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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
11/25/18 - 01/11/19
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M1811120202-01-R2.A3L

FCC ID: **A3LSMG9750**

APPLICANT: **SAMSUNG ELECTRONICS CO., LTD.**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-G9750
Additional Model: SM-G9758

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.12	0.24	0.53	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.30	0.95	2.77
PCE	UMTS 850	826.40 - 846.60 MHz	0.27	0.24	0.64	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.16	0.58	0.86	1.44
PCE	LTE Band 12	699.7 - 715.3 MHz	0.18	0.28	0.30	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.23	0.25	0.54	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.34	0.32	0.66	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.35	0.41	0.75	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.15	0.66	0.73	3.22
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.21	0.83	0.93	2.70
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.35	1.16	1.37
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.18	< 0.1	0.15	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.27	0.20	N/A	2.29
NII	U-NII-2C	5500 - 5720 MHz	0.32	0.37	N/A	2.58
NII	U-NII-3	5745 - 5825 MHz	0.33	0.42	0.77	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	1.35	0.12	0.24	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	1.59	1.59	3.95

Note: This revised Test Report (S/N: 1M1811120202-01-R2.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.
Note: This test report addresses compliance data for material 1. Please see test report ID 1M1812260233-01-R1.A3L for compliance data for material 2.
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

TESTING CERT#2041.01

The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: SARTICK@MWFAI.INFO.

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 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	555 Hz - 8.33 kHz

1.2 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions, under some conditions when the device is being used in close proximity to the user's hand. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions. 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. Detailed descriptions of the power reduction mechanism are included in the operational description.

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 2G/3G/4G Output 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	**33.5**	**33.5**	**32.5**	**30.5**	**28.5**	**28.0**	**26.0**	**24.0**	**23.0**
	Nominal	**32.5**	**32.5**	**31.5**	**29.5**	**27.5**	**27.0**	**25.0**	**23.0**	**22.0**
GSM/GPRS/EDGE 1900	Maximum	**30.5**	**30.5**	**29.5**	**27.5**	**25.5**	**27.0**	**25.0**	**23.0**	**22.0**
	Nominal	**29.5**	**29.5**	**28.5**	**26.5**	**24.5**	**26.0**	**24.0**	**22.0**	**21.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**25.0**	**24.0**	**24.0**	**24.0**
	Nominal	**24.0**	**23.0**	**23.0**	**23.0**
UMTS Band 2 (1900 MHz)	Maximum	**24.5**	**23.5**	**23.5**	**23.5**
	Nominal	**23.5**	**22.5**	**22.5**	**22.5**

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 13	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 26 (Cell)	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 5 (Cell)	Maximum	**25.5**
	Nominal	**24.5**
LTE Band 4 (AWS)	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 25 (PCS)	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 2 (PCS)	Maximum	**25.0**
	Nominal	**24.0**
LTE Band 41	Maximum	**25.0**
	Nominal	**24.0**

1.3.2 Reduced 2G/3G/4G Output Power – Hotspot Mode Active

Mode / Band		Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		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	**28.5**	**27.5**	**25.5**	**23.5**	**27.0**	**25.0**	**23.0**	**22.0**
	Nominal	**27.5**	**26.5**	**24.5**	**22.5**	**26.0**	**24.0**	**22.0**	**21.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 2 (1900 MHz)	Maximum	**20.5**	**19.5**	**19.5**	**19.5**
	Nominal	**19.5**	**18.5**	**18.5**	**18.5**

Mode / Band		Modulated Average (dBm)
LTE Band 4 (AWS)	Maximum	**21.0**
	Nominal	**20.0**
LTE Band 25 (PCS)	Maximum	**20.5**
	Nominal	**19.5**
LTE Band 2 (PCS)	Maximum	**20.5**
	Nominal	**19.5**
LTE Band 41	Maximum	**23.0**
	Nominal	**22.0**

1.3.3 Reduced 2G/3G/4G Output Power – Grip Sensor 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	**28.5**	**28.5**	**27.5**	**25.5**	**23.5**	**27.0**	**25.0**	**23.0**	**22.0**
	Nominal	**27.5**	**27.5**	**26.5**	**24.5**	**22.5**	**26.0**	**24.0**	**22.0**	**21.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 2 (1900 MHz)	Maximum	**22.0**	**21.0**	**21.0**	**21.0**
	Nominal	**21.0**	**20.0**	**20.0**	**20.0**

Mode / Band		Modulated Average (dBm)
LTE Band 4 (AWS)	Maximum	**21.5**
	Nominal	**20.5**
LTE Band 25 (PCS)	Maximum	**21.5**
	Nominal	**20.5**
LTE Band 2 (PCS)	Maximum	**21.5**
	Nominal	**20.5**
LTE Band 41	Maximum	**23.0**
	Nominal	**22.0**

1.3.4 Maximum Bluetooth and SISO/MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I.

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 1				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum	**20.0**			**11.0**	**5.5**
	Nominal	**19.0**			**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum	**18.0**		**17.0**	**11.0**	**5.5**
	Nominal	**17.0**		**16.0**	**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum	**18.0**		**17.0**	**11.0**	**5.5**
	Nominal	**17.0**		**16.0**	**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**11.0**	**5.5**
	Nominal	**15.0**	**16.0**	**14.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 2				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum	**19.0**			**11.0**	**5.5**
	Nominal	**18.0**			**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum	**18.0**			**11.0**	**5.5**
	Nominal	**17.0**			**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum	**18.0**			**11.0**	**5.5**
	Nominal	**17.0**			**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**11.0**	**5.5**
	Nominal	**15.0**	**16.0**	**14.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - Single Tx Chain - Ant 1 (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**16.5**	**18.0**				
	Nominal	**14.5**	**15.5**	**17.0**				
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**16.5**	**18.0**	**13.0**	**17.0**		
	Nominal	**14.5**	**15.5**	**17.0**	**12.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**16.5**	**18.0**	**13.0**	**17.0**	**13.0**	**16.0**
	Nominal	**14.5**	**15.5**	**17.0**	**12.0**	**16.0**	**12.0**	**15.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**16.0**			**14.0**		**13.0**	
	Nominal	**15.0**			**13.0**		**12.0**	

Mode / Band		Modulated Average - Single Tx Chain - Ant 2 (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**16.5**	**18.0**				
	Nominal	**14.5**	**15.5**	**17.0**				
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**17.0**	**18.0**	**13.0**	**17.0**		
	Nominal	**14.5**	**16.0**	**17.0**	**12.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**17.0**	**18.0**	**13.0**	**17.0**	**13.0**	**16.0**
	Nominal	**14.5**	**16.0**	**17.0**	**12.0**	**16.0**	**12.0**	**15.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**16.0**			**14.0**		**13.0**	
	Nominal	**15.0**			**13.0**		**12.0**	

Mode / Band		Modulated Average - MIMO (dBm)				
Channels		1	2-10	11	12	13
IEEE 802.11g (2.4 GHz)	Maximum	**21.0**		**20.5**	**14.0**	**8.5**
	Nominal	**20.0**		**19.5**	**13.0**	**7.5**
IEEE 802.11n (2.4 GHz)	Maximum	**21.0**		**20.0**	**14.0**	**8.5**
	Nominal	**20.0**		**19.0**	**13.0**	**7.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**14.0**	**8.5**
	Nominal	**15.0**	**16.0**	**14.0**	**13.0**	**7.5**

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**16.5**	**21.0**				
	Nominal	**14.5**	**15.5**	**20.0**				
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**16.5**	**21.0**	**13.0**	**20.0**		
	Nominal	**14.5**	**15.5**	**20.0**	**12.0**	**19.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**16.5**	**21.0**	**13.0**	**20.0**	**13.0**	**19.0**
	Nominal	**14.5**	**15.5**	**20.0**	**12.0**	**19.0**	**12.0**	**18.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**16.0**			**14.0**		**13.0**	
	Nominal	**15.0**			**13.0**		**12.0**	

Mode / Band		Modulated Average - Single Tx Chain (dBm)
Bluetooth	Maximum	**18.5**
	Nominal	**17.5**
Bluetooth LE	Maximum	**11.5**
	Nominal	**10.5**
Bluetooth EDR	Maximum	**12.5**
	Nominal	**11.5**

1.3.5 Reduced SISO and MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I.

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 1				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11g (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11n (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11ax SU (2.4 GHz)	Maximum	16.0	17.0	15.0	11.0	5.5
	Nominal	15.0	16.0	14.0	10.0	4.5

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 2				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11g (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11n (2.4 GHz)	Maximum		17.0		11.0	5.5
	Nominal		16.0		10.0	4.5
IEEE 802.11ax SU (2.4 GHz)	Maximum	16.0	17.0	15.0	11.0	5.5
	Nominal	15.0	16.0	14.0	10.0	4.5

Mode / Band		Modulated Average - MIMO (dBm)				
Channels		1	2-10	11	12	13
IEEE 802.11g (2.4 GHz)	Maximum		20.0		14.0	8.5
	Nominal		19.0		13.0	7.5
IEEE 802.11n (2.4 GHz)	Maximum		20.0		14.0	8.5
	Nominal		19.0		13.0	7.5
IEEE 802.11ax SU (2.4 GHz)	Maximum	16.0	17.0	15.0	14.0	8.5
	Nominal	15.0	16.0	14.0	13.0	7.5

Mode / Band		Modulated Average - Single Tx Chain (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**14.0**				
	Nominal	**13.0**				
IEEE 802.11n (5 GHz)	Maximum	**14.0**	**13.0**	**14.0**		
	Nominal	**13.0**	**12.0**	**13.0**		
IEEE 802.11ac (5 GHz)	Maximum	**14.0**	**13.0**	**14.0**	**13.0**	**14.0**
	Nominal	**13.0**	**12.0**	**13.0**	**12.0**	**13.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**14.0**	**14.0**		**13.0**	
	Nominal	**13.0**	**13.0**		**12.0**	

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**				
	Nominal	**14.5**	**15.5**	**16.0**				
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**	**13.0**	**17.0**		
	Nominal	**14.5**	**15.5**	**16.0**	**12.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**	**13.0**	**17.0**	**13.0**	**17.0**
	Nominal	**14.5**	**15.5**	**16.0**	**12.0**	**16.0**	**12.0**	**16.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**16.0**			**14.0**		**13.0**	
	Nominal	**15.0**			**13.0**		**12.0**	

1.3.6 Maximum Output Power During Conditions with Simultaneous 2.4 GHz WLAN and 5 GHz WLAN

Note: Targets for 802.11ax RU operations can be found in Appendix I.

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 1				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**11.0**	**5.5**
	Nominal	**15.0**	**16.0**	**14.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 2				
Channels		1	2-10	11	12	13
IEEE 802.11b (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum		**17.0**		**11.0**	**5.5**
	Nominal		**16.0**		**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**11.0**	**5.5**
	Nominal	**15.0**	**16.0**	**14.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - MIMO (dBm)				
Channels		1	2-10	11	12	13
IEEE 802.11g (2.4 GHz)	Maximum	**20.0**			**14.0**	**8.5**
	Nominal	**19.0**			**13.0**	**7.5**
IEEE 802.11n (2.4 GHz)	Maximum	**20.0**			**14.0**	**8.5**
	Nominal	**19.0**			**13.0**	**7.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**	**14.0**	**8.5**
	Nominal	**15.0**	**16.0**	**14.0**	**13.0**	**7.5**

Mode / Band		Modulated Average - Single Tx Chain (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**14.0**				
	Nominal	**13.0**				
IEEE 802.11n (5 GHz)	Maximum	**14.0**	**13.0**	**14.0**		
	Nominal	**13.0**	**12.0**	**13.0**		
IEEE 802.11ac (5 GHz)	Maximum	**14.0**	**13.0**	**14.0**	**13.0**	**14.0**
	Nominal	**13.0**	**12.0**	**13.0**	**12.0**	**13.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**14.0**	**14.0**		**13.0**	
	Nominal	**13.0**	**13.0**		**12.0**	

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**				
	Nominal	**14.5**	**15.5**	**16.0**				
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**	**13.0**	**17.0**		
	Nominal	**14.5**	**15.5**	**16.0**	**12.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**16.5**	**17.0**	**13.0**	**17.0**	**13.0**	**17.0**
	Nominal	**14.5**	**15.5**	**16.0**	**12.0**	**16.0**	**12.0**	**16.0**
IEEE 802.11ax SU (5 GHz)	Maximum	**16.0**			**14.0**		**13.0**	
	Nominal	**15.0**			**13.0**		**12.0**	

1.3.7 Reduced Output Power During Conditions with Simultaneous 2.4 GHz WLAN and 5 GHz WLAN

Note: Targets for 802.11ax RU operations can be found in Appendix I.

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 1		
Channels		1-11	12	13
IEEE 802.11b (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - Single Tx Chain (dBm) - Ant 2		
Channels		1-11	12	13
IEEE 802.11b (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11g (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11n (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**
IEEE 802.11ax SU (2.4 GHz)	Maximum	**14.0**	**11.0**	**5.5**
	Nominal	**13.0**	**10.0**	**4.5**

Mode / Band		Modulated Average - MIMO (dBm)				
Channels		1	2-10	11	12	13
IEEE 802.11g (2.4 GHz)	Maximum	17.0			14.0	8.5
	Nominal	16.0			13.0	7.5
IEEE 802.11n (2.4 GHz)	Maximum	17.0			14.0	8.5
	Nominal	16.0			13.0	7.5
IEEE 802.11ax SU (2.4 GHz)	Maximum	16.0	17.0	15.0	14.0	8.5
	Nominal	15.0	16.0	14.0	13.0	7.5

Mode / Band		Modulated Average - Single Tx Chain (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	14.0						
	Nominal	13.0						
IEEE 802.11n (5 GHz)	Maximum	14.0			13.0	14.0		
	Nominal	13.0			12.0	13.0		
IEEE 802.11ac (5 GHz)	Maximum	14.0			13.0	14.0	13.0	14.0
	Nominal	13.0			12.0	13.0	12.0	13.0
IEEE 802.11ax SU (5 GHz)	Maximum	14.0			14.0		13.0	
	Nominal	13.0			13.0		12.0	

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth			40 MHz Bandwidth		80 MHz Bandwidth	
	Channel	36	64	40-60, 100-165	38, 62	46-54, 102-159	42-106	122-155
IEEE 802.11a (5 GHz)	Maximum	15.5	16.5	17.0				
	Nominal	14.5	15.5	16.0				
IEEE 802.11n (5 GHz)	Maximum	15.5	16.5	17.0	13.0	17.0		
	Nominal	14.5	15.5	16.0	12.0	16.0		
IEEE 802.11ac (5 GHz)	Maximum	15.5	16.5	17.0	13.0	17.0	13.0	17.0
	Nominal	14.5	15.5	16.0	12.0	16.0	12.0	16.0
IEEE 802.11ax SU (5 GHz)	Maximum	16.0			14.0		13.0	
	Nominal	15.0			13.0		12.0	

1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix F. Since the diagonal dimension of this device is > 160 mm and <200 mm, it is considered a "phablet."

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	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 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	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 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	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. 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.

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 operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

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	Phablet	Notes
1	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
2	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
3	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered
4	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered
5	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered
6	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
7	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
9	GSM voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
10	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
11	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
12	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
13	UMTS + 2.4 GHz Bluetooth + 5 GHz WIFI	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
14	UMTS + 2.4 GHz Bluetooth + 5 GHz WIFI MIMO	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
15	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
16	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
17	UMTS + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
18	UMTS + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
19	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
20	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
22	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
23	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered
24	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
25	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
26	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
27	LTE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
28	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	Yes	
29	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
30	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^Bluetooth Tethering is considered
31	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI	N/A	N/A	Yes^	Yes	^Bluetooth Tethering is considered
32	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	N/A	N/A	Yes^	Yes	^Bluetooth Tethering is considered
33	GPRS/EDGE + 2.4 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
34	GPRS/EDGE + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
35	GPRS/EDGE + 2.4 GHz WI-FI + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
36	GPRS/EDGE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	

1. 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. 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.
4. 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. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII-2A, and U-NII-2C were not evaluated for wireless router conditions.
6. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac/ax. 802.11a/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. Each WLAN antenna can transmit independently or together when operating with MIMO.
7. This device supports VoLTE.
8. This device supports VoWIFI.
9. This device supports Bluetooth Tethering.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.

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.

Per FCC Guidance, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode.

This device supports IEEE 802.11ax with the following features:

a) Up to 80 MHz Bandwidth only for 5GHz
b) Up to 20 MHz Bandwidth only for 2.4 GHz
c) No aggregate channel configurations
d) 2 Tx antenna output
e) Up to 1024 QAM is supported
f) TDWR and Band gap channels are supported for 5GHz
g) MU-MIMO UL Operations are not supported

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz, U-NII-3 WLAN, and Bluetooth operations since wireless router 1g SAR was < 1.2 W/kg.
This device supports channel 1-13 for 2.4 GHz WLAN. However, due to the reduced output power for channels 12 and 13, channels 1, 6, and 11 were considered for SAR testing per KDB 248227 D01v02r02.

(B) Licensed Transmitter(s)

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

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. The downlink carrier aggregation exclusion analysis can be found in Appendix H.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

This device supports downlink 4x4 MIMO operations for some LTE Bands. Per May 2017 TCB Workshop Guidance, SAR for downlink 4x4 MIMO was not needed since the maximum average output power in 4x4 downlink MIMO mode was not > 0.25 dB higher than the maximum output power with downlink 4x4 MIMO inactive.

This device supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

This device supports LTE Carrier Aggregation (CA) for LTE Band 41 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per 2017 Fall TCB Workshop Notes.

This device supports 64QAM on the uplink and 256QAM on the downlink for LTE Operations. Conducted powers for 64QAM uplink configurations were measured per Section 5.1 of FCC KDB Publication 941225 D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64 QAM is ≤ ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

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)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)

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. The serial numbers used for each test are indicated alongside the results in Section 11.

2 LTE INFORMATION

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	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 13: 5 MHz	779.5 (23205)		782 (23230)		784.5 (23255)
LTE Band 13: 10 MHz	N/A		782 (23230)		N/A
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)		848.3 (27033)
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)		847.5 (27025)
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)		846.5 (27015)
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)		844 (26990)
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)		841.5 (26965)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)		848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)		847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)		846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)		844 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)		1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)		1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)		1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)		1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)		1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)		1745 (20300)
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)		1914.3 (26683)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)		1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)		1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)		1910 (26640)
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)		1907.5 (26615)
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)		1905 (26590)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)		1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)		1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)		1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)		1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)		1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)		1900 (19100)
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	DL UE Cat 20, UL UE Cat 18				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
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 Additional Information	This device does not support full CA features on 3GPP Release 14. It supports carrier aggregation, downlink MIMO features as shown in Section 9 and Appendix H. All other uplink communications are identical to the Release 8 specifications. Uplink communications are done on the PCC unless otherwise specified. The following LTE Release 14 Features are not supported: Wifi Offloading, Relay, HetNet, Enhanced eICIC, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

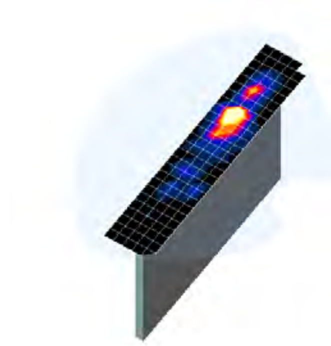


Figure 4-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 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.

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

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

*Also compliant to IEEE 1528-2013 Table 6

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

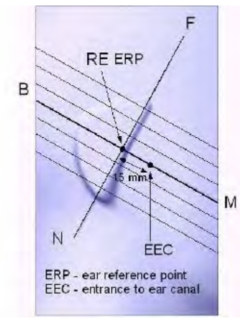


Figure 5-1
Close-Up Side view of ERP

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 than 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

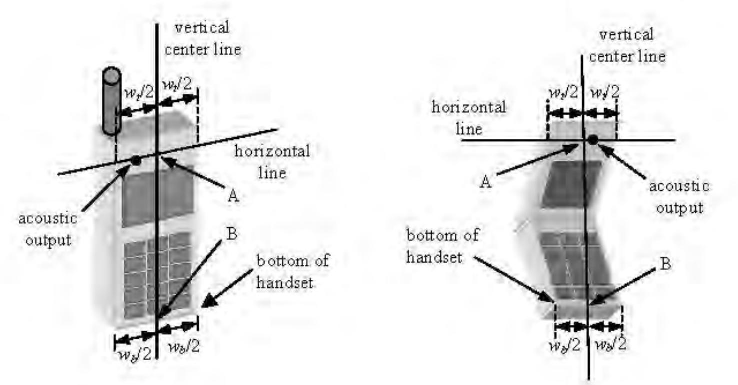


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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 ε = 3 and loss tangent δ = 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 was 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 / 15º 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 15degrees.
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).

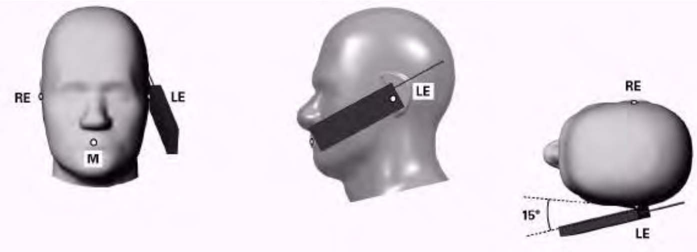


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

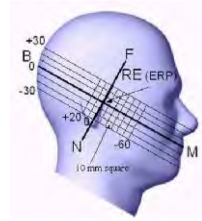


Figure 6-3
Side view w/ relevant markings

6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

6.5 Body-Worn Accessory Configurations

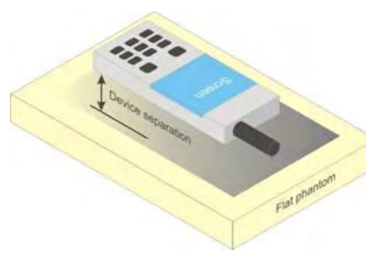


Figure 6-4
Sample Body-Worn Diagram

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not 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 1g body and 10g 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 x W ≥ 9 cm x 5 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.

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

6.9 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user’s body.

When the device’s antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, additional evaluation is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Appendix G.

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antennas.

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

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

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.

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).

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 ½ 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 carrier aggregation is inactive on the PCC. 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 downlink only 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. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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 mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. Per FCC Guidance, 802.11ax was considered a higher order 802.11 mode when compared to a/b/g/n/ac to apply KDB Publication 248227 Guidance. 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, 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). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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

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

9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

Table 9-1
Maximum Conducted Power

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	33.10	33.11	32.01	**29.80**	27.47	27.28	25.60	23.65	22.03
	190	33.17	33.20	32.16	**30.04**	27.86	27.33	25.77	23.74	22.31
	251	33.21	33.22	31.88	**29.86**	27.35	27.32	25.72	23.76	22.21
GSM 1900	512	29.91	30.15	28.98	**26.86**	24.67	26.20	24.32	22.27	20.95
	661	29.88	30.07	28.92	**26.85**	24.65	26.14	24.13	22.33	20.99
	810	29.50	29.89	28.42	**26.26**	24.32	25.58	23.97	21.72	20.81

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 850	128	24.07	24.08	25.99	**25.54**	24.46	18.25	19.58	19.39	19.02
	190	24.14	24.17	26.14	**25.78**	24.85	18.30	19.75	19.48	19.30
	251	24.18	24.19	25.86	**25.60**	24.34	18.29	19.70	19.50	19.20
GSM 1900	512	20.88	21.12	22.96	**22.60**	21.66	17.17	18.30	18.01	17.94
	661	20.85	21.04	22.90	**22.59**	21.64	17.11	18.11	18.07	17.98
	810	20.47	20.86	22.40	**22.00**	21.31	16.55	17.95	17.46	17.80
GSM 850	Frame Avg.Targets:	23.47	23.47	25.48	**25.24**	24.49	17.97	18.98	18.74	18.99
GSM 1900		20.47	20.47	22.48	**22.24**	21.49	16.97	17.98	17.74	17.99

Table 9-2
Reduced Conducted Power - Hotspot/Grip Sensor 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	28.10	28.17	27.00	**24.93**	22.74	25.94	24.25	22.20	20.97
	661	28.05	28.08	26.51	**24.92**	22.62	26.09	24.71	22.17	21.12
	810	27.66	27.71	26.45	**24.21**	22.32	25.56	24.31	22.07	20.89
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	19.07	19.14	20.98	**20.67**	19.73	16.91	18.23	17.94	17.96
	661	19.02	19.05	20.49	**20.66**	19.61	17.06	18.69	17.91	18.11
	810	18.63	18.68	20.43	**19.95**	19.31	16.53	18.29	17.81	17.88

GSM 1900	**Frame Avg.Targets:**	18.47	18.47	20.48	**20.24**	19.49	16.97	17.98	17.74	17.99

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

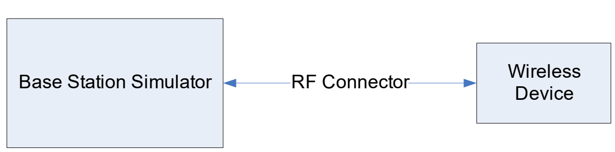


Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-3
Maximum Conducted Power

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.71	24.84	24.67	24.15	24.11	23.77	-
99		12.2 kbps AMR	24.70	24.78	24.64	24.19	24.23	23.83	-
6	HSDPA	Subtest 1	23.63	23.78	23.66	23.03	23.11	22.84	0
6		Subtest 2	23.59	23.79	23.74	23.14	23.12	22.81	0
6		Subtest 3	23.12	23.23	23.13	22.69	22.63	22.34	0.5
6		Subtest 4	23.07	23.30	23.11	22.53	22.62	22.34	0.5
6	HSUPA	Subtest 1	23.58	23.81	23.69	23.14	23.11	22.79	0
6		Subtest 2	21.15	21.29	21.20	21.08	21.06	20.76	2
6		Subtest 3	22.11	22.26	22.11	22.11	22.07	21.84	1
6		Subtest 4	21.14	21.24	21.18	21.09	21.06	20.79	2
6		Subtest 5	23.15	23.33	23.21	23.13	23.12	22.81	0
8	DC-HSDPA	Subtest 1	23.59	23.75	23.30	22.93	22.99	22.69	0
8		Subtest 2	23.61	23.77	23.65	22.79	23.01	22.72	0
8		Subtest 3	23.20	23.27	23.26	22.48	22.52	22.24	0.5
8		Subtest 4	23.19	23.29	23.22	22.51	22.50	22.21	0.5

Table 9-4
Reduced Conducted Power – Hotspot Mode Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	20.08	20.13	19.78	-
99		12.2 kbps AMR	20.13	20.11	19.84	-
6	HSDPA	Subtest 1	19.07	19.06	18.80	0
6		Subtest 2	19.12	19.07	18.84	0
6		Subtest 3	18.53	18.54	18.18	0.5
6		Subtest 4	18.49	18.53	18.26	0.5
6	HSUPA	Subtest 1	19.13	19.10	18.82	0
6		Subtest 2	17.09	17.11	16.83	2
6		Subtest 3	18.11	18.10	17.82	1
6		Subtest 4	17.08	17.11	16.80	2
6		Subtest 5	19.11	19.12	18.79	0
8	DC-HSDPA	Subtest 1	18.97	18.99	18.73	0
8		Subtest 2	19.01	18.99	18.69	0
8		Subtest 3	18.48	18.48	18.21	0.5
8		Subtest 4	18.52	18.51	18.19	0.5

Table 9-5
Reduced Conducted Powers - Grip Sensor Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	21.78	21.70	21.37	-
99		12.2 kbps AMR	21.55	21.59	21.35	-
6	HSDPA	Subtest 1	20.63	20.60	20.34	0
6		Subtest 2	20.53	20.63	20.36	0
6		Subtest 3	20.12	20.11	19.86	0.5
6		Subtest 4	20.05	20.13	19.81	0.5
6	HSUPA	Subtest 1	20.55	20.56	20.26	0
6		Subtest 2	18.59	18.62	18.34	2
6		Subtest 3	19.57	19.62	19.33	1
6		Subtest 4	18.58	18.61	18.33	2
6		Subtest 5	20.63	20.56	20.33	0
8	DC-HSDPA	Subtest 1	20.52	20.49	20.24	0
8		Subtest 2	20.48	20.52	20.19	0
8		Subtest 3	20.01	20.02	19.69	0.5
8		Subtest 4	19.98	20.01	19.67	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.

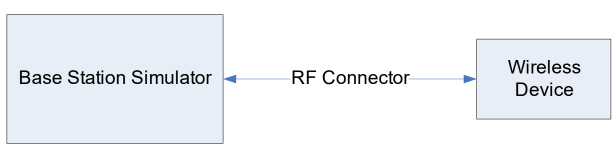


Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

9.3.1 LTE Band 12

Table 9-6
LTE Band 12 Conducted Powers - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.01**	0	0
	1	25	23.41		0
	1	49	23.88		0
	25	0	**23.05**	0-1	1
	25	12	22.98		1
	25	25	22.89		1
	50	0	23.00		1
16QAM	1	0	23.16	0-1	1
	1	25	22.80		1
	1	49	23.00		1
	25	0	22.00	0-2	2
	25	12	21.95		2
	25	25	21.86		2
	50	0	21.94		2
64QAM	1	0	22.22	0-2	2
	1	25	21.72		2
	1	49	22.02		2
	25	0	21.01	0-3	3
	25	12	20.95		3
	25	25	20.88		3
	50	0	20.91		3

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 9-7
LTE Band 12 Conducted Powers - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.93	23.99	23.80	0	0
	1	12	24.00	24.04	23.86		0
	1	24	23.89	24.02	23.74		0
	12	0	23.13	23.28	22.94	0-1	1
	12	6	23.20	23.28	22.98		1
	12	13	23.12	23.24	22.93		1
	25	0	23.16	23.27	22.93		1
16QAM	1	0	23.25	23.18	23.07	0-1	1
	1	12	23.30	23.26	23.13		1
	1	24	23.17	23.15	22.97		1
	12	0	22.15	22.25	21.96	0-2	2
	12	6	22.22	22.18	21.99		2
	12	13	22.14	22.14	21.98		2
	25	0	22.14	22.10	21.91		2
64QAM	1	0	22.23	22.15	22.08	0-2	2
	1	12	22.21	22.25	22.10		2
	1	24	22.15	22.13	22.05		2
	12	0	21.19	21.19	20.97	0-3	3
	12	6	21.27	21.19	21.00		3
	12	13	21.18	21.11	20.96		3
	25	0	21.20	21.11	20.94		3

Table 9-8
LTE Band 12 Conducted Powers - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.97	23.89	23.85	0	0
	1	7	23.95	23.88	23.79		0
	1	14	23.96	23.88	23.75		0
	8	0	23.10	23.05	22.94	0-1	1
	8	4	23.14	23.08	22.95		1
	8	7	23.12	23.02	22.89		1
	15	0	23.19	23.09	23.00		1
16QAM	1	0	23.14	23.13	23.13	0-1	1
	1	7	23.14	23.16	23.07		1
	1	14	23.21	23.06	23.05		1
	8	0	22.09	22.08	22.00	0-2	2
	8	4	22.17	22.11	21.97		2
	8	7	22.16	22.06	21.94		2
	15	0	22.13	22.03	21.94		2
64QAM	1	0	22.17	22.12	22.12	0-2	2
	1	7	22.18	22.13	22.10		2
	1	14	22.21	22.14	22.08		2
	8	0	21.10	21.10	21.00	0-3	3
	8	4	21.18	21.11	20.98		3
	8	7	21.13	21.03	20.96		3
	15	0	21.15	21.07	20.94		3

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

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.91	23.89	23.64	0	0
	1	2	23.98	23.96	23.77		0
	1	5	23.93	23.89	23.66		0
	3	0	23.93	23.86	23.68		0
	3	2	23.99	23.95	23.78		0
	3	3	23.91	23.90	23.69		0
	6	0	23.06	23.03	22.84	0-1	1
16QAM	1	0	23.17	23.20	23.01	0-1	1
	1	2	23.23	23.24	23.11		1
	1	5	23.14	23.19	23.01		1
	3	0	23.09	23.04	22.86		1
	3	2	23.13	23.13	22.92		1
	3	3	23.04	23.08	22.90		1
	6	0	22.12	22.08	21.84	0-2	2
64QAM	1	0	22.13	22.16	21.92	0-2	2
	1	2	22.22	22.16	22.06		2
	1	5	22.15	22.11	22.02		2
	3	0	22.12	22.05	21.87		2
	3	2	22.17	22.11	22.03		2
	3	3	22.10	22.06	21.96		2
	6	0	21.06	20.97	20.81	0-3	3

9.3.2 LTE Band 13

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

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**23.79**	0	0
	1	25	23.20		0
	1	49	23.76		0
	25	0	22.78	0-1	1
	25	12	**22.81**		1
	25	25	22.76		1
	50	0	22.75		1
16QAM	1	0	22.89	0-1	1
	1	25	22.53		1
	1	49	22.97		1
	25	0	21.72	0-2	2
	25	12	21.70		2
	25	25	21.72		2
	50	0	21.71		2
64QAM	1	0	21.98	0-2	2
	1	25	21.35		2
	1	49	21.93		2
	25	0	20.80	0-3	3
	25	12	20.98		3
	25	25	20.75		3
	50	0	20.75		3

Table 9-11
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	**RB Size**	**RB Offset**	**Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
QPSK	1	0	23.78	0	0
	1	12	23.80		0
	1	24	23.80		0
	12	0	22.92	0-1	1
	12	6	22.80		1
	12	13	22.71		1
	25	0	22.95		1
16QAM	1	0	23.01	0-1	1
	1	12	23.04		1
	1	24	22.98		1
	12	0	22.17	0-2	2
	12	6	22.20		2
	12	13	21.88		2
	25	0	21.94		2
64QAM	1	0	21.97	0-2	2
	1	12	22.02		2
	1	24	21.96		2
	12	0	20.94	0-3	3
	12	6	21.06		3
	12	13	20.98		3
	25	0	20.84		3

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.

9.3.3 LTE Band 26 (Cell)

Table 9-12
LTE Band 26 (Cell) Conducted Powers - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 26865 (831.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.20	0	0
	1	36	**24.21**		0
	1	74	24.16		0
	36	0	**23.41**	0-1	1
	36	18	23.36		1
	36	37	23.30		1
	75	0	23.40		1
16QAM	1	0	23.50	0-1	1
	1	36	23.50		1
	1	74	23.49		1
	36	0	22.33	0-2	2
	36	18	22.35		2
	36	37	22.31		2
	75	0	22.33		2
64QAM	1	0	22.47	0-2	2
	1	36	22.49		2
	1	74	22.41		2
	36	0	21.34	0-3	3
	36	18	21.40		3
	36	37	21.29		3
	75	0	21.32		3

Note: LTE Band 26 (Cell) at 15 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 9-13
LTE Band 26 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26740 (819.0 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 26990 (844.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.11	24.18	24.24	0	0
	1	25	23.84	24.08	24.01		0
	1	49	24.08	24.11	24.10		0
	25	0	23.26	23.37	23.36	0-1	1
	25	12	23.21	23.37	23.27		1
	25	25	23.15	23.29	23.18		1
	50	0	23.21	23.39	23.27		1
16QAM	1	0	23.30	23.45	23.37	0-1	1
	1	25	23.02	23.12	22.91		1
	1	49	23.32	23.34	23.36		1
	25	0	22.25	22.37	22.32	0-2	2
	25	12	22.19	22.34	22.26		2
	25	25	22.13	22.27	22.19		2
	50	0	22.17	22.34	22.25		2
64QAM	1	0	22.42	22.49	22.40	0-2	2
	1	25	21.70	22.20	22.18		2
	1	49	22.31	22.34	22.30		2
	25	0	21.32	21.40	21.36	0-3	3
	25	12	21.20	21.39	21.31		3
	25	25	21.14	21.27	21.19		3
	50	0	21.22	21.33	21.27		3

Table 9-14
LTE Band 26 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26715 (816.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27015 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.04	24.20	24.10	0	0
	1	12	24.10	24.21	24.18		0
	1	24	24.08	24.17	24.04		0
	12	0	23.18	23.30	23.31	0-1	1
	12	6	23.27	23.40	23.30		1
	12	13	23.23	23.38	23.20		1
	25	0	23.23	23.32	23.22		1
16QAM	1	0	23.27	23.50	23.30	0-1	1
	1	12	23.38	23.49	23.33		1
	1	24	23.32	23.46	23.32		1
	12	0	22.22	22.35	22.21	0-2	2
	12	6	22.35	22.41	22.36		2
	12	13	22.10	22.39	22.23		2
	25	0	22.19	22.31	22.17		2
64QAM	1	0	22.27	22.49	22.39	0-2	2
	1	12	22.45	22.50	22.36		2
	1	24	22.23	22.47	22.29		2
	12	0	21.19	21.39	21.24	0-3	3
	12	6	21.25	21.42	21.33		3
	12	13	21.24	21.41	21.24		3
	25	0	21.22	21.34	21.18		3

Table 9-15
LTE Band 26 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26705 (815.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27025 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.01	24.21	24.16	0	0
	1	7	24.07	24.25	24.08		0
	1	14	24.09	24.26	24.06		0
	8	0	23.15	23.32	23.28	0-1	1
	8	4	23.20	23.33	23.27		1
	8	7	23.17	23.38	23.23		1
	15	0	23.24	23.40	23.29		1
16QAM	1	0	23.30	23.48	23.27	0-1	1
	1	7	23.43	23.50	23.39		1
	1	14	23.42	23.46	23.22		1
	8	0	22.16	22.32	22.35	0-2	2
	8	4	22.20	22.34	22.28		2
	8	7	22.27	22.37	22.26		2
	15	0	22.19	22.30	22.21		2
64QAM	1	0	22.32	22.43	22.41	0-2	2
	1	7	22.30	22.46	22.33		2
	1	14	22.43	22.49	22.36		2
	8	0	21.19	21.40	21.35	0-3	3
	8	4	21.24	21.29	21.32		3
	8	7	21.20	21.40	21.27		3
	15	0	21.21	21.29	21.19		3

Table 9-16
LTE Band 26 (Cell) Conducted Powers -1.4 MHz Bandwidth

LTE Band 26 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26697 (814.7 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27033 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.98	24.07	24.04	0	0
	1	2	24.17	24.21	24.06		0
	1	5	24.08	24.16	24.02		0
	3	0	24.03	24.11	24.04		0
	3	2	24.05	24.23	24.07		0
	3	3	24.00	24.20	24.04		0
	6	0	23.17	23.27	23.19	0-1	1
16QAM	1	0	23.30	23.43	23.25	0-1	1
	1	2	23.45	23.50	23.39		1
	1	5	23.50	23.48	23.28		1
	3	0	23.20	23.30	23.18		1
	3	2	23.32	23.32	23.20		1
	3	3	23.20	23.25	23.19		1
	6	0	22.21	22.31	22.21	0-2	2
64QAM	1	0	22.26	22.41	22.36	0-2	2
	1	2	22.41	22.50	22.23		2
	1	5	22.36	22.46	22.15		2
	3	0	22.26	22.37	22.23		2
	3	2	22.34	22.48	22.25		2
	3	3	22.27	22.41	22.25		2
	6	0	21.11	21.24	21.07	0-3	3

9.3.4 LTE Band 5 (Cell)

Table 9-17
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.89**	0	0
	1	25	24.75		0
	1	49	24.82		0
	25	0	**23.95**	0-1	1
	25	12	23.88		1
	25	25	23.78		1
	50	0	23.87		1
16QAM	1	0	24.17	0-1	1
	1	25	24.03		1
	1	49	24.05		1
	25	0	23.00	0-2	2
	25	12	22.92		2
	25	25	22.81		2
	50	0	22.82		2
64QAM	1	0	22.95	0-2	2
	1	25	22.94		2
	1	49	23.05		2
	25	0	22.01	0-3	3
	25	12	21.93		3
	25	25	21.78		3
	50	0	21.93		3

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 9-18
LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.50	24.67	24.59	0	0
	1	12	24.66	24.70	24.57		0
	1	24	24.62	24.61	24.41		0
	12	0	23.70	23.78	23.72	0-1	1
	12	6	23.80	23.79	23.76		1
	12	13	23.76	23.83	23.71		1
	25	0	23.76	23.77	23.72		1
16QAM	1	0	23.76	23.86	23.85	0-1	1
	1	12	23.94	24.00	23.99		1
	1	24	23.92	23.98	23.72		1
	12	0	22.74	22.80	22.76	0-2	2
	12	6	22.81	22.79	22.73		2
	12	13	22.79	22.84	22.77		2
	25	0	22.74	22.72	22.69		2
64QAM	1	0	22.80	22.86	22.87	0-2	2
	1	12	22.86	23.00	23.02		2
	1	24	22.89	22.84	22.71		2
	12	0	21.77	21.82	21.78	0-3	3
	12	6	21.81	21.84	21.80		3
	12	13	21.80	21.83	21.77		3
	25	0	21.82	21.75	21.70		3

Table 9-19
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.60	24.64	24.51	0	0
	1	7	24.63	24.79	24.50		0
	1	14	24.65	24.74	24.21		0
	8	0	23.67	23.65	23.75	0-1	1
	8	4	23.81	23.73	23.77		1
	8	7	23.80	23.78	23.66		1
	15	0	23.82	23.83	23.77		1
16QAM	1	0	23.97	23.91	23.78	0-1	1
	1	7	23.93	24.06	23.71		1
	1	14	23.90	24.08	23.65		1
	8	0	22.81	22.86	22.79	0-2	2
	8	4	22.85	22.86	22.83		2
	8	7	22.83	22.85	22.79		2
	15	0	22.80	22.78	22.77		2
64QAM	1	0	22.92	22.95	22.90	0-2	2
	1	7	22.81	22.94	22.84		2
	1	14	22.99	22.50	22.50		2
	8	0	21.78	21.81	21.75	0-3	3
	8	4	21.87	21.88	21.83		3
	8	7	21.87	21.81	21.81		3
	15	0	21.79	21.80	21.80		3

Table 9-20
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 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.48	24.59	24.47	0	0
	1	2	24.62	24.71	24.48		0
	1	5	24.55	24.63	24.23		0
	3	0	24.52	24.62	24.43		0
	3	2	24.58	24.72	24.38		0
	3	3	24.54	24.64	24.28		0
	6	0	23.67	23.79	23.76	0-1	1
16QAM	1	0	23.77	23.94	23.71	0-1	1
	1	2	23.91	23.95	23.49		1
	1	5	23.79	23.93	23.56		1
	3	0	23.73	23.77	23.66		1
	3	2	23.74	23.79	23.63		1
	3	3	23.70	23.83	23.55		1
	6	0	22.70	22.81	22.67	0-2	2
64QAM	1	0	22.77	22.85	22.82	0-2	2
	1	2	22.84	22.96	22.91		2
	1	5	22.83	22.92	22.64		2
	3	0	22.75	22.79	22.79		2
	3	2	22.80	22.95	22.76		2
	3	3	22.75	22.87	22.66		2
	6	0	21.54	21.72	21.63	0-3	3

9.3.5 LTE Band 4 (AWS)

Table 9-21
LTE Band 4 (AWS) Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.93**	0	0
	1	50	24.90		0
	1	99	24.92		0
	50	0	**23.89**	0-1	1
	50	25	23.86		1
	50	50	23.82		1
	100	0	23.86		1
16QAM	1	0	23.96	0-1	1
	1	50	23.86		1
	1	99	23.84		1
	50	0	22.93	0-2	2
	50	25	22.94		2
	50	50	22.88		2
	100	0	22.89		2
64QAM	1	0	22.79	0-2	2
	1	50	22.76		2
	1	99	22.74		2
	50	0	21.91	0-3	3
	50	25	21.91		3
	50	50	21.87		3
	100	0	21.85		3

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 9-22
LTE Band 4 (AWS) Maximum Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.65	24.85	24.66	0	0
	1	36	24.56	24.72	24.51		0
	1	74	24.57	24.64	24.49		0
	36	0	23.65	23.66	23.60	0-1	1
	36	18	23.65	23.63	23.63		1
	36	37	23.56	23.64	23.60		1
	75	0	23.63	23.68	23.64		1
16QAM	1	0	24.00	23.96	23.70	0-1	1
	1	36	23.98	23.83	23.66		1
	1	74	23.99	23.82	23.80		1
	36	0	22.65	22.73	22.63	0-2	2
	36	18	22.64	22.63	22.60		2
	36	37	22.61	22.65	22.51		2
	75	0	22.62	22.63	22.67		2
64QAM	1	0	22.27	22.52	22.51	0-2	2
	1	36	22.20	22.41	22.45		2
	1	74	22.41	22.47	22.45		2
	36	0	21.28	21.47	21.19	0-3	3
	36	18	21.25	21.32	21.42		3
	36	37	21.24	21.41	21.39		3
	75	0	21.23	21.43	21.37		3

Table 9-23
LTE Band 4 (AWS) Maximum Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
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	24.28	24.35	24.20	0	0
	1	25	24.22	24.28	24.13		0
	1	49	24.20	24.31	24.12		0
	25	0	23.41	23.46	23.40	0-1	1
	25	12	23.39	23.50	23.38		1
	25	25	23.38	23.47	23.37		1
	50	0	23.38	23.45	23.40		1
16QAM	1	0	23.44	24.00	23.56	0-1	1
	1	25	23.40	23.86	23.52		1
	1	49	23.31	23.91	23.50		1
	25	0	22.40	22.55	22.47	0-2	2
	25	12	22.40	22.51	22.46		2
	25	25	22.38	22.50	22.43		2
	50	0	22.35	22.48	22.43		2
64QAM	1	0	22.16	22.42	22.33	0-2	2
	1	25	22.19	22.29	22.37		2
	1	49	22.13	22.23	22.31		2
	25	0	21.10	21.21	21.18	0-3	3
	25	12	21.10	21.23	21.22		3
	25	25	21.11	21.22	21.12		3
	50	0	21.09	21.33	21.23		3

Table 9-24
LTE Band 4 (AWS) Maximum Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
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	24.30	24.28	24.38	0	0
	1	12	24.40	24.38	24.42		0
	1	24	24.33	24.34	24.34		0
	12	0	23.43	23.50	23.45	0-1	1
	12	6	23.48	23.54	23.47		1
	12	13	23.47	23.50	23.46		1
	25	0	23.46	23.45	23.47		1
16QAM	1	0	23.60	23.51	23.64	0-1	1
	1	12	23.71	23.56	23.65		1
	1	24	23.68	23.57	23.59		1
	12	0	22.37	22.46	22.48	0-2	2
	12	6	22.46	22.50	22.50		2
	12	13	22.42	22.51	22.47		2
	25	0	22.41	22.47	22.51		2
64QAM	1	0	22.06	22.30	22.32	0-2	2
	1	12	22.18	22.37	22.34		2
	1	24	22.17	22.35	22.31		2
	12	0	21.09	21.30	21.34	0-3	3
	12	6	21.20	21.36	21.36		3
	12	13	21.23	21.35	21.31		3
	25	0	21.11	21.21	21.28		3

Table 9-25
LTE Band 4 (AWS) Maximum Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.35	24.40	24.26	0	0
	1	7	24.31	24.41	24.31		0
	1	14	24.38	24.41	24.21		0
	8	0	23.46	23.55	23.44	0-1	1
	8	4	23.47	23.54	23.43		1
	8	7	23.42	23.52	23.42		1
	15	0	23.46	23.48	23.44		1
16QAM	1	0	23.45	23.95	23.61	0-1	1
	1	7	23.46	23.91	23.62		1
	1	14	23.45	23.96	23.55		1
	8	0	22.42	22.62	22.61	0-2	2
	8	4	22.43	22.65	22.48		2
	8	7	22.39	22.63	22.45		2
	15	0	22.46	22.58	22.85		2
64QAM	1	0	22.15	22.38	22.39	0-2	2
	1	7	22.17	22.40	22.35		2
	1	14	22.18	22.35	22.37		2
	8	0	20.62	21.32	21.30	0-3	3
	8	4	21.15	21.37	21.29		3
	8	7	21.10	21.30	21.25		3
	15	0	21.07	21.26	21.24		3

Table 9-26
LTE Band 4 (AWS) Maximum Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
QPSK	1	0	24.22	24.43	24.14	0	0
	1	2	24.34	24.52	24.22		0
	1	5	24.26	24.47	24.12		0
	3	0	24.31	24.41	24.31		0
	3	2	24.39	24.47	24.39		0
	3	3	24.31	24.40	24.32		0
	6	0	23.41	23.40	23.69	0-1	1
16QAM	1	0	23.36	23.31	23.51	0-1	1
	1	2	23.49	23.38	23.57		1
	1	5	23.41	23.32	23.50		1
	3	0	23.34	23.46	23.21		1
	3	2	23.37	23.53	23.26		1
	3	3	23.33	23.50	23.24		1
	6	0	22.40	22.59	22.46	0-2	2
64QAM	1	0	21.99	22.13	22.22	0-2	2
	1	2	22.13	22.27	22.34		2
	1	5	22.09	22.24	22.25		2
	3	0	22.00	22.16	22.16		2
	3	2	22.05	22.23	22.21		2
	3	3	21.97	22.14	22.22		2
	6	0	20.96	21.18	21.13	0-3	3

Table 9-27
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**20.97**	0	0
	1	50	20.88		0
	1	99	20.76		0
	50	0	20.79	0-1	0
	50	25	**20.80**		0
	50	50	20.75		0
	100	0	20.77		0
16QAM	1	0	20.95	0-1	0
	1	50	20.71		0
	1	99	20.75		0
	50	0	20.86	0-2	0
	50	25	20.84		0
	50	50	20.85		0
	100	0	20.81		0
64QAM	1	0	20.95	0-2	0
	1	50	20.74		0
	1	99	20.75		0
	50	0	20.89	0-3	0
	50	25	20.89		0
	50	50	20.85		0
	100	0	20.87		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 9-28
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.32	20.95	20.63	0	0
	1	36	20.69	20.87	20.84		0
	1	74	20.14	20.76	20.52		0
	36	0	20.51	20.85	20.87	0-1	0
	36	18	20.65	20.94	20.94		0
	36	37	20.52	20.86	20.54		0
	75	0	20.55	20.81	20.61		0
16QAM	1	0	20.59	20.76	20.85	0-1	0
	1	36	20.79	20.79	20.90		0
	1	74	20.70	20.73	20.74		0
	36	0	20.53	20.76	20.51	0-2	0
	36	18	20.68	20.84	20.62		0
	36	37	20.55	20.72	20.54		0
	75	0	20.56	20.70	20.50		0
64QAM	1	0	20.63	20.90	20.57	0-2	0
	1	36	20.64	20.87	20.87		0
	1	74	20.55	20.72	20.65		0
	36	0	20.52	20.68	20.87	0-3	0
	36	18	20.61	20.81	20.91		0
	36	37	20.50	20.69	20.50		0
	75	0	20.50	20.68	20.51		0

Table 9-29
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.36	20.77	20.64	0	0
	1	25	20.71	20.43	20.85		0
	1	49	20.34	20.70	20.72		0
	25	0	20.96	20.76	20.92	0-1	0
	25	12	20.58	20.78	20.82		0
	25	25	20.77	20.76	20.88		0
	50	0	20.78	20.78	20.91		0
16QAM	1	0	20.65	20.94	20.69	0-1	0
	1	25	20.47	20.74	20.69		0
	1	49	20.70	20.89	20.59		0
	25	0	20.77	20.61	20.93	0-2	0
	25	12	20.39	20.64	20.82		0
	25	25	20.32	20.63	20.89		0
	50	0	20.46	20.62	20.90		0
64QAM	1	0	20.61	20.88	20.57	0-2	0
	1	25	20.69	20.69	20.85		0
	1	49	20.66	20.87	20.52		0
	25	0	20.92	20.66	20.91	0-3	0
	25	12	20.89	20.62	20.82		0
	25	25	20.65	20.61	20.88		0
	50	0	20.69	20.64	20.92		0

Table 9-30
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
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	20.62	20.89	20.93	0	0
	1	12	20.90	20.86	20.82		0
	1	24	20.71	20.88	20.86		0
	12	0	20.88	20.86	20.87	0-1	0
	12	6	20.92	20.88	20.84		0
	12	13	20.95	20.83	20.84		0
	25	0	20.95	20.72	20.92		0
16QAM	1	0	20.89	20.82	20.91	0-1	0
	1	12	20.83	20.98	20.94		0
	1	24	20.97	20.81	20.85		0
	12	0	20.97	20.79	20.82	0-2	0
	12	6	20.90	20.86	20.99		0
	12	13	20.94	20.75	20.97		0
	25	0	20.95	20.62	20.95		0
64QAM	1	0	20.83	20.76	20.92	0-2	0
	1	12	20.88	20.95	20.96		0
	1	24	20.90	20.77	20.91		0
	12	0	20.94	20.78	20.96	0-3	0
	12	6	20.87	20.82	20.93		0
	12	13	20.98	20.71	20.95		0
	25	0	20.92	20.65	20.93		0

Table 9-31
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.49	20.92	20.74	0	0
	1	7	20.60	20.93	20.92		0
	1	14	20.54	20.95	20.65		0
	8	0	20.62	20.97	20.77	0-1	0
	8	4	20.72	20.91	20.80		0
	8	7	20.71	20.98	20.76		0
	15	0	20.70	20.90	20.80		0
16QAM	1	0	20.74	20.96	20.94	0-1	0
	1	7	20.90	20.98	20.88		0
	1	14	20.87	20.94	20.85		0
	8	0	20.79	20.97	20.93	0-2	0
	8	4	20.87	20.89	20.92		0
	8	7	20.85	20.85	20.91		0
	15	0	20.80	20.81	20.90		0
64QAM	1	0	20.81	20.88	20.94	0-2	0
	1	7	20.92	20.92	20.88		0
	1	14	20.85	20.87	20.95		0
	8	0	20.73	20.87	20.98	0-3	0
	8	4	20.84	20.93	20.93		0
	8	7	20.80	20.95	20.90		0
	15	0	20.82	20.98	20.90		0

Table 9-32
LTE Band 4 (AWS) Hotspot Reduced Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.62	20.73	20.71	0	0
	1	2	20.54	20.72	20.42		0
	1	5	20.41	20.64	20.59		0
	3	0	20.49	20.69	20.62		0
	3	2	20.47	20.74	20.76		0
	3	3	20.35	20.66	20.71		0
	6	0	20.46	20.79	20.87	0-1	0
16QAM	1	0	20.63	20.93	20.95	0-1	0
	1	2	20.76	20.92	20.84		0
	1	5	20.66	20.86	20.86		0
	3	0	20.55	20.92	20.91		0
	3	2	20.57	20.90	20.96		0
	3	3	20.50	20.84	20.89		0
	6	0	20.55	20.92	20.91	0-2	0
64QAM	1	0	20.68	20.92	20.82	0-2	0
	1	2	20.80	20.89	20.95		0
	1	5	20.69	20.92	20.97		0
	3	0	20.62	20.94	20.93		0
	3	2	20.65	20.88	20.95		0
	3	3	20.63	20.94	20.88		0
	6	0	20.56	20.93	20.86	0-3	0

Table 9-33
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**21.42**	0	0
	1	50	21.27		0
	1	99	21.24		0
	50	0	**21.31**	0-1	0
	50	25	21.29		0
	50	50	21.30		0
	100	0	21.27		0
16QAM	1	0	21.47	0-1	0
	1	50	21.29		0
	1	99	21.26		0
	50	0	21.37	0-2	0
	50	25	21.36		0
	50	50	21.31		0
	100	0	21.32		0
64QAM	1	0	21.45	0-2	0
	1	50	21.30		0
	1	99	21.26		0
	50	0	21.44	0-3	0
	50	25	21.43		0
	50	50	21.38		0
	100	0	21.37		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 9-34
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	21.41	21.45	21.35	0	0
	1	36	21.30	21.35	21.21		0
	1	74	21.41	21.33	21.32		0
	36	0	21.46	21.48	21.41	0-1	0
	36	18	21.48	21.46	21.39		0
	36	37	21.47	21.50	21.36		0
	75	0	21.46	21.44	21.41		0
16QAM	1	0	21.49	21.49	21.45	0-1	0
	1	36	21.45	21.47	21.29		0
	1	74	21.43	21.45	21.34		0
	36	0	21.50	21.49	21.21	0-2	0
	36	18	21.46	21.48	21.43		0
	36	37	21.44	21.48	21.35		0
	75	0	21.49	21.50	21.40		0
64QAM	1	0	21.49	21.50	21.48	0-2	0
	1	36	21.45	21.49	21.38		0
	1	74	21.47	21.46	21.47		0
	36	0	21.47	21.49	21.36	0-3	0
	36	18	21.44	21.48	21.43		0
	36	37	21.41	21.43	21.40		0
	75	0	21.41	21.48	21.37		0

Table 9-35
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
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	21.15	21.21	21.21	0	0
	1	25	21.13	21.22	21.10		0
	1	49	21.05	21.20	21.14		0
	25	0	21.23	21.32	21.21	0-1	0
	25	12	21.25	21.32	21.23		0
	25	25	21.20	21.26	21.20		0
	50	0	21.25	21.31	21.21		0
16QAM	1	0	21.22	21.33	21.17	0-1	0
	1	25	21.19	21.32	21.23		0
	1	49	21.15	21.22	21.14		0
	25	0	21.23	21.28	21.23	0-2	0
	25	12	21.23	21.31	21.18		0
	25	25	21.20	21.25	21.16		0
	50	0	21.20	21.29	21.16		0
64QAM	1	0	21.36	21.49	21.37	0-2	0
	1	25	21.36	21.41	21.37		0
	1	49	21.32	21.39	21.32		0
	25	0	21.22	21.30	21.26	0-3	0
	25	12	21.25	21.30	21.33		0
	25	25	21.24	21.27	21.23		0
	50	0	21.24	21.30	21.20		0

Table 9-36
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.25	21.35	21.34	0	0
	1	12	21.37	21.46	21.36		0
	1	24	21.33	21.32	21.31		0
	12	0	21.36	21.42	21.36	0-1	0
	12	6	21.43	21.50	21.37		0
	12	13	21.42	21.46	21.33		0
	25	0	21.39	21.40	21.38		0
16QAM	1	0	21.28	21.42	21.24	0-1	0
	1	12	21.41	21.48	21.31		0
	1	24	21.35	21.42	21.28		0
	12	0	21.34	21.40	21.32	0-2	0
	12	6	21.43	21.50	21.35		0
	12	13	21.39	21.47	21.28		0
	25	0	21.38	21.40	21.32		0
64QAM	1	0	21.40	21.49	21.47	0-2	0
	1	12	21.48	21.50	21.47		0
	1	24	21.48	21.47	21.46		0
	12	0	21.40	21.49	21.44	0-3	0
	12	6	21.50	21.50	21.47		0
	12	13	21.45	21.49	21.43		0
	25	0	21.45	21.40	21.41		0

Table 9-37
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.42	21.47	21.40	0	0
	1	7	21.38	21.39	21.35		0
	1	14	21.41	21.39	21.47		0
	8	0	21.33	21.43	21.38	0-1	0
	8	4	21.43	21.47	21.42		0
	8	7	21.46	21.42	21.39		0
	15	0	21.47	21.48	21.43		0
16QAM	1	0	21.38	21.42	21.45	0-1	0
	1	7	21.45	21.44	21.39		0
	1	14	21.37	21.48	21.44		0
	8	0	21.42	21.45	21.42	0-2	0
	8	4	21.47	21.49	21.45		0
	8	7	21.46	21.49	21.41		0
	15	0	21.42	21.45	21.41		0
64QAM	1	0	21.49	21.50	21.45	0-2	0
	1	7	21.49	21.47	21.43		0
	1	14	21.50	21.49	21.47		0
	8	0	21.41	21.46	21.46	0-3	0
	8	4	21.50	21.47	21.50		0
	8	7	21.48	21.50	21.42		0
	15	0	21.50	21.44	21.45		0

Table 9-38
LTE Band 4 (AWS) Grip Sensor Active Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	21.24	21.41	21.28	0	0
	1	2	21.38	21.42	21.33		0
	1	5	21.31	21.40	21.25		0
	3	0	21.29	21.42	21.29		0
	3	2	21.35	21.45	21.31		0
	3	3	21.32	21.38	21.27		0
	6	0	21.41	21.48	21.39	0-1	0
16QAM	1	0	21.30	21.44	21.41	0-1	0
	1	2	21.46	21.49	21.37		0
	1	5	21.41	21.43	21.36		0
	3	0	21.44	21.45	21.37		0
	3	2	21.40	21.49	21.41		0
	3	3	21.47	21.50	21.33		0
	6	0	21.40	21.47	21.40	0-2	0
64QAM	1	0	21.47	21.49	21.46	0-2	0
	1	2	21.50	21.50	21.50		0
	1	5	21.48	21.49	21.44		0
	3	0	21.50	21.48	21.50		0
	3	2	21.49	21.45	21.45		0
	3	3	21.45	21.46	21.45		0
	6	0	21.48	21.47	21.42	0-3	0

9.3.6 LTE Band 25 (PCS)

Table 9-39
LTE Band 25 (PCS) Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**24.16**	24.12	24.10	0	0
	1	50	23.83	23.64	23.62		0
	1	99	24.09	23.75	23.55		0
	50	0	**23.30**	23.24	23.07	0-1	1
	50	25	23.24	23.19	22.98		1
	50	50	23.23	22.64	22.86		1
	100	0	23.24	23.22	23.02		1
16QAM	1	0	23.42	23.35	23.15	0-1	1
	1	50	23.02	23.01	22.87		1
	1	99	23.33	23.07	22.89		1
	50	0	22.26	22.23	21.99	0-2	2
	50	25	22.23	22.22	22.01		2
	50	50	22.22	21.56	21.74		2
	100	0	22.25	22.21	22.00		2
64QAM	1	0	22.36	22.35	22.17	0-2	2
	1	50	21.78	22.02	21.60		2
	1	99	22.31	22.08	21.90		2
	50	0	21.29	21.25	21.06	0-3	3
	50	25	21.22	21.13	20.99		3
	50	50	21.20	20.69	20.87		3
	100	0	21.20	21.23	21.00		3

Table 9-40
LTE Band 25 (PCS) Maximum Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.35	24.26	24.06	0	0
	1	36	24.20	23.88	23.79		0
	1	74	24.19	23.50	23.88		0
	36	0	23.34	23.35	23.13	0-1	1
	36	18	23.31	22.97	23.06		1
	36	37	23.23	22.49	22.86		1
	75	0	23.30	23.02	23.10		1
16QAM	1	0	23.50	23.33	23.32	0-1	1
	1	36	23.39	23.26	23.24		1
	1	74	23.31	22.76	23.26		1
	36	0	22.33	22.20	22.10	0-2	2
	36	18	22.31	21.93	22.10		2
	36	37	22.24	21.42	21.81		2
	75	0	22.29	22.07	22.10		2
64QAM	1	0	22.50	22.33	22.28	0-2	2
	1	36	22.29	22.17	22.20		2
	1	74	22.26	21.71	22.21		2
	36	0	21.28	21.22	21.13	0-3	3
	36	18	21.23	21.02	21.11		3
	36	37	21.17	20.48	20.93		3
	75	0	21.22	21.01	21.08		3

Table 9-41
LTE Band 25 (PCS) Maximum Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.23	24.11	23.88	0	0
	1	25	24.16	23.63	23.50		0
	1	49	24.11	23.40	23.84		0
	25	0	23.22	23.12	22.93	0-1	1
	25	12	23.22	22.75	22.78		1
	25	25	23.13	22.55	22.94		1
	50	0	23.21	22.87	22.95		1
16QAM	1	0	23.48	23.36	23.12	0-1	1
	1	25	23.38	23.07	22.76		1
	1	49	23.37	22.70	23.10		1
	25	0	22.22	22.12	21.95	0-2	2
	25	12	22.21	21.78	21.80		2
	25	25	22.13	21.55	21.87		2
	50	0	22.20	21.79	21.90		2
64QAM	1	0	22.42	22.30	22.08	0-2	2
	1	25	22.31	22.08	21.61		2
	1	49	22.27	21.68	22.10		2
	25	0	21.20	21.10	20.95	0-3	3
	25	12	21.20	20.87	20.88		3
	25	25	21.14	20.55	20.89		3
	50	0	21.18	20.88	20.92		3

Table 9-42
LTE Band 25 (PCS) Maximum Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.22	23.97	23.69	0	0
	1	12	24.21	23.66	23.81		0
	1	24	24.13	23.50	23.86		0
	12	0	23.31	22.99	22.71	0-1	1
	12	6	23.35	22.79	22.87		1
	12	13	23.28	22.56	22.99		1
	25	0	23.30	22.61	22.81		1
16QAM	1	0	23.44	23.28	22.99	0-1	1
	1	12	23.45	23.06	23.07		1
	1	24	23.38	22.76	23.14		1
	12	0	22.26	21.98	21.88	0-2	2
	12	6	22.29	21.80	21.94		2
	12	13	22.21	21.58	21.87		2
	25	0	22.24	21.63	21.85		2
64QAM	1	0	22.36	22.22	22.00	0-2	2
	1	12	22.50	22.12	22.00		2
	1	24	22.28	21.82	21.99		2
	12	0	21.30	21.09	20.90	0-3	3
	12	6	21.30	20.91	20.93		3
	12	13	21.23	20.66	20.86		3
	25	0	21.25	20.77	20.85		3

Table 9-43
LTE Band 25 (PCS) Maximum Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.14	23.98	23.86	0	0
	1	7	24.09	23.95	23.84		0
	1	14	24.09	23.76	23.85		0
	8	0	23.24	23.05	22.91	0-1	1
	8	4	23.22	23.02	22.91		1
	8	7	23.18	22.87	22.92		1
	15	0	23.27	22.93	22.92		1
16QAM	1	0	23.34	23.28	23.14	0-1	1
	1	7	23.36	23.26	23.11		1
	1	14	23.34	23.11	23.16		1
	8	0	22.24	22.12	21.97	0-2	2
	8	4	22.23	22.05	21.97		2
	8	7	22.19	21.90	21.95		2
	15	0	22.16	21.88	21.90		2
64QAM	1	0	22.34	22.23	22.05	0-2	2
	1	7	22.29	22.19	21.98		2
	1	14	22.25	22.21	22.05		2
	8	0	21.22	21.11	20.94	0-3	3
	8	4	21.23	21.12	20.97		3
	8	7	21.19	20.95	20.92		3
	15	0	21.22	21.05	20.88		3

Table 9-44
LTE Band 25 (PCS) Maximum 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	24.12	23.88	23.76	0	0
	1	2	24.19	23.88	23.87		0
	1	5	24.06	23.71	23.77		0
	3	0	24.06	23.93	23.82		0
	3	2	24.16	23.88	23.85		0
	3	3	24.06	23.79	23.80		0
	6	0	23.21	22.95	22.89	0-1	1
16QAM	1	0	23.36	23.22	23.12	0-1	1
	1	2	23.41	23.22	23.18		1
	1	5	23.33	23.05	23.11		1
	3	0	23.29	23.13	22.98		1
	3	2	23.32	23.09	23.04		1
	3	3	23.23	23.01	22.99		1
	6	0	22.25	21.88	21.95	0-2	2
64QAM	1	0	22.34	22.17	22.01	0-2	2
	1	2	22.37	22.26	22.09		2
	1	5	22.29	22.11	22.02		2
	3	0	22.30	22.19	21.99		2
	3	2	22.32	22.21	22.06		2
	3	3	22.32	22.09	22.01		2
	6	0	21.17	20.88	20.86	0-3	3

Table 9-45
LTE Band 25 (PCS) Hotspot Reduced Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.14	**20.34**	20.17	0	0
	1	50	19.70	20.00	19.75		0
	1	99	20.10	20.27	20.02		0
	50	0	20.32	**20.35**	20.19	0-1	0
	50	25	20.34	20.33	20.15		0
	50	50	20.30	20.26	20.10		0
	100	0	20.33	20.29	20.16		0
16QAM	1	0	20.50	20.43	20.35	0-1	0
	1	50	19.91	19.91	19.85		0
	1	99	20.42	20.38	20.33		0
	50	0	20.32	20.24	20.10	0-2	0
	50	25	20.30	20.25	20.09		0
	50	50	20.23	20.20	20.11		0
	100	0	20.28	20.24	20.14		0
64QAM	1	0	20.50	20.39	20.47	0-2	0
	1	50	20.07	19.90	19.90		0
	1	99	20.48	20.34	20.47		0
	50	0	20.30	20.33	20.19	0-3	0
	50	25	20.27	20.32	20.16		0
	50	50	20.24	20.28	20.13		0
	100	0	20.26	20.24	20.09		0

Table 9-46
LTE Band 25 (PCS) Hotspot Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.36	20.31	20.29	0	0
	1	36	20.21	20.28	20.13		0
	1	74	20.25	20.29	20.24		0
	36	0	20.47	20.50	20.42	0-1	0
	36	18	20.47	20.49	20.38		0
	36	37	20.38	20.41	20.39		0
	75	0	20.41	20.47	20.41		0
16QAM	1	0	20.49	20.50	20.46	0-1	0
	1	36	20.46	20.49	20.38		0
	1	74	20.44	20.47	20.38		0
	36	0	20.34	20.45	20.48	0-2	0
	36	18	20.31	20.43	20.30		0
	36	37	20.33	20.38	20.31		0
	75	0	20.32	20.40	20.35		0
64QAM	1	0	20.39	20.50	20.41	0-2	0
	1	36	20.42	20.48	20.20		0
	1	74	20.40	20.47	20.42		0
	36	0	20.27	20.50	20.39	0-3	0
	36	18	20.43	20.47	20.34		0
	36	37	20.48	20.48	20.33		0
	75	0	20.36	20.48	20.32		0

Table 9-47
LTE Band 25 (PCS) Hotspot Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.27	20.26	20.09	0	0
	1	25	20.24	20.29	20.20		0
	1	49	20.11	20.22	20.04		0
	25	0	19.70	20.41	20.21	0-1	0
	25	12	20.35	20.43	20.27		0
	25	25	20.26	20.37	20.28		0
	50	0	20.30	20.40	20.21		0
16QAM	1	0	20.44	20.47	20.33	0-1	0
	1	25	20.39	20.50	20.02		0
	1	49	20.37	20.31	20.25		0
	25	0	20.22	20.32	20.18	0-2	0
	25	12	20.23	20.29	20.19		0
	25	25	20.17	20.23	20.13		0
	50	0	20.22	20.40	20.21		0
64QAM	1	0	20.41	20.43	20.32	0-2	0
	1	25	20.30	20.38	20.23		0
	1	49	20.31	20.40	20.21		0
	25	0	20.37	20.37	20.18	0-3	0
	25	12	20.14	20.35	20.18		0
	25	25	20.25	20.29	20.10		0
	50	0	20.25	20.36	20.15		0

Table 9-48
LTE Band 25 (PCS) Hotspot Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.22	20.23	20.20	0	0
	1	12	20.30	20.29	20.22		0
	1	24	20.22	20.25	20.18		0
	12	0	20.49	20.37	20.29	0-1	0
	12	6	20.43	20.50	20.30		0
	12	13	20.41	20.40	20.28		0
	25	0	20.39	20.38	20.34		0
16QAM	1	0	20.40	20.44	20.29	0-1	0
	1	12	20.43	20.42	20.28		0
	1	24	20.35	20.41	20.30		0
	12	0	20.37	20.35	20.46	0-2	0
	12	6	20.39	20.50	20.37		0
	12	13	20.38	20.42	20.22		0
	25	0	20.27	20.27	20.19		0
64QAM	1	0	20.42	20.46	20.35	0-2	0
	1	12	20.39	20.48	20.33		0
	1	24	20.33	20.45	20.41		0
	12	0	20.39	20.36	20.36	0-3	0
	12	6	20.45	20.48	20.28		0
	12	13	20.34	20.37	20.17		0
	25	0	20.33	20.29	20.33		0

Table 9-49
LTE Band 25 (PCS) Hotspot Reduced Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.35	20.40	20.22	0	0
	1	7	20.25	20.32	20.14		0
	1	14	20.27	20.26	20.13		0
	8	0	20.33	20.44	20.28	0-1	0
	8	4	20.37	20.34	20.34		0
	8	7	20.39	20.41	20.24		0
	15	0	20.41	20.50	20.30		0
16QAM	1	0	20.45	20.40	20.45	0-1	0
	1	7	20.42	20.49	20.35		0
	1	14	20.48	20.46	20.45		0
	8	0	20.38	20.45	20.50	0-2	0
	8	4	20.44	20.33	20.09		0
	8	7	20.32	20.43	20.31		0
	15	0	20.38	20.46	20.25		0
64QAM	1	0	20.46	20.48	20.37	0-2	0
	1	7	20.35	20.45	20.29		0
	1	14	20.42	20.48	20.38		0
	8	0	20.45	20.46	20.50	0-3	0
	8	4	20.39	20.43	20.32		0
	8	7	20.34	20.47	20.26		0
	15	0	20.37	20.48	20.36		0

Table 9-50
LTE Band 25 (PCS) Hotspot Reduced 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	20.21	20.27	20.11	0	0
	1	2	20.27	20.33	20.13		0
	1	5	20.19	20.25	20.10		0
	3	0	20.26	20.29	20.13		0
	3	2	20.24	20.37	20.18		0
	3	3	20.22	20.23	20.11		0
	6	0	20.33	20.33	20.21	0-1	0
16QAM	1	0	20.47	20.45	20.33	0-1	0
	1	2	20.38	20.49	20.25		0
	1	5	20.39	20.37	20.26		0
	3	0	20.20	20.33	20.12		0
	3	2	20.31	20.15	20.22		0
	3	3	20.21	20.22	20.29		0
	6	0	20.26	20.20	20.18	0-2	0
64QAM	1	0	20.35	20.46	20.35	0-2	0
	1	2	20.40	20.23	20.27		0
	1	5	20.07	20.45	20.35		0
	3	0	20.35	20.37	20.25		0
	3	2	20.34	20.39	20.11		0
	3	3	20.32	20.20	20.19		0
	6	0	20.25	20.30	20.16	0-3	0

Table 9-51
LTE Band 25 (PCS) Grip Sensor Mode Active Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.32	**21.40**	21.32	0	0
	1	50	20.85	20.91	20.78		0
	1	99	21.31	21.37	21.31		0
	50	0	21.46	**21.47**	21.34	0-1	0
	50	25	21.44	21.43	21.32		0
	50	50	21.41	21.40	21.27		0
	100	0	21.39	21.39	21.28		0
16QAM	1	0	21.50	21.50	21.50	0-1	0
	1	50	21.05	20.94	21.02		0
	1	99	21.50	21.49	21.45		0
	50	0	21.49	21.46	21.35	0-2	0
	50	25	21.47	21.48	21.32		0
	50	50	21.48	21.49	21.28		0
	100	0	21.47	21.40	21.32		0
64QAM	1	0	21.45	21.46	21.20	0-2	0
	1	50	20.78	21.00	20.51		0
	1	99	21.39	21.49	21.22		0
	50	0	21.16	21.17	20.99	0-3	0
	50	25	21.12	21.14	20.96		0
	50	50	21.08	20.51	20.86		0
	100	0	21.10	21.07	20.94		0

Table 9-52
LTE Band 25 (PCS) Grip Sensor Active Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.27	21.27	21.24	0	0
	1	36	21.10	21.31	21.27		0
	1	74	21.14	21.19	21.15		0
	36	0	21.36	21.45	21.42	0-1	0
	36	18	21.39	21.49	21.37		0
	36	37	21.32	21.46	21.30		0
	75	0	21.33	21.48	21.36		0
16QAM	1	0	21.32	21.46	21.44	0-1	0
	1	36	21.50	21.43	21.50		0
	1	74	21.30	21.46	21.30		0
	36	0	21.39	21.41	21.41	0-2	0
	36	18	21.35	21.50	21.34		0
	36	37	21.34	21.49	21.40		0
	75	0	21.46	21.45	21.33		0
64QAM	1	0	21.05	21.24	21.13	0-2	0
	1	36	21.05	21.24	21.25		0
	1	74	20.88	21.12	21.12		0
	36	0	21.03	21.22	21.22	0-3	0
	36	18	21.07	21.13	21.14		0
	36	37	21.05	20.65	21.05		0
	75	0	21.07	21.14	21.13		0

Table 9-53
LTE Band 25 (PCS) Grip Sensor Active Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.31	21.38	21.15	0	0
	1	25	21.35	21.33	21.02		0
	1	49	21.11	21.26	21.12		0
	25	0	21.43	21.42	21.27	0-1	0
	25	12	21.44	21.40	21.27		0
	25	25	21.33	21.34	21.20		0
	50	0	21.37	21.47	21.31		0
16QAM	1	0	21.46	21.50	21.44	0-1	0
	1	25	21.42	21.48	21.40		0
	1	49	21.41	21.44	21.33		0
	25	0	21.43	21.44	21.26	0-2	0
	25	12	21.06	21.48	21.32		0
	25	25	21.33	21.37	21.30		0
	50	0	21.41	21.39	21.24		0
64QAM	1	0	20.73	21.25	21.25	0-2	0
	1	25	21.26	21.17	20.75		0
	1	49	21.21	21.12	21.04		0
	25	0	21.26	21.15	21.01	0-3	0
	25	12	21.22	20.93	20.92		0
	25	25	21.15	20.62	20.92		0
	50	0	21.18	20.97	20.91		0

Table 9-54
LTE Band 25 (PCS) Grip Sensor Active Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.27	21.15	21.11	0	0
	1	12	21.34	21.20	21.21		0
	1	24	21.17	21.24	21.08		0
	12	0	21.41	21.39	21.24	0-1	0
	12	6	21.39	21.43	21.23		0
	12	13	21.45	21.36	21.21		0
	25	0	21.42	21.38	21.23		0
16QAM	1	0	21.50	21.50	21.47	0-1	0
	1	12	21.48	21.48	21.50		0
	1	24	21.35	21.42	21.47		0
	12	0	21.36	21.45	21.32	0-2	0
	12	6	21.44	21.34	21.34		0
	12	13	21.42	21.50	21.37		0
	25	0	21.37	21.40	21.23		0
64QAM	1	0	21.21	21.23	21.19	0-2	0
	1	12	21.29	21.21	21.24		0
	1	24	21.22	21.16	21.11		0
	12	0	21.24	21.05	20.98	0-3	0
	12	6	21.20	21.22	21.15		0
	12	13	21.16	21.03	20.92		0
	25	0	21.22	20.98	20.93		0

Table 9-55
LTE Band 25 (PCS) Grip Sensor Active Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.28	21.33	21.14	0	0
	1	7	21.25	21.34	21.12		0
	1	14	21.13	21.36	21.23		0
	8	0	21.33	21.37	21.24	0-1	0
	8	4	21.34	21.42	21.25		0
	8	7	21.29	21.38	21.23		0
	15	0	21.44	21.45	21.26		0
16QAM	1	0	21.45	21.50	21.26	0-1	0
	1	7	21.44	21.49	21.25		0
	1	14	21.39	21.48	21.33		0
	8	0	21.37	21.42	21.32	0-2	0
	8	4	21.43	21.44	21.35		0
	8	7	21.40	21.43	21.27		0
	15	0	21.41	21.35	21.25		0
64QAM	1	0	21.36	21.27	21.03	0-2	0
	1	7	21.25	21.12	20.98		0
	1	14	21.27	21.25	20.97		0
	8	0	21.18	21.16	21.03	0-3	0
	8	4	21.08	21.10	20.93		0
	8	7	21.02	21.06	20.95		0
	15	0	21.20	21.06	20.96		0

Table 9-56
LTE Band 25 (PCS) Grip Sensor Active Conducted Powers -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.25	21.17	21.15	0	0
	1	2	21.28	21.32	21.20		0
	1	5	21.20	21.15	21.10		0
	3	0	21.19	21.22	21.01		0
	3	2	21.21	21.23	21.10		0
	3	3	21.15	21.16	21.07		0
	6	0	21.33	21.30	21.15	0-1	0
16QAM	1	0	21.37	21.36	21.21	0-1	0
	1	2	21.36	21.35	21.45		0
	1	5	21.38	21.45	21.20		0
	3	0	21.35	21.34	21.29		0
	3	2	21.33	21.42	21.26		0
	3	3	21.31	21.17	21.27		0
	6	0	20.88	21.33	21.15	0-2	0
64QAM	1	0	21.16	21.10	21.05	0-2	0
	1	2	21.18	21.22	21.13		0
	1	5	21.22	21.13	21.00		0
	3	0	21.20	21.06	20.88		0
	3	2	21.15	21.14	20.94		0
	3	3	21.27	21.10	20.87		0
	6	0	21.24	21.00	20.87	0-3	0

9.3.7 LTE Band 41

Table 9-57
LTE Band 41 Maximum 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	24.37	**24.45**	24.11	24.14	24.12	0	0
	1	50	24.18	24.14	23.86	23.88	23.97		0
	1	99	24.42	24.29	23.84	23.84	23.98		0
	50	0	23.67	**23.72**	23.28	23.35	23.37	0-1	1
	50	25	23.66	23.65	23.19	23.22	23.29		1
	50	50	23.63	23.59	23.11	23.15	23.22		1
	100	0	23.63	23.64	23.20	23.23	23.26		1
16QAM	1	0	23.53	23.54	23.18	23.15	23.18	0-1	1
	1	50	23.28	23.21	22.93	22.91	23.04		1
	1	99	23.46	23.41	22.86	22.83	23.03		1
	50	0	22.66	22.68	22.26	22.34	22.32	0-2	2
	50	25	22.66	22.65	22.20	22.19	22.26		2
	50	50	22.65	22.58	22.11	22.12	22.20		2
	100	0	22.67	22.65	22.18	22.21	22.27		2
64QAM	1	0	22.25	22.29	21.88	21.87	21.92	0-2	2
	1	50	21.95	21.99	21.64	21.56	21.78		2
	1	99	22.18	22.10	21.56	21.54	21.72		2
	50	0	21.71	21.73	21.29	21.32	21.33	0-3	3
	50	25	21.69	21.67	21.17	21.20	21.30		3
	50	50	21.65	21.57	21.15	21.12	21.22		3
	100	0	21.65	21.63	21.15	21.16	21.25		3

Table 9-58
LTE Band 41 Maximum 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	24.48	24.57	24.45	24.23	24.36	0	0
	1	36	24.37	24.43	24.17	24.12	24.26		0
	1	74	24.49	24.55	24.29	24.13	24.17		0
	36	0	23.71	23.75	23.31	23.33	23.37	0-1	1
	36	18	23.65	23.74	23.24	23.27	23.36		1
	36	37	23.70	23.69	23.33	23.33	23.30		1
	75	0	23.76	23.65	23.29	23.27	23.37		1
16QAM	1	0	23.68	23.56	23.25	23.19	23.13	0-1	1
	1	36	23.56	23.44	23.10	23.01	23.15		1
	1	74	23.47	23.46	23.13	22.86	23.27		1
	36	0	22.62	22.62	22.23	22.25	22.32	0-2	2
	36	18	22.65	22.65	22.22	22.27	22.26		2
	36	37	22.55	22.52	22.22	22.20	22.19		2
	75	0	22.62	22.57	22.27	22.25	22.33		2
64QAM	1	0	22.54	22.43	22.02	22.07	22.12	0-2	2
	1	36	22.42	22.32	21.85	21.88	22.04		2
	1	74	22.43	22.33	21.90	21.81	22.01		2
	36	0	21.72	21.72	21.23	21.20	21.34	0-3	3
	36	18	21.69	21.69	21.33	21.20	21.28		3
	36	37	21.59	21.64	21.26	21.28	21.27		3
	75	0	21.71	21.60	21.29	21.24	21.28		3

Table 9-59
LTE Band 41 Maximum 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	24.50	24.42	24.02	24.14	24.05	0	0
	1	25	24.32	24.41	24.09	24.19	24.11		0
	1	49	24.47	24.51	24.07	24.12	23.95		0
	25	0	23.76	23.57	23.25	23.17	23.27	0-1	1
	25	12	23.61	23.52	23.28	23.12	23.22		1
	25	25	23.67	23.56	23.17	23.22	23.25		1
	50	0	23.71	23.51	23.14	23.20	23.16		1
16QAM	1	0	23.35	23.49	23.13	23.06	23.06	0-1	1
	1	25	23.46	23.33	22.89	23.08	23.17		1
	1	49	23.34	23.33	22.95	22.93	23.02		1
	25	0	22.67	22.62	22.05	22.18	22.26	0-2	2
	25	12	22.63	22.57	22.10	22.17	22.21		2
	25	25	22.67	22.51	22.16	22.18	22.15		2
	50	0	22.64	22.54	22.15	22.24	22.23		2
64QAM	1	0	22.42	22.35	21.85	21.88	21.98	0-2	2
	1	25	21.88	22.21	21.75	21.87	21.94		2
	1	49	22.23	22.30	21.79	21.70	21.85		2
	25	0	21.61	21.51	21.07	21.09	21.15	0-3	3
	25	12	21.57	21.52	21.11	21.10	21.22		3
	25	25	21.52	21.47	21.05	21.10	21.16		3
	50	0	21.66	21.56	21.17	21.24	21.22		3

Table 9-60
LTE Band 41 Maximum 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	24.58	24.57	24.06	24.03	24.08	0	0
	1	12	24.57	24.55	24.05	24.09	24.15		0
	1	24	24.62	24.51	24.04	24.08	24.07		0
	12	0	23.67	23.63	23.65	23.15	23.24	0-1	1
	12	6	23.69	23.64	23.20	23.25	23.25		1
	12	13	23.68	23.63	23.15	23.17	23.27		1
	25	0	23.73	23.52	23.20	23.12	23.22		1
16QAM	1	0	23.65	23.49	23.09	22.97	23.14	0-1	1
	1	12	23.59	23.14	23.13	23.05	23.22		1
	1	24	23.56	23.46	23.04	23.06	23.16		1
	12	0	22.62	22.45	22.13	22.08	22.07	0-2	2
	12	6	22.64	22.53	22.09	22.13	22.18		2
	12	13	22.62	22.47	22.02	22.07	22.21		2
	25	0	22.74	22.64	22.19	22.23	22.23		2
64QAM	1	0	22.52	22.34	21.91	21.81	21.97	0-2	2
	1	12	22.39	22.35	21.90	21.93	22.00		2
	1	24	22.45	22.24	21.91	21.84	21.93		2
	12	0	21.58	21.56	21.12	21.05	21.12	0-3	3
	12	6	21.65	21.53	21.12	21.17	21.13		3
	12	13	21.62	21.47	21.16	21.12	21.19		3
	25	0	21.63	21.51	21.15	21.18	21.18		3

Table 9-61
LTE Band 41 Hotspot/Grip Sensor Active 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	22.48	22.43	22.13	22.13	22.11	0	0
	1	50	22.23	22.07	21.91	21.87	21.97		0
	1	99	**22.54**	22.28	21.81	21.83	21.95		0
	50	0	22.71	22.67	22.24	22.33	22.33	0-1	0
	50	25	22.66	22.57	22.19	22.20	22.28		0
	50	50	**22.73**	22.53	22.12	22.13	22.22		0
	100	0	22.53	22.42	22.16	22.21	22.28		0
16QAM	1	0	22.49	22.49	22.20	22.14	22.15	0-1	0
	1	50	22.17	22.15	21.92	21.88	22.05		0
	1	99	22.40	22.34	21.87	21.89	21.99		0
	50	0	22.65	22.65	22.26	22.31	22.32	0-2	0
	50	25	22.64	22.61	22.18	22.19	22.27		0
	50	50	22.63	22.57	22.12	22.14	22.21		0
	100	0	22.66	22.59	22.19	22.22	22.28		0
64QAM	1	0	22.25	22.21	21.92	21.90	21.90	0-2	0
	1	50	21.93	21.93	21.67	21.62	21.78		0
	1	99	22.14	22.07	21.54	21.56	21.73		0
	50	0	21.71	21.67	21.29	21.36	21.35	0-3	1
	50	25	21.68	21.71	21.21	21.23	21.30		1
	50	50	21.64	21.57	21.13	21.29	21.24		1
	100	0	21.64	21.58	21.17	21.19	21.27		1

Table 9-62
LTE Band 41 Hotspot/Grip Sensor Active 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	22.35	22.42	21.91	21.88	21.79	0	0
	1	36	22.29	22.25	21.77	21.73	21.73		0
	1	74	22.36	22.32	21.84	21.79	22.06		0
	36	0	22.54	22.43	22.05	21.97	22.15	0-1	0
	36	18	22.56	22.44	22.04	22.01	22.10		0
	36	37	22.54	22.40	22.00	21.98	22.12		0
	75	0	22.57	22.48	22.05	22.02	22.04		0
16QAM	1	0	22.41	22.40	21.96	21.91	22.11	0-1	0
	1	36	22.31	22.21	21.78	21.74	22.24		0
	1	74	22.32	22.27	21.84	21.77	22.10		0
	36	0	22.51	22.38	21.95	21.93	22.15	0-2	0
	36	18	22.49	22.39	21.96	21.94	22.09		0
	36	37	22.48	22.38	21.97	21.91	22.06		0
	75	0	22.57	22.45	22.20	22.01	22.11		0
64QAM	1	0	22.33	22.29	21.84	21.78	22.08	0-2	0
	1	36	22.25	22.17	21.68	21.62	21.98		0
	1	74	22.26	22.20	21.72	21.64	22.00		0
	36	0	21.55	21.47	21.04	21.02	21.16	0-3	1
	36	18	21.55	21.45	21.07	21.01	21.15		1
	36	37	21.53	21.41	21.02	20.97	21.08		1
	75	0	21.56	21.48	21.04	21.01	21.14		1

Table 9-63
LTE Band 41 Hotspot/Grip Sensor Active 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	22.28	22.25	21.74	21.68	21.80	0	0
	1	25	21.97	22.26	21.74	21.75	21.78		0
	1	49	22.25	22.27	21.71	21.62	21.67		0
	25	0	22.41	22.33	21.89	21.84	21.96	0-1	0
	25	12	22.41	22.35	21.90	21.88	21.93		0
	25	25	22.37	22.30	21.89	21.86	21.88		0
	50	0	22.45	22.37	21.94	21.92	21.97		0
16QAM	1	0	22.21	22.19	21.72	21.66	22.08	0-1	0
	1	25	22.02	22.16	21.77	21.72	21.93		0
	1	49	22.30	22.17	21.65	21.59	21.97		0
	25	0	22.41	22.34	21.93	21.89	21.98	0-2	0
	25	12	22.45	22.34	21.93	21.90	21.89		0
	25	25	22.43	22.33	21.93	21.88	21.92		0
	50	0	22.43	22.35	21.93	21.90	21.95		0
64QAM	1	0	22.13	21.99	21.72	21.62	21.89	0-2	0
	1	25	22.93	22.07	21.66	21.52	21.88		0
	1	49	22.04	21.98	21.64	21.50	21.90		0
	25	0	21.38	21.34	20.83	20.91	20.94	0-3	1
	25	12	21.34	21.35	20.86	20.90	20.90		1
	25	25	21.33	21.31	20.81	20.86	20.92		1
	50	0	21.47	21.34	20.93	20.89	21.01		1

Table 9-64
LTE Band 41 Hotspot/Grip Sensor Active 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	22.30	22.30	21.70	21.79	21.74	0	0
	1	12	22.31	22.29	21.83	21.84	21.86		0
	1	24	22.39	22.24	21.72	21.81	21.82		0
	12	0	22.42	22.31	21.95	21.81	21.95	0-1	0
	12	6	22.46	22.37	21.99	21.93	21.96		0
	12	13	22.42	22.32	21.86	21.87	21.99		0
	25	0	22.45	22.33	21.87	21.91	21.90		0
16QAM	1	0	22.35	22.18	21.87	21.69	22.01	0-1	0
	1	12	22.30	22.23	21.84	21.72	22.09		0
	1	24	22.28	22.16	21.73	21.71	22.06		0
	12	0	22.34	22.26	21.86	21.73	21.85	0-2	0
	12	6	22.37	22.28	21.88	21.84	21.92		0
	12	13	22.34	22.23	21.79	21.78	21.92		0
	25	0	22.46	22.39	21.98	21.94	21.95		0
64QAM	1	0	22.24	22.07	21.73	21.56	21.78	0-2	0
	1	12	22.21	22.13	21.75	21.64	21.90		0
	1	24	22.18	22.04	21.63	21.62	21.92		0
	12	0	21.40	21.27	20.89	20.76	20.89	0-3	1
	12	6	21.40	21.30	20.93	20.83	20.92		1
	12	13	21.34	21.26	20.81	20.80	20.93		1
	25	0	21.38	21.30	20.90	20.86	20.90		1

9.3.8 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-65
LTE Uplink Carrier Aggregation Maximum Conducted Powers

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	40185	2549.5	QPSK	1	0	LTE B41	20	39987	2529.7	QPSK	1	99	24.19	24.45

Table 9-66
LTE Uplink Carrier Aggregation Hotspot Reduced Conducted Powers

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	40620	2593.0	QPSK	50	0	LTE B41	20	40422	2573.2	QPSK	50	50	23.00	22.24

Table 9-67
LTE Uplink Carrier Aggregation Grip Reduced Conducted Powers

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	22.50	22.54

Notes:

1. This device supports uplink carrier aggregation for LTE CA_41C (1) with a maximum of two 20 MHz component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

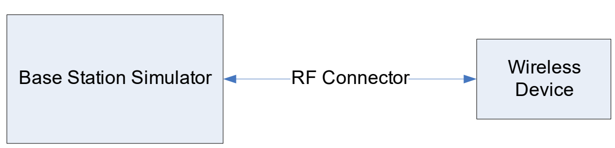


Figure 9-3
Power Measurement Setup

9.4 WLAN Conducted Powers

Table 9-68
2.4 GHz WLAN Maximum Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	19.47	17.91	17.81	15.82
2417	2	N/A	N/A	N/A	16.59
2437	6	**19.65**	17.51	17.36	16.97
2457	10	N/A	17.96	17.98	16.65
2462	11	19.63	16.71	16.74	14.70

Table 9-69
2.4 GHz WLAN Maximum Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	18.85	17.82	17.76	15.67
2417	2	N/A	N/A	N/A	16.94
2437	6	**18.89**	17.56	17.65	16.91
2457	10	N/A	N/A	N/A	16.78
2462	11	18.79	17.55	17.46	14.68

Table 9-70
5 GHz WLAN Maximum Average RF Power – Ant 1

5GHz (20MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11a	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average
5180	36	15.21	15.47	15.45	15.75
5200	40	17.59	17.84	17.83	15.79
5220	44	17.56	17.79	17.80	15.69
5240	48	17.61	17.76	17.91	15.77
5260	52	17.67	17.56	17.53	15.61
5280	56	17.81	17.61	17.63	15.75
5300	60	**17.97**	17.74	17.67	15.87
5320	64	16.20	16.39	16.37	15.83
5500	100	17.57	17.73	17.93	15.81
5600	120	17.65	17.94	17.89	15.96
5620	124	**17.89**	17.88	17.86	15.98
5720	144	17.82	17.98	17.98	15.99
5745	149	**17.93**	17.84	17.89	15.89
5785	157	17.52	17.97	17.97	15.97
5825	165	17.84	17.84	17.81	15.78

Table 9-71
5 GHz WLAN Maximum Average RF Power – Ant 2

5GHz (20MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11a	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average
5180	36	15.24	15.24	15.30	15.56
5200	40	17.46	17.57	17.56	15.78
5220	44	17.63	17.70	17.68	15.95
5240	48	17.70	17.76	17.70	15.51
5260	52	17.64	17.68	17.77	15.62
5280	56	**17.91**	17.64	17.64	15.60
5300	60	17.90	17.60	17.61	15.90
5320	64	16.10	16.41	16.58	15.81
5500	100	17.56	17.61	17.68	15.98
5600	120	17.78	17.81	17.81	15.96
5620	124	17.67	17.78	17.72	15.99
5720	144	**17.79**	17.75	17.88	15.60
5745	149	**17.77**	17.76	17.71	15.58
5785	157	17.42	17.84	17.75	15.84
5825	165	17.40	17.35	17.89	15.71

Table 9-72
5 GHz WLAN Maximum Average RF Power – MIMO

5GHz (20MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5180	36	12.06	11.84	14.96
5200	40	17.84	17.57	20.72
5220	44	17.79	17.70	20.76
5240	48	17.76	17.76	20.77
5260	52	17.56	17.68	20.63
5280	56	17.61	17.64	20.64
5300	60	**17.74**	**17.60**	**20.68**
5320	64	13.11	12.58	15.86
5500	100	17.73	17.61	20.68
5600	120	**17.94**	**17.81**	**20.89**
5620	124	17.88	17.78	20.84
5720	144	17.98	17.75	20.88
5745	149	17.84	17.76	20.81
5785	157	**17.97**	**17.84**	**20.92**
5825	165	17.84	17.35	20.61

Table 9-73
Maximum Output Powers During Conditions with 2.4 GHz and 5 GHz WLAN

2.4GHz 802.11n Conducted Power [dBm]			
Freq [MHz]	Channel	ANT1	ANT2
2412	1	**16.70**	**16.60**
2437	6	16.66	16.48
2462	11	16.65	16.50

5GHz (80MHz) 802.11ac Conducted Power [dBm]			
Freq [MHz]	Channel	ANT1	ANT2
5210	42	9.85	9.85
5290	58	9.96	9.81
5530	106	9.90	9.53
5610	122	**13.92**	**13.99**
5690	138	13.89	13.79
5775	155	**13.97**	**13.44**

Table 9-74
2.4 GHz WLAN Reduced Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	**16.96**	16.85	16.70	N/A
2417	2	N/A	N/A	N/A	16.79
2437	6	16.81	16.95	16.66	16.60
2457	10	N/A	N/A	N/A	16.94
2462	11	16.69	16.97	16.65	N/A

Table 9-75
2.4 GHz WLAN Reduced Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	16.50	16.75	16.60	N/A
2417	2	N/A	N/A	N/A	16.84
2437	6	16.57	16.53	16.48	16.88
2457	10	N/A	N/A	N/A	16.57
2462	11	**16.92**	16.65	16.50	N/A

Table 9-76
5 GHz WLAN Reduced Average RF Power – Ant 1

5GHz (40MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11n	802.11ac	802.11ax
		Average	Average	Average
5190	38	12.61	12.64	13.81
5230	46	13.51	13.63	13.91
5270	54	**13.90**	13.57	13.58
5310	62	12.92	12.91	13.61
5510	102	13.66	13.55	13.86
5590	118	13.58	13.62	13.88
5630	126	13.72	13.76	13.96
5710	142	13.80	13.81	13.60
5755	151	13.78	13.85	13.67
5795	159	13.74	13.68	13.51

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
		Average
5210	42	12.90
5290	58	12.71
5530	106	12.83
5610	122	**13.92**
5690	138	13.89
5775	155	**13.97**

Table 9-77
5 GHz WLAN Reduced Average RF Power – Ant 2

5GHz (40MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11n	802.11ac	802.11ax
		Average	Average	Average
5190	38	12.72	12.54	13.54
5230	46	13.74	13.96	13.56
5270	54	**13.61**	13.70	13.43
5310	62	12.70	12.83	13.51
5510	102	13.69	13.93	13.81
5590	118	13.76	13.48	13.76
5630	126	13.81	13.59	13.88
5710	142	13.70	13.40	13.66
5755	151	13.62	13.61	13.90
5795	159	13.55	13.26	13.45

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
		Average
5210	42	12.64
5290	58	12.62
5530	106	12.98
5610	122	**13.99**
5690	138	13.79
5775	155	**13.44**

Table 9-78
5 GHz WLAN Reduced Average RF Power – MIMO

5GHz (40MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	**Channel**	**ANT1**	**ANT2**	**MIMO**
5190	38	9.95	9.59	12.78
5230	46	13.51	13.74	16.64
5270	54	**13.90**	**13.61**	**16.77**
5310	62	9.94	9.83	12.90
5510	102	13.66	13.69	16.69
5590	118	13.58	13.76	16.68
5630	126	13.72	13.81	16.78
5710	142	13.80	13.70	16.76
5755	151	13.78	13.62	16.71
5795	159	13.74	13.55	16.66
5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	**Channel**	**ANT1**	**ANT2**	**MIMO**
5210	42	9.85	9.85	12.86
5290	58	9.96	9.81	12.90
5530	106	9.90	9.53	12.73
5610	122	**13.92**	**13.99**	**16.97**
5690	138	13.89	13.79	16.85
5775	155	**13.97**	**13.44**	**16.72**

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.

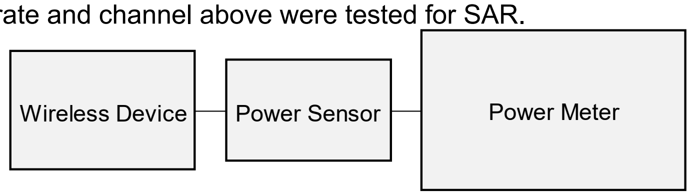


Figure 9-4
Power Measurement Setup

9.5 Bluetooth Conducted Powers

Table 9-79
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power [dBm]	Avg Conducted Power [mW]
2402	1.0	0	17.69	58.700
2441	1.0	39	**18.37**	68.701
2480	1.0	78	17.48	55.928
2402	2.0	0	11.17	13.081
2441	2.0	39	11.98	15.762
2480	2.0	78	10.10	10.231
2402	3.0	0	11.30	13.493
2441	3.0	39	12.15	16.417
2480	3.0	78	10.20	10.466

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

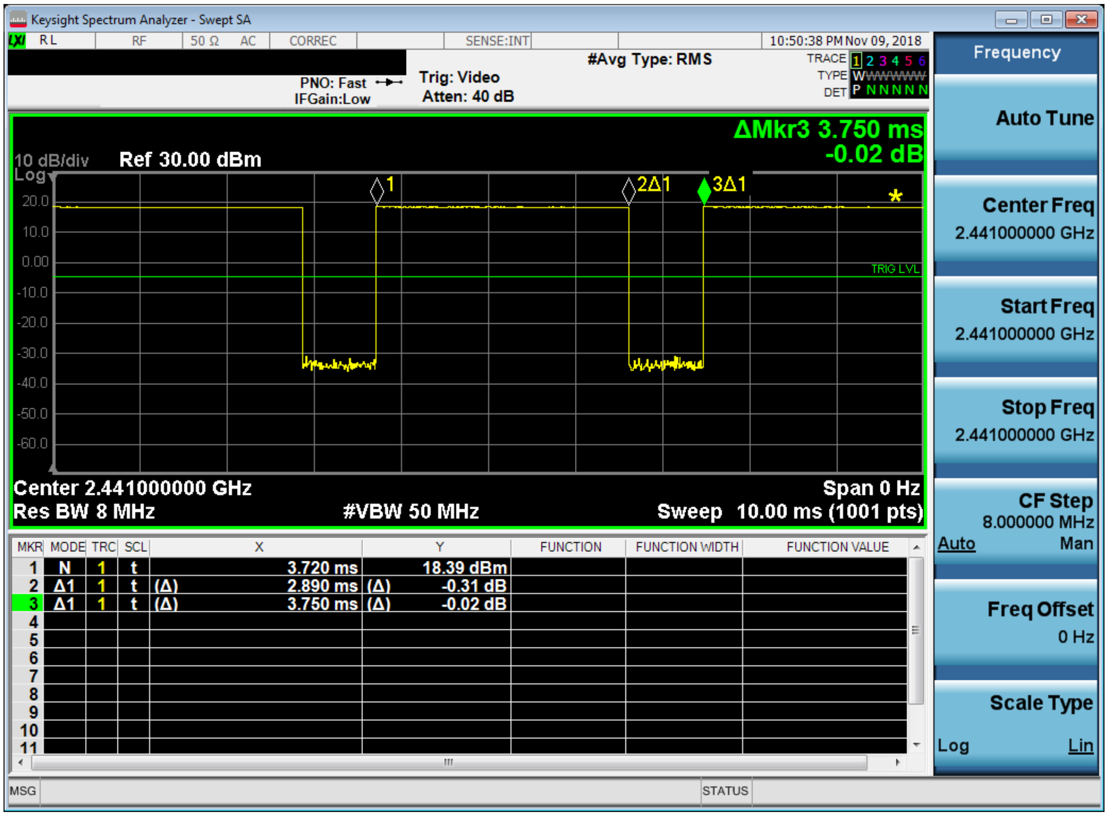


Figure 9-5
Bluetooth Transmission Plot

Equation 9-1
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.89ms}{3.75ms} * 100\% = 77.1\%$$

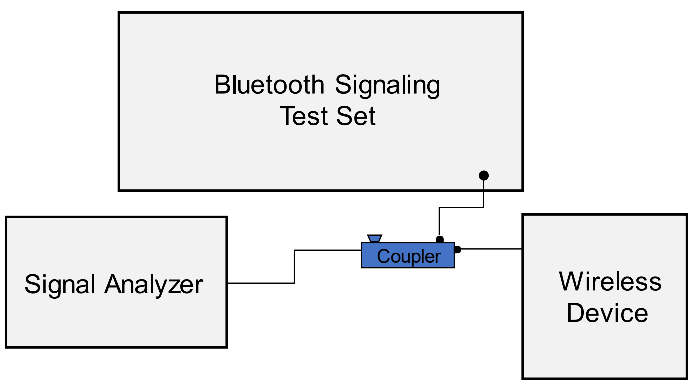


Figure 9-6
Power Measurement Setup

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
12/19/2018	750H	19.8	740	0.874	42.354	0.893	41.994	-2.13%	0.86%
			755	0.880	42.310	0.894	41.916	-1.57%	0.94%
			770	0.886	42.279	0.895	41.838	-1.01%	1.05%
			785	0.891	42.245	0.896	41.760	-0.56%	1.16%
1/9/2019	750H	20.3	700	0.857	43.632	0.889	42.201	-3.60%	3.39%
			710	0.860	43.590	0.890	42.149	-3.37%	3.42%
			740	0.875	43.491	0.893	41.994	-2.02%	3.56%
			755	0.883	43.426	0.894	41.916	-1.23%	3.60%
12/17/2018	835H	20.1	820	0.885	40.227	0.899	41.578	-1.56%	-3.25%
			835	0.890	40.179	0.900	41.500	-1.11%	-3.18%
			850	0.895	40.133	0.916	41.500	-2.29%	-3.29%
11/26/2018	1750H	20.3	1710	1.323	39.585	1.348	40.142	-1.85%	-1.39%
			1750	1.347	39.501	1.371	40.079	-1.75%	-1.44%
			1790	1.371	39.422	1.394	40.016	-1.65%	-1.48%
12/3/2018	1900H	20.5	1850	1.409	39.007	1.400	40.000	0.64%	-2.48%
			1880	1.430	38.983	1.400	40.000	2.14%	-2.54%
			1910	1.448	38.944	1.400	40.000	3.43%	-2.64%
12/3/2018	2450H	22.5	2500	1.909	38.651	1.855	39.136	2.91%	-1.24%
			2550	1.964	38.504	1.909	39.073	2.88%	-1.46%
			2600	2.021	38.303	1.964	39.009	2.90%	-1.81%
			2650	2.077	38.125	2.018	38.945	2.92%	-2.11%
			2700	2.139	37.917	2.073	38.882	3.18%	-2.48%
12/12/2018	2450H	22.8	2400	1.797	38.648	1.756	39.289	2.33%	-1.63%
			2450	1.859	38.469	1.800	39.200	3.28%	-1.86%
			2500	1.909	38.227	1.855	39.136	2.91%	-2.32%
			2550	1.968	38.094	1.909	39.073	3.09%	-2.51%
			2600	2.022	37.860	1.964	39.009	2.95%	-2.95%
12/17/2018	2450H	22.7	2400	1.805	38.467	1.756	39.289	2.79%	-2.09%
			2450	1.862	38.272	1.800	39.200	3.44%	-2.37%
			2500	1.914	38.094	1.855	39.136	3.18%	-2.66%
			2550	1.971	37.894	1.909	39.073	3.25%	-3.02%
			2600	2.027	37.718	1.964	39.009	3.21%	-3.31%
1/9/2019	2450H	21.0	2400	1.828	40.510	1.756	39.289	4.10%	3.11%
			2450	1.869	40.474	1.800	39.200	3.83%	3.25%
			2500	1.909	40.396	1.855	39.136	2.91%	3.22%
12/26/2018	5200H-5800H	20.2	5240	4.582	35.294	4.696	35.940	-2.43%	-1.80%
			5260	4.604	35.320	4.717	35.917	-2.40%	-1.66%
			5280	4.629	35.233	4.737	35.894	-2.28%	-1.84%
			5600	4.957	34.816	5.065	35.529	-2.13%	-2.01%
			5620	4.977	34.798	5.086	35.506	-2.14%	-1.99%
			5700	5.056	34.711	5.168	35.414	-2.17%	-1.99%
			5745	5.105	34.613	5.214	35.363	-2.09%	-2.12%
			5765	5.131	34.588	5.234	35.340	-1.97%	-2.13%
			5785	5.161	34.572	5.255	35.317	-1.79%	-2.11%
			5800	5.173	34.525	5.270	35.300	-1.84%	-2.20%
			5805	5.170	34.521	5.275	35.294	-1.99%	-2.19%
			5825	5.189	34.508	5.296	35.271	-2.02%	-2.16%
01/07/2019	5200H-5800H	20.6	5240	4.553	35.330	4.696	35.940	-3.05%	-1.70%
			5260	4.575	35.295	4.717	35.917	-3.01%	-1.73%
			5280	4.602	35.239	4.737	35.894	-2.85%	-1.82%
			5600	4.923	34.867	5.065	35.529	-2.80%	-1.86%
			5620	4.941	34.841	5.086	35.506	-2.85%	-1.87%
			5700	5.028	34.735	5.168	35.414	-2.71%	-1.92%
			5745	5.082	34.602	5.214	35.363	-2.53%	-2.15%
			5765	5.100	34.606	5.234	35.340	-2.56%	-2.08%
			5785	5.115	34.616	5.255	35.317	-2.66%	-1.98%
			5800	5.123	34.555	5.270	35.300	-2.79%	-2.11%
			5805	5.127	34.544	5.275	35.294	-2.81%	-2.13%
			5825	5.152	34.508	5.296	35.271	-2.72%	-2.16%

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
11/26/2018	750B	21.1	700	0.934	53.381	0.959	55.726	-2.61%	-4.21%
			710	0.937	53.372	0.960	55.687	-2.40%	-4.16%
			720	0.941	53.352	0.961	55.648	-2.08%	-4.13%
			725	0.942	53.345	0.961	55.629	-1.98%	-4.11%
			740	0.947	53.303	0.963	55.570	-1.66%	-4.08%
			755	0.953	53.285	0.964	55.512	-1.14%	-4.01%
			770	0.959	53.260	0.965	55.453	-0.62%	-3.95%
			785	0.965	53.223	0.966	55.395	-0.10%	-3.92%
11/26/2018	835B	20.5	820	1.004	54.134	0.969	55.258	3.61%	-2.03%
			835	1.018	53.976	0.970	55.200	4.95%	-2.22%
			850	1.034	53.818	0.988	55.154	4.66%	-2.42%
1/2/2019	835B	20.4	820	0.961	55.480	0.969	55.258	-0.83%	0.40%
			835	0.968	55.401	0.970	55.200	-0.21%	0.36%
			850	0.975	55.398	0.988	55.154	-1.32%	0.44%
1/7/2019	835B	20.8	820	0.963	54.688	0.969	55.258	-0.62%	-1.03%
			835	0.968	54.669	0.970	55.200	-0.21%	-0.96%
			850	0.974	54.635	0.988	55.154	-1.42%	-0.94%
11/26/2018	1750B	19.9	1710	1.488	51.746	1.463	53.537	1.71%	-3.35%
			1750	1.534	51.542	1.488	53.432	3.09%	-3.54%
			1790	1.579	51.377	1.514	53.326	4.29%	-3.65%
11/25/2018	1900B	22.6	1850	1.509	51.245	1.520	53.300	-0.72%	-3.86%
			1880	1.541	51.136	1.520	53.300	1.38%	-4.06%
			1910	1.576	51.025	1.520	53.300	3.68%	-4.27%
12/5/2018	1900B	23.5	1850	1.517	51.165	1.520	53.300	-0.20%	-4.01%
			1880	1.550	51.085	1.520	53.300	1.97%	-4.16%
			1910	1.583	50.992	1.520	53.300	4.14%	-4.33%
12/19/2018	1900B	22.3	1850	1.518	53.708	1.520	53.300	-0.13%	0.77%
			1880	1.551	53.602	1.520	53.300	2.04%	0.57%
			1910	1.584	53.462	1.520	53.300	4.21%	0.30%
12/26/2018	1900B	21.9	1850	1.502	51.500	1.520	53.300	-1.18%	-3.38%
			1880	1.536	51.379	1.520	53.300	1.05%	-3.60%
			1910	1.572	51.264	1.520	53.300	3.42%	-3.82%
12/20/2018	2450B	23.0	2400	1.974	52.035	1.902	52.767	3.79%	-1.39%
			2450	2.030	51.940	1.950	52.700	4.10%	-1.44%
			2500	2.089	51.768	2.021	52.636	3.36%	-1.65%
12/20/2018	2450B	24.5	2400	1.994	50.921	1.902	52.767	4.84%	-3.50%
			2450	2.040	50.852	1.950	52.700	4.62%	-3.51%
			2500	2.080	50.774	2.021	52.636	2.92%	-3.54%
12/23/2018	2450B	22.3	2400	1.990	52.279	1.902	52.767	4.63%	-0.92%
			2450	2.047	52.144	1.950	52.700	4.97%	-1.06%
			2500	2.105	51.983	2.021	52.636	4.16%	-1.24%
			2550	2.169	51.858	2.092	52.573	3.68%	-1.36%
			2600	2.226	51.694	2.163	52.509	2.91%	-1.55%
			2650	2.290	51.573	2.234	52.445	2.51%	-1.66%
			2700	2.352	51.390	2.305	52.382	2.04%	-1.89%
12/26/2018	2450B	22.7	2400	1.982	51.672	1.902	52.767	4.21%	-2.08%
			2450	2.041	51.540	1.950	52.700	4.67%	-2.20%
			2500	2.096	51.398	2.021	52.636	3.71%	-2.35%
			2550	2.159	51.266	2.092	52.573	3.20%	-2.49%
			2600	2.216	51.124	2.163	52.509	2.45%	-2.64%
			2650	2.279	50.996	2.234	52.445	2.01%	-2.76%
			2700	2.339	50.818	2.305	52.382	1.48%	-2.99%
1/9/2019	2450B	22.9	2400	1.988	52.322	1.902	52.767	4.52%	-0.84%
			2450	2.033	52.283	1.950	52.700	4.26%	-0.79%
			2500	2.082	52.153	2.021	52.636	3.02%	-0.92%

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
12/17/2018	5200B-5800B	22.3	5240	5.410	47.871	5.346	48.960	1.20%	-2.22%
			5260	5.416	47.835	5.369	48.933	0.88%	-2.24%
			5280	5.465	47.761	5.393	48.906	1.34%	-2.34%
			5300	5.502	47.755	5.416	48.879	1.59%	-2.30%
			5320	5.508	47.681	5.439	48.851	1.27%	-2.40%
			5500	5.775	47.404	5.650	48.607	2.21%	-2.47%
			5520	5.801	47.337	5.673	48.580	2.26%	-2.56%
			5540	5.832	47.276	5.696	48.553	2.39%	-2.63%
			5560	5.869	47.256	5.720	48.526	2.60%	-2.62%
			5580	5.894	47.228	5.743	48.499	2.63%	-2.62%
			5600	5.910	47.181	5.766	48.471	2.50%	-2.66%
			5620	5.940	47.144	5.790	48.444	2.59%	-2.68%
			5640	5.975	47.077	5.813	48.417	2.79%	-2.77%
			5660	6.008	47.073	5.837	48.390	2.93%	-2.72%
			5680	6.036	47.060	5.860	48.363	3.00%	-2.69%
			5700	6.070	46.976	5.883	48.336	3.18%	-2.81%
			5745	6.137	46.835	5.936	48.275	3.39%	-2.98%
			5765	6.168	46.829	5.959	48.248	3.51%	-2.94%
			5785	6.190	46.823	5.982	48.220	3.48%	-2.90%
			5800	6.215	46.764	6.000	48.200	3.58%	-2.98%
			5805	6.227	46.757	6.006	48.193	3.68%	-2.98%
			5825	6.267	46.663	6.029	48.166	3.95%	-3.12%
12/26/2018	5200B-5800B	21.9	5240	5.403	47.944	5.346	48.960	1.07%	-2.08%
			5260	5.439	47.943	5.369	48.933	1.30%	-2.02%
			5280	5.466	47.832	5.393	48.906	1.35%	-2.20%
			5300	5.490	47.824	5.416	48.879	1.37%	-2.16%
			5320	5.519	47.811	5.439	48.851	1.47%	-2.13%
			5500	5.789	47.465	5.650	48.607	2.46%	-2.35%
			5520	5.807	47.430	5.673	48.580	2.36%	-2.37%
			5540	5.851	47.372	5.696	48.553	2.72%	-2.43%
			5560	5.877	47.365	5.720	48.526	2.74%	-2.39%
			5580	5.909	47.298	5.743	48.499	2.89%	-2.48%
			5600	5.939	47.285	5.766	48.471	3.00%	-2.45%
			5620	5.959	47.254	5.790	48.444	2.92%	-2.46%
			5640	5.989	47.225	5.813	48.417	3.03%	-2.46%
			5660	6.032	47.158	5.837	48.390	3.34%	-2.55%
			5680	6.071	47.118	5.860	48.363	3.60%	-2.57%
			5700	6.085	47.116	5.883	48.336	3.43%	-2.52%
			5745	6.147	47.016	5.936	48.275	3.55%	-2.61%
			5765	6.176	46.990	5.959	48.248	3.64%	-2.61%
			5785	6.219	46.931	5.982	48.220	3.96%	-2.67%
			5800	6.241	46.875	6.000	48.200	4.02%	-2.75%
			5805	6.243	46.872	6.006	48.193	3.95%	-2.74%
			5825	6.274	46.853	6.029	48.166	4.06%	-2.73%
01/08/2019	5200B-5800B	22.8	5700	5.990	46.925	5.883	48.336	1.82%	-2.92%
			5745	6.073	46.860	5.936	48.275	2.31%	-2.93%
			5765	6.102	46.863	5.959	48.248	2.40%	-2.87%
			5785	6.133	46.811	5.982	48.220	2.52%	-2.92%
			5800	6.141	46.750	6.000	48.200	2.35%	-3.01%
			5805	6.147	46.727	6.006	48.193	2.35%	-3.04%
			5825	6.184	46.671	6.029	48.166	2.57%	-3.10%
01/11/2019	5200B-5800B	21.7	5700	6.086	47.244	5.883	48.336	3.45%	-2.26%
			5745	6.158	47.118	5.936	48.275	3.74%	-2.40%
			5765	6.177	47.112	5.959	48.248	3.66%	-2.35%
			5785	6.215	47.091	5.982	48.220	3.90%	-2.34%
			5800	6.235	47.061	6.000	48.200	3.92%	-2.36%
			5805	6.241	47.053	6.006	48.193	3.91%	-2.37%
			5825	6.292	47.053	6.029	48.166	4.36%	-2.31%

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.

10.2 Test System Verification

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

Table 10-3
System Verification Results – 1g

System Verification TARGET & MEASURED											
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	Deviation$_{1g}$ (%)
M	750	HEAD	12/19/2018	21.3	19.8	0.200	1054	3287	1.730	8.370	8.650	3.35%
I	750	HEAD	01/09/2019	21.7	20.3	0.200	1054	7406	1.620	8.370	8.100	-3.23%
M	835	HEAD	12/17/2018	22.3	20.1	0.200	4d132	3287	1.910	9.360	9.550	2.03%
M	1750	HEAD	11/26/2018	20.7	21.6	0.100	1150	3287	3.570	36.500	35.700	-2.19%
M	1900	HEAD	12/03/2018	21.7	20.5	0.100	5d148	3287	4.200	40.100	42.000	4.74%
G	2450	HEAD	12/12/2018	22.2	21.9	0.100	981	7410	5.250	52.300	52.500	0.38%
G	2450	HEAD	12/17/2018	21.9	22.0	0.100	981	7410	5.250	52.300	52.500	0.38%
G	2450	HEAD	01/09/2019	22.4	20.8	0.100	797	7410	5.450	52.700	54.500	3.42%
G	2600	HEAD	12/03/2018	22.0	21.3	0.100	1004	7410	5.810	55.900	58.100	3.94%
H	5250	HEAD	12/26/2018	20.5	20.2	0.050	1057	7409	3.870	79.200	77.400	-2.27%
H	5600	HEAD	12/26/2018	20.5	20.2	0.050	1057	7409	4.090	84.100	81.800	-2.73%
H	5750	HEAD	12/26/2018	20.5	20.2	0.050	1057	7409	3.790	80.500	75.800	-5.84%
H	5250	HEAD	01/07/2019	21.2	20.6	0.050	1191	7409	3.650	78.900	73.000	-7.48%
H	5600	HEAD	01/07/2019	21.2	20.6	0.050	1191	7409	4.000	83.600	80.000	-4.31%
H	5750	HEAD	01/07/2019	21.2	20.6	0.050	1191	7409	3.790	79.100	75.800	-4.17%
D	750	BODY	11/26/2018	22.6	20.6	0.200	1003	7357	1.730	8.580	8.650	0.82%
I	835	BODY	11/26/2018	19.9	21.5	0.200	4d047	7406	2.100	9.710	10.500	8.14%
H	835	BODY	01/02/2019	21.1	20.4	0.200	4d047	7409	2.060	9.710	10.300	6.08%
J	835	BODY	01/07/2019	20.9	20.8	0.200	4d133	3347	1.970	9.750	9.850	1.03%
J	1750	BODY	11/26/2018	19.9	19.9	0.100	1148	3347	3.950	37.000	39.500	6.76%
E	1900	BODY	11/25/2018	20.7	20.9	0.100	5d080	3213	3.740	39.200	37.400	-4.59%
E	1900	BODY	12/05/2018	24.5	23.3	0.100	5d148	3332	4.150	39.600	41.500	4.80%
J	2450	BODY	12/20/2018	19.7	22.6	0.100	719	3347	5.230	50.100	52.300	4.39%
K	2450	BODY	12/20/2018	23.2	22.4	0.100	797	3319	5.280	51.100	52.800	3.33%
K	2450	BODY	12/23/2018	23.4	22.3	0.100	797	3319	5.420	51.100	54.200	6.07%
I	2450	BODY	01/09/2019	23.4	21.0	0.100	797	7406	5.270	51.100	52.700	3.13%
K	2600	BODY	12/23/2018	23.4	22.3	0.100	1071	3319	5.630	54.200	56.300	3.87%
L	5250	BODY	12/17/2018	23.0	20.6	0.050	1237	7308	3.630	75.600	72.600	-3.97%
L	5600	BODY	12/17/2018	23.0	20.6	0.050	1237	7308	3.830	78.500	76.600	-2.42%
L	5750	BODY	12/17/2018	23.0	20.6	0.050	1237	7308	3.490	75.900	69.800	-8.04%
D	5750	BODY	01/08/2019	23.0	22.8	0.050	1191	7357	3.600	76.100	72.000	-5.39%
L	5750	BODY	01/11/2019	21.3	21.7	0.050	1191	7308	3.550	76.100	71.000	-6.70%

Table 10-4
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
J	1750	BODY	11/26/2018	19.9	19.9	0.100	1148	3347	2.100	19.800	21.000	6.06%
E	1900	BODY	11/25/2018	20.7	20.9	0.100	5d080	3213	1.930	20.600	19.300	-6.31%
E	1900	BODY	12/19/2018	21.6	22.3	0.100	5d148	3332	2.000	20.900	20.000	-4.31%
E	1900	BODY	12/26/2018	22.3	21.9	0.100	5d149	3332	2.110	20.700	21.100	1.93%
K	2450	BODY	12/26/2018	23.2	22.7	0.100	797	3319	2.430	24.200	24.300	0.41%
K	2600	BODY	12/26/2018	23.2	22.7	0.100	1071	3319	2.420	24.500	24.200	-1.22%
L	5250	BODY	12/26/2018	21.3	21.5	0.050	1191	7308	1.000	21.600	20.000	-7.41%
L	5600	BODY	12/26/2018	21.3	21.5	0.050	1191	7308	1.070	22.200	21.400	-3.60%
L	5750	BODY	12/26/2018	21.3	21.5	0.050	1191	7308	0.976	21.200	19.520	-7.92%

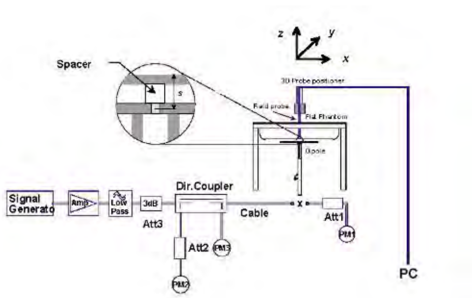


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

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	33.5	33.17	0.02	Right	Cheek	1726M	1:8.3	0.112	1.079	0.121	A1
836.60	190	GSM 850	GSM	33.5	33.17	0.09	Right	Tilt	1726M	1:8.3	0.055	1.079	0.059	
836.60	190	GSM 850	GSM	33.5	33.17	0.10	Left	Cheek	1726M	1:8.3	0.082	1.079	0.088	
836.60	190	GSM 850	GSM	33.5	33.17	0.01	Left	Tilt	1726M	1:8.3	0.049	1.079	0.053	
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
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	30.5	29.88	-0.02	Right	Cheek	1341M	1:8.3	0.032	1.153	0.037	
1880.00	661	GSM 1900	GSM	30.5	29.88	0.12	Right	Tilt	1341M	1:8.3	0.017	1.153	0.020	
1880.00	661	GSM 1900	GSM	30.5	29.88	0.16	Left	Cheek	1341M	1:8.3	0.074	1.153	0.085	A2
1880.00	661	GSM 1900	GSM	30.5	29.88	0.13	Left	Tilt	1341M	1:8.3	0.015	1.153	0.017	
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 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.06	Right	Cheek	1726M	1:1	0.263	1.038	0.273	A3
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.10	Right	Tilt	1726M	1:1	0.120	1.038	0.125	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	-0.01	Left	Cheek	1726M	1:1	0.186	1.038	0.193	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.11	Left	Tilt	1726M	1:1	0.110	1.038	0.114	
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 11-4
UMTS 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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	9400	UMTS 1900	RMC	24.5	24.11	1	0.01	Right	Cheek	0531M	1:1	0.086	1.094	0.094	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	1	-0.19	Right	Tilt	0531M	1:1	0.041	1.094	0.045	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	1	0.00	Left	Cheek	0531M	1:1	0.149	1.094	0.163	A4
1880.00	9400	UMTS 1900	RMC	24.5	24.11	1	0.09	Left	Tilt	0531M	1:1	0.033	1.094	0.036	
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
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	1	-0.04	0	Right	Cheek	QPSK	1	0	1696M	1:1	0.144	1.256	0.181	A5
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	1	0.03	1	Right	Cheek	QPSK	25	0	1696M	1:1	0.122	1.245	0.152	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	1	0.05	0	Right	Tilt	QPSK	1	0	1696M	1:1	0.082	1.256	0.103	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	1	0.02	1	Right	Tilt	QPSK	25	0	1696M	1:1	0.072	1.245	0.090	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	1	0.06	0	Left	Cheek	QPSK	1	0	1696M	1:1	0.117	1.256	0.147	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	1	0.05	1	Left	Cheek	QPSK	25	0	1696M	1:1	0.097	1.245	0.121	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	1	-0.08	0	Left	Tilt	QPSK	1	0	1696M	1:1	0.081	1.256	0.102	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	1	0.09	1	Left	Tilt	QPSK	25	0	1696M	1:1	0.066	1.245	0.082	
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 13 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	1	0.02	0	Right	Cheek	QPSK	1	0	1696M	1:1	0.173	1.321	0.229	A6
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	1	-0.03	1	Right	Cheek	QPSK	25	12	1696M	1:1	0.146	1.315	0.192	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	1	-0.02	0	Right	Tilt	QPSK	1	0	1696M	1:1	0.080	1.321	0.106	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	1	-0.01	1	Right	Tilt	QPSK	25	12	1696M	1:1	0.069	1.315	0.091	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	1	-0.06	0	Left	Cheek	QPSK	1	0	1696M	1:1	0.136	1.321	0.180	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	1	-0.03	1	Left	Cheek	QPSK	25	12	1696M	1:1	0.108	1.315	0.142	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	1	0.11	0	Left	Tilt	QPSK	1	0	1696M	1:1	0.074	1.321	0.098	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	1	0.01	1	Left	Tilt	QPSK	25	12	1696M	1:1	0.062	1.315	0.082	
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 11-7
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	0.00	0	Right	Cheek	QPSK	1	36	1696M	1:1	0.281	1.199	0.337	A7
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	0.01	1	Right	Cheek	QPSK	36	0	1696M	1:1	0.232	1.146	0.266	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	-0.07	0	Right	Tilt	QPSK	1	36	1696M	1:1	0.142	1.199	0.170	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	0.03	1	Right	Tilt	QPSK	36	0	1696M	1:1	0.114	1.146	0.131	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	-0.20	0	Left	Cheek	QPSK	1	36	1696M	1:1	0.193	1.199	0.231	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	0.02	1	Left	Cheek	QPSK	36	0	1696M	1:1	0.160	1.146	0.183	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	0.08	0	Left	Tilt	QPSK	1	36	1696M	1:1	0.133	1.199	0.159	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	-0.02	1	Left	Tilt	QPSK	36	0	1696M	1:1	0.113	1.146	0.129	
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 5 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.09	0	Right	Cheek	QPSK	1	0	1696M	1:1	0.301	1.151	0.346	A8
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.00	1	Right	Cheek	QPSK	25	0	1696M	1:1	0.232	1.135	0.263	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	0.03	0	Right	Tilt	QPSK	1	0	1696M	1:1	0.164	1.151	0.189	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.01	1	Right	Tilt	QPSK	25	0	1696M	1:1	0.125	1.135	0.142	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.02	0	Left	Cheek	QPSK	1	0	1696M	1:1	0.208	1.151	0.239	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.01	1	Left	Cheek	QPSK	25	0	1696M	1:1	0.173	1.135	0.196	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.07	0	Left	Tilt	QPSK	1	0	1696M	1:1	0.143	1.151	0.165	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.05	1	Left	Tilt	QPSK	25	0	1696M	1:1	0.113	1.135	0.128	
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 4 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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	25.0	24.93	56	0.07	0	Right	Cheek	QPSK	1	0	1340M	1:1	0.092	1.016	0.093	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.07	1	Right	Cheek	QPSK	50	0	1340M	1:1	0.071	1.026	0.073	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	0.05	0	Right	Tilt	QPSK	1	0	1340M	1:1	0.103	1.016	0.105	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.04	1	Right	Tilt	QPSK	50	0	1340M	1:1	0.078	1.026	0.080	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	0.05	0	Left	Cheek	QPSK	1	0	1340M	1:1	0.149	1.016	0.151	A9
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.04	1	Left	Cheek	QPSK	50	0	1340M	1:1	0.127	1.026	0.130	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	-0.01	0	Left	Tilt	QPSK	1	0	1340M	1:1	0.088	1.016	0.089	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.03	1	Left	Tilt	QPSK	50	0	1340M	1:1	0.082	1.026	0.084	
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 11-10
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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	25.0	24.16	34	-0.20	0	Right	Cheek	QPSK	1	0	0531M	1:1	0.096	1.213	0.116	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	34	-0.03	1	Right	Cheek	QPSK	50	0	0531M	1:1	0.087	1.175	0.102	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	34	-0.15	0	Right	Tilt	QPSK	1	0	0531M	1:1	0.068	1.213	0.082	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	34	-0.19	1	Right	Tilt	QPSK	50	0	0531M	1:1	0.055	1.175	0.065	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	34	0.13	0	Left	Cheek	QPSK	1	0	0531M	1:1	0.173	1.213	0.210	A10
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	34	0.02	1	Left	Cheek	QPSK	50	0	0531M	1:1	0.141	1.175	0.166	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	34	0.13	0	Left	Tilt	QPSK	1	0	0531M	1:1	0.045	1.213	0.055	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	34	0.13	1	Left	Tilt	QPSK	50	0	0531M	1:1	0.029	1.175	0.034	
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 41 Head SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	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)	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	0.14	0	Right	Cheek	QPSK	1	0	1399M	1:1.58	0.034	1.135	0.039	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	0.13	1	Right	Cheek	QPSK	50	0	1399M	1:1.58	0.030	1.067	0.032	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	0.16	0	Right	Tilt	QPSK	1	0	1399M	1:1.58	0.039	1.135	0.044	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	0.16	1	Right	Tilt	QPSK	50	0	1399M	1:1.58	0.036	1.067	0.038	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	0.12	0	Left	Cheek	QPSK	1	0	1399M	1:1.58	0.060	1.135	0.068	A11
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	0.13	1	Left	Cheek	QPSK	50	0	1399M	1:1.58	0.054	1.067	0.058	
2 CC Uplink	PCC	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.19	0.14	0	Left	Cheek	QPSK	1	0	1399M	1:1.58	0.054	1.205	0.065	
	SCC	2529.70	39987	Low-Mid	LTE Band 41	20								1	99						
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	0.12	0	Left	Tilt	QPSK	1	0	1399M	1:1.58	0.042	1.135	0.048	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	-0.19	1	Left	Tilt	QPSK	50	0	1399M	1:1.58	0.038	1.067	0.041	
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
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)	
2412	1	802.11b	DSSS	22	17.0	16.96	0.17	Right	Cheek	1	1689M	1	99.9	0.254	0.174	1.009	1.001	0.176	A12
2412	1	802.11b	DSSS	22	17.0	16.96	0.17	Right	Tilt	1	1689M	1	99.9	0.139	-	1.009	1.001	-	
2412	1	802.11b	DSSS	22	17.0	16.96	0.19	Left	Cheek	1	1689M	1	99.9	0.069	-	1.009	1.001	-	
2412	1	802.11b	DSSS	22	17.0	16.96	-0.20	Left	Tilt	1	1689M	1	99.9	0.064	-	1.009	1.001	-	
2462	11	802.11b	DSSS	22	17.0	16.92	0.12	Right	Cheek	2	1689M	1	99.9	0.125	-	1.019	1.001	-	
2462	11	802.11b	DSSS	22	17.0	16.92	0.18	Right	Tilt	2	1689M	1	99.9	0.134	0.092	1.019	1.001	0.094	
2462	11	802.11b	DSSS	22	17.0	16.92	0.14	Left	Cheek	2	1689M	1	99.9	0.080	-	1.019	1.001	-	
2462	11	802.11b	DSSS	22	17.0	16.92	0.17	Left	Tilt	2	1689M	1	99.9	0.081	-	1.019	1.001	-	
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 11-13
NII SISO 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)	
5270	54	802.11n	OFDM	40	14.0	13.90	0.18	Right	Cheek	1	1689M	13.5	97.4	0.608	0.256	1.023	1.027	0.269	
5270	54	802.11n	OFDM	40	14.0	13.90	0.19	Right	Tilt	1	1689M	13.5	97.4	0.575	-	1.023	1.027	-	
5270	54	802.11n	OFDM	40	14.0	13.90	-0.14	Left	Cheek	1	1689M	13.5	97.4	0.326	-	1.023	1.027	-	
5270	54	802.11n	OFDM	40	14.0	13.90	-0.16	Left	Tilt	1	1689M	13.5	97.4	0.390	-	1.023	1.027	-	
5270	54	802.11n	OFDM	40	14.0	13.61	0.13	Right	Cheek	2	1689M	13.5	97.3	0.018	-	1.094	1.028	-	
5270	54	802.11n	OFDM	40	14.0	13.61	-0.16	Right	Tilt	2	1689M	13.5	97.3	0.021	0.002	1.094	1.028	0.002	
5270	54	802.11n	OFDM	40	14.0	13.61	-0.14	Left	Cheek	2	1689M	13.5	97.3	0.013	-	1.094	1.028	-	
5270	54	802.11n	OFDM	40	14.0	13.61	0.13	Left	Tilt	2	1689M	13.5	97.3	0.017	-	1.094	1.028	-	
5610	122	802.11ac	OFDM	80	14.0	13.92	0.19	Right	Cheek	1	1689M	29.3	94.4	0.818	0.299	1.019	1.059	0.323	
5610	122	802.11ac	OFDM	80	14.0	13.92	0.19	Right	Tilt	1	1689M	29.3	94.4	0.797	-	1.019	1.059	-	
5610	122	802.11ac	OFDM	80	14.0	13.92	0.13	Left	Cheek	1	1689M	29.3	94.4	0.337	-	1.019	1.059	-	
5610	122	802.11ac	OFDM	80	14.0	13.92	0.19	Left	Tilt	1	1689M	29.3	94.4	0.344	-	1.019	1.059	-	
5610	122	802.11ac	OFDM	80	14.0	13.99	-0.04	Right	Cheek	2	1689M	29.3	94.5	0.025	0.006	1.002	1.058	0.006	
5610	122	802.11ac	OFDM	80	14.0	13.99	0.08	Right	Tilt	2	1689M	29.3	94.5	0.023	-	1.002	1.058	-	
5610	122	802.11ac	OFDM	80	14.0	13.99	0.00	Left	Cheek	2	1689M	29.3	94.5	0.024	-	1.002	1.058	-	
5610	122	802.11ac	OFDM	80	14.0	13.99	-0.19	Left	Tilt	2	1689M	29.3	94.5	0.015	-	1.002	1.058	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	-0.08	Right	Cheek	1	1689M	29.3	94.4	0.875	0.312	1.007	1.059	0.333	
5775	155	802.11ac	OFDM	80	14.0	13.97	0.19	Right	Tilt	1	1689M	29.3	94.4	0.827	-	1.007	1.059	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	0.19	Left	Cheek	1	1689M	29.3	94.4	0.334	-	1.007	1.059	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	0.20	Left	Tilt	1	1689M	29.3	94.4	0.348	-	1.007	1.059	-	
5775	155	802.11ac	OFDM	80	14.0	13.44	0.14	Right	Cheek	2	1689M	29.3	94.5	0.045	-	1.138	1.058	-	
5775	155	802.11ac	OFDM	80	14.0	13.44	0.19	Right	Tilt	2	1689M	29.3	94.5	0.047	0.013	1.138	1.058	0.016	
5775	155	802.11ac	OFDM	80	14.0	13.44	-0.16	Left	Cheek	2	1689M	29.3	94.5	0.028	-	1.138	1.058	-	
5775	155	802.11ac	OFDM	80	14.0	13.44	0.19	Left	Tilt	2	1689M	29.3	94.5	0.036	-	1.138	1.058	-	
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
NII MIMO Head SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [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)	
5270	54	802.11n	OFDM	40	14.0	13.90	14.0	13.61	-0.14	Right	Cheek	MIMO	1689M	27	98.1	0.802	0.377	1.094	1.019	0.420	A13
5270	54	802.11n	OFDM	40	14.0	13.90	14.0	13.61	0.14	Right	Tilt	MIMO	1689M	27	98.1	0.834	0.357	1.094	1.019	0.398	
5270	54	802.11n	OFDM	40	14.0	13.90	14.0	13.61	0.21	Left	Cheek	MIMO	1689M	27	98.1	0.348	-	1.094	1.019	-	
5270	54	802.11n	OFDM	40	14.0	13.90	14.0	13.61	-0.15	Left	Tilt	MIMO	1689M	27	98.1	0.419	-	1.094	1.019	-	
5610	122	802.11ac	OFDM	80	14.0	13.92	14.0	13.99	0.18	Right	Cheek	MIMO	1689M	58.5	98.0	0.695	0.253	1.019	1.020	0.263	
5610	122	802.11ac	OFDM	80	14.0	13.92	14.0	13.99	0.18	Right	Tilt	MIMO	1689M	58.5	98.0	0.786	0.280	1.019	1.020	0.291	
5610	122	802.11ac	OFDM	80	14.0	13.92	14.0	13.99	0.19	Left	Cheek	MIMO	1689M	58.5	98.0	0.336	-	1.019	1.020	-	
5610	122	802.11ac	OFDM	80	14.0	13.92	14.0	13.99	0.13	Left	Tilt	MIMO	1689M	58.5	98.0	0.317	-	1.019	1.020	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.18	Right	Cheek	MIMO	1689M	58.5	98.0	0.880	0.280	1.138	1.020	0.325	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.13	Right	Tilt	MIMO	1689M	58.5	98.0	0.923	0.303	1.138	1.020	0.352	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	-0.20	Left	Cheek	MIMO	1689M	58.5	98.0	0.345	-	1.138	1.020	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.21	Left	Tilt	MIMO	1689M	58.5	98.0	0.343	-	1.138	1.020	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

To achieve the 17 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 14 dBm.

Table 11-15
DSS Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2402.00	0	Bluetooth	FHSS	18.5	17.69	0.04	Right	Cheek	1690M	1	77.1	0.691	1.205	1.297	1.080	
2441.00	39	Bluetooth	FHSS	18.5	18.37	0.13	Right	Cheek	1690M	1	77.1	1.010	1.030	1.297	**1.349**	A14
2480.00	78	Bluetooth	FHSS	18.5	17.48	0.15	Right	Cheek	1690M	1	77.1	0.754	1.265	1.297	1.237	
2402.00	0	Bluetooth	FHSS	18.5	17.69	-0.07	Right	Tilt	1690M	1	77.1	0.570	1.205	1.297	0.891	
2441.00	39	Bluetooth	FHSS	18.5	18.37	-0.09	Right	Tilt	1690M	1	77.1	0.800	1.030	1.297	1.069	
2480.00	78	Bluetooth	FHSS	18.5	17.48	0.03	Right	Tilt	1690M	1	77.1	0.569	1.265	1.297	0.934	
2441.00	39	Bluetooth	FHSS	18.5	18.37	0.01	Left	Cheek	1690M	1	77.1	0.256	1.030	1.297	0.342	
2441.00	39	Bluetooth	FHSS	18.5	18.37	0.06	Left	Tilt	1690M	1	77.1	0.233	1.030	1.297	0.311	
2441.00	39	Bluetooth	FHSS	18.5	18.37	0.15	Right	Cheek	1690M	1	77.1	0.956	1.030	1.297	1.277	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Head 1.6 W/kg (mW/g)** averaged over 1 gram									

Blue entries represent variability measurements.

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]	Ant State	Power Drift [dB]	Spacing	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	33.5	33.17	N/A	-0.04	15 mm	1373M	1:8.3	back	0.220	1.079	0.237	A15
1880.00	661	GSM 1900	GSM	30.5	29.88	N/A	0.06	15 mm	1805M	1:8.3	back	0.259	1.153	0.299	A17
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.01	15 mm	1726M	1:1	back	0.234	1.038	0.243	A19
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	0.00	15 mm	1341M	1:1	back	0.527	1.094	0.577	A21
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 11-17
LTE FDD Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	0.00	0	1399M	QPSK	1	0	15 mm	back	1:1	0.219	1.256	0.275	A23
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	0.03	1	1399M	QPSK	25	0	15 mm	back	1:1	0.175	1.245	0.218	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	76	-0.06	0	1399M	QPSK	1	0	15 mm	back	1:1	0.189	1.321	0.250	A25
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	-0.04	1	1399M	QPSK	25	12	15 mm	back	1:1	0.154	1.315	0.203	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	0.00	0	1373M	QPSK	1	36	15 mm	back	1:1	0.268	1.199	0.321	A27
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	-0.02	1	1373M	QPSK	36	0	15 mm	back	1:1	0.220	1.146	0.252	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.01	0	1373M	QPSK	1	0	15 mm	back	1:1	0.360	1.151	0.414	A29
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.02	1	1373M	QPSK	25	0	15 mm	back	1:1	0.294	1.135	0.334	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	-0.07	0	1370M	QPSK	1	0	15 mm	back	1:1	0.652	1.016	0.662	A31
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	-0.02	1	1370M	QPSK	50	0	15 mm	back	1:1	0.522	1.026	0.536	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	-0.04	0	1371M	QPSK	1	0	15 mm	back	1:1	0.686	1.213	0.832	A33
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.12	38	-0.02	0	1371M	QPSK	1	0	15 mm	back	1:1	0.681	1.225	0.834	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.10	38	-0.06	0	1371M	QPSK	1	0	15 mm	back	1:1	0.676	1.230	0.831	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.03	1	1371M	QPSK	50	0	15 mm	back	1:1	0.553	1.175	0.650	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.24	38	0.00	1	1371M	QPSK	100	0	15 mm	back	1:1	0.535	1.191	0.637	
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 11-18
LTE TDD Body-Worn SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	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)	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	-0.06	0	1341M	QPSK	1	0	15 mm	back	1:1.58	0.287	1.135	0.326	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	-0.02	1	1341M	QPSK	50	0	15 mm	back	1:1.58	0.280	1.067	0.299	
2 CC Uplink	PCC	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.19	0.07	0	1341M	QPSK	1	0	15 mm	back	1:1.58	0.294	1.205	0.354	A35
	SCC	2529.70	39987	Low-Mid	LTE Band 41	20							1	99							
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 11-19
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)	
2437	6	802.11b	DSSS	22	20.0	19.65	0.16	15 mm	1	1689M	1	back	99.9	0.081	0.066	1.084	1.001	0.072	A37
2437	6	802.11b	DSSS	22	19.0	18.89	0.09	15 mm	2	1689M	1	back	99.9	0.023	0.019	1.026	1.001	0.020	
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 11-20
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)	
5300	60	802.11a	OFDM	20	18.0	17.97	-0.09	15 mm	1	1364M	6	back	98.8	0.220	0.104	1.007	1.012	0.106	
5280	56	802.11a	OFDM	20	18.0	17.91	-0.03	15 mm	2	1690M	6	back	98.9	0.449	0.197	1.021	1.011	0.203	
5620	124	802.11a	OFDM	20	18.0	17.89	-0.09	15 mm	1	1364M	6	back	98.8	0.426	0.205	1.026	1.012	0.213	
5720	144	802.11a	OFDM	20	18.0	17.79	-0.05	15 mm	2	1690M	6	back	98.9	0.830	0.351	1.050	1.011	0.373	
5745	149	802.11a	OFDM	20	18.0	17.93	0.01	15 mm	1	1364M	6	back	98.8	0.440	0.189	1.016	1.012	0.194	
5745	149	802.11a	OFDM	20	18.0	17.77	0.06	15 mm	2	1690M	6	back	98.9	0.949	0.398	1.054	1.011	0.424	A39
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 11-21
DSS Body-Worn SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	18.5	18.37	0.14	15 mm	1689M	1	back	77.1	0.092	1.030	1.297	0.123	A41
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

11.3 Standalone Hotspot SAR Data

Table 11-22
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	30.5	30.04	N/A	-0.19	10 mm	1422M	3	1:2.76	back	0.479	1.112	0.533	A16
836.60	190	GSM 850	GPRS	30.5	30.04	N/A	0.03	10 mm	1422M	3	1:2.76	front	0.328	1.112	0.365	
836.60	190	GSM 850	GPRS	30.5	30.04	N/A	-0.03	10 mm	1422M	3	1:2.76	bottom	0.288	1.112	0.320	
836.60	190	GSM 850	GPRS	30.5	30.04	N/A	0.04	10 mm	1422M	3	1:2.76	right	0.263	1.112	0.292	
836.60	190	GSM 850	GPRS	30.5	30.04	N/A	-0.06	10 mm	1422M	3	1:2.76	left	0.094	1.112	0.105	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	-0.03	10 mm	1805M	3	1:2.76	back	0.382	1.140	0.435	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	0.01	10 mm	1805M	3	1:2.76	front	0.286	1.140	0.326	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	0.01	10 mm	1805M	3	1:2.76	bottom	0.585	1.140	0.667	
1880.00	661	GSM 1900	GPRS	25.5	24.92	N/A	0.02	10 mm	1805M	3	1:2.76	bottom	0.653	1.143	0.746	
1909.80	810	GSM 1900	GPRS	25.5	24.21	N/A	-0.08	10 mm	1805M	3	1:2.76	bottom	0.705	1.346	0.949	A18
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	-0.04	10 mm	1805M	3	1:2.76	right	0.042	1.140	0.048	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	0.05	10 mm	1805M	3	1:2.76	left	0.067	1.140	0.076	
826.40	4132	UMTS 850	RMC	25.0	24.71	1	-0.02	10 mm	1726M	N/A	1:1	back	0.598	1.069	0.639	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.13	10 mm	1726M	N/A	1:1	back	0.618	1.038	0.641	A20
846.60	4233	UMTS 850	RMC	25.0	24.67	1	0.00	10 mm	1726M	N/A	1:1	back	0.530	1.079	0.572	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	-0.01	10 mm	1726M	N/A	1:1	front	0.260	1.038	0.270	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.01	10 mm	1726M	N/A	1:1	bottom	0.307	1.038	0.319	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	0.00	10 mm	1726M	N/A	1:1	right	0.297	1.038	0.308	
836.60	4183	UMTS 850	RMC	25.0	24.84	1	-0.03	10 mm	1726M	N/A	1:1	left	0.108	1.038	0.112	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	51	0.03	10 mm	1341M	N/A	1:1	back	0.395	1.089	0.430	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	51	-0.08	10 mm	1341M	N/A	1:1	front	0.346	1.089	0.377	
1852.40	9262	UMTS 1900	RMC	20.5	20.08	51	-0.06	10 mm	1341M	N/A	1:1	bottom	0.748	1.102	0.824	A22
1880.00	9400	UMTS 1900	RMC	20.5	20.13	51	-0.07	10 mm	1341M	N/A	1:1	bottom	0.712	1.089	0.775	
1907.60	9538	UMTS 1900	RMC	20.5	19.78	51	-0.06	10 mm	1341M	N/A	1:1	bottom	0.725	1.180	0.856	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	51	0.05	10 mm	1341M	N/A	1:1	right	0.052	1.089	0.057	
1880.00	9400	UMTS 1900	RMC	20.5	20.13	51	0.05	10 mm	1341M	N/A	1:1	left	0.087	1.089	0.095	
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 11-23
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	0.01	0	1399M	QPSK	1	0	10 mm	back	1:1	0.241	1.256	0.303	A24
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	0.02	1	1399M	QPSK	25	0	10 mm	back	1:1	0.192	1.245	0.239	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	-0.01	0	1399M	QPSK	1	0	10 mm	front	1:1	0.220	1.256	0.276	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	-0.01	1	1399M	QPSK	25	0	10 mm	front	1:1	0.180	1.245	0.224	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	-0.11	0	1399M	QPSK	1	0	10 mm	bottom	1:1	0.123	1.256	0.154	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	-0.04	1	1399M	QPSK	25	0	10 mm	bottom	1:1	0.100	1.245	0.125	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	0.00	0	1399M	QPSK	1	0	10 mm	right	1:1	0.187	1.256	0.235	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	-0.06	1	1399M	QPSK	25	0	10 mm	right	1:1	0.150	1.245	0.187	
707.50	23095	Mid	LTE Band 12	10	25.0	24.01	10	0.03	0	1399M	QPSK	1	0	10 mm	left	1:1	0.146	1.256	0.183	
707.50	23095	Mid	LTE Band 12	10	24.0	23.05	10	-0.03	1	1399M	QPSK	25	0	10 mm	left	1:1	0.115	1.245	0.143	
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 11-24
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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	23.79	76	0.15	0	1399M	QPSK	1	0	10 mm	back	1:1	0.405	1.321	0.535	A26
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	-0.07	1	1399M	QPSK	25	12	10 mm	back	1:1	0.321	1.315	0.422	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	76	0.01	0	1399M	QPSK	1	0	10 mm	front	1:1	0.320	1.321	0.423	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	0.05	1	1399M	QPSK	25	12	10 mm	front	1:1	0.260	1.315	0.342	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	76	0.18	0	1399M	QPSK	1	0	10 mm	bottom	1:1	0.283	1.321	0.374	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	0.12	1	1399M	QPSK	25	12	10 mm	bottom	1:1	0.206	1.315	0.271	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	76	0.00	0	1399M	QPSK	1	0	10 mm	right	1:1	0.170	1.321	0.225	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	0.00	1	1399M	QPSK	25	12	10 mm	right	1:1	0.148	1.315	0.195	
782.00	23230	Mid	LTE Band 13	10	25.0	23.79	76	0.05	0	1399M	QPSK	1	0	10 mm	left	1:1	0.096	1.321	0.127	
782.00	23230	Mid	LTE Band 13	10	24.0	22.81	76	-0.04	1	1399M	QPSK	25	12	10 mm	left	1:1	0.083	1.315	0.109	
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 11-25
LTE Band 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	0.00	0	1373M	QPSK	1	36	10 mm	back	1:1	0.550	1.199	0.659	A28
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	-0.01	1	1373M	QPSK	36	0	10 mm	back	1:1	0.453	1.146	0.519	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	0.00	0	1373M	QPSK	1	36	10 mm	front	1:1	0.354	1.199	0.424	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	-0.01	1	1373M	QPSK	36	0	10 mm	front	1:1	0.289	1.146	0.331	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	-0.01	0	1373M	QPSK	1	36	10 mm	bottom	1:1	0.382	1.199	0.458	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	-0.03	1	1373M	QPSK	36	0	10 mm	bottom	1:1	0.307	1.146	0.352	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	-0.02	0	1373M	QPSK	1	36	10 mm	right	1:1	0.321	1.199	0.385	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	0.00	1	1373M	QPSK	36	0	10 mm	right	1:1	0.277	1.146	0.317	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.21	1	-0.02	0	1373M	QPSK	1	36	10 mm	left	1:1	0.130	1.199	0.156	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.41	1	0.05	1	1373M	QPSK	36	0	10 mm	left	1:1	0.120	1.146	0.138	
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 11-26
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.01	0	1373M	QPSK	1	0	10 mm	back	1:1	0.648	1.151	0.746	A30
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	-0.02	1	1373M	QPSK	25	0	10 mm	back	1:1	0.535	1.135	0.607	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	0.02	0	1373M	QPSK	1	0	10 mm	front	1:1	0.528	1.151	0.608	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.01	1	1373M	QPSK	25	0	10 mm	front	1:1	0.438	1.135	0.497	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	0.02	0	1373M	QPSK	1	0	10 mm	bottom	1:1	0.469	1.151	0.540	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	-0.11	1	1373M	QPSK	25	0	10 mm	bottom	1:1	0.364	1.135	0.413	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.02	0	1373M	QPSK	1	0	10 mm	right	1:1	0.360	1.151	0.414	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.03	1	1373M	QPSK	25	0	10 mm	right	1:1	0.283	1.135	0.321	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.89	2	-0.01	0	1373M	QPSK	1	0	10 mm	left	1:1	0.141	1.151	0.162	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.95	2	0.02	1	1373M	QPSK	25	0	10 mm	left	1:1	0.115	1.135	0.131	
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 11-27
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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	21.0	20.97	56	-0.04	0	1370M	QPSK	1	0	10 mm	back	1:1	0.470	1.007	0.473	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.80	56	-0.07	0	1370M	QPSK	50	25	10 mm	back	1:1	0.485	1.047	0.508	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.97	56	-0.10	0	1370M	QPSK	1	0	10 mm	front	1:1	0.382	1.007	0.385	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.80	56	-0.06	0	1370M	QPSK	50	25	10 mm	front	1:1	0.397	1.047	0.416	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.97	56	-0.11	0	1370M	QPSK	1	0	10 mm	bottom	1:1	0.692	1.007	0.697	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.80	56	-0.08	0	1370M	QPSK	50	25	10 mm	bottom	1:1	0.697	1.047	0.730	A32
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.97	56	-0.04	0	1370M	QPSK	1	0	10 mm	right	1:1	0.069	1.007	0.069	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.80	56	-0.05	0	1370M	QPSK	50	25	10 mm	right	1:1	0.069	1.047	0.072	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.97	56	-0.05	0	1370M	QPSK	1	0	10 mm	left	1:1	0.093	1.007	0.094	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.80	56	0.01	0	1370M	QPSK	50	25	10 mm	left	1:1	0.102	1.047	0.107	
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 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.34	38	-0.15	0	1371M	QPSK	1	0	10 mm	back	1:1	0.483	1.038	0.501	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	-0.01	0	1371M	QPSK	50	0	10 mm	back	1:1	0.500	1.035	0.518	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.34	38	0.04	0	1371M	QPSK	1	0	10 mm	front	1:1	0.405	1.038	0.420	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	0.03	0	1371M	QPSK	50	0	10 mm	front	1:1	0.412	1.035	0.426	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	20.14	38	-0.08	0	1371M	QPSK	1	0	10 mm	bottom	1:1	0.860	1.086	0.934	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.34	38	-0.15	0	1371M	QPSK	1	0	10 mm	bottom	1:1	0.849	1.038	0.881	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	20.17	38	-0.14	0	1371M	QPSK	1	0	10 mm	bottom	1:1	0.826	1.079	0.891	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	20.34	38	-0.03	0	1371M	QPSK	50	25	10 mm	bottom	1:1	0.830	1.038	0.862	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	-0.03	0	1371M	QPSK	50	0	10 mm	bottom	1:1	0.872	1.035	0.903	A34
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	20.19	38	-0.03	0	1371M	QPSK	50	0	10 mm	bottom	1:1	0.849	1.074	0.912	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	20.33	38	-0.09	0	1371M	QPSK	100	0	10 mm	bottom	1:1	0.807	1.040	0.839	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.34	38	-0.12	0	1371M	QPSK	1	0	10 mm	right	1:1	0.063	1.038	0.065	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	-0.04	0	1371M	QPSK	50	0	10 mm	right	1:1	0.063	1.035	0.065	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.34	38	0.06	0	1371M	QPSK	1	0	10 mm	left	1:1	0.079	1.038	0.082	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	-0.10	0	1371M	QPSK	50	0	10 mm	left	1:1	0.087	1.035	0.090	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.35	38	-0.06	0	1371M	QPSK	50	0	10 mm	bottom	1:1	0.870	1.035	0.900	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram										

Blue entries represent variability measurements.

Table 11-29
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	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)	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	0.11	0	1341M	QPSK	1	99	10 mm	back	1:1.58	0.428	1.112	0.476	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	0.02	0	1341M	QPSK	50	50	10 mm	back	1:1.58	0.464	1.064	0.494	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	-0.07	0	1341M	QPSK	1	99	10 mm	front	1:1.58	0.243	1.112	0.270	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	0.01	0	1341M	QPSK	50	50	10 mm	front	1:1.58	0.262	1.064	0.279	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	-0.03	0	1341M	QPSK	1	99	10 mm	bottom	1:1.58	0.673	1.112	0.748	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	23.0	22.43	0.00	0	1341M	QPSK	1	0	10 mm	bottom	1:1.58	0.617	1.140	0.703	
1 CC Uplink	N/A	2593.00	40620	Mid	LTE Band 41	20	23.0	22.13	-0.09	0	1341M	QPSK	1	0	10 mm	bottom	1:1.58	0.801	1.222	0.979	
1 CC Uplink	N/A	2636.50	41055	Mid-High	LTE Band 41	20	23.0	22.13	-0.07	0	1341M	QPSK	1	0	10 mm	bottom	1:1.58	0.734	1.222	0.897	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.0	22.11	-0.09	0	1341M	QPSK	1	0	10 mm	bottom	1:1.58	0.663	1.227	0.814	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	-0.05	0	1341M	QPSK	50	50	10 mm	bottom	1:1.58	0.727	1.064	0.774	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	23.0	22.67	-0.08	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	0.684	1.079	0.738	
1 CC Uplink	N/A	2593.00	40620	Mid	LTE Band 41	20	23.0	22.24	0.15	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	0.975	1.191	**1.161**	
1 CC Uplink	N/A	2636.50	41055	Mid-High	LTE Band 41	20	23.0	22.33	-0.03	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	0.762	1.167	0.889	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.0	22.33	-0.02	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	0.665	1.167	0.776	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.53	-0.01	0	1341M	QPSK	100	0	10 mm	bottom	1:1.58	0.743	1.114	0.828	
2 CC Uplink	PCC	2593.00	40620	Mid	LTE Band 41	20	23.0	23.00	0.20	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	1.090	1.000	1.090	A36
	SCC	2573.20	40422	Mid	LTE Band 41	20							50	50							
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	-0.11	0	1341M	QPSK	1	99	10 mm	left	1:1.58	0.074	1.112	0.082	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	0.03	0	1341M	QPSK	50	50	10 mm	left	1:1.58	0.077	1.064	0.082	
2 CC Uplink	PCC	2593.00	40620	Mid	LTE Band 41	20	23.0	23.00	-0.03	0	1341M	QPSK	50	0	10 mm	bottom	1:1.58	1.010	1.000	1.010	
	SCC	2573.20	40422	Mid	LTE Band 41	20							50	50							
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

Blue entries represent variability measurements.

Table 11-30
WLAN SISO 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)	
2437	6	802.11b	DSSS	22	20.0	19.65	0.09	10 mm	1	1689M	1	back	99.9	0.167	0.139	1.084	1.001	**0.151**	A38
2437	6	802.11b	DSSS	22	20.0	19.65	0.14	10 mm	1	1689M	1	front	99.9	0.146	0.104	1.084	1.001	0.113	
2437	6	802.11b	DSSS	22	20.0	19.65	-0.17	10 mm	1	1689M	1	top	99.9	0.094	-	1.084	1.001	-	
2437	6	802.11b	DSSS	22	20.0	19.65	-0.18	10 mm	1	1689M	1	left	99.9	0.163	-	1.084	1.001	-	
2437	6	802.11b	DSSS	22	19.0	18.89	0.16	10 mm	2	1689M	1	back	99.9	0.049	-	1.026	1.001	-	
2437	6	802.11b	DSSS	22	19.0	18.89	0.12	10 mm	2	1689M	1	front	99.9	0.018	0.018	1.026	1.001	0.018	
2437	6	802.11b	DSSS	22	19.0	18.89	0.20	10 mm	2	1689M	1	top	99.9	0.069	0.062	1.026	1.001	0.064	
2437	6	802.11b	DSSS	22	19.0	18.89	0.14	10 mm	2	1689M	1	left	99.9	0.004	-	1.026	1.001	-	
5745	149	802.11a	OFDM	20	18.0	17.93	-0.03	10 mm	1	1364M	6	back	98.8	0.650	0.289	1.016	1.012	0.297	
5745	149	802.11a	OFDM	20	18.0	17.93	0.19	10 mm	1	1364M	6	front	98.8	0.133	-	1.016	1.012	-	
5745	149	802.11a	OFDM	20	18.0	17.93	0.15	10 mm	1	1364M	6	top	98.8	0.537	-	1.016	1.012	-	
5745	149	802.11a	OFDM	20	18.0	17.93	0.14	10 mm	1	1364M	6	left	98.8	0.581	-	1.016	1.012	-	
5745	149	802.11a	OFDM	20	18.0	17.77	0.05	10 mm	2	1690M	6	back	98.9	1.578	0.654	1.054	1.011	0.697	
5785	157	802.11a	OFDM	20	18.0	17.42	0.08	10 mm	2	1690M	6	back	98.9	1.530	0.665	1.143	1.011	**0.768**	A40
5825	165	802.11a	OFDM	20	18.0	17.40	0.00	10 mm	2	1690M	6	back	98.9	1.548	0.650	1.148	1.011	0.754	
5745	149	802.11a	OFDM	20	18.0	17.77	0.00	10 mm	2	1690M	6	front	98.9	0.024	0.010	1.054	1.011	0.011	
5745	149	802.11a	OFDM	20	18.0	17.77	0.19	10 mm	2	1690M	6	top	98.9	0.146	-	1.054	1.011	-	
5745	149	802.11a	OFDM	20	18.0	17.77	0.13	10 mm	2	1690M	6	left	98.9	0.311	0.112	1.054	1.011	0.119	
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 11-31
WLAN MIMO Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [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)	
5745	149	802.11n	OFDM	20	18.0	17.84	18.0	17.76	-0.02	10 mm	MIMO	1690M	13	back	98.7	1.562	0.613	1.057	1.013	0.656	
5785	157	802.11n	OFDM	20	18.0	17.97	18.0	17.84	0.00	10 mm	MIMO	1690M	13	back	98.7	1.428	0.641	1.038	1.013	0.674	
5825	165	802.11n	OFDM	20	18.0	17.84	18.0	17.35	0.04	10 mm	MIMO	1690M	13	back	98.7	1.547	0.640	1.161	1.013	0.753	
5785	157	802.11n	OFDM	20	18.0	17.97	18.0	17.84	0.17	10 mm	MIMO	1690M	13	front	98.7	0.144	0.044	1.038	1.013	0.046	
5785	157	802.11n	OFDM	20	18.0	17.97	18.0	17.84	0.16	10 mm	MIMO	1690M	13	top	98.7	0.503	-	1.038	1.013	-	
5785	157	802.11n	OFDM	20	18.0	17.97	18.0	17.84	0.14	10 mm	MIMO	1690M	13	left	98.7	0.607	0.258	1.038	1.013	0.271	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

Table 11-32
WLAN MIMO Hotspot SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [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	802.11n	OFDM	20	17.0	16.70	17.0	16.60	0.16	10 mm	MIMO	1689M	13	back	98.7	0.041	0.033	1.096	1.013	0.037	
2412	1	802.11n	OFDM	20	17.0	16.70	17.0	16.60	0.21	10 mm	MIMO	1689M	13	front	98.7	0.028	-	1.096	1.013	-	
2412	1	802.11n	OFDM	20	17.0	16.70	17.0	16.60	0.19	10 mm	MIMO	1689M	13	top	98.7	0.043	0.041	1.096	1.013	0.046	
2412	1	802.11n	OFDM	20	17.0	16.70	17.0	16.60	0.13	10 mm	MIMO	1689M	13	left	98.7	0.041	-	1.096	1.013	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	-0.02	10 mm	MIMO	1690M	58.5	back	98.0	0.503	0.235	1.138	1.020	0.273	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.00	10 mm	MIMO	1690M	58.5	front	98.0	0.039	0.012	1.138	1.020	0.014	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.13	10 mm	MIMO	1690M	58.5	top	98.0	0.142	-	1.138	1.020	-	
5775	155	802.11ac	OFDM	80	14.0	13.97	14.0	13.44	0.19	10 mm	MIMO	1690M	58.5	left	98.0	0.183	-	1.138	1.020	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

DTS and NII MIMO were additionally evaluated at the maximum allowed output power during operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 2.4 GHz WIFI was not transmitting during NII MIMO and 5 GHz WIFI was not transmitting during DTS MIMO.

Table 11-33
DSS Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	18.5	18.37	-0.15	10 mm	1689M	1	back	77.1	0.172	1.030	1.297	0.230	
2441	39	Bluetooth	FHSS	18.5	18.37	-0.06	10 mm	1689M	1	front	77.1	0.110	1.030	1.297	0.147	
2441	39	Bluetooth	FHSS	18.5	18.37	-0.05	10 mm	1689M	1	top	77.1	0.105	1.030	1.297	0.140	
2441	39	Bluetooth	FHSS	18.5	18.37	-0.06	10 mm	1689M	1	left	77.1	0.181	1.030	1.297	0.242	A42
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram								

11.4 Standalone Phablet SAR Data

Table 11-34
GPRS/UMTS Phablet SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1850.20	512	GSM 1900	GPRS	27.5	26.86	N/A	-0.13	7 mm	1805M	3	1:2.76	back	0.434	1.159	0.503	
1850.20	512	GSM 1900	GPRS	27.5	26.86	N/A	-0.02	5 mm	1805M	3	1:2.76	front	0.501	1.159	0.581	
1850.20	512	GSM 1900	GPRS	27.5	26.86	N/A	-0.01	9 mm	1805M	3	1:2.76	bottom	0.537	1.159	0.622	
1850.20	512	GSM 1900	GPRS	27.5	26.86	N/A	-0.16	0 mm	1805M	3	1:2.76	right	0.117	1.159	0.136	
1850.20	512	GSM 1900	GPRS	27.5	26.86	N/A	-0.11	0 mm	1805M	3	1:2.76	left	0.250	1.159	0.290	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	-0.03	0 mm	1805M	3	1:2.76	back	1.150	1.140	1.311	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	0.11	0 mm	1805M	3	1:2.76	front	0.991	1.140	1.130	
1850.20	512	GSM 1900	GPRS	25.5	24.93	N/A	0.19	0 mm	1805M	3	1:2.76	bottom	1.980	1.140	2.257	
1880.00	661	GSM 1900	GPRS	25.5	24.92	N/A	0.12	0 mm	1805M	3	1:2.76	bottom	2.240	1.143	2.560	A43
1909.80	810	GSM 1900	GPRS	25.5	24.21	N/A	0.04	0 mm	1805M	3	1:2.76	bottom	2.060	1.346	2.773	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	-0.02	7 mm	1805M	N/A	1:1	back	0.964	1.094	1.055	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	0.04	5 mm	1805M	N/A	1:1	front	1.320	1.094	1.444	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	-0.12	9 mm	1805M	N/A	1:1	bottom	0.560	1.094	0.613	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	-0.04	0 mm	1805M	N/A	1:1	right	0.279	1.094	0.305	
1880.00	9400	UMTS 1900	RMC	24.5	24.11	51	-0.21	0 mm	1805M	N/A	1:1	left	0.555	1.094	0.607	
1880.00	9400	UMTS 1900	RMC	22.0	21.70	51	0.11	0 mm	1364M	N/A	1:1	back	1.330	1.072	1.426	
1880.00	9400	UMTS 1900	RMC	22.0	21.70	51	0.02	0 mm	1364M	N/A	1:1	front	1.070	1.072	1.147	
1880.00	9400	UMTS 1900	RMC	22.0	21.70	51	-0.06	0 mm	1364M	N/A	1:1	bottom	1.340	1.072	1.436	A44
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams								

Table 11-35
LTE FDD Phablet SAR Data

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Ant State	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	-0.01	0	1370M	QPSK	1	0	7 mm	back	1:1	1.020	1.016	1.036	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	-0.02	1	1370M	QPSK	50	0	7 mm	back	1:1	0.829	1.026	0.851	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	0.10	0	1370M	QPSK	1	0	5 mm	front	1:1	1.160	1.016	1.179	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.05	1	1370M	QPSK	50	0	5 mm	front	1:1	0.946	1.026	0.971	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	-0.02	0	1370M	QPSK	1	0	9 mm	bottom	1:1	1.080	1.016	1.097	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	-0.02	1	1370M	QPSK	50	0	9 mm	bottom	1:1	0.877	1.026	0.900	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	0.14	0	1370M	QPSK	1	0	0 mm	right	1:1	0.347	1.016	0.353	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	0.01	1	1370M	QPSK	50	0	0 mm	right	1:1	0.283	1.026	0.290	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	25.0	24.93	56	-0.09	0	1370M	QPSK	1	0	0 mm	left	1:1	0.542	1.016	0.551	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	23.89	56	-0.12	1	1370M	QPSK	50	0	0 mm	left	1:1	0.446	1.026	0.458	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.42	56	0.19	0	1370M	QPSK	1	0	0 mm	back	1:1	2.120	1.019	2.160	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.31	56	0.19	0	1370M	QPSK	50	0	0 mm	back	1:1	2.070	1.045	2.163	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.27	56	-0.13	0	1370M	QPSK	100	0	0 mm	back	1:1	2.080	1.054	2.192	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.42	56	-0.10	0	1370M	QPSK	1	0	0 mm	front	1:1	1.570	1.019	1.600	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.31	56	0.00	0	1370M	QPSK	50	0	0 mm	front	1:1	1.650	1.045	1.724	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.42	56	-0.10	0	1370M	QPSK	1	0	0 mm	bottom	1:1	2.850	1.019	2.904	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.31	56	-0.11	0	1370M	QPSK	50	0	0 mm	bottom	1:1	3.050	1.045	3.187	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.27	56	-0.12	0	1370M	QPSK	100	0	0 mm	bottom	1:1	3.050	1.054	3.215	A45
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	21.31	56	-0.11	0	1370M	QPSK	50	0	0 mm	bottom	1:1	2.990	1.045	3.125	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	-0.03	0	1687M	QPSK	1	0	7 mm	back	1:1	0.603	1.213	0.731	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.03	1	1687M	QPSK	50	0	7 mm	back	1:1	0.479	1.175	0.563	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	0.00	0	1687M	QPSK	1	0	5 mm	front	1:1	1.380	1.213	1.674	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.03	1	1687M	QPSK	50	0	5 mm	front	1:1	1.100	1.175	1.293	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	-0.02	0	1687M	QPSK	1	0	9 mm	bottom	1:1	1.480	1.213	1.795	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.12	38	0.04	0	1687M	QPSK	1	0	9 mm	bottom	1:1	1.460	1.225	1.789	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.10	38	-0.03	0	1687M	QPSK	1	0	9 mm	bottom	1:1	1.450	1.230	1.784	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.01	1	1687M	QPSK	50	0	9 mm	bottom	1:1	1.140	1.175	1.340	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	-0.13	0	1687M	QPSK	1	0	0 mm	right	1:1	0.362	1.213	0.439	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.06	1	1687M	QPSK	50	0	0 mm	right	1:1	0.286	1.175	0.336	
1860.00	26140	Low	LTE Band 25 (PCS)	20	25.0	24.16	38	-0.12	0	1687M	QPSK	1	0	0 mm	left	1:1	0.593	1.213	0.719	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	23.30	38	-0.12	1	1687M	QPSK	50	0	0 mm	left	1:1	0.490	1.175	0.576	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.40	38	-0.01	0	1371M	QPSK	1	0	0 mm	back	1:1	1.690	1.023	1.729	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.47	38	0.04	0	1371M	QPSK	50	0	0 mm	back	1:1	1.780	1.007	1.792	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.40	38	-0.02	0	1371M	QPSK	1	0	0 mm	front	1:1	1.610	1.023	1.647	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.47	38	-0.04	0	1371M	QPSK	50	0	0 mm	front	1:1	1.700	1.007	1.712	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	21.32	38	0.02	0	1371M	QPSK	1	0	0 mm	bottom	1:1	2.530	1.042	2.636	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.40	38	-0.05	0	1371M	QPSK	1	0	0 mm	bottom	1:1	1.950	1.023	1.995	
1905.00	26590	High	LTE Band 25 (PCS)	20	21.5	21.32	38	-0.07	0	1371M	QPSK	1	0	0 mm	bottom	1:1	1.960	1.042	2.042	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	21.46	38	-0.04	0	1371M	QPSK	50	0	0 mm	bottom	1:1	2.680	1.009	2.704	A46
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.47	38	-0.09	0	1371M	QPSK	50	0	0 mm	bottom	1:1	2.060	1.007	2.074	
1905.00	26590	High	LTE Band 25 (PCS)	20	21.5	21.34	38	-0.08	0	1371M	QPSK	50	0	0 mm	bottom	1:1	2.040	1.038	2.118	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.5	21.39	38	0.00	0	1371M	QPSK	100	0	0 mm	bottom	1:1	2.070	1.026	2.124	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.5	21.46	38	-0.09	0	1371M	QPSK	50	0	0 mm	bottom	1:1	2.590	1.009	2.613	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Blue entries represent variability measurements.

Table 11-36
LTE TDD Phablet SAR Data

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	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 (10g)	Scaling Factor	Reported SAR (10g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	0.04	0	1341M	QPSK	1	0	7 mm	back	1:1.58	0.408	1.135	0.463	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	-0.01	1	1341M	QPSK	50	0	7 mm	back	1:1.58	0.315	1.067	0.336	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	-0.01	0	1341M	QPSK	1	0	5 mm	front	1:1.58	0.374	1.135	0.424	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	0.03	1	1341M	QPSK	50	0	5 mm	front	1:1.58	0.301	1.067	0.321	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	-0.09	0	1341M	QPSK	1	0	9 mm	bottom	1:1.58	0.514	1.135	0.583	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	-0.09	1	1341M	QPSK	50	0	9 mm	bottom	1:1.58	0.407	1.067	0.434	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.45	-0.16	0	1341M	QPSK	1	0	0 mm	left	1:1.58	0.499	1.135	0.566	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.72	-0.14	1	1341M	QPSK	50	0	0 mm	left	1:1.58	0.374	1.067	0.399	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	-0.18	0	1341M	QPSK	1	99	0 mm	back	1:1.58	1.230	1.112	1.368	A47
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	-0.12	0	1341M	QPSK	50	50	0 mm	back	1:1.58	1.200	1.064	1.277	
2 CC Uplink	PCC	2506.00	39750	Low	LTE Band 41	20	23.0	22.50	-0.16	0	1341M	QPSK	1	99	0 mm	back	1:1.58	1.170	1.122	1.313	
	SCC	2525.80	39948	Low	LTE Band 41								1	0							
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	0.14	0	1341M	QPSK	1	99	0 mm	front	1:1.58	0.597	1.112	0.664	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	0.09	0	1341M	QPSK	50	50	0 mm	front	1:1.58	0.617	1.064	0.656	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.54	-0.17	0	1341M	QPSK	1	99	0 mm	bottom	1:1.58	0.908	1.112	1.010	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.0	22.73	-0.12	0	1341M	QPSK	50	50	0 mm	bottom	1:1.58	0.900	1.064	0.958	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Table 11-37
WLAN SISO Phablet SAR Data

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 (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5300	60	802.11a	OFDM	20	18.0	17.97	0.18	0 mm	1	1364M	6	back	98.8	6.117	0.766	1.007	1.012	0.781	
5300	60	802.11a	OFDM	20	18.0	17.97	0.10	0 mm	1	1364M	6	front	98.8	7.198	0.568	1.007	1.012	0.579	
5300	60	802.11a	OFDM	20	18.0	17.97	0.16	0 mm	1	1364M	6	top	98.8	9.366	0.614	1.007	1.012	0.626	
5300	60	802.11a	OFDM	20	18.0	17.97	-0.17	0 mm	1	1364M	6	left	98.8	11.301	1.060	1.007	1.012	1.080	
5280	56	802.11a	OFDM	20	18.0	17.91	-0.18	0 mm	2	1690M	6	back	98.9	8.553	2.220	1.021	1.011	2.292	
5300	60	802.11a	OFDM	20	18.0	17.90	0.19	0 mm	2	1690M	6	back	98.9	6.758	2.190	1.023	1.011	2.265	
5280	56	802.11a	OFDM	20	18.0	17.91	0.00	0 mm	2	1690M	6	front	98.9	0.241	0.013	1.021	1.011	0.013	
5280	56	802.11a	OFDM	20	18.0	17.91	0.12	0 mm	2	1690M	6	top	98.9	0.419	-	1.021	1.011	-	
5280	56	802.11a	OFDM	20	18.0	17.91	-0.19	0 mm	2	1690M	6	left	98.9	1.457	0.122	1.021	1.011	0.126	
5620	124	802.11a	OFDM	20	18.0	17.89	-0.14	0 mm	1	1364M	6	back	98.8	8.358	0.800	1.026	1.012	0.831	
5620	124	802.11a	OFDM	20	18.0	17.89	0.15	0 mm	1	1364M	6	front	98.8	4.387	-	1.026	1.012	-	
5620	124	802.11a	OFDM	20	18.0	17.89	0.18	0 mm	1	1364M	6	top	98.8	7.852	-	1.026	1.012	-	
5620	124	802.11a	OFDM	20	18.0	17.89	0.15	0 mm	1	1364M	6	left	98.8	10.123	0.796	1.026	1.012	0.826	
5500	100	802.11a	OFDM	20	18.0	17.56	0.19	0 mm	2	1690M	6	back	98.9	12.580	2.220	1.107	1.011	2.485	
5600	120	802.11a	OFDM	20	18.0	17.78	0.19	0 mm	2	1690M	6	back	98.9	10.196	2.430	1.052	1.011	2.584	
5720	144	802.11a	OFDM	20	18.0	17.79	0.15	0 mm	2	1690M	6	back	98.9	8.929	2.290	1.050	1.011	2.431	
5720	144	802.11a	OFDM	20	18.0	17.79	0.00	0 mm	2	1690M	6	front	98.9	0.347	0.044	1.050	1.011	0.047	
5720	144	802.11a	OFDM	20	18.0	17.79	0.17	0 mm	2	1690M	6	top	98.9	0.283	-	1.050	1.011	-	
5720	144	802.11a	OFDM	20	18.0	17.79	0.00	0 mm	2	1690M	6	left	98.9	2.334	0.178	1.050	1.011	0.189	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Table 11-38
WLAN MIMO Phablet SAR Data

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5260	52	802.11n	OFDM	20	18.0	17.56	18.0	17.68	-0.02	0 mm	MIMO	1690M	13	back	98.7	38.421	2.150	1.107	1.013	2.411	
5280	56	802.11n	OFDM	20	18.0	17.61	18.0	17.64	0.12	0 mm	MIMO	1690M	13	back	98.7	31.626	2.880	1.094	1.013	3.192	A48
5300	60	802.11n	OFDM	20	18.0	17.74	18.0	17.60	0.17	0 mm	MIMO	1690M	13	back	98.7	46.535	2.840	1.096	1.013	3.153	
5300	60	802.11n	OFDM	20	18.0	17.74	18.0	17.60	-0.12	0 mm	MIMO	1690M	13	front	98.7	7.417	0.563	1.096	1.013	0.625	
5300	60	802.11n	OFDM	20	18.0	17.74	18.0	17.60	0.16	0 mm	MIMO	1690M	13	top	98.7	9.775	0.563	1.096	1.013	0.625	
5300	60	802.11n	OFDM	20	18.0	17.74	18.0	17.60	0.17	0 mm	MIMO	1690M	13	left	98.7	7.521	-	1.096	1.013	-	
5600	120	802.11n	OFDM	20	18.0	17.94	18.0	17.81	0.07	0 mm	MIMO	1690M	13	back	98.7	40.790	2.570	1.045	1.013	2.721	
5720	144	802.11n	OFDM	20	18.0	17.98	18.0	17.75	0.10	0 mm	MIMO	1690M	13	back	98.7	30.196	2.410	1.059	1.013	2.585	
5600	120	802.11n	OFDM	20	18.0	17.94	18.0	17.81	-0.14	0 mm	MIMO	1690M	13	front	98.7	4.137	0.444	1.045	1.013	0.470	
5600	120	802.11n	OFDM	20	18.0	17.94	18.0	17.81	0.10	0 mm	MIMO	1690M	13	top	98.7	5.970	-	1.045	1.013	-	
5600	120	802.11n	OFDM	20	18.0	17.94	18.0	17.81	0.15	0 mm	MIMO	1690M	13	left	98.7	7.188	0.813	1.045	1.013	0.861	
5280	56	802.11n	OFDM	20	18.0	17.61	18.0	17.64	0.12	0 mm	MIMO	1690M	13	back	98.7	32.084	2.530	1.094	1.013	2.804	
5600	120	802.11n	OFDM	20	18.0	17.94	18.0	17.81	0.21	0 mm	MIMO	1690M	13	back	98.7	30.671	2.640	1.045	1.013	2.795	
5720	144	802.11n	OFDM	20	18.0	17.98	18.0	17.75	-0.10	0 mm	MIMO	1690M	13	back	98.7	22.441	2.480	1.059	1.013	2.660	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Phablet 4.0 W/kg (mW/g) averaged over 10 grams					

Notes:
1. To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.
2. Blue entries represent variability measurements.

11.5 SAR Test Notes

General Notes:

1. 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.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. 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.
7. 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.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. 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).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 14 for supplemental data.
12. This device utilizes power reduction for some wireless modes and technologies, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.
13. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds below.
14. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).

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 for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

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 for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 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 and MCC=001 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 LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, 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 downlink only 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.
7. For LTE Band 41, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

WLAN Notes:

1. For held-to-ear, and hotspot, and phablet 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 for 1g evaluations, 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 for 1g evaluations. 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 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. 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 for 1g evaluations 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.
7. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9.5 for the time domain plot and calculation for the duty factor of the device.
2. Head and hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

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 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB Publication 248227, the worst case WLAN SAR result for the applicable exposure condition was used for simultaneous transmission analysis.

Per FCC KDB Publication 648474 D04 Handset SAR v01r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-“).

12.3 Head SAR Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN 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	0.121	0.176	0.094	0.297	0.215	0.391
	GSM 1900	0.085	0.176	0.094	0.261	0.179	0.355
	UMTS 850	0.273	0.176	0.094	0.449	0.367	0.543
	UMTS 1900	0.163	0.176	0.094	0.339	0.257	0.433
	LTE Band 12	0.181	0.176	0.094	0.357	0.275	0.451
	LTE Band 13	0.229	0.176	0.094	0.405	0.323	0.499
	LTE Band 26 (Cell)	0.337	0.176	0.094	0.513	0.431	0.607
	LTE Band 5 (Cell)	0.346	0.176	0.094	0.522	0.440	**0.616**
	LTE Band 4 (AWS)	0.151	0.176	0.094	0.327	0.245	0.421
	LTE Band 25 (PCS)	0.210	0.176	0.094	0.386	0.304	0.480
	LTE Band 41	0.068	0.176	0.094	0.244	0.162	0.338

Table 12-2
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	0.121	0.333	0.016	0.454	0.137	0.470
	GSM 1900	0.085	0.333	0.016	0.418	0.101	0.434
	UMTS 850	0.273	0.333	0.016	0.606	0.289	0.622
	UMTS 1900	0.163	0.333	0.016	0.496	0.179	0.512
	LTE Band 12	0.181	0.333	0.016	0.514	0.197	0.530
	LTE Band 13	0.229	0.333	0.016	0.562	0.245	0.578
	LTE Band 26 (Cell)	0.337	0.333	0.016	0.670	0.353	0.686
	LTE Band 5 (Cell)	0.346	0.333	0.016	0.679	0.362	**0.695**
	LTE Band 4 (AWS)	0.151	0.333	0.016	0.484	0.167	0.500
	LTE Band 25 (PCS)	0.210	0.333	0.016	0.543	0.226	0.559
	LTE Band 41	0.068	0.333	0.016	0.401	0.084	0.417

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (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)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Head SAR	GSM 850	0.121	0.176	0.094	0.333	0.016	0.740
	GSM 1900	0.085	0.176	0.094	0.333	0.016	0.704
	UMTS 850	0.273	0.176	0.094	0.333	0.016	0.892
	UMTS 1900	0.163	0.176	0.094	0.333	0.016	0.782
	LTE Band 12	0.181	0.176	0.094	0.333	0.016	0.800
	LTE Band 13	0.229	0.176	0.094	0.333	0.016	0.848
	LTE Band 26 (Cell)	0.337	0.176	0.094	0.333	0.016	0.956
	LTE Band 5 (Cell)	0.346	0.176	0.094	0.333	0.016	**0.965**
	LTE Band 4 (AWS)	0.151	0.176	0.094	0.333	0.016	0.770
	LTE Band 25 (PCS)	0.210	0.176	0.094	0.333	0.016	0.829
	LTE Band 41	0.068	0.176	0.094	0.333	0.016	0.687

Table 12-4
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.121	1.349	1.470
	GSM 1900	0.085	1.349	1.434
	UMTS 850	0.273	1.349	See Table Below
	UMTS 1900	0.163	1.349	1.512
	LTE Band 12	0.181	1.349	1.530
	LTE Band 13	0.229	1.349	**1.578**
	LTE Band 26 (Cell)	0.337	1.349	See Table Below
	LTE Band 5 (Cell)	0.346	1.349	See Table Below
	LTE Band 4 (AWS)	0.151	1.349	1.500
	LTE Band 25 (PCS)	0.210	1.349	1.559
	LTE Band 41	0.068	1.349	1.417

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Head SAR	Right Cheek	0.273	1.349	See Note 1	0.03
	Right Tilt	0.125	1.069	**1.194**	N/A
	Left Cheek	0.193	0.342	0.535	N/A
	Left Tilt	0.114	0.311	0.425	N/A

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Head SAR	Right Cheek	0.337	1.349	See Note 1	0.03
	Right Tilt	0.170	1.069	**1.239**	N/A
	Left Cheek	0.231	0.342	0.573	N/A
	Left Tilt	0.159	0.311	0.470	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Head SAR	Right Cheek	0.346	1.349	See Note 1	0.03
	Right Tilt	0.189	1.069	**1.258**	N/A
	Left Cheek	0.239	0.342	0.581	N/A
	Left Tilt	0.165	0.311	0.476	N/A

Note 1 - No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the distribution pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.10 for detailed SPLS ratio analysis.

12.4 Head SAR Simultaneous Transmission Analysis for Main Band, Bluetooth, and 5GHz WLAN

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.121	1.349	0.333	See Note 1
	Right Tilt	0.059	1.069	0.333*	**1.461**
	Left Cheek	0.088	0.342	0.333*	0.763
	Left Tilt	0.053	0.311	0.333*	0.697

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.037	1.349	0.333	See Note 1
	Right Tilt	0.020	1.069	0.333*	**1.422**
	Left Cheek	0.085	0.342	0.333*	0.760
	Left Tilt	0.017	0.311	0.333*	0.661

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.273	1.349	0.333	See Note 1
	Right Tilt	0.125	1.069	0.333*	**1.527**
	Left Cheek	0.193	0.342	0.333*	0.868
	Left Tilt	0.114	0.311	0.333*	0.758

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.094	1.349	0.333	See Note 1
	Right Tilt	0.045	1.069	0.333*	**1.447**
	Left Cheek	0.163	0.342	0.333*	0.838
	Left Tilt	0.036	0.311	0.333*	0.680

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.181	1.349	0.333	See Note 1
	Right Tilt	0.103	1.069	0.333*	**1.505**
	Left Cheek	0.147	0.342	0.333*	0.822
	Left Tilt	0.102	0.311	0.333*	0.746

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.229	1.349	0.333	See Note 1
	Right Tilt	0.106	1.069	0.333*	**1.508**
	Left Cheek	0.180	0.342	0.333*	0.855
	Left Tilt	0.098	0.311	0.333*	0.742

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.337	1.349	0.333	See Note 1
	Right Tilt	0.170	1.069	0.333*	**1.572**
	Left Cheek	0.231	0.342	0.333*	0.906
	Left Tilt	0.159	0.311	0.333*	0.803

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.346	1.349	0.333	See Note 1
	Right Tilt	0.189	1.069	0.333*	**1.591**
	Left Cheek	0.239	0.342	0.333*	0.914
	Left Tilt	0.165	0.311	0.333*	0.809

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.093	1.349	0.333	See Note 1
	Right Tilt	0.105	1.069	0.333*	**1.507**
	Left Cheek	0.151	0.342	0.333*	0.826
	Left Tilt	0.089	0.311	0.333*	0.733

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.116	1.349	0.333	See Note 1
	Right Tilt	0.082	1.069	0.333*	**1.484**
	Left Cheek	0.210	0.342	0.333*	0.885
	Left Tilt	0.055	0.311	0.333*	0.699

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.039	1.349	0.333	See Note 1
	Right Tilt	0.044	1.069	0.333*	**1.446**
	Left Cheek	0.068	0.342	0.333*	0.743
	Left Tilt	0.048	0.311	0.333*	0.692

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	GSM 850	0.121	1.349	0.016	1.486
	GSM 1900	0.085	1.349	0.016	1.450
	UMTS 850	0.273	1.349	0.016	See Table Below
	UMTS 1900	0.163	1.349	0.016	1.528
	LTE Band 12	0.181	1.349	0.016	1.546
	LTE Band 13	0.229	1.349	0.016	**1.594**
	LTE Band 26 (Cell)	0.337	1.349	0.016	See Table Below
	LTE Band 5 (Cell)	0.346	1.349	0.016	See Table Below
	LTE Band 4 (AWS)	0.151	1.349	0.016	1.516
	LTE Band 25 (PCS)	0.210	1.349	0.016	1.575
	LTE Band 41	0.068	1.349	0.016	1.433

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.273	1.349	0.006	See Note 1
	Right Tilt	0.125	1.069	0.016	**1.210**
	Left Cheek	0.193	0.342	0.016*	0.551
	Left Tilt	0.114	0.311	0.016*	0.441

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.337	1.349	0.006	See Note 1
	Right Tilt	0.170	1.069	0.016	**1.255**
	Left Cheek	0.231	0.342	0.016*	0.589
	Left Tilt	0.159	0.311	0.016*	0.486

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.346	1.349	0.006	See Note 1
	Right Tilt	0.189	1.069	0.016	**1.274**
	Left Cheek	0.239	0.342	0.016*	0.597
	Left Tilt	0.165	0.311	0.016*	0.492

Simult Tx	Configuration	GSM 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.121	1.349	0.420	See Note 1
	Right Tilt	0.059	1.069	0.398	**1.526**
	Left Cheek	0.088	0.342	0.420*	0.850
	Left Tilt	0.053	0.311	0.420*	0.784

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.037	1.349	0.420	See Note 1
	Right Tilt	0.020	1.069	0.398	**1.487**
	Left Cheek	0.085	0.342	0.420*	0.847
	Left Tilt	0.017	0.311	0.420*	0.748

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.273	1.349	0.420	See Note 1
	Right Tilt	0.125	1.069	0.398	**1.592**
	Left Cheek	0.193	0.342	0.420*	0.955
	Left Tilt	0.114	0.311	0.420*	0.845

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.094	1.349	0.420	See Note 1
	Right Tilt	0.045	1.069	0.398	**1.512**
	Left Cheek	0.163	0.342	0.420*	0.925
	Left Tilt	0.036	0.311	0.420*	0.767

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.181	1.349	0.420	See Note 1
	Right Tilt	0.103	1.069	0.398	**1.570**
	Left Cheek	0.147	0.342	0.420*	0.909
	Left Tilt	0.102	0.311	0.420*	0.833

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.229	1.349	0.420	See Note 1
	Right Tilt	0.106	1.069	0.398	**1.573**
	Left Cheek	0.180	0.342	0.420*	0.942
	Left Tilt	0.098	0.311	0.420*	0.829

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.337	1.349	0.420	See Note 1
	Right Tilt	0.170	1.069	0.398	See Note 1
	Left Cheek	0.231	0.342	0.420*	0.993
	Left Tilt	0.159	0.311	0.420*	0.890

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.346	1.349	0.420	See Note 1
	Right Tilt	0.189	1.069	0.398	See Note 1
	Left Cheek	0.239	0.342	0.420*	1.001
	Left Tilt	0.165	0.311	0.420*	0.896

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.093	1.349	0.420	See Note 1
	Right Tilt	0.105	1.069	0.398	**1.572**
	Left Cheek	0.151	0.342	0.420*	0.913
	Left Tilt	0.089	0.311	0.420*	0.820

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.116	1.349	0.420	See Note 1
	Right Tilt	0.082	1.069	0.398	**1.549**
	Left Cheek	0.210	0.342	0.420*	0.972
	Left Tilt	0.055	0.311	0.420*	0.786

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.039	1.349	0.420	See Note 1
	Right Tilt	0.044	1.069	0.398	**1.511**
	Left Cheek	0.068	0.342	0.420*	0.830
	Left Tilt	0.048	0.311	0.420*	0.779

Note 1 - No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the distribution pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.11 for detailed SPLS ratio analysis.

12.5 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	0.237	0.072	0.020	0.309	0.257	0.329
	GSM 1900	0.299	0.072	0.020	0.371	0.319	0.391
	UMTS 850	0.243	0.072	0.020	0.315	0.263	0.335
	UMTS 1900	0.577	0.072	0.020	0.649	0.597	0.669
	LTE Band 12	0.275	0.072	0.020	0.347	0.295	0.367
	LTE Band 13	0.250	0.072	0.020	0.322	0.270	0.342
	LTE Band 26 (Cell)	0.321	0.072	0.020	0.393	0.341	0.413
	LTE Band 5 (Cell)	0.414	0.072	0.020	0.486	0.434	0.506
	LTE Band 4 (AWS)	0.662	0.072	0.020	0.734	0.682	0.754
	LTE Band 25 (PCS)	0.834	0.072	0.020	0.906	0.854	**0.926**
	LTE Band 41	0.354	0.072	0.020	0.426	0.374	0.446

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	0.237	0.213	0.424	0.450	0.661	0.874
	GSM 1900	0.299	0.213	0.424	0.512	0.723	0.936
	UMTS 850	0.243	0.213	0.424	0.456	0.667	0.880
	UMTS 1900	0.577	0.213	0.424	0.790	1.001	1.214
	LTE Band 12	0.275	0.213	0.424	0.488	0.699	0.912
	LTE Band 13	0.250	0.213	0.424	0.463	0.674	0.887
	LTE Band 26 (Cell)	0.321	0.213	0.424	0.534	0.745	0.958
	LTE Band 5 (Cell)	0.414	0.213	0.424	0.627	0.838	1.051
	LTE Band 4 (AWS)	0.662	0.213	0.424	0.875	1.086	1.299
	LTE Band 25 (PCS)	0.834	0.213	0.424	1.047	1.258	**1.471**
	LTE Band 41	0.354	0.213	0.424	0.567	0.778	0.991

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (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)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Body-Worn	GSM 850	0.237	0.072	0.020	0.213	0.424	0.966
	GSM 1900	0.299	0.072	0.020	0.213	0.424	1.028
	UMTS 850	0.243	0.072	0.020	0.213	0.424	0.972
	UMTS 1900	0.577	0.072	0.020	0.213	0.424	1.306
	LTE Band 12	0.275	0.072	0.020	0.213	0.424	1.004
	LTE Band 13	0.250	0.072	0.020	0.213	0.424	0.979
	LTE Band 26 (Cell)	0.321	0.072	0.020	0.213	0.424	1.050
	LTE Band 5 (Cell)	0.414	0.072	0.020	0.213	0.424	1.143
	LTE Band 4 (AWS)	0.662	0.072	0.020	0.213	0.424	1.391
	LTE Band 25 (PCS)	0.834	0.072	0.020	0.213	0.424	**1.563**
	LTE Band 41	0.354	0.072	0.020	0.213	0.424	1.083

Table 12-9
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	0.237	0.123	0.360
	GSM 1900	0.299	0.123	0.422
	UMTS 850	0.243	0.123	0.366
	UMTS 1900	0.577	0.123	0.700
	LTE Band 12	0.275	0.123	0.398
	LTE Band 13	0.250	0.123	0.373
	LTE Band 26 (Cell)	0.321	0.123	0.444
	LTE Band 5 (Cell)	0.414	0.123	0.537
	LTE Band 4 (AWS)	0.662	0.123	0.785
	LTE Band 25 (PCS)	0.834	0.123	**0.957**
	LTE Band 41	0.354	0.123	0.477

Table 12-10
Simultaneous Transmission Scenario with Bluetooth and 5GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth 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	4	1+2+3+4
Body-Worn	GSM 850	0.237	0.123	0.213	0.424	0.997
	GSM 1900	0.299	0.123	0.213	0.424	1.059
	UMTS 850	0.243	0.123	0.213	0.424	1.003
	UMTS 1900	0.577	0.123	0.213	0.424	1.337
	LTE Band 12	0.275	0.123	0.213	0.424	1.035
	LTE Band 13	0.250	0.123	0.213	0.424	1.010
	LTE Band 26 (Cell)	0.321	0.123	0.213	0.424	1.081
	LTE Band 5 (Cell)	0.414	0.123	0.213	0.424	1.174
	LTE Band 4 (AWS)	0.662	0.123	0.213	0.424	1.422
	LTE Band 25 (PCS)	0.834	0.123	0.213	0.424	**1.594**
	LTE Band 41	0.354	0.123	0.213	0.424	1.114

12.6 Hotspot SAR Simultaneous Transmission Analysis

Table 12-11
Simultaneous Transmission Scenario with 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	0.533	0.151	0.064	0.684	0.597	0.748
	GPRS 1900	0.949	0.151	0.064	1.100	1.013	1.164
	UMTS 850	0.641	0.151	0.064	0.792	0.705	0.856
	UMTS 1900	0.856	0.151	0.064	1.007	0.920	1.071
	LTE Band 12	0.303	0.151	0.064	0.454	0.367	0.518
	LTE Band 13	0.535	0.151	0.064	0.686	0.599	0.750
	LTE Band 26 (Cell)	0.659	0.151	0.064	0.810	0.723	0.874
	LTE Band 5 (Cell)	0.746	0.151	0.064	0.897	0.810	0.961
	LTE Band 4 (AWS)	0.730	0.151	0.064	0.881	0.794	0.945
	LTE Band 25 (PCS)	0.934	0.151	0.064	1.085	0.998	1.149
	LTE Band 41	1.161	0.151	0.064	1.312	1.225	**1.376**

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
Hotspot SAR	GPRS 850	0.533	0.297	0.768	0.830	1.301
	GPRS 1900	0.949	0.297	0.768	1.246	See Table Below
	UMTS 850	0.641	0.297	0.768	0.938	1.409
	UMTS 1900	0.856	0.297	0.768	1.153	See Table Below
	LTE Band 12	0.303	0.297	0.768	0.600	1.071
	LTE Band 13	0.535	0.297	0.768	0.832	1.303
	LTE Band 26 (Cell)	0.659	0.297	0.768	0.956	1.427
	LTE Band 5 (Cell)	0.746	0.297	0.768	1.043	**1.514**
	LTE Band 4 (AWS)	0.730	0.297	0.768	1.027	1.498
	LTE Band 25 (PCS)	0.934	0.297	0.768	1.231	See Table Below
	LTE Band 41	1.161	0.297	0.768	1.458	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.435	0.768	**1.203**
	Front	0.326	0.011	0.337
	Top	-	0.768*	0.768
	Bottom	0.949	-	0.949
	Right	0.048	-	0.048
	Left	0.076	0.119	0.195

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.430	0.768	**1.198**
	Front	0.377	0.011	0.388
	Top	-	0.768*	0.768
	Bottom	0.856	-	0.856
	Right	0.057	-	0.057
	Left	0.095	0.119	0.214

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.518	0.768	**1.286**
	Front	0.426	0.011	0.437
	Top	-	0.768*	0.768
	Bottom	0.934	-	0.934
	Right	0.065	-	0.065
	Left	0.090	0.119	0.209

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.494	0.768	**1.262**
	Front	0.279	0.011	0.290
	Top	-	0.768*	0.768
	Bottom	1.161	-	1.161
	Right	-	-	-
	Left	0.082	0.119	0.201

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.533	0.753	1.286
	GPRS 1900	0.949	0.753	See Table Below
	UMTS 850	0.641	0.753	1.394
	UMTS 1900	0.856	0.753	See Table Below
	LTE Band 12	0.303	0.753	1.056
	LTE Band 13	0.535	0.753	1.288
	LTE Band 26 (Cell)	0.659	0.753	1.412
	LTE Band 5 (Cell)	0.746	0.753	**1.499**
	LTE Band 4 (AWS)	0.730	0.753	1.483
	LTE Band 25 (PCS)	0.934	0.753	See Table Below
	LTE Band 41	1.161	0.753	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.435	0.753	**1.188**
	Front	0.326	0.046	0.372
	Top	-	0.753*	0.753
	Bottom	0.949	-	0.949
	Right	0.048	-	0.048
	Left	0.076	0.271	0.347

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.430	0.753	**1.183**
	Front	0.377	0.046	0.423
	Top	-	0.753*	0.753
	Bottom	0.856	-	0.856
	Right	0.057	-	0.057
	Left	0.095	0.271	0.366

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.518	0.753	**1.271**
	Front	0.426	0.046	0.472
	Top	-	0.753*	0.753
	Bottom	0.934	-	0.934
	Right	0.065	-	0.065
	Left	0.090	0.271	0.361

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.494	0.753	**1.247**
	Front	0.279	0.046	0.325
	Top	-	0.753*	0.753
	Bottom	1.161	-	1.161
	Right	-	-	-
	Left	0.082	0.271	0.353

Table 12-13
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO at 19 dBm SAR (W/kg)	5 GHz WLAN MIMO at 16 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.533	0.046	0.273	0.852
	GPRS 1900	0.949	0.046	0.273	1.268
	UMTS 850	0.641	0.046	0.273	0.960
	UMTS 1900	0.856	0.046	0.273	1.175
	LTE Band 12	0.303	0.046	0.273	0.622
	LTE Band 13	0.535	0.046	0.273	0.854
	LTE Band 26 (Cell)	0.659	0.046	0.273	0.978
	LTE Band 5 (Cell)	0.746	0.046	0.273	1.065
	LTE Band 4 (AWS)	0.730	0.046	0.273	1.049
	LTE Band 25 (PCS)	0.934	0.046	0.273	1.253
	LTE Band 41	1.161	0.046	0.273	**1.480**

Table 12-14
Simultaneous Transmission Scenario with Bluetooth (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.533	0.242	0.775
	GPRS 1900	0.949	0.242	1.191
	UMTS 850	0.641	0.242	0.883
	UMTS 1900	0.856	0.242	1.098
	LTE Band 12	0.303	0.242	0.545
	LTE Band 13	0.535	0.242	0.777
	LTE Band 26 (Cell)	0.659	0.242	0.901
	LTE Band 5 (Cell)	0.746	0.242	0.988
	LTE Band 4 (AWS)	0.730	0.242	0.972
	LTE Band 25 (PCS)	0.934	0.242	1.176
	LTE Band 41	1.161	0.242	**1.403**

12.8 Hotspot SAR Simultaneous Transmission Analysis for Main Band, Bluetooth, and 5GHz WLAN

Table 12-15
Simultaneous Transmission Scenario with Bluetooth and 5GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.533	0.242	0.297	1.072
	GPRS 1900	0.949	0.242	0.297	**1.488**
	UMTS 850	0.641	0.242	0.297	1.180
	UMTS 1900	0.856	0.242	0.297	1.395
	LTE Band 12	0.303	0.242	0.297	0.842
	LTE Band 13	0.535	0.242	0.297	1.074
	LTE Band 26 (Cell)	0.659	0.242	0.297	1.198
	LTE Band 5 (Cell)	0.746	0.242	0.297	1.285
	LTE Band 4 (AWS)	0.730	0.242	0.297	1.269
	LTE Band 25 (PCS)	0.934	0.242	0.297	1.473
	LTE Band 41	1.161	0.242	0.297	See Table Below

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.494	0.230	0.297	1.021
	Front	0.279	0.147	0.297*	0.723
	Top	-	0.140	0.297*	0.437
	Bottom	1.161	-	-	**1.161**
	Right	-	-	-	-
	Left	0.082	0.242	0.297*	0.621

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.533	0.242	0.768	1.543
	GPRS 1900	0.949	0.242	0.768	See Table Below
	UMTS 850	0.641	0.242	0.768	See Table Below
	UMTS 1900	0.856	0.242	0.768	See Table Below
	LTE Band 12	0.303	0.242	0.768	1.313
	LTE Band 13	0.535	0.242	0.768	**1.545**
	LTE Band 26 (Cell)	0.659	0.242	0.768	See Table Below
	LTE Band 5 (Cell)	0.746	0.242	0.768	See Table Below
	LTE Band 4 (AWS)	0.730	0.242	0.768	See Table Below
	LTE Band 25 (PCS)	0.934	0.242	0.768	See Table Below
	LTE Band 41	1.161	0.242	0.768	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.435	0.230	0.768	**1.433**
	Front	0.326	0.147	0.011	0.484
	Top	-	0.140	0.768*	0.908
	Bottom	0.949	-	-	0.949
	Right	0.048	-	-	0.048
	Left	0.076	0.242	0.119	0.437

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.641	0.230	0.768	See Note 1
	Front	0.270	0.147	0.011	0.428
	Top	-	0.140	0.768*	0.908
	Bottom	0.319	-	-	0.319
	Right	0.308	-	-	0.308
	Left	0.112	0.242	0.119	0.473

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.430	0.230	0.768	**1.428**
	Front	0.377	0.147	0.011	0.535
	Top	-	0.140	0.768*	0.908
	Bottom	0.856	-	-	0.856
	Right	0.057	-	-	0.057
	Left	0.095	0.242	0.119	0.456

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.659	0.230	0.768	See Note 1
	Front	0.424	0.147	0.011	0.582
	Top	-	0.140	0.768*	**0.908**
	Bottom	0.458	-	-	0.458
	Right	0.385	-	-	0.385
	Left	0.156	0.242	0.119	0.517

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.746	0.230	0.768	See Note 1
	Front	0.608	0.147	0.011	0.766
	Top	-	0.140	0.768*	**0.908**
	Bottom	0.540	-	-	0.540
	Right	0.414	-	-	0.414
	Left	0.162	0.242	0.119	0.523

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.508	0.230	0.768	**1.506**
	Front	0.416	0.147	0.011	0.574
	Top	-	0.140	0.768*	0.908
	Bottom	0.730	-	-	0.730
	Right	0.072	-	-	0.072
	Left	0.107	0.242	0.119	0.468

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.518	0.230	0.768	**1.516**
	Front	0.426	0.147	0.011	0.584
	Top	-	0.140	0.768*	0.908
	Bottom	0.934	-	-	0.934
	Right	0.065	-	-	0.065
	Left	0.090	0.242	0.119	0.451

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.494	0.230	0.768	**1.492**
	Front	0.279	0.147	0.011	0.437
	Top	-	0.140	0.768*	0.908
	Bottom	1.161	-	-	1.161
	Right	-	-	-	-
	Left	0.082	0.242	0.119	0.443

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.533	0.242	0.753	1.528
	GPRS 1900	0.949	0.242	0.753	See Table Below
	UMTS 850	0.641	0.242	0.753	See Table Below
	UMTS 1900	0.856	0.242	0.753	See Table Below
	LTE Band 12	0.303	0.242	0.753	1.298
	LTE Band 13	0.535	0.242	0.753	**1.530**
	LTE Band 26 (Cell)	0.659	0.242	0.753	See Table Below
	LTE Band 5 (Cell)	0.746	0.242	0.753	See Table Below
	LTE Band 4 (AWS)	0.730	0.242	0.753	See Table Below
	LTE Band 25 (PCS)	0.934	0.242	0.753	See Table Below
	LTE Band 41	1.161	0.242	0.753	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.435	0.230	0.753	**1.418**
	Front	0.326	0.147	0.046	0.519
	Top	-	0.140	0.753*	0.893
	Bottom	0.949	-	-	0.949
	Right	0.048	-	-	0.048
	Left	0.076	0.242	0.271	0.589

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.641	0.230	0.753	See Note 1
	Front	0.270	0.147	0.046	0.463
	Top	-	0.140	0.753*	**0.893**
	Bottom	0.319	-	-	0.319
	Right	0.308	-	-	0.308
	Left	0.112	0.242	0.271	0.625

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.430	0.230	0.753	**1.413**
	Front	0.377	0.147	0.046	0.570
	Top	-	0.140	0.753*	**0.893**
	Bottom	0.856	-	-	0.856
	Right	0.057	-	-	0.057
	Left	0.095	0.242	0.271	0.608

Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.659	0.230	0.753	See Note 1
	Front	0.424	0.147	0.046	0.617
	Top	-	0.140	0.753*	**0.893**
	Bottom	0.458	-	-	0.458
	Right	0.385	-	-	0.385
	Left	0.156	0.242	0.271	0.669

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.746	0.230	0.753	See Note 1
	Front	0.608	0.147	0.046	0.801
	Top	-	0.140	0.753*	**0.893**
	Bottom	0.540	-	-	0.540
	Right	0.414	-	-	0.414
	Left	0.162	0.242	0.271	0.675

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.508	0.230	0.753	**1.491**
	Front	0.416	0.147	0.046	0.609
	Top	-	0.140	0.753*	0.893
	Bottom	0.730	-	-	0.730
	Right	0.072	-	-	0.072
	Left	0.107	0.242	0.271	0.620

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.518	0.230	0.753	**1.501**
	Front	0.426	0.147	0.046	0.619
	Top	-	0.140	0.753*	0.893
	Bottom	0.934	-	-	0.934
	Right	0.065	-	-	0.065
	Left	0.090	0.242	0.271	0.603

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.494	0.230	0.753	**1.477**
	Front	0.279	0.147	0.046	0.472
	Top	-	0.140	0.753*	0.893
	Bottom	1.161	-	-	1.161
	Right	-	-	-	-
	Left	0.082	0.242	0.271	0.595

Note 1 - No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the distribution pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.11 for detailed SPLS ratio analysis.

12.9 Phablet Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required if wireless router 1g SAR (scaled to the maximum output power, including tolerance) < 1.2 W/kg. Therefore, no further analysis beyond the tables included in this section was required to determine that possible simultaneous transmission scenarios would not exceed the SAR limit.

For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

Table 12-16
Simultaneous Transmission Scenario with 5 GHz WLAN SISO (Phablet)

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
GPRS 1900	2.773	1.080	2.584	3.853	See Table Below
UMTS 1900	1.444	1.080	2.584	2.524	See Table Below
LTE Band 4 (AWS)	3.215	1.080	2.584	See Table Below	See Table Below
LTE Band 25 (PCS)	2.704	1.080	2.584	3.784	See Table Below
LTE Band 41	1.368	1.080	2.584	2.448	**3.952**

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	1.311	2.584	**3.895**
	Front	1.130	0.047	1.177
	Top	-	2.584*	2.584
	Bottom	2.773	-	2.773
	Right	0.136	-	0.136
	Left	0.290	0.189	0.479

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.426	2.584	See Note 1	0.06
	Front	1.444	0.047	1.491	N/A
	Top	-	2.584*	**2.584**	N/A
	Bottom	1.436	-	1.436	N/A
	Right	0.305	-	0.305	N/A
	Left	0.607	0.189	0.796	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		SPLSR
		1	2	3	1+2	1+3	1+3
Phablet SAR	Back	2.192	0.831	2.584	3.023	See Note 1	0.08
	Front	1.724	0.579	0.047	2.303	1.771	N/A
	Top	-	0.626	2.584*	0.626	2.584	N/A
	Bottom	3.215	-	-	**3.215**	**3.215**	N/A
	Right	0.353	-	-	0.353	0.353	N/A
	Left	0.551	1.080	0.189	1.631	0.740	N/A

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.792	2.584	See Note 1	0.07
	Front	1.712	0.047	1.759	N/A
	Top	-	2.584*	2.584	N/A
	Bottom	2.704	-	**2.704**	N/A
	Right	0.439	-	0.439	N/A
	Left	0.719	0.189	0.908	N/A

Table 12-17
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Phablet)

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.311	3.192	See Note 1	0.07
	Front	1.130	0.625	1.755	N/A
	Top	-	0.625	0.625	N/A
	Bottom	2.773	-	**2.773**	N/A
	Right	0.136	-	0.136	N/A
	Left	0.290	0.861	1.151	N/A

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.426	3.192	See Note 1	0.07
	Front	1.444	0.625	**2.069**	N/A
	Top	-	0.625	0.625	N/A
	Bottom	1.436	-	1.436	N/A
	Right	0.305	-	0.305	N/A
	Left	0.607	0.861	1.468	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.192	3.192	See Note 1	0.10
	Front	1.724	0.625	2.349	N/A
	Top	-	0.625	0.625	N/A
	Bottom	3.215	-	**3.215**	N/A
	Right	0.353	-	0.353	N/A
	Left	0.551	0.861	1.412	N/A

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.792	3.192	See Note 1	0.08
	Front	1.712	0.625	2.337	N/A
	Top	-	0.625	0.625	N/A
	Bottom	2.704	-	**2.704**	N/A
	Right	0.439	-	0.439	N/A
	Left	0.719	0.861	1.580	N/A

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	1.368	3.192	See Note 1	0.08
	Front	0.664	0.625	1.289	N/A
	Top	-	0.625	0.625	N/A
	Bottom	1.010	-	1.010	N/A
	Right	-	-	-	N/A
	Left	0.566	0.861	**1.427**	N/A

Note 1 - No evaluation was performed to determine the aggregate 10g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.10 per FCC KDB 447498 D01v06. See Section 12.10 for detailed SPLS ratio analysis.

12.10 SPLSR Evaluation and Analysis

Per FCC KDB Publication 447498 D01v06, when the sum of the standalone transmitters is more than 1.6 W/kg for 1g and 4 W/kg for 10g, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is $\leq$ 0.04 for 1g and $\leq$0.10 for 10g, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

$$\text{Distance}_{Tx1-Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2} \text{ (Head)}$$

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

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

12.10.1 Right Cheek SPLSR Evaluation and Analysis

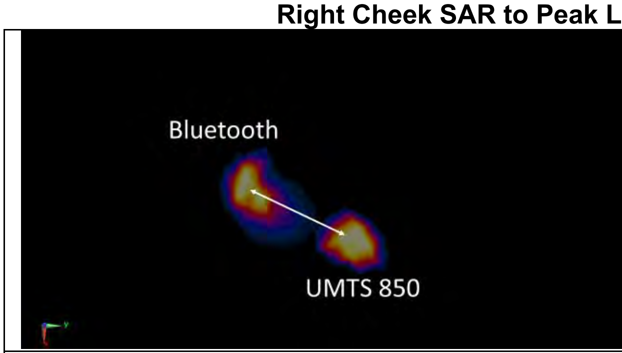
Table 12-18
Peak SAR Locations for Right Cheek

Mode/Band	x (mm)	y (mm)	z (mm)
Bluetooth	14.72	-331.19	-173.64
UMTS 850	39.38	-256.37	-172.65
LTE Band 26 (Cell)	36.93	-265.21	-173.80
LTE Band 5 (Cell)	35.32	-259.13	-173.41

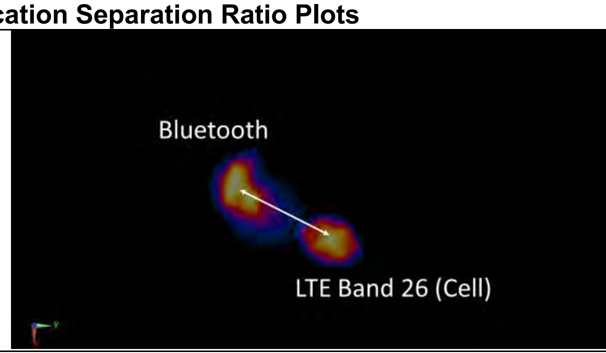
Table 12-19
Right Cheek SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
Bluetooth	UMTS 850	1.349	0.273	1.622	78.79	0.03	1
Bluetooth	LTE Band 26 (Cell)	1.349	0.337	1.686	69.62	0.03	2
Bluetooth	LTE Band 5 (Cell)	1.349	0.346	1.695	74.95	0.03	3

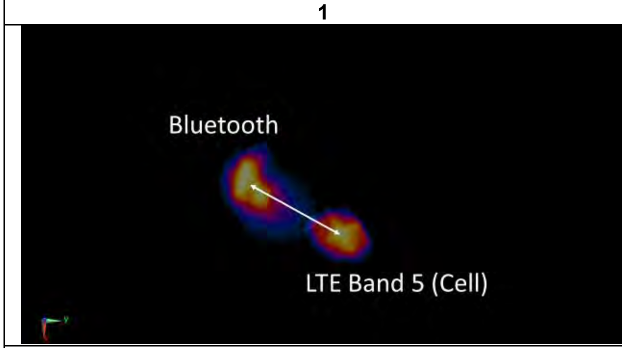
Table 12-20
Right Cheek SAR to Peak Location Separation Ratio Plots



1



2



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12.10.2 Phablet Back Side SPLSR Evaluation and Analysis

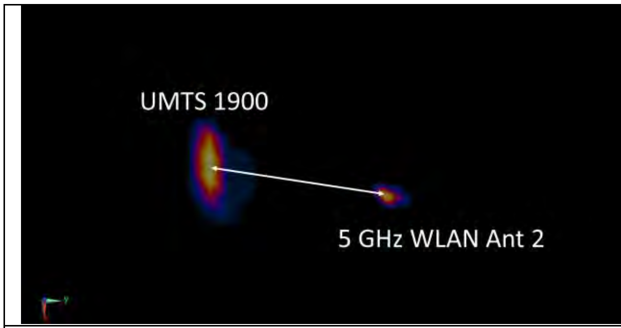
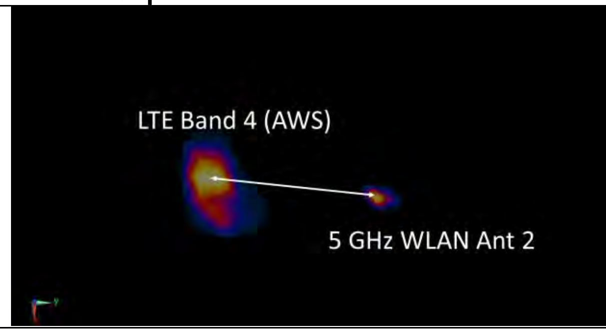
Table 12-21
Peak SAR Locations for Phablet Back Side

Mode/Band	x (mm)	y (mm)
5 GHz WLAN Ant 2	11.00	54.00
5 GHz WLAN MIMO	9.00	51.00
GPRS 1900	-23.00	-79.00
UMTS 1900	-35.50	-76.50
LTE Band 4 (AWS)	-20.00	-69.00
LTE Band 25 (PCS)	-23.00	-79.50
LTE Band 41	2.70	-74.40

Table 12-22
Phablet Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
UMTS 1900	5 GHz WLAN Ant 2	1.426	2.584	4.010	138.54	0.06	1
LTE Band 4 (AWS)	5 GHz WLAN Ant 2	2.192	2.584	4.776	126.85	0.08	2
LTE Band 25 (PCS)	5 GHz WLAN Ant 2	1.792	2.584	4.376	137.76	0.07	3
GPRS 1900	5 GHz WLAN MIMO	1.311	3.192	4.503	133.88	0.07	4
UMTS 1900	5 GHz WLAN MIMO	1.426	3.192	4.618	135.04	0.07	5
LTE Band 4 (AWS)	5 GHz WLAN MIMO	2.192	3.192	5.384	123.45	0.10	6
LTE Band 25 (PCS)	5 GHz WLAN MIMO	1.792	3.192	4.984	134.37	0.08	7
LTE Band 41	5 GHz WLAN MIMO	1.368	3.192	4.560	125.56	0.08	8

Table 12-23
Phablet Back Side SAR to Peak Location Separation Ratio Plots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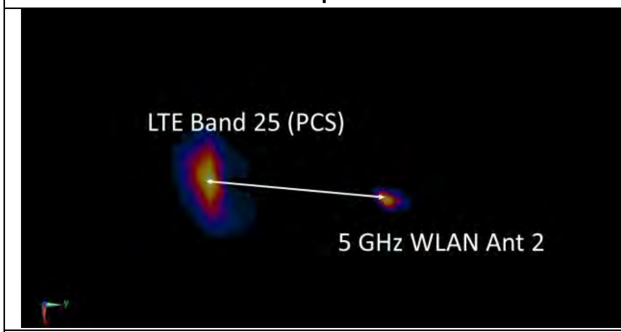	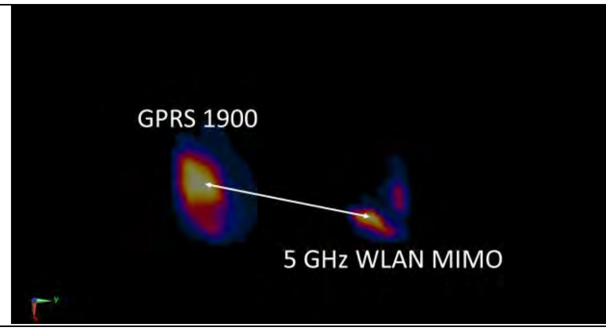
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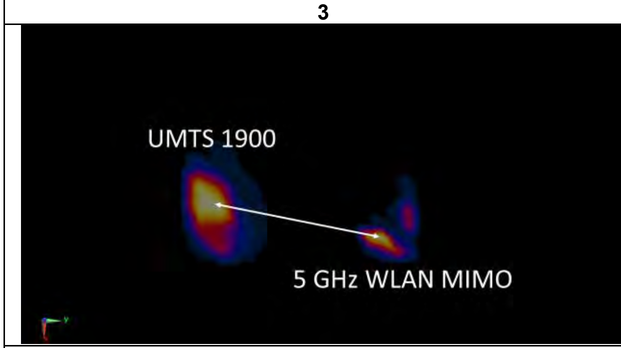	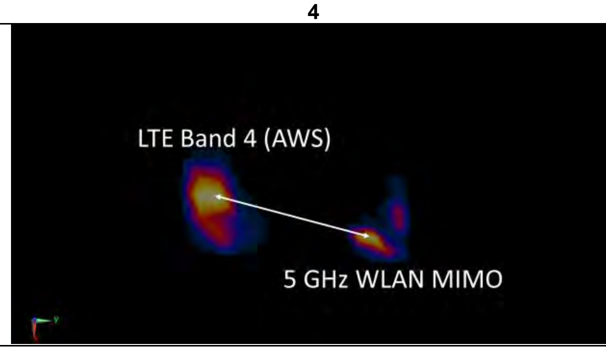
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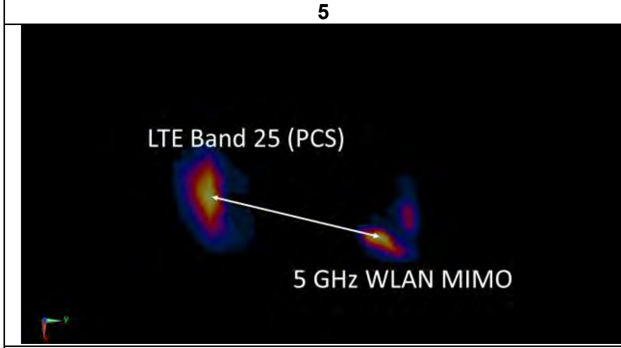	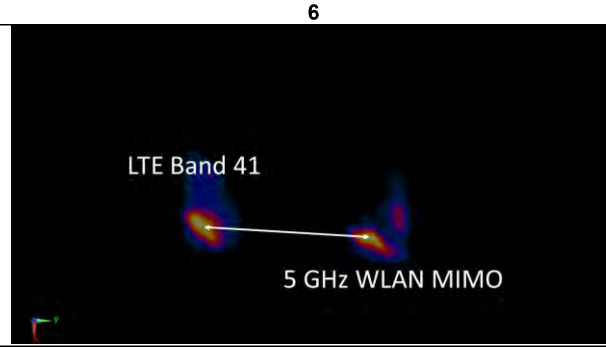
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12.11 Additional Simultaneous SAR Evaluation and Analysis for Main Band, Bluetooth and 5 GHz WLAN Operations

Per KDB Publication 865664, when the sum of the transmitters potentially operating simultaneously is greater than the 1.6 W/kg or 4.0 W/kg and the sum to peak SAR location separation ratio between any pair of transmitters is more than 0.04 for 1g or 0.1 for 10g, SAR tests are required for simultaneous transmission to determine the aggregate 1g or 10g SAR. When required, each transmitter is tested for simultaneous transmission in the configuration, channel and operating mode that resulted in the highest SAR during the stand-alone evaluation.

The Bluetooth and 5 GHz WLAN transmitters are spatially separated from the 2G/3G/4G antenna. Therefore, simultaneous transmission SAR evaluations (Volumetric SAR Evaluations) were performed for the transmitters with the overlapping distributions - Bluetooth and 5 GHz WIFI. The SPLSR procedures in FCC KDB Publication 447498 was applied to the 2G/3G/4G transmitter and the aggregate Bluetooth and 5 GHz WLAN distribution to determine simultaneous SAR compliance.

12.11.1 Right Cheek SAR Evaluation and Analysis for Bluetooth and 5GHz WLAN Simultaneous Transmission

Table 12-24
Simultaneous Transmission SAR Analysis

Band/ Mode	Configuration	Frequency [MHz]	Measured Standalone 1g SAR [W/kg]	Maximum Allowed Power [dBm]	Conducted Power (Ant 1) [dBm]	Conducted Power (Ant 2) [dBm]	Duty Cycle (%)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Volumetric 1g SAR [W/kg]	Scaled Volumetric 1g SAR [W/kg]	Volumetric SAR Plot Number
Bluetooth	Right Cheek, Ch. 39, 1 Mbps	2441	1.010	18.5	18.37	N/A	77.1	1.030	1.297	0.974	1.301	A49
5GHz WLAN Ant 1	Right Cheek, 802.11ac, 80 MHz, Ch. 155, 29.3 Mbps	5775	0.312	14.0	13.97	N/A	94.4	1.007	1.059	0.251	0.268	A50
5GHz WLAN Ant 2	Right Cheek, 802.11ac, 80 MHz, Ch. 122, 29.3 Mbps	5610	0.006	14.0	N/A	13.99	94.5	1.002	1.058	0.003	0.003	A51
5GHz WLAN MIMO	Right Cheek, 802.11n, 40 MHz, Ch. 54, 27 Mbps	5270	0.377	14.0	13.90	13.61	98.1	1.094	1.019	0.328	0.366	A52

Simultaneous Transmission Bands/Modes		Scaled Multi-Band SAR (W/kg)	Simultaneous SAR Plot Number
Bluetooth	5GHz WLAN Ant 1	1.350	A58
Bluetooth	5GHz WLAN Ant 2	1.280	A59
Bluetooth	5GHz WLAN MIMO	1.430	A60

Note:
1. All volumetric zoom scans were performed with DASY52 SAR system version 52.10. Post processor SEMCAD X Versions 14.6.12 (7450) multiband combiner requires enlarged zoom scans to overlap but does not require measurement point resolutions within the volumes to be identical for interpolation and superposition.
2. Each antenna was evaluated independently using the channel/configuration that produced the highest measured SAR when the standalone SAR was tested.
3. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05. The simultaneous transmission SAR results of the individual transmitters were scaled using SEMCAD X during processing.
4. The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.11.2 Right Cheek SPLSR Evaluation and Analysis for Main Band, Bluetooth, and 5GHz WLAN Simultaneous Transmission

Table 12-25
Peak SAR Locations for Right Cheek

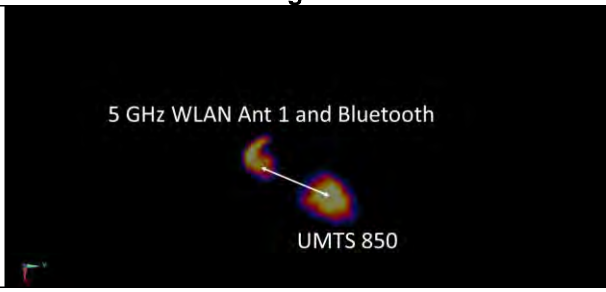
Mode/Band	x (mm)	y (mm)	z (mm)	Reported SAR (W/kg)
5 GHz WLAN Ant 1 and Bluetooth	13.46	-336.97	-175.20	1.35
5 GHz WLAN Ant 2 and Bluetooth	13.45	-336.96	-175.24	1.28
5 GHz WLAN MIMO and Bluetooth	7.96	-335.40	-175.10	1.43
UMTS 850	39.38	-256.37	-172.65	0.273
LTE Band 12	37.76	-255.55	-172.73	0.181
LTE Band 13	41.32	-258.72	-172.44	0.229
LTE Band 26 (Cell)	36.93	-265.21	-173.80	0.337
LTE Band 5 (Cell)	35.32	-259.13	-173.41	0.346

Table 12-26
Right Cheek SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN Ant 1 and Bluetooth	UMTS 850	1.35	0.273	1.623	84.70	0.02	1
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 26 (Cell)	1.35	0.337	1.687	75.51	0.03	2
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 5 (Cell)	1.35	0.346	1.696	80.87	0.03	3
5 GHz WLAN Ant 2 and Bluetooth	LTE Band 26 (Cell)	1.28	0.337	1.617	75.51	0.03	4
5 GHz WLAN Ant 2 and Bluetooth	LTE Band 5 (Cell)	1.28	0.346	1.626	80.87	0.03	5
5 GHz WLAN MIMO and Bluetooth	UMTS 850	1.43	0.273	1.703	85.08	0.03	6
5 GHz WLAN MIMO and Bluetooth	LTE Band 12	1.43	0.181	1.611	85.26	0.02	7
5 GHz WLAN MIMO and Bluetooth	LTE Band 13	1.43	0.229	1.659	83.66	0.03	8
5 GHz WLAN MIMO and Bluetooth	LTE Band 26 (Cell)	1.43	0.337	1.767	75.94	0.03	9
5 GHz WLAN MIMO and Bluetooth	LTE Band 5 (Cell)	1.43	0.346	1.776	81.05	0.03	10

The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

Table 12-27
Right Cheek SAR to Peak Location Separation Ratio Plots



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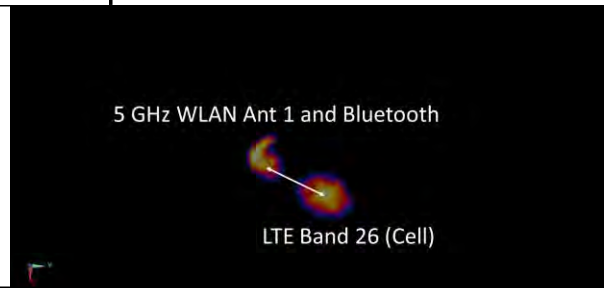

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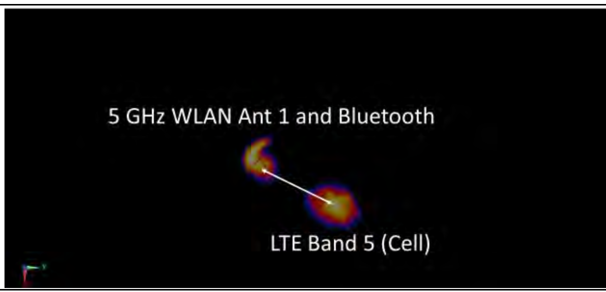

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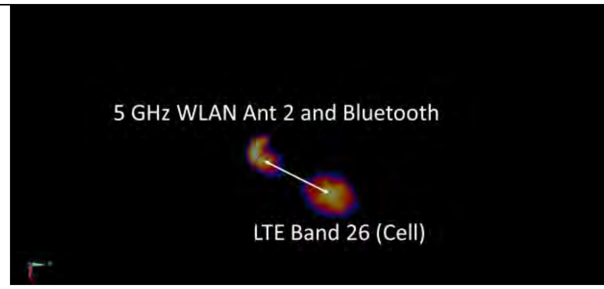

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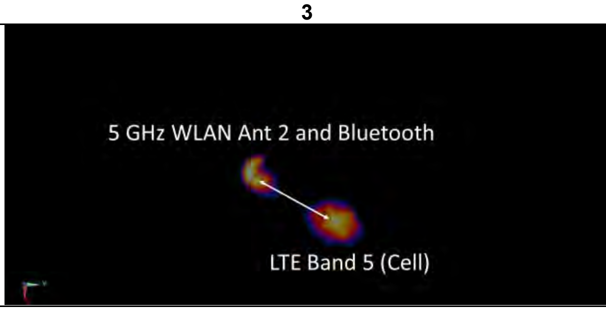

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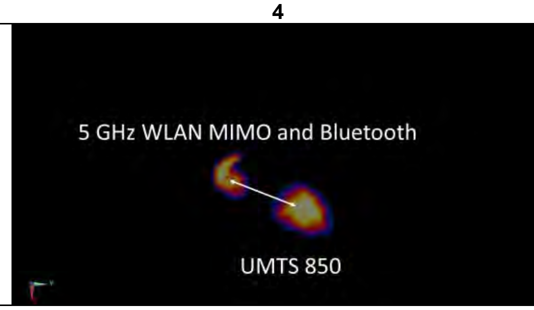

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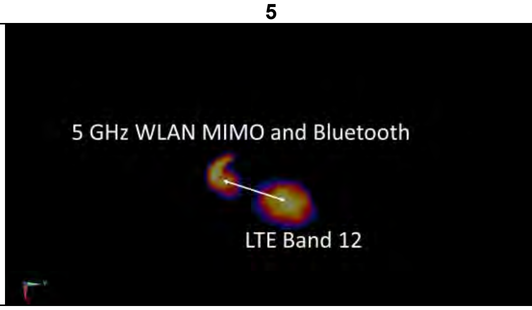

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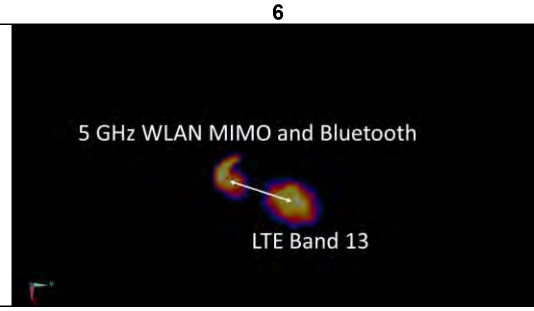

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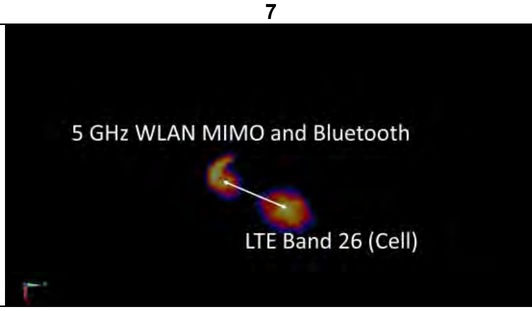

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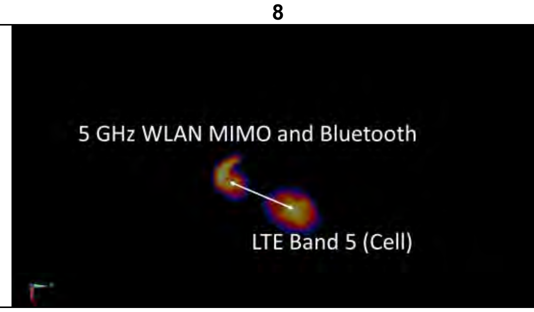

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Table 12-28
Right Cheek Simultaneous Transmission SAR Analysis

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)
Ant "a"	Ant "b"	a	b	a+b
5 GHz WLAN Ant 1 and Bluetooth	GSM 850	1.35	0.121	1.471
5 GHz WLAN Ant 1 and Bluetooth	GSM 1900	1.35	0.037	1.387
5 GHz WLAN Ant 1 and Bluetooth	UMTS 1900	1.35	0.094	1.444
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 12	1.35	0.181	1.531
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 13	1.35	0.229	1.579
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 4 (AWS)	1.35	0.093	1.443
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 25 (PCS)	1.35	0.116	1.466
5 GHz WLAN Ant 1 and Bluetooth	LTE Band 41	1.35	0.039	1.389
5 GHz WLAN Ant 2 and Bluetooth	UMTS 850	1.28	0.273	1.553
5 GHz WLAN MIMO and Bluetooth	GSM 850	1.43	0.121	1.551
5 GHz WLAN MIMO and Bluetooth	GSM 1900	1.43	0.037	1.467
5 GHz WLAN MIMO and Bluetooth	UMTS 1900	1.43	0.094	1.524
5 GHz WLAN MIMO and Bluetooth	LTE Band 4 (AWS)	1.43	0.093	1.523
5 GHz WLAN MIMO and Bluetooth	LTE Band 25 (PCS)	1.43	0.116	1.546
5 GHz WLAN MIMO and Bluetooth	LTE Band 41	1.43	0.039	1.469

The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.11.3 Right Tilt SAR Evaluation and Analysis for Bluetooth and 5GHz WLAN Simultaneous Transmission

Table 12-29
Simultaneous Transmission SAR Analysis

Band/ Mode	Configuration	Frequency [MHz]	Measured Standalone 1g SAR [W/kg]	Maximum Allowed Power [dBm]	Conducted Power (Ant 1) [dBm]	Conducted Power (Ant 2) [dBm]	Duty Cycle (%)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Volumetric 1g SAR [W/kg]	Scaled Volumetric 1g SAR [W/kg]	Volumetric SAR Plot Number
Bluetooth	Right Tilt, Ch. 39, 1 Mbps	2441	0.800	18.5	18.37	N/A	77.1	1.030	1.297	0.742	0.991	A53
5GHz WLAN MIMO	Right Tilt, 802.11n, 40 MHz, Ch. 54, 27 Mbps	5270	0.357	14.0	13.90	13.61	98.1	1.094	1.019	0.319	0.356	A54

Simultaneous Transmission		Scaled Multi-Band	Simultaneous SAR
Bluetooth	5GHz WLAN MIMO	1.070	A61

Note:
1. All volumetric zoom scans were performed with DASY52 SAR system version 52.10. Post processor SEMCAD X Versions 14.6.12 (7450) multiband combiner requires enlarged zoom scans to overlap but does not require measurement point resolutions within the volumes to be identical for interpolation and superposition.
2. Each antenna was evaluated independently using the channel/configuration that produced the highest measured SAR when the standalone SAR was tested.
3. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05. The simultaneous transmission SAR results of the individual transmitters were scaled using SEMCAD X during processing.
4. The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.11.4 Right Tilt SPLSR Evaluation and Analysis for Main Band, Bluetooth, and 5GHz WLAN Simultaneous Transmission

Table 12-30
Right Tilt Simultaneous Transmission SAR Analysis

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)
Ant "a"	Ant "b"	a	b	a+b
5 GHz WLAN MIMO and Bluetooth	LTE Band 26 (Cell)	1.07	0.17	1.240
5 GHz WLAN MIMO and Bluetooth	LTE Band 5 (Cell)	1.07	0.189	1.259

The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.11.5 Hotspot SAR Evaluation and Analysis for Bluetooth and 5GHz WLAN Simultaneous Transmission

Table 12-31
Simultaneous Transmission SAR Analysis

Band/ Mode	Configuration	Frequency [MHz]	Measured Standalone 1g SAR [W/kg]	Maximum Allowed Power [dBm]	Conducted Power (Ant 1) [dBm]	Conducted Power (Ant 2) [dBm]	Duty Cycle (%)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Volumetric 1g SAR [W/kg]	Scaled Volumetric 1g SAR [W/kg]	Volumetric SAR Plot Number
Bluetooth	Back side, Ch. 39, 1 Mbps, 10 mm	2441	0.172	18.5	18.37	N/A	77.1	1.030	1.297	0.149	0.199	A55
5GHz WLAN Ant 2	Back side, 802.11a, 20 MHz, Ch. 157, 6 Mbps, 10 mm	5785	0.665	18.0	17.42	N/A	98.9	1.143	1.011	0.658	0.760	A56
5GHz WLAN MIMO	Back side, 802.11n, 20 MHz, Ch. 165, 13 Mbps, 10 mm	5825	0.640	18.0	17.84	17.35	98.7	1.161	1.013	0.637	0.749	A57

Simultaneous Transmission Bands/Modes		Scaled Multi-Band SAR (W/kg)	Simultaneous SAR Plot Number
Bluetooth	5GHz WLAN Ant 2	0.949	A62
Bluetooth	5GHz WLAN MIMO	0.946	A63

Note:
1. All volumetric zoom scans were performed with DASY52 SAR system version 52.10. Post processor SEMCAD X Versions 14.6.12 (7450) multiband combiner requires enlarged zoom scans to overlap but does not require measurement point resolutions within the volumes to be identical for interpolation and superposition.
2. Each antenna was evaluated independently using the channel/configuration that produced the highest measured SAR when the standalone SAR was tested.
3. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05. The simultaneous transmission SAR results of the individual transmitters were scaled using SEMCAD X during processing.
4. The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.11.6 Hotspot Back Side SPLSR Evaluation and Analysis for Main Band, Bluetooth, and 5GHz WLAN Simultaneous Transmission

Table 12-32
Peak SAR Locations for Hotspot Back Side

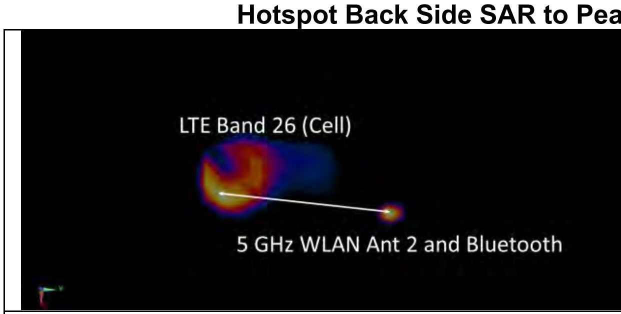
Mode/Band	x (mm)	y (mm)
5 GHz WLAN Ant 2 and Bluetooth	7.00	48.00
5 GHz WLAN MIMO and Bluetooth	15.00	56.00
UMTS 850	-13.00	-73.50
LTE Band 26 (Cell)	-19.50	-81.50
LTE Band 5 (Cell)	-18.00	-81.50

Table 12-33
Hotspot Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN Ant 2 and Bluetooth	LTE Band 26 (Cell)	0.949	0.659	1.608	132.18	0.02	1
5 GHz WLAN Ant 2 and Bluetooth	LTE Band 5 (Cell)	0.949	0.746	1.695	131.89	0.02	2
5 GHz WLAN MIMO and Bluetooth	LTE Band 26 (Cell)	0.946	0.659	1.605	141.76	0.01	3
5 GHz WLAN MIMO and Bluetooth	LTE Band 5 (Cell)	0.946	0.746	1.692	141.40	0.02	4

The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

Table 12-34
Hotspot Back Side SAR to Peak Location Separation Ratio Plots



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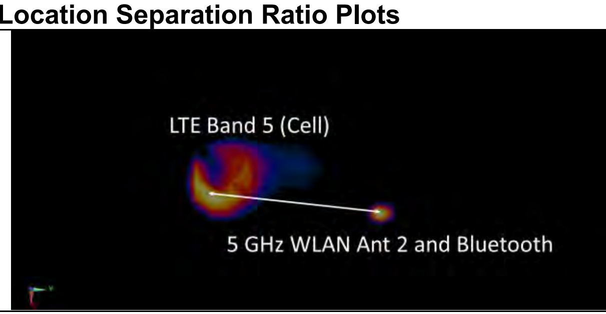

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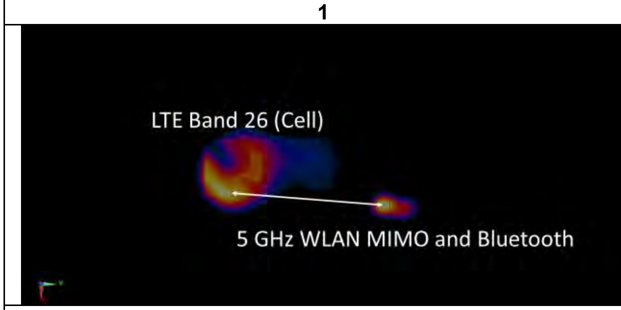

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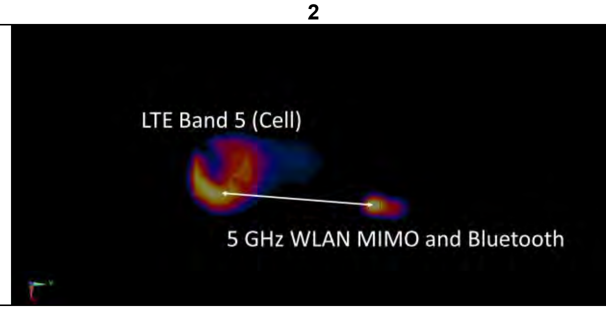

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Table 12-35
Hotspot Back Side Simultaneous Transmission SAR Analysis

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)
Ant "a"	Ant "b"	a	b	a+b
5 GHz WLAN Ant 2 and Bluetooth	UMTS 850	0.949	0.641	1.590
5 GHz WLAN MIMO and Bluetooth	UMTS 850	0.946	0.641	1.587

The Bluetooth and 5 GHz WIFI SAR values above represent the aggregate distributions from the simultaneous transmission (volumetric) SAR evaluation.

12.12 Simultaneous Transmission Conclusion

The above analysis 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 per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
5) When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Table 13-1
Head SAR Measurement Variability Results

HEAD VARIABILITY RESULTS													
Band	FREQUENCY		Mode/Band	Service	Side	Test Position	Data Rate (Mbps)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2450	2441.00	39	Bluetooth	FHSS	Right	Cheek	1	1.010	0.956	1.06	N/A	N/A	N/A	N/A
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 13-2
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	Component Carrier	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
		MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	N/A	1882.50	26365	LTE Band 25 (PCS), 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	bottom	10 mm	0.872	0.870	1.00	N/A	N/A	N/A	N/A
2600	PCC	2593.00	40620	LTE Band 41 ULCA, 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	bottom	10 mm	1.090	1.010	1.08	N/A	N/A	N/A	N/A
	SCC	2573.20	40422		QPSK, 50 RB, 50 RB Offset									
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 13-3
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Data Rate (Mbps)	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1732.50	20175	LTE Band 4 (AWS), 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	N/A	bottom	0 mm	3.050	2.990	1.02	N/A	N/A	N/A	N/A
1900	1860.00	26140	LTE Band 25 (PCS), 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	N/A	bottom	0 mm	2.680	2.590	1.03	N/A	N/A	N/A	N/A
5250	5280.00	56	802.11n, 20 MHz Bandwidth	OFDM, MIMO	13	back	0 mm	2.880	2.530	1.14	N/A	N/A	N/A	N/A
5600	5600.00	120	802.11n, 20 MHz Bandwidth	OFDM, MIMO	13	back	0 mm	2.570	2.640	1.03	N/A	N/A	N/A	N/A
5750	5720.00	144	802.11n, 20 MHz Bandwidth	OFDM, MIMO	13	back	0 mm	2.410	2.480	1.03	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

13.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g and <3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

14 ADDITIONAL TESTING PER FCC GUIDANCE

14.1 Tuner Testing

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 on the antenna characteristics, other than impedance matching.

To evaluate all the tuner states, the 80 tuner states were divided among the aggregate band, mode and exposure combinations so that each combination was evaluated for at least 20 tuner states and also so that at least 3 single point SAR measurements were made for every available tuner state. 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. The tuner state was able to be established remotely so that the device was not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination. When the single point SAR or 1g SAR was > 1.2 W/kg for a particular band/mode/exposure condition, point SAR measurements were made for all 80 states.

Per FCC Guidance, several bands/modes were combined to be treated as a single aggregate band. Additionally, LTE bands 12 and 13 were considered as an aggregated band to select single point measurement configurations. The wireless configuration and exposure condition combinations were divided evenly among the two bands (i.e., the number of required single point measurements (at least 20) apply to the aggregated band). All other bands were treated independently.

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

Table 14-1
UMTS Supplemental Head SAR Data

Supplemental Head SAR Data			
UMTS Band 5		UMTS Band 2	
RMC		RMC	
Test Position	Right Cheek	Test Position	Left Cheek
Frequency (MHz)	836.6	Frequency (MHz)	1880
Channel	4183	Channel	9400
Measured 1g SAR (W/kg)	0.263	Measured 1g SAR (W/kg)	0.149
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 1)	0.302	Auto-tune (State 1)	0.214
Default (State 1)	0.31	Default (State 1)	0.214
State 1	0.310	State 1	0.214
State 5	0.278	State 4	0.162
State 16	0.297	State 6	0.151
State 18	0.287	State 7	0.14
State 21	0.265	State 9	0.126
State 22	0.241	State 17	0.168
State 25	0.184	State 24	0.122
State 27	0.119	State 26	0.097
State 28	0.086	State 29	0.057
State 29	0.068	State 32	0.216
State 32	0.117	State 42	0.198
State 35	0.154	State 44	0.135
State 40	0.133	State 47	0.068
State 43	0.063	State 52	0.222
State 49	0.117	State 54	0.215
State 53	0.157	State 57	0.194
State 58	0.083	State 62	0.089
State 63	0.014	State 66	0.192
State 68	0.308	State 67	0.191
State 69	0.305	State 70	0.217
State 71	0.117	State 72	0.18
State 74	0.116	State 75	0.21
State 76	0.307	State 78	0.22

Table 14-2
LTE Supplemental Head SAR Data

Supplemental Head SAR Data											
LTE Band 12		LTE Band 13		LTE Band 5		LTE Band 26		LTE Band 4		LTE Band 25	
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 15 MHz Bandwidth, 1 RB, 36 RB Offsets		QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offsets	
Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	707.5	Frequency (MHz)	782	Frequency (MHz)	836.5	Frequency (MHz)	831.5	Frequency (MHz)	1732.5	Frequency (MHz)	1860
Channel	23095	Channel	23230	Channel	20525	Channel	26865	Channel	20175	Channel	26140
Measured 1g SAR (W/kg)	0.144	Measured 1g SAR (W/kg)	0.173	Measured 1g SAR (W/kg)	0.301	Measured 1g SAR (W/kg)	0.281	Measured 1g SAR (W/kg)	0.149	Measured 1g SAR (W/kg)	0.173
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 1)	0.183	Auto-tune (State 1)	0.212	Auto-tune (State 2)	0.316	Auto-tune (State 1)	0.332	Auto-tune (State 56)	0.175	Auto-tune (State 34)	0.2
Default (State 1)	0.185	Default (State 1)	0.219	Default (State 1)	0.313	Default (State 1)	0.321	Default (State 1)	0.109	Default (State 1)	0.172
State 0	0.185	State 0	0.215	State 1	0.313	State 0	0.319	State 0	0.114	State 1	0.172
State 1	0.185	State 1	0.219	State 2	0.308	State 1	0.321	State 1	0.109	State 3	0.149
State 2	0.154	State 2	0.191	State 3	0.299	State 7	0.250	State 4	0.089	State 5	0.143
State 10	0.093	State 8	0.126	State 6	0.274	State 8	0.245	State 5	0.091	State 10	0.108
State 12	0.060	State 12	0.029	State 10	0.184	State 9	0.204	State 6	0.085	State 12	0.076
State 14	0.039	State 17	0.212	State 13	0.082	State 12	0.088	State 11	0.061	State 14	0.054
State 22	0.121	State 20	0.168	State 19	0.281	State 14	0.048	State 15	0.029	State 17	0.155
State 25	0.097	State 24	0.122	State 23	0.246	State 17	0.319	State 16	0.095	State 20	0.13
State 29	0.042	State 33	0.170	State 24	0.244	State 21	0.270	State 19	0.078	State 28	0.063
State 34	0.036	State 40	0.149	State 26	0.173	State 28	0.081	State 20	0.076	State 34	0.205
State 40	0.019	State 49	0.167	State 30	0.053	State 30	0.039	State 21	0.077	State 35	0.208
State 62	0.001	State 50	0.193	State 31	0.033	State 31	0.026	State 25	0.061	State 38	0.2
State 64	0.184	State 55	0.156	State 37	0.150	State 34	0.140	State 31	0.020	State 41	0.194
State 68	0.184	State 67	0.161	State 38	0.152	State 37	0.138	State 37	0.174	State 46	0.103
State 70	0.032	State 75	0.165	State 41	0.126	State 43	0.058	State 43	0.165	State 51	0.198
State 79	0.033	State 76	0.211	State 44	0.046	State 48	0.105	State 45	0.133	State 55	0.186
				State 51	0.141	State 52	0.144	State 48	0.157	State 60	0.128
				State 55	0.141	State 57	0.11	State 53	0.169	State 62	0.099
				State 58	0.097	State 61	0.028	State 56	0.174	State 64	0.138
				State 59	0.071	State 67	0.108	State 59	0.161	State 66	0.165
				State 65	0.294	State 72	0.307	State 65	0.087	State 69	0.154
				State 69	0.301	State 75	0.109	State 71	0.158	State 74	0.187
				State 79	0.102	State 78	0.106	State 77	0.093	State 79	0.200

Table 14-3
UMTS Supplemental Body SAR Data

Supplemental Body SAR Data			
UMTS Band 5		UMTS Band 2	
RMC		RMC	
Test Position	Back Side	Test Position	Bottom Edge
Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	836.6	Frequency (MHz)	1907.6
Channel	4183	Channel	9538
Measured 1g SAR (W/kg)	0.618	Measured 1g SAR (W/kg)	0.725
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 1)	0.823	Auto-tune (State 51)	0.989
Default (State 1)	0.821	Default (State 1)	0.873
State 1	0.821	State 0	0.879
State 2	0.830	State 1	0.873
State 4	0.809	State 5	0.771
State 7	0.697	State 10	0.626
State 14	0.166	State 15	0.271
State 19	0.796	State 16	0.809
State 24	0.640	State 18	0.714
State 27	0.357	State 21	0.679
State 31	0.106	State 25	0.576
State 34	0.368	State 30	0.274
State 37	0.38	State 33	0.912
State 38	0.367	State 36	0.984
State 42	0.195	State 39	0.991
State 45	0.077	State 42	0.971
State 48	0.284	State 49	0.920
State 50	0.37	State 51	0.988
State 52	0.381	State 53	0.973
State 59	0.152	State 57	0.960
State 62	0.056	State 58	0.939
State 65	0.800	State 60	0.79
State 70	0.281	State 67	0.746
State 73	0.804	State 72	0.818
State 77	0.814	State 73	0.748
State 78	0.281	State 77	0.793

Table 14-4
LTE Supplemental Body SAR Data

Supplemental Body SAR Data											
LTE Band 12		LTE Band 13		LTE Band 5		LTE Band 26		LTE Band 4		LTE Band 25	
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 15 MHz Bandwidth, 1 RB, 36 RB Offsets		QPSK, 20 MHz Bandwidth, 50 RB, 25 RB Offsets		QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offsets	
Test Position	Back Side	Test Position	Back Side	Test Position	Back Side	Test Position	Back Side	Test Position	Bottom Edge	Test Position	Bottom Edge
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	707.5	Frequency (MHz)	782	Frequency (MHz)	836.5	Frequency (MHz)	831.5	Frequency (MHz)	1732.5	Frequency (MHz)	1860
Channel	23095	Channel	23230	Channel	20525	Channel	26865	Channel	20175	Channel	26140
Measured 1g SAR (W/kg)	0.241	Measured 1g SAR (W/kg)	0.405	Measured 1g SAR (W/kg)	0.648	Measured 1g SAR (W/kg)	0.550	Measured 1g SAR (W/kg)	0.697	Measured 1g SAR (W/kg)	0.860
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 10)	0.333	Auto-tune (State 76)	0.569	Auto-tune (State 2)	0.819	Auto-tune (State 1)	0.749	Auto-tune (State 56)	1.014	Auto-tune (State 38)	1.168
Default (State 1)	0.255	Default (State 1)	0.565	Default (State 1)	0.812	Default (State 1)	0.75	Default (State 1)	0.785	Default (State 1)	0.962
State 0	0.254	State 1	0.565	State 1	0.812	State 1	0.75	State 0	0.788	State 0	0.98
State 1	0.255	State 6	0.494	State 2	0.815	State 3	0.745	State 1	0.785	State 1	0.962
State 10	0.332	State 11	0.221	State 8	0.738	State 7	0.687	State 2	0.706	State 6	0.791
State 12	0.271	State 13	0.113	State 9	0.660	State 10	0.509	State 4	0.685	State 11	0.594
State 15	0.118	State 18	0.556	State 14	0.209	State 13	0.225	State 8	0.637	State 13	0.442
State 21	0.303	State 19	0.544	State 15	0.139	State 17	0.748	State 11	0.503	State 17	0.873
State 23	0.31	State 21	0.520	State 16	0.793	State 18	0.740	State 14	0.346	State 19	0.744
State 27	0.289	State 26	0.276	State 18	0.804	State 22	0.684	State 17	0.655	State 26	0.546
State 31	0.122	State 41	0.293	State 20	0.78	State 23	0.657	State 19	0.563	State 30	0.284
State 39	0.03	State 44	0.112	State 29	0.259	State 29	0.207	State 20	0.556	State 32	1.064
State 45	0.004	State 51	0.400	State 33	0.219	State 30	0.150	State 22	0.522	State 35	1.165
State 47	0.001	State 61	0.083	State 34	0.289	State 35	0.271	State 28	0.328	State 36	1.175
State 50	0.042	State 72	0.564	State 36	0.299	State 42	0.178	State 36	0.986	State 37	1.144
State 59	0.009	State 73	0.552	State 46	0.054	State 43	0.131	State 37	0.983	State 38	1.187
State 66	0.032	State 76	0.572	State 47	0.032	State 44	0.081	State 38	0.986	State 39	1.132
State 77	0.265	State 78	0.318	State 50	0.293	State 53	0.280	State 41	0.957	State 44	0.979
				State 56	0.299	State 54	0.276	State 46	0.497	State 48	1.067
				State 57	0.264	State 61	0.06	State 52	1.008	State 54	1.121
				State 60	0.107	State 66	0.199	State 56	1.01	State 58	1.081
				State 64	0.794	State 69	0.736	State 63	0.410	State 61	0.831
				State 67	0.22	State 70	0.201	State 68	0.774	State 63	0.532
				State 75	0.222	State 73	0.722	State 71	0.925	State 65	0.696
				State 76	0.805	State 74	0.200	State 74	0.827	State 72	0.895
				State 78	0.219	State 78	0.2	State 79	0.932	State 77	0.827

15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	8/13/2018	Annual	8/13/2019	MY53402352
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113238
Agilent	8753E	(30kHz-6GHz) Network Analyzer	9/28/2018	Annual	9/28/2019	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	2/8/2018	Annual	2/8/2019	US39170122
Agilent	8753ES	Network Analyzer	2/21/2018	Annual	2/21/2019	MY40001472
Agilent	8753ES	S-Parameter Network Analyzer	7/30/2018	Annual	7/30/2019	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/30/2018	Annual	8/30/2019	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	4/19/2018	Annual	4/19/2019	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/21/2017	Biennial	3/21/2019	MY45090700
Agilent	E4440A	PSA Series Spectrum Analyzer	11/14/2018	Annual	11/14/2019	MY46186272
Agilent	E5515C	Wireless Communications Test Set	1/24/2018	Annual	1/24/2019	GB44400860
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Agilent	N5182A	MXG Vector Signal Generator	1/24/2018	Annual	1/24/2019	MY47420651
Agilent	N5182A	MXG Vector Signal Generator	4/18/2018	Annual	4/18/2019	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	6/15/2018	Annual	6/15/2019	MY47420837
Agilent	N5182A-506	MXG Vector Signal Generator	6/19/2018	Annual	6/19/2019	MY48180366
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	MA24106A	USB Power Sensor	7/17/2018	Annual	7/17/2019	1827527
Anritsu	MA24106A	USB Power Sensor	1/19/2018	Annual	1/19/2019	1349509
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1339018
Anritsu	MA2411B	Pulse Power Sensor	10/30/2018	Annual	10/30/2019	1126066
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
Anritsu	ML2495A	Power Meter	11/20/2018	Annual	11/20/2019	1039008
Anritsu	MT8820C	Radio Communication Analyzer	3/20/2018	Annual	3/20/2019	6201144419
Anritsu	MT8821C	Radio Communication Analyzer	7/24/2018	Annual	7/24/2019	6201664756
Anritsu	MT8821C	Radio Communication Analyzer	7/26/2018	Annual	7/26/2019	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	11/6/2018	Annual	11/6/2019	6200901190
Anritsu	MT8862A	Wireless Connectivity Test Set	7/3/2018	Annual	7/3/2019	6261782395
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/9/2018	Biennial	10/9/2020	181647812
Control Company	4352	Ultra Long Stem Thermometer	6/6/2018	Biennial	6/6/2020	181334694
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Keysight Technologies	U3401A	Digital Multimeter	5/17/2018	Annual	5/17/2019	MY57201470
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mitutoyo	CD-6"CSX	Digital Caliper	4/18/2018	Biennial	4/18/2020	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
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	4/18/2018	Annual	4/18/2019	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	5/18/2018	Annual	5/18/2019	109892
Rohde & Schwarz	CMW500	Radio Communication Tester	4/5/2018	Annual	4/5/2019	128633
Rohde & Schwarz	CMW500	Radio Communication Tester	4/20/2018	Annual	4/20/2019	128635
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	D750V3	750 MHz Dipole	3/7/2017	Biennial	3/7/2019	1054
SPEAG	D835V2	835 MHz SAR Dipole	1/15/2018	Annual	1/15/2019	4d132
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2018	Annual	10/22/2019	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	2/7/2018	Annual	2/7/2019	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	8/16/2018	Annual	8/16/2019	981
SPEAG	D2450V2	2450 MHz SAR Dipole	9/11/2017	Biennial	9/11/2019	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/11/2018	Annual	4/11/2019	1004
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/16/2018	Annual	1/16/2019	1057
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/21/2016	Triennial	9/21/2019	1191
SPEAG	D750V3	750 MHz SAR Dipole	1/15/2018	Annual	1/15/2019	1003
SPEAG	D835V2	835 MHz SAR Dipole	10/19/2018	Annual	10/19/2019	4d047
SPEAG	D835V2	835 MHz SAR Dipole	10/19/2018	Annual	10/19/2019	4d133
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Biennial	5/9/2019	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Annual	10/23/2019	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	8/17/2017	Biennial	8/17/2019	719
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Triennial	9/13/2019	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/10/2018	Annual	8/10/2019	1237
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Annual	10/23/2019	5d149
SPEAG	ES3DV3	SAR Probe	10/22/2018	Annual	10/22/2019	3287
SPEAG	EX3DV4	SAR Probe	5/22/2018	Annual	5/22/2019	7406
SPEAG	EX3DV4	SAR Probe	7/20/2018	Annual	7/20/2019	7410
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409
SPEAG	EX3DV4	SAR Probe	4/18/2018	Annual	4/18/2019	7357
SPEAG	ES3DV3	SAR Probe	3/27/2018	Annual	3/27/2019	3347
SPEAG	ES3DV3	SAR Probe	2/13/2018	Annual	2/13/2019	3213
SPEAG	ES3DV3	SAR Probe	8/22/2018	Annual	8/22/2019	3332
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3319
SPEAG	EX3DV4	SAR Probe	8/23/2018	Annual	8/23/2019	7308
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/22/2018	Annual	5/22/2019	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/18/2018	Annual	10/18/2019	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/11/2018	Annual	7/11/2019	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2018	Annual	4/11/2019	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/15/2018	Annual	2/15/2019	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2018	Annual	2/9/2019	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/3/2018	Annual	10/3/2019	1558

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.

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 Unceritainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)		RSS				11.5	11.3	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				23.0	22.6	

17 CONCLUSION

17.1 Measurement Conclusion

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

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

18 REFERENCES

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

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

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

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

[5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2013, IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

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

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

[8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 1 -124.

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

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

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

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

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

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

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

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

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

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

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

[20] IEC 62209-1, Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz), July 2016.

[21] Innovation, Science, Economic Development Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 5, March 2015.

[22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2015

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

[24] SAR Measurement Guidance for IEEE 802.11 Transmitters, KDB Publication 248227 D01

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

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

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

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

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

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

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1726M

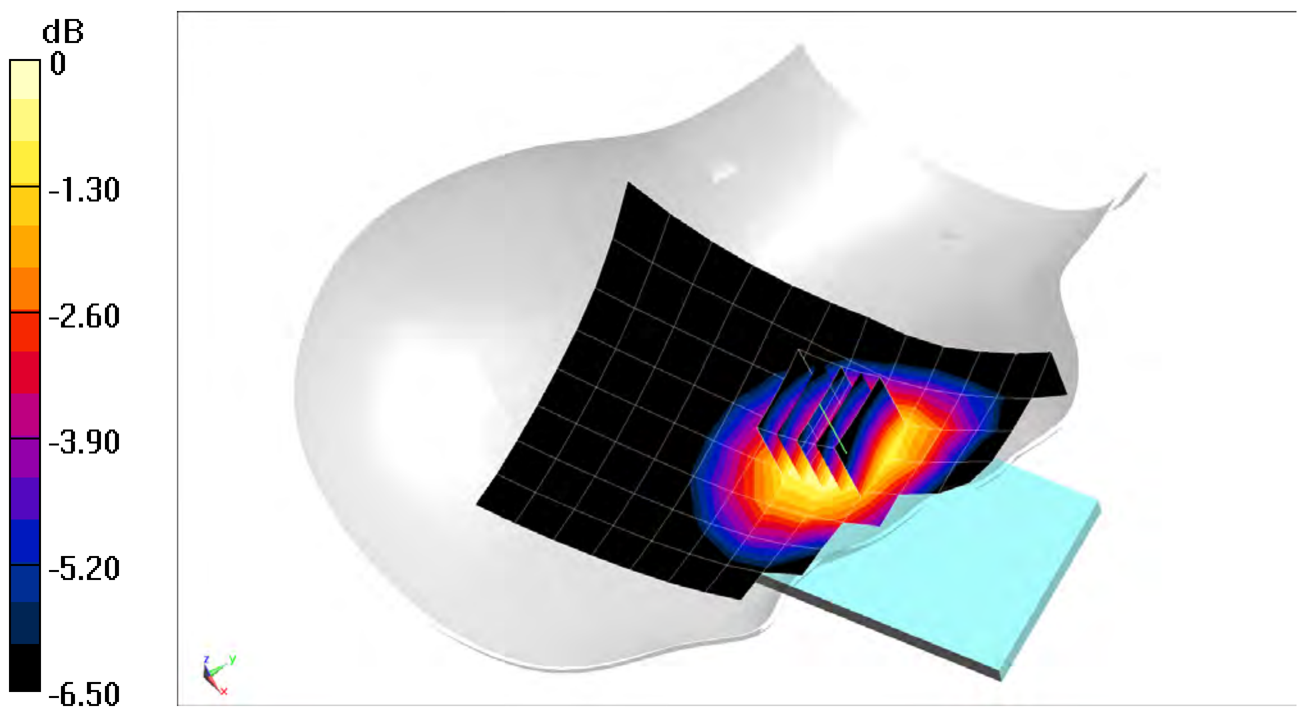
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.891 S/m; ε_r = 40.174; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-17-2018; Ambient Temp: 22.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(6.61, 6.61, 6.61) @ 836.6 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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 = 11.51 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.141 W/kg
SAR(1 g) = 0.112 W/kg



0 dB = 0.121 W/kg = -9.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

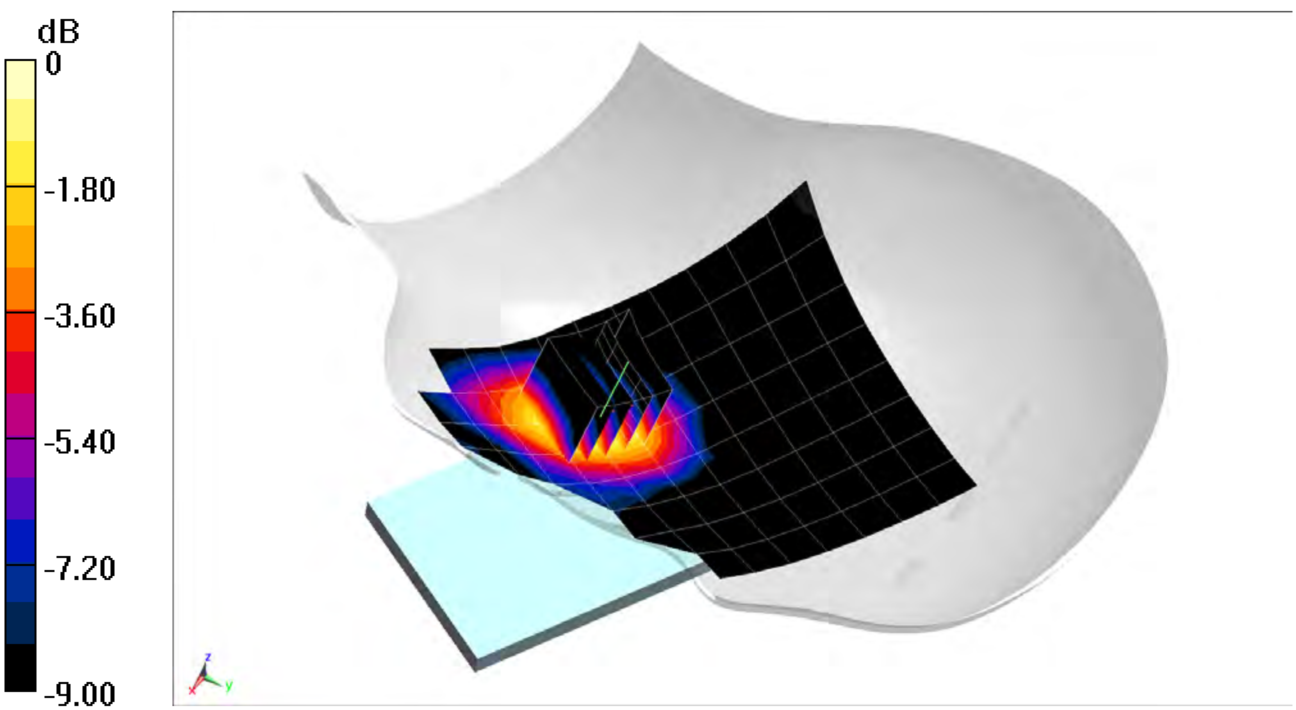
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.43 S/m; ε_r = 38.983; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-03-2018; Ambient Temp: 21.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3287; ConvF(5.24, 5.24, 5.24) @ 1880 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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 = 7.326 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.115 W/kg
SAR(1 g) = 0.074 W/kg



0 dB = 0.0870 W/kg = -10.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1726M

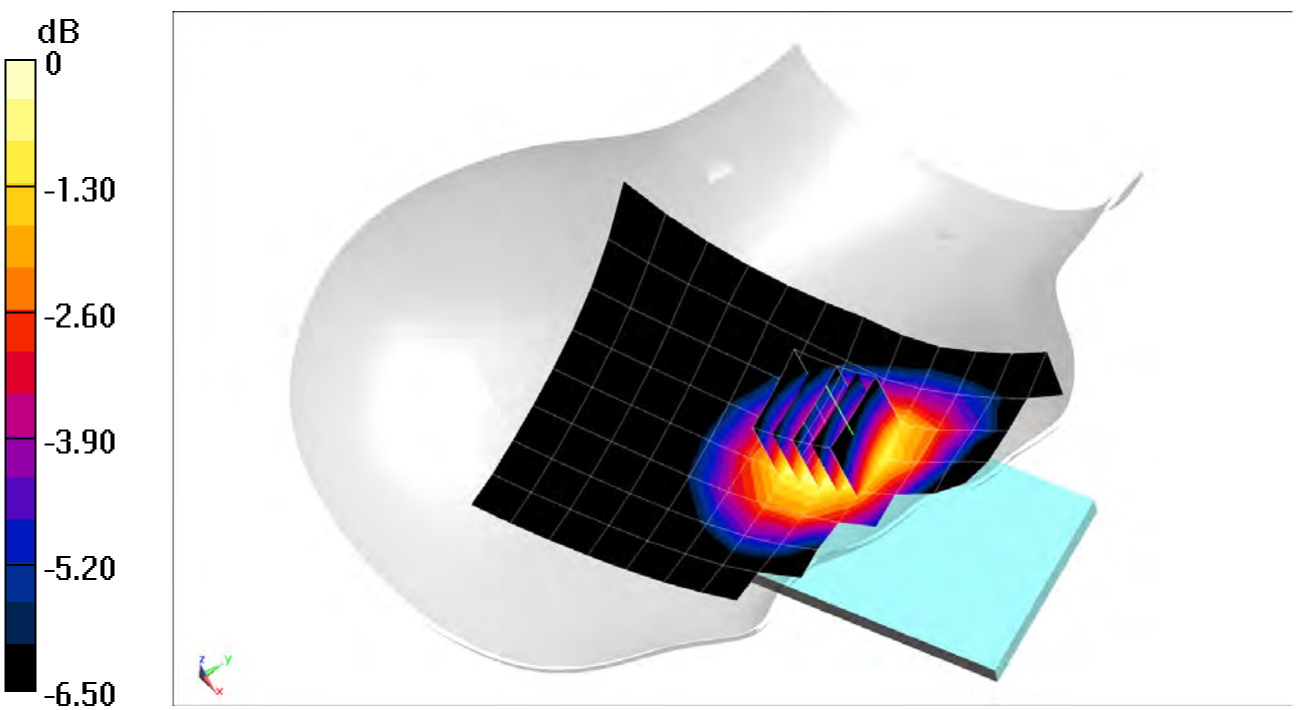
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.891 S/m; ε_r = 40.174; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-17-2018; Ambient Temp: 22.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(6.61, 6.61, 6.61) @ 836.6 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 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 = 17.61 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.338 W/kg
SAR(1 g) = 0.263 W/kg



0 dB = 0.289 W/kg = -5.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 0531M

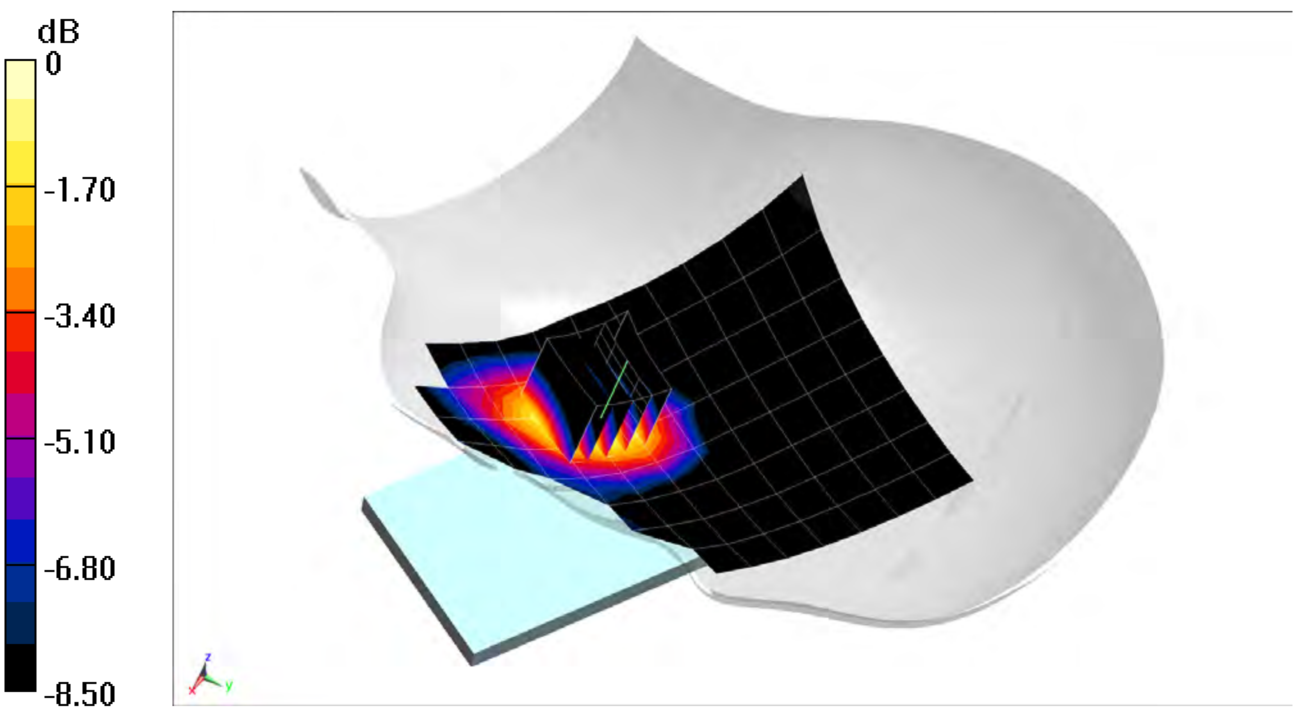
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.43 S/m; ε_r = 38.983; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-03-2018; Ambient Temp: 21.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3287; ConvF(5.24, 5.24, 5.24) @ 1880 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 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 = 12.63 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.149 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1696M

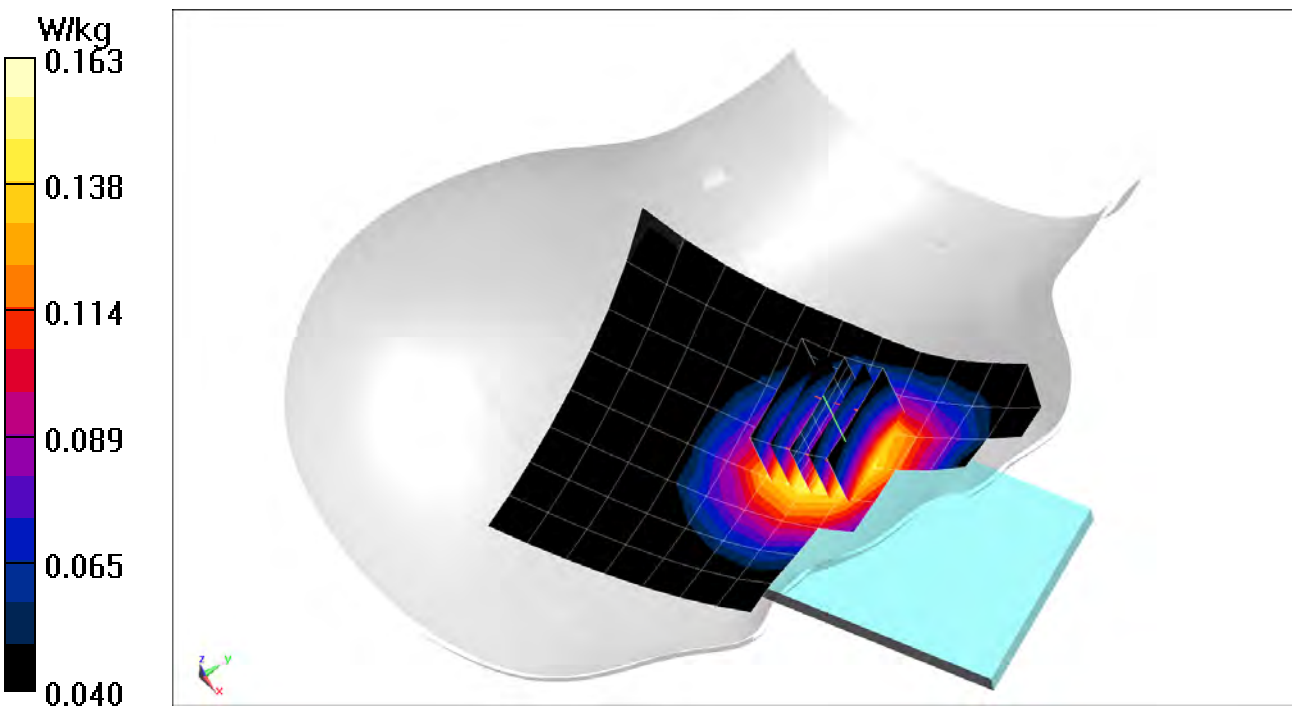
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.859 S/m; ε_r = 43.6; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-09-2019; Ambient Temp: 21.7°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(10.09, 10.09, 10.09) @ 707.5 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 12, Right Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.53 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.174 W/kg
SAR(1 g) = 0.144 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1696M

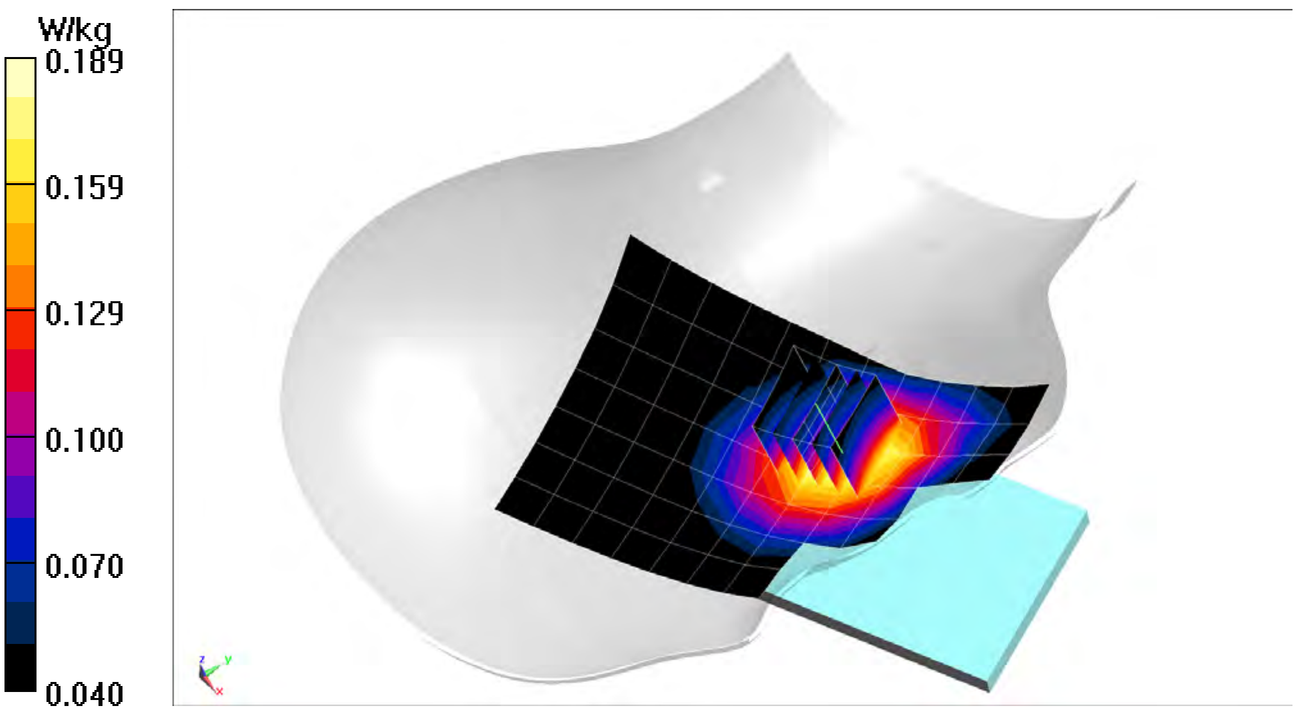
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.89 S/m; ε_r = 42.252; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-19-2018; Ambient Temp: 21.3°C; Tissue Temp: 19.8°C

Probe: ES3DV3 - SN3287; ConvF(6.76, 6.76, 6.76) @ 782 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 13, Right Head, Cheek, Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 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 = 15.05 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.215 W/kg
SAR(1 g) = 0.173 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1696M

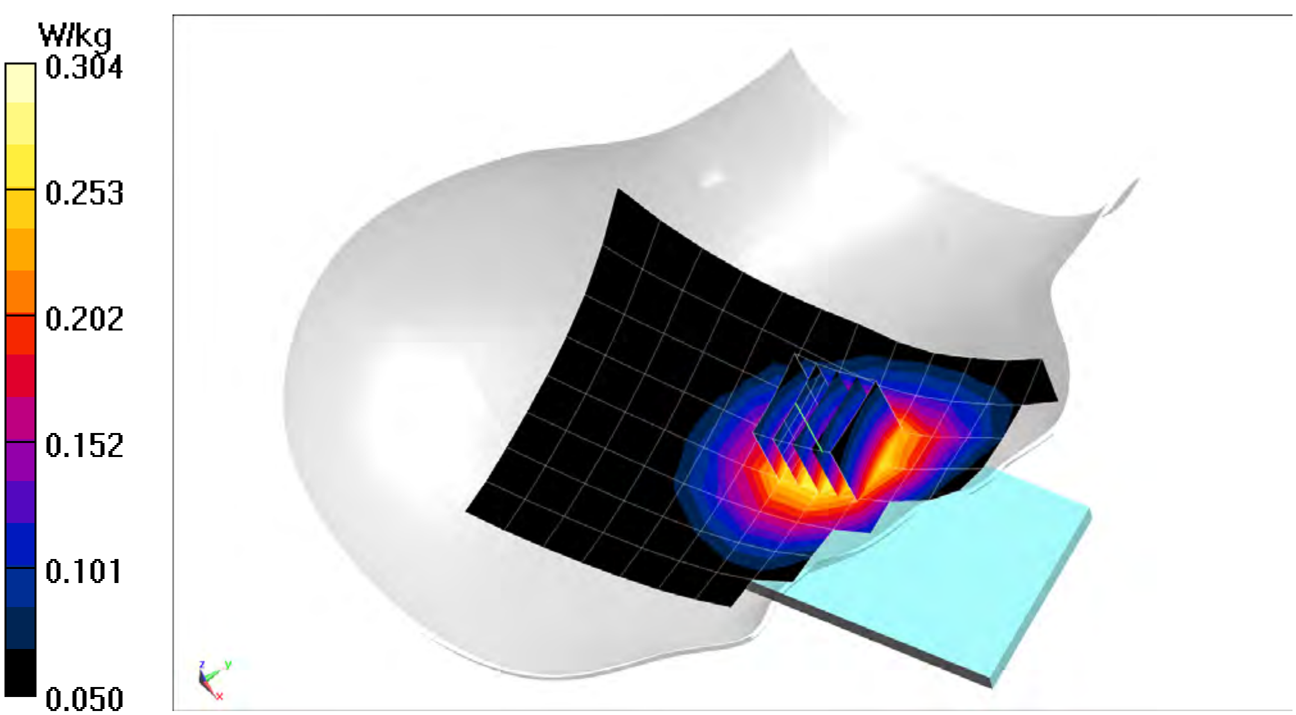
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.889 S/m; ε_r = 40.19; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-17-2018; Ambient Temp: 22.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(6.61, 6.61, 6.61) @ 831.5 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 26, Right Head, Cheek, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 36 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 = 18.91 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.359 W/kg
SAR(1 g) = 0.281 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1696M

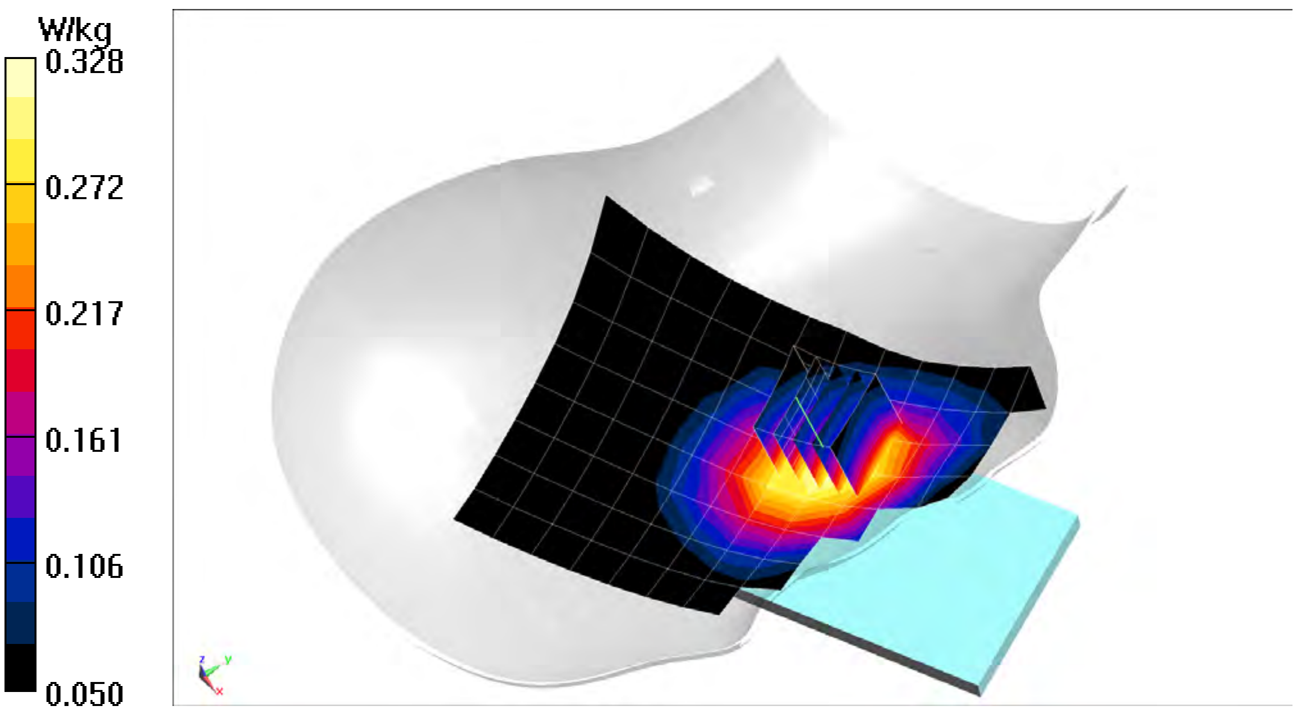
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.89 S/m; ε_r = 40.174; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-17-2018; Ambient Temp: 22.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(6.61, 6.61, 6.61) @ 836.5 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 5, Right Head, Cheek, Mid.ch, 10 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 = 19.59 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.394 W/kg
SAR(1 g) = 0.301 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1340M

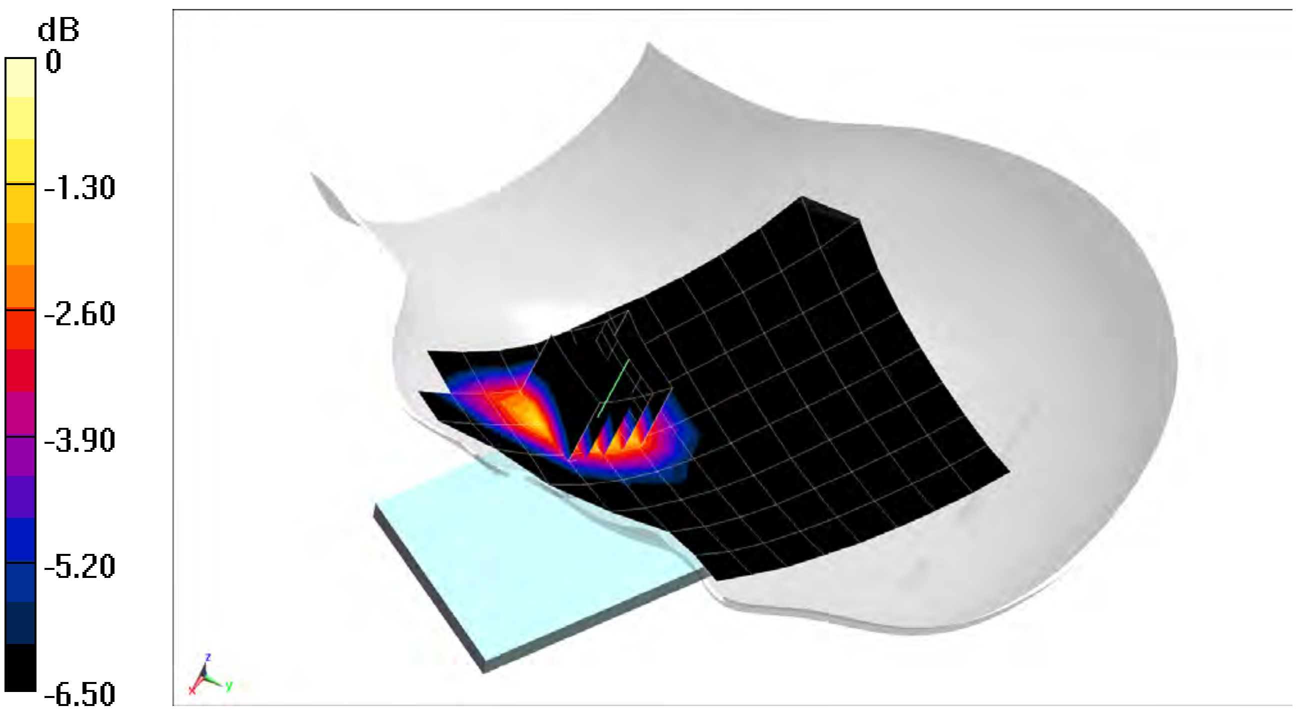
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.337 S/m; ε_r = 39.538; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 11-26-2018; Ambient Temp: 20.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3287; ConvF(5.48, 5.48, 5.48) @ 1732.5 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 4, Left Head, Cheek, 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 = 11.44 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.149 W/kg



0 dB = 0.172 W/kg = -7.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 0531M

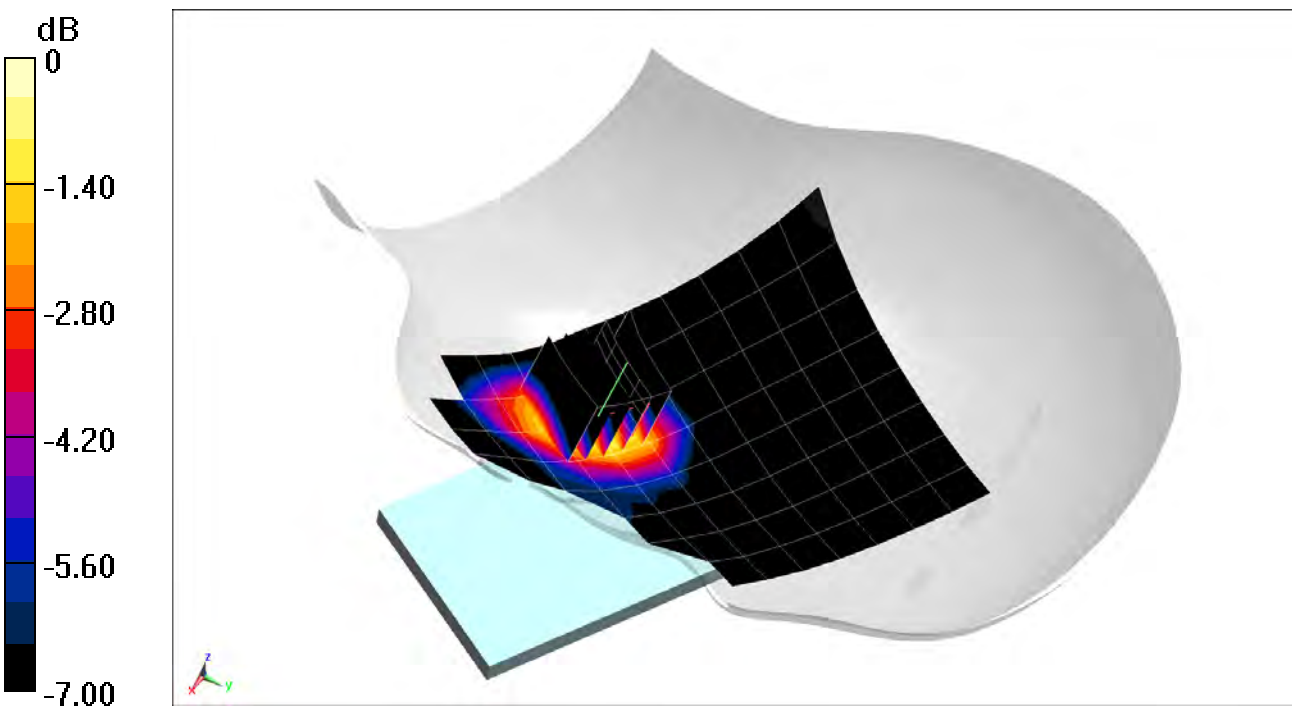
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.416 S/m; ε_r = 38.999; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-03-2018; Ambient Temp: 21.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3287; ConvF(5.24, 5.24, 5.24) @ 1860 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.21 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.173 W/kg;



0 dB = 0.275 W/kg = -5.61 dBW/kg

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1399M

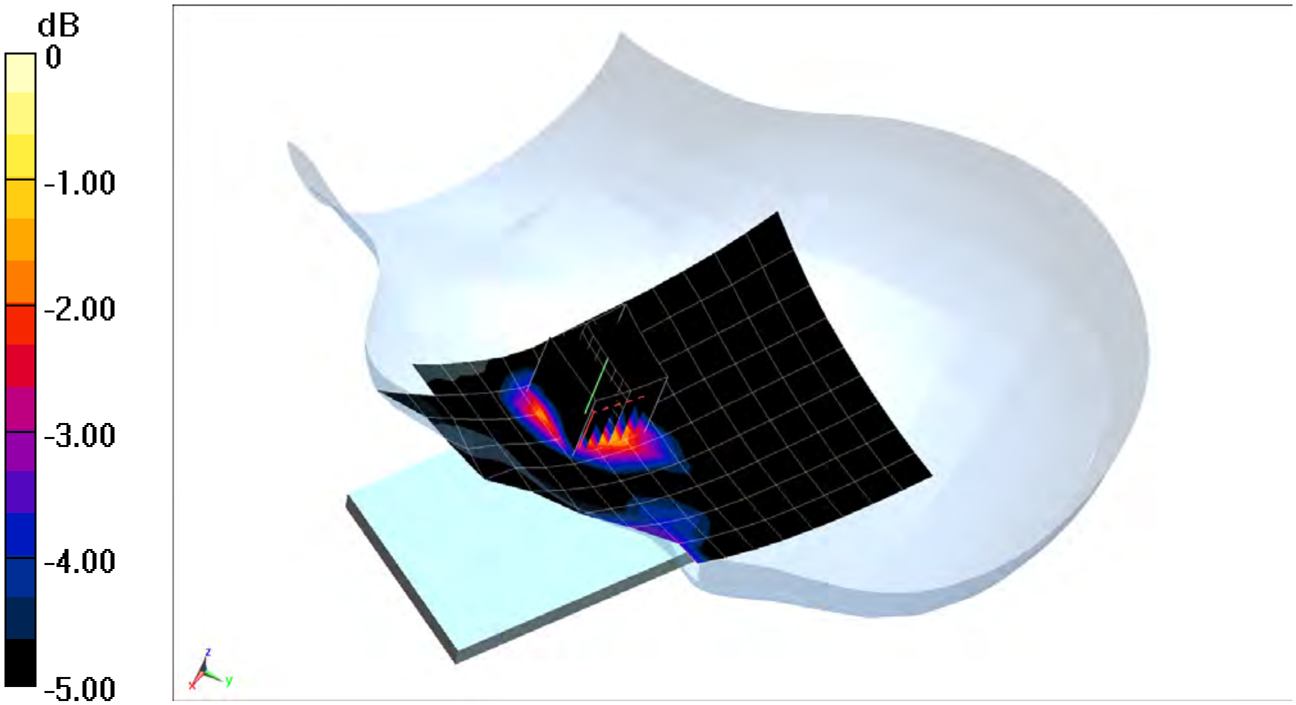
Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2450 Head Medium parameters used:
f = 2550 MHz; $\sigma = 1.964$ S/m; $\varepsilon_r = 38.504$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 12-03-2018; Ambient Temp: 22.0°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7410; ConvF(7.24, 7.24, 7.24) @ 2549.5 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 41, Left Head, Cheek, Low-Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.251 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0980 W/kg
SAR(1 g) = 0.060 W/kg



0 dB = 0.0831 W/kg = -10.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

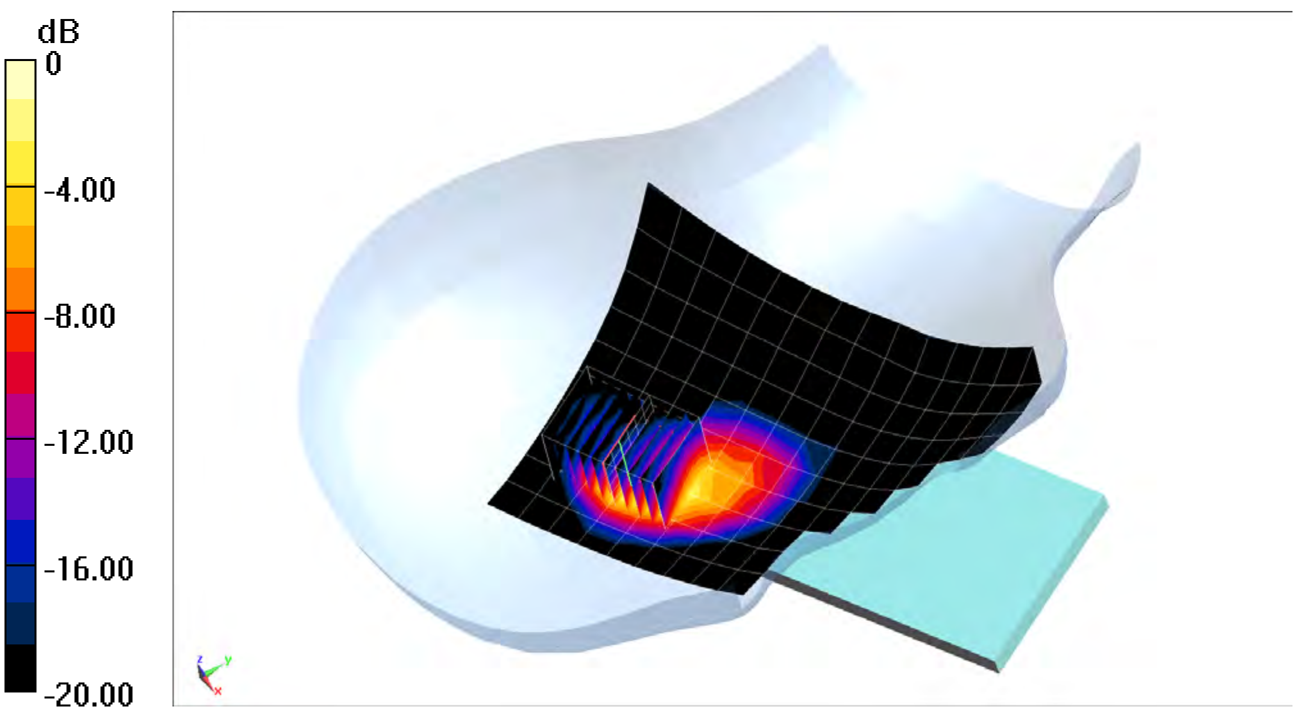
Communication System: UID 0, _IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.812 S/m; ε_r = 38.605; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-12-2018; Ambient Temp: 22.2°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2412 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x10x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.338 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.174 W/kg



0 dB = 0.298 W/kg = -5.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

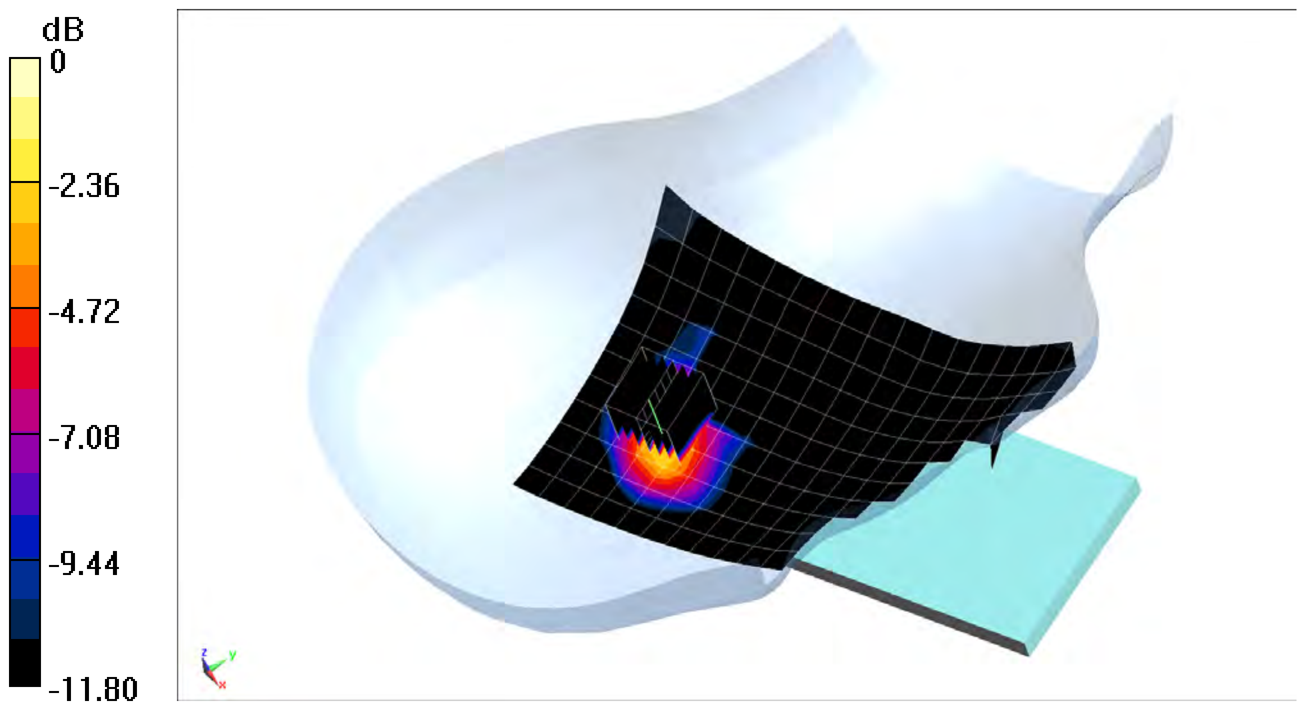
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5270 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5270 MHz; σ = 4.617 S/m; ε_r = 35.276; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-26-2018; Ambient Temp: 20.5°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5270 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11n MIMO, U-NII-2A, 40 MHz Bandwidth, Right Head, Cheek, Ch 54, 27 Mbps

Area Scan (12x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.202 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.377 W/kg



0 dB = 0.986 W/kg = -0.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

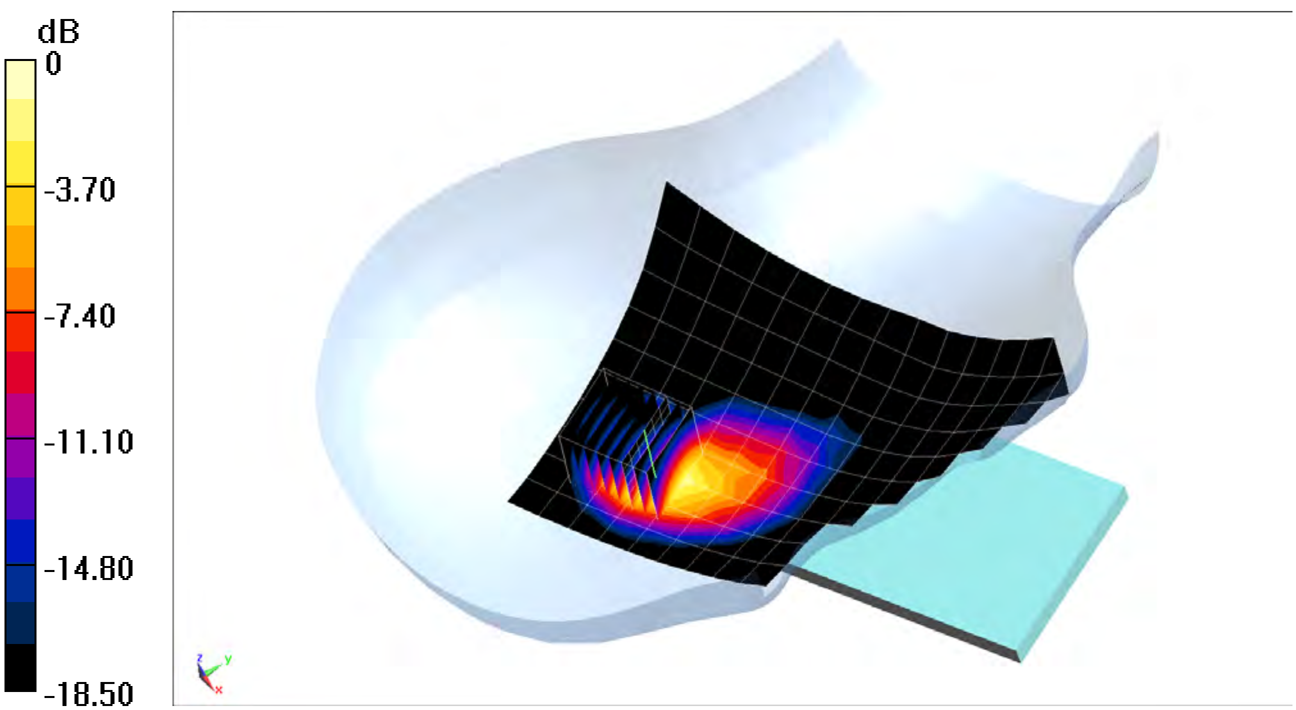
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.852 S/m; ε_r = 38.307; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 12-17-2018; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2441 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: Bluetooth, Right Head, Cheek, Ch 39, 1Mbps

Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.86 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.01 W/kg



0 dB = 1.66 W/kg = 2.20 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1373M

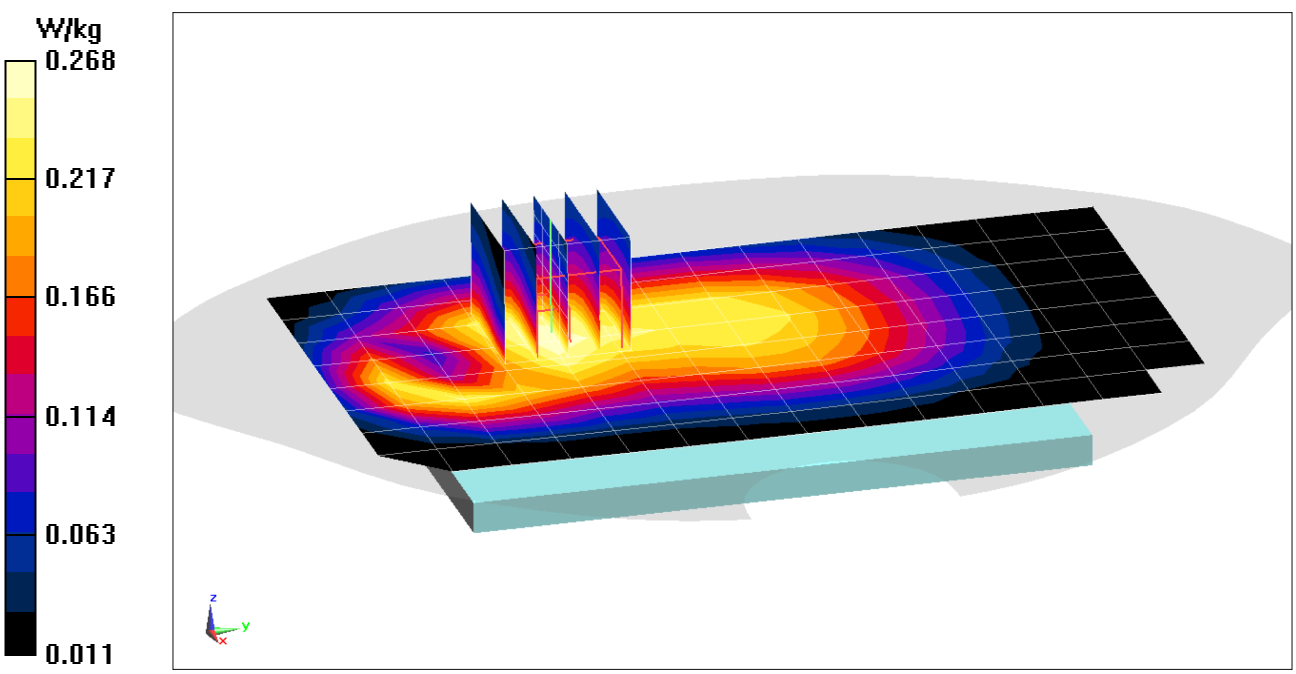
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 1.02$ S/m; $\varepsilon_r = 53.959$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 836.6 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: GSM 850, Body SAR, Back side, 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 = 14.94 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.303 W/kg
SAR(1 g) = 0.220 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1422M

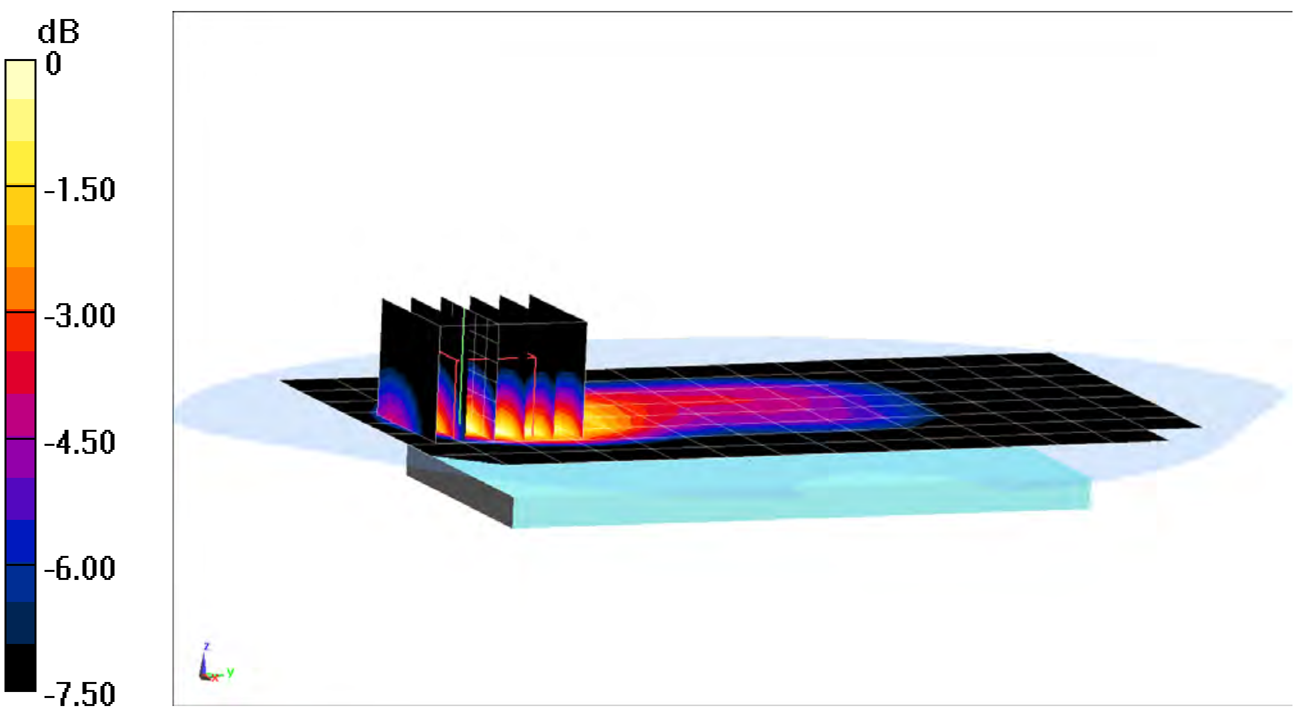
Communication System: UID 0, _GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.969$ S/m; $\varepsilon_r = 55.401$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-02-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7409; ConvF(9.63, 9.63, 9.63) @ 836.6 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 3 Tx Slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.15 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.847 W/kg
SAR(1 g) = 0.479 W/kg



0 dB = 0.701 W/kg = -1.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1805M

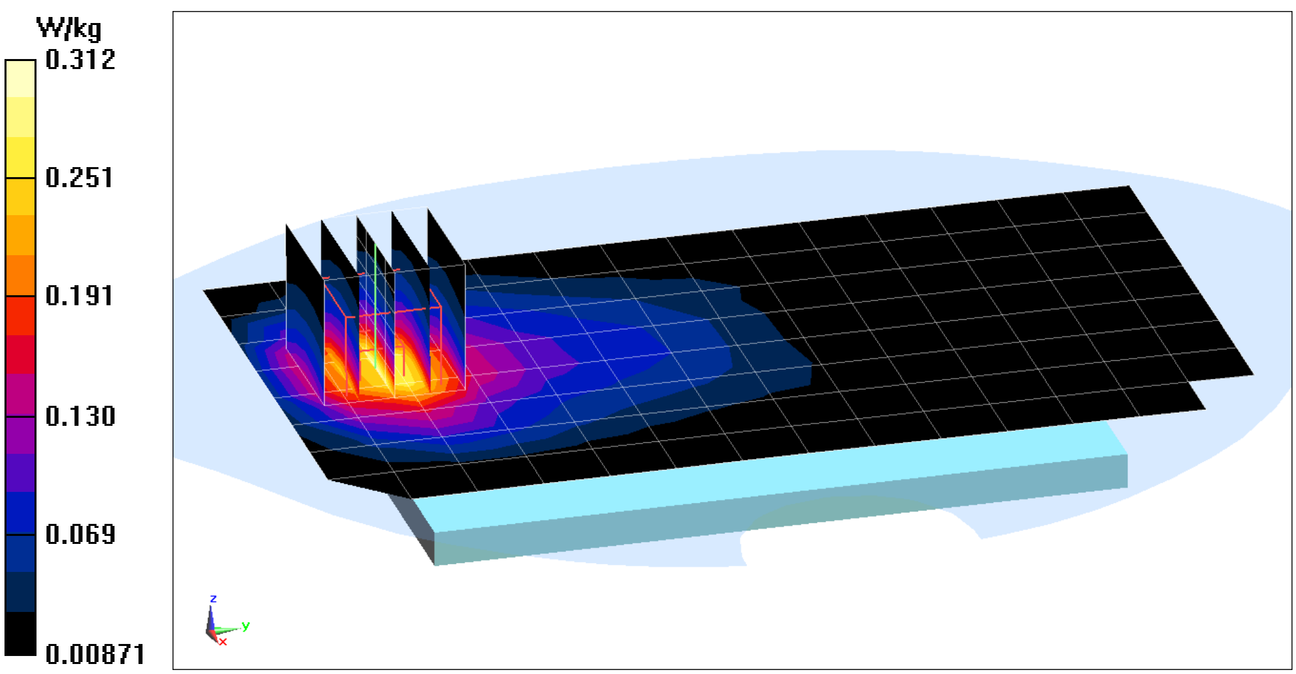
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.55 S/m; ε_r = 51.085; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-05-2018; Ambient Temp: 24.5°C; Tissue Temp: 23.3°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1880 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: GSM 1900, Body SAR, Back side, 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 = 13.76 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.409 W/kg
SAR(1 g) = 0.259 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1805M

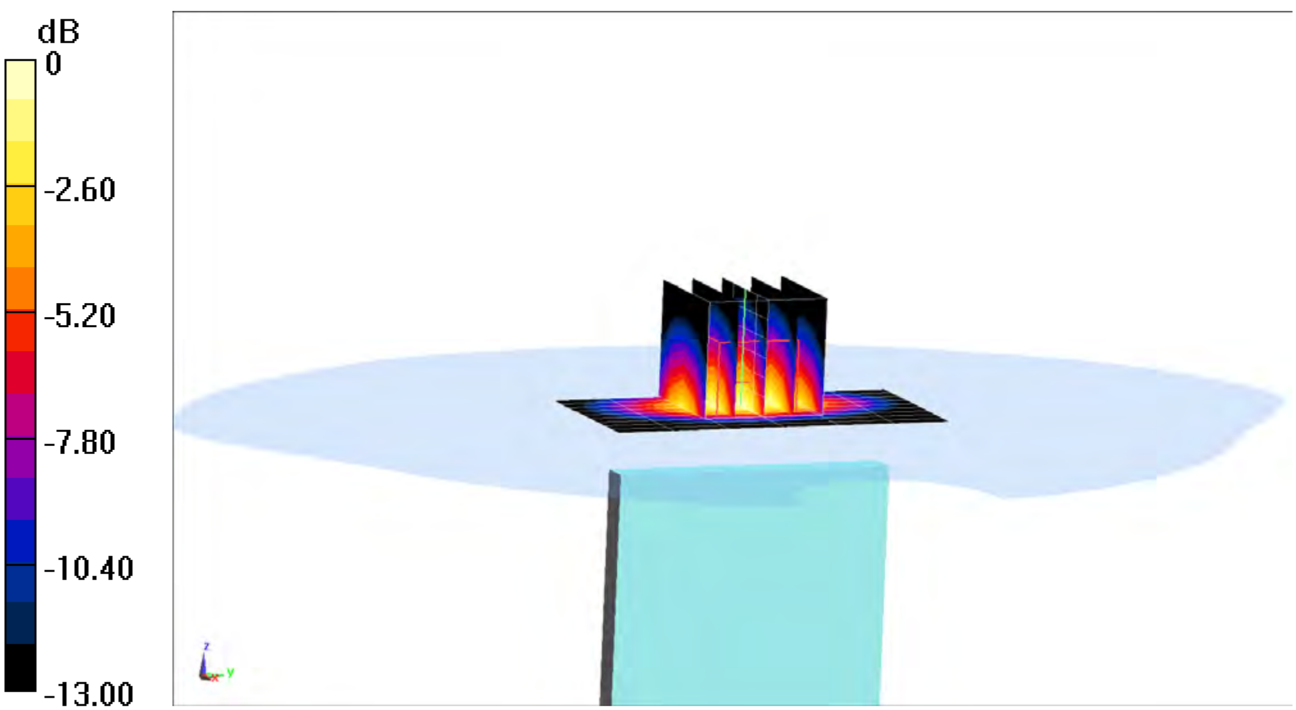
Communication System: UID 0, _GSM GPRS; 3 Tx slots; Frequency: 1909.8 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used (interpolated):
f = 1910 MHz; σ = 1.583 S/m; ε_r = 50.992; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2018; Ambient Temp: 24.5°C; Tissue Temp: 23.3°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1909.8 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: GPRS 1900, Body SAR, Bottom Edge, High.ch, 3 Tx Slots

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.92 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.705 W/kg



0 dB = 0.885 W/kg = -0.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1726M

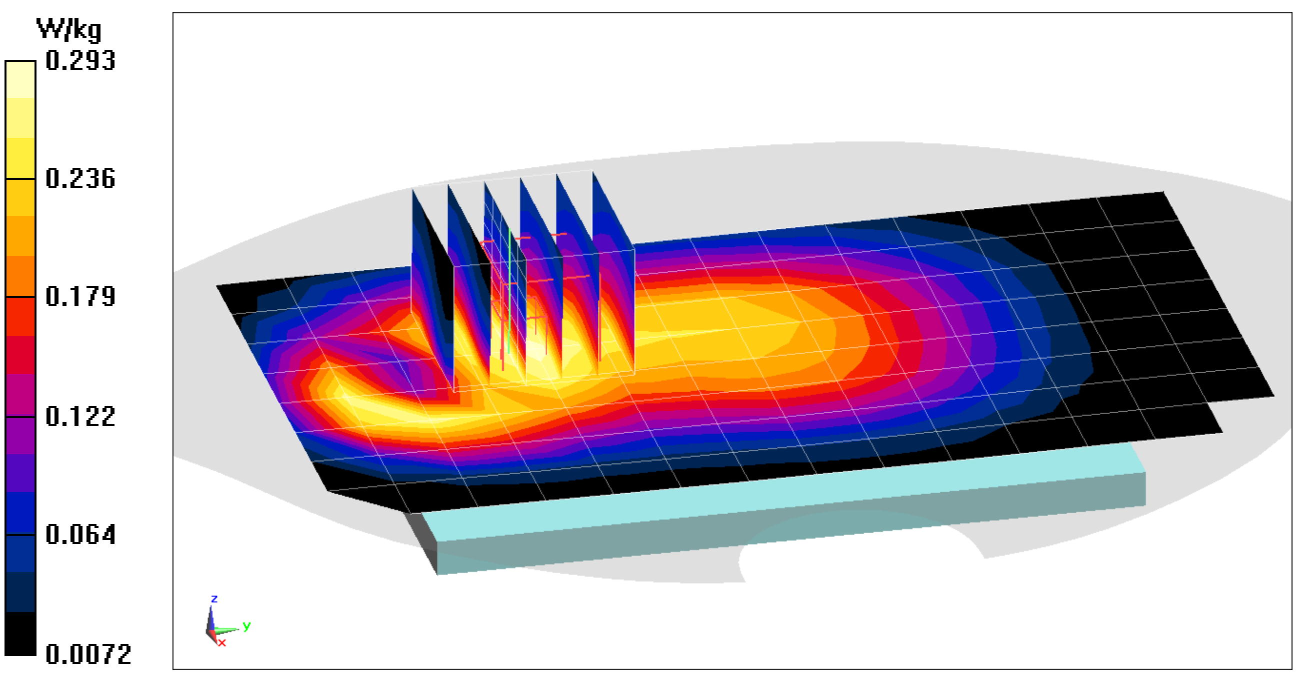
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.02 S/m; ε_r = 53.959; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 836.6 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.34 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.234 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1726M

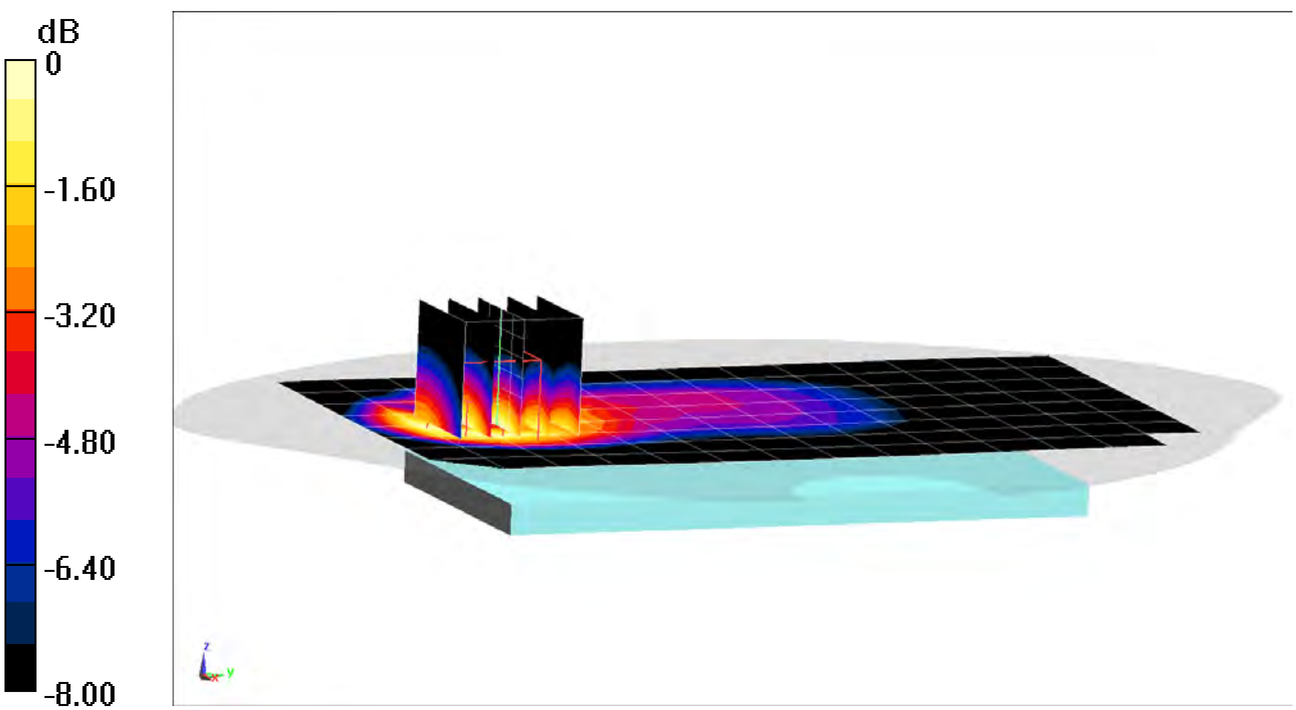
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.969 S/m; ε_r = 54.665; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-07-2019; Ambient Temp: 20.9°C; Tissue Temp: 20.8°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37) @ 836.6 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 850, Body SAR, Back side, 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 = 23.10 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.618 W/kg



0 dB = 0.726 W/kg = -1.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

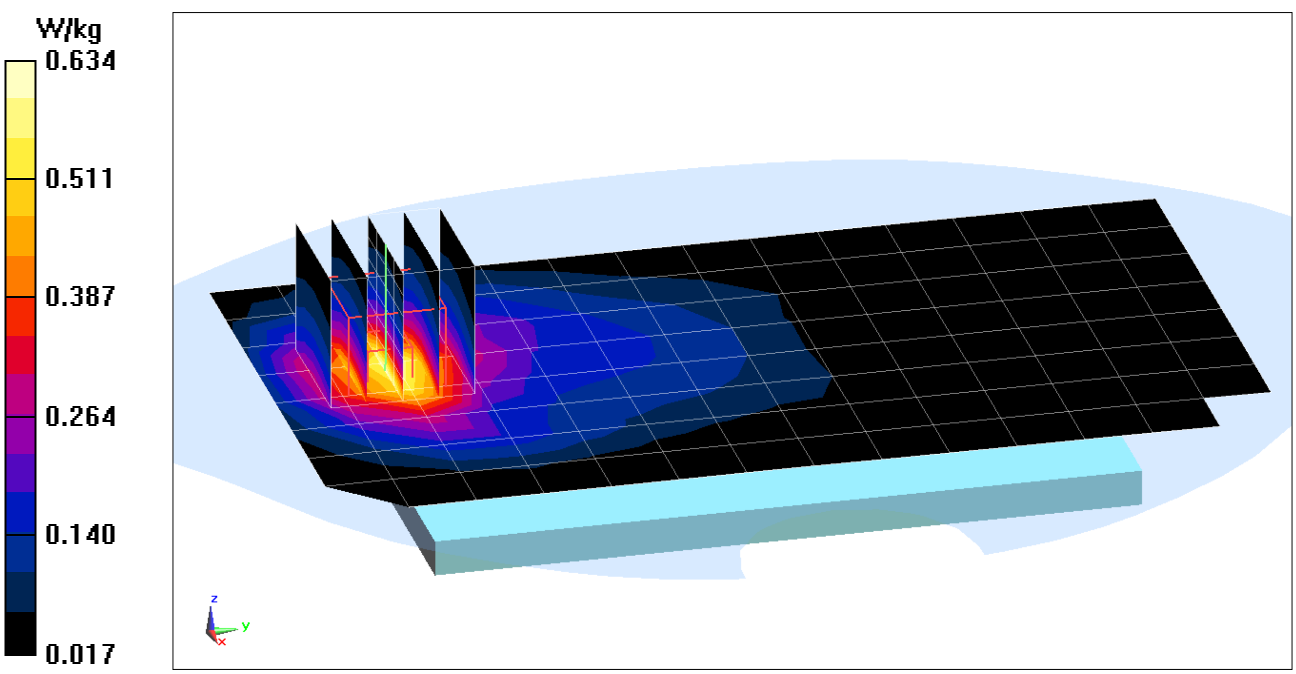
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.541 S/m; ε_r = 51.136; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1880 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 1900, Body SAR, Back side, 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 = 19.83 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.527 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

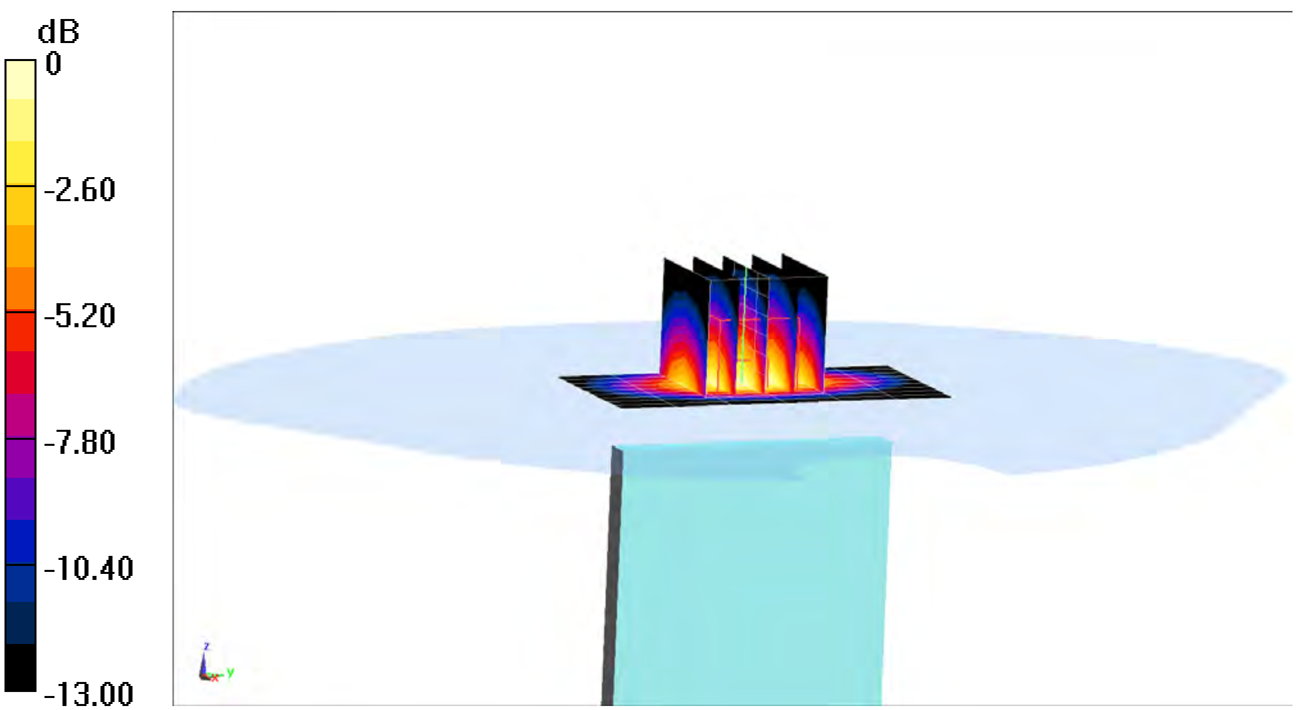
Communication System: UID 0, _UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1852.4 MHz; σ = 1.512 S/m; ε_r = 51.236; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1852.4 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 1900, Body SAR, Bottom Edge, Low.ch

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.16 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.748 W/kg



0 dB = 0.930 W/kg = -0.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1399M

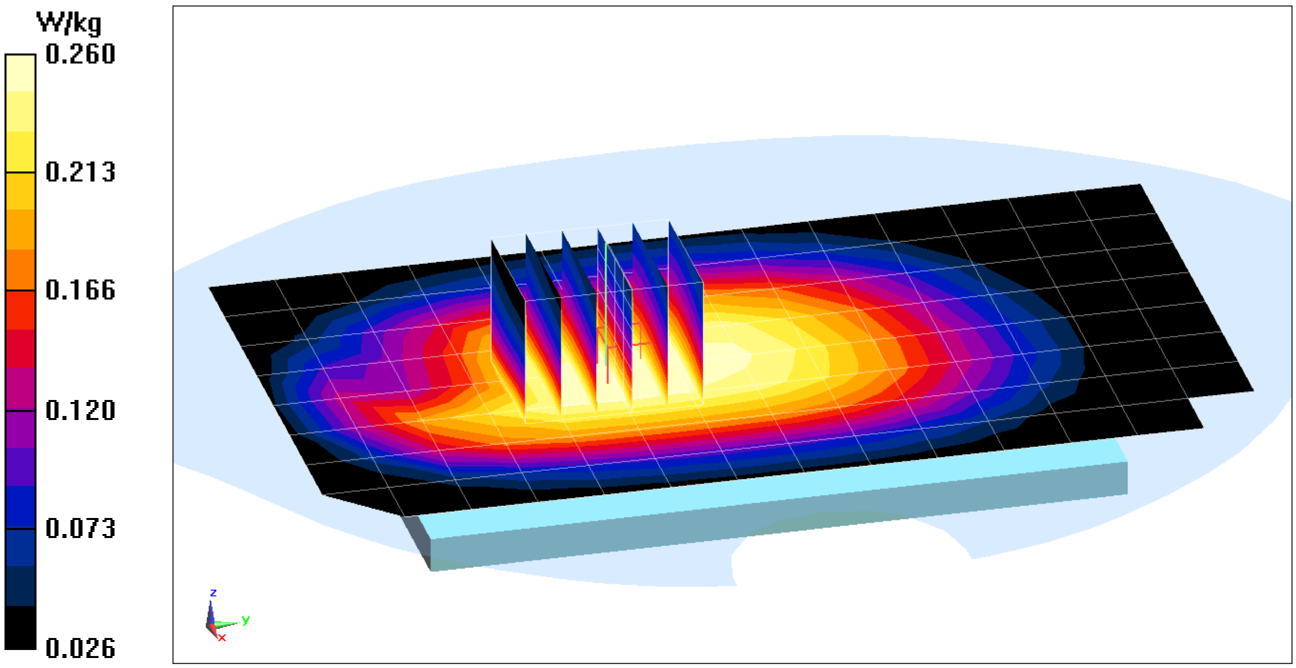
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.936 S/m; ε_r = 53.374; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7357; ConvF(10.37, 10.37, 10.37) @ 707.5 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.46 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.281 W/kg
SAR(1 g) = 0.219 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1399M

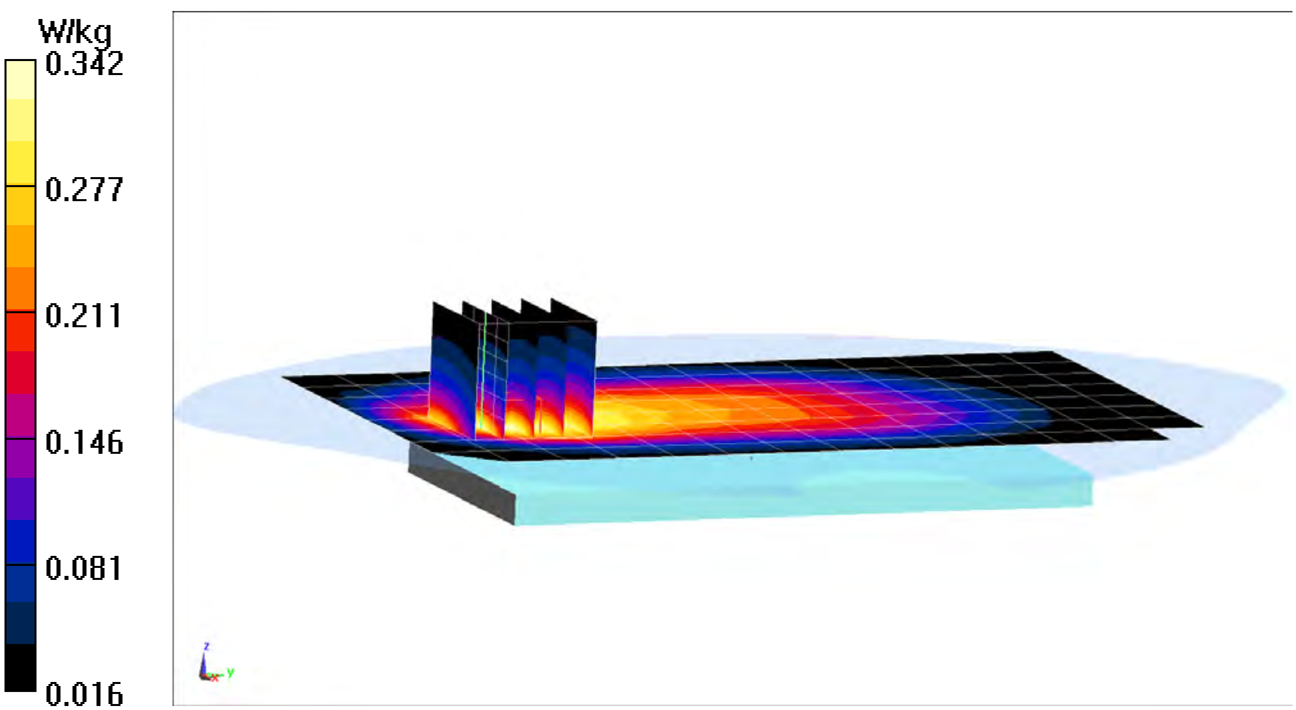
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.936 S/m; ε_r = 53.374; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7357; ConvF(10.37, 10.37, 10.37) @ 707.5 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch, 10 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 = 16.46 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.422 W/kg
SAR(1 g) = 0.241 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1399M

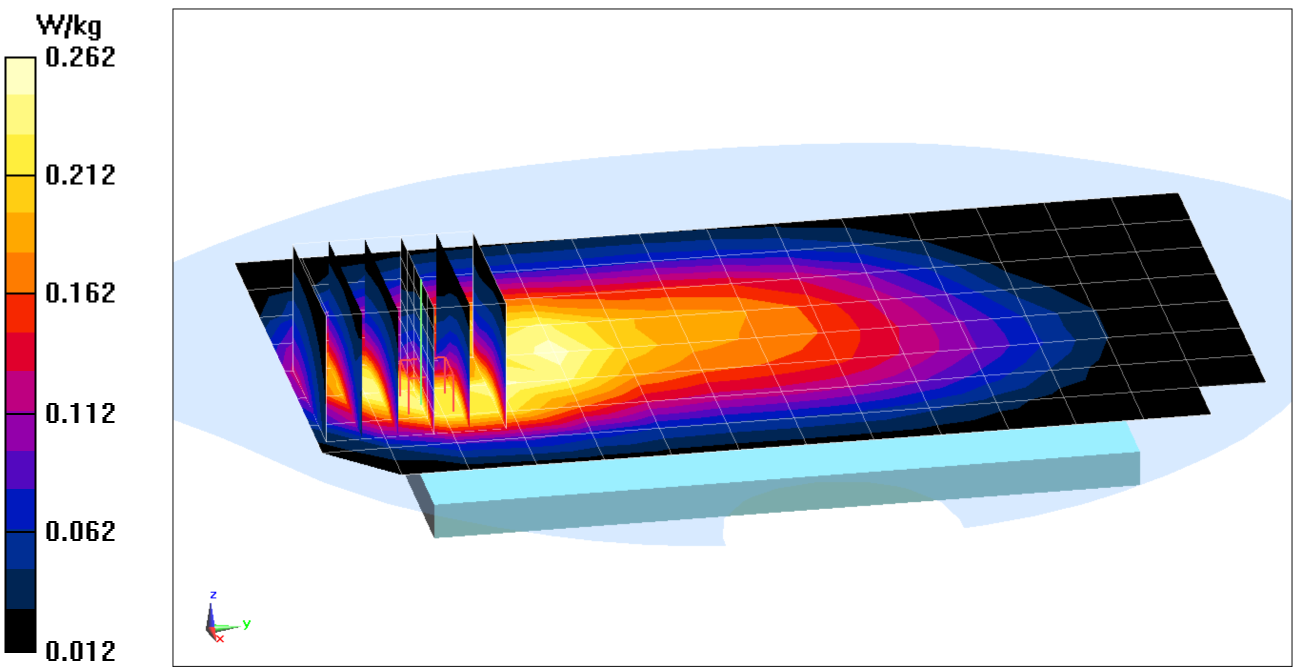
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; $\sigma = 0.964$ S/m; $\varepsilon_r = 53.23$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7357; ConvF(10.37, 10.37, 10.37) @ 782 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 13, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.45 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.303 W/kg
SAR(1 g) = 0.189 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1399M

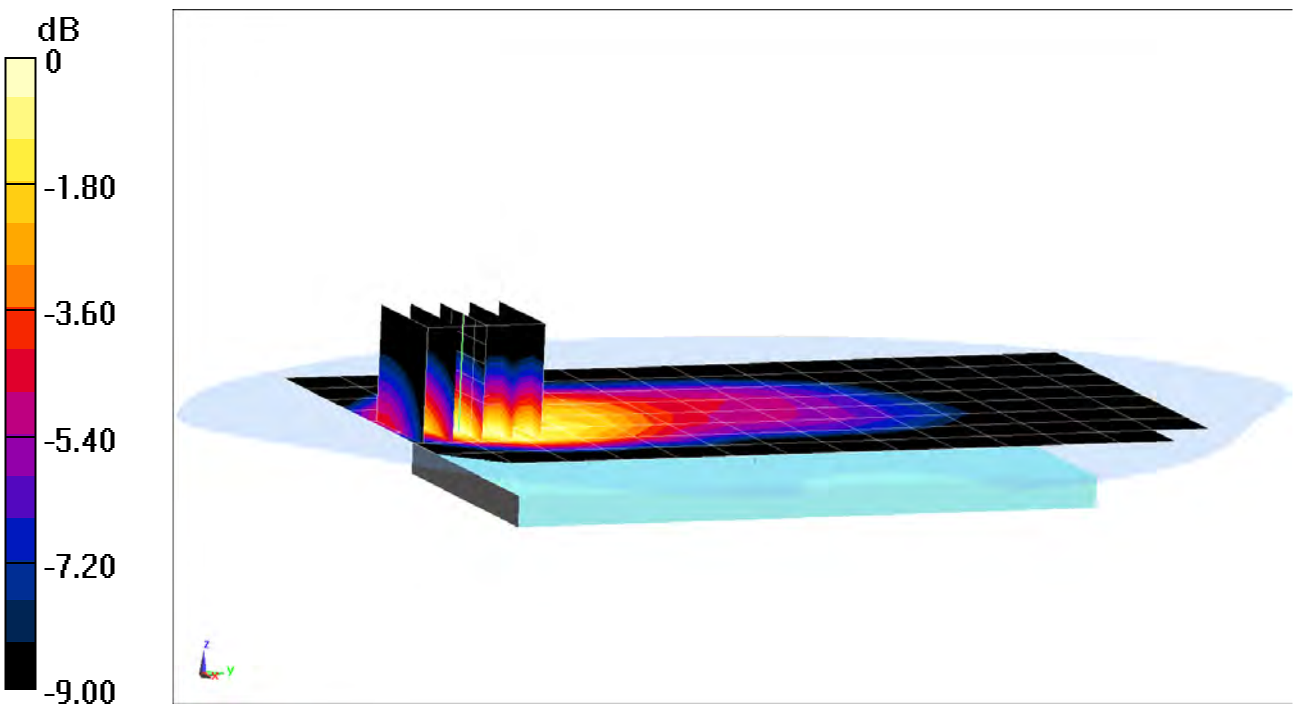
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.964 S/m; ε_r = 53.23; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7357; ConvF(10.37, 10.37, 10.37) @ 782 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 13, Body SAR, Back side, Mid.ch, 10 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 = 20.96 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.697 W/kg
SAR(1 g) = 0.405 W/kg



0 dB = 0.586 W/kg = -2.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1373M

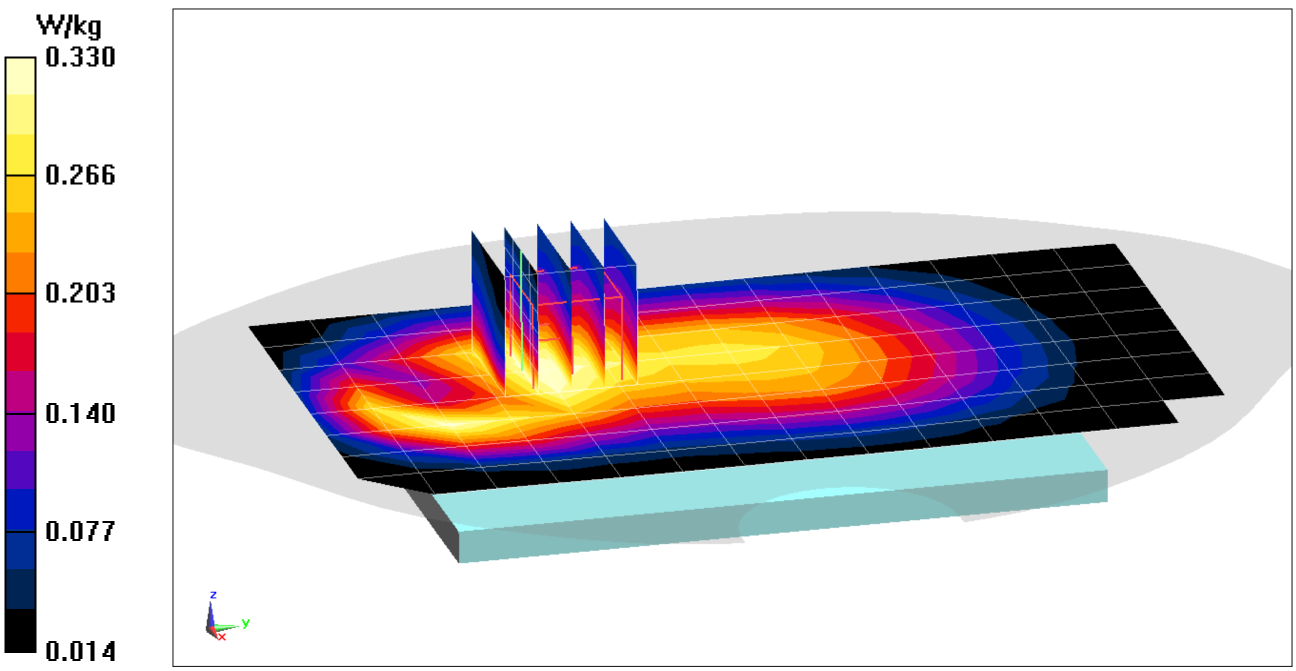
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 1.015 S/m; ε_r = 54.013; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 831.5 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 26 (Cell.), Body SAR, Back side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 36 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 = 16.56 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.376 W/kg
SAR(1 g) = 0.268 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1373M

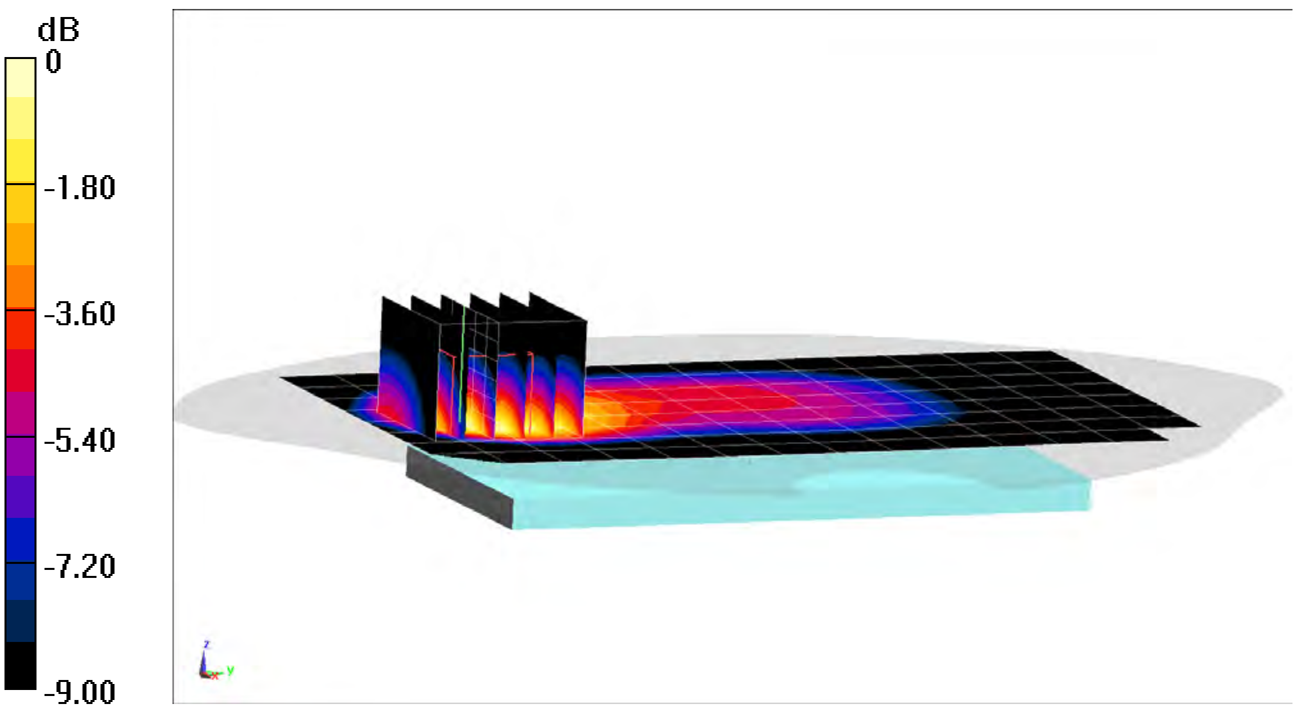
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 1.015 S/m; ε_r = 54.013; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 831.5 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 26, Body SAR, Back side, Mid.ch, 15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.53 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.974 W/kg
SAR(1 g) = 0.550 W/kg



0 dB = 0.819 W/kg = -0.87 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1373M

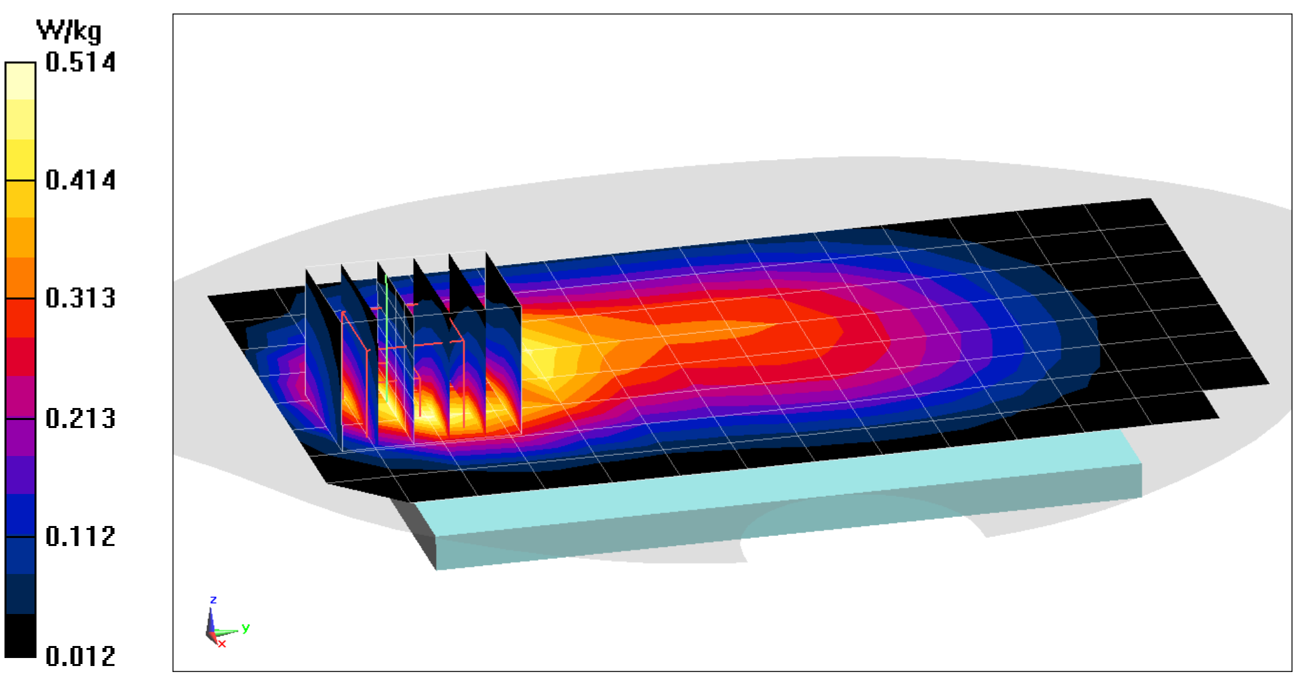
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.02 S/m; ε_r = 53.96; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 836.5 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.10 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.611 W/kg
SAR(1 g) = 0.360 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1373M

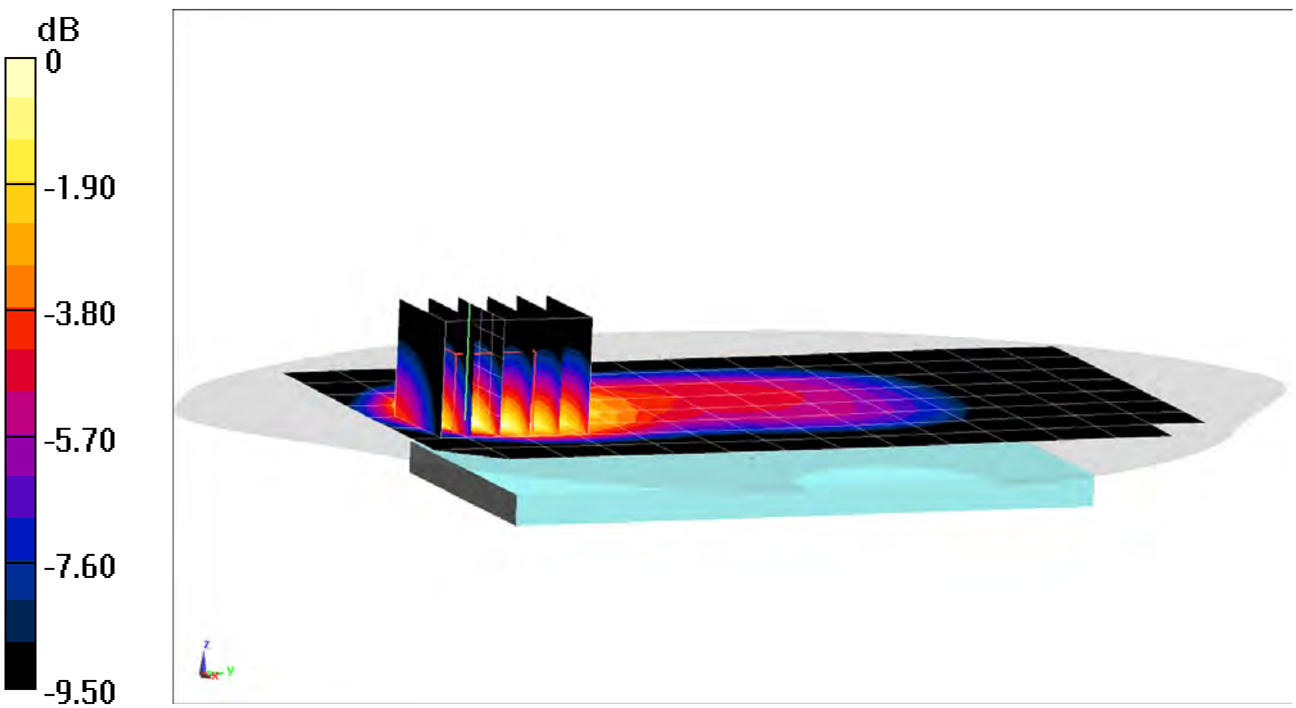
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.02 S/m; ε_r = 53.96; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 836.5 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.04 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.648 W/kg



0 dB = 0.962 W/kg = -0.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1370M

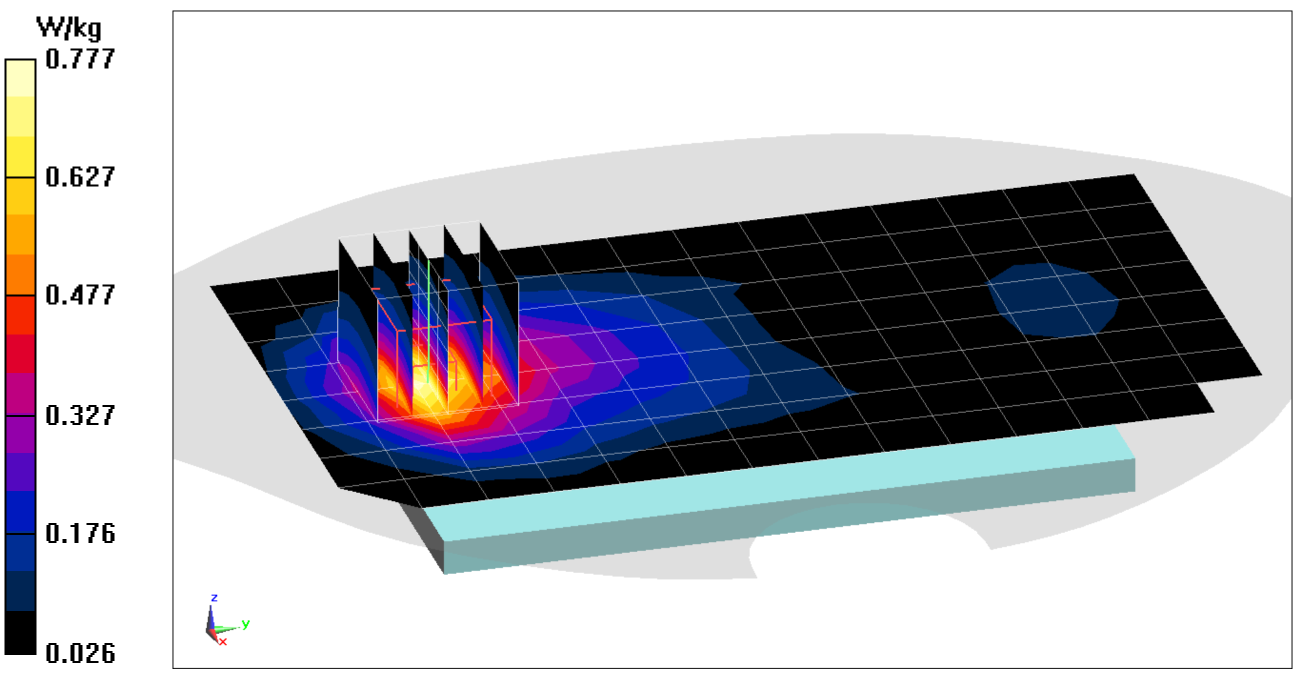
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.514 S/m; ε_r = 51.631; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17) @ 1732.5 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

**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 = 22.27 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.996 W/kg
SAR(1 g) = 0.652 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1370M

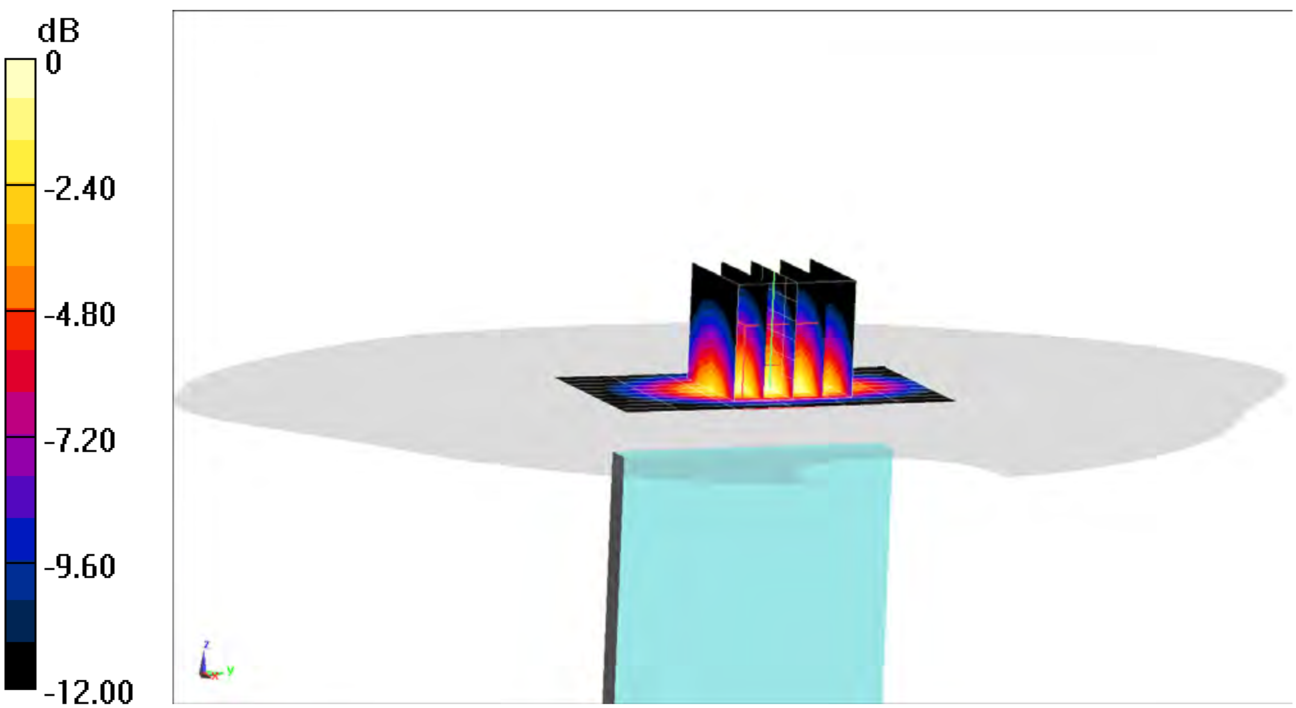
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
$f = 1732.5$ MHz; $\sigma = 1.514$ S/m; $\varepsilon_r = 51.631$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17) @ 1732.5 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 4, Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 50 RB, 25 RB Offset

Area Scan (11x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.24 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.697 W/kg



0 dB = 0.869 W/kg = -0.61 dBW/kg

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1371M

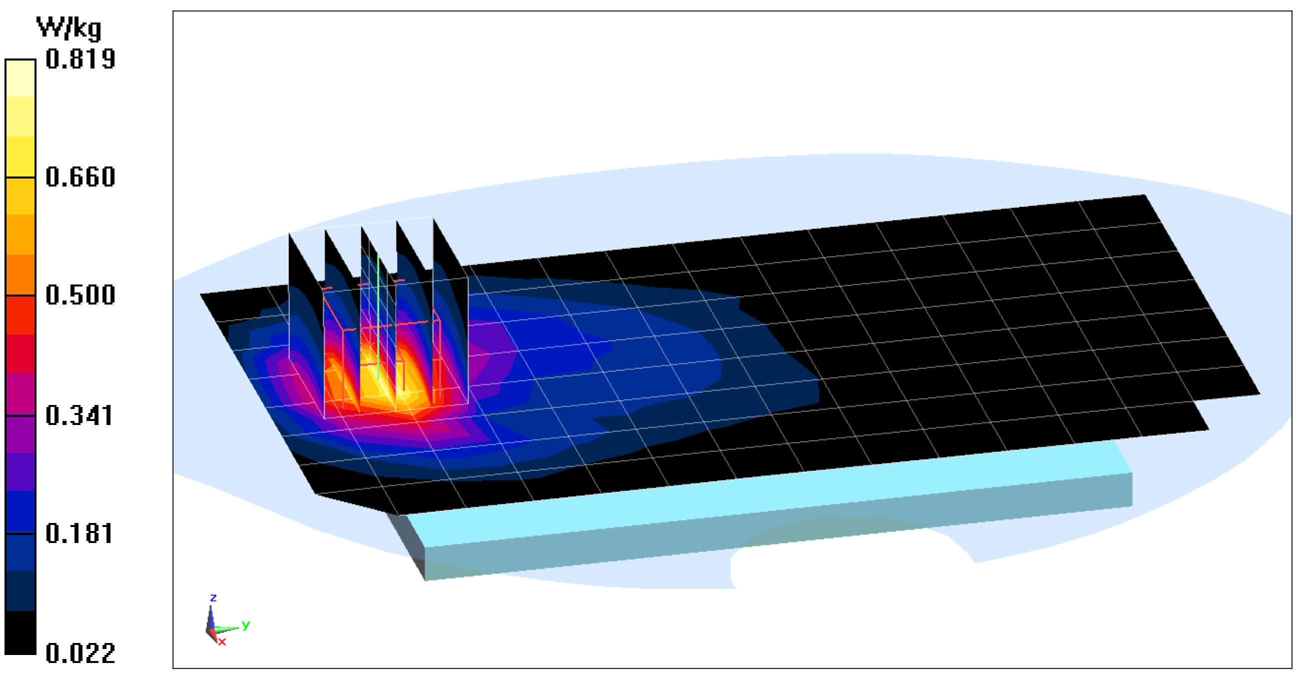
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; $\sigma = 1.52$ S/m; $\varepsilon_r = 51.209$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1860 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 25 (PCS), Body SAR, Back side, Low.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 = 22.63 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.686 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1371M

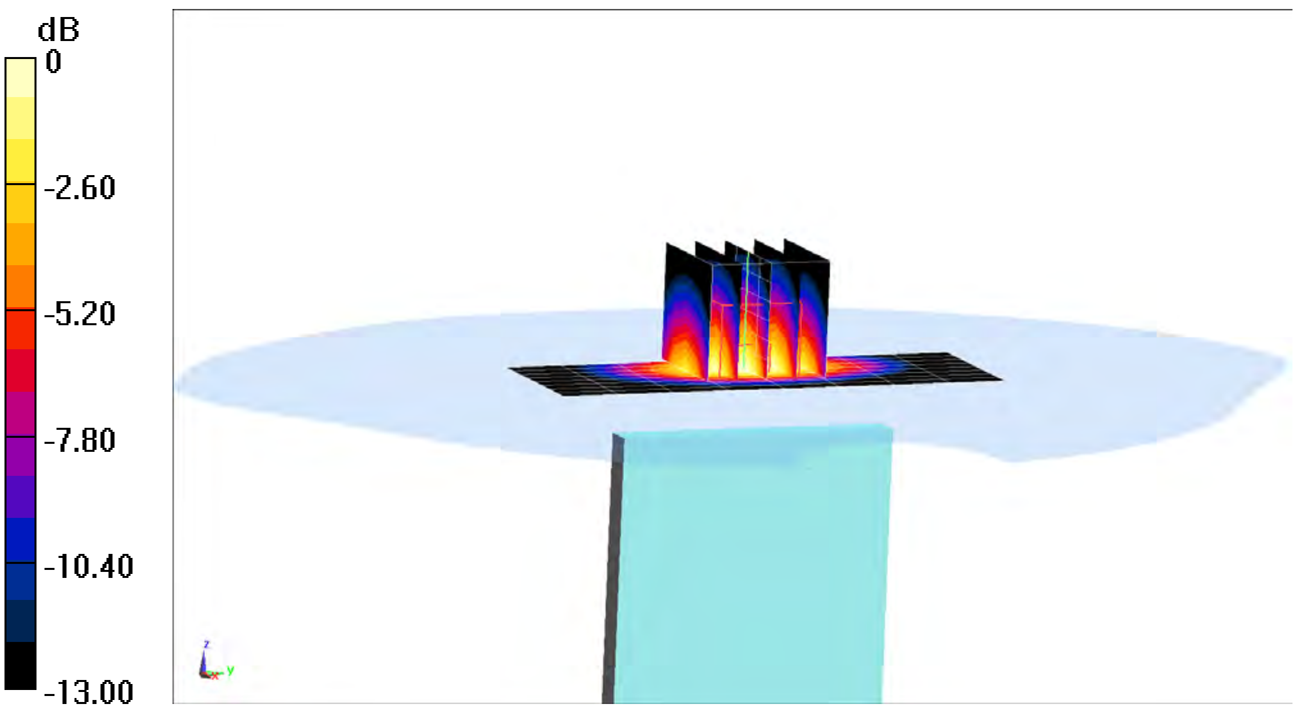
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.544 S/m; ε_r = 51.127; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1882.5 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 25, Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset

Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.88 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.872 W/kg



0 dB = 1.04 W/kg = 0.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

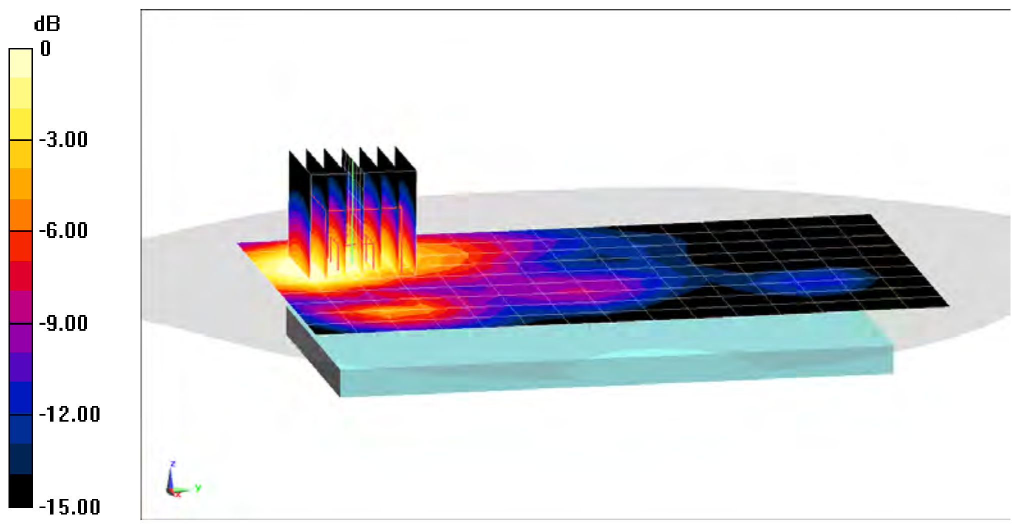
Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2450 Body Medium parameters used:
f = 2550 MHz; σ = 2.169 S/m; ε_r = 51.858; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-23-2018; Ambient Temp: 23.4°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3319; ConvF(4.33, 4.33, 4.33) @ 2549.5 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 41 ULCA, Body SAR, Back side,
PCC: 20 MHz Bandwidth, QPSK, Ch. 40185, 1 RB, 0 RB Offset
SCC: 20 MHz Bandwidth, QPSK, Ch. 39987, 1 RB, 99 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 = 12.36 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.568 W/kg
SAR(1 g) = 0.294 W/kg



0 dB = 0.367 W/kg = -4.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

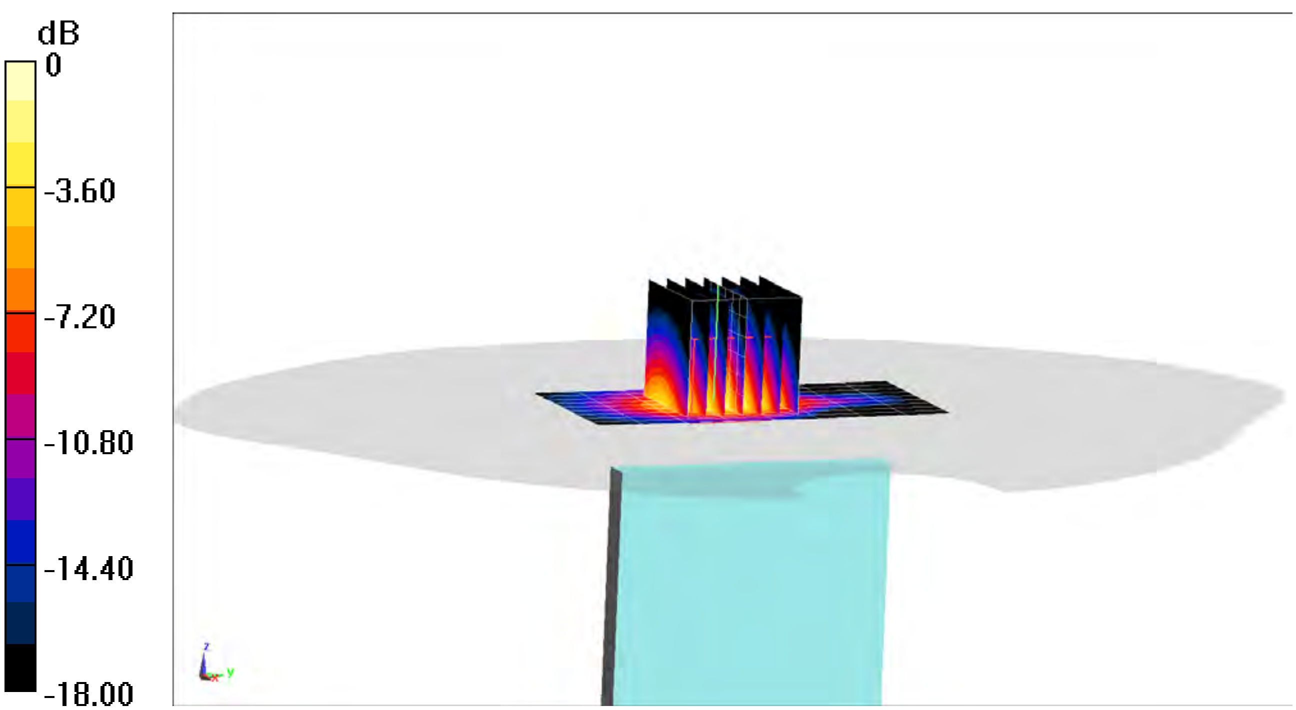
Communication System: UID 0, _LTE Band 41; Frequency: 2593 MHz; Duty Cycle: 1:1.58
Medium: 2450 Body Medium parameters used (interpolated):
$f = 2593$ MHz; $\sigma = 2.218$ S/m; $\varepsilon_r = 51.717$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-23-2018; Ambient Temp: 23.4°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3319; ConvF(4.33, 4.33, 4.33) @ 2593 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 41 ULCA, Body SAR, Bottom Edge
PCC: 20 MHz Bandwidth, QPSK, Ch. 40620, 50 RB, 0 RB Offset
SCC: 20 MHz Bandwidth, QPSK, Ch. 40422, 50 RB, 50 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 = 22.83 V/m; Power Drift = 0.2 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 1.09 W/kg



0 dB = 1.44 W/kg = 1.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

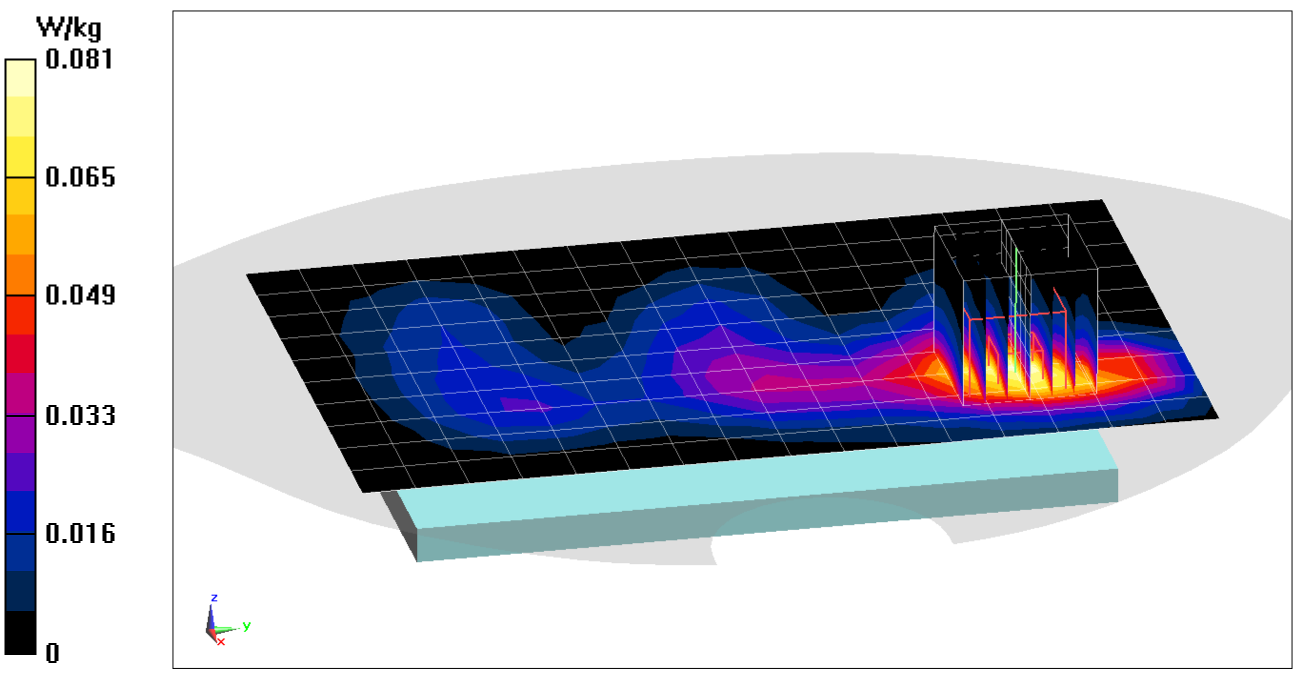
Communication System: UID 0, _IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.015 S/m; ε_r = 51.965; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-20-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2437 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

**Mode: IEEE 802.11b Antenna 1, 22 MHz Bandwidth,
Body SAR, Ch 6, 1 Mbps, Back Side**

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.102 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.123 W/kg
SAR(1 g) = 0.066 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

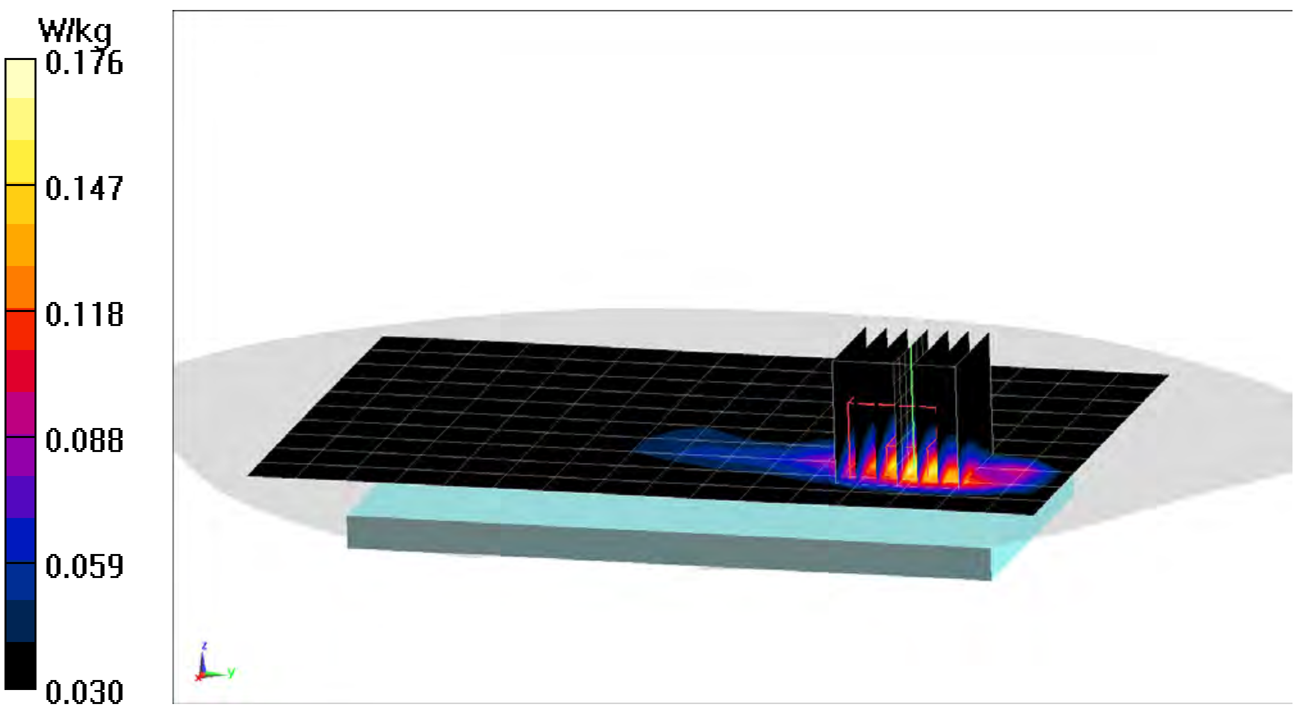
Communication System: UID 0, _IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.015 S/m; ε_r = 51.965; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-20-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2437 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

**Mode: IEEE 802.11b Antenna 1, 22 MHz Bandwidth,
Body SAR, Ch 06, 1 Mbps, Back Side**

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.277 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.263 W/kg
SAR(1 g) = 0.139 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

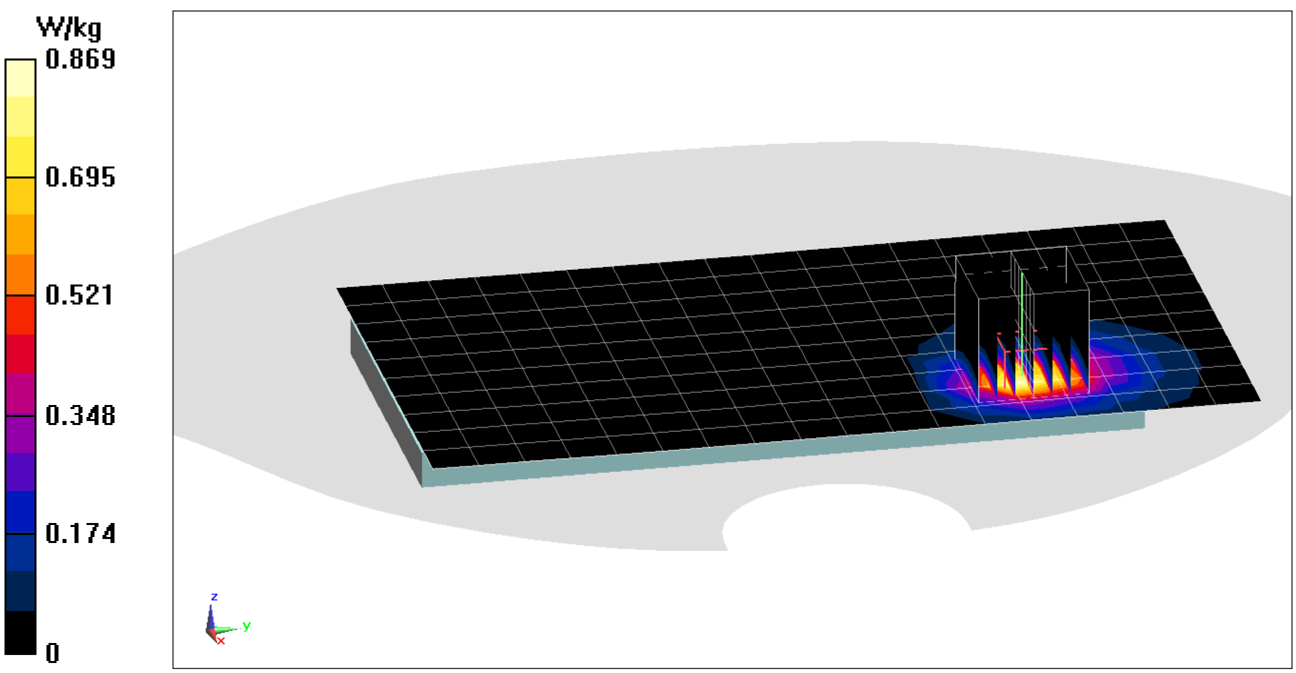
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used:
f = 5745 MHz; σ = 6.137 S/m; ε_r = 46.835; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-17-2018; Ambient Temp: 23.0°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5745 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11a Antenna 2, UNII-3, 20 MHz Bandwidth, Body SAR, Ch 149, 6 Mbps, Back Side

Area Scan (11x19x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 8.490 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 0.398 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

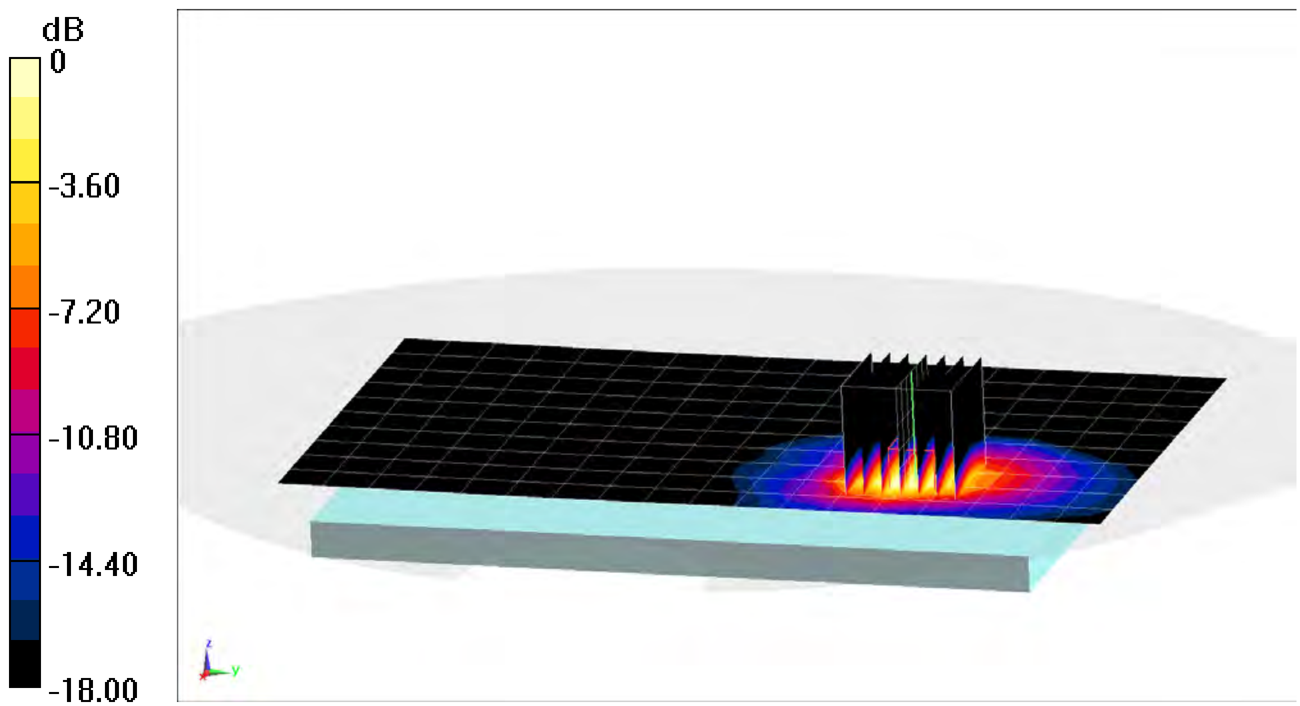
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used:
$f = 5785$ MHz; $\sigma = 6.19$ S/m; $\varepsilon_r = 46.823$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2018; Ambient Temp: 23.0°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5785 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11a Antenna 2, UNII-3, 20 MHz Bandwidth, Body SAR, Ch 157, 6 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 10.94 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 3.04 W/kg
SAR(1 g) = 0.665 W/kg



0 dB = 1.52 W/kg = 1.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

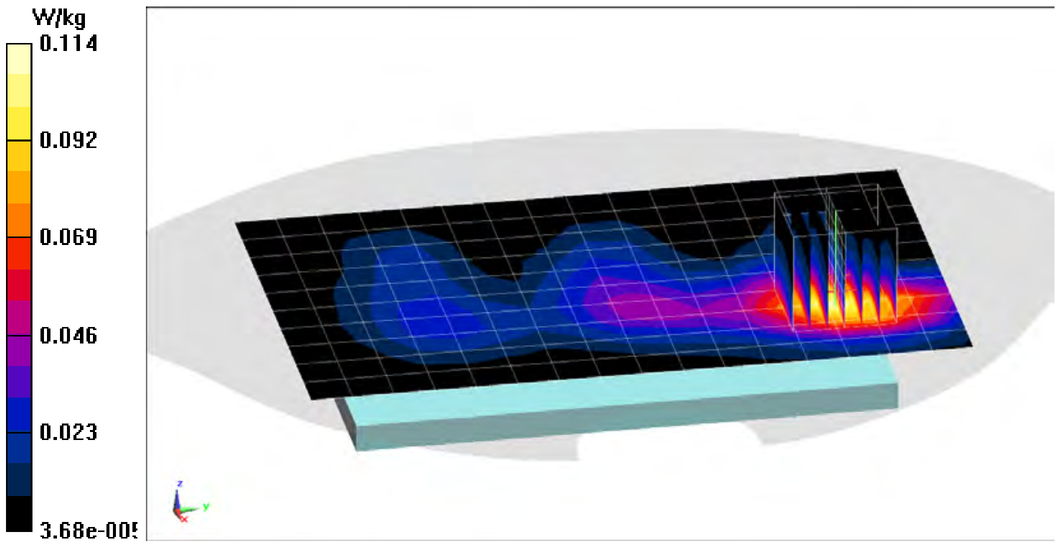
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 MHz Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.032 S/m; ε_r = 50.864; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-20-2018; Ambient Temp: 19.7°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3347; ConvF(4.64, 4.64, 4.64) @ 2441 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.056 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.173 W/kg
SAR(1 g) = 0.092 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

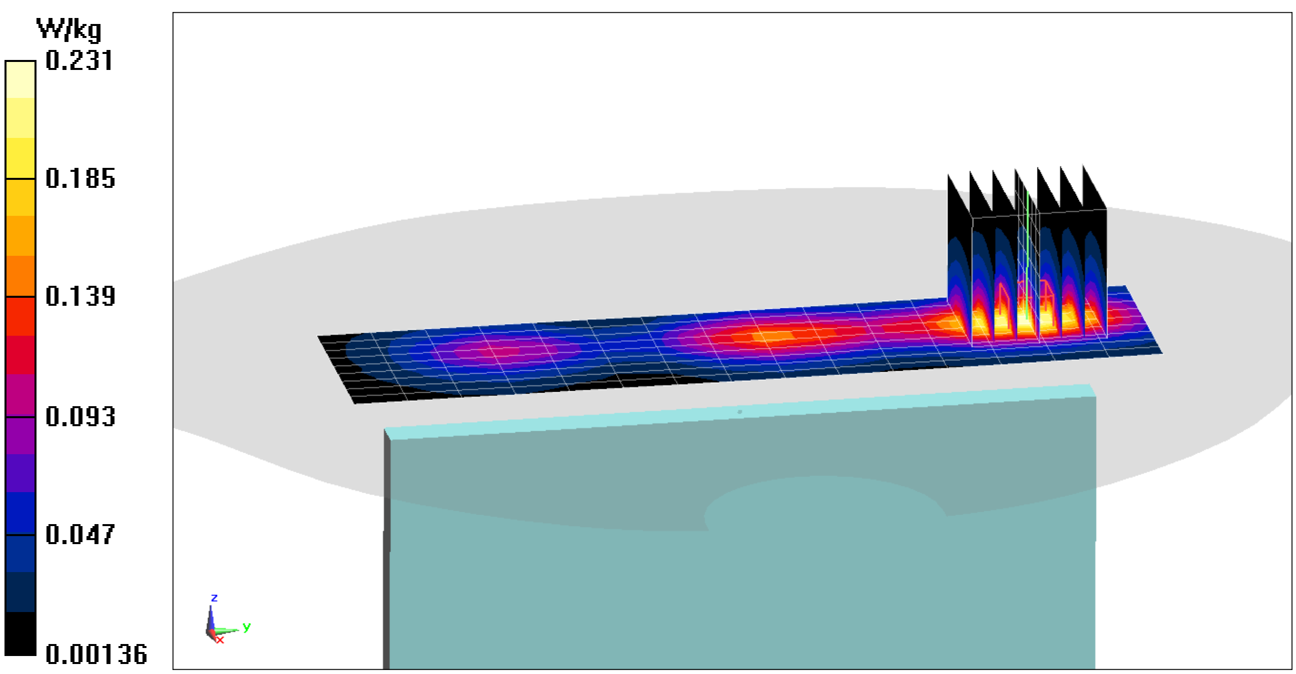
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 MHz Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.032 S/m; ε_r = 50.864; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-20-2018; Ambient Temp: 19.7°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3347; ConvF(4.64, 4.64, 4.64) @ 2441 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: Bluetooth, Body SAR, Ch 39, 1 Mbps, Left Edge

Area Scan (10x16x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.14 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.357 W/kg
SAR(1 g) = 0.181 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1805M

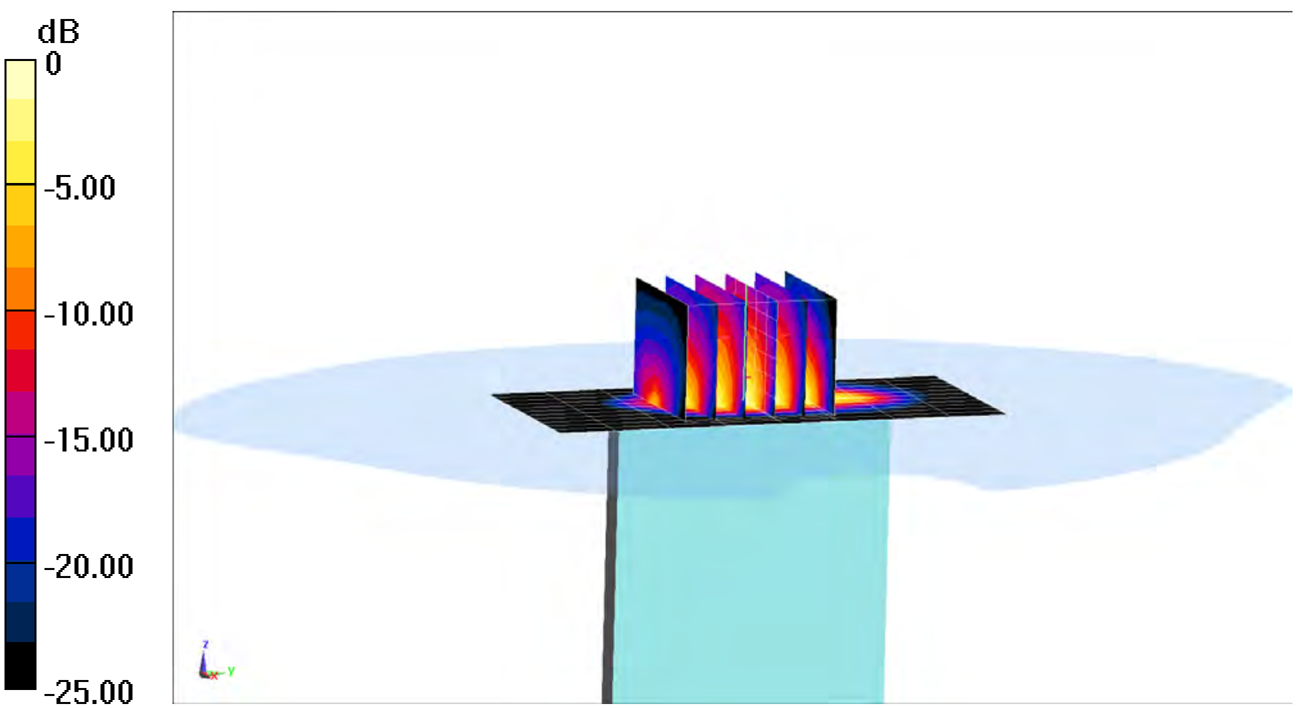
Communication System: UID 0, _GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.551 S/m; ε_r = 53.602; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 12-19-2018; Ambient Temp: 21.6°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1880 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: GPRS 1900, Phablet SAR, Bottom Edge, Mid.ch, 3 Tx Slots

Area Scan (12x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.64 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 10.5 W/kg
SAR(10 g) = 2.24 W/kg



0 dB = 6.70 W/kg = 8.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1364M

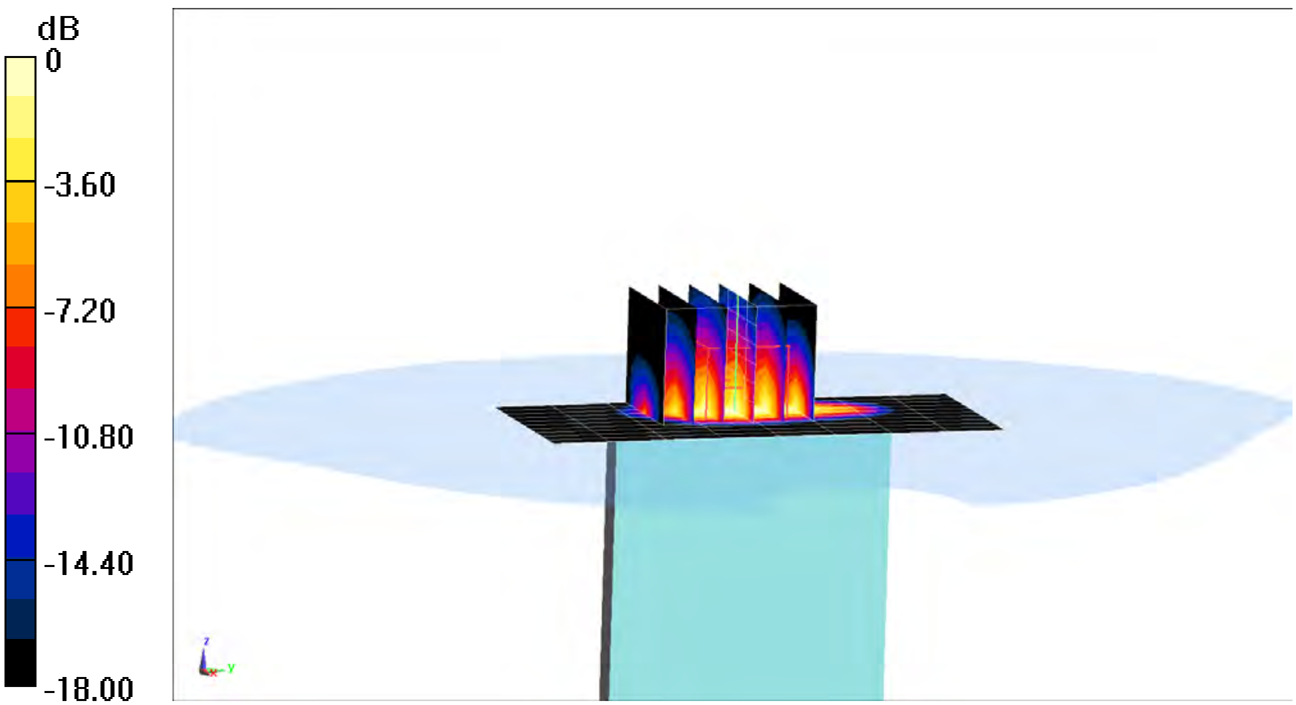
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.541 S/m; ε_r = 51.136; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1880 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 1900, Phablet SAR, Bottom Edge, Mid.ch

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.90 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 6.20 W/kg
SAR(10 g) = 1.34 W/kg



0 dB = 4.11 W/kg = 6.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1370M

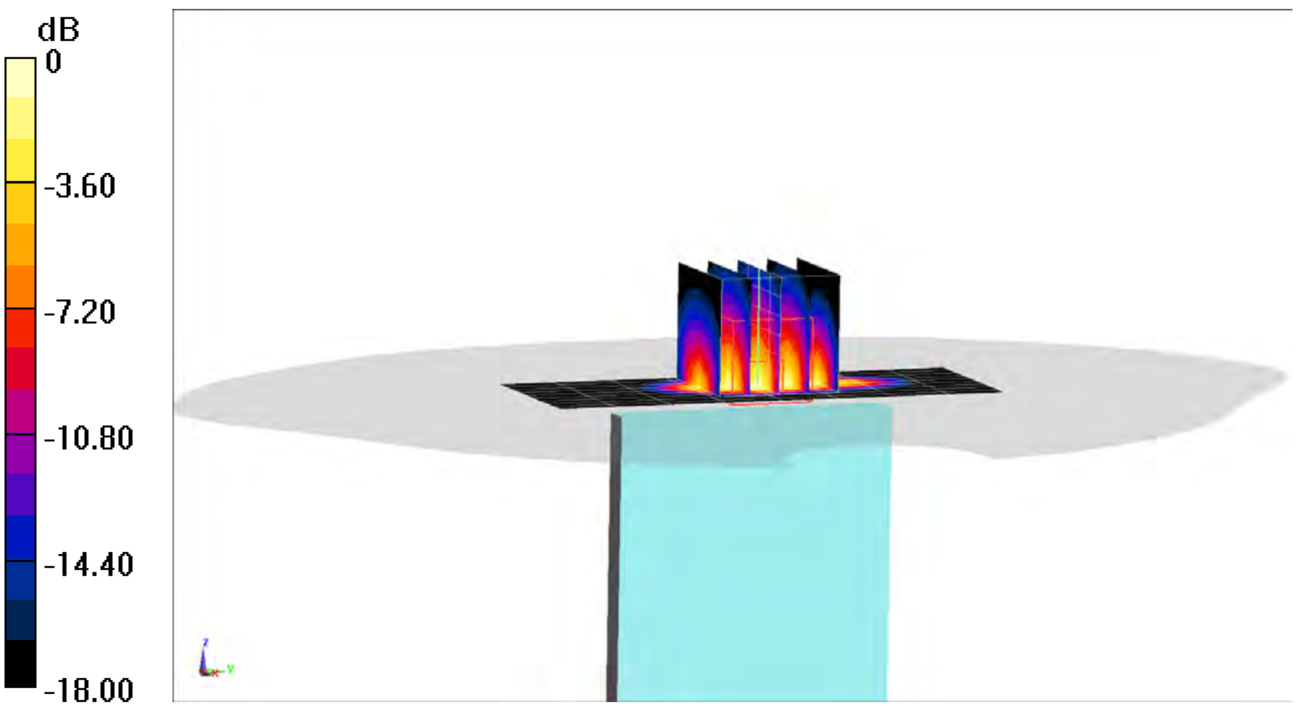
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.514 S/m; ε_r = 51.631; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17) @ 1732.5 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 4, Phablet SAR, Bottom Edge, Mid.ch,
20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.87 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 14.5 W/kg
SAR(10 g) = 3.05 W/kg



0 dB = 9.83 W/kg = 9.93 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1371M

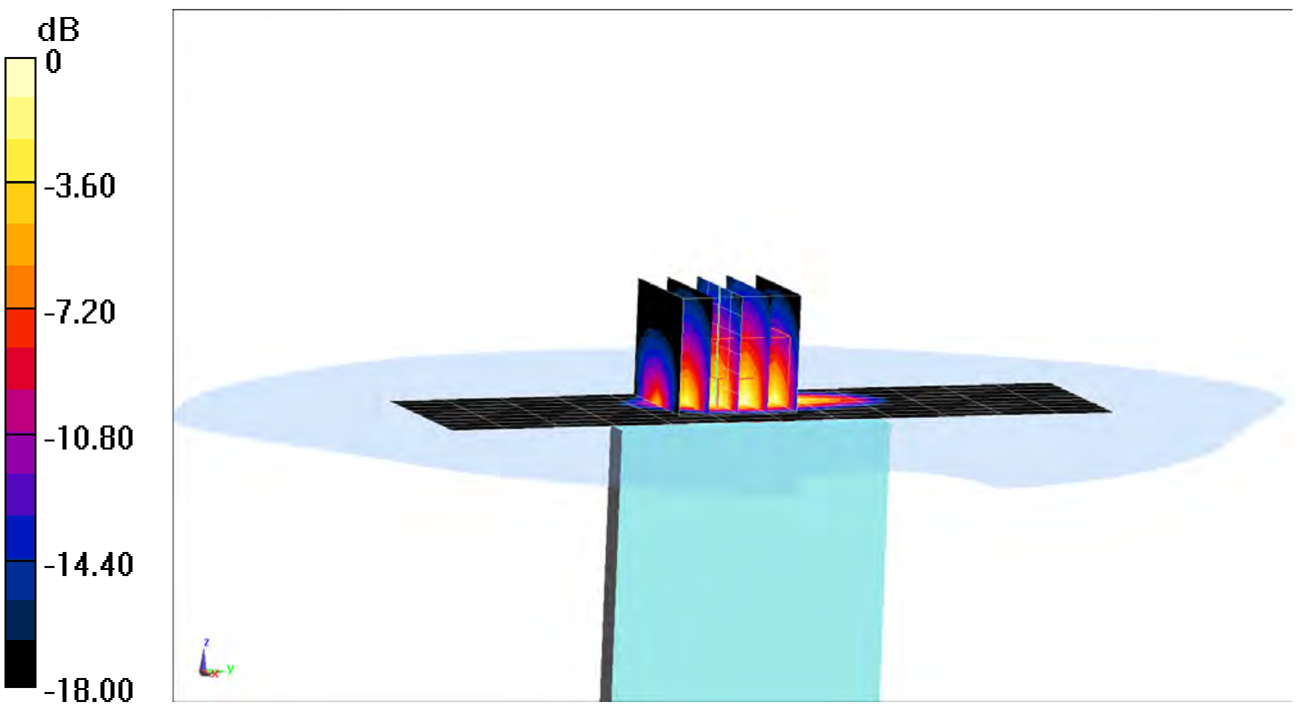
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.52 S/m; ε_r = 51.209; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1860 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 25, Phablet SAR, Bottom Edge, Low.ch,
20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 67.56 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 11.6 W/kg
SAR(10 g) = 2.68 W/kg



0 dB = 7.90 W/kg = 8.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1341M

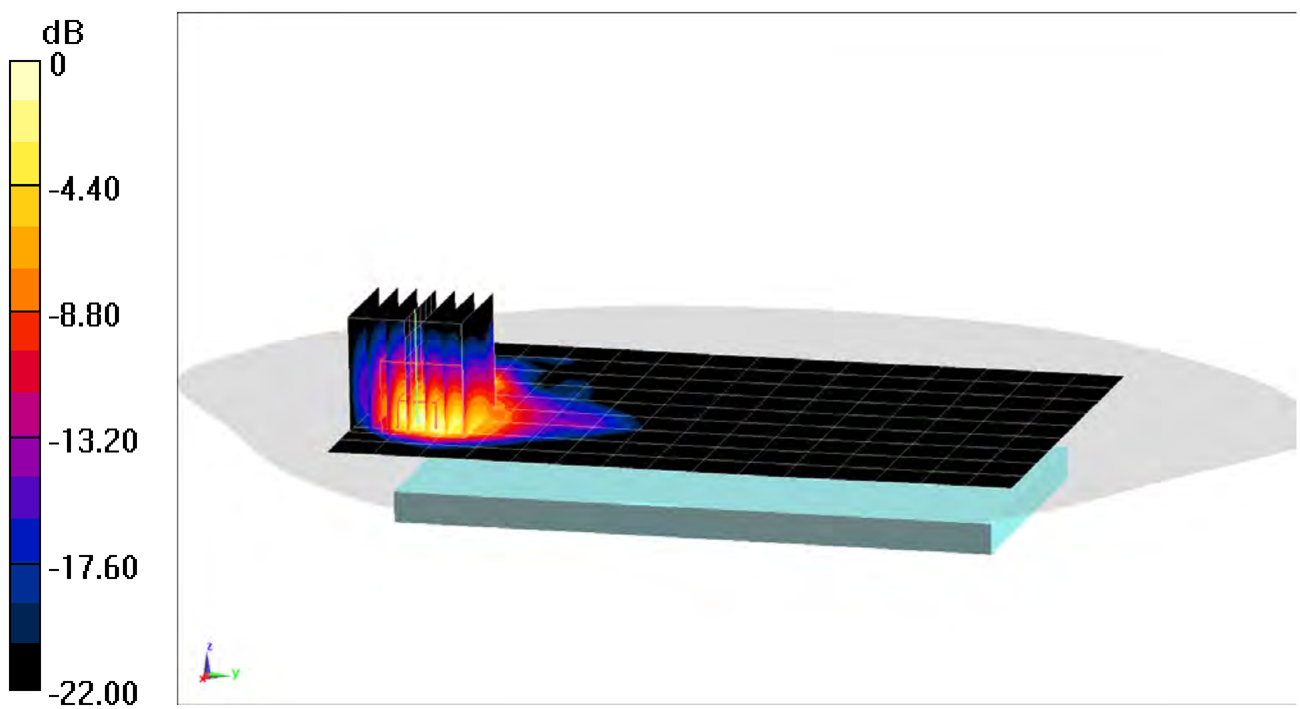
Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.58
Medium: 2450 Body Medium parameters used (interpolated):
f = 2506 MHz; σ = 2.104 S/m; ε_r = 51.382; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 12-26-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2506 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 41, Phablet SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 1 RB, 99 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 = 42.47 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 9.42 W/kg
SAR(10 g) = 1.23 W/kg



0 dB = 4.85 W/kg = 6.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

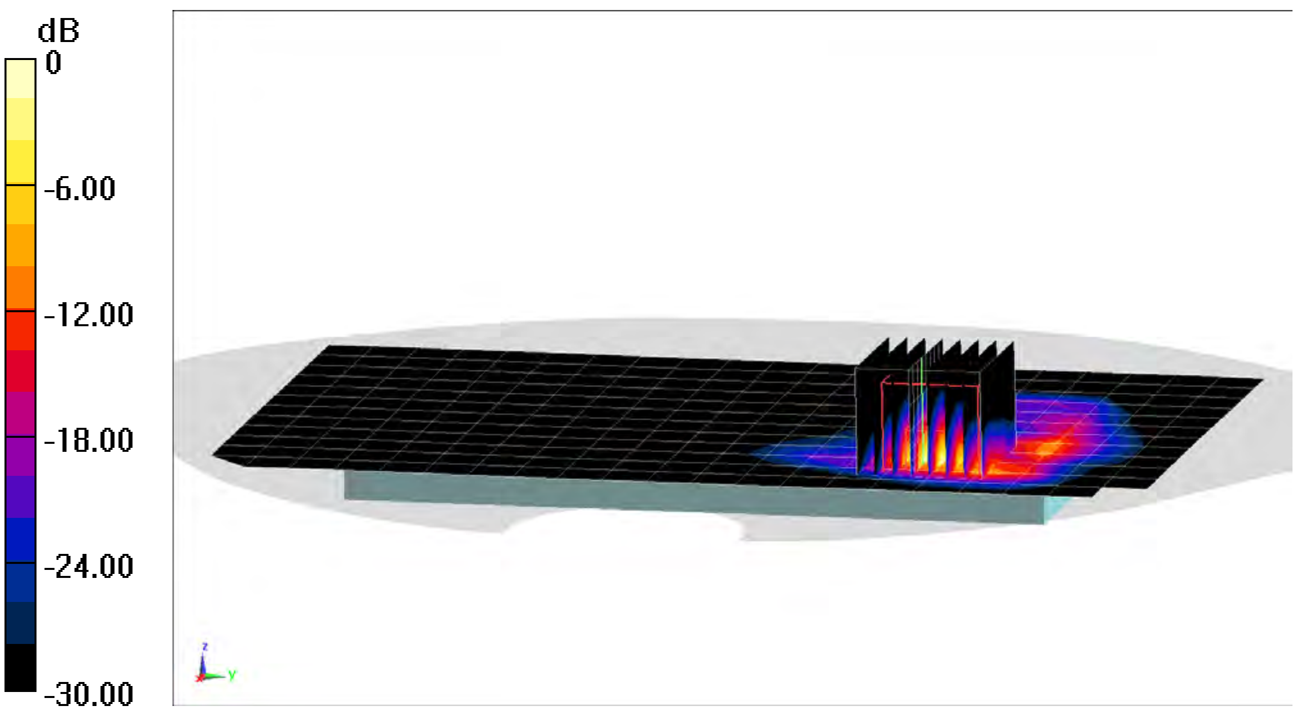
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5280 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5280 MHz; σ = 5.466 S/m; ε_r = 47.832; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 12-26-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(4.48, 4.48, 4.48) @ 5280 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11n MIMO, U-NII-2A, 20 MHz Bandwidth, Phablet SAR, Ch 56, 13 Mbps, Back Side

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 57.18 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 164 W/kg
SAR(10 g) = 2.88 W/kg



0 dB = 66.7 W/kg = 18.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

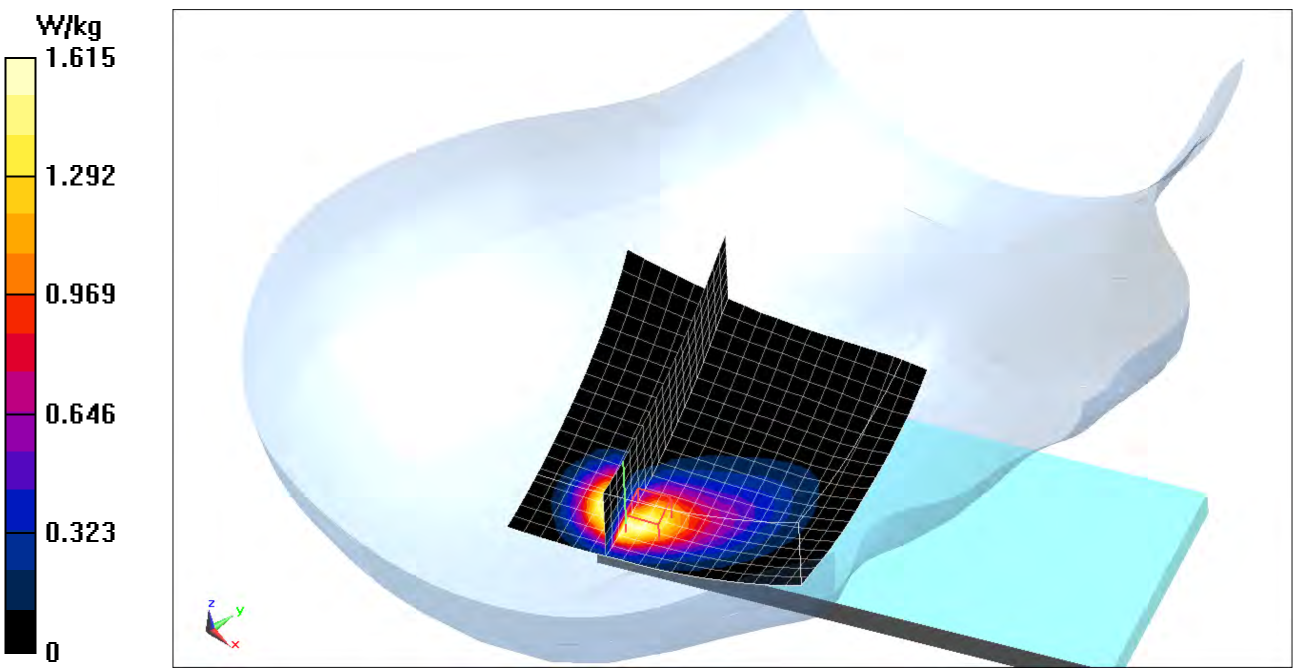
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.862 S/m; ε_r = 40.48; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-09-2019; Ambient Temp: 22.4°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2441 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: Bluetooth, Right Head, Cheek, Ch 39, 1Mbps

Zoom Scan (20x19x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.168 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 2.09 W/kg
SAR(1 g) = 0.974 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

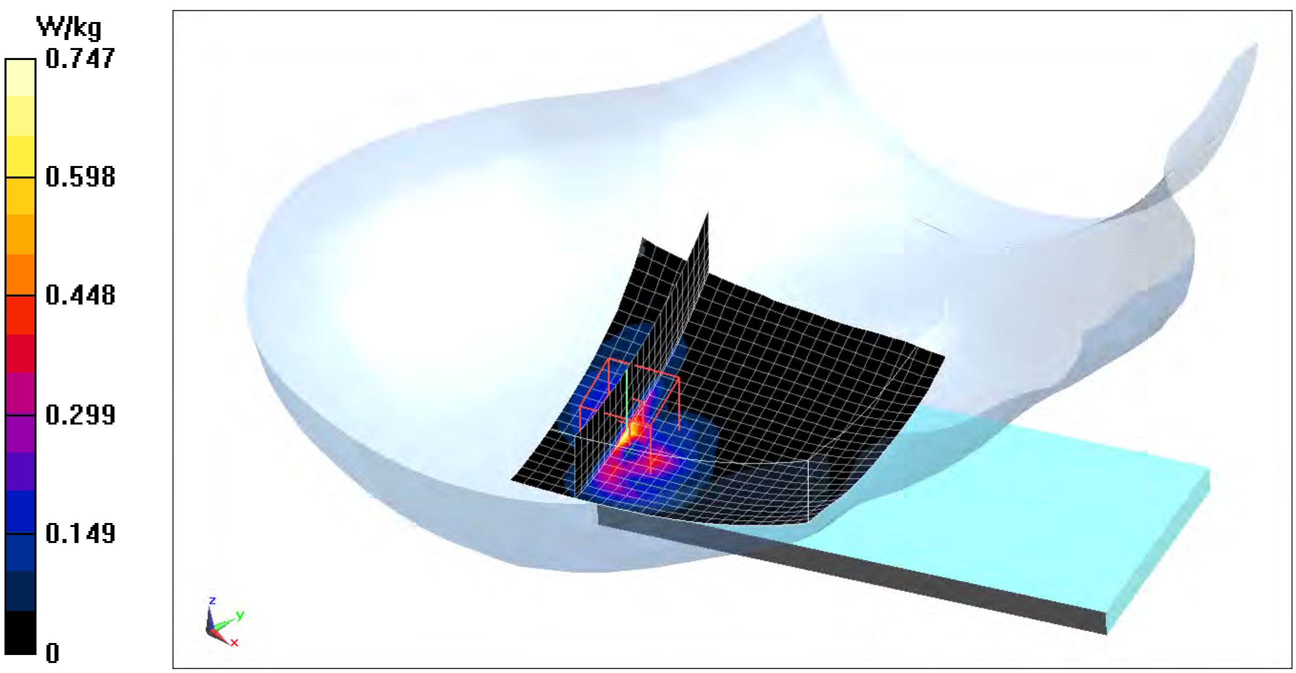
Communication System: UID 0, 802.11ac; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5775 MHz; σ = 5.107 S/m; ε_r = 34.611; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(4.82, 4.82, 4.82) @ 5775 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11ac, Antenna 1, U-NII-3, 80 MHz Bandwidth, Right Head, Cheek, Ch 155, 29.3 Mbps

Zoom Scan (25x24x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 2.579 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.251 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

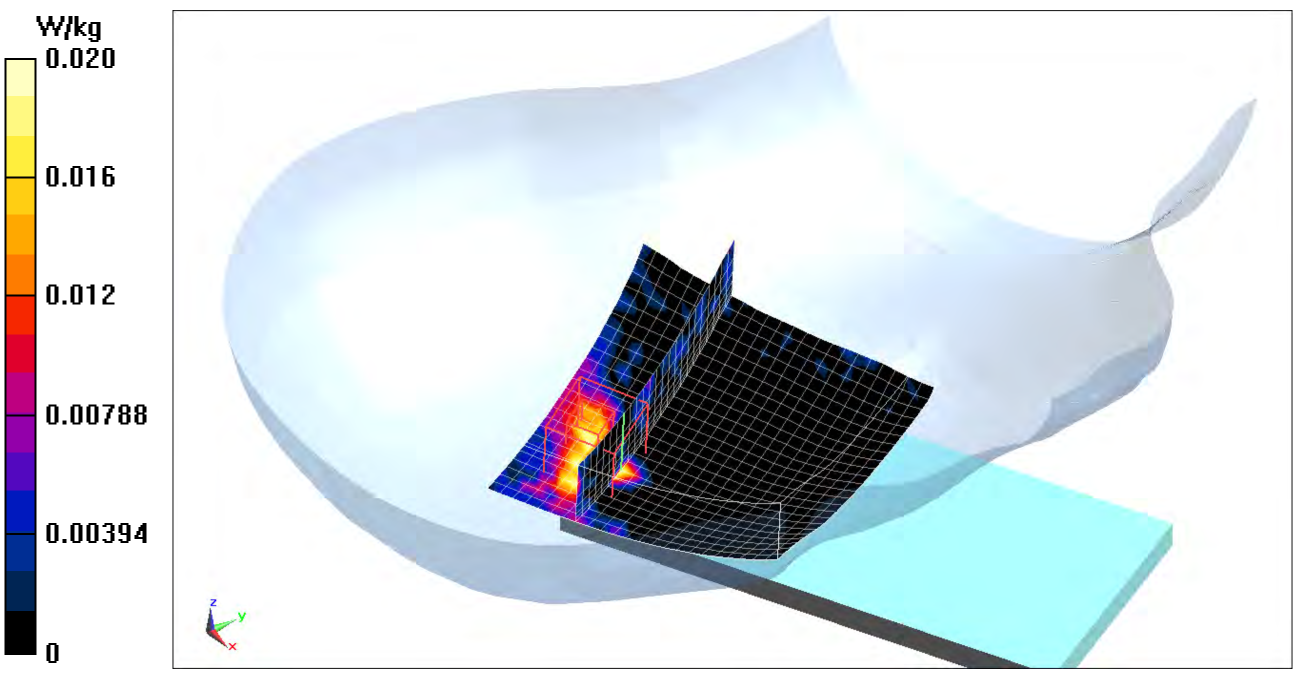
Communication System: UID 0, _IEEE 802.11ac; Frequency: 5610 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5610 MHz; σ = 4.932 S/m; ε_r = 34.854; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(4.77, 4.77, 4.77) @ 5610 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11ac, Antenna 2, U-NII-2C, 80 MHz Bandwidth, Right Head, Cheek, Ch 122, 29.3 Mbps

Zoom Scan (25x24x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0.5080 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0980 W/kg
SAR(1 g) = 0.0026 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

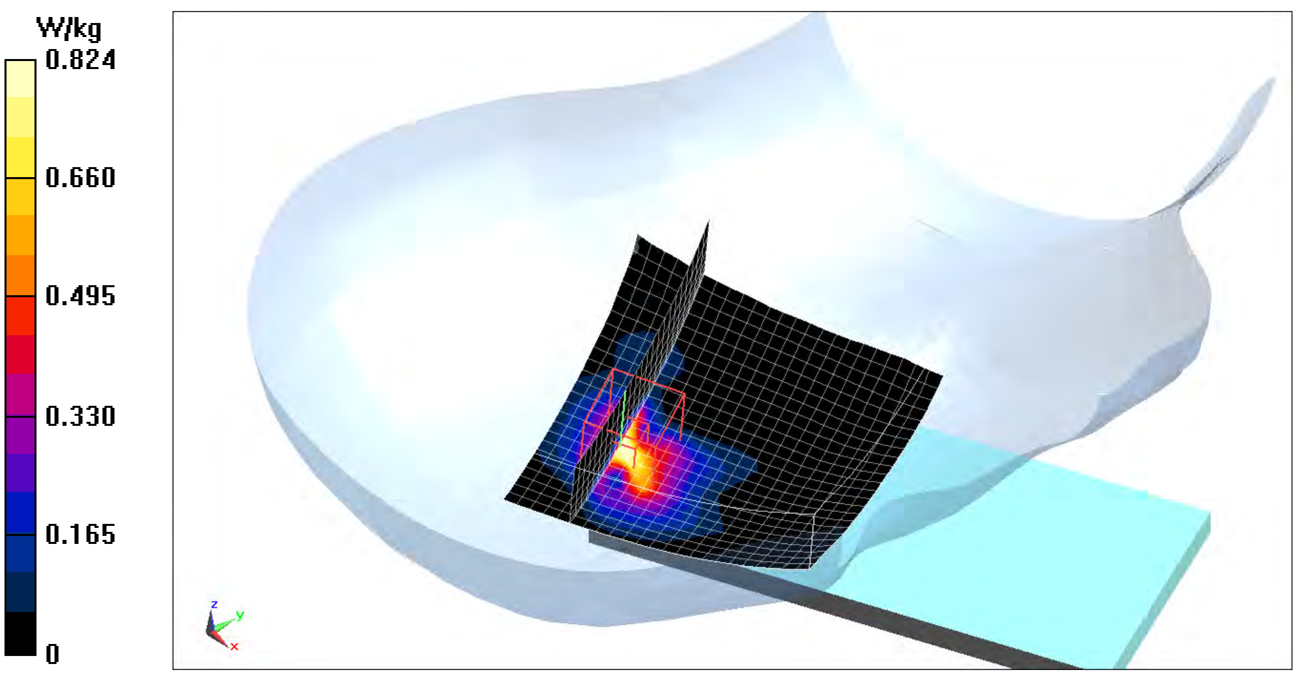
Communication System: UID 0, 802.11n; Frequency: 5270 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5270 MHz; σ = 4.588 S/m; ε_r = 35.267; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5270 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11n, MIMO, U-NII-2A, 40 MHz Bandwidth, Right Head, Cheek, Ch 54, 27 Mbps

Zoom Scan (25x24x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.526 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.328 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

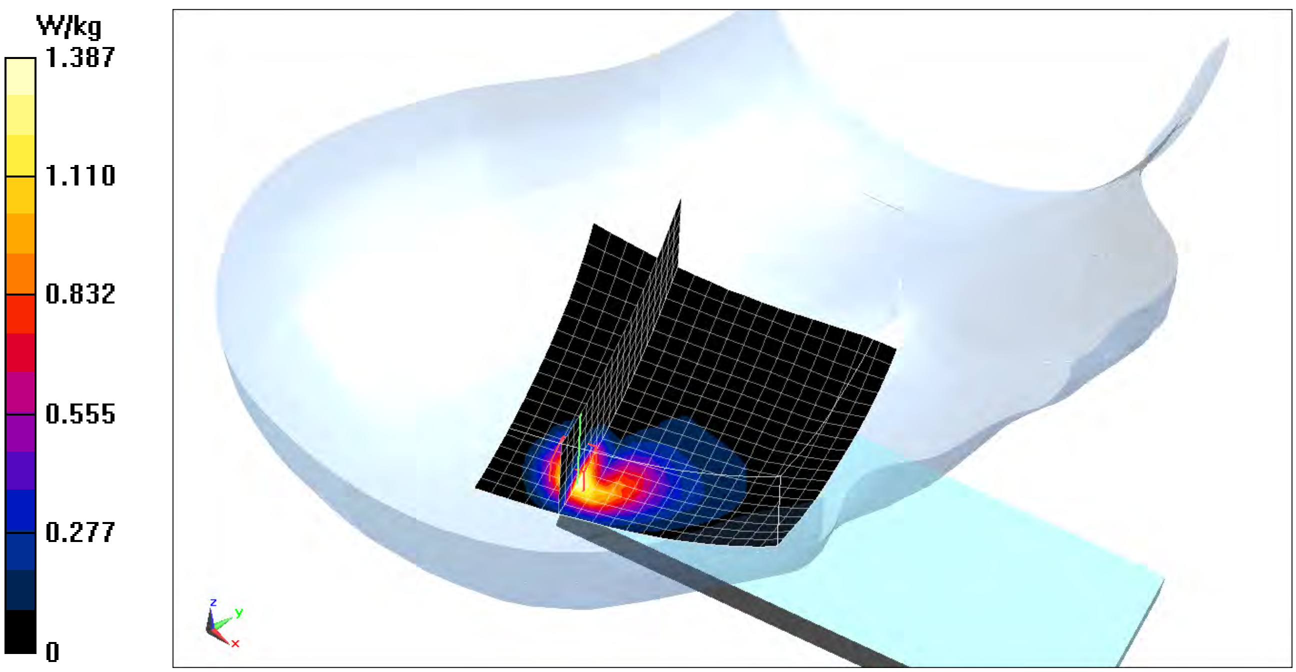
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.862 S/m; ε_r = 40.48; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-09-2019; Ambient Temp: 22.4°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2441 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: Bluetooth, Right Head, Tilt, Ch 39, 1 Mbps

Zoom Scan (20x19x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.712 V/m; Power Drift = 0.21 dB
Peak SAR (extrapolated) = 1.93 W/kg
SAR(1 g) = 0.742 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

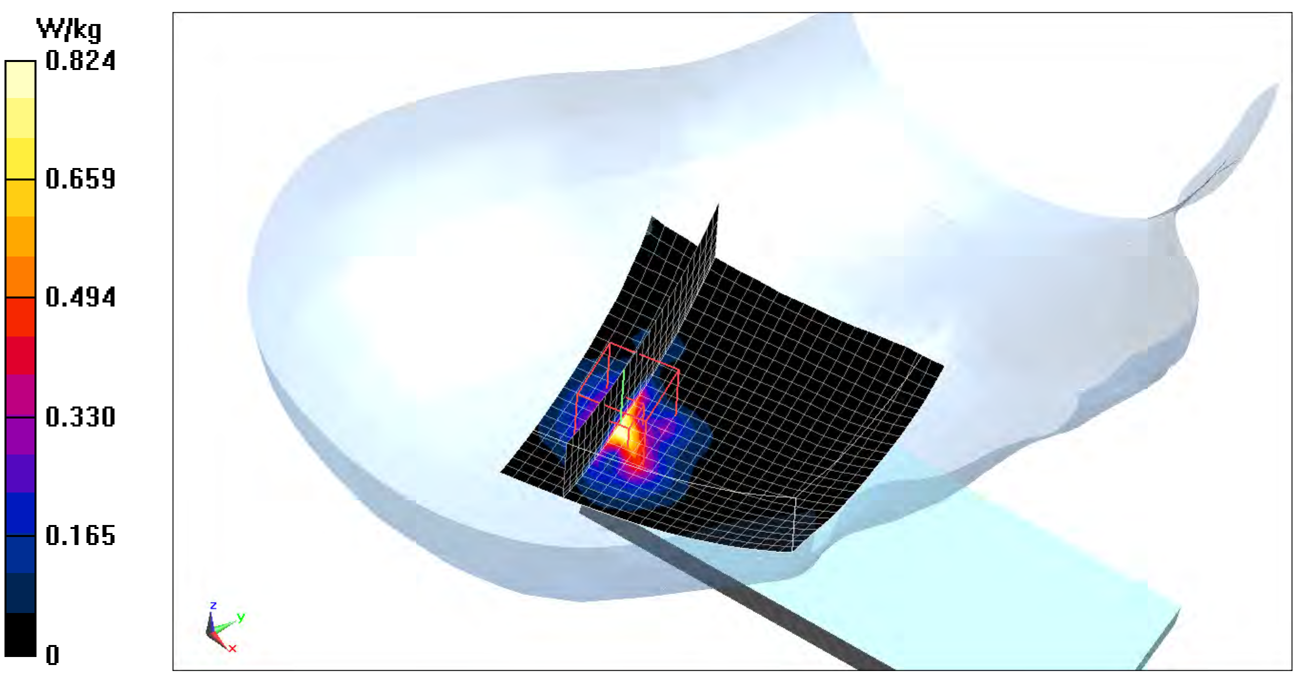
Communication System: UID 0, 802.11n; Frequency: 5270 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5270 MHz; σ = 4.588 S/m; ε_r = 35.267; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5270 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11n, MIMO U-NII-2A, 40 MHz Bandwidth, Right Head, Tilt, Ch 54, 27 Mbps

Zoom Scan (25x24x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.591 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.319 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1689M

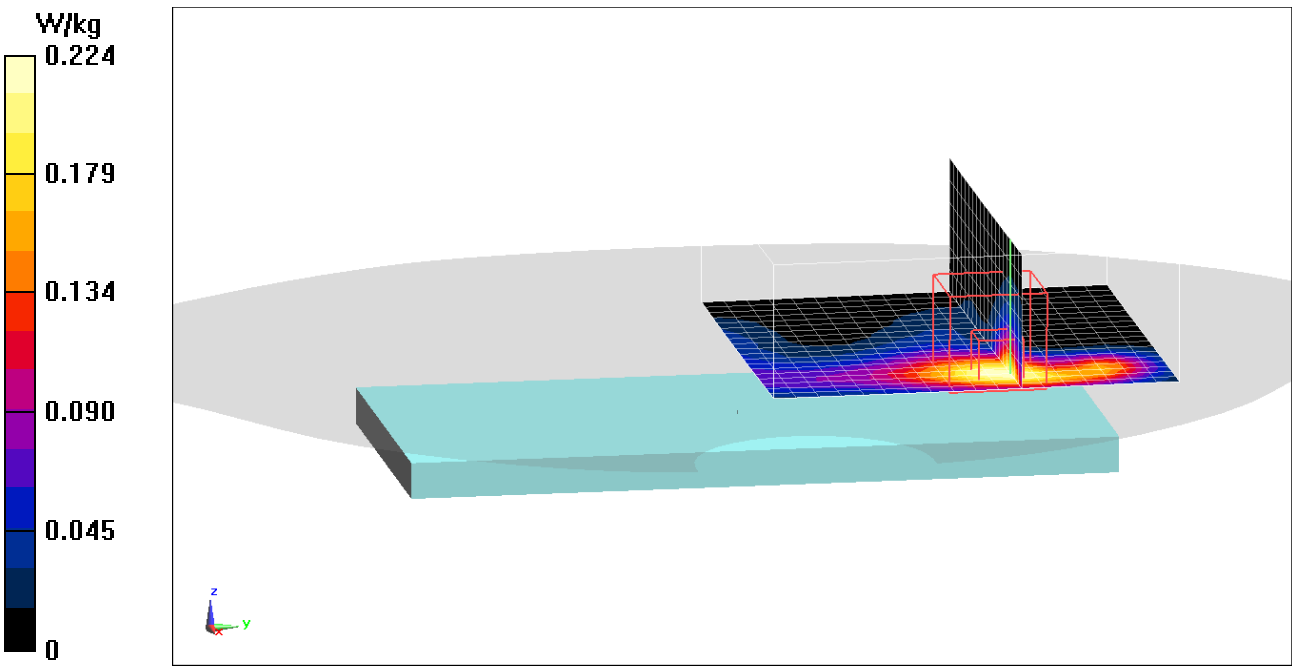
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.025 S/m; ε_r = 52.29; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2019; Ambient Temp: 23.4°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7406; ConvF(7.3, 7.3, 7.3) @ 2441 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V5.0 Back Right; Type: QD 000 P40 CD; Serial: 1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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

Zoom Scan (20x19x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.112 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.149 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

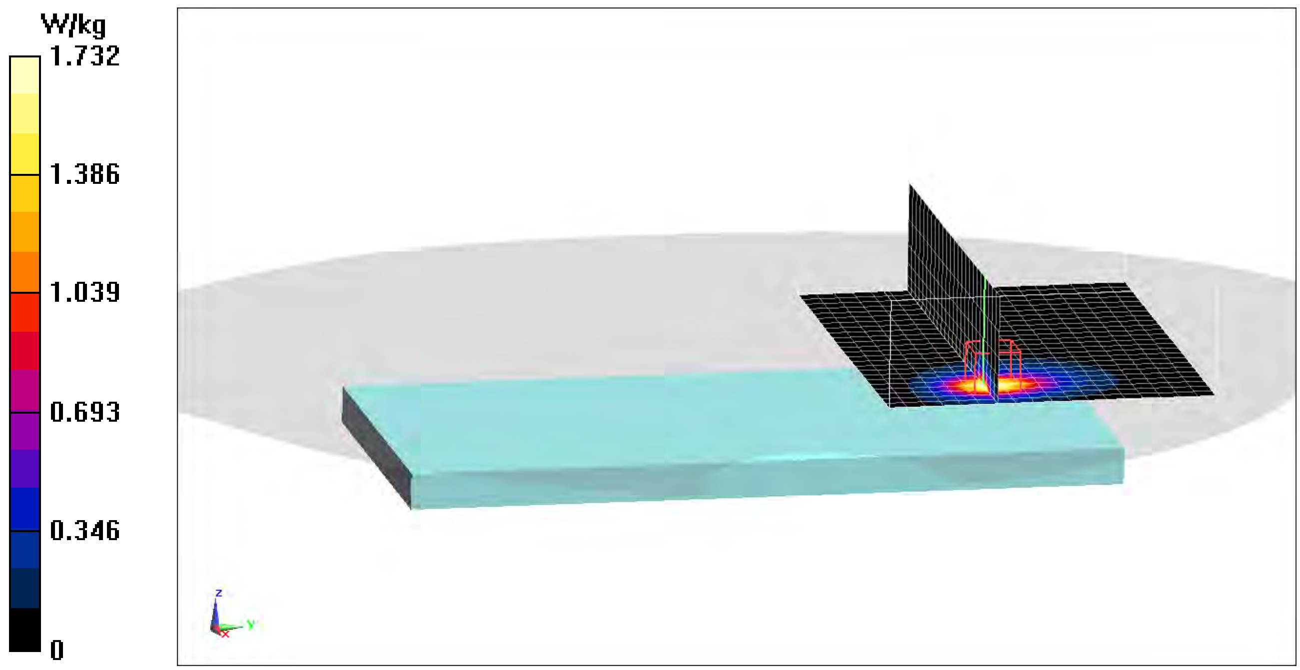
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; $\sigma = 6.215$ S/m; $\varepsilon_r = 47.091$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2019; Ambient Temp: 21.3°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5785 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

**Mode: IEEE 802.11a, Antenna 2, UNII-3, 20 MHz Bandwidth,
Body SAR, Ch 157, 6 Mbps, Back Side**

Zoom Scan (25x19x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0.6350 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 4.52 W/kg
SAR(1 g) = 0.658 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset; Serial: 1690M

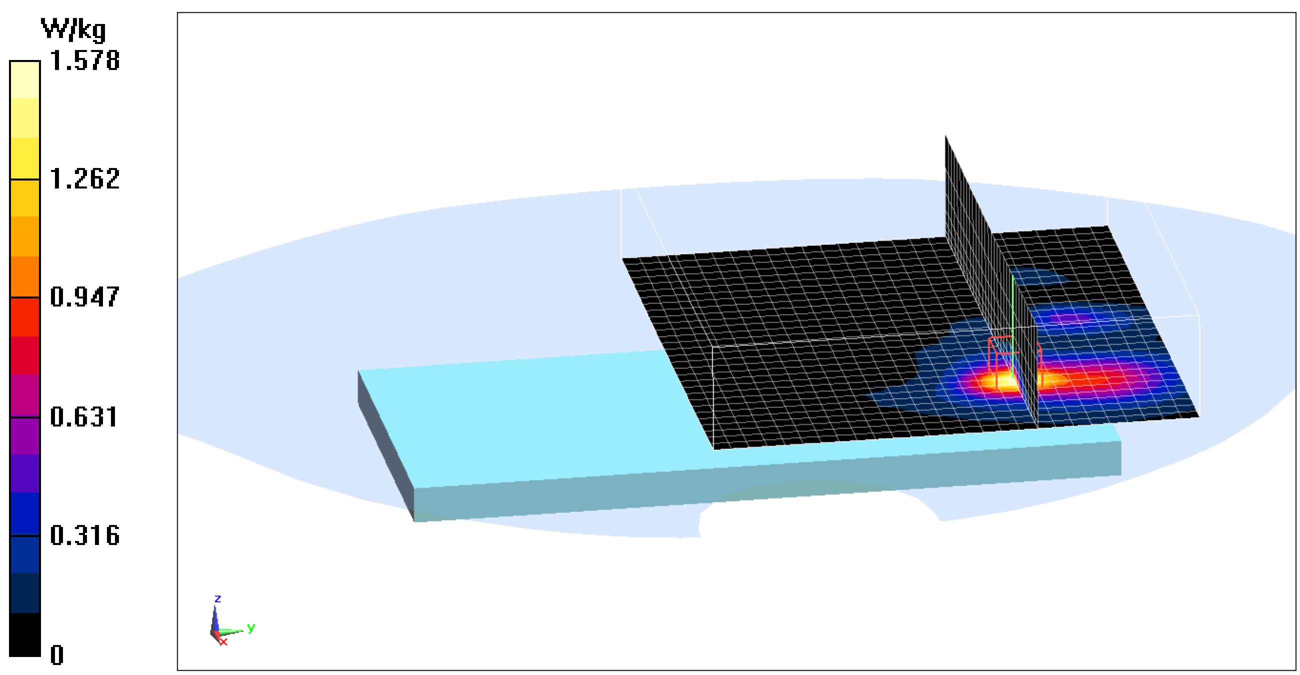
Communication System: UID 0, 802.11n; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5825 MHz; σ = 6.184 S/m; ε_r = 46.671; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-08-2019; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7357; ConvF(4.21, 4.21, 4.21) @ 5825 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

**Mode: IEEE 802.11n, UNII-3, 20 MHz Bandwidth,
Body SAR, Ch 165, 13.5 Mbps, Back Side**

Zoom Scan (31x28x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0.3600 V/m; Power Drift = 0.21 dB
Peak SAR (extrapolated) = 5.10 W/kg
SAR(1 g) = 0.637 W/kg



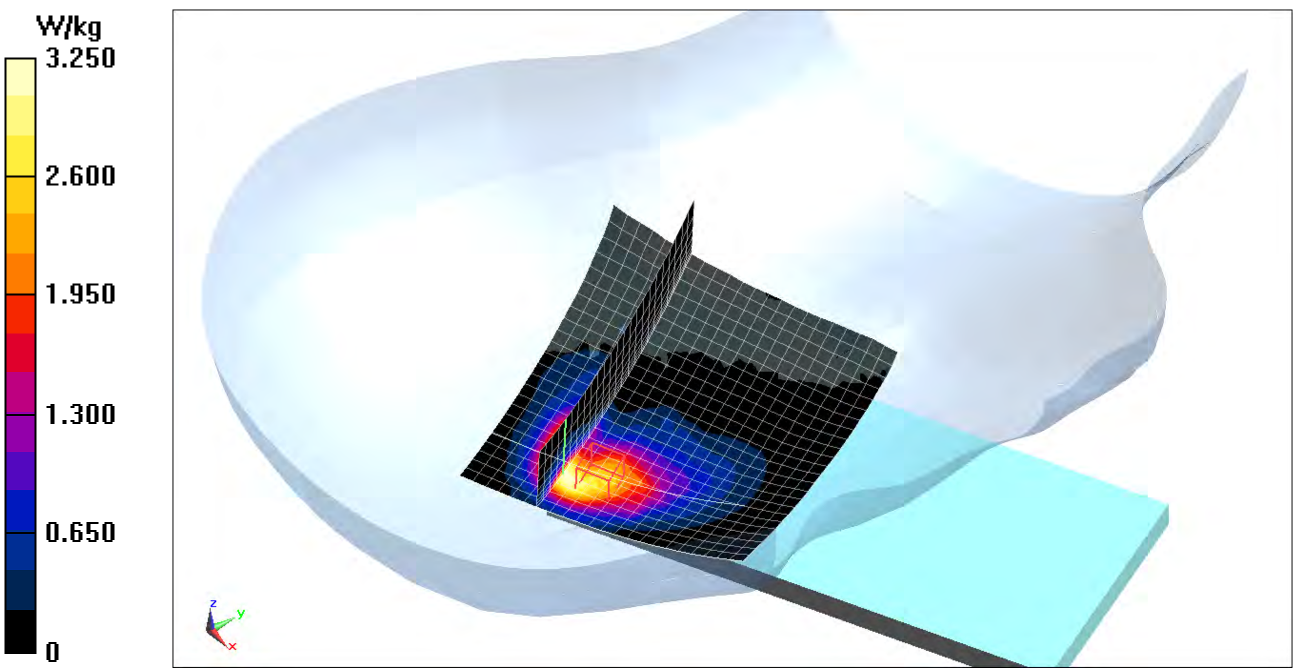
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Right Head, Cheek, Ch 39, 1Mbps, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.862 S/m; ε_r = 40.48; ρ = 1000 kg/m^3
Phantom section: Right Section

Mode: IEEE 802.11ac, Antenna 1, U-NII-3, 80 MHz Bandwidth, Right Head, Cheek, Ch 155, 29.3 Mbps, Scaling Factor: 1.066
Communication System: UID 0, 802.11ac; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5775 MHz; σ = 5.107 S/m; ε_r = 34.611; ρ = 1000 kg/m^3
Phantom section: Right Section

Multi Band Result:
SAR(1 g) = 1.35 W/kg



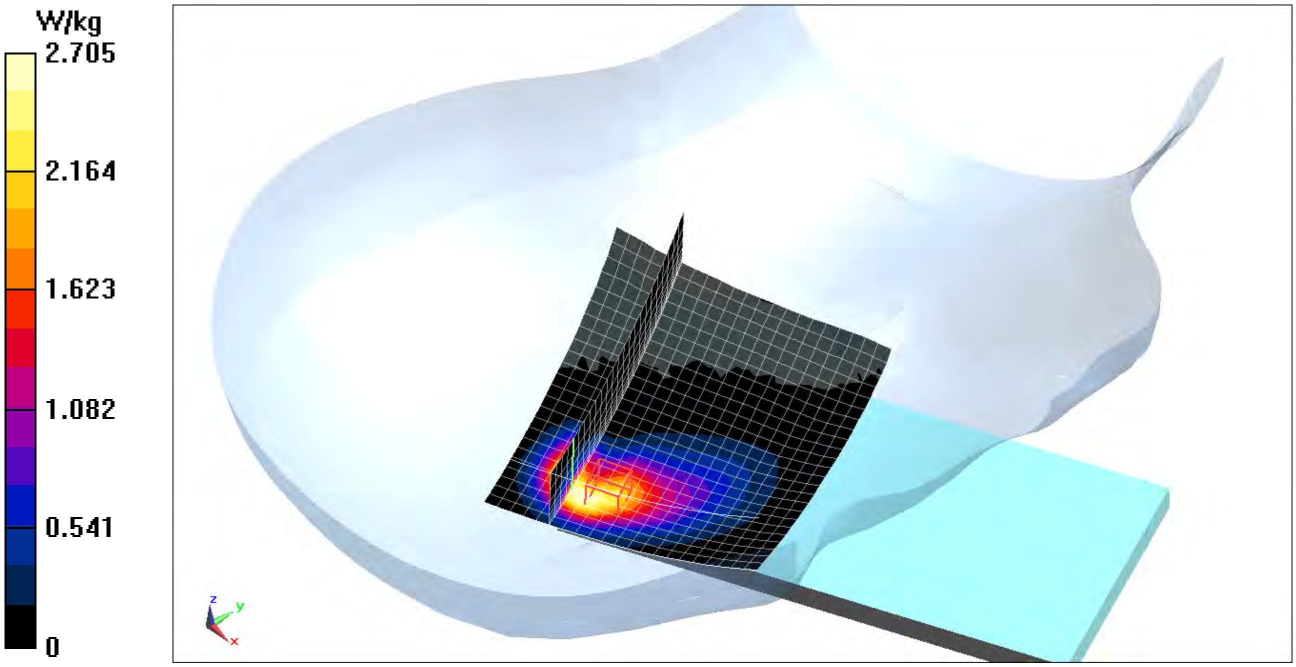
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Right Head, Cheek, Ch 39, 1Mbps, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.862 S/m; ε_r = 40.48; ρ = 1000 kg/m^3
Phantom section: Right Section

Mode: IEEE 802.11ac, Antenna 2, U-NII-2C, 80 MHz Bandwidth, Right Head, Cheek, Ch 122, 29.3 Mbps, Scaling Factor: 1.060
Communication System: UID 0, _IEEE 802.11ac; Frequency: 5610 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5610 MHz; σ = 4.932 S/m; ε_r = 34.854; ρ = 1000 kg/m^3
Phantom section: Right Section

Multi Band Result:
SAR(1 g) = 1.28 W/kg



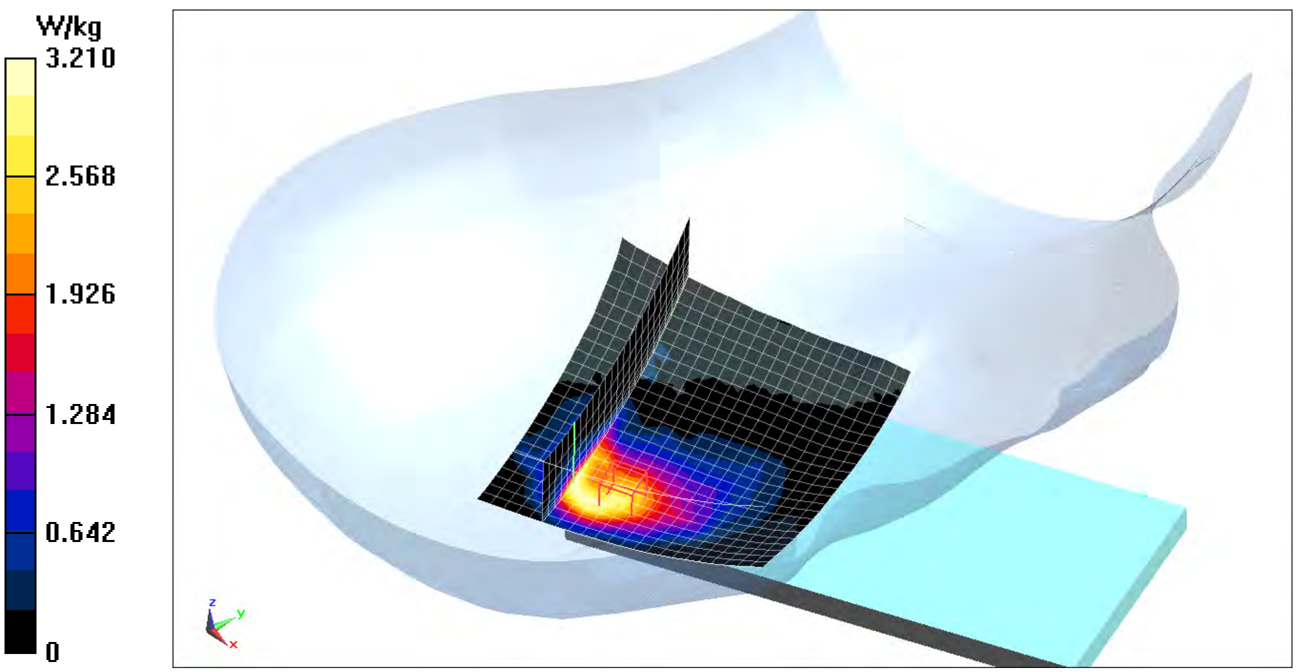
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Right Head, Cheek, Ch 39, 1Mbps, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.862 S/m; ε_r = 40.48; ρ = 1000 kg/m^3
Phantom section: Right Section

Mode: IEEE 802.11n, MIMO, U-NII-2A, 40 MHz Bandwidth, Right Head, Cheek, Ch 54, 27 Mbps, Scaling Factor: 1.115
Communication System: UID 0, 802.11n: 5270 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5270 MHz; σ = 4.588 S/m; ε_r = 35.267; ρ = 1000 kg/m^3
Phantom section: Right Section

Multi Band Result:
SAR(1 g) = 1.43 W/kg



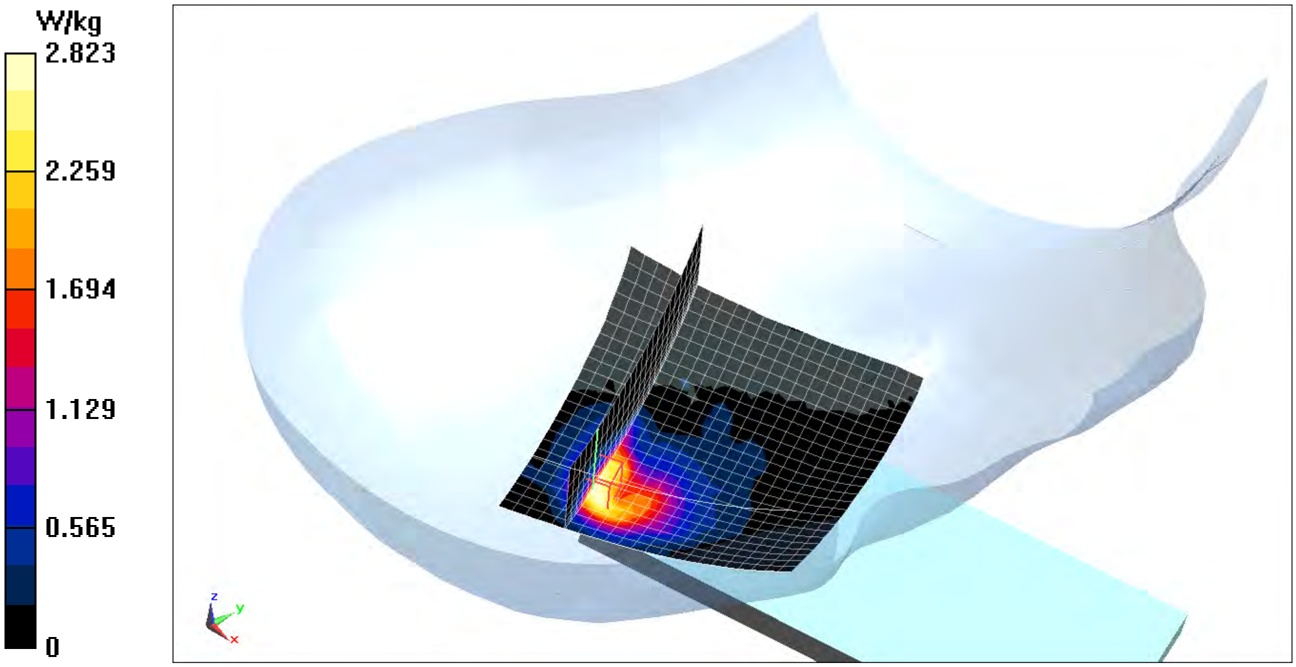
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Right Head, Tilt, Ch 39, 1 Mbps, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2441$ MHz; $\sigma = 1.862$ S/m; $\varepsilon_r = 40.48$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Mode: IEEE 802.11n, MIMO, U-NII-2A, 40 MHz Bandwidth,
Right Head, Cheek, Ch 54, 27 Mbps, Scaling Factor: 1.115
Communication System: UID 0, 802.11n; Frequency: 5270 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
$f = 5270$ MHz; $\sigma = 4.588$ S/m; $\varepsilon_r = 35.267$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Multi Band Result:
SAR(1 g) = 1.07 W/kg



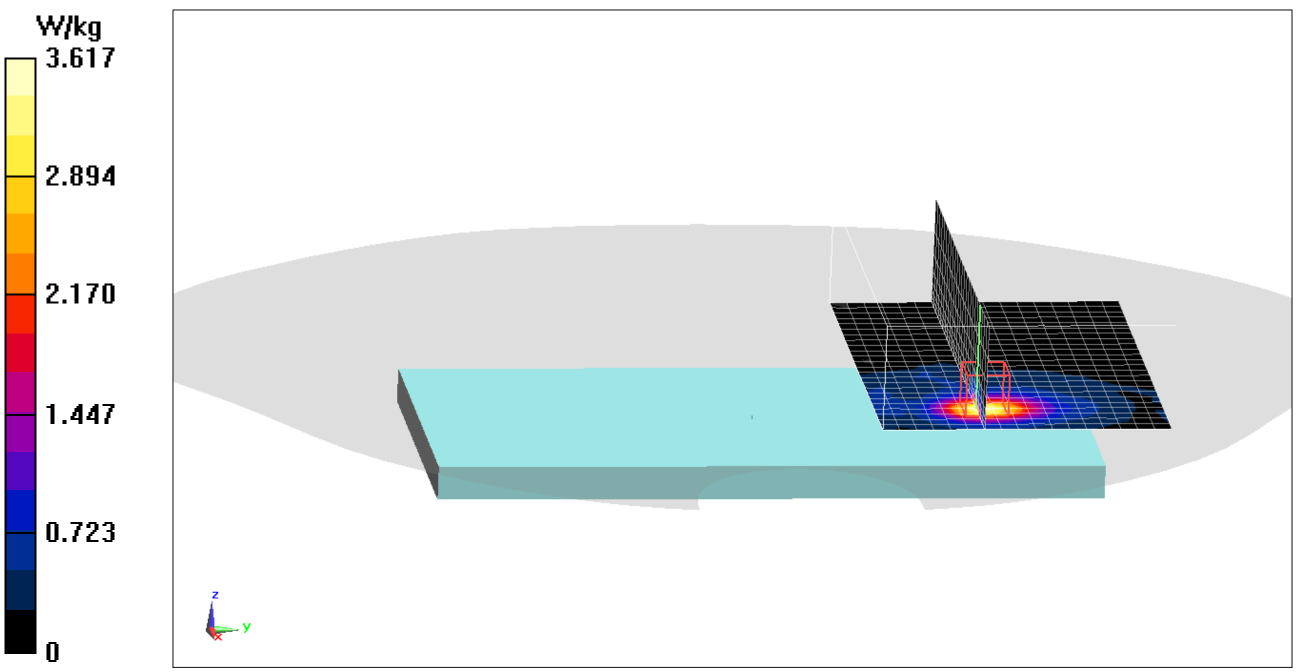
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Body SAR, Ch 39, 1 Mbps, Back Side, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.025 S/m; ε_r = 52.29; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Mode: IEEE 802.11a, Antenna 2, UNII-3, 20 MHz Bandwidth, Body SAR, Ch 157, 6 Mbps, Back Side, Scaling Factor: 1.156
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; σ = 6.215 S/m; ε_r = 47.091; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Multi Band Result:
SAR(1 g) = 0.949 W/kg



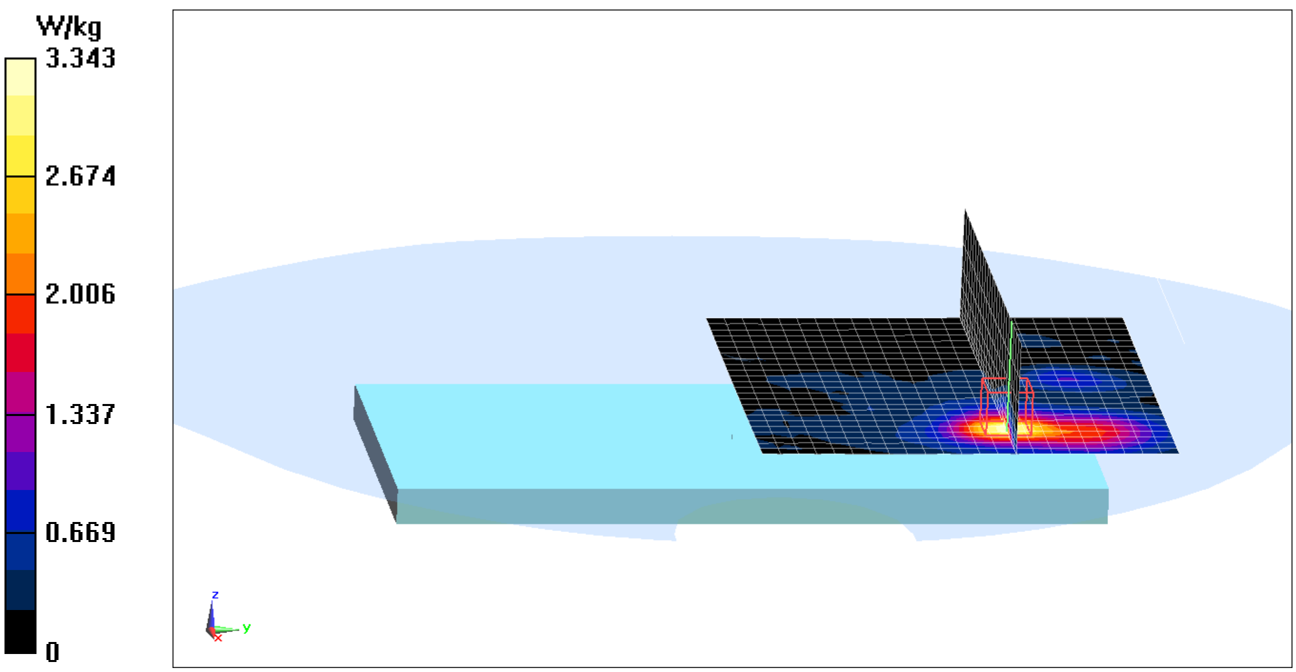
PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG9750; Type: Portable Handset

Mode: Bluetooth, Body SAR, Ch 39, 1 Mbps, Back Side, Scaling Factor: 1.336
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.025 S/m; ε_r = 52.29; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Mode: IEEE 802.11n, MIMO, UNII-3, 20 MHz Bandwidth,
Body SAR, Ch 165, 27 Mbps, Back Side, Scaling Factor: 1.176
Communication System: UID 0, 802.11n; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5825 MHz; σ = 6.184 S/m; ε_r = 46.671; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Multi Band Result:
SAR(1 g) = 0.946 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

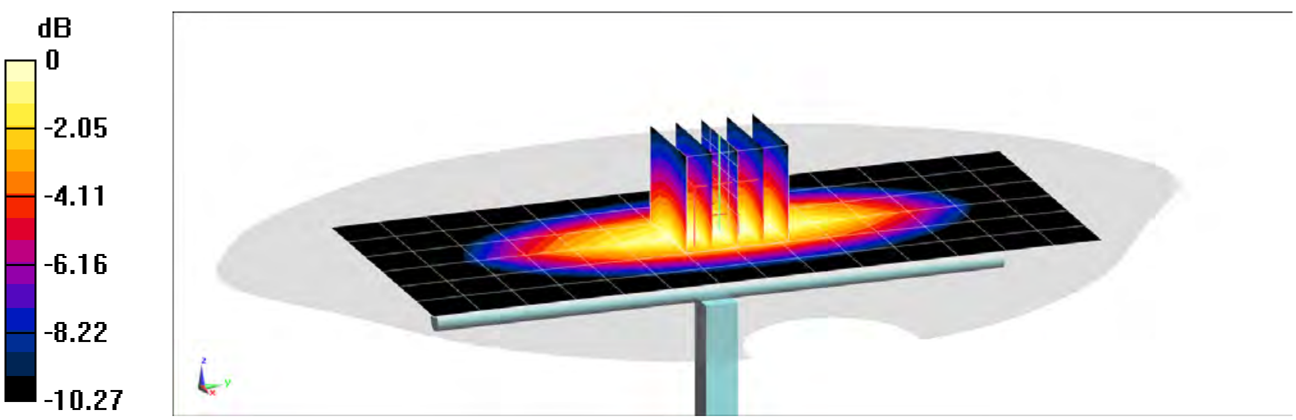
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head; Medium parameters used (interpolated):
f = 750 MHz; σ = 0.878 S/m; ε_r = 42.325; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-19-2018; Ambient Temp: 21.3°C; Tissue Temp: 19.8°C

Probe: ES3DV3 - SN3287; ConvF(6.76, 6.76, 6.76) @ 750 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 2.59 W/kg
SAR(1 g) = 1.73 W/kg
Deviation(1 g) = 3.35%



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

PCTEST ENGINEERING LABORATORY, INC.

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

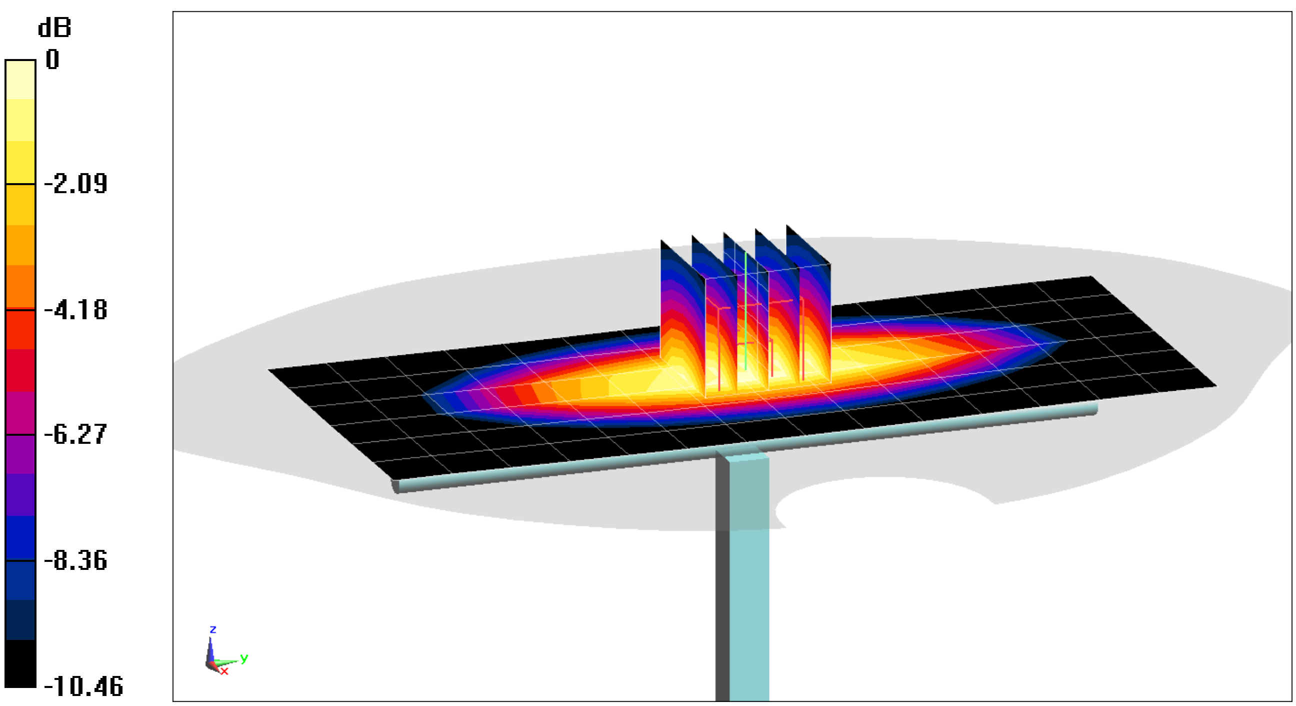
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head; Medium parameters used (interpolated):
f = 750 MHz; σ = 0.88 S/m; ε_r = 43.448; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2019; Ambient Temp: 21.7°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = -3.23%



0 dB = 2.16 W/kg = 3.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

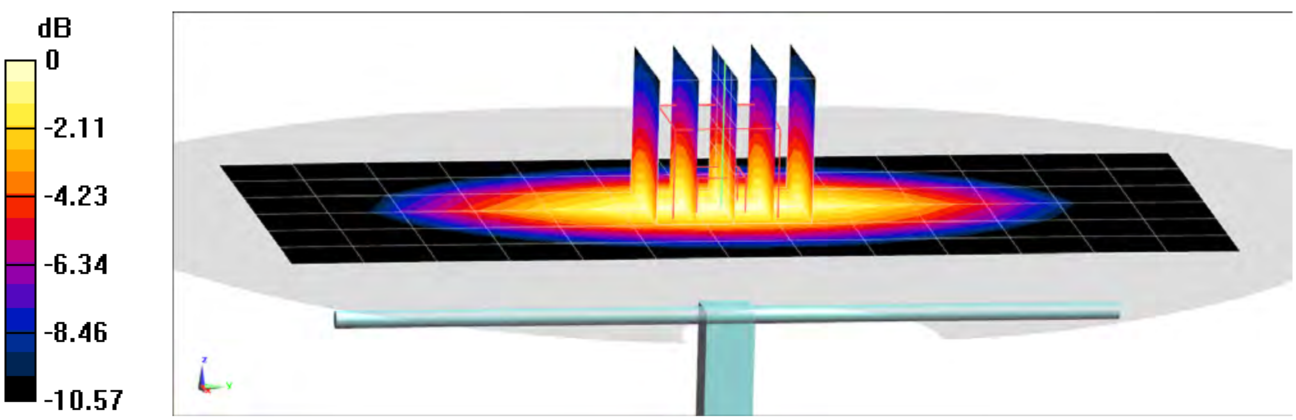
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used:
f = 835 MHz; σ = 0.89 S/m; ε_r = 40.179; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12-17-2018; Ambient Temp: 22.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(6.61, 6.61, 6.61) @ 835 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.12 (7450)

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) = 2.87 W/kg
SAR(1 g) = 1.91 W/kg
Deviation(1 g) = 2.03%



0 dB = 1.65 W/kg = 2.17 dBW/kg

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

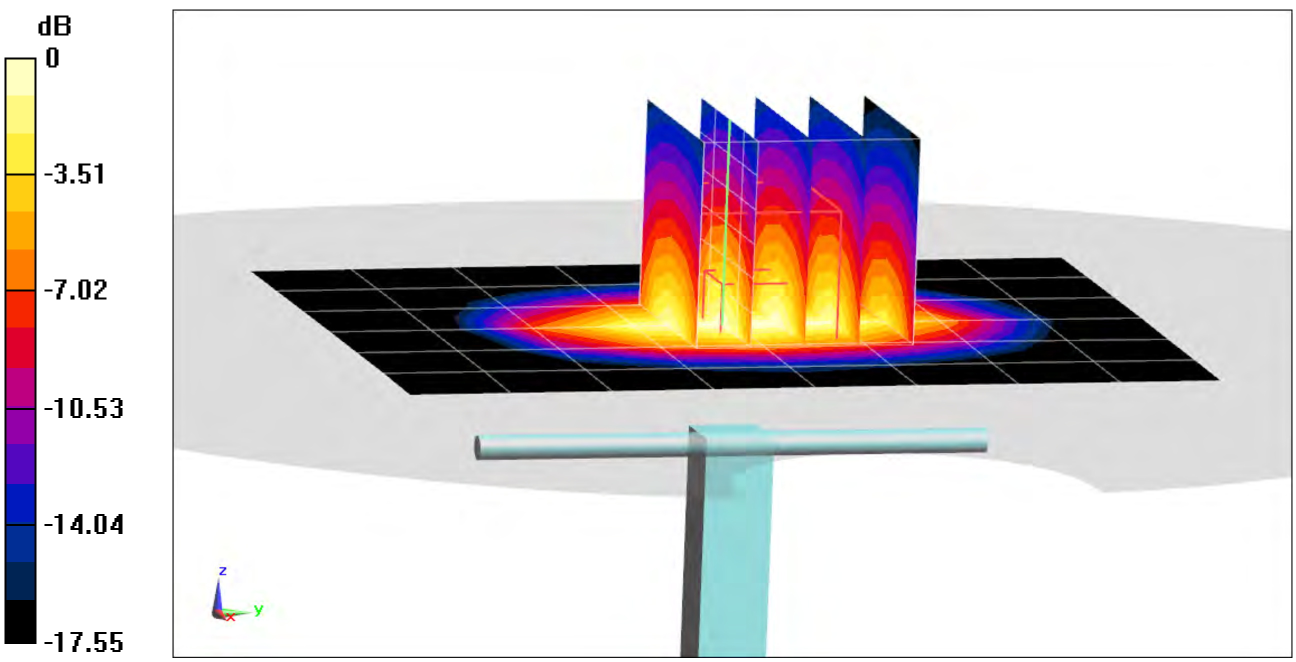
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.347 S/m; ε_r = 39.501; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 20.7°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3287; ConvF(5.48, 5.48, 5.48) @ 1750 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 6.45 W/kg
SAR(1 g) = 3.57 W/kg
Deviation(1 g) = -2.19%



0 dB = 4.50 W/kg = 6.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

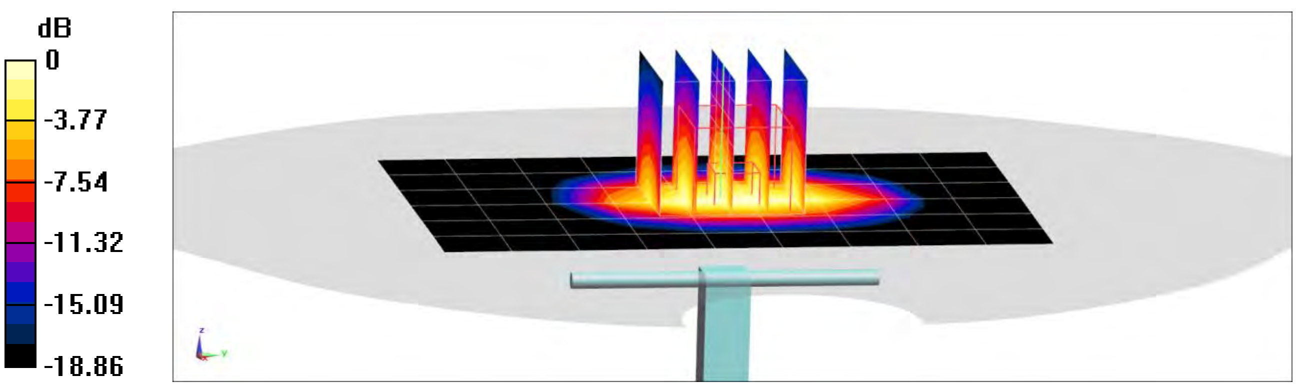
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.442 S/m; ε_r = 38.957; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-03-2018; Ambient Temp: 21.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3287; ConvF(5.24, 5.24, 5.24) @ 1900 MHz; Calibrated: 10/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/18/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1964
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.12 (7450)

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) = 7.65 W/kg
SAR(1 g) = 4.2 W/kg
Deviation(1 g) = 4.74%



0 dB = 5.21 W/kg = 7.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

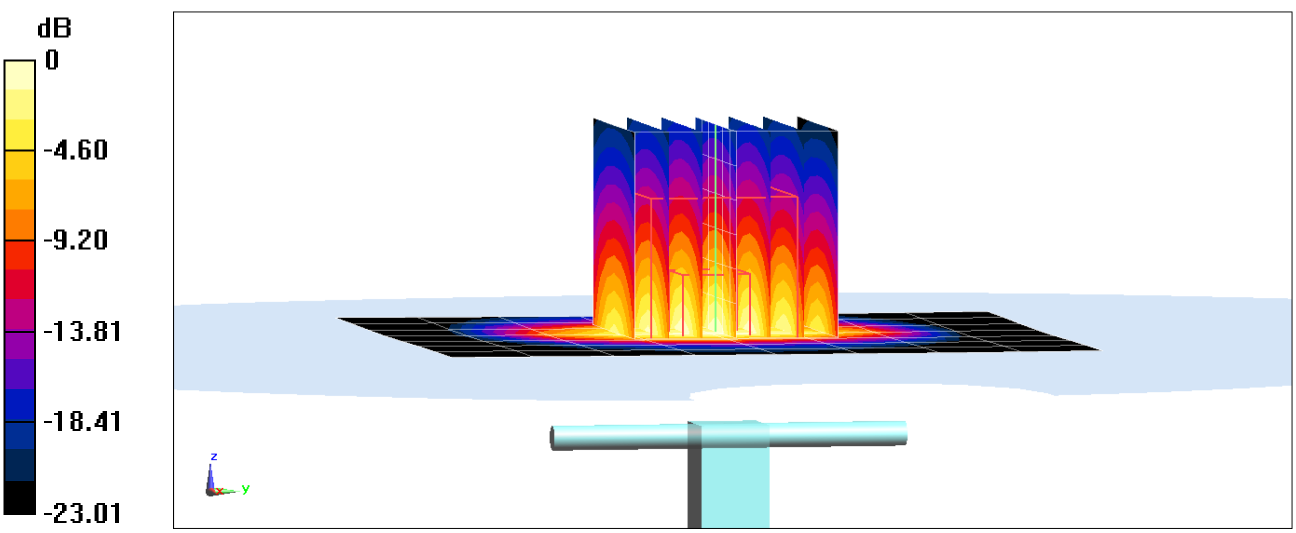
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.862 S/m; ε_r = 38.272; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2018; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2450 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 11.2 W/kg
SAR(1 g) = 5.25 W/kg
Deviation(1 g) = 0.38%



0 dB = 8.96 W/kg = 9.52 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

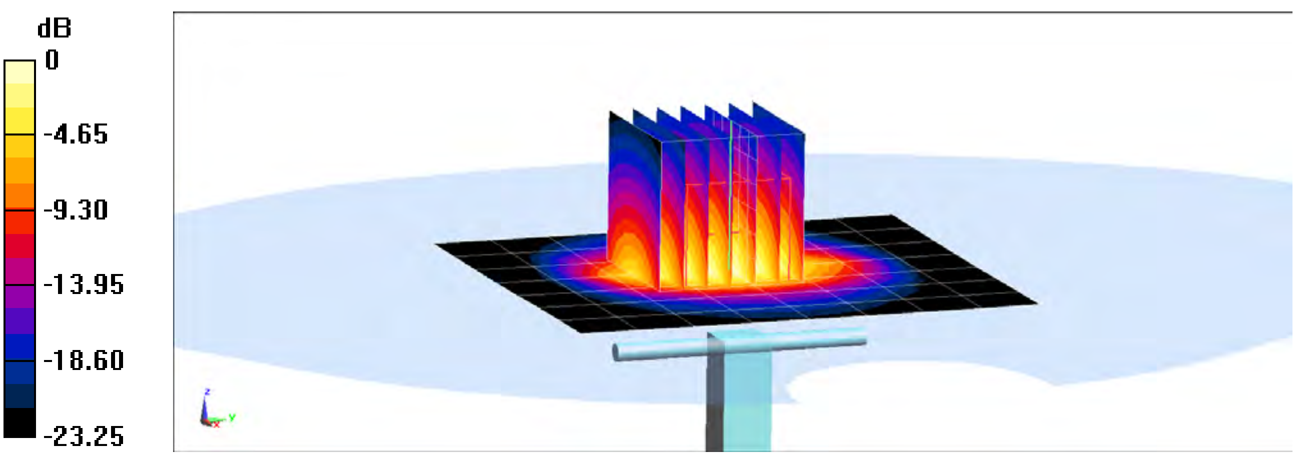
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
$f = 2450$ MHz; $\sigma = 1.869$ S/m; $\varepsilon_r = 40.474$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2019; Ambient Temp: 22.4°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7410; ConvF(7.5, 7.5, 7.5) @ 2450 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 11.4 W/kg
SAR(1 g) = 5.45 W/kg
Deviation(1 g) = 3.42%



0 dB = 9.10 W/kg = 9.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

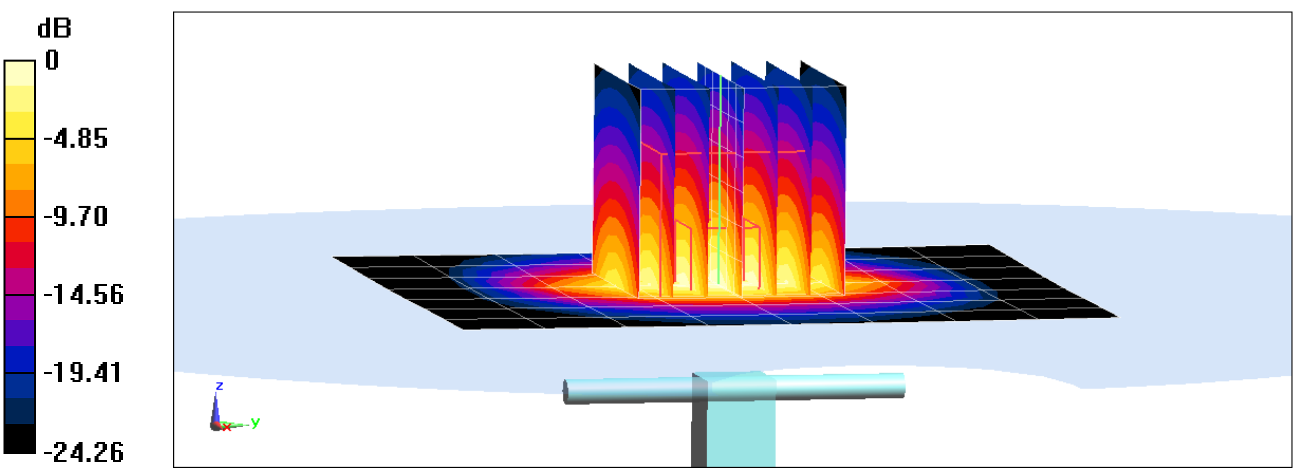
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
$f = 2600$ MHz; $\sigma = 2.021$ S/m; $\varepsilon_r = 38.303$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-03-2018; Ambient Temp: 22.0°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7410; ConvF(7.24, 7.24, 7.24) @ 2600 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2018
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 12.9 W/kg
SAR(1 g) = 5.81 W/kg
Deviation(1 g) = 3.94%



0 dB = 10.1 W/kg = 10.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

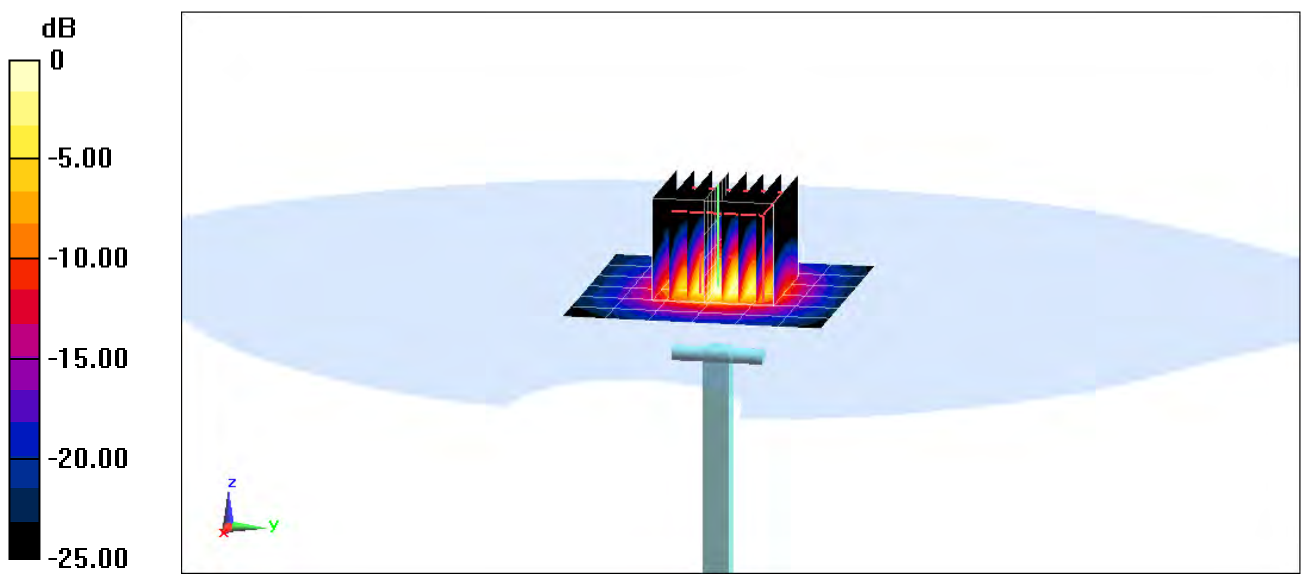
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5250 MHz; σ = 4.593 S/m; ε_r = 35.307; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 20.5°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5250 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 3.87 W/kg
Deviation(1 g) = -2.27%



0 dB = 9.09 W/kg = 9.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

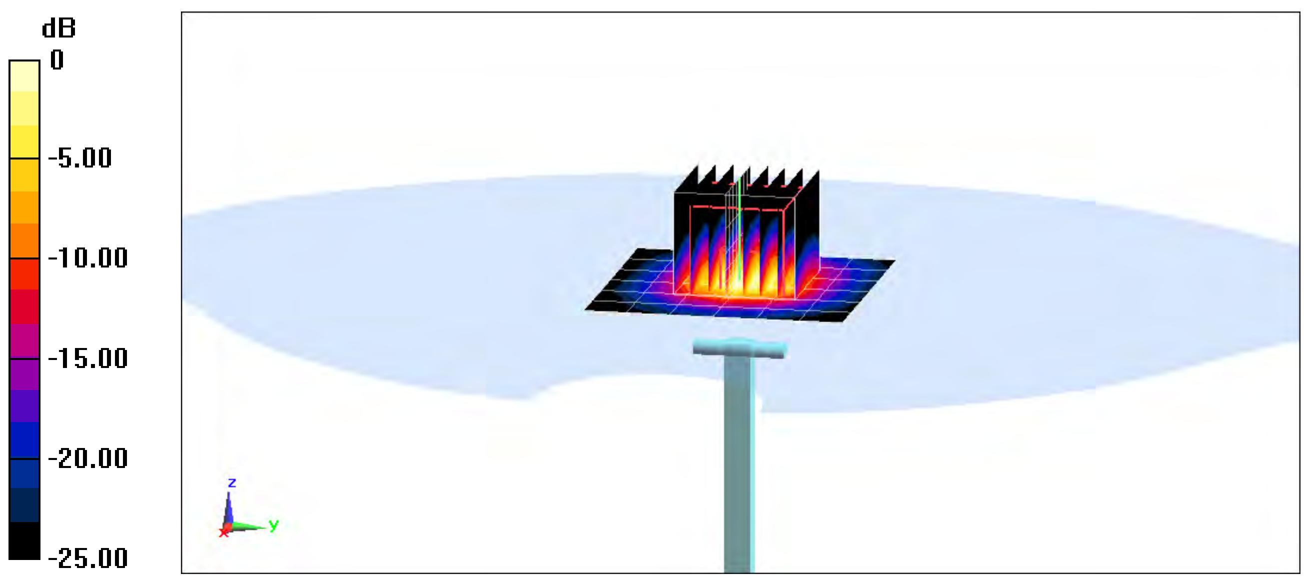
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5600 MHz; $\sigma = 4.957$ S/m; $\varepsilon_r = 34.816$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 20.5°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7409; ConvF(4.77, 4.77, 4.77) @ 5600 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 4.09 W/kg
Deviation(1 g) = -2.73%



0 dB = 9.74 W/kg = 9.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

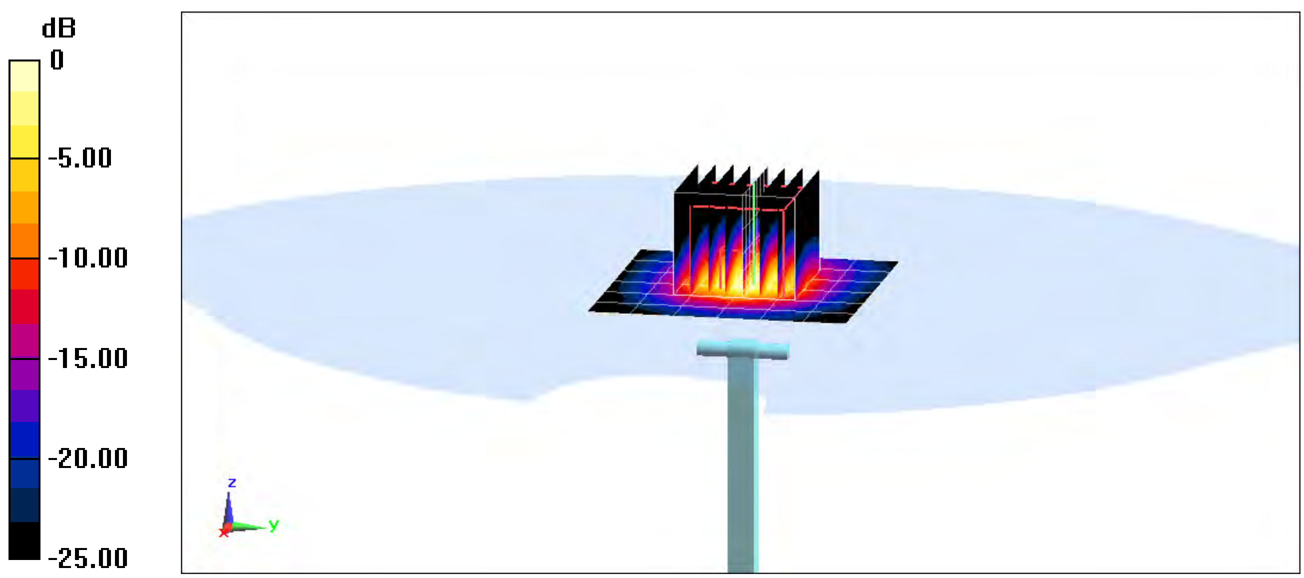
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5750 MHz; σ = 5.111 S/m; ε_r = 34.607; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 20.5°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7409; ConvF(4.82, 4.82, 4.82) @ 5750 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 18.0 W/kg
SAR(1 g) = 3.79 W/kg
Deviation(1 g) = -5.84%



0 dB = 9.34 W/kg = 9.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

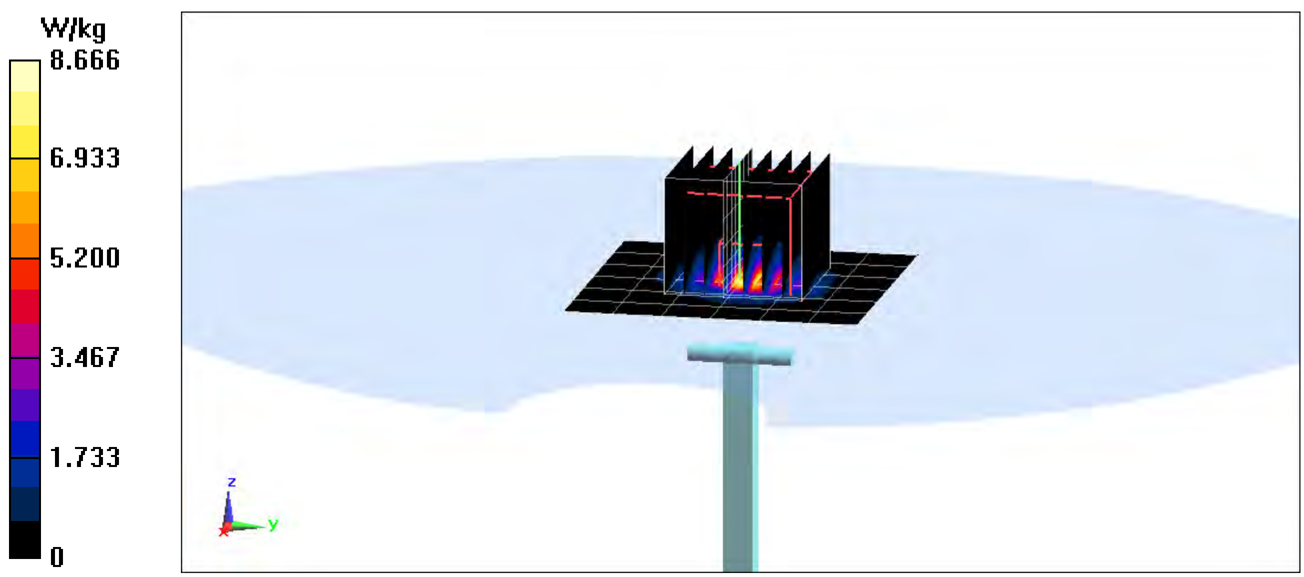
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5250 MHz; σ = 4.564 S/m; ε_r = 35.313; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5250 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 15.1 W/kg
SAR(1 g) = 3.65 W/kg
Deviation(1 g) = -7.48%



PCTEST ENGINEERING LABORATORY, INC.

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

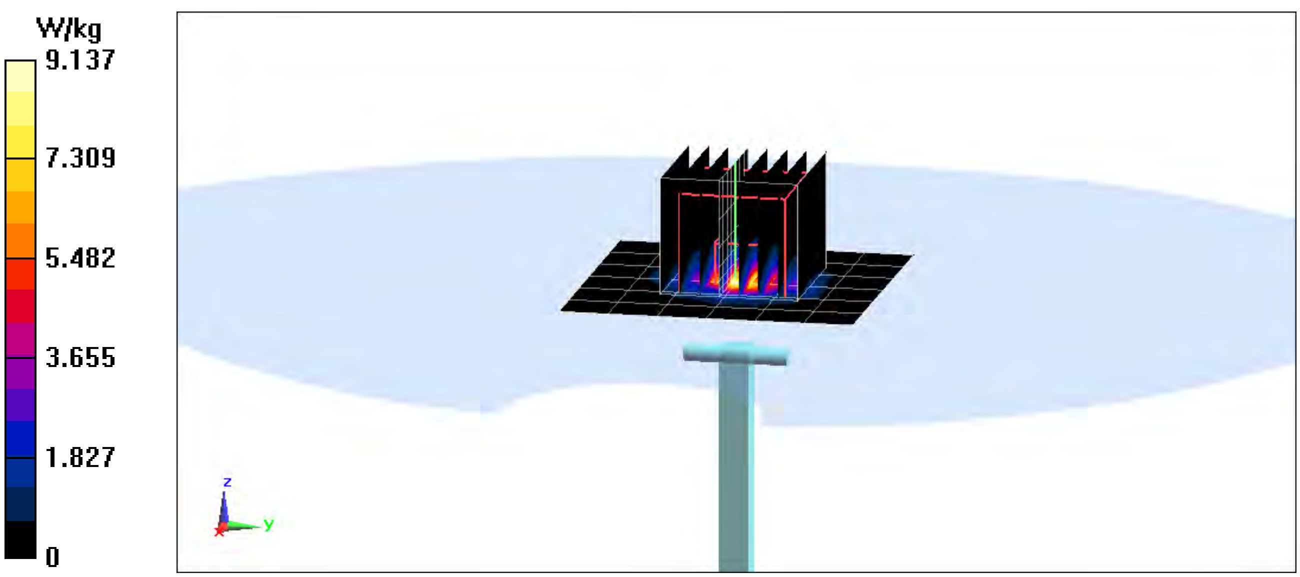
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5600 MHz; σ = 4.923 S/m; ε_r = 34.867; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(4.77, 4.77, 4.77) @ 5600 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 16.6 W/kg
SAR(1 g) = 4.0 W/kg
Deviation(1 g) = -4.31%



PCTEST ENGINEERING LABORATORY, INC.

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

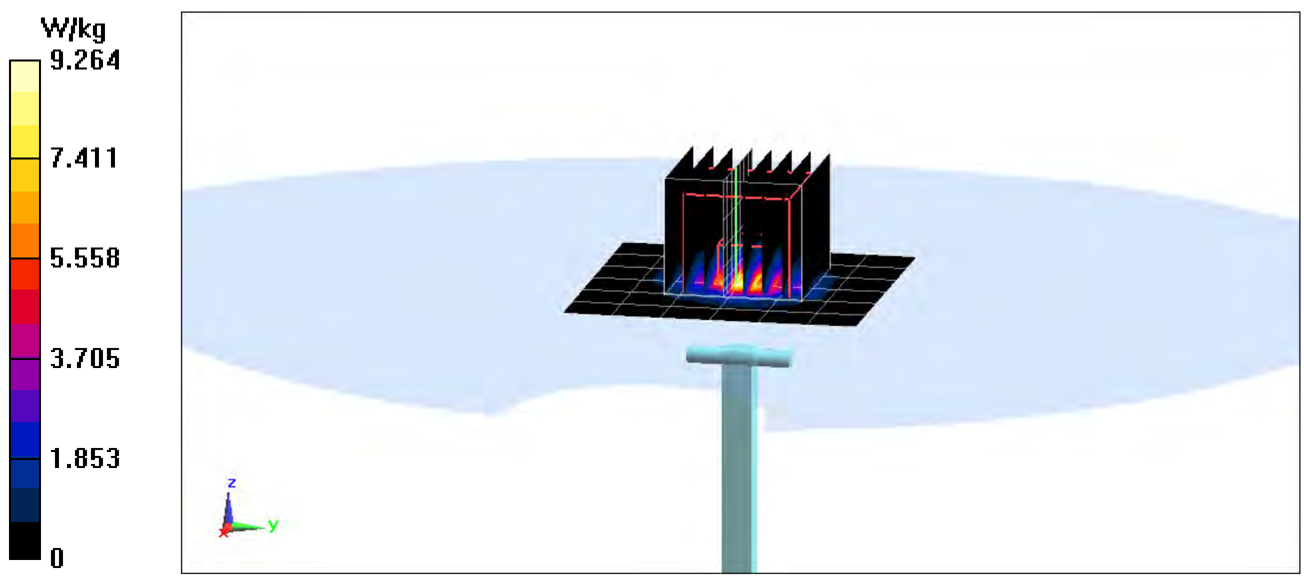
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5750 MHz; σ = 5.087 S/m; ε_r = 34.603; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-07-2019; Ambient Temp: 21.2°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7409; ConvF(4.82, 4.82, 4.82) @ 5750 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 18.2 W/kg
SAR(1 g) = 3.79 W/kg
Deviation(1 g) = -4.17%



PCTEST ENGINEERING LABORATORY, INC.

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

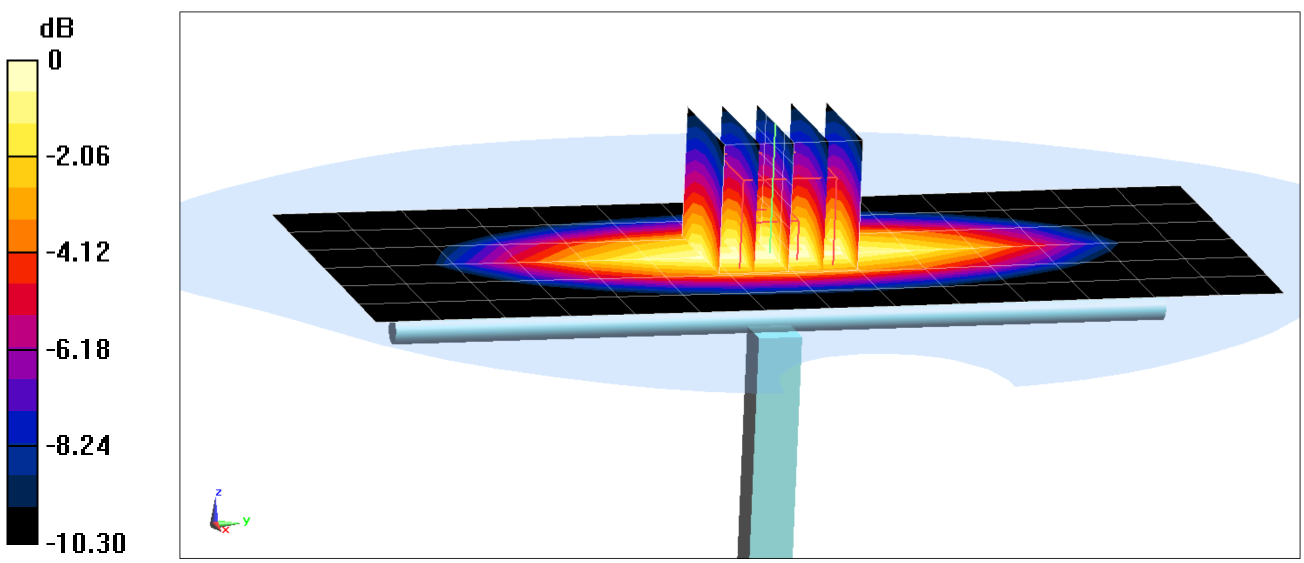
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.951 S/m; ε_r = 53.291; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7357; ConvF(10.37, 10.37, 10.37) @ 750 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 2.63 W/kg
SAR(1 g) = 1.73 W/kg
Deviation(1 g) = 0.82%



0 dB = 2.32 W/kg = 3.65 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

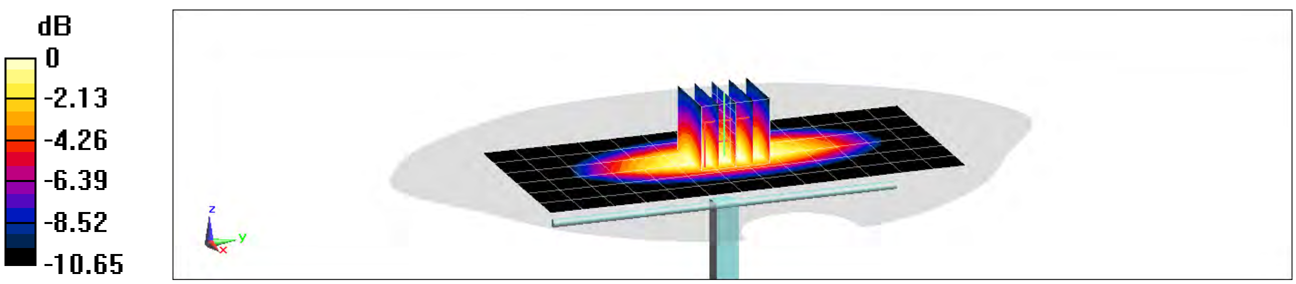
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used:
f = 835 MHz; σ = 1.018 S/m; ε_r = 53.976; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 835 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 3.17 W/kg
SAR(1 g) = 2.1 W/kg
Deviation(1 g) = 8.14%



0 dB = 2.80 W/kg = 4.47 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

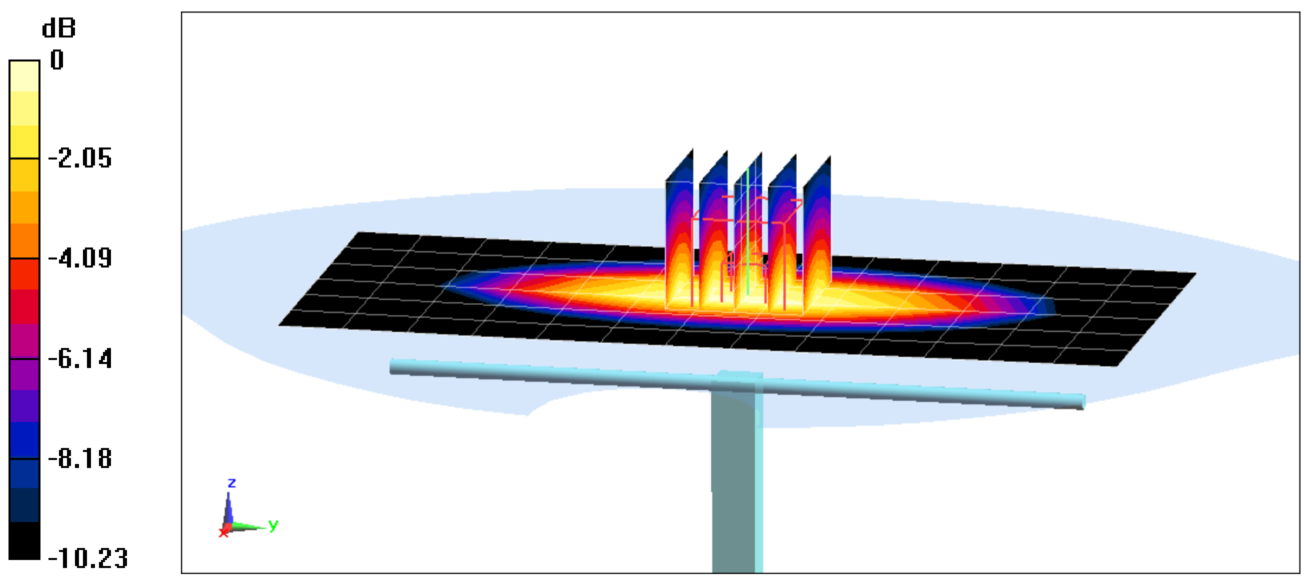
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.968 S/m; ε_r = 55.401; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-02-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7409; ConvF(9.63, 9.63, 9.63) @ 835 MHz; Calibrated: 6/25/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/18/2018
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 3.10 W/kg
SAR(1 g) = 2.06 W/kg
Deviation(1 g) = 6.08%



0 dB = 2.74 W/kg = 4.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

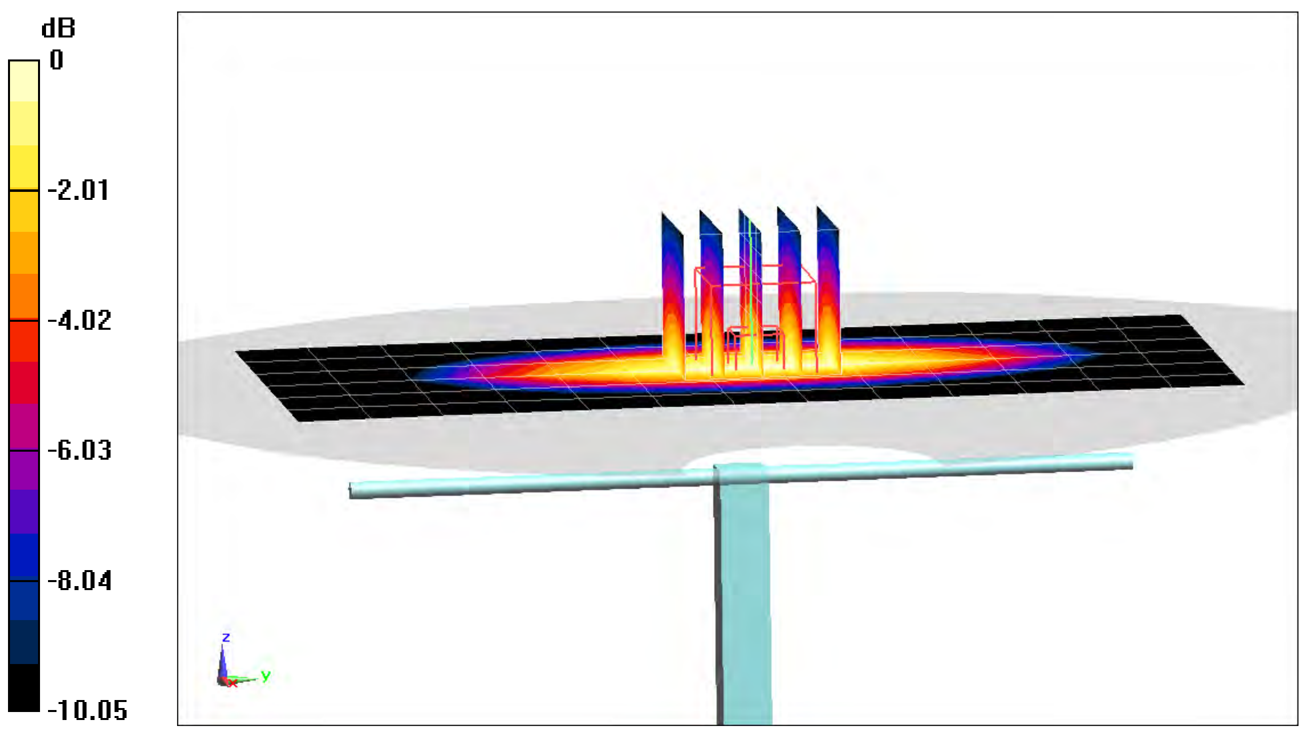
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; $\sigma = 0.968$ S/m; $\varepsilon_r = 54.669$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-07-2019; Ambient Temp: 20.9°C; Tissue Temp: 20.8°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37) @ 835 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 2.87 W/kg
SAR(1 g) = 1.97 W/kg
Deviation(1 g) = 1.03%



0 dB = 2.30 W/kg = 3.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

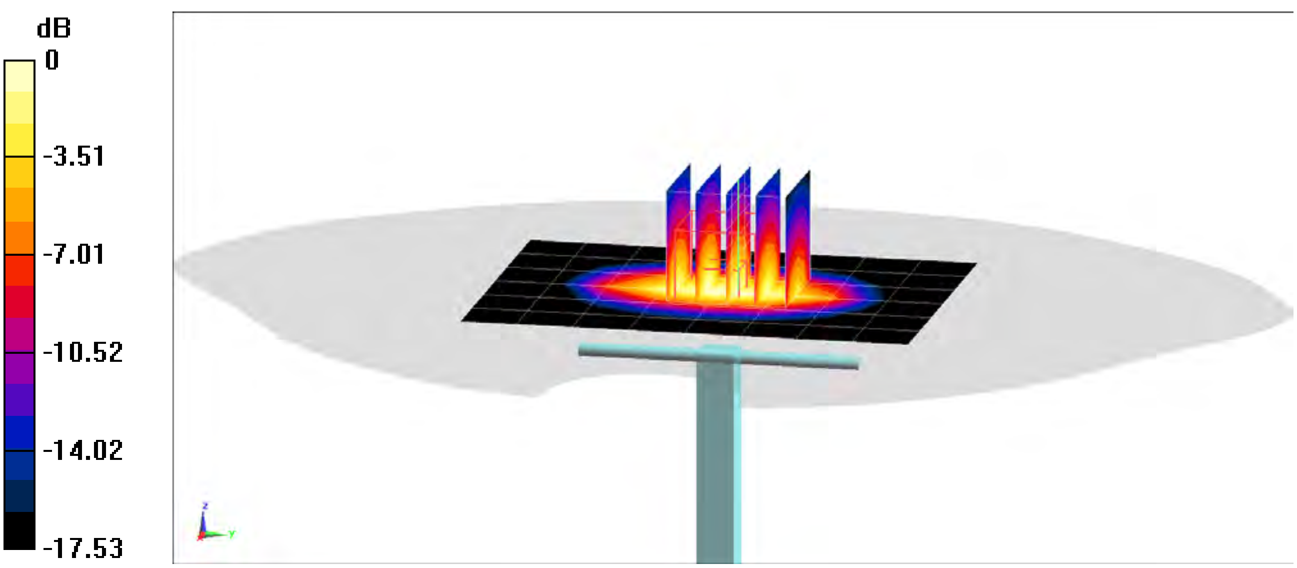
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.534 S/m; ε_r = 51.542; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-26-2018; Ambient Temp: 19.9°C; Tissue Temp: 19.9°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17) @ 1750 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 6.97 W/kg
SAR(1 g) = 3.95 W/kg; SAR(10 g) = 2.1 W/kg
Deviation(1 g) = 6.76%; Deviation(10 g) = 6.06%



0 dB = 4.89 W/kg = 6.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

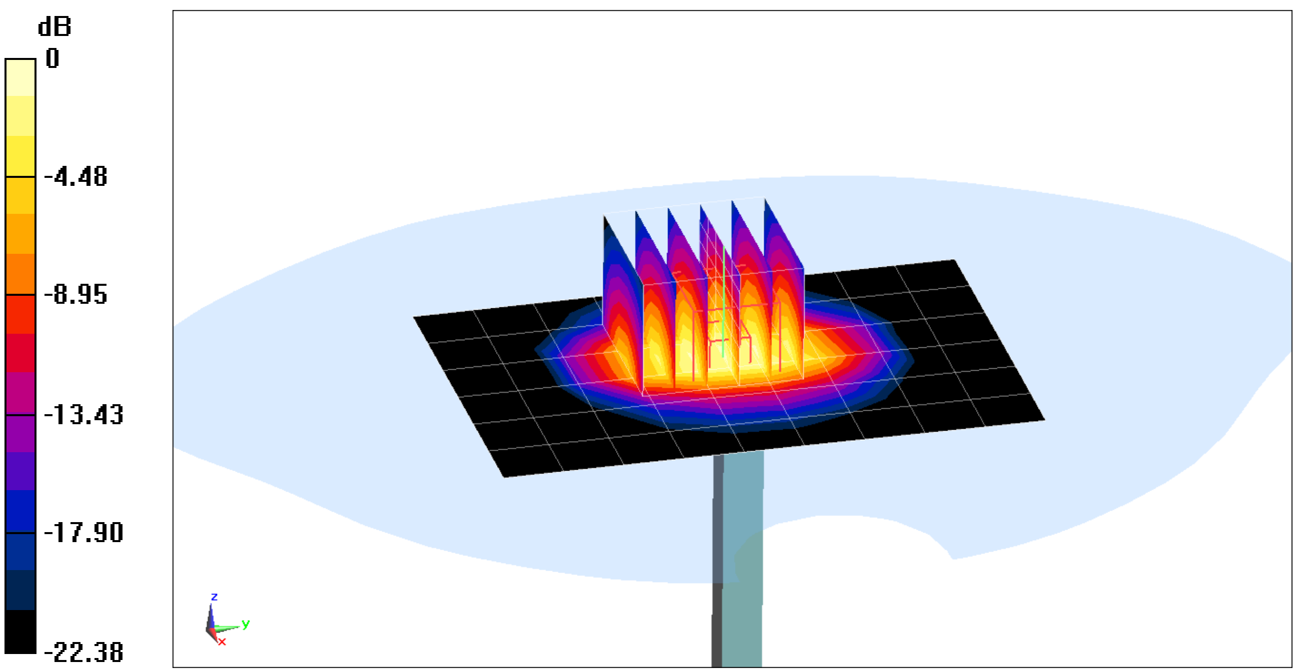
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.564 S/m; ε_r = 51.062; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-25-2018; Ambient Temp: 20.7°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3213; ConvF(4.88, 4.88, 4.88) @ 1900 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.64 W/kg
SAR(1 g) = 3.74 W/kg; SAR(10 g) = 1.93 W/kg
Deviation(1 g) = -4.59%; Deviation(10 g) = -6.31%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

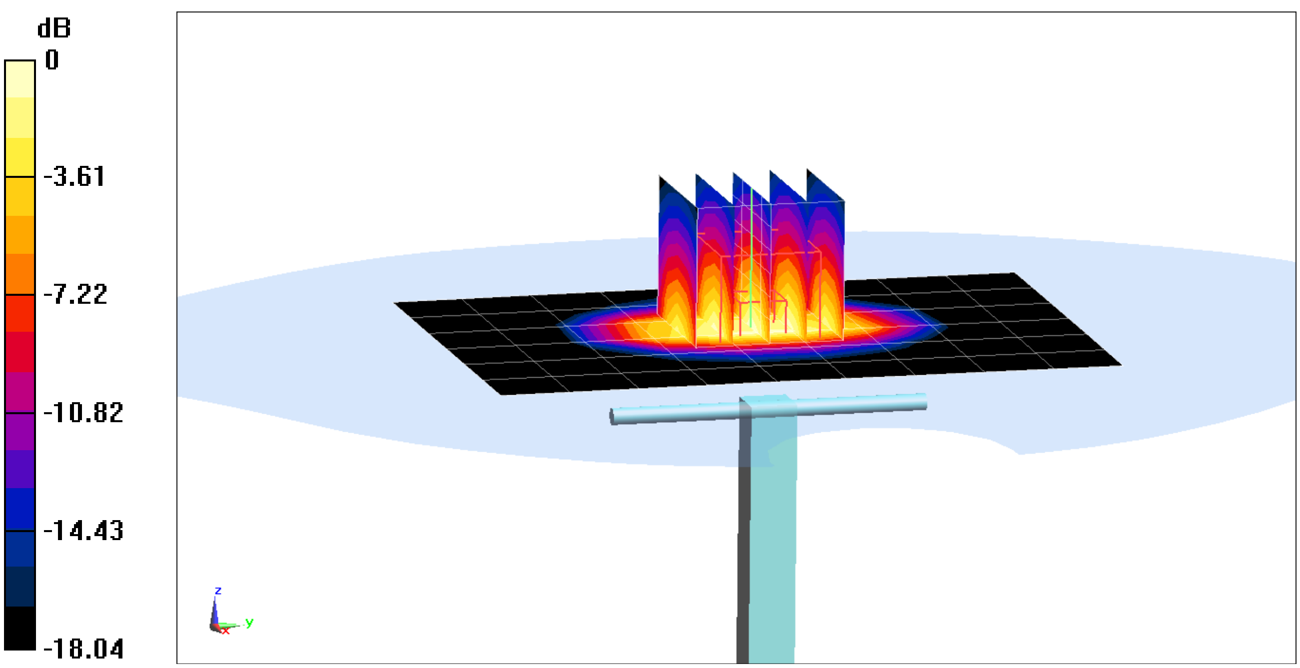
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.572 S/m; ε_r = 51.023; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-05-2018; Ambient Temp: 24.5°C; Tissue Temp: 23.3°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1900 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 7.40 W/kg
SAR(1 g) = 4.15 W/kg
Deviation(1 g) = 4.80%



0 dB = 5.18 W/kg = 7.14 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

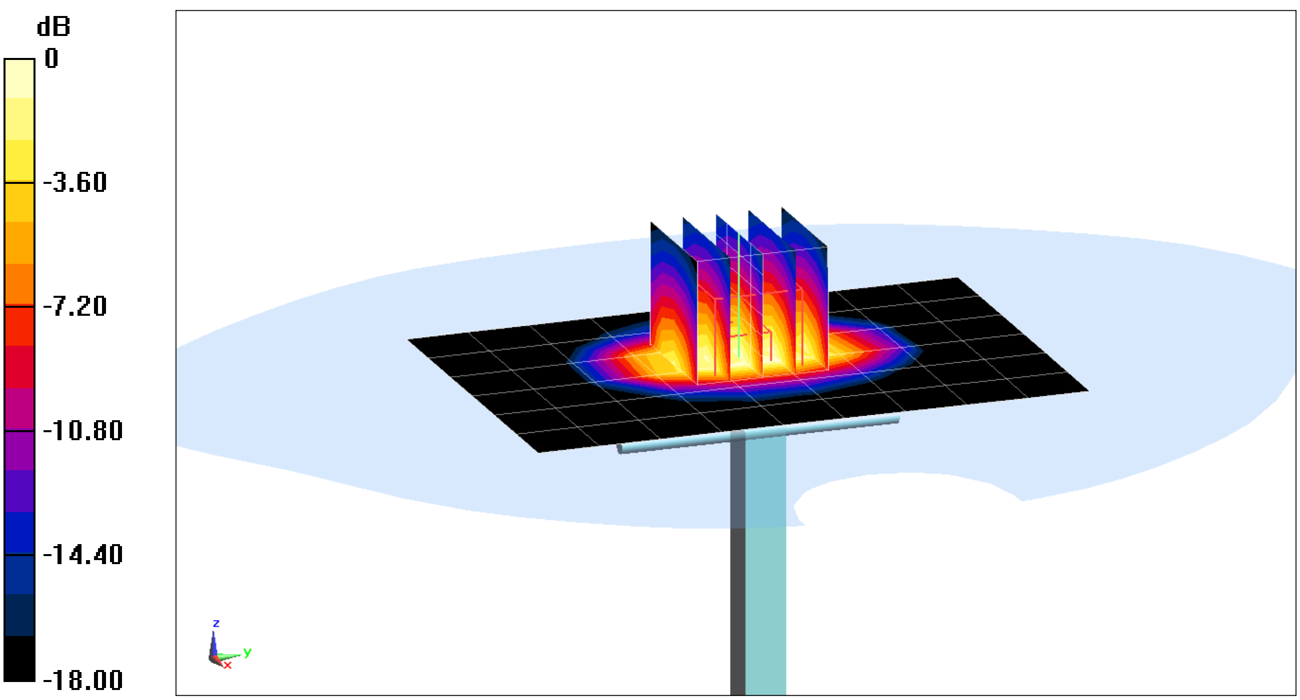
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.573 S/m; ε_r = 53.509; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-19-2018; Ambient Temp: 21.6°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1900 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 6.87 W/kg
SAR(10 g) = 2 W/kg
Deviation(10 g) = -4.31%



0 dB = 4.91 W/kg = 6.91 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

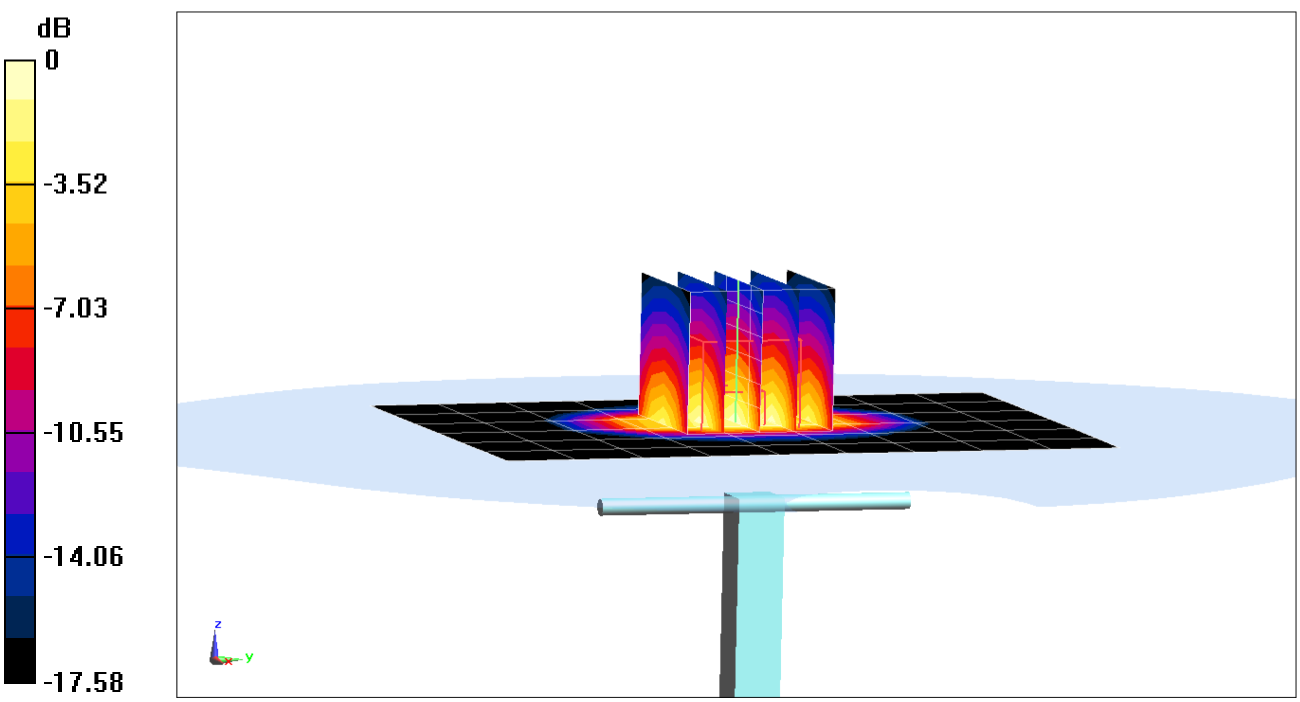
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.56 S/m; ε_r = 51.302; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 22.3°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3332; ConvF(4.77, 4.77, 4.77) @ 1900 MHz; Calibrated: 8/22/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 7.20 W/kg
SAR(10 g) = 2.11 W/kg
Deviation(10 g) = 1.93%



0 dB = 5.16 W/kg = 7.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

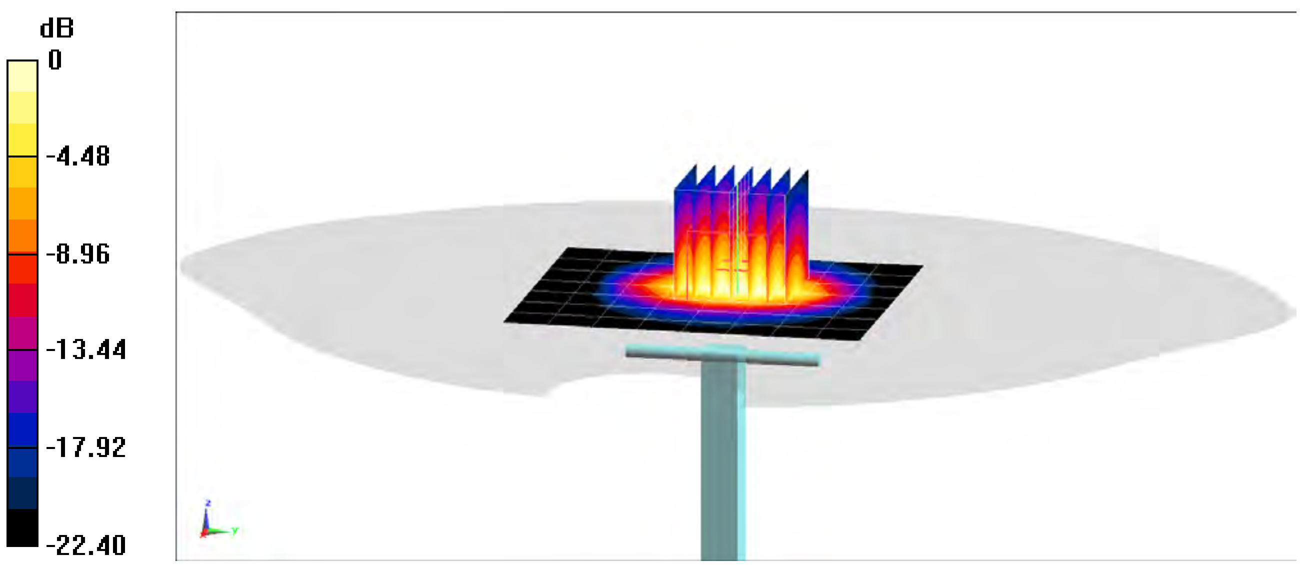
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 MHz Body Medium parameters used:
f = 2450 MHz; σ = 2.04 S/m; ε_r = 50.852; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-20-2018; Ambient Temp: 19.7°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3347; ConvF(4.64, 4.64, 4.64) @ 2450 MHz; Calibrated: 3/27/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 11.1 W/kg
SAR(1 g) = 5.23 W/kg
Deviation(1 g) = 4.39%



0 dB = 6.58 W/kg = 8.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

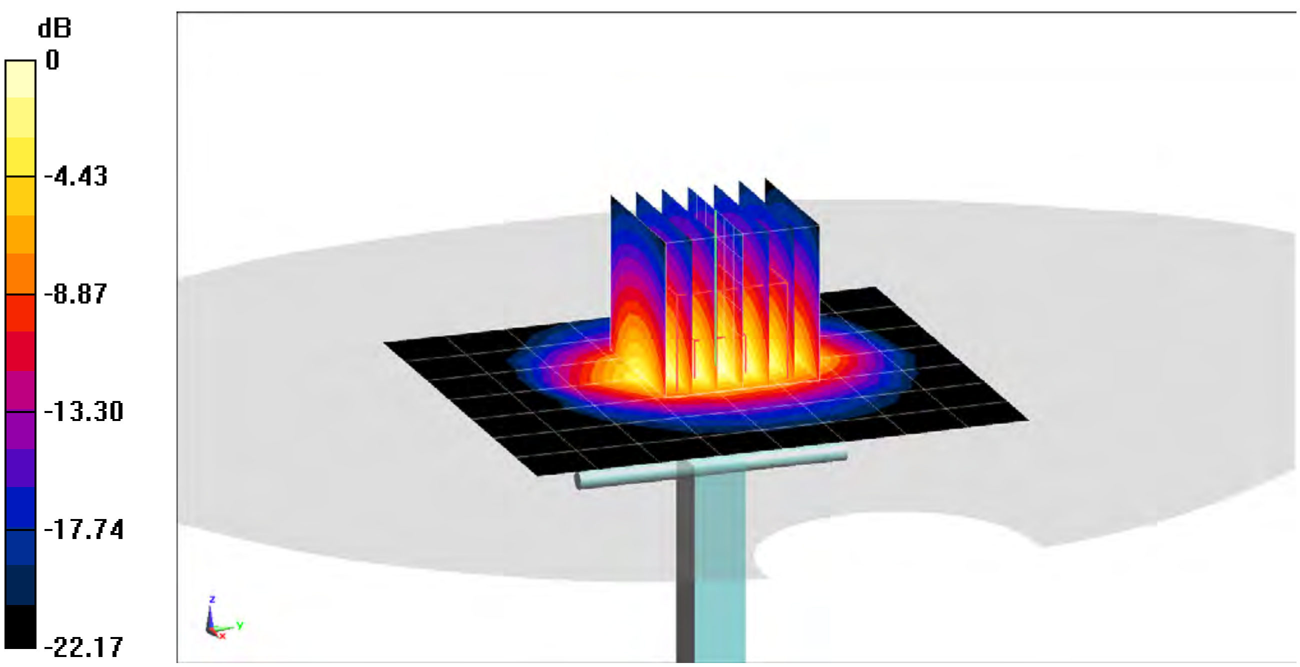
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.03 S/m; ε_r = 51.94; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-20-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2450 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 11.0 W/kg
SAR(1 g) = 5.28 W/kg
Deviation(1 g) = 3.33%



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

PCTEST ENGINEERING LABORATORY, INC.

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

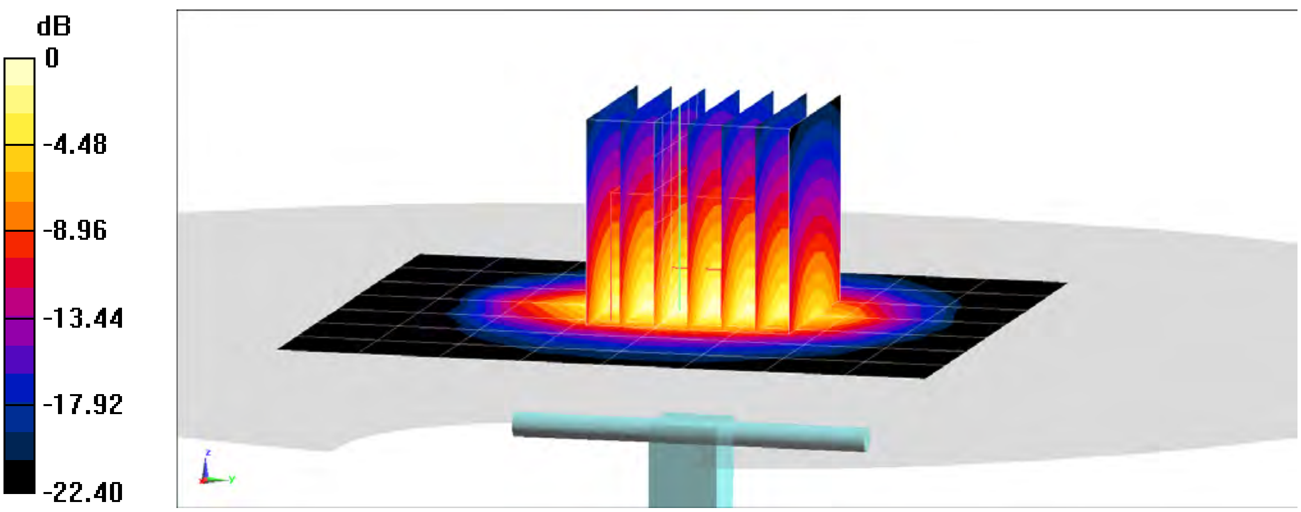
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.047 S/m; ε_r = 52.144; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-23-2018; Ambient Temp: 23.4°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2450 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 5.42 W/kg
Deviation(1 g) = 6.07%



0 dB = 7.08 W/kg = 8.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

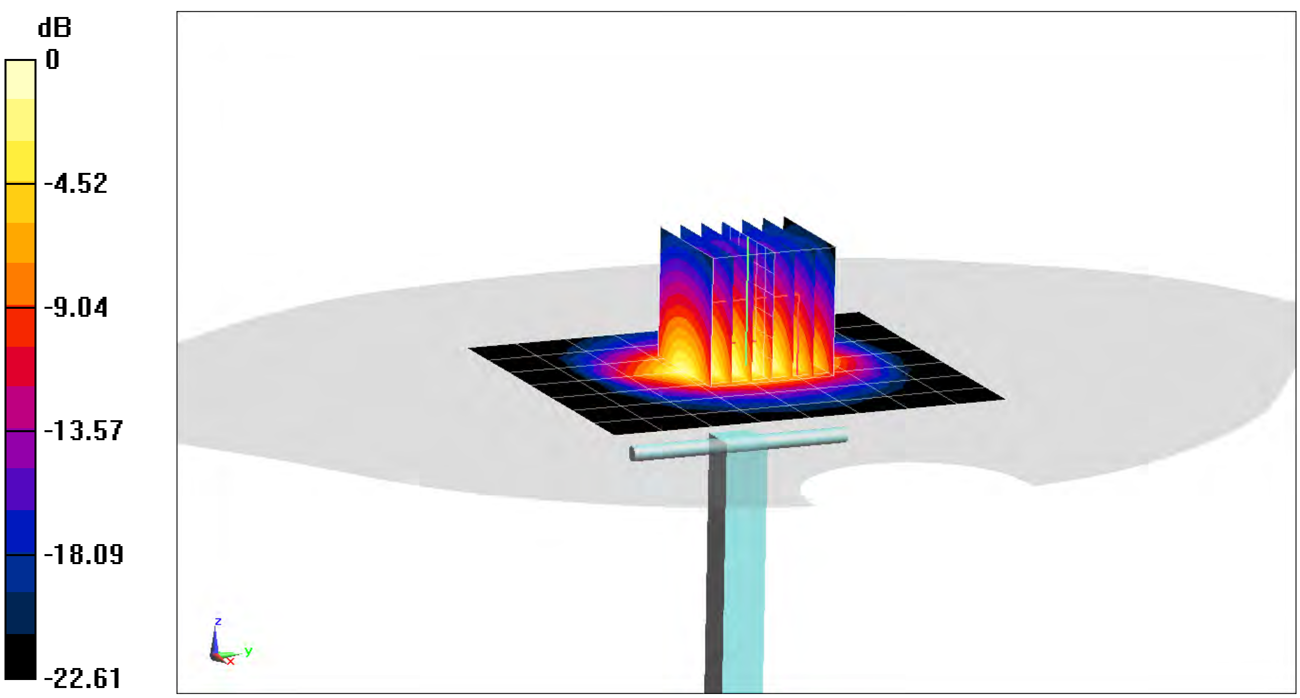
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.041 S/m; ε_r = 51.54; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3319; ConvF(4.51, 4.51, 4.51) @ 2450 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 11.2 W/kg
SAR(10 g) = 2.43 W/kg
Deviation(10 g) = 0.41%



0 dB = 7.00 W/kg = 8.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

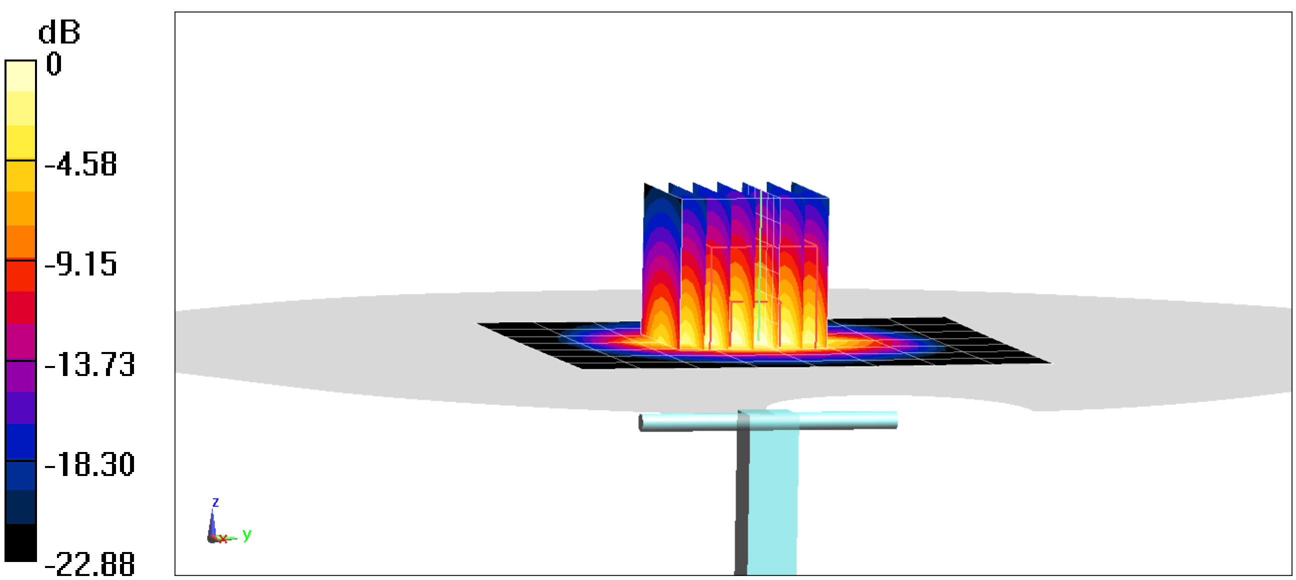
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used:
f = 2450 MHz; σ = 2.033 S/m; ε_r = 52.283; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2019; Ambient Temp: 23.4°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7406; ConvF(7.3, 7.3, 7.3) @ 2450 MHz; Calibrated: 5/22/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/22/2018
Phantom: Twin-SAM V5.0 Back Right; Type: QD 000 P40 CD; Serial: 1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 10.8 W/kg
SAR(1 g) = 5.27 W/kg
Deviation(1 g) = 3.13%



0 dB = 8.54 W/kg = 9.31 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

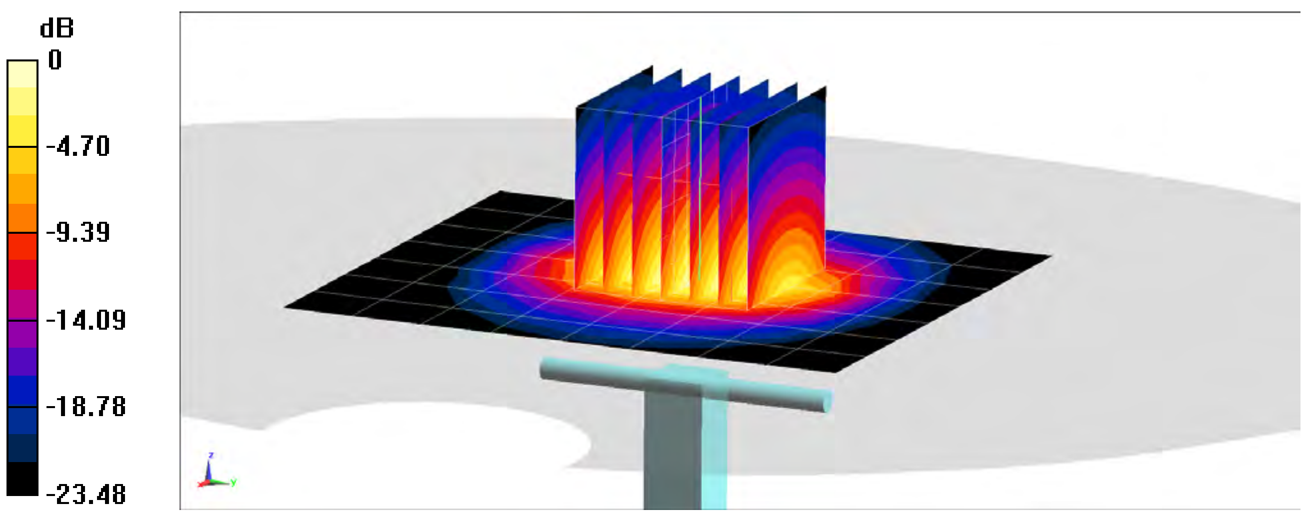
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; σ = 2.226 S/m; ε_r = 51.694; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-23-2018; Ambient Temp: 23.4°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3319; ConvF(4.33, 4.33, 4.33) @ 2600 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 12.4 W/kg
SAR(1 g) = 5.63 W/kg
Deviation(1 g) = 3.87%



0 dB = 7.51 W/kg = 8.76 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

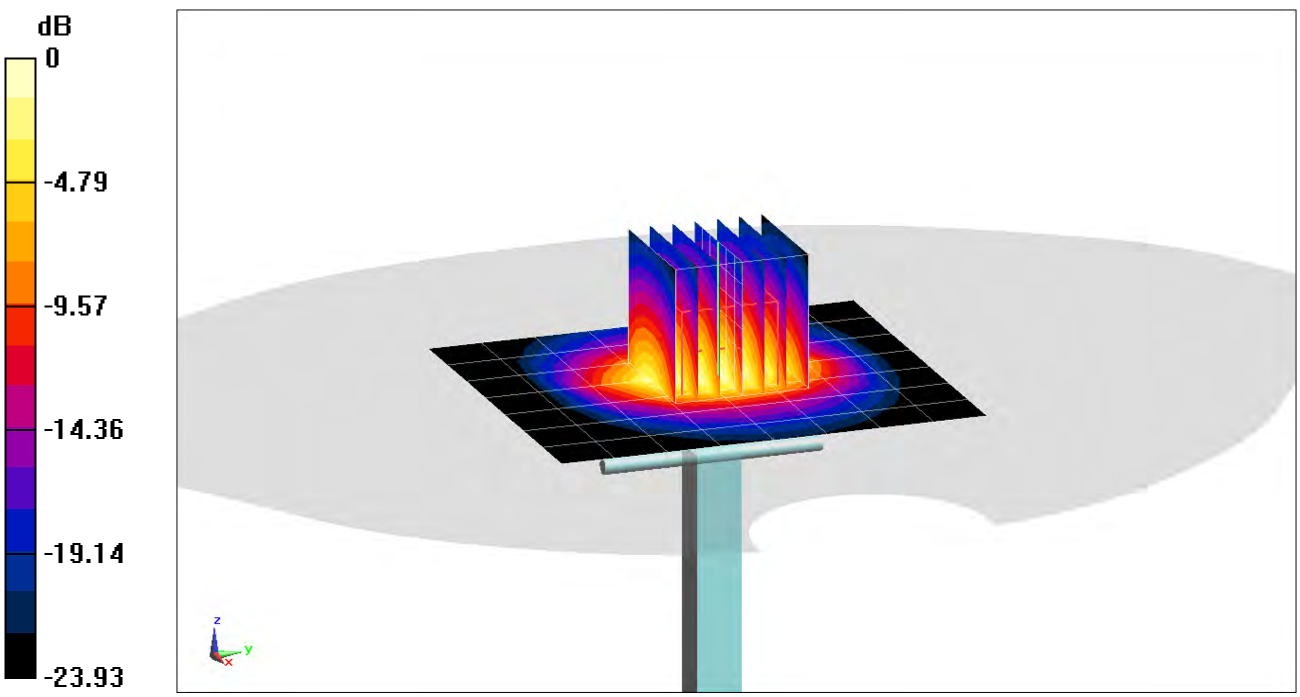
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; σ = 2.216 S/m; ε_r = 51.124; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 23.2°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3319; ConvF(4.33, 4.33, 4.33) @ 2600 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/7/2018
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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(10 g) = 2.42 W/kg
Deviation(10 g) = -1.22%



0 dB = 7.17 W/kg = 8.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

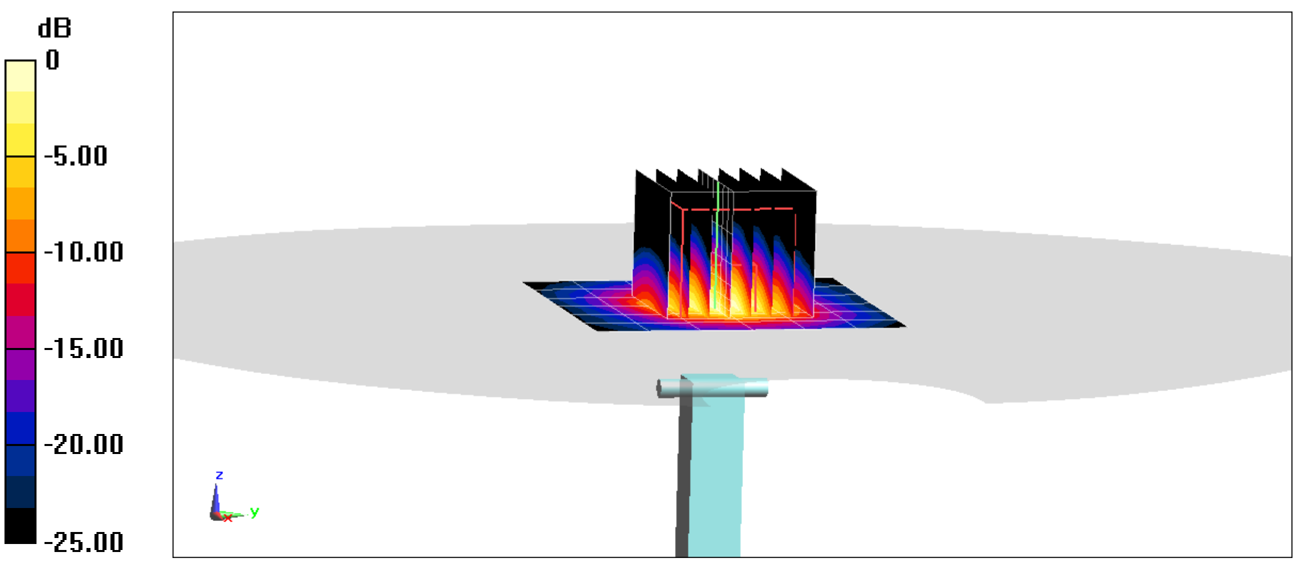
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.413 S/m; ε_r = 47.853; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2018; Ambient Temp: 23.0°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(4.48, 4.48, 4.48) @ 5250 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 15.0 W/kg
SAR(1 g) = 3.63 W/kg
Deviation(1 g) = -3.97%



0 dB = 8.44 W/kg = 9.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

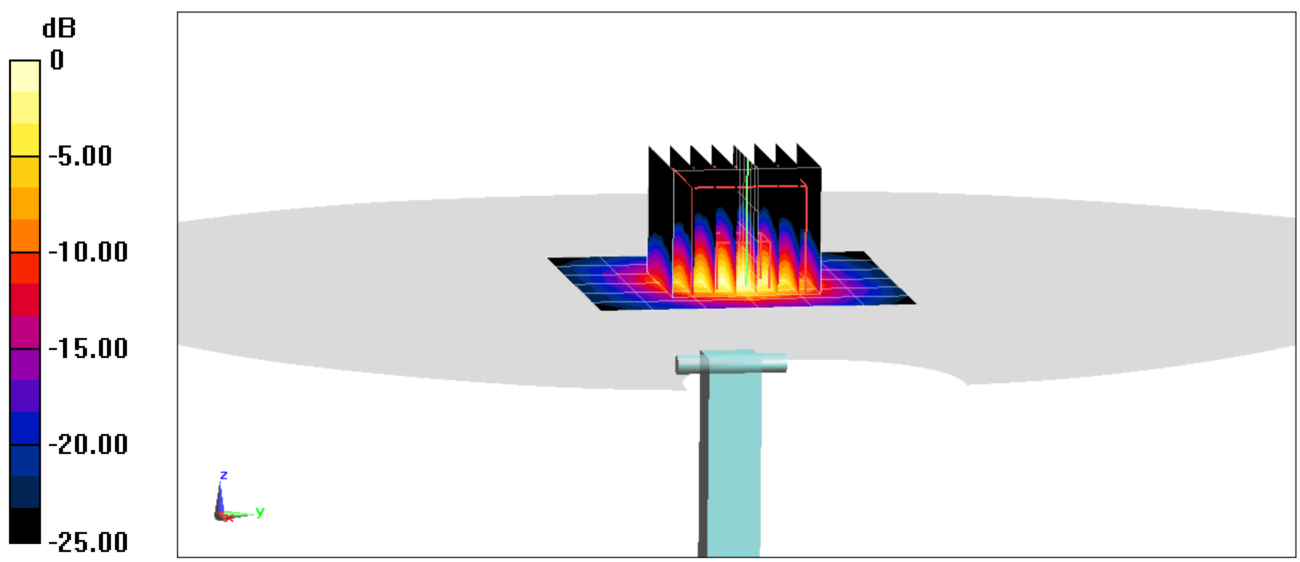
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.91 S/m; ε_r = 47.181; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2018; Ambient Temp: 23.0°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(4, 4, 4) @ 5600 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 17.6 W/kg
SAR(1 g) = 3.83 W/kg
Deviation(1 g) = -2.42%



0 dB = 9.66 W/kg = 9.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

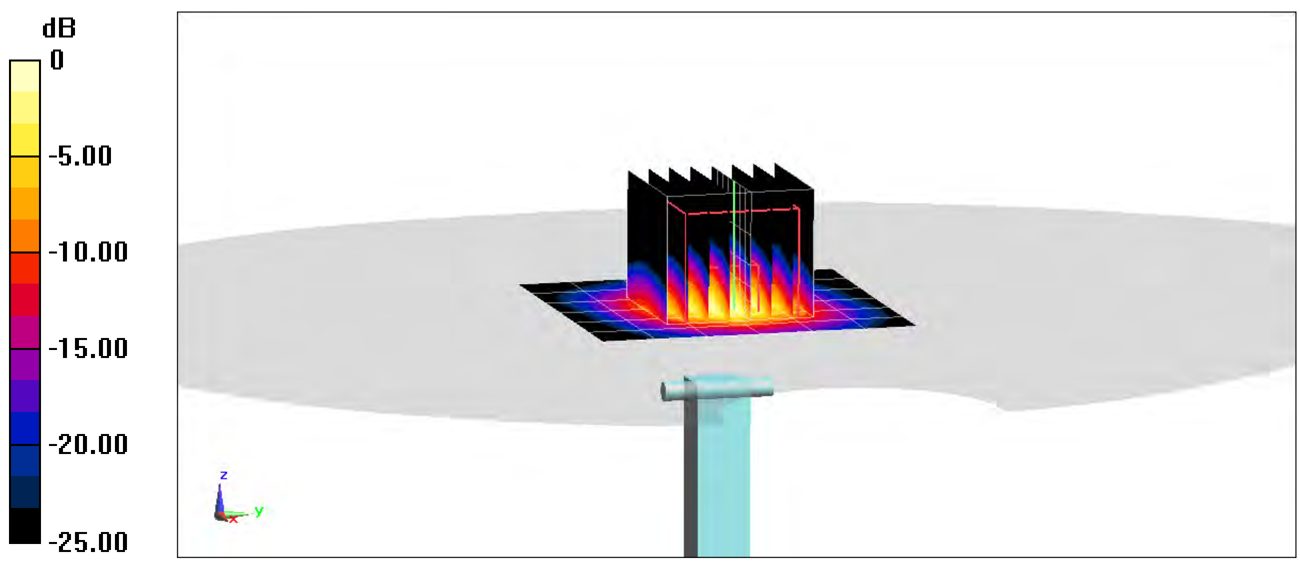
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.145 S/m; ε_r = 46.834; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2018; Ambient Temp: 23.0°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5750 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 16.7 W/kg
SAR(1 g) = 3.49 W/kg
Deviation(1 g) = -8.04%



0 dB = 8.91 W/kg = 9.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

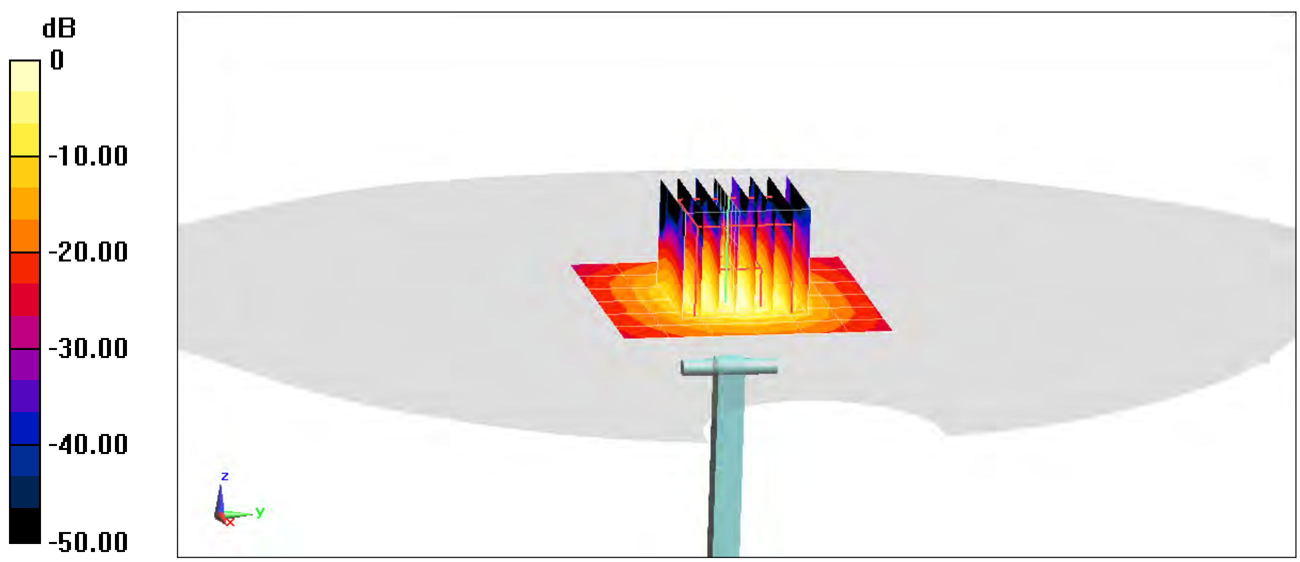
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.421 S/m; ε_r = 47.944; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(4.48, 4.48, 4.48) @ 5250 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.12 (7450)

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) = 14.6 W/kg
SAR(10 g) = 1 W/kg
Deviation(10 g) = -7.41%



0 dB = 8.56 W/kg = 9.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

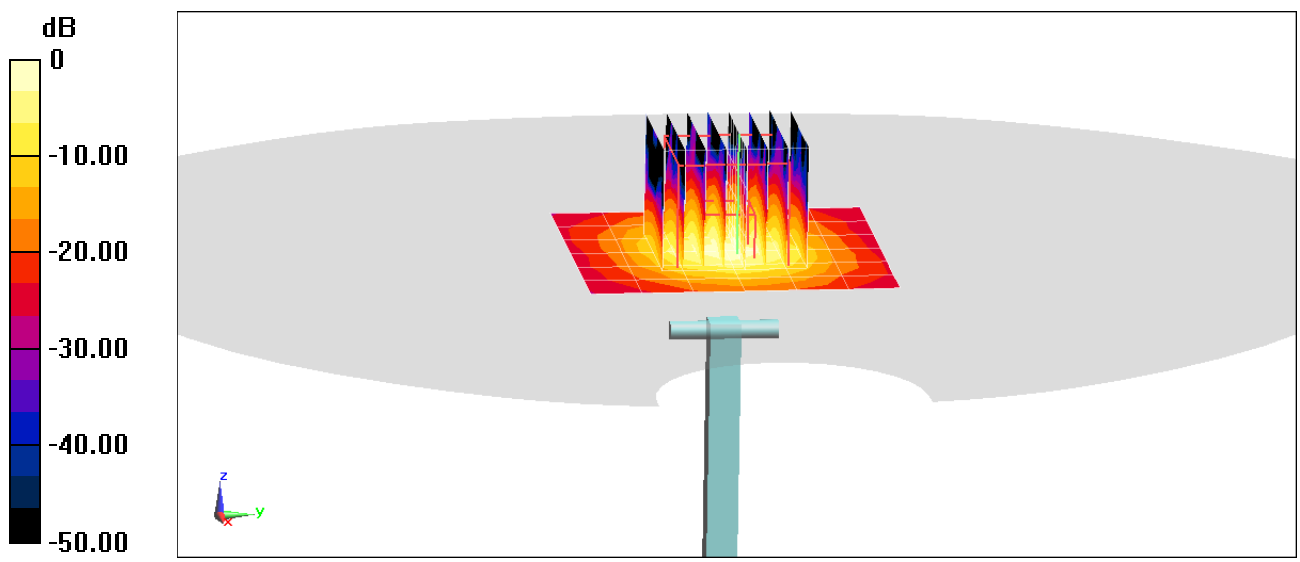
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.939 S/m; ε_r = 47.285; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(4, 4, 4) @ 5600 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.12 (7450)

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) = 17.5 W/kg
SAR(10 g) = 1.07 W/kg
Deviation(10 g) = -3.60%



0 dB = 9.63 W/kg = 9.84 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

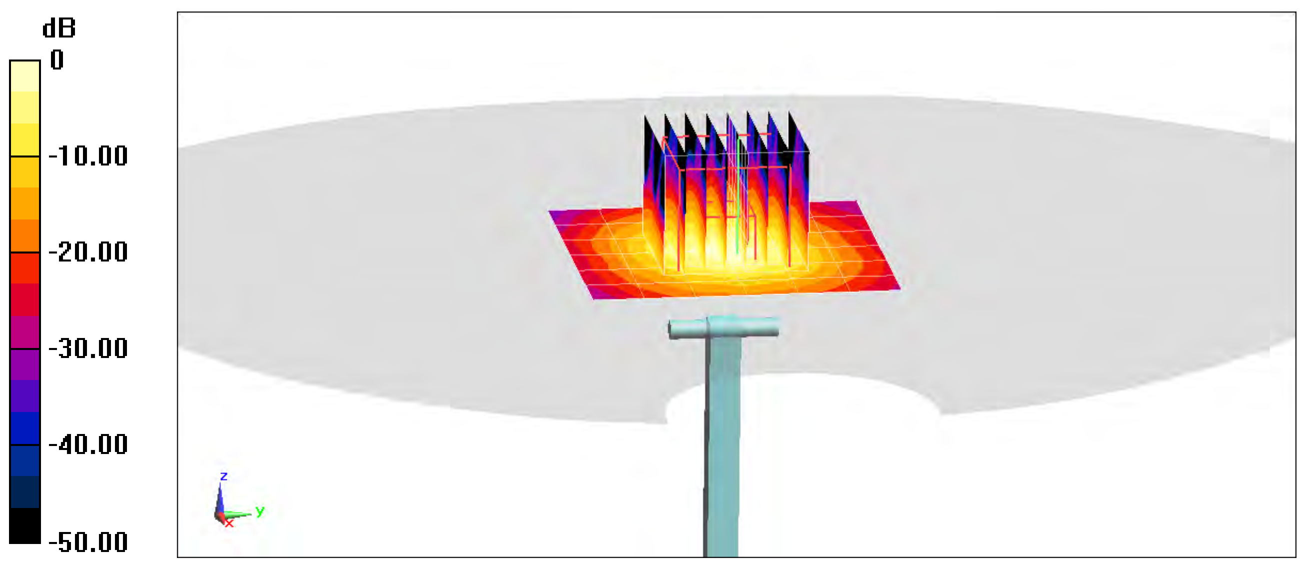
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.154 S/m; ε_r = 47.01; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-26-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5750 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.12 (7450)

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) = 16.1 W/kg
SAR(10 g) = 0.976 W/kg
Deviation(10 g) = -7.92%



0 dB = 8.59 W/kg = 9.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

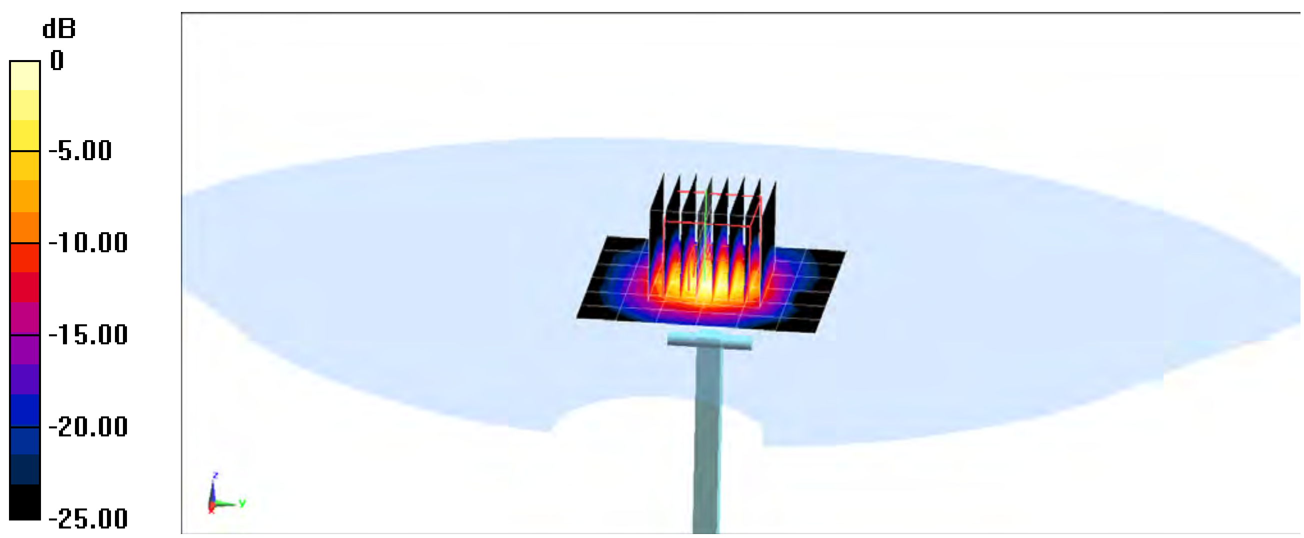
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.08 S/m; ε_r = 46.861; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-08-2019; Ambient Temp: 23.0°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7357; ConvF(4.21, 4.21, 4.21) @ 5750 MHz; Calibrated: 4/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2018
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 16.7 W/kg
SAR(1 g) = 3.6 W/kg
Deviation(1 g) = -5.39%



0 dB = 8.93 W/kg = 9.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

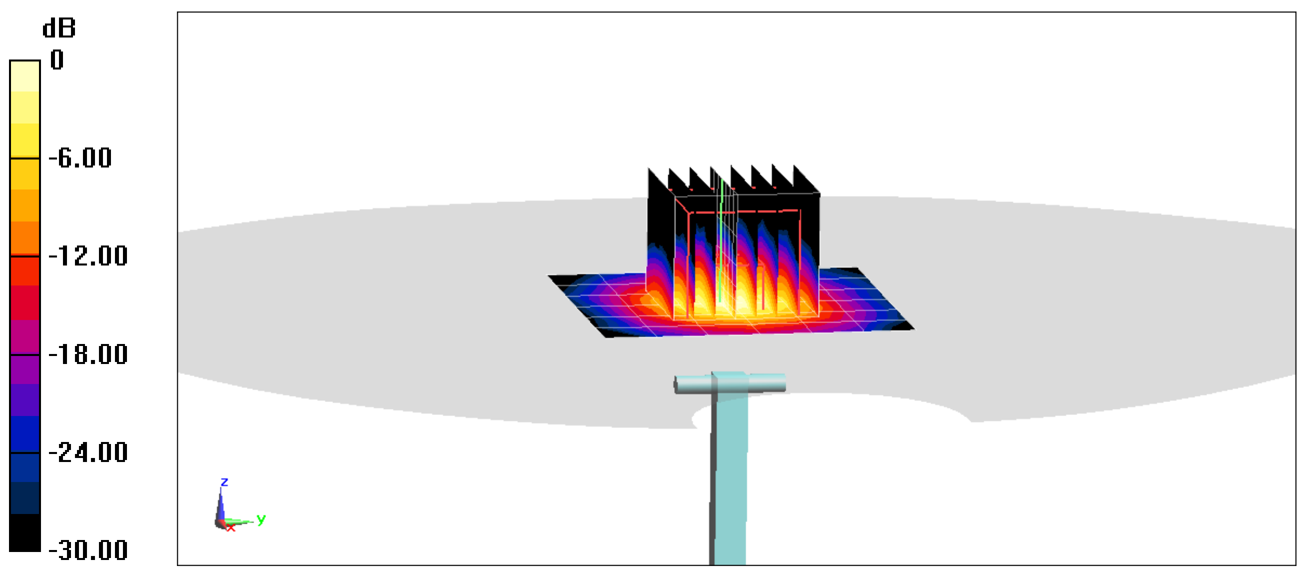
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
$f = 5750$ MHz; $\sigma = 6.163$ S/m; $\varepsilon_r = 47.116$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2019; Ambient Temp: 21.3°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5750 MHz; Calibrated: 8/23/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.12 (7450)

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) = 17.2 W/kg
SAR(1 g) = 3.55 W/kg
Deviation(1 g) = -6.70%



0 dB = 8.69 W/kg = 9.39 dBW/kg

APPENDIX C: PROBE CALIBRATION

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

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

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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1054_Mar17**

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1054
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	March 07, 2017

BN✓
03-27-2017

BN✓
04-04-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	04-Jan-17 (No. DAE4-601_Jan17)	Jan-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 14, 2017

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.37 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.60 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.6 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.61 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.68 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.7 Ω - 0.7 jΩ
Return Loss	- 26.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.7 Ω - 3.6 jΩ
Return Loss	- 28.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 08, 2011

DASY5 Validation Report for Head TSL

Date: 07.03.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

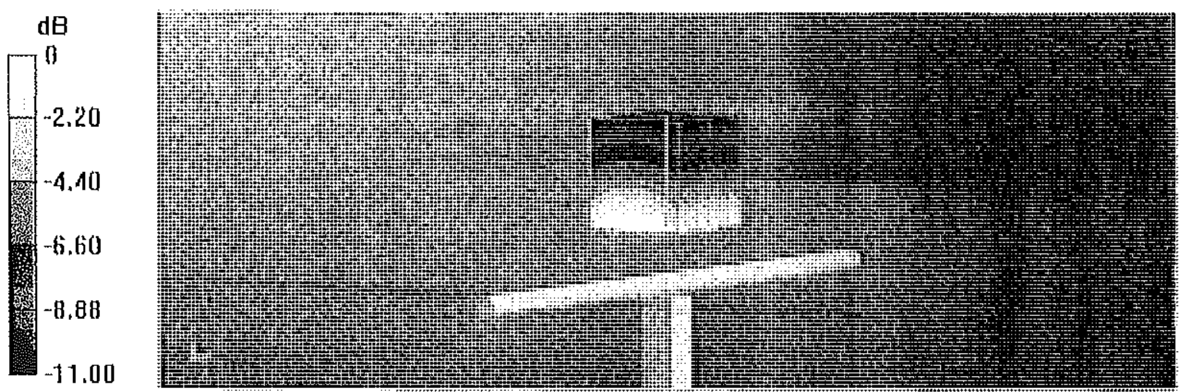
Communication System: UID 0 - CW ; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.17, 10.17, 10.17); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

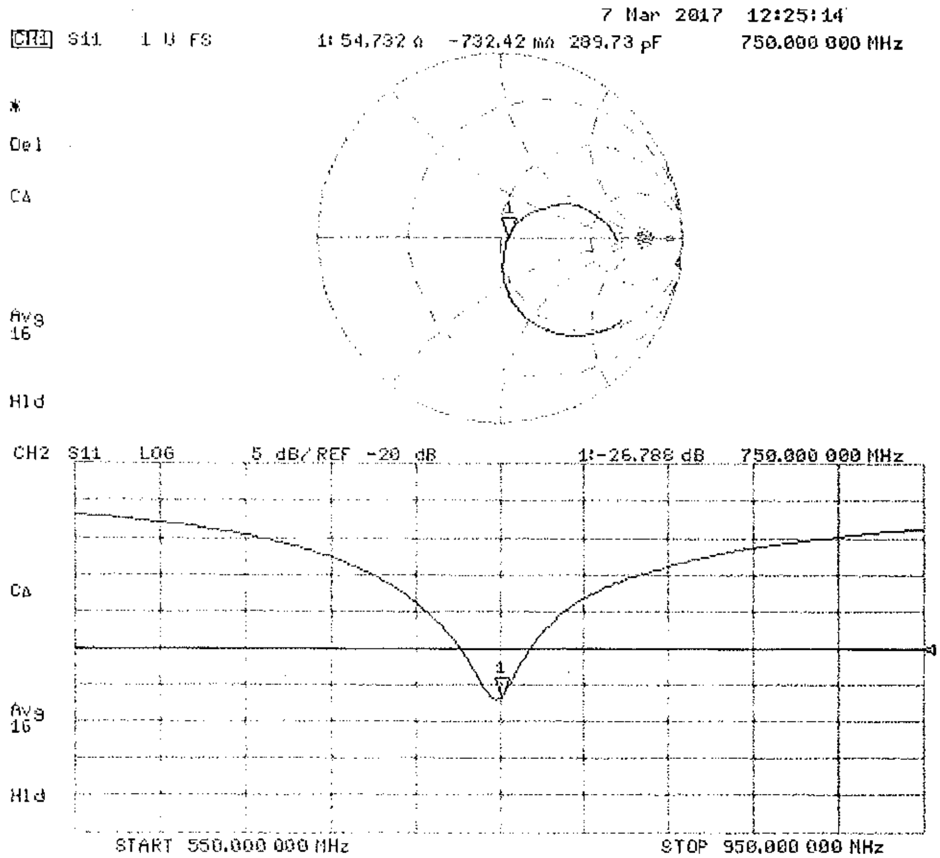
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.71 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.21 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.4 W/kg
Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.03.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

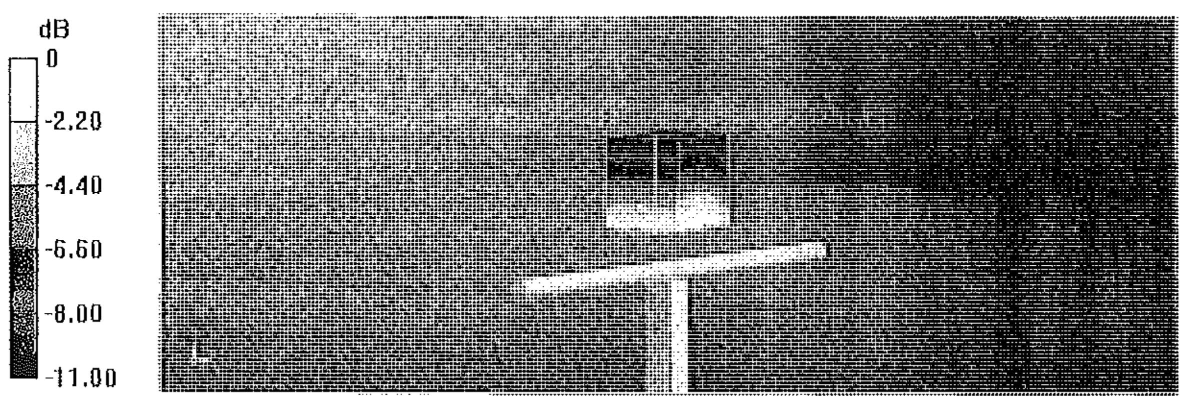
Communication System: UID 0 - CW ; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

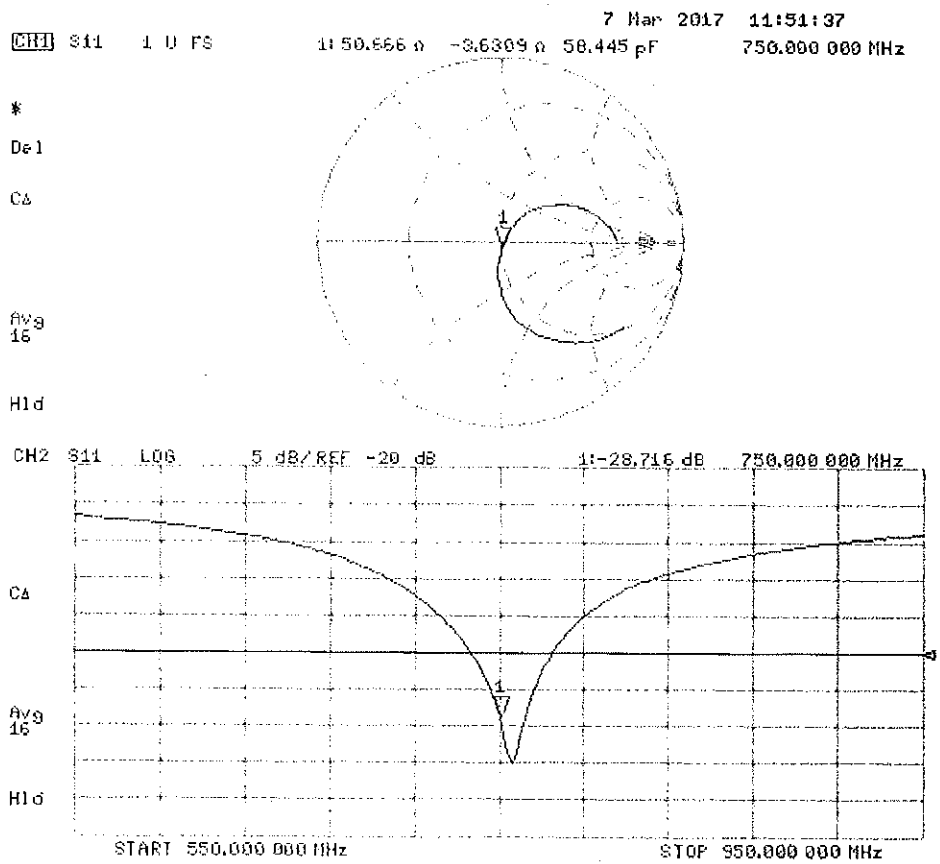
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.88 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.31 W/kg
SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Impedance Measurement Plot for Body TSL



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

Certification of Calibration

Object D750V3 – SN:1054

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: March 07, 2018

Description: SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	8/3/2017	Annual	8/3/2018	MY40000670
Agilent	N5182A	MXG Vector Signal Generator	1/24/2018	Annual	1/24/2019	MY47420651
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	10/16/2017	Annual	10/16/2018	1126066
Anritsu	ML2495A	Power Meter	10/22/2017	Annual	10/22/2018	1328004
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	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
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	1/22/2018	Annual	1/22/2019	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2017	Annual	7/13/2018	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2017	Annual	6/21/2018	1333
SPEAG	EX3DV4	SAR Probe	7/17/2017	Annual	7/17/2018	7410
SPEAG	ES3DV3	SAR Probe	9/18/2017	Annual	9/18/2018	3287

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

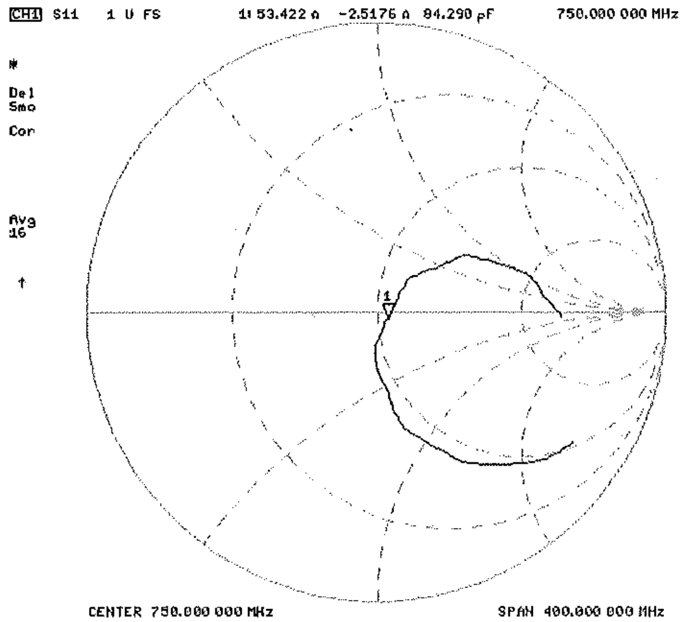
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

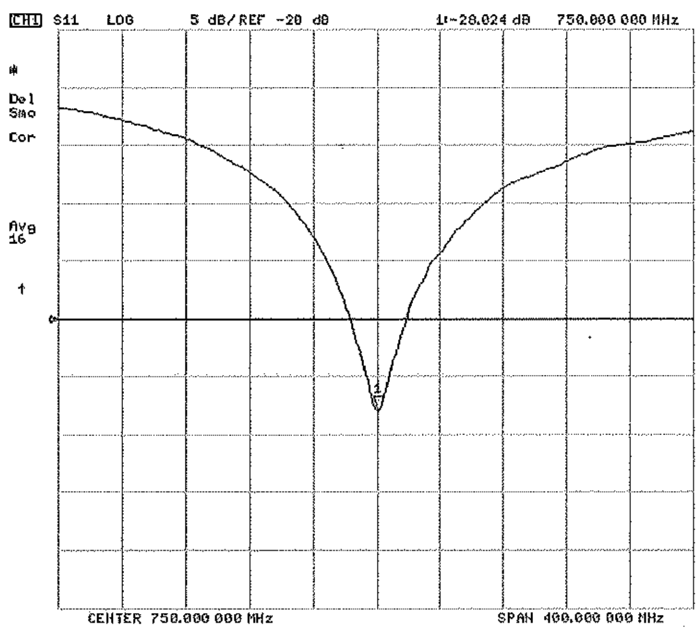
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
3/7/2017	3/7/2018	1.033	1.67	1.70	1.80%	1.10	1.11	0.91%	54.7	53.4	1.3	-0.7	-2.5	1.8	-26.8	-28.0	-4.60%	PASS

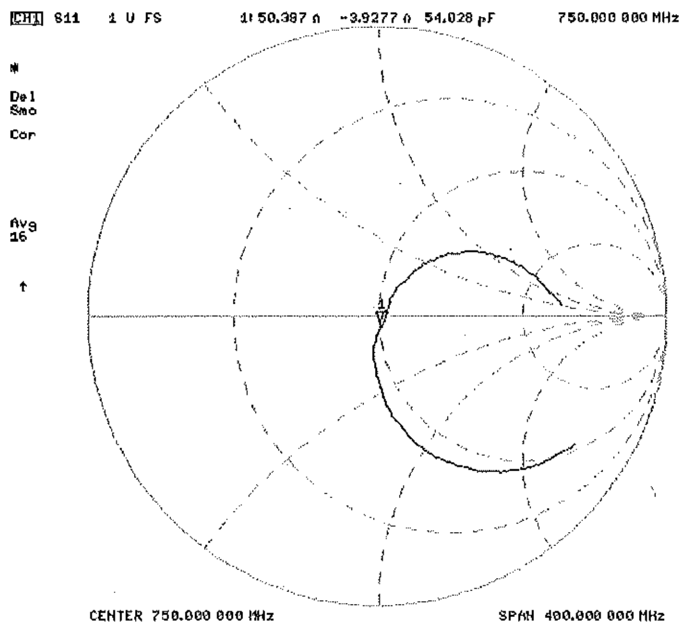
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
3/7/2017	3/7/2019	1.033	1.72	1.70	-1.28%	1.14	1.12	-1.41%	50.7	50.4	0.3	-3.6	-3.9	0.3	-28.7	-28.5	0.60%	PASS

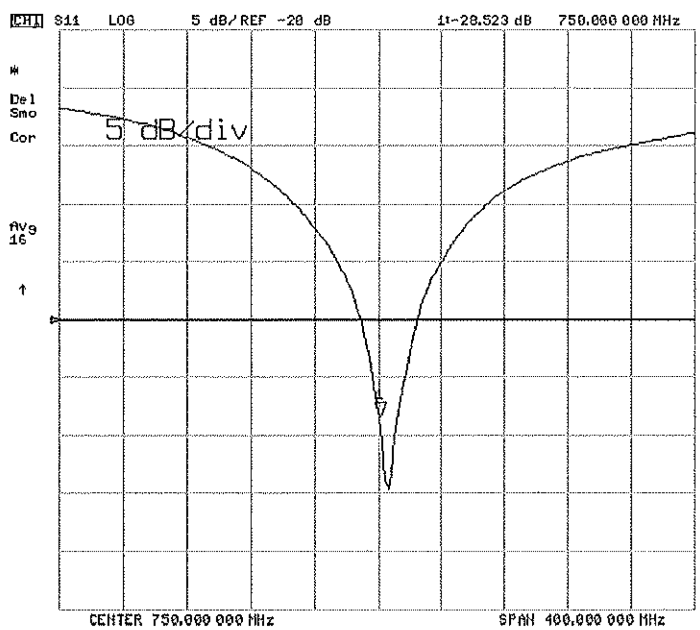
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d132_Jan18

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d132
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	January 15, 2018

BN ✓
01-25-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	Leif Klysner
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 15, 2018

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Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.36 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.8 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.71 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.39 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.8 Ω - 2.9 jΩ
Return Loss	- 29.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω - 5.7 jΩ
Return Loss	- 23.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L

SAR result with SAM Head (Top)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.41 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.21 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.69 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.64 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.45 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Neck)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.22 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.25 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Ear)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**7.96 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 W/kg ± 16.9 % (k=2)**

DASY5 Validation Report for Head TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

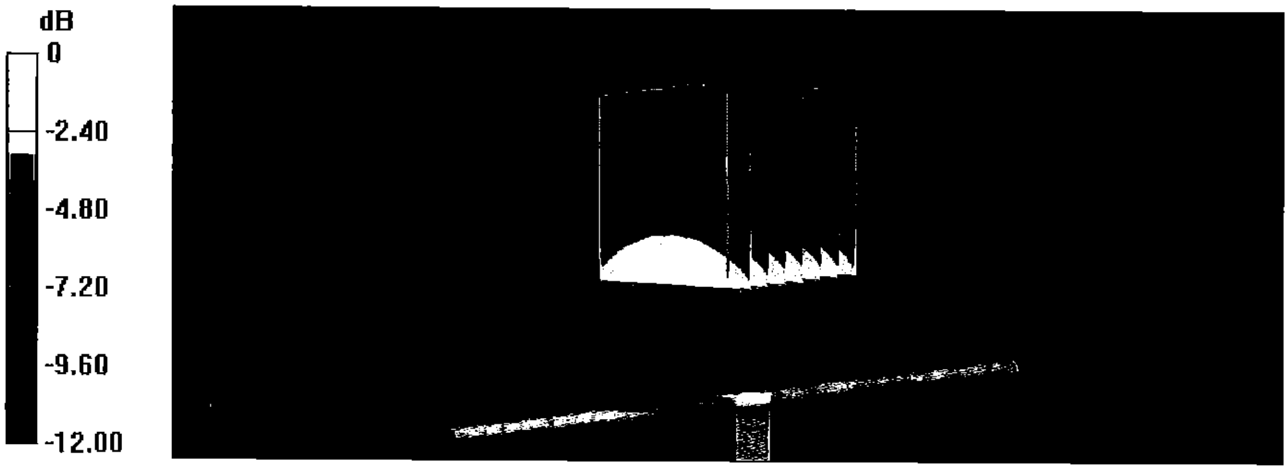
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

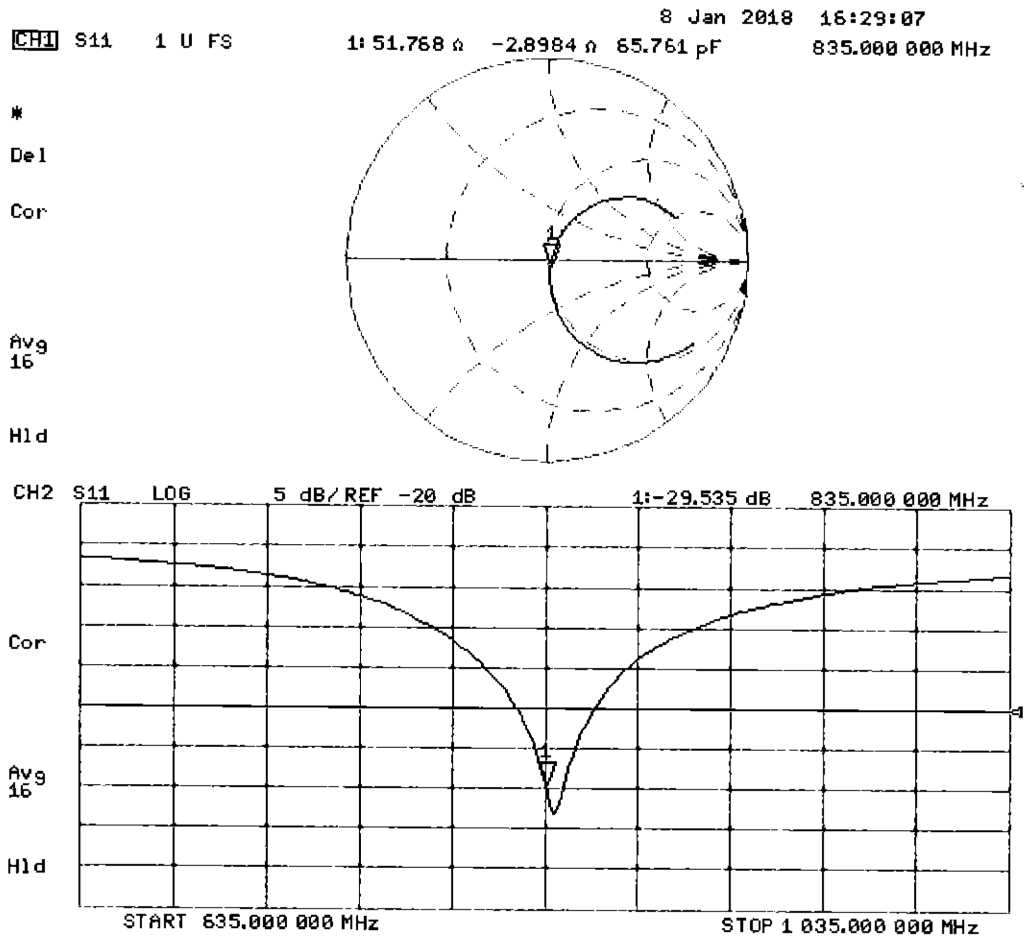
- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.23 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.22 W/kg



0 dB = 3.22 W/kg = 5.08 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

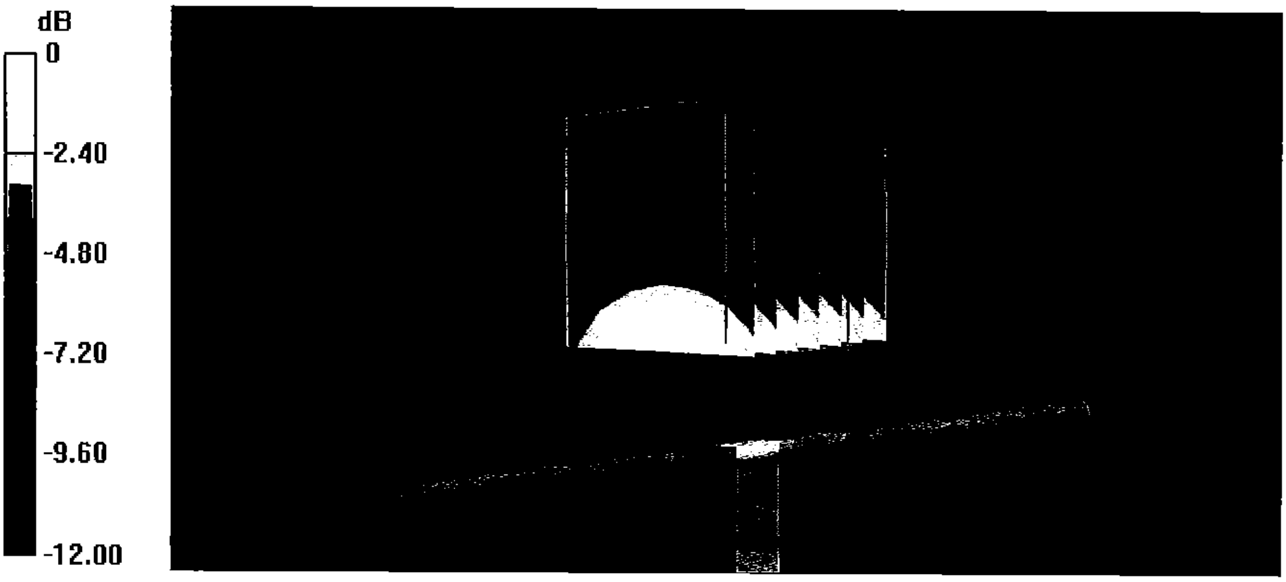
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

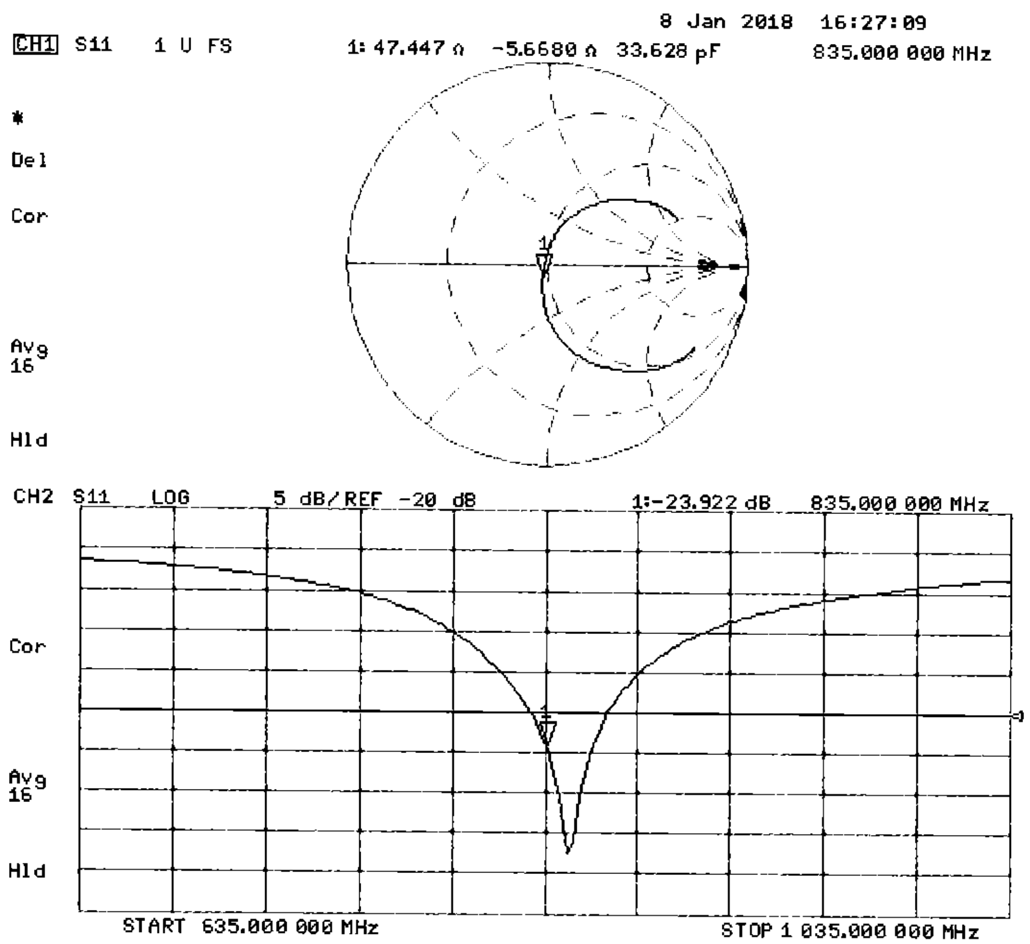
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.55 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 3.24 W/kg



0 dB = 3.24 W/kg = 5.11 dBW/kg

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 15.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.94$ S/m; $\varepsilon_r = 44.1$; $\rho = 1000$ kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

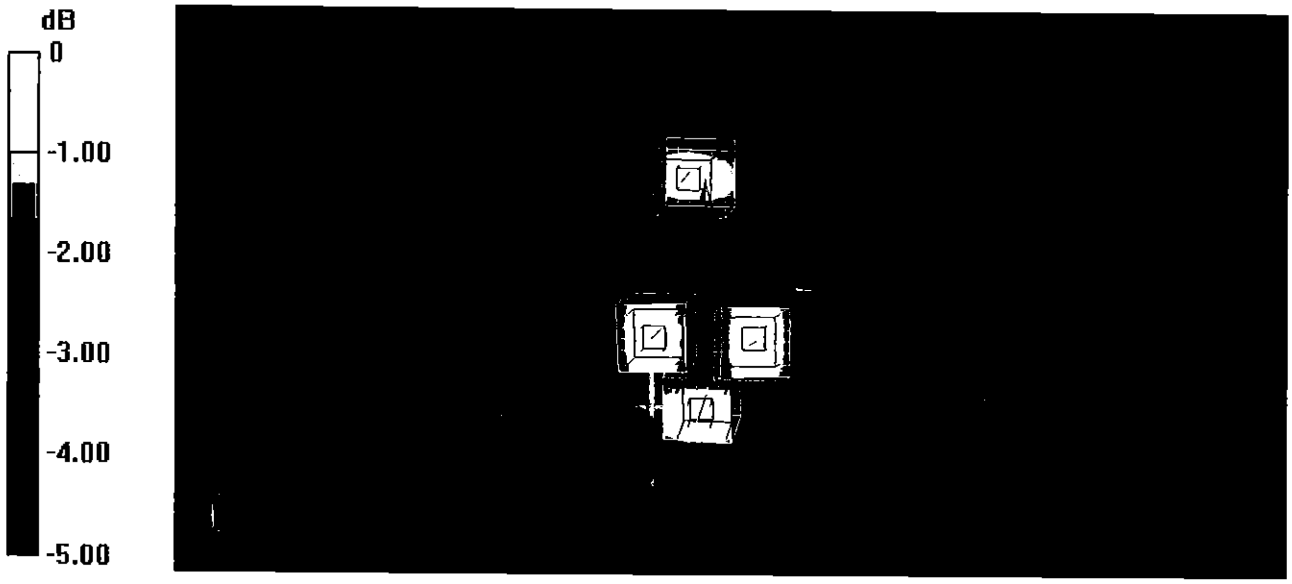
- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

SAM Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.00 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.16 W/kg

SAM Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.99 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.65 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.64 W/kg
Maximum value of SAR (measured) = 3.19 W/kg

SAM Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.20 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 3.04 W/kg

SAM Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.03 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.90 W/kg
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.61 W/kg



0 dB = 2.61 W/kg = 4.17 dBW/kg

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1750V2-1150_Oct18

CALIBRATION CERTIFICATE

Object	D1750V2 - SN:1150
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	October 22, 2018

BN✓
10/30/2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

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

Issued: October 22, 2018

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.33 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.76 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.5 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.04 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.82 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.4 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 Ω - 0.4 jΩ
Return Loss	- 40.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.6 Ω - 0.1 jΩ
Return Loss	- 29.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.217 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 10, 2015

DASY5 Validation Report for Head TSL

Date: 22.10.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1150

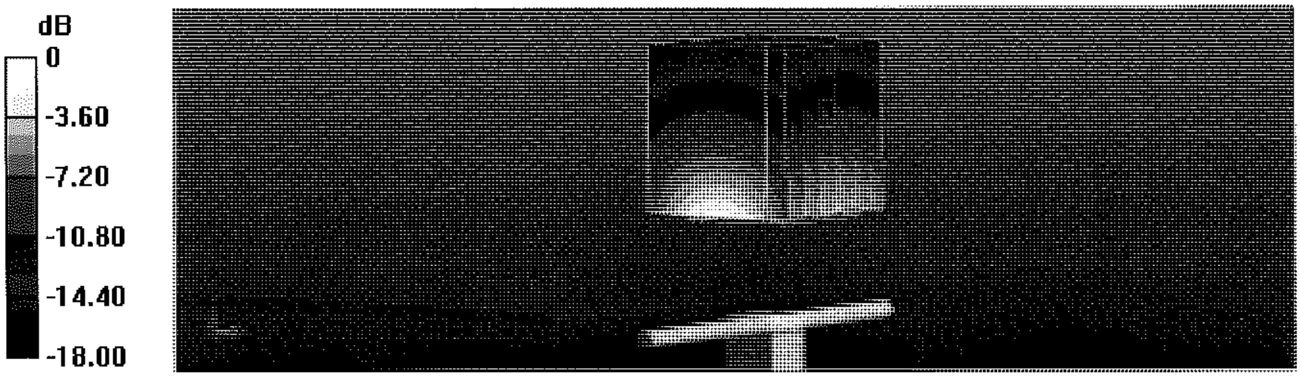
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.33 S/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

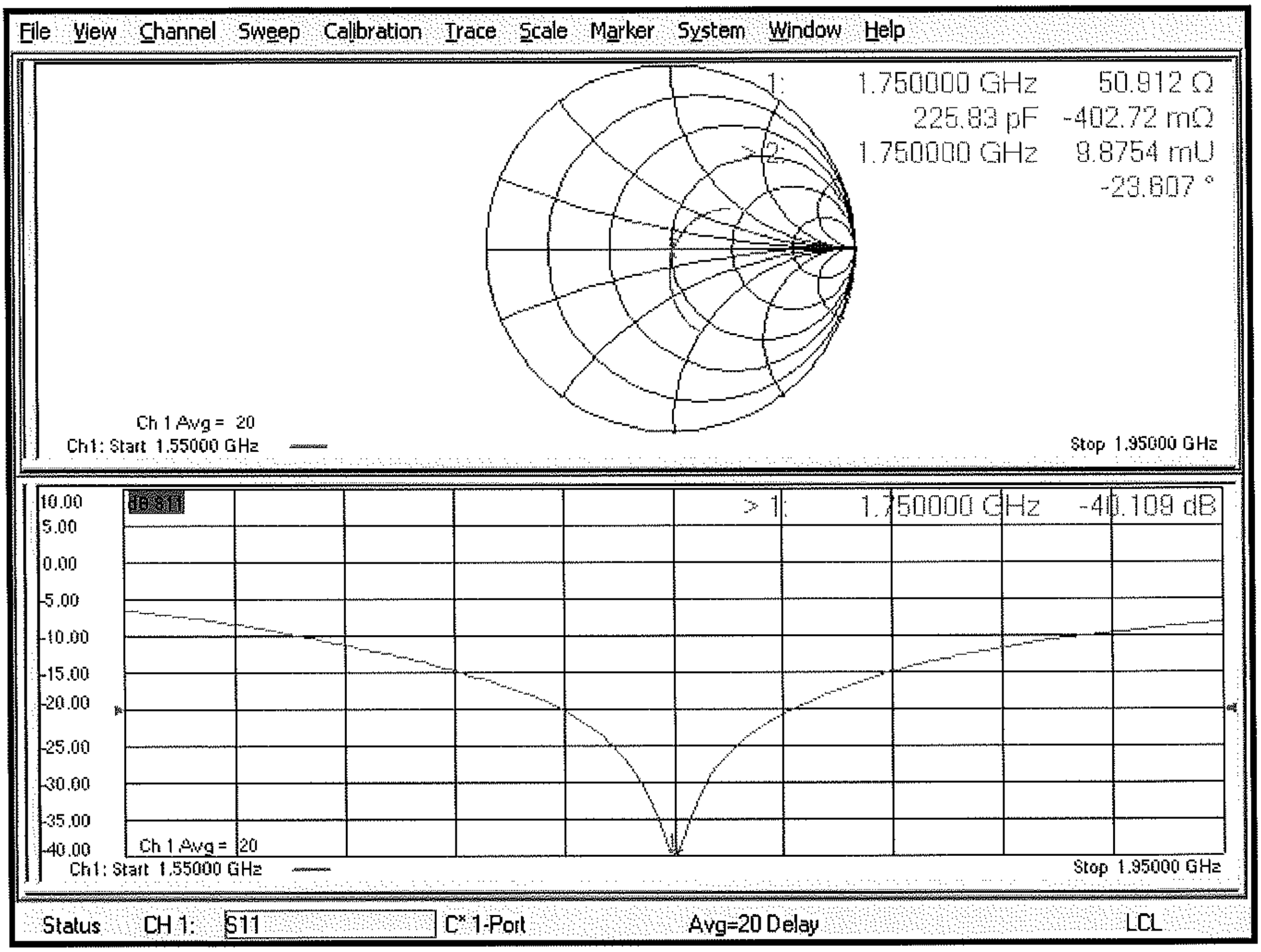
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.1 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.02 W/kg; SAR(10 g) = 4.76 W/kg
Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 22.10.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1150

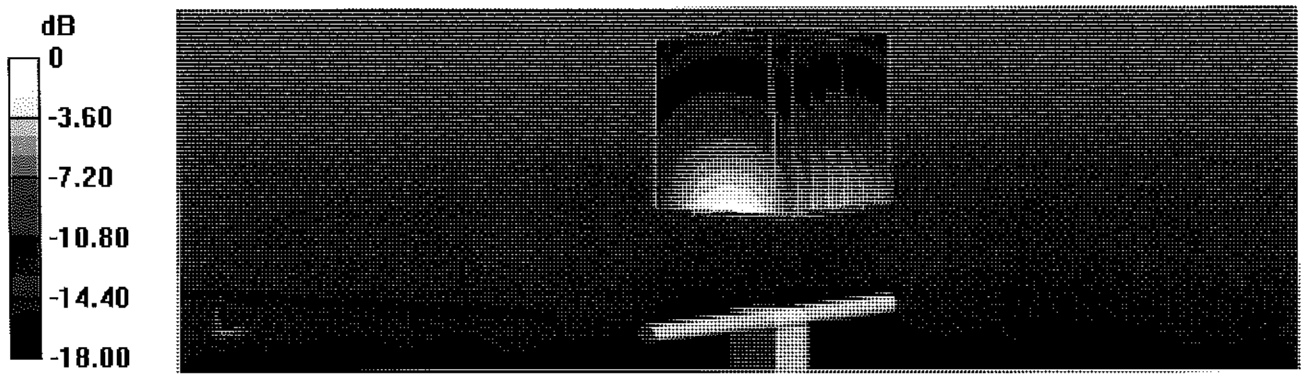
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.46 S/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

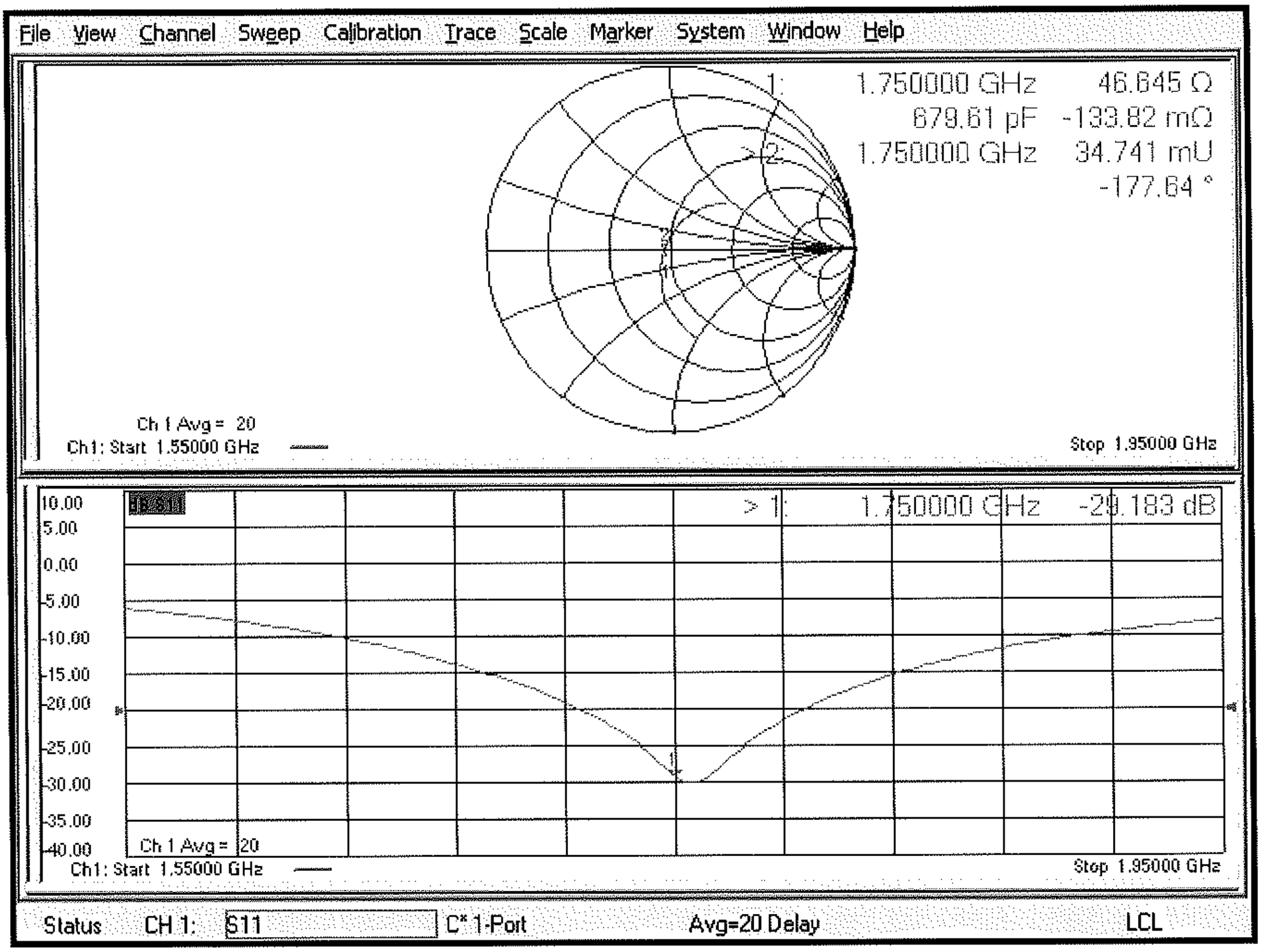
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.1 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.04 W/kg; SAR(10 g) = 4.82 W/kg
Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 W/kg = 11.34 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d148_Feb18

CALIBRATION CERTIFICATE

Object	D1900V2 - SN:5d148
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	February 07, 2018

BN
03-02-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 7, 2018

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.22 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.68 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.9 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 5.8 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω + 6.5 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d148

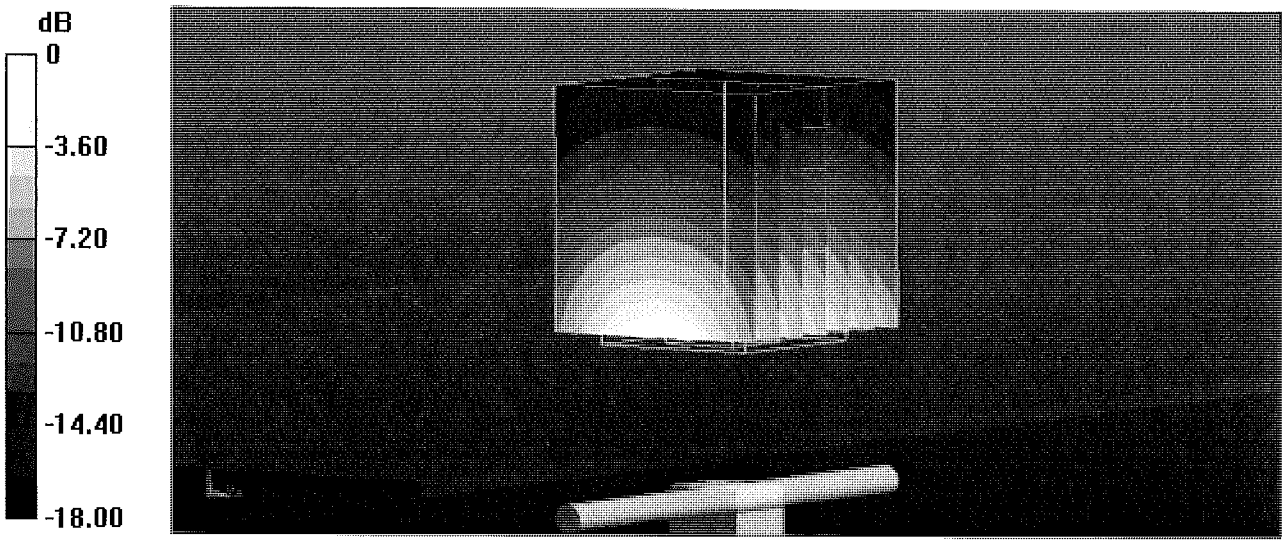
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.39 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

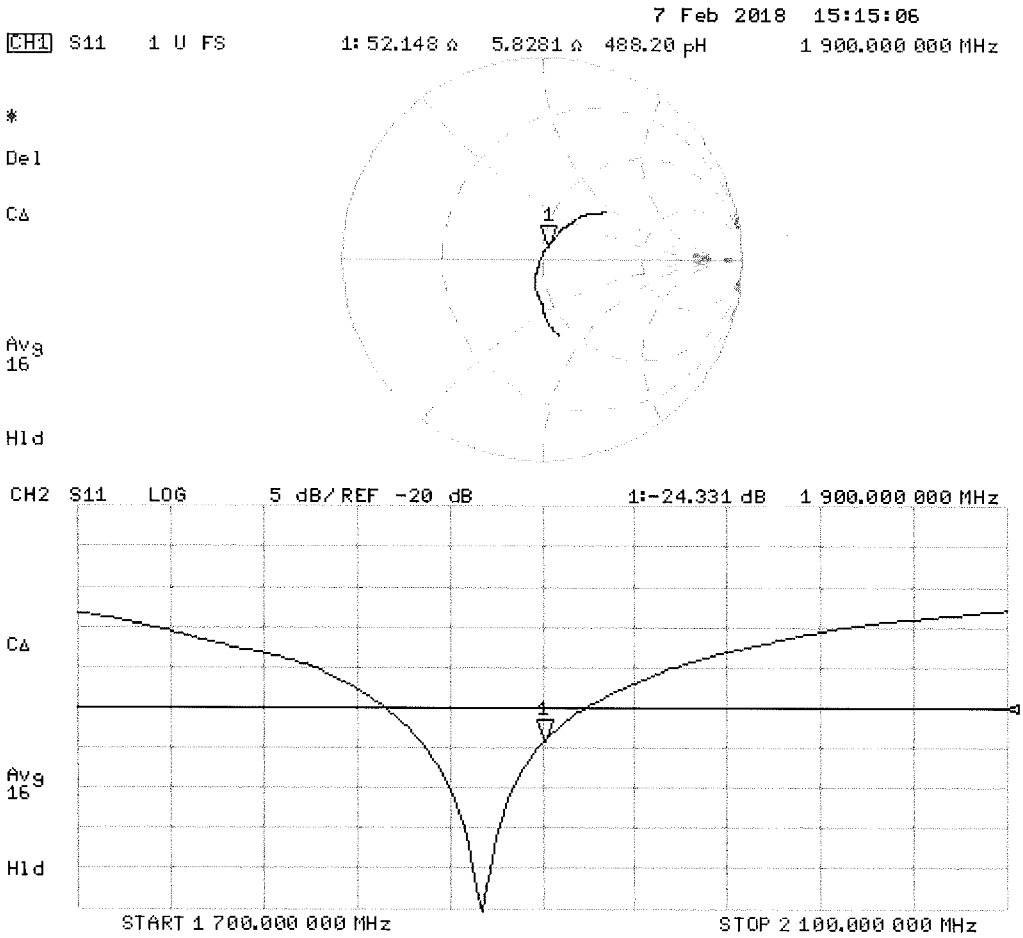
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.6 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 18.5 W/kg
SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.22 W/kg
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d148

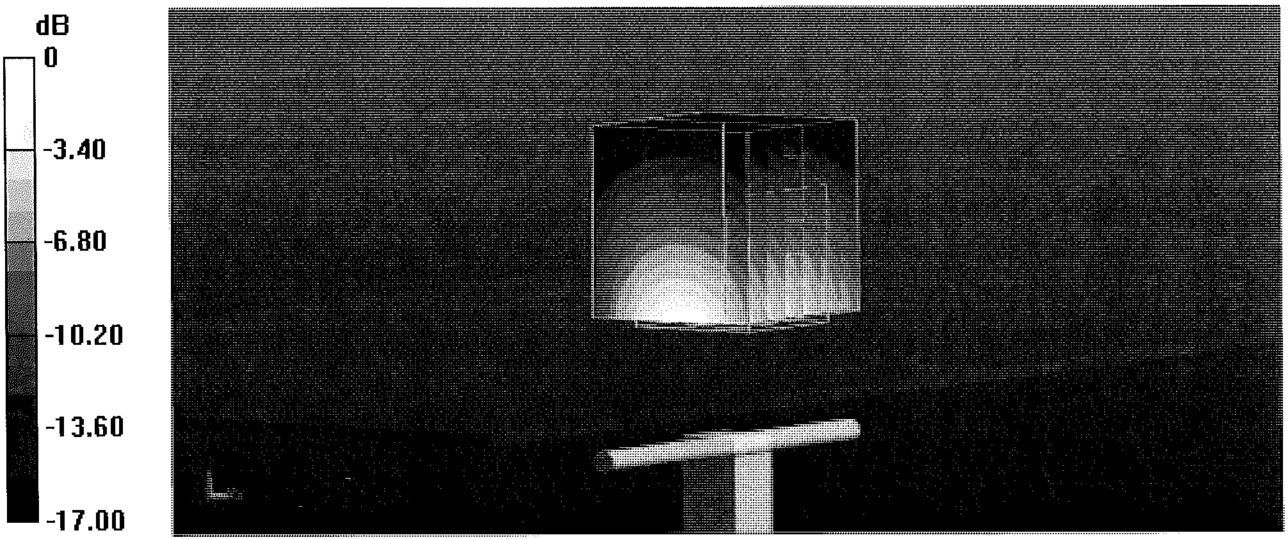
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.48 S/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

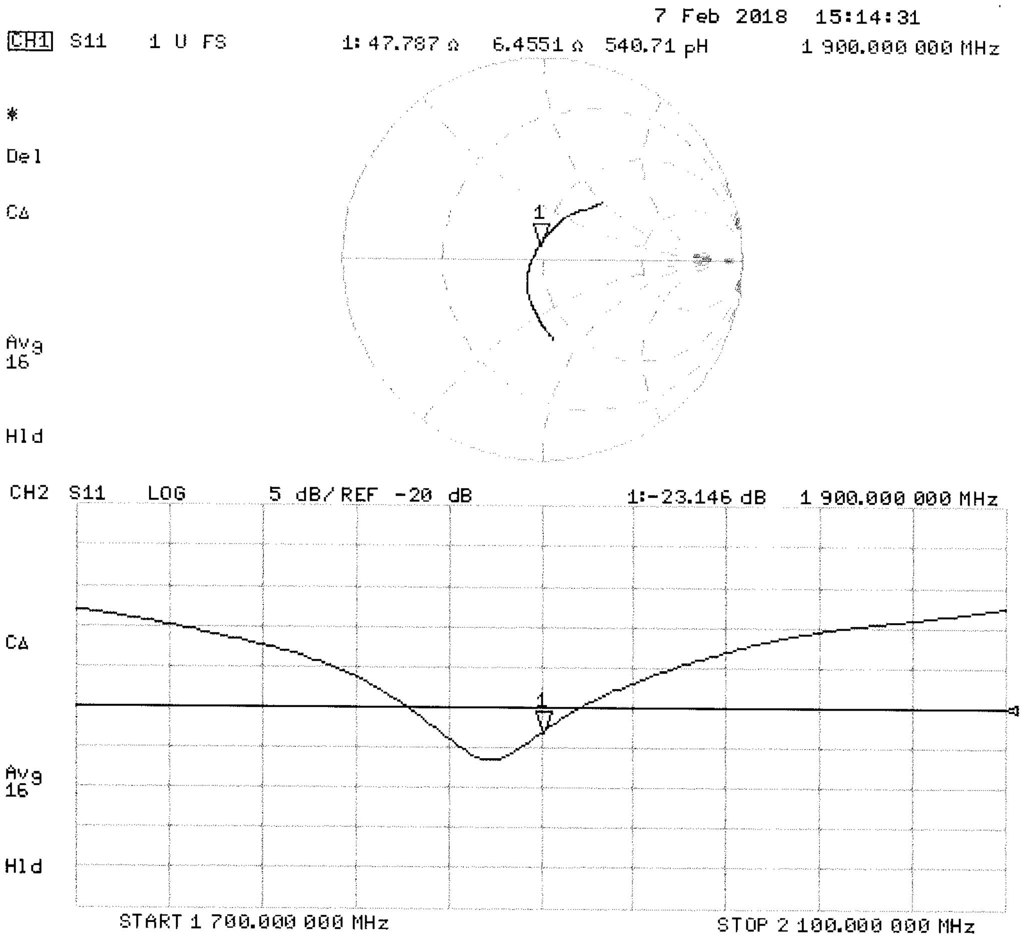
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.0 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.68 W/kg; SAR(10 g) = 5.14 W/kg
Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kg = 11.58 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D2450V2-981_Aug18

CALIBRATION CERTIFICATE

Object: D2450V2 - SN:981

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

BN ✓
09-06/2018

Calibration date: August 16, 2018

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	Leif Klysner
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 23, 2018

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.7 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.20 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.4 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	2.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.0 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**50.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.11 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.0 Ω + 2.3 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω + 4.7 jΩ
Return Loss	- 26.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 30, 2014

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L

SAR result with SAM Head (Top)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**54.0 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.2 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**54.0 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.3 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Neck)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**51.2 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.4 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Ear)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	8.74 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**34.7 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**17.5 W/kg ± 16.9 % (k=2)**

DASY5 Validation Report for Head TSL

Date: 13.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

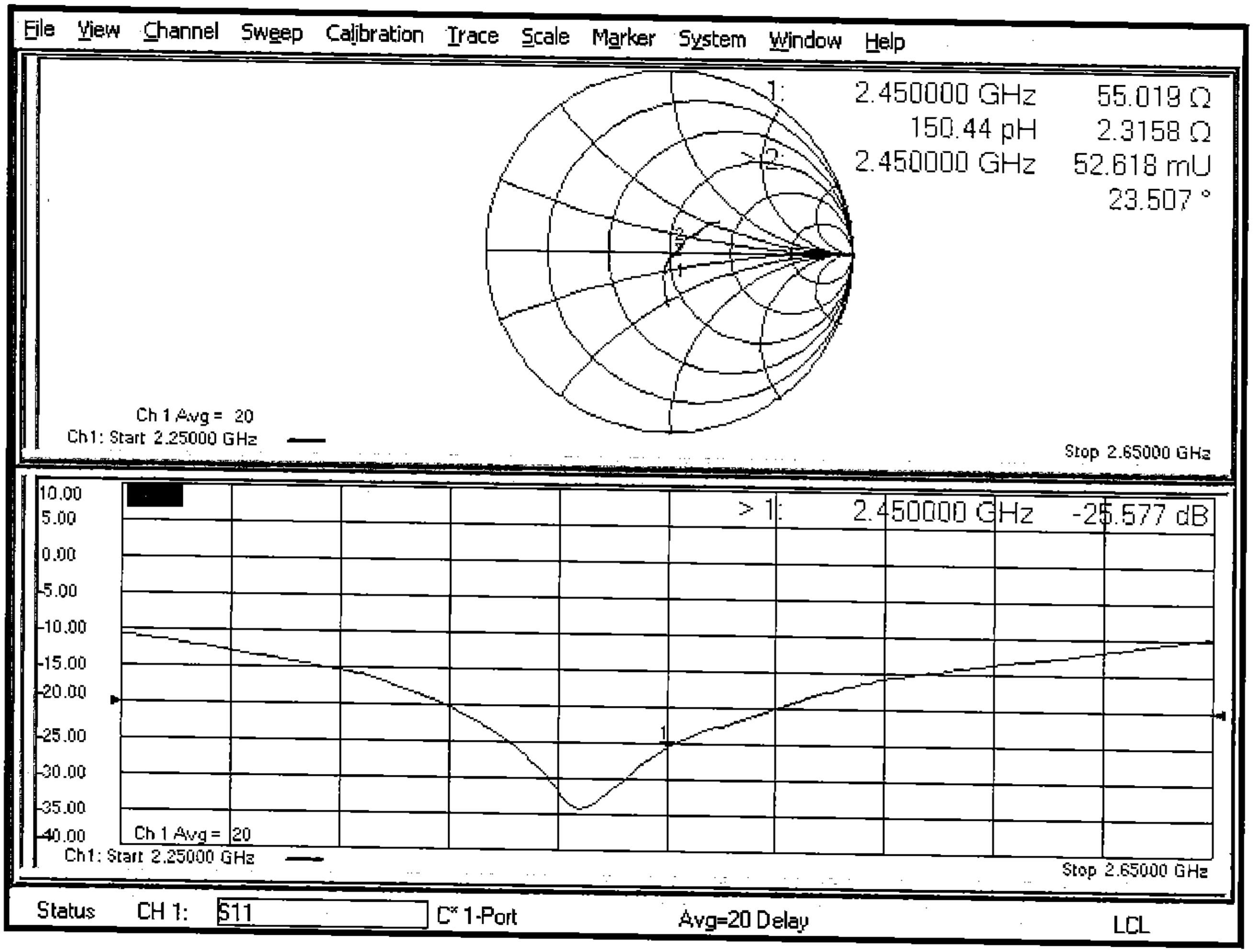
DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.6 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 26.7 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.2 W/kg
Maximum value of SAR (measured) = 22.1 W/kg

0 dB = 22.1 W/kg = 13.44 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

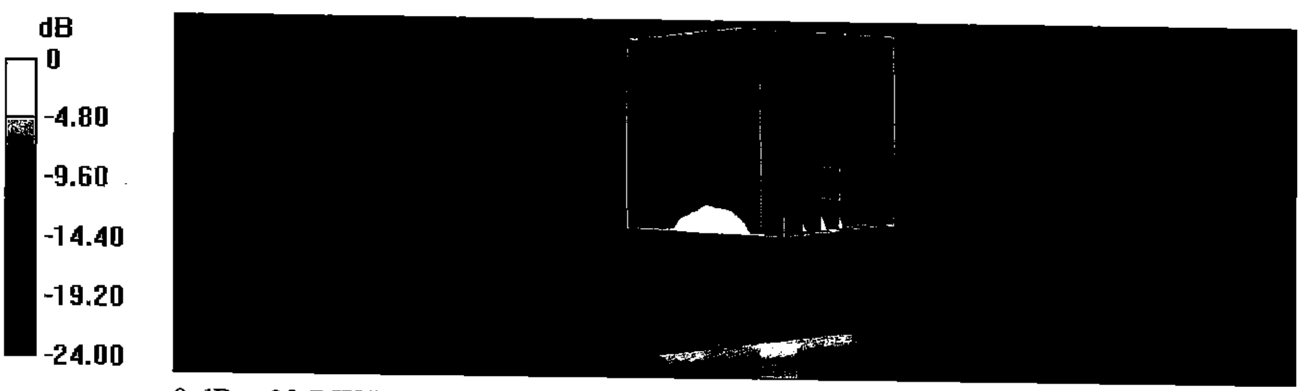
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.02 S/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.01, 8.01, 8.01) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

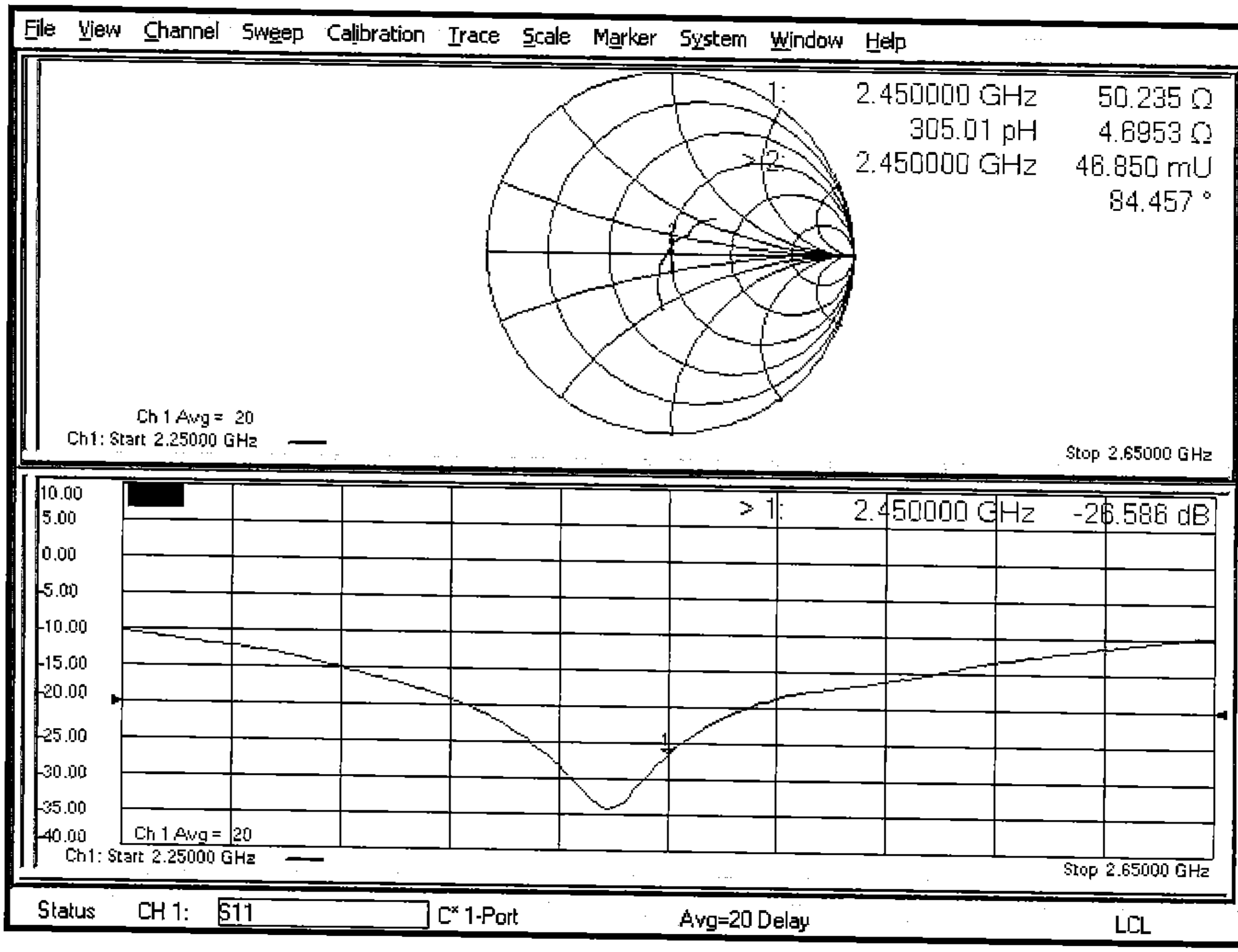
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.0 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 25.3 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (measured) = 20.7 W/kg



0 dB = 20.7 W/kg = 13.16 dBW/kg

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 16.08.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW ; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 S/m; ε_r = 40.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

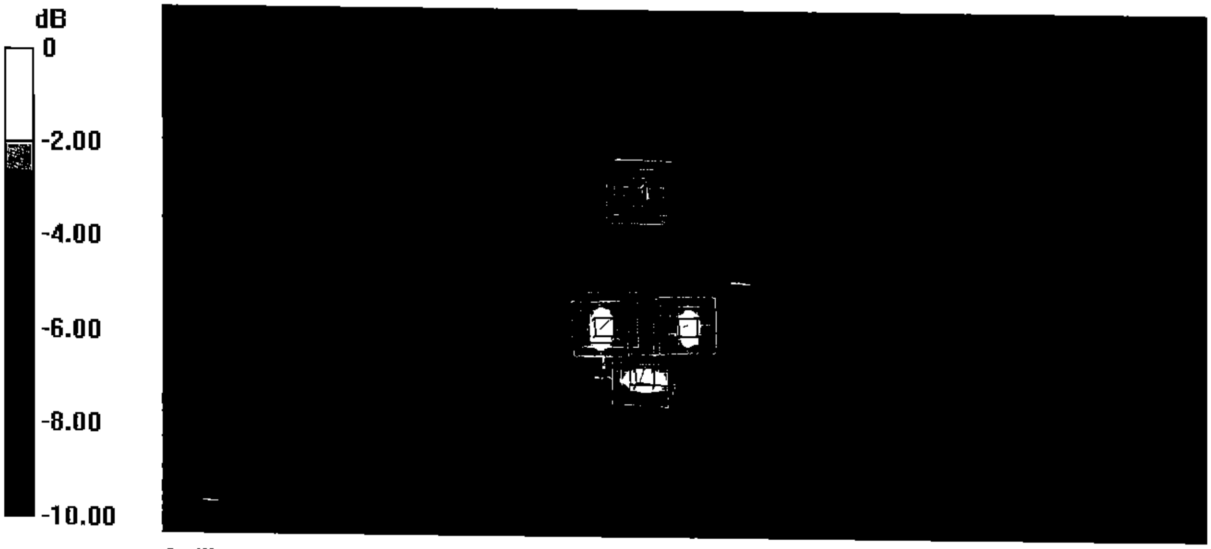
- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

SAM Head Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.2 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.33 W/kg
Maximum value of SAR (measured) = 22.0 W/kg

SAM Head Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.9 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 26.3 W/kg
SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.35 W/kg
Maximum value of SAR (measured) = 21.7 W/kg

SAM Head Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 112.0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 24.1 W/kg
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (measured) = 20.5 W/kg

SAM Head Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.03 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 8.74 W/kg; SAR(10 g) = 4.4 W/kg
Maximum value of SAR (measured) = 13.5 W/kg



0 dB = 22.0 W/kg = 13.42 dBW/kg