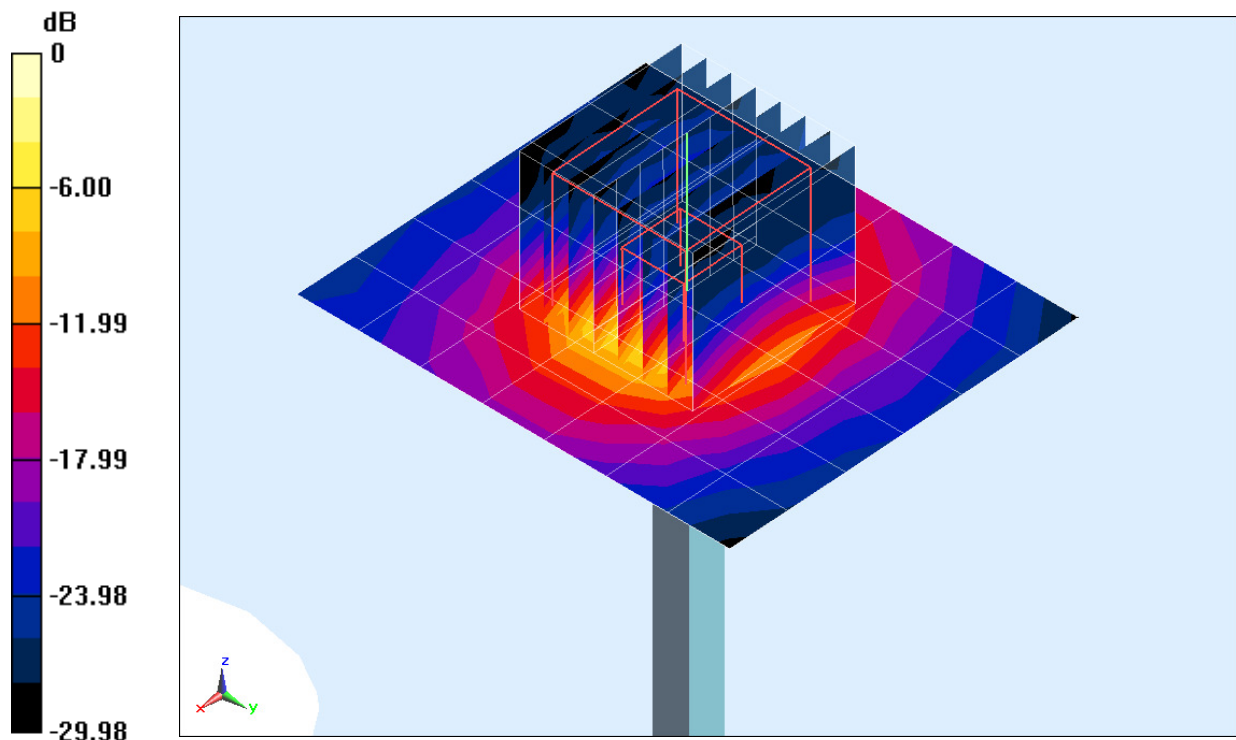
Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 14.9 W/kg

SAR(1 g) = 3.77 W/kg

Deviation(1 g) = 0.27%



0 dB = 8.94 W/kg = 9.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5500 \text{ MHz}$; $\sigma = 5.711 \text{ S/m}$; $\epsilon_r = 48.227$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 23.8°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7357; ConvF(3.83, 3.83, 3.83); Calibrated: 4/23/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5500 MHz System Verification at 17.0 dBm (50 mW)

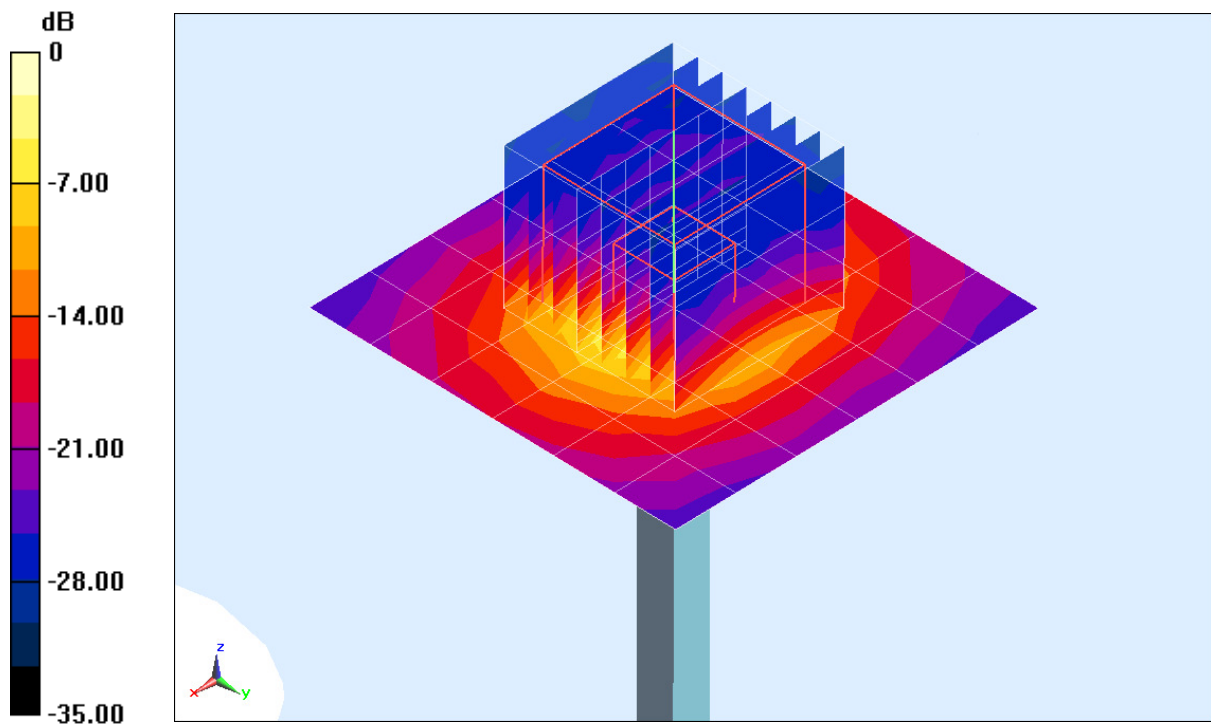
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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) = 15.9 W/kg

SAR(1 g) = 3.82 W/kg

Deviation(1 g) = -3.90%



0 dB = 9.39 W/kg = 9.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5800 \text{ MHz}$; $\sigma = 6.135 \text{ S/m}$; $\epsilon_r = 47.714$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-12-2016; Ambient Temp: 23.8°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7357; ConvF(3.82, 3.82, 3.82); Calibrated: 4/23/2015;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/20/2015

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8);SEMCAD X Version 14.6.10 (7331)

5800 MHz System Verification at 17.0 dBm (50 mW)

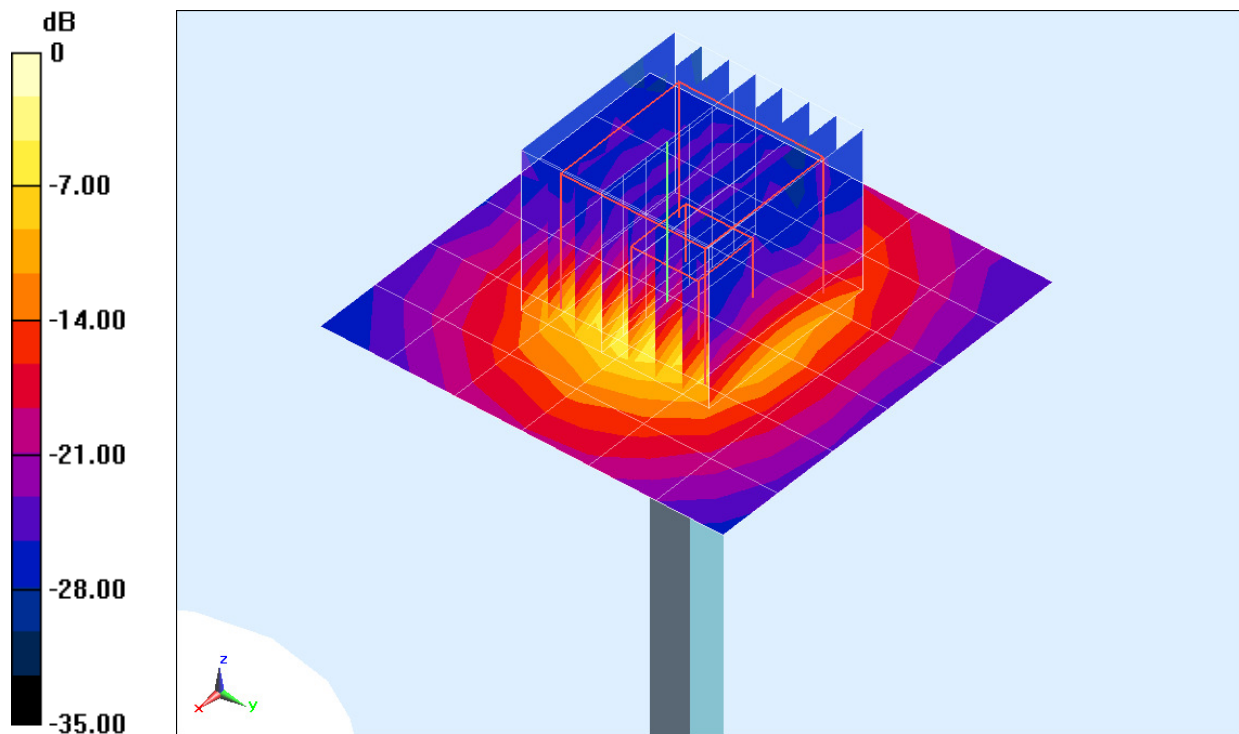
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 3.72 W/kg

Deviation(1 g) = -2.49%



0 dB = 9.02 W/kg = 9.55 dBW/kg