PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctestlab.com

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:
12/30/16 – 02/15/17
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M1701030007-01-R1.A3L

FCC ID: **A3LSMG955F**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-G955F, SM-G955FD, SM-G955X

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.20	0.27	0.76	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.41	0.62	1.10	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.17	0.97	0.92	2.15
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.14	0.49	1.09	3.24
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.25	0.76	1.09	2.02
PCE	LTE Band 12	699.7 - 715.3 MHz	0.12	0.18	0.29	N/A
PCE	LTE Band 17	706.5 - 713.5 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.10	0.20	0.39	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.20	0.31	0.70	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.19	0.35	0.70	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.14	0.96	1.09	2.17
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.12	0.86	1.09	2.21
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	0.24	0.53	N/A
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.67	0.16	0.26	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.50	< 0.1	N/A	0.56
NII	U-NII-2C	5500 - 5720 MHz	0.27	< 0.1	N/A	0.80
NII	U-NII-3	5745 - 5825 MHz	0.58	0.10	0.14	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.15	0.10	<0.1	0.61
Simultaneous SAR per KDB 690783 D01v01r03:			1.52	1.21	1.59	3.98

Note: This revised Test Report (S/N: 1M1701030007-01-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 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

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

TABLE OF CONTENTS

1 DEVICE UNDER TEST 3

2 LTE INFORMATION 13

3 INTRODUCTION 14

4 DOSIMETRIC ASSESSMENT 15

5 DEFINITION OF REFERENCE POINTS 16

6 TEST CONFIGURATION POSITIONS 17

7 RF EXPOSURE LIMITS 21

8 FCC MEASUREMENT PROCEDURES 22

9 RF CONDUCTED POWERS 28

10 SYSTEM VERIFICATION 61

11 SAR DATA SUMMARY 65

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS 85

13 SAR MEASUREMENT VARIABILITY 94

14 ADDITIONAL TUNER TESTING PER FCC GUIDANCE 95

15 EQUIPMENT LIST 96

16 MEASUREMENT UNCERTAINTIES 97

17 CONCLUSION 98

18 REFERENCES 99

APPENDIX A: SAR TEST PLOTS

APPENDIX B: SAR DIPOLE VERIFICATION PLOTS

APPENDIX C: PROBE AND DIPOLE CALIBRATION CERTIFICATES

APPENDIX D: SAR TISSUE SPECIFICATIONS

APPENDIX E: SAR SYSTEM VALIDATION

APPENDIX F: DUT ANTENNA DIAGRAM & SAR TEST SETUP PHOTOGRAPHS

APPENDIX G: CONDUCTED POWERS FOR 4X4 DL MIMO

APPENDIX H: SENSOR TRIGGERING DATA SUMMARY

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 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
MST	Data	555 Hz - 8.33 kHz
ANT+	Data	2402 - 2480 MHz

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 and 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 PCE Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**34.0**	**34.0**	**32.0**	**30.5**	**29.0**	**27.5**	**26.0**	**24.0**	**22.5**
	Nominal	**33.5**	**33.5**	**31.5**	**30.0**	**28.5**	**27.0**	**25.5**	**23.5**	**22.0**
GSM/GPRS/EDGE 1900	Maximum	**31.0**	**31.0**	**28.2**	**25.0**	**24.2**	**26.5**	**25.0**	**23.0**	**21.0**
	Nominal	**30.5**	**30.5**	**27.7**	**24.5**	**23.7**	**26.0**	**24.5**	**22.5**	**20.5**

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*
UMTS Band 5 (850 MHz)	Maximum	**25.0**	**24.5**	**24.5**
	Nominal	**24.5**	**24.0**	**24.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.5**	**24.0**	**22.5**
	Nominal	**24.0**	**23.5**	**22.0**
UMTS Band 2 (1900 MHz)	Maximum	**24.5**	**24.0**	**24.0**
	Nominal	**24.0**	**23.5**	**23.5**

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 17	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 13	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 26 (Cell)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 5 (Cell)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 66 (AWS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 4 (AWS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 25 (PCS)	Maximum	**23.5**
	Nominal	**23.5**
LTE Band 2 (PCS)	Maximum	**23.5**
	Nominal	**23.5**
LTE Band 41	Maximum	**25.0**
	Nominal	**24.5**

1.3.2 Reduced PCE Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 1900	Maximum	**31.0**	**29.0**	**25.0**	**23.0**	**22.2**	**26.5**	**25.0**	**23.0**	**21.0**
	Nominal	**30.5**	**28.5**	**24.5**	**22.5**	**21.7**	**26.0**	**24.5**	**22.5**	**20.5**

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*
UMTS Band 4 (1750 MHz)	Maximum	**21.0**	**21.0**	**21.0**
	Nominal	**20.5**	**20.5**	**20.5**
UMTS Band 2 (1900 MHz)	Maximum	**20.5**	**20.5**	**20.5**
	Nominal	**20.0**	**20.0**	**20.0**

Mode / Band		Modulated Average (dBm)
LTE Band 66 (AWS)	Maximum	**21.0**
	Nominal	**20.5**
LTE Band 4 (AWS)	Maximum	**21.0**
	Nominal	**20.5**
LTE Band 25 (PCS)	Maximum	**20.5**
	Nominal	**20.0**
LTE Band 2 (PCS)	Maximum	**20.5**
	Nominal	**20.0**

1.3.3 Maximum Bluetooth and SISO and MIMO WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**18.5**
	Nominal	**18.0**
IEEE 802.11g (2.4 GHz)	Maximum	**17.5**
	Nominal	**17.0**
IEEE 802.11n (2.4 GHz)	Maximum	**15.5**
	Nominal	**15.0**
Bluetooth	Maximum	**16.0**
	Nominal	**15.5**
Bluetooth (2 MBps)	Maximum	**10.0**
	Nominal	**9.5**
Bluetooth (3 MBps)	Maximum	**10.0**
	Nominal	**9.5**
Bluetooth LE	Maximum	**10.0**
	Nominal	**9.5**

Mode / Band		Modulated Average - MIMO (dBm)
IEEE 802.11g (2.4 GHz)	Maximum	**20.5**
	Nominal	**20.0**
IEEE 802.11n (2.4 GHz)	Maximum	**18.5**
	Nominal	**18.0**

2.4 GHz WLAN Channel 12 will operate with Single Tx target power of 2.5dBm.
2.4 GHz WLAN Channel 13 will operate with Single Tx target power of 0.25dBm.

Mode / Band		Modulated Average - Single Tx Chain (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
		CH 36-48	Ch 52 - 165	Ch 38-46	Ch 52-62	Ch 102 - 157	Ch 42, 58	Ch 106 - 155
IEEE 802.11a (5 GHz)	Maximum	**16.5**	**18.5**					
	Nominal	**16.0**	**18.0**					
IEEE 802.11n (5 GHz)	Maximum	**16.5**	**18.5**	**15.5**	**14.5**	**16.5**		
	Nominal	**16.0**	**18.0**	**15.0**	**14.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**16.5**	**18.5**	**15.5**	**14.5**	**16.5**	**14.5**	**15.5**
	Nominal	**16.0**	**18.0**	**15.0**	**14.0**	**16.0**	**14.0**	**15.0**

Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
		CH 36-48	Ch 52 - 165	Ch 38-46	Ch 52-62	Ch 102 - 157	Ch 42, 58	Ch 106 - 155
IEEE 802.11a (5 GHz)	Maximum	**19.5**	**21.5**					
	Nominal	**19.0**	**21.0**					
IEEE 802.11n (5 GHz)	Maximum	**19.5**	**21.5**	**18.5**	**17.5**	**19.5**		
	Nominal	**19.0**	**21.0**	**18.0**	**17.0**	**19.0**		
IEEE 802.11ac (5 GHz)	Maximum	**19.5**	**21.5**	**18.5**	**17.5**	**19.5**	**17.5**	**18.5**
	Nominal	**19.0**	**21.0**	**18.0**	**17.0**	**19.0**	**17.0**	**18.0**

1.3.4 Reduced SISO and MIMO WLAN power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**15.5**
	Nominal	**15.0**
IEEE 802.11g (2.4 GHz)	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11n (2.4 GHz)	Maximum	**12.5**
	Nominal	**12.0**
Mode / Band		Modulated Average - MIMO (dBm)
IEEE 802.11g (2.4 GHz)	Maximum	**17.5**
	Nominal	**17.0**
IEEE 802.11n (2.4 GHz)	Maximum	**15.5**
	Nominal	**15.0**

2.4 GHz WLAN Channel 12 will operate with Single Tx target power of 2.5dBm.
2.4 GHz WLAN Channel 13 will operate with Single Tx target power of 0.25dBm.

Mode / Band		Modulated Average - Single Tx Chain (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
		CH 36-48	Ch 52 - 165	Ch 38-46	Ch 52-62	Ch 102 - 157	Ch 42, 58	Ch 106 - 155
IEEE 802.11a (5 GHz)	Maximum	**15.5**	**15.5**					
	Nominal	**15.0**	**15.0**					
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**15.5**	**13.5**	**13.5**	**13.5**		
	Nominal	**15.0**	**15.0**	**13.0**	**13.0**	**13.0**		
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**15.5**	**13.5**	**13.5**	**13.5**	**12.5**	**12.5**
	Nominal	**15.0**	**15.0**	**13.0**	**13.0**	**13.0**	**12.0**	**12.0**
Mode / Band		Modulated Average - MIMO (dBm)						
		20 MHz Bandwidth		40 MHz Bandwidth			80 MHz Bandwidth	
		CH 36-48	Ch 52 - 165	Ch 38-46	Ch 52-62	Ch 102 - 157	Ch 42, 58	Ch 106 - 155
IEEE 802.11a (5 GHz)	Maximum	**18.5**	**18.5**					
	Nominal	**18.0**	**18.0**					
IEEE 802.11n (5 GHz)	Maximum	**18.5**	**18.5**	**16.5**	**16.5**	**16.5**		
	Nominal	**18.0**	**18.0**	**16.0**	**16.0**	**16.0**		
IEEE 802.11ac (5 GHz)	Maximum	**18.5**	**18.5**	**16.5**	**16.5**	**16.5**	**15.5**	**15.5**
	Nominal	**18.0**	**18.0**	**16.0**	**16.0**	**16.0**	**15.0**	**15.0**

1.3.5 Maximum Powers During Conditions with Simultaneous 2.4 GHz and 5 GHz WLAN

	# Tx	5 GHz WIFI [dBm]		2.4 GHz WIFI [dBm]		802.11 Modes
		Ant1	Ant2	Ant1	Ant2	
2.4 GHz + 5 GHz	2	A	-	-	B	2.4 GHz: b,g,n 5 GHz: a,n,ac
	2	-	A	B	-	
	2	A	-	B	-	
	2	-	A	-	B	
	3	A	A	B	-	2.4 GHz: b, g, n 5 GHz: n, ac, a (CDD + STBC only)
	3	A	A	-	B	
	3	A	-	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: a, n, ac
	3	-	A	B	B	
	4	A	A	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: n, ac, a (CDD + STBC only)

A = 12 dBm
B = 12 dBm
2.4 GHz WLAN Channel 12 will operate with Single Tx target power of 2.5dBm.
2.4 GHz WLAN Channel 13 will operate with Single Tx target power of 0.25dBm.
(Upper tolerance: target + 0.5 dB)

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
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 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 66 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41	Yes	Yes	No	Yes	Yes	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. Therefore, U-NII-1, U-NII-2A, U-NII-2C operations are not considered in this section.

1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 1-1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

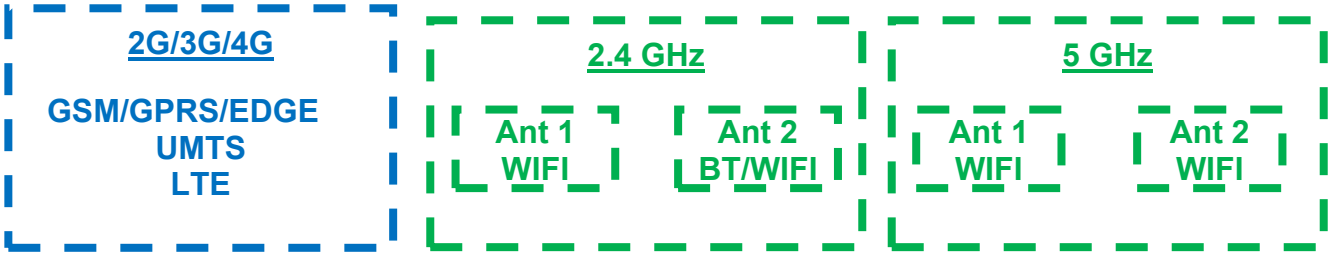


Figure 1-1
Simultaneous Transmission Paths

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.

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	*BT Tethering applications are considered
4	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
5	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	GSM voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
8	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
9	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
10	UMTS + 2.4 GHz Bluetooth	Yes*	Yes	Yes*	Yes	*BT Tethering applications are considered
11	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
12	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
13	UMTS + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
14	UMTS + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
15	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
16	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
17	LTE + 2.4 GHz Bluetooth	Yes*	Yes	Yes*	Yes	*BT Tethering applications are considered
18	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
19	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
20	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	LTE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
22	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	Yes	
23	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
24	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes*	Yes	*BT Tethering applications are considered
25	GPRS/EDGE + 2.4 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
26	GPRS/EDGE + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
27	GPRS/EDGE + 2.4 GHz WI-FI + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
28	GPRS/EDGE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	

Table 1-2
Simultaneous Transmission Scenarios

1. This device supports 2x2 MIMO Tx for WLAN. 802.11a/g/n/ac supports CDD and STBC and 802.11n/ac additionally supports SDM.
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-NII2A, and U-NII2C were not evaluated for wireless router conditions.
6. This device supports Bluetooth tethering for EDR packet only
7. This device supports VOLTE.
8. This device supports VOWIFI

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since U-NII-1 maximum output power is less than U-NII-2A 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.

This device supports IEEE 802.11ac with the following features:

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

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 and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

(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 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.

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.

This device supports downlink 4x4 MIMO operations for LTE Bands 4 only. Per FCC 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 both LTE B17 and LTE B12. Since the supported frequency span for LTE B17 falls completely within the supported frequency span for LTE B12, both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B12.

This device supports both LTE B2 and LTE B25. Since the supported frequency span for LTE B2 falls completely within the supported frequency span for LTE B25, both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B25.

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. Phablet SAR was not evaluated for licensed technologies since wireless router 1g SAR was < 1.2 W/kg for these modes.

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)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

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. Power level was configured for tested via software only available to the manufacturer (end user cannot control power level) per KDB 616217.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Phablet Serial Number
GSM/GPRS/EDGE 850	07EA5	07EA5	07EA5	-
UMTS 850	07EA5	07CF5	07CF5	-
UMTS 1750	07CF0	07CF0	07CF0	07CF0
GSM/GPRS/EDGE 1900	07EAD	07E7A	07EA5	07EA5
UMTS 1900	07EAD	07EB0	07EB0	07EB0
LTE Band 12	07CF0	07CF0	07CF0	-
LTE Band 13	07CF0	07D04	07D04	-
LTE Band 26 (Cell)	07EA5	07EA5	07EA5	-
LTE Band 5 (Cell)	07CF0	07D04	07D04	-
LTE Band 66 (AWS)	07CF0	07CF0	07CF0	07E7A
LTE Band 25 (PCS)	07EAD	07EB0	07EB0	07EB0
LTE Band 41	07E80	07EA5	07EA5	-
2.4 GHz WLAN	07D04	07D04	07D04	-
5 GHz WLAN	07E7A	07E7A	07E7A	07E7A
Bluetooth	07EA5	07EB0	07EB0	07EB0

2 LTE INFORMATION

LTE Information					
FCC ID	**A3LSMG955F**				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 66 (AWS) (1710.7 - 1779.3 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 17: 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 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 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 17: 5 MHz	706.5 (23755)		710 (23790)		713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)		710 (23790)		711 (23800)
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)		784.5 (23255)
LTE Band 13: 10 MHz	N/A		782 (23230)		N/A
LTE Band 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 66 (AWS): 1.4 MHz	1710.7 (131979)	1733.6 (132208)		1756.4 (132436)	1779.3 (132665)
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)		1778.5 (132657)
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)		1777.5 (132647)
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)		1775 (132622)
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)		1772.5 (132597)
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)		1770 (132572)
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 16 (QPSK, 16QAM, 64QAM, 256QAM) UL UE Cat 5 (QPSK, 16QAM, 64QAM)				
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 Release 10 Additional Information	This device does not support full CA features on 3GPP Release 12. It supports carrier aggregation and downlink MIMO features as shown in Section 9, and Appendix G. 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 12 Features are not supported: Relay, HetNet, Enhanced eICIC, WIFI Offloading, 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:

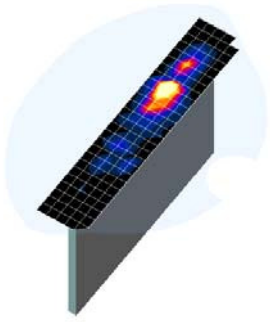


Figure 4-1
Sample SAR Area Scan

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*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

5 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].

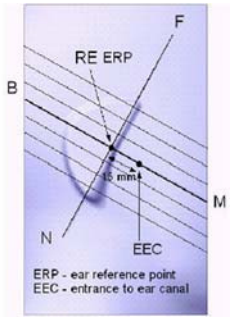


Figure 5-1
Close-Up Side view of ERP

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.

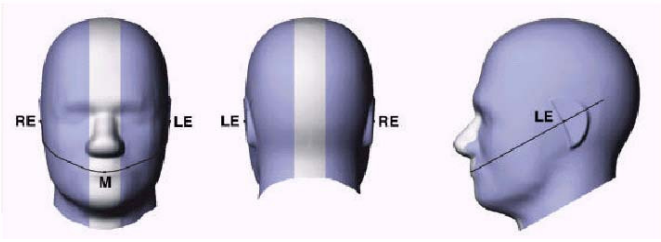


Figure 5-2
Front, back and side view of SAM Twin Phantom

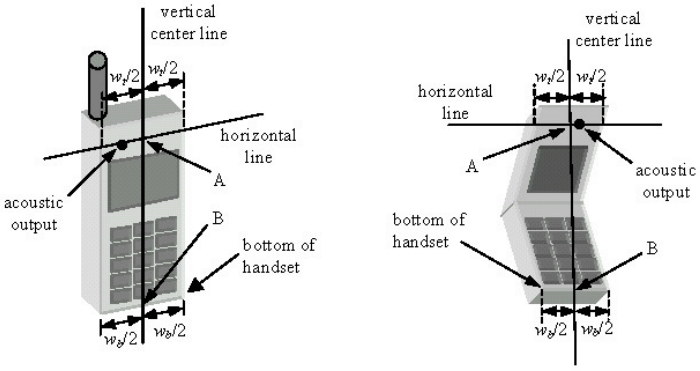


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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).

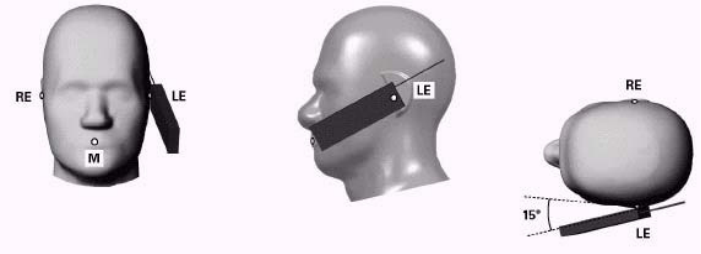


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

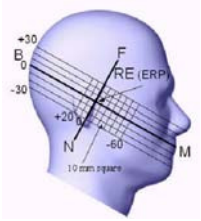


Figure 6-3
Side view w/ relevant markings

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

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.

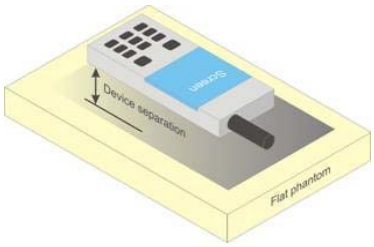


Figure 6-4
Sample Body-Worn Diagram

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 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

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

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L 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 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

6.9 Additional Test Positions due to Proximity Conditions

This device uses a sensor to reduce voice and data powers in extremity (hand-held) use conditions.

When the sensor detects a user is touching the device on or near to the antenna the device reduces the maximum allowed output power However, the proximity sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, an additional exposure condition is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level.

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

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.

8.5 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. For every supported combination of downlink only carrier aggregation, additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each

frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

8.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

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

8.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10-g 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 10-g 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 10-g 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. 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 10-g 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 10-g 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 10-g 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 Powers

Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	33.40	33.49	30.99	**29.57**	28.50	26.87	24.55	23.25	21.96
	190	33.31	33.31	30.98	**29.62**	28.37	26.80	24.56	23.34	21.99
	251	33.38	33.41	30.90	**29.43**	28.34	26.82	24.50	23.31	21.95
GSM 1900	512	29.71	29.72	**27.23**	24.34	23.40	25.92	23.68	22.45	20.59
	661	29.90	29.70	**26.85**	23.96	23.10	25.52	23.33	21.75	20.01
	810	30.28	30.20	**27.32**	23.97	23.35	26.03	23.86	22.29	20.47
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	24.37	24.46	24.97	**25.31**	25.49	17.84	18.53	18.99	18.95
	190	24.28	24.28	24.96	**25.36**	25.36	17.77	18.54	19.08	18.98
	251	24.35	24.38	24.88	**25.17**	25.33	17.79	18.48	19.05	18.94
GSM 1900	512	20.68	20.69	**21.21**	20.08	20.39	16.89	17.66	18.19	17.58
	661	20.87	20.67	**20.83**	19.70	20.09	16.49	17.31	17.49	17.00
	810	21.25	21.17	**21.30**	19.71	20.34	17.00	17.84	18.03	17.46
GSM 850	Frame Avg.Targets:	24.47	24.47	25.48	**25.74**	25.49	17.97	19.48	19.24	18.99
GSM 1900		21.47	21.47	**21.68**	20.24	20.69	16.97	18.48	18.24	17.49

Table 9-2
Reduced Conducted Powers

Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 1900	512	**29.71**	**27.55**	23.85	22.39	21.49	25.23	22.75	21.45	19.73
	661	**29.90**	**27.69**	23.55	22.20	21.36	25.33	22.94	21.48	19.54
	810	**30.28**	**28.27**	23.61	22.64	21.75	25.80	23.41	21.89	20.07
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	**20.68**	**18.52**	17.83	18.13	18.48	16.20	16.73	17.19	16.72
	661	**20.87**	**18.66**	17.53	17.94	18.35	16.30	16.92	17.22	16.53
	810	**21.25**	**19.24**	17.59	18.38	18.74	16.77	17.39	17.63	17.06
GSM 1900	Frame Avg.Targets:	**21.47**	**19.47**	18.48	18.24	18.69	16.97	17.98	18.24	17.49

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 Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.43	24.50	24.89	23.09	23.23	23.19	23.10	22.78	22.84	-
99		12.2 kbps AMR	24.40	24.46	24.54	23.07	23.20	23.11	23.12	22.84	22.87	-
6	HSDPA	Subtest 1	23.22	23.28	23.40	22.99	23.15	23.06	23.11	22.94	22.94	0
6		Subtest 2	22.43	22.49	22.48	23.03	23.20	23.26	23.27	22.82	23.02	0
6		Subtest 3	22.47	22.62	22.65	22.10	22.11	22.10	22.34	22.06	22.19	0.5
6		Subtest 4	21.53	21.50	21.85	22.11	22.16	22.15	22.39	22.15	22.04	0.5
6	HSUPA	Subtest 1	22.39	22.45	22.53	21.53	21.74	21.68	22.42	22.05	22.10	0
6		Subtest 2	20.65	20.85	20.73	18.02	18.03	18.04	19.88	19.56	19.62	2
6		Subtest 3	22.40	22.50	22.50	21.61	21.76	21.74	22.40	22.16	22.15	1
6		Subtest 4	20.77	20.85	20.90	18.51	18.56	18.50	19.82	19.62	19.69	2
6		Subtest 5	24.50	24.48	24.49	22.50	22.45	22.48	23.00	22.18	22.89	0

Table 9-4
Reduced Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	20.16	20.23	20.21	19.90	19.82	19.95	-
99		12.2 kbps AMR	20.15	20.22	20.26	20.08	19.91	19.92	-
6	HSDPA	Subtest 1	20.00	20.18	20.00	20.21	19.95	19.88	0
6		Subtest 2	20.05	20.22	20.13	20.21	20.00	20.01	0
6		Subtest 3	20.06	20.28	20.19	20.36	20.04	20.10	0.5
6		Subtest 4	20.07	20.28	20.14	20.29	19.94	20.02	0.5
6	HSUPA	Subtest 1	20.09	20.31	20.17	20.22	19.88	20.02	0
6		Subtest 2	17.51	17.50	17.49	19.87	19.54	19.57	2
6		Subtest 3	20.19	20.25	20.29	20.28	20.07	20.05	1
6		Subtest 4	18.12	18.24	18.22	19.81	19.54	19.60	2
6		Subtest 5	20.10	20.15	20.18	20.29	20.25	20.01	0

This device does not support DC-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 9-5
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	**23.90**	0	0
	1	25	23.73		0
	1	49	23.78		0
	25	0	22.83	0-1	1
	25	12	**22.86**		1
	25	25	22.75		1
	50	0	22.84		1
16QAM	1	0	22.99	0-1	1
	1	25	22.93		1
	1	49	22.97		1
	25	0	21.83	0-2	2
	25	12	21.85		2
	25	25	21.75		2
	50	0	21.79		2
64QAM	1	0	21.66	0-2	2
	1	25	21.70		2
	1	49	21.49		2
	25	0	20.78	0-3	3
	25	12	20.62		3
	25	25	20.52		3
	50	0	20.65		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 9-6
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	24.20	23.82	24.23	0	0
	1	12	24.21	23.72	24.34		0
	1	24	24.34	23.75	24.32		0
	12	0	23.16	22.66	23.20	0-1	1
	12	6	23.21	22.69	23.26		1
	12	13	23.15	22.63	23.19		1
	25	0	23.17	22.67	23.23		1
16QAM	1	0	23.15	22.83	23.44	0-1	1
	1	12	23.21	22.78	23.37		1
	1	24	23.26	22.64	23.61		1
	12	0	22.22	21.75	22.26	0-2	2
	12	6	22.21	21.77	22.27		2
	12	13	22.24	21.73	22.28		2
	25	0	22.21	21.77	22.30		2
64QAM	1	0	21.95	21.84	21.96	0-2	2
	1	12	22.19	21.47	21.94		2
	1	24	22.22	21.64	21.89		2
	12	0	21.10	20.45	21.03	0-3	3
	12	6	21.24	20.44	21.09		3
	12	13	21.12	20.48	21.03		3
	25	0	21.17	20.49	20.99		3

Table 9-7
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	24.23	23.79	24.37	0	0
	1	7	24.20	23.66	24.33		0
	1	14	24.17	23.68	24.29		0
	8	0	23.17	22.65	23.21	0-1	1
	8	4	23.17	22.63	23.23		1
	8	7	23.12	22.63	23.19		1
	15	0	23.15	22.64	23.20		1
16QAM	1	0	23.33	22.78	23.23	0-1	1
	1	7	23.21	22.81	23.31		1
	1	14	23.24	22.88	23.31		1
	8	0	22.17	21.73	22.20	0-2	2
	8	4	22.24	21.68	22.24		2
	8	7	22.28	21.58	22.23		2
	15	0	22.23	21.77	22.35		2
64QAM	1	0	22.10	21.65	22.04	0-2	2
	1	7	21.79	21.69	21.86		2
	1	14	21.92	21.65	22.25		2
	8	0	21.00	20.52	21.00	0-3	3
	8	4	21.03	20.43	20.99		3
	8	7	20.92	20.51	20.96		3
	15	0	21.12	20.59	21.01		3

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

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 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	24.05	23.68	24.19	0	0
	1	2	24.04	23.74	24.21		0
	1	5	24.06	23.63	24.26		0
	3	0	23.98	23.58	24.08		0
	3	2	24.01	23.63	24.09		0
	3	3	24.02	23.58	24.13		0
	6	0	23.01	22.59	23.09	0-1	1
16QAM	1	0	23.00	22.75	23.08	0-1	1
	1	2	23.16	22.64	23.12		1
	1	5	22.96	22.83	23.10		1
	3	0	22.98	22.77	23.22		1
	3	2	23.02	22.63	23.11		1
	3	3	23.05	22.75	23.26		1
	6	0	22.23	21.58	22.30	0-2	2
64QAM	1	0	21.87	21.62	22.14	0-2	2
	1	2	21.90	21.71	21.85		2
	1	5	22.00	21.59	21.81		2
	3	0	22.00	21.53	21.92		2
	3	2	21.74	21.49	22.00		2
	3	3	21.96	21.69	22.01		2
	6	0	20.72	20.43	20.97	0-3	3

9.3.2 LTE Band 13

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

LTE Band 13 10 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**22.95**	0	0
	1	25	22.92		0
	1	49	22.87		0
	25	0	21.83	0-1	1
	25	12	21.78		1
	25	25	**21.91**		1
	50	0	21.90		1
16QAM	1	0	21.97	0-1	1
	1	25	21.90		1
	1	49	21.93		1
	25	0	20.83	0-2	2
	25	12	20.85		2
	25	25	20.90		2
	50	0	20.87		2
64QAM	1	0	20.71	0-2	2
	1	25	20.79		2
	1	49	20.53		2
	25	0	19.89	0-3	3
	25	12	19.69		3
	25	25	19.66		3
	50	0	19.73		3

Table 9-10
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.02	0	0
	1	12	23.19		0
	1	24	23.16		0
	12	0	22.11	0-1	1
	12	6	22.11		1
	12	13	22.09		1
	25	0	22.08		1
16QAM	1	0	22.23	0-1	1
	1	12	22.00		1
	1	24	22.12		1
	12	0	21.08	0-2	2
	12	6	21.06		2
	12	13	21.01		2
	25	0	21.00		2
64QAM	1	0	20.79	0-2	2
	1	12	20.75		2
	1	24	20.78		2
	12	0	19.86	0-3	3
	12	6	19.80		3
	12	13	19.77		3
	25	0	19.87		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 9-11
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	**24.07**	0	0
	1	36	24.03		0
	1	74	24.00		0
	36	0	**23.03**	0-1	1
	36	18	22.93		1
	36	37	22.95		1
	75	0	23.01		1
16QAM	1	0	22.72	0-1	1
	1	36	22.82		1
	1	74	22.65		1
	36	0	22.01	0-2	2
	36	18	21.92		2
	36	37	21.83		2
	75	0	21.99		2
64QAM	1	0	21.92	0-2	2
	1	36	21.80		2
	1	74	21.72		2
	36	0	20.84	0-3	3
	36	18	20.86		3
	36	37	20.70		3
	75	0	20.87		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 9-12
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]
QPSK	1	0	23.98	24.25	24.12	0	0
	1	25	24.01	24.18	24.10		0
	1	49	23.89	24.15	24.03		0
	25	0	22.95	23.12	23.08	0-1	1
	25	12	22.96	23.15	23.05		1
	25	25	22.96	23.12	22.99		1
	50	0	22.93	23.15	22.99		1
16QAM	1	0	23.11	23.31	23.15	0-1	1
	1	25	23.01	23.32	23.05		1
	1	49	23.09	23.22	23.04		1
	25	0	22.00	22.30	22.14	0-2	2
	25	12	21.96	22.26	22.11		2
	25	25	21.97	22.26	22.08		2
	50	0	22.00	22.17	22.19		2
64QAM	1	0	21.88	22.06	22.09	0-2	2
	1	25	21.78	21.99	21.99		2
	1	49	21.83	21.98	21.82		2
	25	0	20.97	21.22	21.04	0-3	3
	25	12	20.86	21.14	21.02		3
	25	25	20.88	21.14	20.93		3
	50	0	20.89	21.17	21.01		3

Table 9-13
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	23.88	24.22	24.31	0	0
	1	12	23.85	24.16	24.26		0
	1	24	23.81	24.16	24.29		0
	12	0	22.86	23.20	23.33	0-1	1
	12	6	22.79	23.15	23.23		1
	12	13	22.77	23.16	23.23		1
	25	0	22.87	23.18	23.23		1
16QAM	1	0	23.01	23.34	23.45	0-1	1
	1	12	22.88	23.21	23.51		1
	1	24	22.95	23.20	23.38		1
	12	0	21.91	22.28	22.26	0-2	2
	12	6	21.89	22.27	22.30		2
	12	13	21.89	22.18	22.31		2
	25	0	21.98	22.18	22.31		2
64QAM	1	0	21.65	22.21	21.95	0-2	2
	1	12	21.72	22.12	21.90		2
	1	24	21.68	22.04	22.00		2
	12	0	20.79	21.15	21.00	0-3	3
	12	6	20.79	21.11	20.97		3
	12	13	20.79	21.13	20.99		3
	25	0	20.81	21.20	21.01		3

Table 9-14
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	23.97	24.15	24.37	0	0
	1	7	23.95	24.13	24.22		0
	1	14	23.93	24.07	24.35		0
	8	0	22.88	23.11	23.28	0-1	1
	8	4	22.87	23.09	23.27		1
	8	7	22.88	23.13	23.33		1
	15	0	22.84	23.11	23.31		1
16QAM	1	0	22.89	23.13	23.45	0-1	1
	1	7	22.83	23.37	23.47		1
	1	14	22.91	23.31	23.40		1
	8	0	21.82	22.23	22.34	0-2	2
	8	4	21.86	22.22	22.27		2
	8	7	21.80	22.31	22.32		2
	15	0	21.96	22.22	22.39		2
64QAM	1	0	21.78	22.14	22.16	0-2	2
	1	7	21.72	22.09	22.29		2
	1	14	21.66	22.02	22.25		2
	8	0	20.77	21.11	21.13	0-3	3
	8	4	20.77	21.09	21.07		3
	8	7	20.82	21.03	21.03		3
	15	0	20.87	20.99	21.08		3

Table 9-15
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	24.03	24.19	24.38	0	0
	1	2	23.97	24.25	24.37		0
	1	5	23.96	24.24	24.36		0
	3	0	23.95	24.06	24.28		0
	3	2	23.93	24.10	24.33		0
	3	3	23.95	24.08	24.23		0
	6	0	22.92	23.18	23.26	0-1	1
16QAM	1	0	23.00	23.17	23.29	0-1	1
	1	2	23.08	23.13	23.21		1
	1	5	23.12	23.17	23.34		1
	3	0	22.97	23.12	23.21		1
	3	2	22.93	23.10	23.32		1
	3	3	22.94	23.18	23.29		1
	6	0	22.06	22.16	22.41	0-2	2
64QAM	1	0	21.90	22.13	22.10	0-2	2
	1	2	21.94	22.10	22.11		2
	1	5	21.91	22.04	22.08		2
	3	0	21.89	21.97	22.13		2
	3	2	21.95	22.00	22.23		2
	3	3	21.94	21.99	22.13		2
	6	0	20.86	21.02	21.06	0-3	3

9.3.4 LTE Band 5 (Cell)

Table 9-16
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	**24.45**	0	0
	1	25	24.38		0
	1	49	24.32		0
	25	0	**23.37**	0-1	1
	25	12	23.31		1
	25	25	23.33		1
	50	0	23.32		1
16QAM	1	0	23.07	0-1	1
	1	25	23.05		1
	1	49	23.13		1
	25	0	22.36	0-2	2
	25	12	22.18		2
	25	25	22.20		2
	50	0	22.26		2
64QAM	1	0	22.28	0-2	2
	1	25	22.20		2
	1	49	22.12		2
	25	0	21.13	0-3	3
	25	12	21.17		3
	25	25	21.27		3
	50	0	21.33		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 9-17
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	24.41	24.63	24.46	0	0
	1	12	24.41	24.50	24.41		0
	1	24	24.34	24.54	24.48		0
	12	0	23.32	23.50	23.41	0-1	1
	12	6	23.34	23.43	23.39		1
	12	13	23.30	23.44	23.37		1
	25	0	23.34	23.45	23.42		1
16QAM	1	0	23.41	23.58	23.58	0-1	1
	1	12	23.34	23.59	23.43		1
	1	24	23.34	23.45	23.35		1
	12	0	22.36	22.53	22.48	0-2	2
	12	6	22.36	22.54	22.45		2
	12	13	22.28	22.48	22.49		2
	25	0	22.27	22.46	22.40		2
64QAM	1	0	22.06	22.35	22.18	0-2	2
	1	12	22.05	22.73	22.09		2
	1	24	22.10	22.34	22.13		2
	12	0	21.15	21.35	21.18	0-3	3
	12	6	21.12	21.32	21.14		3
	12	13	21.10	21.22	21.19		3
	25	0	21.16	21.33	21.24		3

Table 9-18
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	24.34	24.58	24.53	0	0
	1	7	24.36	24.58	24.53		0
	1	14	24.28	24.63	24.55		0
	8	0	23.28	23.53	23.42	0-1	1
	8	4	23.25	23.51	23.42		1
	8	7	23.32	23.48	23.41		1
	15	0	23.21	23.50	23.39		1
16QAM	1	0	23.14	23.54	23.49	0-1	1
	1	7	23.20	23.60	23.30		1
	1	14	23.20	23.83	23.33		1
	8	0	22.32	22.51	22.35	0-2	2
	8	4	22.28	22.54	22.44		2
	8	7	22.37	22.51	22.37		2
	15	0	22.39	22.56	22.49		2
64QAM	1	0	22.03	22.16	22.24	0-2	2
	1	7	22.06	22.53	22.13		2
	1	14	22.05	22.16	22.18		2
	8	0	21.22	21.47	21.36	0-3	3
	8	4	21.15	21.32	21.28		3
	8	7	21.09	21.37	21.24		3
	15	0	21.00	21.41	21.32		3

Table 9-19
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	24.33	24.57	24.40	0	0
	1	2	24.24	24.50	24.43		0
	1	5	24.26	24.50	24.47		0
	3	0	24.23	24.47	24.33		0
	3	2	24.27	24.49	24.39		0
	3	3	24.24	24.44	24.32		0
	6	0	23.29	23.44	23.34	0-1	1
16QAM	1	0	23.25	23.57	23.26	0-1	1
	1	2	23.36	23.32	23.40		1
	1	5	23.27	23.61	23.40		1
	3	0	23.31	23.47	23.21		1
	3	2	23.12	23.31	23.26		1
	3	3	23.21	23.53	23.44		1
	6	0	22.29	22.37	22.38	0-2	2
64QAM	1	0	22.16	22.35	22.02	0-2	2
	1	2	22.23	22.64	22.02		2
	1	5	22.26	22.54	22.16		2
	3	0	22.10	22.48	22.21		2
	3	2	22.19	22.22	22.15		2
	3	3	22.15	22.22	22.15		2
	6	0	21.08	21.27	21.09	0-3	3

9.3.5 LTE Band 66 (AWS)

Table 9-20
LTE Band 66 (AWS) Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.43	**22.72**	22.50	0	0
	1	50	22.46	22.60	22.66		0
	1	99	22.36	22.55	22.62		0
	50	0	21.42	21.50	21.51	0-1	1
	50	25	21.32	**21.54**	21.52		1
	50	50	21.37	21.37	21.43		1
	100	0	21.39	21.37	21.44		1
16QAM	1	0	21.40	21.52	21.73	0-1	1
	1	50	21.50	21.54	21.82		1
	1	99	21.38	21.32	21.65		1
	50	0	20.51	20.62	20.75	0-2	2
	50	25	20.46	20.55	20.75		2
	50	50	20.38	20.54	20.59		2
	100	0	20.49	20.58	20.58		2
64QAM	1	0	20.27	20.41	20.57	0-2	2
	1	50	20.25	20.60	20.72		2
	1	99	20.35	20.44	20.47		2
	50	0	19.31	19.56	19.33	0-3	3
	50	25	19.23	19.53	19.35		3
	50	50	19.23	19.39	19.41		3
	100	0	19.26	19.48	19.30		3

Table 9-21
LTE Band 66 (AWS) Maximum Conducted Powers - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.70	22.97	22.89	0	0
	1	36	22.67	22.85	22.82		0
	1	74	22.56	22.79	22.73		0
	36	0	21.59	21.91	21.82	0-1	1
	36	18	21.62	21.78	21.74		1
	36	37	21.58	21.84	21.69		1
	75	0	21.65	21.77	21.72		1
16QAM	1	0	21.69	21.94	21.97	0-1	1
	1	36	21.59	21.88	21.91		1
	1	74	21.49	21.74	21.73		1
	36	0	20.70	20.88	20.88	0-2	2
	36	18	20.64	20.96	20.85		2
	36	37	20.69	20.87	20.82		2
	75	0	20.73	20.96	20.81		2
64QAM	1	0	20.67	21.04	20.96	0-2	2
	1	36	20.61	21.01	20.86		2
	1	74	20.43	20.90	20.73		2
	36	0	19.62	19.92	19.76	0-3	3
	36	18	19.59	19.83	19.71		3
	36	37	19.56	19.75	19.71		3
	75	0	19.56	19.81	19.69		3

Table 9-22
LTE Band 66 (AWS) Maximum Conducted Powers - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.95	22.94	23.16	0	0
	1	25	22.70	22.95	23.04		0
	1	49	22.68	23.00	23.04		0
	25	0	21.64	21.85	21.91	0-1	1
	25	12	21.72	21.90	21.89		1
	25	25	21.67	21.85	21.91		1
	50	0	21.69	21.92	21.91		1
16QAM	1	0	21.79	21.96	21.93	0-1	1
	1	25	21.79	21.87	21.78		1
	1	49	21.77	21.88	21.74		1
	25	0	20.69	20.91	20.97	0-2	2
	25	12	20.71	20.89	20.90		2
	25	25	20.76	20.86	20.93		2
	50	0	20.88	20.91	21.00		2
64QAM	1	0	20.65	20.87	21.01	0-2	2
	1	25	20.67	20.77	20.79		2
	1	49	20.59	20.71	20.83		2
	25	0	19.64	19.76	19.88	0-3	3
	25	12	19.62	19.83	19.85		3
	25	25	19.63	19.84	19.77		3
	50	0	19.63	19.87	19.85		3

Table 9-23
LTE Band 66 (AWS) Maximum Conducted Powers - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.61	22.91	23.08	0	0
	1	12	22.59	22.96	23.07		0
	1	24	22.60	22.88	23.06		0
	12	0	21.52	21.87	21.92	0-1	1
	12	6	21.52	21.83	21.89		1
	12	13	21.52	21.87	21.85		1
	25	0	21.53	21.81	21.94		1
16QAM	1	0	21.56	21.68	22.09	0-1	1
	1	12	21.46	21.79	22.04		1
	1	24	21.53	21.69	21.89		1
	12	0	20.56	20.87	21.00	0-2	2
	12	6	20.51	20.85	21.07		2
	12	13	20.51	20.90	20.98		2
	25	0	20.57	20.90	21.03		2
64QAM	1	0	20.71	20.73	20.92	0-2	2
	1	12	20.63	20.71	20.85		2
	1	24	20.52	20.72	20.82		2
	12	0	19.47	19.71	19.98	0-3	3
	12	6	19.45	19.69	19.95		3
	12	13	19.42	19.70	19.92		3
	25	0	19.53	19.76	19.91		3

Table 9-24
LTE Band 66 (AWS) Maximum Conducted Powers - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.74	22.92	23.20	0	0
	1	7	22.67	22.89	23.14		0
	1	14	22.68	22.92	23.11		0
	8	0	21.57	21.87	21.98	0-1	1
	8	4	21.55	21.90	22.02		1
	8	7	21.58	21.90	21.94		1
	15	0	21.60	21.96	21.94		1
16QAM	1	0	21.61	21.94	22.10	0-1	1
	1	7	21.46	21.86	21.95		1
	1	14	21.50	21.92	21.94		1
	8	0	20.67	20.88	21.03	0-2	2
	8	4	20.69	20.82	21.04		2
	8	7	20.61	20.93	21.02		2
	15	0	20.59	20.93	20.97		2
64QAM	1	0	20.61	21.00	21.08	0-2	2
	1	7	20.64	20.84	20.98		2
	1	14	20.57	20.89	21.05		2
	8	0	19.48	19.74	19.94	0-3	3
	8	4	19.50	19.76	19.87		3
	8	7	19.53	19.80	19.89		3
	15	0	19.62	19.89	19.92		3

Table 9-25
LTE Band 66 (AWS) Maximum Conducted Powers -1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Low-Mid Channel 132208 (1733.6 MHz)	Mid-High 132436 (1756.4 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	22.69	23.02	22.95	22.98	0	0
	1	2	22.55	23.02	23.01	23.05		0
	1	5	22.65	23.04	22.97	22.95		0
	3	0	22.53	22.92	22.98	23.02		0
	3	2	22.49	22.86	22.89	23.01		0
	3	3	22.58	22.91	22.86	23.06		0
	6	0	21.53	21.89	21.85	21.92	0-1	1
16QAM	1	0	21.60	21.88	21.97	22.20	0-1	1
	1	2	21.69	21.77	21.79	21.92		1
	1	5	21.62	21.77	21.97	22.06		1
	3	0	21.63	21.96	21.89	22.02		1
	3	2	21.62	22.02	21.89	22.01		1
	3	3	21.69	22.01	21.87	21.97		1
	6	0	20.54	20.91	20.87	21.00	0-2	2
64QAM	1	0	20.57	20.86	20.94	21.07	0-2	2
	1	2	20.55	20.82	20.93	21.03		2
	1	5	20.62	20.86	20.97	21.06		2
	3	0	20.58	21.00	20.91	20.87		2
	3	2	20.58	20.97	20.85	20.95		2
	3	3	20.55	20.94	20.92	20.87		2
	6	0	19.50	19.87	19.79	19.99	0-3	3

Per FCC KDB Publication 447498 D01v06 Section 4.1g), 4 channels are required for LTE Band 66 with 1.4 MHz Bandwidth.

Table 9-26
LTE Band 66 (AWS) Reduced Conducted Powers - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.77	19.96	19.79	0	0
	1	50	19.73	**19.98**	19.97		0
	1	99	19.76	19.82	19.76		0
	50	0	19.64	**19.98**	19.97	0-1	0
	50	25	19.60	19.80	19.68		0
	50	50	19.65	19.77	19.61		0
	100	0	19.61	19.82	19.73		0
16QAM	1	0	19.57	19.75	19.72	0-1	0
	1	50	19.68	19.81	19.87		0
	1	99	19.66	19.72	19.84		0
	50	0	19.72	19.87	19.74	0-2	0
	50	25	19.68	19.71	19.80		0
	50	50	19.74	19.85	19.77		0
	100	0	19.67	19.83	19.63		0
64QAM	1	0	19.80	19.86	19.75	0-2	0
	1	50	19.66	19.76	19.69		0
	1	99	19.77	19.78	19.78		0
	50	0	19.62	19.93	19.88	0-3	0
	50	25	19.68	19.92	19.83		0
	50	50	19.64	19.87	19.72		0
	100	0	19.76	19.92	19.76		0

Table 9-27
LTE Band 66 (AWS) Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.66	19.91	19.94	0	0
	1	36	19.64	19.94	19.88		0
	1	74	19.60	19.96	19.90		0
	36	0	19.66	19.94	19.89	0-1	0
	36	18	19.63	19.81	19.87		0
	36	37	19.64	19.86	19.90		0
	75	0	19.63	19.87	19.86		0
16QAM	1	0	19.71	19.83	19.95	0-1	0
	1	36	19.75	19.82	19.94		0
	1	74	19.73	19.81	19.87		0
	36	0	19.65	19.90	19.85	0-2	0
	36	18	19.63	19.99	19.84		0
	36	37	19.72	19.89	19.83		0
	75	0	19.74	19.91	19.86		0
64QAM	1	0	19.64	19.96	19.84	0-2	0
	1	36	19.75	19.97	19.99		0
	1	74	19.70	19.90	19.92		0
	36	0	19.74	19.94	19.90	0-3	0
	36	18	19.74	19.95	19.90		0
	36	37	19.72	19.94	19.91		0
	75	0	19.70	19.98	19.91		0

Table 9-28
LTE Band 66 (AWS) Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.73	19.92	19.98	0	0
	1	25	19.74	19.91	19.97		0
	1	49	19.68	19.93	19.94		0
	25	0	19.63	19.87	19.91	0-1	0
	25	12	19.61	19.86	19.86		0
	25	25	19.58	19.90	19.82		0
	50	0	19.63	19.84	19.78		0
16QAM	1	0	19.68	19.93	19.98	0-1	0
	1	25	19.65	19.88	19.99		0
	1	49	19.66	19.86	19.98		0
	25	0	19.70	19.88	19.95	0-2	0
	25	12	19.65	19.98	19.92		0
	25	25	19.72	19.95	19.93		0
	50	0	19.76	19.97	19.94		0
64QAM	1	0	19.90	19.90	19.81	0-2	0
	1	25	19.87	19.80	19.88		0
	1	49	19.98	19.96	19.81		0
	25	0	19.88	19.92	19.91	0-3	0
	25	12	19.80	19.84	19.97		0
	25	25	19.87	19.86	19.96		0
	50	0	19.67	19.87	19.97		0

Table 9-29
LTE Band 66 (AWS) Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.82	19.96	19.98	0	0
	1	12	19.74	19.98	19.95		0
	1	24	19.81	19.96	19.98		0
	12	0	19.61	19.83	19.95	0-1	0
	12	6	19.67	19.81	19.94		0
	12	13	19.62	19.82	19.97		0
	25	0	19.63	19.83	19.98		0
16QAM	1	0	19.70	19.83	19.92	0-1	0
	1	12	19.65	19.80	19.88		0
	1	24	19.63	19.77	19.93		0
	12	0	19.63	19.74	19.94	0-2	0
	12	6	19.63	19.80	19.96		0
	12	13	19.95	19.88	19.98		0
	25	0	19.66	19.98	19.99		0
64QAM	1	0	19.88	19.99	19.96	0-2	0
	1	12	19.76	19.86	19.99		0
	1	24	19.80	19.92	19.89		0
	12	0	19.73	19.94	19.97	0-3	0
	12	6	19.77	19.93	19.98		0
	12	13	19.80	19.94	19.97		0
	25	0	19.81	19.95	19.99		0

Table 9-30
LTE Band 66 (AWS) Reduced Conducted Powers - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.61	19.97	19.96	0	0
	1	7	19.64	19.95	19.98		0
	1	14	19.54	19.94	19.97		0
	8	0	19.57	19.86	19.99	0-1	0
	8	4	19.56	19.80	19.98		0
	8	7	19.56	19.76	19.99		0
	15	0	19.55	19.83	19.99		0
16QAM	1	0	19.84	19.98	19.95	0-1	0
	1	7	19.82	19.93	19.97		0
	1	14	19.90	19.90	19.98		0
	8	0	19.65	19.91	19.99	0-2	0
	8	4	19.60	19.90	19.98		0
	8	7	19.63	19.83	19.97		0
	15	0	19.71	19.87	19.96		0
64QAM	1	0	19.94	19.97	19.97	0-2	0
	1	7	19.80	19.86	19.94		0
	1	14	19.84	19.88	19.87		0
	8	0	19.85	19.99	19.99	0-3	0
	8	4	19.70	19.90	19.98		0
	8	7	19.73	19.98	19.94		0
	15	0	19.68	19.99	19.99		0

Table 9-31
LTE Band 66 (AWS) Reduced Conducted Powers -1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Low-Mid Channel 132208 (1733.6 MHz)	Mid-High 132436 (1756.4 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	19.66	19.93	19.90	19.98	0	0
	1	2	19.65	19.91	19.92	19.97		0
	1	5	19.53	19.91	19.94	19.99		0
	3	0	19.58	19.83	19.86	19.97		0
	3	2	19.54	19.82	19.82	19.98		0
	3	3	19.57	19.83	19.88	19.99		0
	6	0	19.56	19.88	19.86	19.99	0-1	0
16QAM	1	0	19.77	19.91	19.87	19.93	0-1	0
	1	2	19.71	19.93	19.93	19.95		0
	1	5	19.73	19.94	19.94	19.94		0
	3	0	19.47	19.85	19.86	19.99		0
	3	2	19.52	19.83	19.76	19.97		0
	3	3	19.47	19.81	19.76	19.97		0
	6	0	19.62	19.96	19.91	19.99	0-2	0
64QAM	1	0	19.88	19.93	19.94	19.81	0-2	0
	1	2	19.77	19.87	19.98	19.91		0
	1	5	19.79	19.85	19.91	19.96		0
	3	0	19.77	19.94	19.97	19.97		0
	3	2	19.82	19.92	19.90	19.99		0
	3	3	19.73	19.93	19.84	19.94		0
	6	0	19.73	19.85	19.98	19.99	0-3	0

Per FCC KDB Publication 447498 D01v06 Section 4.1g), 4 channels are required for LTE Band 66 with 1.4 MHz Bandwidth.

9.3.6 LTE Band 25 (PCS)

Table 9-32
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	22.49	22.55	**22.85**	0	0
	1	50	22.47	22.49	22.72		0
	1	99	22.42	22.53	22.82		0
	50	0	21.45	21.53	**21.79**	0-1	1
	50	25	21.43	21.44	21.69		1
	50	50	21.50	21.46	21.70		1
	100	0	21.43	21.40	21.69		1
16QAM	1	0	21.64	21.66	21.92	0-1	1
	1	50	21.65	21.48	21.75		1
	1	99	21.57	21.67	21.82		1
	50	0	20.49	20.42	20.80	0-2	2
	50	25	20.47	20.54	20.73		2
	50	50	20.49	20.50	20.76		2
	100	0	20.40	20.56	20.76		2
64QAM	1	0	20.45	20.39	20.64	0-2	2
	1	50	20.46	20.40	20.78		2
	1	99	20.41	20.41	20.60		2
	50	0	19.31	19.35	19.67	0-3	3
	50	25	19.30	19.36	19.61		3
	50	50	19.33	19.31	19.51		3
	100	0	19.33	19.30	19.53		3

Table 9-33
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	22.64	22.78	23.19	0	0
	1	36	22.60	22.85	23.17		0
	1	74	22.69	22.94	23.10		0
	36	0	21.45	21.50	22.17	0-1	1
	36	18	21.34	21.46	22.09		1
	36	37	21.40	21.42	22.13		1
	75	0	21.32	21.48	22.05		1
16QAM	1	0	21.54	21.94	22.14	0-1	1
	1	36	21.45	21.76	22.15		1
	1	74	21.72	21.95	22.21		1
	36	0	20.59	20.66	20.90	0-2	2
	36	18	20.68	20.75	20.93		2
	36	37	20.59	20.70	20.97		2
	75	0	20.59	20.63	20.97		2
64QAM	1	0	20.91	20.87	21.21	0-2	2
	1	36	20.89	20.83	21.12		2
	1	74	20.85	20.83	21.16		2
	36	0	19.74	19.80	20.06	0-3	3
	36	18	19.76	19.81	20.06		3
	36	37	19.69	19.71	20.11		3
	75	0	19.63	19.77	20.08		3

Table 9-34
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	22.64	22.83	23.30	0	0
	1	25	22.60	22.85	23.33		0
	1	49	22.69	22.94	23.27		0
	25	0	21.45	21.50	22.11	0-1	1
	25	12	21.34	21.48	22.22		1
	25	25	21.34	21.43	22.22		1
	50	0	21.32	21.48	22.20		1
16QAM	1	0	21.79	21.94	22.18	0-1	1
	1	25	21.45	21.76	22.21		1
	1	49	21.71	21.95	22.44		1
	25	0	20.55	20.70	20.99	0-2	2
	25	12	20.50	20.75	20.92		2
	25	25	20.54	20.70	20.98		2
	50	0	20.59	20.63	20.97		2
64QAM	1	0	20.81	20.58	21.25	0-2	2
	1	25	20.69	20.39	21.35		2
	1	49	20.72	20.44	21.31		2
	25	0	19.61	19.73	20.24	0-3	3
	25	12	19.70	19.84	20.27		3
	25	25	19.73	19.74	20.15		3
	50	0	19.80	19.76	20.12		3

Table 9-35
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	22.68	22.87	23.19	0	0
	1	12	22.66	22.60	23.20		0
	1	24	22.60	22.74	23.32		0
	12	0	21.35	21.56	22.15	0-1	1
	12	6	21.38	21.46	22.14		1
	12	13	21.40	21.42	22.14		1
	25	0	21.34	21.44	22.13		1
16QAM	1	0	21.63	22.02	22.43	0-1	1
	1	12	21.58	21.83	22.21		1
	1	24	21.57	21.80	22.36		1
	12	0	20.49	20.68	21.09	0-2	2
	12	6	20.56	20.68	21.09		2
	12	13	20.52	20.65	21.01		2
	25	0	20.57	20.55	20.96		2
64QAM	1	0	20.62	20.64	21.01	0-2	2
	1	12	20.57	20.84	21.10		2
	1	24	20.62	20.87	21.06		2
	12	0	19.57	19.71	19.93	0-3	3
	12	6	19.54	19.58	20.10		3
	12	13	19.50	19.60	20.03		3
	25	0	19.54	19.60	19.97		3

Table 9-36
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	22.64	22.84	23.07	0	0
	1	7	22.55	22.62	23.06		0
	1	14	22.60	22.72	23.06		0
	8	0	21.40	21.58	22.14	0-1	1
	8	4	21.40	21.58	22.08		1
	8	7	21.43	21.56	22.16		1
	15	0	21.30	21.51	22.25		1
16QAM	1	0	21.63	21.72	22.17	0-1	1
	1	7	21.61	21.86	22.23		1
	1	14	21.68	22.00	22.18		1
	8	0	20.51	20.77	21.06	0-2	2
	8	4	20.66	20.74	20.90		2
	8	7	20.56	20.79	20.91		2
	15	0	20.66	20.71	20.99		2
64QAM	1	0	20.82	20.94	21.45	0-2	2
	1	7	20.80	20.95	21.48		2
	1	14	20.82	21.06	21.39		2
	8	0	19.66	19.56	20.01	0-3	3
	8	4	19.58	19.70	20.09		3
	8	7	19.63	19.72	20.08		3
	15	0	19.62	19.77	20.11		3

Table 9-37
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 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	22.69	22.94	23.25	0	0
	1	2	22.60	22.87	23.21		0
	1	5	22.66	22.86	23.20		0
	3	0	22.53	22.67	23.27		0
	3	2	22.41	22.62	23.08		0
	3	3	22.47	22.64	23.08		0
	6	0	21.52	21.56	22.21	0-1	1
16QAM	1	0	21.70	22.00	22.15	0-1	1
	1	2	21.57	21.65	22.22		1
	1	5	21.60	21.92	22.06		1
	3	0	21.48	21.90	21.80		1
	3	2	21.50	21.93	21.91		1
	3	3	21.60	21.80	21.98		1
	6	0	20.65	20.79	21.16	0-2	2
64QAM	1	0	20.83	20.79	21.08	0-2	2
	1	2	20.86	20.76	21.08		2
	1	5	20.78	20.85	21.16		2
	3	0	20.67	20.79	21.11		2
	3	2	20.74	20.73	21.19		2
	3	3	20.78	20.81	21.14		2
	6	0	19.57	19.55	20.03	0-3	3

Table 9-38
LTE Band 25 (PCS) 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	19.65	19.74	19.91	0	0
	1	50	19.63	19.75	**19.96**		0
	1	99	19.72	19.68	19.95		0
	50	0	19.50	19.60	19.72	0-1	0
	50	25	19.61	19.61	**19.77**		0
	50	50	19.51	19.67	19.74		0
	100	0	19.58	19.63	19.73		0
16QAM	1	0	19.52	19.64	19.79	0-1	0
	1	50	19.53	19.62	19.80		0
	1	99	19.61	19.69	19.81		0
	50	0	19.62	19.68	19.87	0-2	0
	50	25	19.73	19.70	19.86		0
	50	50	19.62	19.66	19.89		0
	100	0	19.56	19.68	19.95		0
64QAM	1	0	19.62	19.60	19.88	0-2	0
	1	50	19.61	19.72	19.94		0
	1	99	19.69	19.63	19.87		0
	50	0	19.57	19.66	19.90	0-3	0
	50	25	19.51	19.65	19.89		0
	50	50	19.63	19.79	19.86		0
	100	0	19.57	19.62	19.84		0

Table 9-39
LTE Band 25 (PCS) 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	19.88	19.81	19.97	0	0
	1	36	19.87	19.78	19.96		0
	1	74	19.76	19.77	19.99		0
	36	0	19.70	19.73	19.94	0-1	0
	36	18	19.69	19.76	19.88		0
	36	37	19.64	19.71	19.87		0
	75	0	19.69	19.63	19.90		0
16QAM	1	0	19.60	19.87	19.98	0-1	0
	1	36	19.50	19.81	19.97		0
	1	74	19.62	19.84	19.99		0
	36	0	19.83	19.57	19.99	0-2	0
	36	18	19.85	19.86	19.98		0
	36	37	19.86	19.83	19.97		0
	75	0	19.87	19.79	19.98		0
64QAM	1	0	19.95	19.94	19.92	0-2	0
	1	36	19.90	19.91	19.91		0
	1	74	19.82	19.95	19.98		0
	36	0	19.72	19.84	19.99	0-3	0
	36	18	19.74	19.88	19.98		0
	36	37	19.73	19.80	19.99		0
	75	0	19.68	19.76	19.99		0

Table 9-40
LTE Band 25 (PCS) 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	19.92	19.95	19.91	0	0
	1	25	19.85	19.89	19.95		0
	1	49	19.83	19.90	19.99		0
	25	0	19.66	19.73	19.98	0-1	0
	25	12	19.68	19.66	19.98		0
	25	25	19.70	19.67	19.98		0
	50	0	19.64	19.68	19.95		0
16QAM	1	0	19.89	19.88	19.99	0-1	0
	1	25	19.82	19.83	19.99		0
	1	49	19.86	19.76	19.98		0
	25	0	19.80	19.86	19.97	0-2	0
	25	12	19.85	19.88	19.99		0
	25	25	19.84	19.84	19.98		0
	50	0	19.70	19.78	19.99		0
64QAM	1	0	19.76	19.87	19.84	0-2	0
	1	25	19.78	19.98	19.99		0
	1	49	19.76	19.84	19.92		0
	25	0	19.77	19.81	19.94	0-3	0
	25	12	19.80	19.91	19.95		0
	25	25	19.81	19.78	19.99		0
	50	0	19.75	19.83	19.98		0

Table 9-41
LTE Band 25 (PCS) 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	19.76	19.94	19.99	0	0
	1	12	19.74	19.81	19.98		0
	1	24	19.79	19.81	19.97		0
	12	0	19.64	19.70	19.99	0-1	0
	12	6	19.70	19.79	19.98		0
	12	13	19.70	19.76	19.99		0
	25	0	19.64	19.73	19.98		0
16QAM	1	0	19.66	19.73	19.97	0-1	0
	1	12	19.71	19.69	19.99		0
	1	24	19.64	19.68	19.98		0
	12	0	19.75	19.83	19.98	0-2	0
	12	6	19.73	19.86	19.99		0
	12	13	19.77	19.80	19.98		0
	25	0	19.74	19.81	19.98		0
64QAM	1	0	19.81	19.77	19.96	0-2	0
	1	12	19.89	19.79	19.96		0
	1	24	19.78	19.82	19.99		0
	12	0	19.74	19.86	19.98	0-3	0
	12	6	19.74	19.87	19.99		0
	12	13	19.78	19.88	19.91		0
	25	0	19.78	19.91	19.99		0

Table 9-42
LTE Band 25 (PCS) 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	19.87	19.96	19.98	0	0
	1	7	19.86	19.82	19.95		0
	1	14	19.85	19.85	19.96		0
	8	0	19.80	19.83	19.91	0-1	0
	8	4	19.76	19.81	19.97		0
	8	7	19.71	19.73	19.99		0
	15	0	19.65	19.77	19.96		0
16QAM	1	0	19.83	19.86	19.96	0-1	0
	1	7	19.84	19.98	19.97		0
	1	14	19.83	19.96	19.99		0
	8	0	19.86	19.83	19.97	0-2	0
	8	4	19.85	19.82	19.99		0
	8	7	19.82	19.84	19.99		0
	15	0	19.80	19.83	19.98		0
64QAM	1	0	19.85	19.84	19.98	0-2	0
	1	7	19.91	19.85	19.99		0
	1	14	19.77	19.83	19.99		0
	8	0	19.77	19.86	19.98	0-3	0
	8	4	19.80	19.72	19.96		0
	8	7	19.80	19.81	19.91		0
	15	0	19.77	19.85	19.96		0

Table 9-43
LTE Band 25 (PCS) Reduced 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	19.96	19.95	19.98	0	0
	1	2	19.98	19.96	19.92		0
	1	5	19.93	19.95	19.95		0
	3	0	19.87	19.83	19.81		0
	3	2	19.92	19.85	19.82		0
	3	3	19.90	19.88	19.83		0
	6	0	19.90	19.85	19.81	0-1	0
16QAM	1	0	19.87	19.89	19.84	0-1	0
	1	2	19.85	19.91	19.82		0
	1	5	19.89	19.88	19.86		0
	3	0	19.75	19.84	19.75		0
	3	2	19.79	19.84	19.71		0
	3	3	19.78	19.81	19.67		0
	6	0	19.89	19.98	19.78	0-2	0
64QAM	1	0	19.79	19.90	19.99	0-2	0
	1	2	19.77	19.82	19.88		0
	1	5	19.89	19.93	19.97		0
	3	0	19.83	19.91	19.97		0
	3	2	19.80	19.92	19.93		0
	3	3	19.74	19.94	19.96		0
	6	0	19.71	19.83	19.94	0-3	0

9.3.7 LTE Band 41

Table 9-44
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.72	**23.96**	23.57	23.64	23.38	0	0
	1	50	23.75	23.88	23.53	23.52	23.30		0
	1	99	23.61	23.83	23.50	23.35	23.22		0
	50	0	22.62	**22.82**	22.40	22.37	22.20	0-1	1
	50	25	22.60	22.79	22.43	22.33	22.17		1
	50	50	22.53	22.73	22.37	22.26	22.21		1
	100	0	22.52	22.76	22.41	22.39	22.21		1
16QAM	1	0	22.57	22.77	22.40	22.48	22.24	0-1	1
	1	50	22.60	22.72	22.52	22.30	22.28		1
	1	99	22.48	22.58	22.38	22.31	22.22		1
	50	0	21.77	21.85	21.52	21.55	21.32	0-2	2
	50	25	21.72	21.85	21.57	21.45	21.29		2
	50	50	21.71	21.78	21.59	21.41	21.32		2
	100	0	21.73	21.82	21.58	21.46	21.35		2
64QAM	1	0	21.85	21.86	21.61	21.65	21.43	0-2	2
	1	50	21.64	21.73	21.58	21.56	21.38		2
	1	99	21.52	21.72	21.51	21.44	21.32		2
	50	0	20.67	20.82	20.48	20.50	20.22	0-3	3
	50	25	20.65	20.78	20.55	20.45	20.28		3
	50	50	20.65	20.77	20.54	20.35	20.28		3
	100	0	20.68	20.76	20.51	20.43	20.31		3

Table 9-45
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.87	24.21	24.06	24.27	24.07	0	0
	1	36	23.83	24.24	24.10	24.23	24.09		0
	1	74	23.82	24.28	24.12	24.17	24.08		0
	36	0	22.67	23.14	22.97	23.09	23.01	0-1	1
	36	18	22.67	23.15	22.96	23.07	22.94		1
	36	37	22.71	23.14	23.02	23.05	22.92		1
	75	0	22.71	23.17	23.03	23.10	22.93		1
16QAM	1	0	22.92	23.14	22.81	22.83	22.78	0-1	1
	1	36	22.87	23.16	22.79	22.79	22.74		1
	1	74	22.82	23.20	22.80	22.76	22.69		1
	36	0	21.73	22.08	22.09	22.11	21.92	0-2	2
	36	18	21.74	22.10	22.07	22.08	21.87		2
	36	37	21.72	22.09	22.05	22.09	21.86		2
	75	0	21.71	22.08	22.03	22.11	21.89		2
64QAM	1	0	21.34	22.22	21.83	22.04	22.09	0-2	2
	1	36	21.36	22.30	21.81	21.97	22.04		2
	1	74	21.33	22.32	21.87	21.93	22.00		2
	36	0	20.60	21.09	21.08	21.08	20.94	0-3	3
	36	18	20.61	21.10	21.10	21.07	20.91		3
	36	37	20.60	21.12	21.05	21.03	20.92		3
	75	0	20.68	21.12	21.01	21.04	20.88		3

Table 9-46
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	23.76	24.23	24.16	24.27	24.12	0	0
	1	25	23.73	24.19	24.13	24.25	24.07		0
	1	49	23.73	24.30	24.15	24.26	24.04		0
	25	0	22.50	23.02	22.90	23.06	22.92	0-1	1
	25	12	22.49	23.04	22.87	23.02	22.91		1
	25	25	22.51	23.05	22.91	23.01	22.85		1
	50	0	22.46	23.07	22.88	23.00	22.84		1
16QAM	1	0	22.56	22.89	22.95	23.03	23.00	0-1	1
	1	25	22.56	22.91	22.93	22.97	22.94		1
	1	49	22.54	22.89	22.96	22.95	22.90		1
	25	0	21.46	22.04	21.86	22.03	21.81	0-2	2
	25	12	21.46	22.03	21.85	22.02	21.80		2
	25	25	21.47	22.07	21.89	22.01	21.81		2
	50	0	21.50	21.99	21.84	21.99	21.76		2
64QAM	1	0	21.54	22.02	21.94	22.14	21.49	0-2	2
	1	25	21.55	22.08	21.90	22.15	21.47		2
	1	49	21.53	22.09	21.92	22.13	21.46		2
	25	0	20.61	21.03	20.84	20.95	20.83	0-3	3
	25	12	20.57	21.03	20.82	20.94	20.84		3
	25	25	20.55	21.06	20.83	20.93	20.81		3
	50	0	20.57	21.07	20.89	20.93	20.78		3

Table 9-47
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	23.54	24.00	24.07	24.06	23.92	0	0
	1	12	23.52	23.99	24.08	24.01	23.89		0
	1	24	23.56	24.07	24.10	24.06	23.90		0
	12	0	22.46	23.02	22.87	22.98	22.89	0-1	1
	12	6	22.47	23.04	22.89	22.99	22.88		1
	12	13	22.46	23.03	22.86	22.97	22.87		1
	25	0	22.48	23.02	22.91	22.96	22.85		1
16QAM	1	0	22.60	23.16	23.09	23.07	23.03	0-1	1
	1	12	22.59	23.14	23.10	23.03	22.98		1
	1	24	22.61	23.15	23.13	23.05	23.01		1
	12	0	21.63	22.10	21.87	22.04	21.96	0-2	2
	12	6	21.62	22.11	21.89	22.01	21.92		2
	12	13	21.61	22.12	21.88	22.03	21.96		2
	25	0	21.49	22.03	21.89	22.00	21.86		2
64QAM	1	0	21.49	22.22	21.72	22.28	21.77	0-2	2
	1	12	21.48	22.23	21.73	22.29	21.72		2
	1	24	21.43	22.28	21.74	22.30	21.73		2
	12	0	20.48	21.09	20.82	21.02	20.83	0-3	3
	12	6	20.46	21.07	20.81	21.00	20.82		3
	12	13	20.48	21.12	20.79	21.01	20.83		3
	25	0	20.58	21.02	20.92	20.94	20.82		3

9.3.8 LTE Carrier Aggregation Conducted Powers

Table 9-48
Two Component Carrier LTE Carrier Aggregation Maximum Conducted Powers

PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power (dBm) With DL CA Enabled	LTE Single Carrier Tx.Power (dBm)
LTE B2	10	19150	1905	QPSK	1	25	1150	1985	LTE B12	10	5095	737.5	22.81	23.33
LTE B4	3	20385	1753.5	QPSK	1	0	2385	2153.5	LTE B12	10	5095	737.5	22.78	23.20
LTE B4	10	20350	1750	QPSK	1	0	2350	2150	LTE B17	10	5790	740	22.91	23.16
LTE B12	3	23165	714.5	QPSK	1	0	5165	744.5	LTE B2	20	900	1960	24.26	24.37
LTE B66	3	132657	1778.5	QPSK	1	0	67121	2178.5	LTE B12	10	5095	737.5	22.81	23.20
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B17	10	5790	740	22.98	23.16
LTE B12	5	23035	701.5	QPSK	1	24	5035	731.5	LTE B12	10	5110	739	24.38	24.34
LTE B41	10	40185	2549.5	QPSK	1	49	40185	2549.5	LTE B41	20	40035	2534.5	24.12	24.30
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	20	66936	2160	22.64	23.16
LTE B12	5	23035	701.5	QPSK	1	24	5035	731.5	LTE B12	5	5155	743.5	24.35	24.34
LTE B41	10	40185	2549.5	QPSK	1	49	40185	2549.5	LTE B41	5	41565	2687.5	24.12	24.30
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	5	66461	2112.5	22.76	23.16
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	10	66987	2165.1	23.03	23.16

Table 9-49
Three Component Carrier LTE Carrier Aggregation Maximum Conducted Powers

PCC									SCC 1				SCC 2				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power (dBm) With DL CA Enabled	LTE Single Carrier Tx.Power (dBm)
LTE B4	10	20350	1750	QPSK	1	0	2350	2150	LTE B12	10	5095	737.5	LTE B12	5	5170	745	22.51	23.16
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B12	10	5095	737.5	LTE B66	20	66936	2160	22.68	23.16
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	20	66936	2160	LTE B17	10	5790	740	22.63	23.16
LTE B41	10	40185	2549.5	QPSK	1	49	40185	2549.5	LTE B41	20	40335	2564.5	LTE B41	20	40485	2579.5	23.71	24.30
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	5	66461	2112.5	LTE B12	10	5095	737.5	22.94	23.16
LTE B66	10	132622	1775	QPSK	1	0	67086	2175	LTE B66	5	66461	2112.5	LTE B17	10	5790	740	23.01	23.16

Table 9-50
Two Component Carrier LTE Carrier Aggregation Reduced Conducted Powers

PCC									SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power (dBm) With DL CA Enabled	LTE Single Carrier Tx.Power (dBm)
LTE B2	15	19125	1902.5	QPSK	1	74	1125	1982.5	LTE B12	10	5095	737.5	19.94	19.99
LTE B4	15	20300	1745	16QAM	36	18	2300	2145	LTE B12	10	5095	737.5	19.67	19.99
LTE B4	10	20350	1750	16QAM	1	25	2350	2150	LTE B17	10	5790	740	19.73	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B12	10	5095	737.5	19.59	19.99
LTE B66	10	132622	1775	16QAM	1	25	67086	2175	LTE B17	10	5790	740	19.66	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	15	66636	2130	19.58	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	5	66461	2112.5	19.56	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	5	66885	2154.9	19.72	19.99

Table 9-51
Three Component Carrier LTE Carrier Aggregation Reduced Conducted Powers

PCC									SCC 1				SCC 2				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power (dBm) With DL CA Enabled	LTE Single Carrier Tx.Power (dBm)
LTE B4	15	20300	1745	16QAM	36	18	2300	2145	LTE B12	10	5095	737.5	LTE B12	10	5179	747.4	19.66	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B12	10	5095	737.5	LTE B66	20	66612	2127.6	19.68	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	20	66612	2127.6	LTE B17	10	5790	740	19.64	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	5	66461	2112.5	LTE B12	10	5095	737.5	19.66	19.99
LTE B66	15	132322	1745	16QAM	36	18	66786	2145	LTE B66	5	66885	2154.9	LTE B17	10	5790	740	19.71	19.99

Notes:

1. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. For downlink carrier aggregation combinations, PCC uplink channel was selected based on section C)3)b)ii) of KBD 941225 D05 V01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers. All selected downlink channels remained fully within the downlink transmission band of the respective component carrier.
4. Since the supported frequency span for LTE B2/4 falls completely within the supported frequency span for LTE B25/66, both LTE bands have the same target power, and both LTE bands share the same transmission path, the configuration with the highest conducted power from LTE B25/66 was used to assess LTE CA combinations with LTE B2/4.

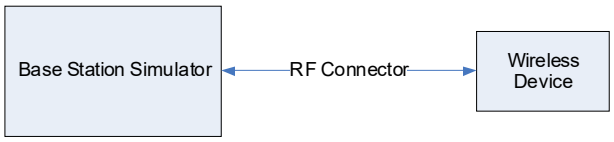


Figure 9-3
Power Measurement Setup

9.4 WLAN Conducted Powers

Table 9-52
2.4 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	17.90	17.17	15.28
2437	6	17.91	16.94	15.07
2462	11	**18.03**	17.03	15.19

Table 9-53
2.4 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**17.96**	17.05	14.89
2437	6	17.74	17.04	15.19
2462	11	17.63	16.96	14.92

Table 9-54
5 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	16.23	16.29	16.28
5200	40	16.18	16.05	16.24
5220	44	15.90	16.35	16.29
5240	48	16.26	16.19	15.91
5260	52	18.08	18.11	18.14
5280	56	18.02	18.01	18.10
5300	60	18.02	18.12	18.05
5320	64	**18.08**	18.12	17.81
5500	100	**17.96**	17.91	17.79
5600	120	17.93	17.89	17.90
5620	124	17.87	17.63	17.85
5720	144	17.85	17.98	17.59
5745	149	**17.82**	17.57	17.73
5785	157	17.54	17.72	17.67
5825	165	17.64	17.59	17.72

Table 9-55
5 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	16.17	16.11	16.17
5200	40	16.06	16.03	16.09
5220	44	15.97	15.98	15.97
5240	48	15.94	15.92	15.72
5260	52	18.27	18.24	18.25
5280	56	18.31	18.40	18.39
5300	60	**18.42**	18.27	18.15
5320	64	17.86	18.26	18.38
5500	100	17.95	17.53	17.66
5600	120	**17.95**	17.88	17.91
5620	124	17.92	17.90	17.92
5720	144	17.94	17.51	17.59
5745	149	17.12	17.89	17.97
5785	157	18.20	18.02	17.92
5825	165	**18.20**	18.19	18.13

Table 9-56
2.4 GHz WLAN Reduced Average RF Power – Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**15.18**	13.89	11.78
2437	6	14.67	14.04	11.82
2462	11	14.68	14.25	12.02

Table 9-57
2.4 GHz WLAN Reduced Average RF Power – Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	14.95	13.80	11.59
2437	6	**15.05**	13.51	11.45
2462	11	14.87	13.47	11.46

Table 9-58
5 GHz WLAN Reduced Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	14.12	14.04	14.01
5200	40	14.11	14.10	14.15
5220	44	14.02	14.01	13.99
5240	48	14.10	14.00	14.02
5260	52	**15.13**	15.00	15.03
5280	56	14.98	14.89	14.86
5300	60	15.09	15.05	15.02
5320	64	15.03	15.15	15.10
5500	100	14.78	14.76	14.66
5600	120	14.62	14.60	14.54
5620	124	14.75	14.66	14.60
5720	144	**14.86**	14.73	14.89
5745	149	**14.57**	14.55	14.49
5785	157	14.51	14.44	14.49
5825	165	14.50	14.50	14.43

Table 9-59
5 GHz WLAN Reduced Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	14.04	14.02	14.00
5200	40	14.11	14.15	14.11
5220	44	14.43	14.35	14.25
5240	48	14.24	14.11	14.10
5260	52	14.77	14.56	14.35
5280	56	14.98	14.89	14.77
5300	60	**15.44**	15.25	15.12
5320	64	15.30	15.15	15.07
5500	100	**15.34**	15.13	15.14
5600	120	15.26	15.16	15.17
5620	124	15.14	15.10	15.00
5720	144	14.74	14.73	14.89
5745	149	**15.31**	15.25	15.19
5785	157	14.83	14.80	14.85
5825	165	15.28	15.20	15.25

Table 9-60
Maximum Output Powers During Simultaneous MIMO Conditions with 2.4 GHz WLAN 802.11n and 5 GHz WLAN 802.11ac

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]	
		ANT1	ANT2
2412	1	11.77	11.22
2437	6	11.00	11.18
2462	11	11.08	11.12
Freq [MHz]	**Channel**	**5GHz (80MHz) Conducted Power [dBm]**	
		ANT1	**ANT2**
5210	42	11.88	11.43
5290	58	12.10	11.16
5530	106	11.78	10.73
5610	122	11.66	10.89
5690	138	11.92	10.94
5775	155	11.70	10.62

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

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

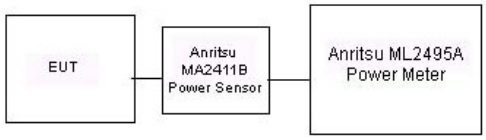


Figure 9-4
Power Measurement Setup for Bandwidths < 50 MHz

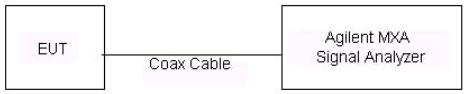


Figure 9-5
Power Measurement Setup for Bandwidths > 50 MHz

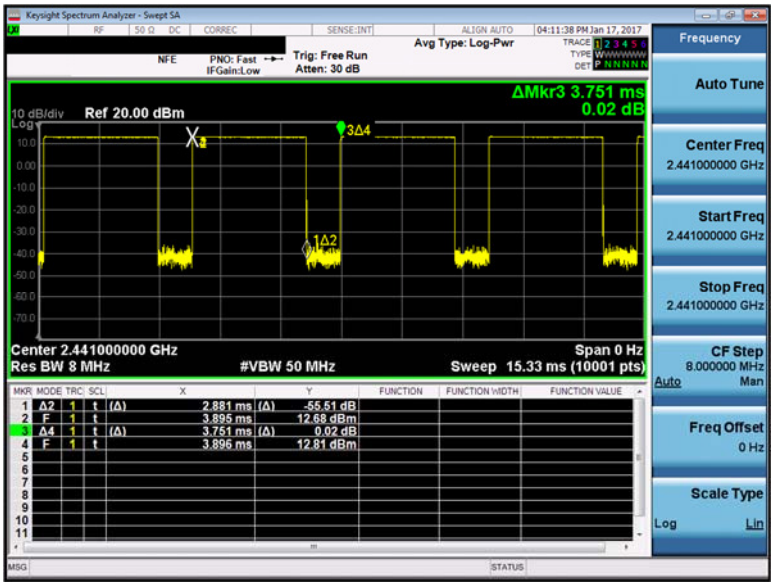
9.5 Bluetooth Conducted Powers

Table 9-61
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	14.16	26.032
2441	1.0	39	**15.60**	36.299
2480	1.0	78	14.54	28.464
2402	2.0	0	8.14	6.517
2441	2.0	39	9.50	8.917
2480	2.0	78	8.69	7.396
2402	3.0	0	7.97	6.262
2441	3.0	39	9.55	9.014
2480	3.0	78	8.77	7.538

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

Figure 9-6
Bluetooth Transmission Plot



Equation 2
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = Pulse\frac{Width}{Period} * 100\% = \frac{2.881ms}{3.751ms} * 100\% = 76.8\%$$

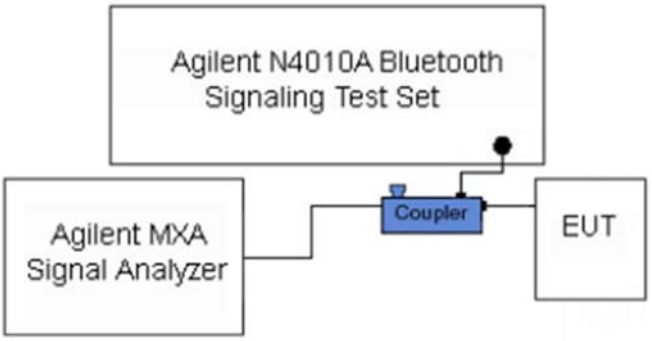


Figure 9-7
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Head Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	%dev σ	%dev ε
1/6/2017	750H	21.6	700	0.850	42.562	0.889	42.201	-4.39%	0.86%
			710	0.859	42.407	0.890	42.149	-3.48%	0.61%
			720	0.868	42.270	0.891	42.097	-2.58%	0.41%
			740	0.886	41.994	0.893	41.994	-0.78%	0.00%
			755	0.899	41.787	0.894	41.916	0.56%	-0.31%
			770	0.913	41.583	0.895	41.838	2.01%	-0.61%
			785	0.927	41.386	0.896	41.760	3.46%	-0.90%
1/9/2017	835H	20.7	820	0.896	41.795	0.899	41.578	-0.33%	0.52%
			835	0.911	41.612	0.900	41.500	1.22%	0.27%
			850	0.925	41.418	0.916	41.500	0.98%	-0.20%
1/23/2017	835H	21.8	820	0.901	43.424	0.899	41.578	0.22%	4.44%
			835	0.916	43.244	0.900	41.500	1.78%	4.20%
			850	0.931	43.058	0.916	41.500	1.64%	3.75%
12/30/2016	1750H	21.0	1710	1.340	39.216	1.348	40.142	-0.59%	-2.31%
			1750	1.379	39.004	1.371	40.079	0.58%	-2.68%
			1790	1.419	38.815	1.394	40.016	1.79%	-3.00%
12/31/2016	1900H	22.4	1850	1.380	38.867	1.400	40.000	-1.43%	-2.83%
			1880	1.408	38.733	1.400	40.000	0.57%	-3.17%
			1910	1.443	38.620	1.400	40.000	3.07%	-3.45%
2/6/2017	1900H	20.1	1850	1.392	38.674	1.400	40.000	-0.57%	-3.32%
			1880	1.425	38.533	1.400	40.000	1.79%	-3.67%
			1910	1.459	38.426	1.400	40.000	4.21%	-3.94%
2/14/2017	1900H	23.3	1850	1.373	40.090	1.400	40.000	-1.93%	0.23%
			1880	1.404	39.955	1.400	40.000	0.29%	-0.11%
			1910	1.436	39.827	1.400	40.000	2.57%	-0.43%
1/13/2017	2450H	23.9	2400	1.796	39.376	1.756	39.289	2.28%	0.22%
			2450	1.856	39.156	1.800	39.200	3.11%	-0.11%
			2500	1.914	38.964	1.855	39.136	3.18%	-0.44%
1/22/2017	2450H	24.0	2400	1.814	38.386	1.756	39.289	3.30%	-2.30%
			2450	1.869	38.155	1.800	39.200	3.83%	-2.67%
			2500	1.931	37.926	1.855	39.136	4.10%	-3.09%
1/10/2017	2600H	23.5	2500	1.933	38.944	1.855	39.136	4.20%	-0.49%
			2550	1.990	38.788	1.909	39.073	4.24%	-0.73%
			2600	2.053	38.501	1.964	39.009	4.53%	-1.30%
01/06/2017	5200H-5800H	20.6	5240	4.666	35.623	4.696	35.940	-0.64%	-0.88%
			5260	4.682	35.601	4.717	35.917	-0.74%	-0.88%
			5280	4.692	35.601	4.737	35.894	-0.95%	-0.82%
			5300	4.714	35.528	4.758	35.871	-0.92%	-0.96%
			5500	4.919	35.257	4.963	35.643	-0.89%	-1.08%
			5600	5.037	35.110	5.065	35.529	-0.55%	-1.18%
			5680	5.113	35.024	5.147	35.437	-0.66%	-1.17%
			5700	5.135	35.001	5.168	35.414	-0.64%	-1.17%
			5745	5.202	34.896	5.214	35.363	-0.23%	-1.32%
			5765	5.211	34.895	5.234	35.340	-0.44%	-1.26%
			5785	5.219	34.876	5.255	35.317	-0.69%	-1.25%

Table 10-2
Body Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	%dev σ	%dev ε
1/3/2017	750B	21.5	700	0.912	55.866	0.959	55.726	-4.90%	0.25%
			710	0.923	55.733	0.960	55.687	-3.85%	0.08%
			720	0.933	55.604	0.961	55.648	-2.91%	-0.08%
			740	0.953	55.385	0.963	55.570	-1.04%	-0.33%
			755	0.967	55.227	0.964	55.512	0.31%	-0.51%
			770	0.982	55.078	0.965	55.453	1.76%	-0.68%
			785	0.999	54.897	0.966	55.395	3.42%	-0.90%
1/14/2017	750B	22.0	740	0.940	54.920	0.963	55.570	-2.39%	-1.17%
			755	0.957	54.812	0.964	55.512	-0.73%	-1.26%
			770	0.966	54.706	0.965	55.453	0.10%	-1.35%
			785	0.987	54.478	0.966	55.395	2.17%	-1.66%
1/11/2017	835B	21.4	820	0.976	53.819	0.969	55.258	0.72%	-2.60%
			835	0.990	53.702	0.970	55.200	2.06%	-2.71%
			850	1.005	53.608	0.988	55.154	1.72%	-2.80%
1/26/2017	835B	21.4	820	0.989	56.595	0.969	55.258	2.06%	2.42%
			835	1.004	56.440	0.970	55.200	3.51%	2.25%
			850	1.019	56.294	0.988	55.154	3.14%	2.07%
1/9/2017	1750B	21.3	1710	1.452	52.949	1.463	53.537	-0.75%	-1.10%
			1750	1.499	52.884	1.488	53.432	0.74%	-1.03%
			1790	1.548	52.650	1.514	53.326	2.25%	-1.27%
1/4/2017	1900B	23.5	1850	1.490	52.446	1.520	53.300	-1.97%	-1.60%
			1880	1.525	52.359	1.520	53.300	0.33%	-1.77%
			1910	1.556	52.278	1.520	53.300	2.37%	-1.92%
1/9/2017	1900B	22.9	1850	1.521	51.851	1.520	53.300	0.07%	-2.72%
			1880	1.555	51.748	1.520	53.300	2.30%	-2.91%
			1910	1.584	51.581	1.520	53.300	4.21%	-3.23%
2/13/2017	1900B	21.2	1850	1.510	54.997	1.520	53.300	-0.66%	3.18%
			1880	1.546	54.899	1.520	53.300	1.71%	3.00%
			1910	1.581	54.776	1.520	53.300	4.01%	2.77%
2/15/2017	1900B	22.0	1850	1.499	52.962	1.520	53.300	-1.38%	-0.63%
			1880	1.532	52.856	1.520	53.300	0.79%	-0.83%
			1910	1.573	52.810	1.520	53.300	3.49%	-0.92%
1/14/2017	2450B	23.0	2400	1.895	51.343	1.902	52.767	-0.37%	-2.70%
			2450	1.960	51.131	1.950	52.700	0.51%	-2.98%
			2500	2.029	50.973	2.021	52.636	0.40%	-3.16%
1/24/2017	2450B	23.0	2400	1.908	51.547	1.902	52.767	0.32%	-2.31%
			2450	1.973	51.355	1.950	52.700	1.18%	-2.55%
			2500	2.043	51.151	2.021	52.636	1.09%	-2.82%
1/14/2017	2600B	23.0	2500	2.029	50.973	2.021	52.636	0.40%	-3.16%
			2550	2.091	50.813	2.092	52.573	-0.05%	-3.35%
			2600	2.159	50.581	2.163	52.509	-0.18%	-3.67%
01/14/2017	5200B-5800B	22.1	5240	5.454	47.734	5.346	48.960	2.02%	-2.50%
			5260	5.471	47.659	5.369	48.933	1.90%	-2.60%
			5280	5.498	47.637	5.393	48.906	1.95%	-2.59%
			5300	5.514	47.598	5.416	48.879	1.81%	-2.62%
			5320	5.542	47.586	5.439	48.851	1.89%	-2.59%
			5500	5.796	47.295	5.650	48.607	2.58%	-2.70%
			5600	5.930	47.091	5.766	48.471	2.84%	-2.85%
			5680	6.019	47.021	5.860	48.363	2.71%	-2.77%
			5745	6.133	46.888	5.936	48.275	3.32%	-2.87%
			5765	6.160	46.845	5.959	48.248	3.37%	-2.91%
			5785	6.169	46.845	5.982	48.220	3.13%	-2.85%
			5825	6.219	46.703	6.029	48.166	3.15%	-3.04%

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)	Dipole SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
K	750	HEAD	01/06/2017	23.9	22.0	0.200	1054	7409	1.530	8.220	7.650	-6.93%
H	835	HEAD	01/09/2017	22.2	21.1	0.200	4d133	3319	1.850	9.320	9.250	-0.75%
H	835	HEAD	01/23/2017	21.4	21.4	0.200	4d047	3319	1.930	9.130	9.650	5.70%
D	1750	HEAD	12/30/2016	22.8	21.4	0.100	1148	3213	3.600	36.200	36.000	-0.55%
G	1900	HEAD	12/31/2016	23.6	22.4	0.100	5d149	3287	3.950	40.100	39.500	-1.50%
G	1900	HEAD	02/06/2017	20.3	20.1	0.100	5d149	3287	4.160	40.100	41.600	3.74%
I	1900	HEAD	02/14/2017	23.5	22.7	0.100	5d149	3209	4.030	40.100	40.300	0.50%
G	2450	HEAD	01/13/2017	21.9	22.5	0.100	797	3287	5.540	52.100	55.400	6.33%
G	2450	HEAD	01/22/2017	23.2	22.5	0.100	981	3287	5.640	52.800	56.400	6.82%
G	2600	HEAD	01/10/2017	23.6	23.0	0.100	1126	3287	5.880	56.300	58.800	4.44%
J	5250	HEAD	01/06/2017	21.5	20.5	0.050	1191	7357	3.850	78.900	77.000	-2.41%
J	5600	HEAD	01/06/2017	21.5	20.5	0.050	1191	7357	3.840	83.600	76.800	-8.13%
J	5750	HEAD	01/06/2017	21.5	20.5	0.050	1191	7357	3.960	79.100	79.200	0.13%
F	750	BODY	01/03/2017	21.8	21.5	0.200	1161	3332	1.680	8.430	8.400	-0.36%
F	750	BODY	01/14/2017	22.7	22.0	0.200	1054	3332	1.670	8.560	8.350	-2.45%
H	835	BODY	01/11/2017	23.3	21.8	0.200	4d133	3319	2.010	9.500	10.050	5.79%
H	835	BODY	01/26/2017	22.8	21.4	0.200	4d047	3319	2.020	9.570	10.100	5.54%
I	1750	BODY	01/09/2017	22.1	21.3	0.100	1148	3209	3.690	37.100	36.900	-0.54%
K	1900	BODY	01/04/2017	24.0	23.5	0.100	5d149	7409	4.220	39.900	42.200	5.76%
K	1900	BODY	01/09/2017	22.5	22.4	0.100	5d149	7409	4.230	39.900	42.300	6.02%
J	1900	BODY	02/15/2017	23.2	21.1	0.100	5d080	3334	4.010	39.100	40.100	2.56%
E	2450	BODY	01/14/2017	22.7	22.5	0.100	981	7406	5.110	50.800	51.100	0.59%
E	2450	BODY	01/24/2017	24.0	23.0	0.100	981	7406	4.940	50.800	49.400	-2.76%
E	2600	BODY	01/14/2017	22.7	22.5	0.100	1071	7406	5.630	54.200	56.300	3.87%
D	5250	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	3.400	74.800	68.000	-9.09%
D	5600	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	3.870	77.000	77.400	0.52%
D	5750	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	3.460	75.400	69.200	-8.22%

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)	Dipole SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
I	1750	BODY	01/09/2017	22.1	21.3	0.100	1148	3209	1.960	19.700	19.600	-0.51%
K	1900	BODY	01/04/2017	24.0	23.5	0.100	5d149	7409	2.170	21.100	21.700	2.84%
K	1900	BODY	01/09/2017	22.5	22.4	0.100	5d149	7409	2.170	21.100	21.700	2.84%
J	1900	BODY	02/13/2017	20.7	21.2	0.100	5d080	3334	2.180	20.700	21.800	5.31%
E	2450	BODY	01/14/2017	22.7	22.5	0.100	981	7406	2.340	23.800	23.400	-1.68%
D	5250	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	0.957	21.000	19.140	-8.86%
D	5600	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	1.090	21.500	21.800	1.40%
D	5750	BODY	01/14/2017	21.6	21.1	0.050	1237	3914	0.974	20.900	19.480	-6.79%

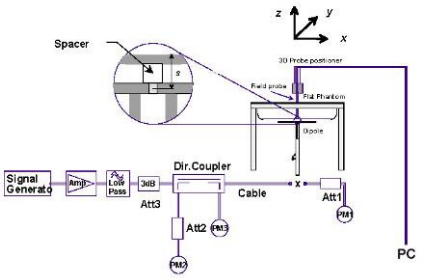


Figure 10-1
System Verification Setup Diagram

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	34.0	33.31	0.00	Right	Cheek	07EA5	1:8.3	0.169	1.172	0.198	A1
836.60	190	GSM 850	GSM	34.0	33.31	0.13	Right	Tilt	07EA5	1:8.3	0.052	1.172	0.061	
836.60	190	GSM 850	GSM	34.0	33.31	0.12	Left	Cheek	07EA5	1:8.3	0.123	1.172	0.144	
836.60	190	GSM 850	GSM	34.0	33.31	0.03	Left	Tilt	07EA5	1:8.3	0.056	1.172	0.066	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-2
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Ant State	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.04	Right	Cheek	6	07EA5	1:1	0.368	1.122	**0.413**	A2
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.01	Right	Tilt	6	07EA5	1:1	0.113	1.122	0.127	
836.60	4183	UMTS 850	RMC	25.0	24.50	0.04	Left	Cheek	6	07EA5	1:1	0.270	1.122	0.303	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.05	Left	Tilt	6	07EA5	1:1	0.130	1.122	0.146	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-3
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.07	Right	Cheek	07CF0	1:1	0.087	1.340	0.117	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.08	Right	Tilt	07CF0	1:1	0.086	1.340	0.115	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.14	Left	Cheek	07CF0	1:1	0.123	1.340	0.165	A3
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.08	Left	Tilt	07CF0	1:1	0.080	1.340	0.107	
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
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)	
1909.80	810	GSM 1900	GSM	31.0	30.28	0.05	Right	Cheek	07EAD	1:8.3	0.083	1.180	0.098	
1909.80	810	GSM 1900	GSM	31.0	30.28	0.06	Right	Tilt	07EAD	1:8.3	0.050	1.180	0.059	
1909.80	810	GSM 1900	GSM	31.0	30.28	0.06	Left	Cheek	07EAD	1:8.3	0.114	1.180	0.135	A4
1909.80	810	GSM 1900	GSM	31.0	30.28	-0.09	Left	Tilt	07EAD	1:8.3	0.048	1.180	0.057	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.10	Right	Cheek	07EAD	1:1	0.128	1.486	0.190	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.16	Right	Tilt	07EAD	1:1	0.059	1.486	0.088	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.07	Left	Cheek	07EAD	1:1	0.171	1.486	0.254	A5
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.20	Left	Tilt	07EAD	1:1	0.043	1.486	0.064	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-6
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	-0.07	0	Right	Cheek	QPSK	1	0	07CF0	1:1	0.090	1.288	0.116	A6
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	-0.10	1	Right	Cheek	QPSK	25	12	07CF0	1:1	0.063	1.300	0.082	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.12	0	Right	Tilt	QPSK	1	0	07CF0	1:1	0.047	1.288	0.061	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.06	1	Right	Tilt	QPSK	25	12	07CF0	1:1	0.034	1.300	0.044	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.11	0	Left	Cheek	QPSK	1	0	07CF0	1:1	0.069	1.288	0.089	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.02	1	Left	Cheek	QPSK	25	12	07CF0	1:1	0.051	1.300	0.066	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.12	0	Left	Tilt	QPSK	1	0	07CF0	1:1	0.061	1.288	0.079	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.16	1	Left	Tilt	QPSK	25	12	07CF0	1:1	0.050	1.300	0.065	
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 13 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	-0.16	0	Right	Cheek	QPSK	1	0	07CF0	1:1	0.078	1.274	0.099	A7
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.01	1	Right	Cheek	QPSK	25	25	07CF0	1:1	0.062	1.285	0.080	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.13	0	Right	Tilt	QPSK	1	0	07CF0	1:1	0.029	1.274	0.037	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.14	1	Right	Tilt	QPSK	25	25	07CF0	1:1	0.020	1.285	0.026	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.04	0	Left	Cheek	QPSK	1	0	07CF0	1:1	0.060	1.274	0.076	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.16	1	Left	Cheek	QPSK	25	25	07CF0	1:1	0.043	1.285	0.055	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.02	0	Left	Tilt	QPSK	1	0	07CF0	1:1	0.036	1.274	0.046	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.15	1	Left	Tilt	QPSK	25	25	07CF0	1:1	0.022	1.285	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 11-8
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	-0.06	0	Right	Cheek	QPSK	1	0	07EA5	1:1	0.160	1.239	0.198	A8
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.02	1	Right	Cheek	QPSK	36	0	07EA5	1:1	0.131	1.250	0.164	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	-0.13	0	Right	Tilt	QPSK	1	0	07EA5	1:1	0.090	1.239	0.112	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.11	1	Right	Tilt	QPSK	36	0	07EA5	1:1	0.073	1.250	0.091	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.10	0	Left	Cheek	QPSK	1	0	07EA5	1:1	0.137	1.239	0.170	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.04	1	Left	Cheek	QPSK	36	0	07EA5	1:1	0.106	1.250	0.133	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.01	0	Left	Tilt	QPSK	1	0	07EA5	1:1	0.129	1.239	0.160	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.00	1	Left	Tilt	QPSK	36	0	07EA5	1:1	0.097	1.250	0.121	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 11-9
LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Ant State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.01	0	Right	Cheek	1	QPSK	1	0	07CF5	1:1	0.170	1.135	0.193	A9
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	-0.01	1	Right	Cheek	1	QPSK	25	0	07CF5	1:1	0.136	1.156	0.157	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.07	0	Right	Tilt	1	QPSK	1	0	07CF5	1:1	0.106	1.135	0.120	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.11	1	Right	Tilt	1	QPSK	25	0	07CF5	1:1	0.071	1.156	0.082	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.10	0	Left	Cheek	1	QPSK	1	0	07CF5	1:1	0.149	1.135	0.169	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.10	1	Left	Cheek	1	QPSK	25	0	07CF5	1:1	0.117	1.156	0.135	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	-0.06	0	Left	Tilt	1	QPSK	1	0	07CF5	1:1	0.141	1.135	0.160	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	-0.02	1	Left	Tilt	1	QPSK	25	0	07CF5	1:1	0.100	1.156	0.116	
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 66 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	0.12	0	Right	Cheek	QPSK	1	0	07CF0	1:1	0.084	1.343	0.113	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	0.16	1	Right	Cheek	QPSK	50	25	07CF0	1:1	0.063	1.400	0.088	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	0.06	0	Right	Tilt	QPSK	1	0	07CF0	1:1	0.068	1.343	0.091	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	0.11	1	Right	Tilt	QPSK	50	25	07CF0	1:1	0.060	1.400	0.084	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	-0.04	0	Left	Cheek	QPSK	1	0	07CF0	1:1	0.103	1.343	0.138	A10
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.01	1	Left	Cheek	QPSK	50	25	07CF0	1:1	0.094	1.400	0.132	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	0.14	0	Left	Tilt	QPSK	1	0	07CF0	1:1	0.078	1.343	0.105	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	0.02	1	Left	Tilt	QPSK	50	25	07CF0	1:1	0.064	1.400	0.090	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 11-11
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	0.11	0	Right	Cheek	QPSK	1	0	07EAD	1:1	0.088	1.303	0.115	A11
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.06	1	Right	Cheek	QPSK	50	0	07EAD	1:1	0.066	1.321	0.087	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.12	0	Right	Tilt	QPSK	1	0	07EAD	1:1	0.012	1.303	0.016	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.21	1	Right	Tilt	QPSK	50	0	07EAD	1:1	0.009	1.321	0.012	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	0.06	0	Left	Cheek	QPSK	1	0	07EAD	1:1	0.036	1.303	0.047	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	-0.11	1	Left	Cheek	QPSK	50	0	07EAD	1:1	0.026	1.321	0.034	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.18	0	Left	Tilt	QPSK	1	0	07EAD	1:1	0.019	1.303	0.025	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.18	1	Left	Tilt	QPSK	50	0	07EAD	1:1	0.014	1.321	0.018	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 11-12
LTE Band 41 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.09	0	Right	Cheek	QPSK	1	0	07E80	1:1.58	0.058	1.271	0.074	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	-0.04	1	Right	Cheek	QPSK	50	0	07E80	1:1.58	0.044	1.312	0.058	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.05	0	Right	Tilt	QPSK	1	0	07E80	1:1.58	0.047	1.271	0.060	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.19	1	Right	Tilt	QPSK	50	0	07E80	1:1.58	0.039	1.312	0.051	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.12	0	Left	Cheek	QPSK	1	0	07E80	1:1.58	0.064	1.271	0.081	A12
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	-0.08	1	Left	Cheek	QPSK	50	0	07E80	1:1.58	0.054	1.312	0.071	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	-0.03	0	Left	Tilt	QPSK	1	0	07E80	1:1.58	0.031	1.271	0.039	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.01	1	Left	Tilt	QPSK	50	0	07E80	1:1.58	0.026	1.312	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 11-13
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	15.5	15.18	0.00	Right	Cheek	1	07D04	1	99.1	0.375	0.407	1.076	1.009	0.442	
2412	1	802.11b	DSSS	22	15.5	15.18	-0.12	Right	Tilt	1	07D04	1	99.1	0.304	0.254	1.076	1.009	0.276	
2412	1	802.11b	DSSS	22	15.5	15.18	-0.18	Left	Cheek	1	07D04	1	99.1	0.300	-	1.076	1.009	-	
2412	1	802.11b	DSSS	22	15.5	15.18	0.01	Left	Tilt	1	07D04	1	99.1	0.263	-	1.076	1.009	-	
2437	6	802.11b	DSSS	22	15.5	15.05	0.11	Right	Cheek	2	07D04	1	99.0	0.711	0.597	1.109	1.010	**0.669**	A13
2437	6	802.11b	DSSS	22	15.5	15.05	0.06	Right	Tilt	2	07D04	1	99.0	0.393	0.381	1.109	1.010	0.427	
2437	6	802.11b	DSSS	22	15.5	15.05	-0.18	Left	Cheek	2	07D04	1	99.0	0.247	-	1.109	1.010	-	
2437	6	802.11b	DSSS	22	15.5	15.05	-0.01	Left	Tilt	2	07D04	1	99.0	0.168	-	1.109	1.010	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-14
DTS MIMO Operations with Simultaneous 2.4 GHz and 5 GHz WLAN Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (per Antenna)	Ant 1 Conducted Power [dBm]	Ant 2 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	802.11n	OFDM	20	12.5	11.77	11.22	0.21	Right	Cheek	MIMO	07D04	13	96.9	0.437	0.327	1.343	1.032	0.453	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.02	Right	Tilt	MIMO	07D04	13	96.9	0.254	0.216	1.343	1.032	0.299	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	-0.11	Left	Cheek	MIMO	07D04	13	96.9	0.122	-	1.343	1.032	-	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.13	Left	Tilt	MIMO	07D04	13	96.9	0.095	-	1.343	1.032	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

Note: DTS MIMO was additionally evaluated at the maximum allowed output power for operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 5 GHz WLAN was not transmitting during the above evaluations.

Table 11-15
NII Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5260	52	802.11a	OFDM	20	15.5	15.13	-0.11	Right	Cheek	1	07E7A	6	98.5	0.353	0.146	1.089	1.015	0.161	
5260	52	802.11a	OFDM	20	15.5	15.13	0.18	Right	Tilt	1	07E7A	6	98.5	0.342	-	1.089	1.015	-	
5260	52	802.11a	OFDM	20	15.5	15.13	0.13	Left	Cheek	1	07E7A	6	98.5	0.084	-	1.089	1.015	-	
5260	52	802.11a	OFDM	20	15.5	15.13	0.13	Left	Tilt	1	07E7A	6	98.5	0.069	-	1.089	1.015	-	
5300	60	802.11a	OFDM	20	15.5	15.44	-0.21	Right	Cheek	2	07E7A	6	98.5	1.195	0.489	1.014	1.015	0.503	
5300	60	802.11a	OFDM	20	15.5	15.44	-0.13	Right	Tilt	2	07E7A	6	98.5	1.015	0.374	1.014	1.015	0.385	
5300	60	802.11a	OFDM	20	15.5	15.44	-0.13	Left	Cheek	2	07E7A	6	98.5	0.536	-	1.014	1.015	-	
5300	60	802.11a	OFDM	20	15.5	15.44	0.14	Left	Tilt	2	07E7A	6	98.5	0.438	-	1.014	1.015	-	
5720	144	802.11a	OFDM	20	15.5	14.86	0.10	Right	Cheek	1	07E7A	6	98.5	0.666	0.225	1.159	1.015	0.265	
5720	144	802.11a	OFDM	20	15.5	14.86	0.15	Right	Tilt	1	07E7A	6	98.5	0.588	-	1.159	1.015	-	
5720	144	802.11a	OFDM	20	15.5	14.86	0.12	Left	Cheek	1	07E7A	6	98.5	0.296	-	1.159	1.015	-	
5720	144	802.11a	OFDM	20	15.5	14.86	0.14	Left	Tilt	1	07E7A	6	98.5	0.236	-	1.159	1.015	-	
5500	100	802.11a	OFDM	20	15.5	15.34	0.12	Right	Cheek	2	07E7A	6	98.5	0.373	0.180	1.038	1.015	0.190	
5500	100	802.11a	OFDM	20	15.5	15.34	0.12	Right	Tilt	2	07E7A	6	98.5	0.300	-	1.038	1.015	-	
5500	100	802.11a	OFDM	20	15.5	15.34	0.13	Left	Cheek	2	07E7A	6	98.5	0.289	-	1.038	1.015	-	
5500	100	802.11a	OFDM	20	15.5	15.34	0.12	Left	Tilt	2	07E7A	6	98.5	0.287	-	1.038	1.015	-	
5745	149	802.11a	OFDM	20	15.5	14.57	0.13	Right	Cheek	1	07E7A	6	98.5	0.623	0.233	1.239	1.015	0.293	
5745	149	802.11a	OFDM	20	15.5	14.57	0.13	Right	Tilt	1	07E7A	6	98.5	0.564	-	1.239	1.015	-	
5745	149	802.11a	OFDM	20	15.5	14.57	0.17	Left	Cheek	1	07E7A	6	98.5	0.307	-	1.239	1.015	-	
5745	149	802.11a	OFDM	20	15.5	14.57	0.13	Left	Tilt	1	07E7A	6	98.5	0.243	-	1.239	1.015	-	
5745	149	802.11a	OFDM	20	15.5	15.31	0.19	Right	Cheek	2	07E7A	6	98.5	1.172	0.546	1.045	1.015	**0.579**	A14
5745	149	802.11a	OFDM	20	15.5	15.31	0.13	Right	Tilt	2	07E7A	6	98.5	0.819	0.325	1.045	1.015	0.345	
5745	149	802.11a	OFDM	20	15.5	15.31	0.17	Left	Cheek	2	07E7A	6	98.5	0.819	-	1.045	1.015	-	
5745	149	802.11a	OFDM	20	15.5	15.31	0.19	Left	Tilt	2	07E7A	6	98.5	0.750	-	1.045	1.015	-	
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 11-16
NII MIMO Operations with Simultaneous 2.4 GHz and 5 GHz WLAN Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (per Antenna)	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	12.5	12.10	11.16	-0.11	Right	Cheek	MIMO	07E7A	58.5	90.6	0.503	0.222	1.361	1.104	0.334	
5290	58	802.11ac	OFDM	80	12.5	12.10	11.16	-0.14	Right	Tilt	MIMO	07E7A	58.5	90.6	0.325	-	1.361	1.104	-	
5290	58	802.11ac	OFDM	80	12.5	12.10	11.16	0.10	Left	Cheek	MIMO	07E7A	58.5	90.6	0.102	-	1.361	1.104	-	
5290	58	802.11ac	OFDM	80	12.5	12.10	11.16	0.00	Left	Tilt	MIMO	07E7A	58.5	90.6	0.080	-	1.361	1.104	-	
5690	138	802.11ac	OFDM	80	12.5	11.92	10.94	0.10	Right	Cheek	MIMO	07E7A	58.5	90.6	0.426	0.180	1.432	1.104	0.285	
5690	138	802.11ac	OFDM	80	12.5	11.92	10.94	0.00	Right	Tilt	MIMO	07E7A	58.5	90.6	0.316	-	1.432	1.104	-	
5690	138	802.11ac	OFDM	80	12.5	11.92	10.94	0.17	Left	Cheek	MIMO	07E7A	58.5	90.6	0.238	-	1.432	1.104	-	
5690	138	802.11ac	OFDM	80	12.5	11.92	10.94	0.12	Left	Tilt	MIMO	07E7A	58.5	90.6	0.186	-	1.432	1.104	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.17	Right	Cheek	MIMO	07E7A	58.5	90.6	0.525	0.219	1.542	1.104	0.373	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.10	Right	Tilt	MIMO	07E7A	58.5	90.6	0.440	-	1.542	1.104	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.10	Left	Cheek	MIMO	07E7A	58.5	90.6	0.333	-	1.542	1.104	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.14	Left	Tilt	MIMO	07E7A	58.5	90.6	0.257	-	1.542	1.104	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Note: NII MIMO was additionally evaluated at the maximum allowed output power for operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 2.4 GHz WLAN was not transmitting during the above evaluations.

Table 11-17
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)	
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.12	Right	Cheek	07EA5	2	76.8	0.103	1.122	1.302	0.150	A15
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	-0.13	Right	Tilt	07EA5	2	76.8	0.060	1.122	1.302	0.088	
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.07	Left	Cheek	07EA5	2	76.8	0.030	1.122	1.302	0.044	
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.14	Left	Tilt	07EA5	2	76.8	0.020	1.122	1.302	0.029	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram									

11.2 Standalone Body-Worn SAR Data

Table 11-18
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant State	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	34.0	33.31	-0.08	15 mm	N/A	07EA5	1	1:8.3	back	0.228	1.172	0.267	A16
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.06	15 mm	6	07CF5	N/A	1:1	back	0.553	1.122	0.620	A18
1712.40	1312	UMTS 1750	RMC	24.5	23.09	0.01	15 mm	N/A	07CF0	N/A	1:1	back	0.620	1.384	0.858	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	-0.02	15 mm	N/A	07CF0	N/A	1:1	back	0.677	1.340	0.907	
1752.60	1513	UMTS 1750	RMC	24.5	23.19	0.01	15 mm	N/A	07CF0	N/A	1:1	back	0.716	1.352	0.968	A20
1909.80	810	GSM 1900	GSM	31.0	30.28	-0.01	15 mm	N/A	07E7A	1	1:8.3	back	0.412	1.180	0.486	A22
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.12	15 mm	N/A	07EB0	N/A	1:1	back	0.512	1.486	0.761	A24
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-19
LTE Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.06	0	N/A	07CF0	QPSK	1	0	15 mm	back	1:1	0.142	1.288	0.183	A26
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.11	1	N/A	07CF0	QPSK	25	12	15 mm	back	1:1	0.111	1.300	0.144	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	-0.13	0	N/A	07D04	QPSK	1	0	15 mm	back	1:1	0.157	1.274	0.200	A28
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.01	1	N/A	07D04	QPSK	25	25	15 mm	back	1:1	0.123	1.285	0.158	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.05	0	N/A	07EA5	QPSK	1	0	15 mm	back	1:1	0.250	1.239	0.310	A30
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	-0.03	1	N/A	07EA5	QPSK	36	0	15 mm	back	1:1	0.200	1.250	0.250	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.04	0	1	07D04	QPSK	1	0	15 mm	back	1:1	0.304	1.135	0.345	A32
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.03	1	1	07D04	QPSK	25	0	15 mm	back	1:1	0.242	1.156	0.280	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	22.46	0.04	0	N/A	07CF0	QPSK	1	50	15 mm	back	1:1	0.575	1.426	0.820	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	-0.04	0	N/A	07CF0	QPSK	1	0	15 mm	back	1:1	0.633	1.343	0.850	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	22.66	-0.03	0	N/A	07CF0	QPSK	1	50	15 mm	back	1:1	0.707	1.361	0.962	A34
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.01	1	N/A	07CF0	QPSK	50	25	15 mm	back	1:1	0.496	1.400	0.694	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.0	21.44	0.03	1	N/A	07CF0	QPSK	100	0	15 mm	back	1:1	0.533	1.432	0.763	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.0	22.49	-0.14	0	N/A	07EB0	QPSK	1	0	15 mm	back	1:1	0.576	1.416	0.816	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.55	-0.07	0	N/A	07EB0	QPSK	1	0	15 mm	back	1:1	0.615	1.396	0.859	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.01	0	N/A	07EB0	QPSK	1	0	15 mm	back	1:1	0.633	1.303	0.825	A36
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.11	1	N/A	07EB0	QPSK	50	0	15 mm	back	1:1	0.476	1.321	0.629	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.69	-0.05	1	N/A	07EB0	QPSK	100	0	15 mm	back	1:1	0.479	1.352	0.648	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.03	0	N/A	07EA5	QPSK	1	0	15 mm	back	1:1.58	0.186	1.271	0.236	A38
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.05	1	N/A	07EA5	QPSK	50	0	15 mm	back	1:1.58	0.160	1.312	0.210	
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
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)	
2462	11	802.11b	DSSS	22	18.5	18.03	0.08	15 mm	1	07D04	1	back	99.1	0.116	0.077	1.114	1.009	0.087	
2412	1	802.11b	DSSS	22	18.5	17.96	0.05	15 mm	2	07D04	1	back	99.0	0.195	0.138	1.132	1.010	**0.158**	A40
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
DTS MIMO Operations with Simultaneous 2.4 GHz and 5 GHz WLAN Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (per Antenna)	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.10	15 mm	MIMO	07D04	13	back	96.9	0.044	0.028	1.343	1.032	0.039	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram					

Note: DTS MIMO was additionally evaluated at the maximum allowed output power for operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 5 GHz WLAN was not transmitting during the above evaluations.

Table 11-22
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)	
5320	64	802.11a	OFDM	20	18.5	18.08	-0.18	15 mm	1	07E7A	6	back	98.5	0.057	0.033	1.102	1.015	0.037	
5300	60	802.11a	OFDM	20	18.5	18.42	-0.13	15 mm	2	07E7A	6	back	98.5	0.088	0.046	1.019	1.015	0.048	
5500	100	802.11a	OFDM	20	18.5	17.96	-0.06	15 mm	1	07E7A	6	back	98.5	0.068	0.037	1.132	1.015	0.043	
5600	120	802.11a	OFDM	20	18.5	17.95	-0.05	15 mm	2	07E7A	6	back	98.5	0.068	0.035	1.135	1.015	0.040	
5745	149	802.11a	OFDM	20	18.5	17.82	0.10	15 mm	1	07E7A	6	back	98.5	0.136	0.067	1.169	1.015	0.079	
5825	165	802.11a	OFDM	20	18.5	18.20	-0.12	15 mm	2	07E7A	6	back	98.5	0.154	0.088	1.072	1.015	0.096	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											

Table 11-23
NII MIMO Operations with Simultaneous 2.4 GHz and 5 GHz WLAN Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (per Antenna)	Ant 1 Conducted Power [dBm]	Ant 2 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)	
5290	58	802.11ac	OFDM	80	12.5	12.10	11.16	0.11	15 mm	MIMO	07E7A	58.5	back	90.6	0.006	0.000	17.783	1.104	0.000	
5690	138	802.11ac	OFDM	80	12.5	11.92	10.94	0.13	15 mm	MIMO	07E7A	58.5	back	90.6	0.023	0.008	1.432	1.104	0.013	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.16	15 mm	MIMO	07E7A	58.5	back	90.6	0.029	0.010	1.542	1.104	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: NII MIMO was additionally evaluated at the maximum allowed output power for operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 2.4 GHz WLAN was not transmitting during the above evaluations.

Table 11-24
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	16.0	15.60	0.08	15 mm	07EB0	1	back	76.8	0.070	1.096	1.302	0.100	A44
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 11-25
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant State	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	30.5	29.62	-0.05	10 mm	N/A	07EA5	3	1:2.76	back	0.624	1.225	0.764	A17
836.60	190	GSM 850	GPRS	30.5	29.62	-0.03	10 mm	N/A	07EA5	3	1:2.76	front	0.498	1.225	0.610	
836.60	190	GSM 850	GPRS	30.5	29.62	0.00	10 mm	N/A	07EA5	3	1:2.76	bottom	0.339	1.225	0.415	
836.60	190	GSM 850	GPRS	30.5	29.62	0.02	10 mm	N/A	07EA5	3	1:2.76	right	0.274	1.225	0.336	
836.60	190	GSM 850	GPRS	30.5	29.62	0.01	10 mm	N/A	07EA5	3	1:2.76	left	0.086	1.225	0.105	
826.40	4132	UMTS 850	RMC	25.0	24.43	-0.03	10 mm	6	07CF5	N/A	1:1	back	0.854	1.140	0.974	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.01	10 mm	6	07CF5	N/A	1:1	back	0.941	1.122	1.056	
846.60	4233	UMTS 850	RMC	25.0	24.89	0.05	10 mm	6	07CF5	N/A	1:1	back	1.070	1.026	**1.098**	A19
826.40	4132	UMTS 850	RMC	25.0	24.43	-0.10	10 mm	6	07CF5	N/A	1:1	front	0.808	1.140	0.921	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.06	10 mm	6	07CF5	N/A	1:1	front	0.936	1.122	1.050	
846.60	4233	UMTS 850	RMC	25.0	24.89	0.03	10 mm	6	07CF5	N/A	1:1	front	1.020	1.026	1.047	
836.60	4183	UMTS 850	RMC	25.0	24.50	0.01	10 mm	6	07CF5	N/A	1:1	bottom	0.550	1.122	0.617	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.01	10 mm	6	07CF5	N/A	1:1	right	0.504	1.122	0.565	
836.60	4183	UMTS 850	RMC	25.0	24.50	-0.03	10 mm	6	07CF5	N/A	1:1	left	0.200	1.122	0.224	
846.60	4233	UMTS 850	RMC	25.0	24.89	-0.04	10 mm	6	07CF5	N/A	1:1	back	1.050	1.026	1.077	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	-0.02	10 mm	N/A	07CF0	N/A	1:1	back	0.613	1.194	0.732	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	0.01	10 mm	N/A	07CF0	N/A	1:1	front	0.501	1.194	0.598	
1712.40	1312	UMTS 1750	RMC	21.0	20.16	-0.02	10 mm	N/A	07CF0	N/A	1:1	bottom	0.628	1.213	0.762	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	-0.01	10 mm	N/A	07CF0	N/A	1:1	bottom	0.720	1.194	0.860	
1752.60	1513	UMTS 1750	RMC	21.0	20.21	-0.02	10 mm	N/A	07CF0	N/A	1:1	bottom	0.764	1.199	0.916	A21
1732.40	1412	UMTS 1750	RMC	21.0	20.23	0.02	10 mm	N/A	07CF0	N/A	1:1	right	0.101	1.194	0.121	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	0.00	10 mm	N/A	07CF0	N/A	1:1	left	0.068	1.194	0.081	
1909.80	810	GSM 1900	GPRS	29.0	28.27	0.08	10 mm	N/A	07EA5	1	1:8.3	back	0.512	1.183	0.606	
1909.80	810	GSM 1900	GPRS	29.0	28.27	-0.06	10 mm	N/A	07EA5	1	1:8.3	front	0.475	1.183	0.562	
1850.20	512	GSM 1900	GPRS	29.0	27.55	-0.09	10 mm	N/A	07EA5	1	1:8.3	bottom	0.780	1.396	1.089	
1880.00	661	GSM 1900	GPRS	29.0	27.69	-0.09	10 mm	N/A	07EA5	1	1:8.3	bottom	0.809	1.352	1.094	
1909.80	810	GSM 1900	GPRS	29.0	28.27	-0.06	10 mm	N/A	07EA5	1	1:8.3	bottom	0.918	1.183	1.086	A23
1909.80	810	GSM 1900	GPRS	29.0	28.27	-0.08	10 mm	N/A	07EA5	1	1:8.3	right	0.098	1.183	0.116	
1909.80	810	GSM 1900	GPRS	29.0	28.27	-0.16	10 mm	N/A	07EA5	1	1:8.3	left	0.058	1.183	0.069	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	-0.04	10 mm	N/A	07EB0	N/A	1:1	back	0.542	1.169	0.634	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	-0.04	10 mm	N/A	07EB0	N/A	1:1	front	0.414	1.169	0.484	
1852.40	9262	UMTS 1900	RMC	20.5	19.90	0.06	10 mm	N/A	07EB0	N/A	1:1	bottom	0.868	1.148	0.996	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.15	10 mm	N/A	07EB0	N/A	1:1	bottom	0.929	1.169	1.086	A25
1907.60	9538	UMTS 1900	RMC	20.5	19.95	0.08	10 mm	N/A	07EB0	N/A	1:1	bottom	0.899	1.135	1.020	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.04	10 mm	N/A	07EB0	N/A	1:1	right	0.108	1.169	0.126	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	-0.10	10 mm	N/A	07EB0	N/A	1:1	left	0.076	1.169	0.089	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.02	10 mm	N/A	07EB0	N/A	1:1	bottom	0.857	1.169	1.002	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entry represents variability data.

Table 11-26
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	-0.11	0	07CF0	QPSK	1	0	10 mm	back	1:1	0.225	1.288	0.290	A27
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	-0.01	1	07CF0	QPSK	25	12	10 mm	back	1:1	0.188	1.300	0.244	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.07	0	07CF0	QPSK	1	0	10 mm	front	1:1	0.183	1.288	0.236	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.01	1	07CF0	QPSK	25	12	10 mm	front	1:1	0.152	1.300	0.198	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	0.11	0	07CF0	QPSK	1	0	10 mm	bottom	1:1	0.120	1.288	0.155	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.01	1	07CF0	QPSK	25	12	10 mm	bottom	1:1	0.102	1.300	0.133	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	-0.03	0	07CF0	QPSK	1	0	10 mm	right	1:1	0.200	1.288	0.258	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	-0.06	1	07CF0	QPSK	25	12	10 mm	right	1:1	0.159	1.300	0.207	
707.50	23095	Mid	LTE Band 12	10	25.0	23.90	-0.09	0	07CF0	QPSK	1	0	10 mm	left	1:1	0.077	1.288	0.099	
707.50	23095	Mid	LTE Band 12	10	24.0	22.86	0.07	1	07CF0	QPSK	25	12	10 mm	left	1:1	0.060	1.300	0.078	
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 13 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.05	0	07D04	QPSK	1	0	10 mm	back	1:1	0.309	1.274	0.394	A29
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	-0.06	1	07D04	QPSK	25	25	10 mm	back	1:1	0.233	1.285	0.299	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.11	0	07D04	QPSK	1	0	10 mm	front	1:1	0.230	1.274	0.293	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.00	1	07D04	QPSK	25	25	10 mm	front	1:1	0.181	1.285	0.233	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	-0.06	0	07D04	QPSK	1	0	10 mm	bottom	1:1	0.192	1.274	0.245	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	-0.12	1	07D04	QPSK	25	25	10 mm	bottom	1:1	0.137	1.285	0.176	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	-0.11	0	07D04	QPSK	1	0	10 mm	right	1:1	0.135	1.274	0.172	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.14	1	07D04	QPSK	25	25	10 mm	right	1:1	0.097	1.285	0.125	
782.00	23230	Mid	LTE Band 13	10	24.0	22.95	0.13	0	07D04	QPSK	1	0	10 mm	left	1:1	0.057	1.274	0.073	
782.00	23230	Mid	LTE Band 13	10	23.0	21.91	0.00	1	07D04	QPSK	25	25	10 mm	left	1:1	0.049	1.285	0.063	
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 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.08	0	07EA5	QPSK	1	0	10 mm	back	1:1	0.561	1.239	0.695	A31
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	-0.03	1	07EA5	QPSK	36	0	10 mm	back	1:1	0.444	1.250	0.555	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.02	0	07EA5	QPSK	1	0	10 mm	front	1:1	0.479	1.239	0.593	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	-0.05	1	07EA5	QPSK	36	0	10 mm	front	1:1	0.380	1.250	0.475	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	0.00	0	07EA5	QPSK	1	0	10 mm	bottom	1:1	0.309	1.239	0.383	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	-0.10	1	07EA5	QPSK	36	0	10 mm	bottom	1:1	0.244	1.250	0.305	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	-0.04	0	07EA5	QPSK	1	0	10 mm	right	1:1	0.244	1.239	0.302	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.00	1	07EA5	QPSK	36	0	10 mm	right	1:1	0.180	1.250	0.225	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.07	-0.02	0	07EA5	QPSK	1	0	10 mm	left	1:1	0.092	1.239	0.114	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.03	0.04	1	07EA5	QPSK	36	0	10 mm	left	1:1	0.079	1.250	0.099	
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 11-29
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.02	0	1	07D04	QPSK	1	0	10 mm	back	1:1	0.619	1.135	0.703	A33
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	-0.02	1	1	07D04	QPSK	25	0	10 mm	back	1:1	0.494	1.156	0.571	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.00	0	1	07D04	QPSK	1	0	10 mm	front	1:1	0.523	1.135	0.594	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.02	1	1	07D04	QPSK	25	0	10 mm	front	1:1	0.415	1.156	0.480	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.05	0	1	07D04	QPSK	1	0	10 mm	bottom	1:1	0.364	1.135	0.413	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	-0.06	1	1	07D04	QPSK	25	0	10 mm	bottom	1:1	0.277	1.156	0.320	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	-0.05	0	1	07D04	QPSK	1	0	10 mm	right	1:1	0.282	1.135	0.320	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.05	1	1	07D04	QPSK	25	0	10 mm	right	1:1	0.218	1.156	0.252	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	24.45	0.01	0	1	07D04	QPSK	1	0	10 mm	left	1:1	0.085	1.135	0.096	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.37	0.06	1	1	07D04	QPSK	25	0	10 mm	left	1:1	0.067	1.156	0.077	
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 11-30
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.09	0	07CF0	QPSK	1	50	10 mm	back	1:1	0.501	1.265	0.634	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.02	0	07CF0	QPSK	50	0	10 mm	back	1:1	0.511	1.265	0.646	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.12	0	07CF0	QPSK	1	50	10 mm	front	1:1	0.431	1.265	0.545	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.09	0	07CF0	QPSK	50	0	10 mm	front	1:1	0.450	1.265	0.569	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	19.77	-0.07	0	07CF0	QPSK	1	0	10 mm	bottom	1:1	0.631	1.327	0.837	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.06	0	07CF0	QPSK	1	50	10 mm	bottom	1:1	0.758	1.265	0.959	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	19.97	-0.12	0	07CF0	QPSK	1	50	10 mm	bottom	1:1	0.858	1.268	1.088	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	19.65	-0.01	0	07CF0	QPSK	50	50	10 mm	bottom	1:1	0.650	1.365	0.887	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.08	0	07CF0	QPSK	50	0	10 mm	bottom	1:1	0.762	1.265	0.964	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	19.97	-0.15	0	07CF0	QPSK	50	0	10 mm	bottom	1:1	0.863	1.268	1.094	A35
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.82	-0.12	0	07CF0	QPSK	100	0	10 mm	bottom	1:1	0.762	1.312	1.000	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.11	0	07CF0	QPSK	1	50	10 mm	right	1:1	0.104	1.265	0.132	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.15	0	07CF0	QPSK	50	0	10 mm	right	1:1	0.096	1.265	0.121	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.06	0	07CF0	QPSK	1	50	10 mm	left	1:1	0.052	1.265	0.066	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.03	0	07CF0	QPSK	50	0	10 mm	left	1:1	0.055	1.265	0.070	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	19.97	-0.12	0	07CF0	QPSK	50	0	10 mm	bottom	1:1	0.861	1.268	1.092	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Blue entry represents variability data.

Table 11-31
LTE Band 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	0.09	0	07EB0	QPSK	1	50	10 mm	back	1:1	0.632	1.132	0.715	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	0.00	0	07EB0	QPSK	50	25	10 mm	back	1:1	0.614	1.183	0.726	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	0.06	0	07EB0	QPSK	1	50	10 mm	front	1:1	0.464	1.132	0.525	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	0.00	0	07EB0	QPSK	50	25	10 mm	front	1:1	0.446	1.183	0.528	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	19.72	0.02	0	07EB0	QPSK	1	99	10 mm	bottom	1:1	0.846	1.197	1.013	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	19.75	0.00	0	07EB0	QPSK	1	50	10 mm	bottom	1:1	0.879	1.189	1.045	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.02	0	07EB0	QPSK	1	50	10 mm	bottom	1:1	0.918	1.132	1.039	A37
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	19.61	-0.07	0	07EB0	QPSK	50	25	10 mm	bottom	1:1	0.818	1.227	1.004	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	19.67	0.07	0	07EB0	QPSK	50	50	10 mm	bottom	1:1	0.884	1.211	1.071	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	0.09	0	07EB0	QPSK	50	25	10 mm	bottom	1:1	0.917	1.183	1.085	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.73	-0.07	0	07EB0	QPSK	100	0	10 mm	bottom	1:1	0.900	1.194	1.075	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.08	0	07EB0	QPSK	1	50	10 mm	right	1:1	0.107	1.132	0.121	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	-0.05	0	07EB0	QPSK	50	25	10 mm	right	1:1	0.104	1.183	0.123	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.12	0	07EB0	QPSK	1	50	10 mm	left	1:1	0.061	1.132	0.069	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	-0.04	0	07EB0	QPSK	50	25	10 mm	left	1:1	0.061	1.183	0.072	
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 11-32
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.04	0	07EA5	QPSK	1	0	10 mm	back	1:1.58	0.359	1.271	0.456	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.02	1	07EA5	QPSK	50	0	10 mm	back	1:1.58	0.306	1.312	0.401	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.02	0	07EA5	QPSK	1	0	10 mm	front	1:1.58	0.409	1.271	0.520	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.05	1	07EA5	QPSK	50	0	10 mm	front	1:1.58	0.346	1.312	0.454	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	-0.02	0	07EA5	QPSK	1	0	10 mm	bottom	1:1.58	0.417	1.271	0.530	A39
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	-0.05	1	07EA5	QPSK	50	0	10 mm	bottom	1:1.58	0.364	1.312	0.478	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.12	0	07EA5	QPSK	1	0	10 mm	right	1:1.58	0.055	1.271	0.070	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.14	1	07EA5	QPSK	50	0	10 mm	right	1:1.58	0.045	1.312	0.059	
2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.96	0.01	0	07EA5	QPSK	1	0	10 mm	left	1:1.58	0.189	1.271	0.240	
2549.50	40185	Low-Mid	LTE Band 41	20	24.0	22.82	0.06	1	07EA5	QPSK	50	0	10 mm	left	1:1.58	0.164	1.312	0.215	
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 11-33
WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	18.5	18.03	0.12	10 mm	1	07D04	1	back	99.1	0.309	0.199	1.114	1.009	0.224	
2462	11	802.11b	DSSS	22	18.5	18.03	0.15	10 mm	1	07D04	1	front	99.1	0.134	-	1.114	1.009	-	
2462	11	802.11b	DSSS	22	18.5	18.03	0.01	10 mm	1	07D04	1	top	99.1	0.082	-	1.114	1.009	-	
2462	11	802.11b	DSSS	22	18.5	18.03	0.06	10 mm	1	07D04	1	left	99.1	0.156	-	1.114	1.009	-	
2412	1	802.11b	DSSS	22	18.5	17.96	0.04	10 mm	2	07D04	1	back	99.0	0.341	0.230	1.132	1.010	**0.263**	A41
2412	1	802.11b	DSSS	22	18.5	17.96	0.14	10 mm	2	07D04	1	front	99.0	0.150	-	1.132	1.010	-	
2412	1	802.11b	DSSS	22	18.5	17.96	0.14	10 mm	2	07D04	1	top	99.0	0.058	-	1.132	1.010	-	
2412	1	802.11b	DSSS	22	18.5	17.96	0.13	10 mm	2	07D04	1	left	99.0	0.067	-	1.132	1.010	-	
5745	149	802.11a	OFDM	20	18.5	17.82	0.06	10 mm	1	07E7A	6	back	98.5	0.259	0.109	1.169	1.015	0.129	
5745	149	802.11a	OFDM	20	18.5	17.82	0.13	10 mm	1	07E7A	6	front	98.5	0.092	-	1.169	1.015	-	
5745	149	802.11a	OFDM	20	18.5	17.82	0.10	10 mm	1	07E7A	6	top	98.5	0.116	-	1.169	1.015	-	
5745	149	802.11a	OFDM	20	18.5	17.82	0.03	10 mm	1	07E7A	6	left	98.5	0.052	-	1.169	1.015	-	
5825	165	802.11a	OFDM	20	18.5	18.20	0.02	10 mm	2	07E7A	6	back	98.5	0.298	0.131	1.072	1.015	**0.143**	A43
5825	165	802.11a	OFDM	20	18.5	18.20	0.13	10 mm	2	07E7A	6	front	98.5	0.211	-	1.072	1.015	-	
5825	165	802.11a	OFDM	20	18.5	18.20	0.12	10 mm	2	07E7A	6	top	98.5	0.129	-	1.072	1.015	-	
5825	165	802.11a	OFDM	20	18.5	18.20	0.15	10 mm	2	07E7A	6	left	98.5	0.130	-	1.072	1.015	-	
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 11-34
WLAN MIMO Operations with Simultaneous 2.4 GHz and 5 GHz WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (per Antenna)	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.12	10 mm	MIMO	07D04	13	back	96.9	0.136	0.088	1.343	1.032	0.122	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	-0.01	10 mm	MIMO	07D04	13	front	96.9	0.053	-	1.343	1.032	-	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.11	10 mm	MIMO	07D04	13	top	96.9	0.023	-	1.343	1.032	-	
2412	1	802.11n	OFDM	20	12.5	11.77	11.22	0.01	10 mm	MIMO	07D04	13	left	96.9	0.043	-	1.342	1.032	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.21	10 mm	MIMO	07E7A	58.5	back	90.6	0.056	0.020	1.542	1.104	0.034	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.14	10 mm	MIMO	07E7A	58.5	front	90.6	0.024	-	1.542	1.104	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.10	10 mm	MIMO	07E7A	58.5	top	90.6	0.007	-	1.542	1.104	-	
5775	155	802.11ac	OFDM	80	12.5	11.70	10.62	0.10	10 mm	MIMO	07E7A	58.5	left	90.6	0.008	-	1.542	1.104	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram					

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

Table 11-35
DSS Hotspot SAR

MEASUREMENT RESULTS																		
FREQUENCY			Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Device Serial Number	Data Rate (Mbps)	Spacing	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	Mid	Bluetooth	FHSS	10.0	9.50	0.13	07EB0	2	10 mm	back	76.8	0.016	1.122	1.302	0.023	A45
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.12	07EB0	2	10 mm	front	76.8	0.002	1.122	1.302	0.003	
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.15	07EB0	2	10 mm	top	76.8	0.002	1.122	1.302	0.003	
2441	39	Mid	Bluetooth	FHSS	10.0	9.50	0.15	07EB0	2	10 mm	left	76.8	0.004	1.122	1.302	0.006	
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 11-36
GSM/GPRS/UMTS Phablet SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	-0.05	5 mm	07CF0	N/A	1:1	back	0.595	1.340	0.797	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.03	6 mm	07CF0	N/A	1:1	front	0.471	1.340	0.631	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	0.03	7 mm	07CF0	N/A	1:1	bottom	0.583	1.340	0.781	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	-0.06	0 mm	07CF0	N/A	1:1	right	0.729	1.340	0.977	
1732.40	1412	UMTS 1750	RMC	24.5	23.23	-0.04	0 mm	07CF0	N/A	1:1	left	0.578	1.340	0.775	
1712.40	1312	UMTS 1750	RMC	21.0	20.16	0.03	0 mm	07CF0	N/A	1:1	back	1.580	1.213	1.917	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	0.07	0 mm	07CF0	N/A	1:1	back	1.680	1.194	2.006	
1752.60	1513	UMTS 1750	RMC	21.0	20.21	0.14	0 mm	07CF0	N/A	1:1	back	1.730	1.199	2.074	
1732.40	1412	UMTS 1750	RMC	21.0	20.23	-0.04	0 mm	07CF0	N/A	1:1	front	1.520	1.194	1.815	
1712.40	1312	UMTS 1750	RMC	21.0	20.16	-0.01	0 mm	07CF0	N/A	1:1	bottom	1.770	1.213	2.147	A46
1732.40	1412	UMTS 1750	RMC	21.0	20.23	-0.01	0 mm	07CF0	N/A	1:1	bottom	1.730	1.194	2.066	
1752.60	1513	UMTS 1750	RMC	21.0	20.21	-0.06	0 mm	07CF0	N/A	1:1	bottom	1.600	1.199	1.918	
1880.00	661	GSM 1900	GPRS	28.2	26.85	-0.05	5 mm	07EA5	2	1:4.15	back	0.783	1.365	1.069	
1880.00	661	GSM 1900	GPRS	28.2	26.85	-0.06	6 mm	07EA5	2	1:4.15	front	0.535	1.365	0.730	
1880.00	661	GSM 1900	GPRS	28.2	26.85	0.18	7 mm	07EA5	2	1:4.15	bottom	0.865	1.365	1.181	
1880.00	661	GSM 1900	GPRS	28.2	26.85	-0.02	0 mm	07EA5	2	1:4.15	right	0.337	1.365	0.460	
1880.00	661	GSM 1900	GPRS	28.2	26.85	-0.03	0 mm	07EA5	2	1:4.15	left	0.294	1.365	0.401	
1850.20	512	GSM 1900	GSM	31.0	29.71	-0.03	0 mm	07EA5	1	1:8.3	back	1.710	1.346	2.302	
1880.00	661	GSM 1900	GSM	31.0	29.90	0.03	0 mm	07EA5	1	1:8.3	back	1.930	1.288	2.486	
1909.80	810	GSM 1900	GSM	31.0	30.28	-0.06	0 mm	07EA5	1	1:8.3	back	2.030	1.180	2.395	
1850.20	512	GSM 1900	GSM	31.0	29.71	-0.04	0 mm	07EA5	1	1:8.3	front	1.700	1.346	2.288	
1880.00	661	GSM 1900	GSM	31.0	29.90	-0.14	0 mm	07EA5	1	1:8.3	front	1.790	1.288	2.306	
1909.80	810	GSM 1900	GSM	31.0	30.28	-0.09	0 mm	07EA5	1	1:8.3	front	1.820	1.180	2.148	
1850.20	512	GSM 1900	GSM	31.0	29.71	-0.02	0 mm	07EA5	1	1:8.3	bottom	2.400	1.346	3.230	
1880.00	661	GSM 1900	GSM	31.0	29.90	-0.15	0 mm	07EA5	1	1:8.3	bottom	2.160	1.288	2.782	
1909.80	810	GSM 1900	GSM	31.0	30.28	-0.05	0 mm	07EA5	1	1:8.3	bottom	1.970	1.180	2.325	
1850.20	512	GSM 1900	GSM	31.0	29.71	0.04	0 mm	07EA5	1	1:8.3	bottom	2.410	1.346	**3.244**	A47
1880.00	9400	UMTS 1900	RMC	24.5	22.78	0.03	5 mm	07EB0	N/A	1:1	back	0.639	1.486	0.950	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	-0.06	6 mm	07EB0	N/A	1:1	front	0.413	1.486	0.614	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	-0.06	7 mm	07EB0	N/A	1:1	bottom	0.692	1.486	1.028	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	-0.12	0 mm	07EB0	N/A	1:1	right	0.491	1.486	0.730	
1880.00	9400	UMTS 1900	RMC	24.5	22.78	-0.15	0 mm	07EB0	N/A	1:1	left	0.418	1.486	0.621	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.03	0 mm	07EB0	N/A	1:1	back	1.520	1.169	1.777	
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.00	0 mm	07EB0	N/A	1:1	front	1.250	1.169	1.461	
1852.40	9262	UMTS 1900	RMC	20.5	19.90	0.09	0 mm	07EB0	N/A	1:1	bottom	1.750	1.148	2.009	A48
1880.00	9400	UMTS 1900	RMC	20.5	19.82	0.05	0 mm	07EB0	N/A	1:1	bottom	1.730	1.169	2.022	
1907.60	9538	UMTS 1900	RMC	20.5	19.95	0.04	0 mm	07EB0	N/A	1:1	bottom	1.560	1.135	1.771	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams								

Note: Blue entry represents variability data.

Table 11-37
LTE Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	0.07	0	07E7A	QPSK	1	0	5 mm	back	1:1	1.180	1.343	1.585	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.07	1	07E7A	QPSK	50	25	5 mm	back	1:1	0.944	1.400	1.322	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	0.10	0	07E7A	QPSK	1	0	6 mm	front	1:1	0.980	1.343	1.316	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	0.09	1	07E7A	QPSK	50	25	6 mm	front	1:1	0.778	1.400	1.089	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	-0.08	0	07E7A	QPSK	1	0	7 mm	bottom	1:1	0.550	1.343	0.739	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.14	1	07E7A	QPSK	50	25	7 mm	bottom	1:1	0.546	1.400	0.764	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	-0.12	0	07E7A	QPSK	1	0	0 mm	right	1:1	0.489	1.343	0.657	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.11	1	07E7A	QPSK	50	25	0 mm	right	1:1	0.373	1.400	0.522	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.72	-0.15	0	07E7A	QPSK	1	0	0 mm	left	1:1	0.294	1.343	0.395	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.0	21.54	-0.13	1	07E7A	QPSK	50	25	0 mm	left	1:1	0.215	1.400	0.301	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.01	0	07E7A	QPSK	1	50	0 mm	back	1:1	1.380	1.265	1.746	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.03	0	07E7A	QPSK	50	0	0 mm	back	1:1	1.400	1.265	1.771	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.06	0	07E7A	QPSK	1	50	0 mm	front	1:1	1.150	1.265	1.455	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.10	0	07E7A	QPSK	50	0	0 mm	front	1:1	1.140	1.265	1.442	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	0.04	0	07E7A	QPSK	1	50	0 mm	bottom	1:1	1.520	1.265	1.923	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	19.65	-0.04	0	07E7A	QPSK	50	50	0 mm	bottom	1:1	1.590	1.365	2.170	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.98	-0.02	0	07E7A	QPSK	50	0	0 mm	bottom	1:1	1.610	1.265	2.037	A49
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	19.97	0.13	0	07E7A	QPSK	50	0	0 mm	bottom	1:1	1.520	1.268	1.927	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	19.82	-0.15	0	07E7A	QPSK	100	0	0 mm	bottom	1:1	1.480	1.312	1.942	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	0.02	0	07EB0	QPSK	1	0	5 mm	back	1:1	1.370	1.303	1.785	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.04	1	07EB0	QPSK	50	0	5 mm	back	1:1	1.060	1.321	1.400	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.05	0	07EB0	QPSK	1	0	6 mm	front	1:1	0.937	1.303	1.221	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	0.00	1	07EB0	QPSK	50	0	6 mm	front	1:1	0.712	1.321	0.941	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	0.08	0	07EB0	QPSK	1	0	7 mm	bottom	1:1	1.420	1.303	1.850	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	-0.09	1	07EB0	QPSK	50	0	7 mm	bottom	1:1	1.100	1.321	1.453	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.12	0	07EB0	QPSK	1	0	0 mm	right	1:1	0.504	1.303	0.657	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	-0.10	1	07EB0	QPSK	50	0	0 mm	right	1:1	0.389	1.321	0.514	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	22.85	-0.13	0	07EB0	QPSK	1	0	0 mm	left	1:1	0.412	1.303	0.537	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	21.79	-0.04	1	07EB0	QPSK	50	0	0 mm	left	1:1	0.311	1.321	0.411	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.03	0	07EB0	QPSK	1	50	0 mm	back	1:1	1.640	1.132	1.856	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	-0.07	0	07EB0	QPSK	50	25	0 mm	back	1:1	1.590	1.183	1.881	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.02	0	07EB0	QPSK	1	50	0 mm	front	1:1	1.320	1.132	1.494	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	-0.06	0	07EB0	QPSK	50	25	0 mm	front	1:1	1.350	1.183	1.597	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.96	-0.02	0	07EB0	QPSK	1	50	0 mm	bottom	1:1	1.680	1.132	1.902	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	19.61	-0.10	0	07EB0	QPSK	50	25	0 mm	bottom	1:1	1.800	1.227	2.209	A50
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	19.67	-0.03	0	07EB0	QPSK	50	50	0 mm	bottom	1:1	1.760	1.211	2.131	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.77	0.07	0	07EB0	QPSK	50	25	0 mm	bottom	1:1	1.700	1.183	2.011	
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	19.73	-0.03	0	07EB0	QPSK	100	0	0 mm	bottom	1:1	1.710	1.194	2.042	
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 Phablet 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 (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	18.5	18.08	0.18	0 mm	1	07E7A	6	back	98.5	2.263	-	1.102	1.015	-	
5320	64	802.11a	OFDM	20	18.5	18.08	0.12	0 mm	1	07E7A	6	front	98.5	3.155	0.288	1.102	1.015	0.322	
5320	64	802.11a	OFDM	20	18.5	18.08	0.10	0 mm	1	07E7A	6	top	98.5	0.299	-	1.102	1.015	-	
5320	64	802.11a	OFDM	20	18.5	18.08	0.13	0 mm	1	07E7A	6	left	98.5	0.441	-	1.102	1.015	-	
5300	60	802.11a	OFDM	20	18.5	18.42	-0.20	0 mm	2	07E7A	6	back	98.5	4.553	-	1.019	1.015	-	
5300	60	802.11a	OFDM	20	18.5	18.42	0.11	0 mm	2	07E7A	6	front	98.5	5.559	0.542	1.019	1.015	0.561	
5300	60	802.11a	OFDM	20	18.5	18.42	0.13	0 mm	2	07E7A	6	top	98.5	2.146	-	1.019	1.015	-	
5300	60	802.11a	OFDM	20	18.5	18.42	0.13	0 mm	2	07E7A	6	left	98.5	0.840	-	1.019	1.015	-	
5500	100	802.11a	OFDM	20	18.5	17.96	0.18	0 mm	1	07E7A	6	back	98.5	4.502	0.601	1.132	1.015	0.691	
5500	100	802.11a	OFDM	20	18.5	17.96	0.14	0 mm	1	07E7A	6	front	98.5	4.384	-	1.132	1.015	-	
5500	100	802.11a	OFDM	20	18.5	17.96	0.13	0 mm	1	07E7A	6	top	98.5	0.548	-	1.132	1.015	-	
5500	100	802.11a	OFDM	20	18.5	17.96	0.13	0 mm	1	07E7A	6	left	98.5	0.810	-	1.132	1.015	-	
5600	120	802.11a	OFDM	20	18.5	17.95	-0.16	0 mm	2	07E7A	6	back	98.5	7.033	0.696	1.135	1.015	0.802	A51
5600	120	802.11a	OFDM	20	18.5	17.95	0.14	0 mm	2	07E7A	6	front	98.5	1.251	-	1.135	1.015	-	
5600	120	802.11a	OFDM	20	18.5	17.95	0.16	0 mm	2	07E7A	6	top	98.5	0.639	-	1.135	1.015	-	
5600	120	802.11a	OFDM	20	18.5	17.95	0.17	0 mm	2	07E7A	6	left	98.5	0.294	-	1.135	1.015	-	
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 11-39
DSS Phablet 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 (10g)	Scaling Factor (Cond. Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	16.0	15.60	0.07	0 mm	07EB0	1	back	76.8	0.398	1.096	1.302	0.568	
2441	39	Bluetooth	FHSS	16.0	15.60	-0.12	0 mm	07EB0	1	front	76.8	0.428	1.096	1.302	**0.611**	A52
2441	39	Bluetooth	FHSS	16.0	15.60	0.21	0 mm	07EB0	1	top	76.8	0.060	1.096	1.302	0.086	
2441	39	Bluetooth	FHSS	16.0	15.60	0.02	0 mm	07EB0	1	left	76.8	0.155	1.096	1.302	0.221	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams				

11.5 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 the tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in the tables above. Please see Section 14 for supplemental data.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > 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 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 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

4. Per FCC KDB Publication 447498 D01v06, when the reported (scaled) for LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

WLAN Notes:

1. For held-to-ear and hotspot operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg. See Section 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
6. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
7. 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.

Bluetooth Notes:

1. Body-worn and phablet 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 BT SAR was evaluated for BT tethering application. Head and hotspot BT SAR was measured with the device connected to a call box wih hopping disabled with 2DH5 operation and Tx Test 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.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

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

(*) 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 applicable exposure conditions was used for simultaneous transmission analysis.

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	0.198	0.442	0.669	0.640	0.867	1.309
	UMTS 850	0.413	0.442	0.669	0.855	1.082	**1.524**
	UMTS 1750	0.165	0.442	0.669	0.607	0.834	1.276
	GSM 1900	0.135	0.442	0.669	0.577	0.804	1.246
	UMTS 1900	0.254	0.442	0.669	0.696	0.923	1.365
	LTE Band 12	0.116	0.442	0.669	0.558	0.785	1.227
	LTE Band 13	0.099	0.442	0.669	0.541	0.768	1.210
	LTE Band 26 (Cell)	0.198	0.442	0.669	0.640	0.867	1.309
	LTE Band 5 (Cell)	0.193	0.442	0.669	0.635	0.862	1.304
	LTE Band 66 (AWS)	0.138	0.442	0.669	0.580	0.807	1.249
	LTE Band 25 (PCS)	0.115	0.442	0.669	0.557	0.784	1.226
	LTE Band 41	0.081	0.442	0.669	0.523	0.750	1.192

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	0.198	0.293	0.579	0.491	0.777	1.070
	UMTS 850	0.413	0.293	0.579	0.706	0.992	**1.285**
	UMTS 1750	0.165	0.293	0.579	0.458	0.744	1.037
	GSM 1900	0.135	0.293	0.579	0.428	0.714	1.007
	UMTS 1900	0.254	0.293	0.579	0.547	0.833	1.126
	LTE Band 12	0.116	0.293	0.579	0.409	0.695	0.988
	LTE Band 13	0.099	0.293	0.579	0.392	0.678	0.971
	LTE Band 26 (Cell)	0.198	0.293	0.579	0.491	0.777	1.070
	LTE Band 5 (Cell)	0.193	0.293	0.579	0.486	0.772	1.065
	LTE Band 66 (AWS)	0.138	0.293	0.579	0.431	0.717	1.010
	LTE Band 25 (PCS)	0.115	0.293	0.579	0.408	0.694	0.987
	LTE Band 41	0.081	0.293	0.579	0.374	0.660	0.953

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz and 5 GHz WLAN 4 Tx (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	GSM 850	0.198	0.453	0.373	1.024
	UMTS 850	0.413	0.453	0.373	**1.239**
	UMTS 1750	0.165	0.453	0.373	0.991
	GSM 1900	0.135	0.453	0.373	0.961
	UMTS 1900	0.254	0.453	0.373	1.080
	LTE Band 12	0.116	0.453	0.373	0.942
	LTE Band 13	0.099	0.453	0.373	0.925
	LTE Band 26 (Cell)	0.198	0.453	0.373	1.024
	LTE Band 5 (Cell)	0.193	0.453	0.373	1.019
	LTE Band 66 (AWS)	0.138	0.453	0.373	0.964
	LTE Band 25 (PCS)	0.115	0.453	0.373	0.941
	LTE Band 41	0.081	0.453	0.373	0.907

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	0.198	0.150	0.348
	UMTS 850	0.413	0.150	**0.563**
	UMTS 1750	0.165	0.150	0.315
	GSM 1900	0.135	0.150	0.285
	UMTS 1900	0.254	0.150	0.404
	LTE Band 12	0.116	0.150	0.266
	LTE Band 13	0.099	0.150	0.249
	LTE Band 26 (Cell)	0.198	0.150	0.348
	LTE Band 5 (Cell)	0.193	0.150	0.343
	LTE Band 66 (AWS)	0.138	0.150	0.288
	LTE Band 25 (PCS)	0.115	0.150	0.265
	LTE Band 41	0.081	0.150	0.231

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-5
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	0.267	0.087	0.158	0.354	0.425	0.512
	UMTS 850	0.620	0.087	0.158	0.707	0.778	0.865
	UMTS 1750	0.968	0.087	0.158	1.055	1.126	**1.213**
	GSM 1900	0.486	0.087	0.158	0.573	0.644	0.731
	UMTS 1900	0.761	0.087	0.158	0.848	0.919	1.006
	LTE Band 12	0.183	0.087	0.158	0.270	0.341	0.428
	LTE Band 13	0.200	0.087	0.158	0.287	0.358	0.445
	LTE Band 26 (Cell)	0.310	0.087	0.158	0.397	0.468	0.555
	LTE Band 5 (Cell)	0.345	0.087	0.158	0.432	0.503	0.590
	LTE Band 66 (AWS)	0.962	0.087	0.158	1.049	1.120	1.207
	LTE Band 25 (PCS)	0.859	0.087	0.158	0.946	1.017	1.104
	LTE Band 41	0.236	0.087	0.158	0.323	0.394	0.481

Table 12-6
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	0.267	0.079	0.096	0.346	0.363	0.442
	UMTS 850	0.620	0.079	0.096	0.699	0.716	0.795
	UMTS 1750	0.968	0.079	0.096	1.047	1.064	**1.143**
	GSM 1900	0.486	0.079	0.096	0.565	0.582	0.661
	UMTS 1900	0.761	0.079	0.096	0.840	0.857	0.936
	LTE Band 12	0.183	0.079	0.096	0.262	0.279	0.358
	LTE Band 13	0.200	0.079	0.096	0.279	0.296	0.375
	LTE Band 26 (Cell)	0.310	0.079	0.096	0.389	0.406	0.485
	LTE Band 5 (Cell)	0.345	0.079	0.096	0.424	0.441	0.520
	LTE Band 66 (AWS)	0.962	0.079	0.096	1.041	1.058	1.137
	LTE Band 25 (PCS)	0.859	0.079	0.096	0.938	0.955	1.034
	LTE Band 41	0.236	0.079	0.096	0.315	0.332	0.411

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz and 5GHz WLAN 4 Tx (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body-Worn	GSM 850	0.267	0.039	0.017	0.323
	UMTS 850	0.620	0.039	0.017	0.676
	UMTS 1750	0.968	0.039	0.017	**1.024**
	GSM 1900	0.486	0.039	0.017	0.542
	UMTS 1900	0.761	0.039	0.017	0.817
	LTE Band 12	0.183	0.039	0.017	0.239
	LTE Band 13	0.200	0.039	0.017	0.256
	LTE Band 26 (Cell)	0.310	0.039	0.017	0.366
	LTE Band 5 (Cell)	0.345	0.039	0.017	0.401
	LTE Band 66 (AWS)	0.962	0.039	0.017	1.018
	LTE Band 25 (PCS)	0.859	0.039	0.017	0.915
	LTE Band 41	0.236	0.039	0.017	0.292

Table 12-8
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	0.267	0.100	0.367
	UMTS 850	0.620	0.100	0.720
	UMTS 1750	0.968	0.100	**1.068**
	GSM 1900	0.486	0.100	0.586
	UMTS 1900	0.761	0.100	0.861
	LTE Band 12	0.183	0.100	0.283
	LTE Band 13	0.200	0.100	0.300
	LTE Band 26 (Cell)	0.310	0.100	0.410
	LTE Band 5 (Cell)	0.345	0.100	0.445
	LTE Band 66 (AWS)	0.962	0.100	1.062
	LTE Band 25 (PCS)	0.859	0.100	0.959
	LTE Band 41	0.236	0.100	0.336

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-9
Simultaneous Transmission Scenario 2.4 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.764	0.224	0.263	0.988	1.027	1.251
	UMTS 850	1.098	0.224	0.263	1.322	1.361	**1.585**
	UMTS 1750	0.916	0.224	0.263	1.140	1.179	1.403
	GPRS 1900	1.094	0.224	0.263	1.318	1.357	1.581
	UMTS 1900	1.086	0.224	0.263	1.310	1.349	1.573
	LTE Band 12	0.290	0.224	0.263	0.514	0.553	0.777
	LTE Band 13	0.394	0.224	0.263	0.618	0.657	0.881
	LTE Band 26 (Cell)	0.695	0.224	0.263	0.919	0.958	1.182
	LTE Band 5 (Cell)	0.703	0.224	0.263	0.927	0.966	1.190
	LTE Band 66 (AWS)	1.094	0.224	0.263	1.318	1.357	1.581
	LTE Band 25 (PCS)	1.085	0.224	0.263	1.309	1.348	1.572
	LTE Band 41	0.530	0.224	0.263	0.754	0.793	1.017

Table 12-10
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.764	0.129	0.143	0.893	0.907	1.036
	UMTS 850	1.098	0.129	0.143	1.227	1.241	**1.370**
	UMTS 1750	0.916	0.129	0.143	1.045	1.059	1.188
	GPRS 1900	1.094	0.129	0.143	1.223	1.237	1.366
	UMTS 1900	1.086	0.129	0.143	1.215	1.229	1.358
	LTE Band 12	0.290	0.129	0.143	0.419	0.433	0.562
	LTE Band 13	0.394	0.129	0.143	0.523	0.537	0.666
	LTE Band 26 (Cell)	0.695	0.129	0.143	0.824	0.838	0.967
	LTE Band 5 (Cell)	0.703	0.129	0.143	0.832	0.846	0.975
	LTE Band 66 (AWS)	1.094	0.129	0.143	1.223	1.237	1.366
	LTE Band 25 (PCS)	1.085	0.129	0.143	1.214	1.228	1.357
	LTE Band 41	0.530	0.129	0.143	0.659	0.673	0.802

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz and 5 GHz WLAN 4 Tx (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.764	0.122	0.034	0.920
	UMTS 850	1.098	0.122	0.034	**1.254**
	UMTS 1750	0.916	0.122	0.034	1.072
	GPRS 1900	1.094	0.122	0.034	1.250
	UMTS 1900	1.086	0.122	0.034	1.242
	LTE Band 12	0.290	0.122	0.034	0.446
	LTE Band 13	0.394	0.122	0.034	0.550
	LTE Band 26 (Cell)	0.695	0.122	0.034	0.851
	LTE Band 5 (Cell)	0.703	0.122	0.034	0.859
	LTE Band 66 (AWS)	1.094	0.122	0.034	1.250
	LTE Band 25 (PCS)	1.085	0.122	0.034	1.241
	LTE Band 41	0.530	0.122	0.034	0.686

Table 12-12
Simultaneous Transmission Scenario 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	0.764	0.023	0.787
	UMTS 850	1.098	0.023	**1.121**
	UMTS 1750	0.916	0.023	0.939
	GPRS 1900	1.094	0.023	1.117
	UMTS 1900	1.086	0.023	1.109
	LTE Band 12	0.290	0.023	0.313
	LTE Band 13	0.394	0.023	0.417
	LTE Band 26 (Cell)	0.695	0.023	0.718
	LTE Band 5 (Cell)	0.703	0.023	0.726
	LTE Band 66 (AWS)	1.094	0.023	1.117
	LTE Band 25 (PCS)	1.085	0.023	1.108
	LTE Band 41	0.530	0.023	0.553

12.6 Phablet SAR 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.

Table 12-13
Simultaneous Transmission Scenario 5GHz WLAN (Phablet)

Exposure Condition	Mode	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
Phablet SAR	UMTS 1750	2.147	0.691	0.802	2.838	2.949	3.640
	GSM 1900	3.244	0.691	0.802	**3.935**	See Table 12-14	See Table 12-14
	UMTS 1900	2.022	0.691	0.802	2.713	2.824	3.515
	LTE Band 66 (AWS)	2.170	0.691	0.802	2.861	2.972	3.663
	LTE Band 25 (PCS)	2.209	0.691	0.802	2.900	3.011	3.702

Table 12-14
Simultaneous Transmission Scenario GSM 1900 and 5GHz WLAN (Phablet)

Simult Tx	Configuration	GSM 1900 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
Phablet SAR	Back	2.486	0.691	0.802	3.177	3.288	**3.979**
	Front	2.306	0.322	0.561	2.628	2.867	3.189
	Top	-	0.691*	0.802*	0.691	0.802	1.493
	Bottom	3.244	-	-	3.244	3.244	3.244
	Right	0.460	-	-	0.460	0.460	0.460
	Left	0.401	0.691*	0.802*	1.092	1.203	1.894

Table 12-15
Simultaneous Transmission Scenario Bluetooth (Phablet)

Exposure Condition	Mode	3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	UMTS 1750	2.147	0.611	2.758
	GSM 1900	3.244	0.611	**3.855**
	UMTS 1900	2.022	0.611	2.633
	LTE Band 66 (AWS)	2.170	0.611	2.781
	LTE Band 25 (PCS)	2.209	0.611	2.820

12.7 Simultaneous Transmission Conclusion

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

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

Table 13-1
Body SAR Measurement Variability Results (1g)

BODY VARIABILITY RESULTS														
Band	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)	
835	846.60	4233	UMTS 850	RMC	back	10 mm	1.070	1.050	1.02	N/A	N/A	N/A	N/A
1750	1770.00	132572	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	bottom	10 mm	0.863	0.861	1.00	N/A	N/A	N/A	N/A
1900	1880.00	9400	UMTS 1900	RMC	bottom	10 mm	0.929	0.857	1.08	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 13-2
Phablet SAR Measurement Variability Results (10g)

PHABLET VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	# of Time Slots	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)	
1900	1850.20	512	GSM 1900	GSM	1	bottom	0 mm	2.400	2.410	1.00	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 all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

14 ADDITIONAL TUNER TESTING PER FCC GUIDANCE

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

To evaluate all of the tuner states, the 25 tuner states were divided evenly among band, mode and exposure combinations so that at least one single point SAR measurement was measured among the configurations. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. While inserting and removing the USB cable between single point SAR measurements, the device was ensured to capture the same physical point SAR that generated the highest SAR. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination.

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

Table 14-1
Supplemental SAR Data

Supplemental Head SAR Data				Supplemental Body SAR Data			
LTE Band 5		UMTS 850		LTE Band 5		UMTS 850	
QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offset		RMC		QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offset		RMC	
Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Back Side	Test Position	Back Side
				Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	836.5	Frequency (MHz)	836.6	Frequency (MHz)	836.5	Frequency (MHz)	846.6
Channel	20525	Channel	4183	Channel	20525	Channel	4233
Measured 1g SAR (W/kg)	0.17	Measured 1g SAR (W/kg)	0.368	Measured 1g SAR (W/kg)	0.619	Measured 1g SAR (W/kg)	1.07
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)	0.199	Auto-tune (State 6)	0.471	Auto-tune (State 1)	0.764	Auto-tune (State 6)	1.454
Default (State 1)	0.190	Default (State 1)	0.461	Default (State 1)	0.761	Default (State 1)	1.384
State 1	0.190	State 4	0.257	State 4	0.391	State 2	1.387
State 5	0.191	State 6	0.480	State 7	0.754	State 3	1.386
State 9	0.181	State 10	0.462	State 8	0.727	State 6	1.416
State 13	0.189	State 16	0.427	State 11	0.759	State 12	1.267
State 19	0.190	State 18	0.411	State 15	0.645	State 14	1.389
State 21	0.119	State 20	0.162	State 17	0.634	State 22	1.417
State 25	0.182	State 23	0.469	State 21	0.404	State 24	1.249

15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753E	(30kHz-6GHz) Network Analyzer	3/2/2016	Annual	3/2/2017	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	6/28/2016	Annual	6/28/2017	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/19/2016	Annual	8/19/2017	MY40003841
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Agilent	E4432B	ESG-D Series Signal Generator	3/5/2016	Annual	3/5/2017	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/13/2015	Biennial	3/13/2017	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	3/13/2015	Biennial	3/13/2017	MY42082659
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41450275
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	10/5/2016	Annual	10/5/2017	GB42230325
Agilent	E5515C	Wireless Communications Test Set	12/12/2016	Annual	12/12/2017	GB44400860
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Biennial	1/29/2018	GB46310798
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/2/2016	Annual	3/2/2017	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	10/27/2016	Annual	10/27/2017	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	2/27/2016	Annual	2/27/2017	MY47420651
Agilent	N5182A	MXG Vector Signal Generator	3/5/2016	Annual	3/5/2017	MY47420800
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Amplifier Research	15S1G6	Amplifier	N/A	N/A	N/A	433977
Amplifier Research	15S1G6	Amplifier	N/A	N/A	N/A	433978
Anritsu	MA24106A	USB Power Sensor	3/4/2016	Annual	3/4/2017	1344557
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1344559
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1349509
Anritsu	MA24106A	USB Power Sensor	3/4/2016	Annual	3/4/2017	1349514
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1126066
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1207470
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	MT8820C	Radio Communication Analyzer	4/14/2016	Annual	4/14/2017	6201240328
Anritsu	MT8820C	Radio Communication Analyzer	12/8/2016	Annual	12/8/2017	6201300731
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194895
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194896
Control Company	4040	Digital Thermometer	3/15/2015	Biennial	3/15/2017	150194897
Control Company	4040	Digital Thermometer	3/15/2015	Biennial	3/15/2017	150194898
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261694
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261701
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261728
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264162
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264165
Narda	BW-S3W2	Attenuator (3dB)	N/A	CBT	N/A	120
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	12/12/2016	Annual	12/12/2017	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	3/29/2016	Annual	3/29/2017	836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester	8/1/2016	Annual	8/1/2017	116743
Rohde & Schwarz	CMW500	Radio Communication Tester	3/25/2016	Annual	3/25/2017	128633
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/20/2016	Annual	7/20/2017	132885
Rohde & Schwarz	CMW500	Radio Communication tester	5/27/2016	Annual	5/27/2017	140144
Rohde & Schwarz	CMW500	Radio Communication Tester	4/13/2016	Annual	4/13/2017	140148
Seekonk	NC-100	Torque Wrench (8" lb)	9/1/2016	Biennial	9/1/2018	21053
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
SPEAG	EX3DV4	SAR Probe	5/17/2016	Annual	5/17/2017	7409
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3319
SPEAG	ES3DV3	SAR Probe	2/19/2016	Annual	2/19/2017	3213
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7357
SPEAG	ES3DV3	SAR Probe	8/25/2016	Annual	8/25/2017	3332
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3209
SPEAG	ES3DV3	SAR Probe	11/15/2016	Annual	11/15/2017	3334
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7406
SPEAG	EX3DV4	SAR Probe	2/22/2016	Annual	2/22/2017	3914
SPEAG	D750V3	750 MHz Dipole	3/16/2016	Annual	3/16/2017	1054
SPEAG	D835V2	835 MHz SAR Dipole	7/14/2016	Annual	7/14/2017	4d133
SPEAG	D835V2	835 MHz SAR Dipole	7/13/2016	Annual	7/13/2017	4d047
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2016	Annual	5/9/2017	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	7/15/2016	Annual	7/15/2017	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	7/8/2016	Annual	7/8/2017	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	797
SPEAG	D2600V2	2600 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	1126
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/21/2016	Annual	9/21/2017	1191
SPEAG	D750V3	750 MHz SAR Dipole	7/13/2016	Annual	7/13/2017	1161
SPEAG	D2450V2	2450 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	981
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/2/2016	Annual	8/2/2017	1237
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2016	Annual	5/11/2017	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/14/2016	Annual	3/14/2017	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2016	Annual	2/18/2017	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/19/2016	Annual	2/19/2017	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/15/2016	Annual	9/15/2017	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/22/2016	Annual	8/22/2017	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/15/2016	Annual	9/15/2017	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2016	Annual	11/11/2017	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/14/2016	Annual	4/14/2017	1407
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2016	Annual	5/10/2017	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/13/2016	Annual	9/13/2017	1091
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/19/2016	Annual	7/19/2017	1039

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.
Each equipment item was used solely within its respective calibration period.

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]

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

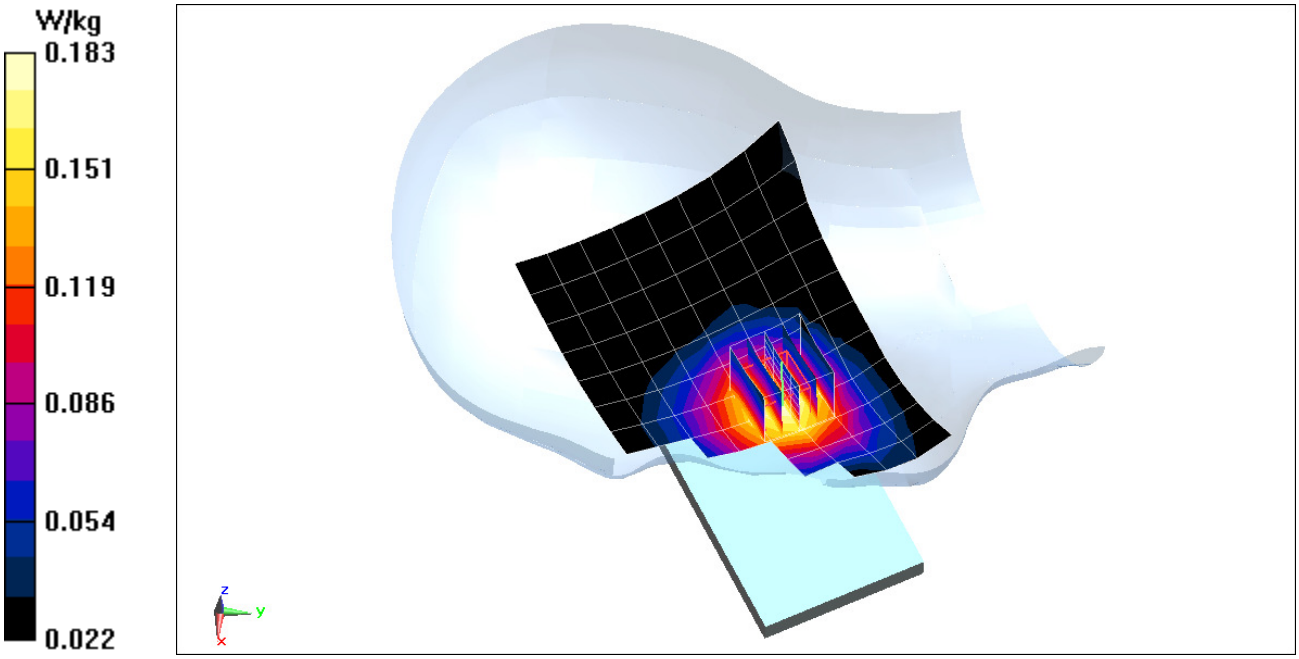
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.912 S/m; ε_r = 41.591; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.33 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.210 W/kg
SAR(1 g) = 0.169 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

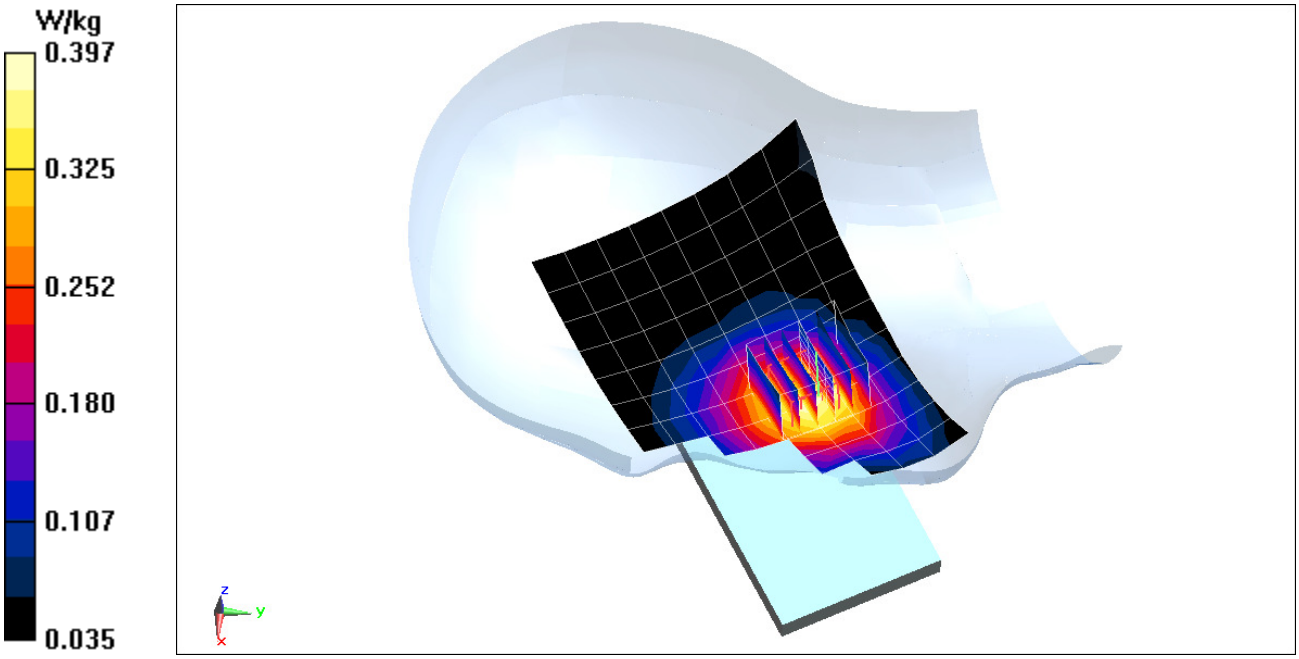
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.912$ S/m; $\varepsilon_r = 41.591$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 01-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.97 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.454 W/kg
SAR(1 g) = 0.368 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

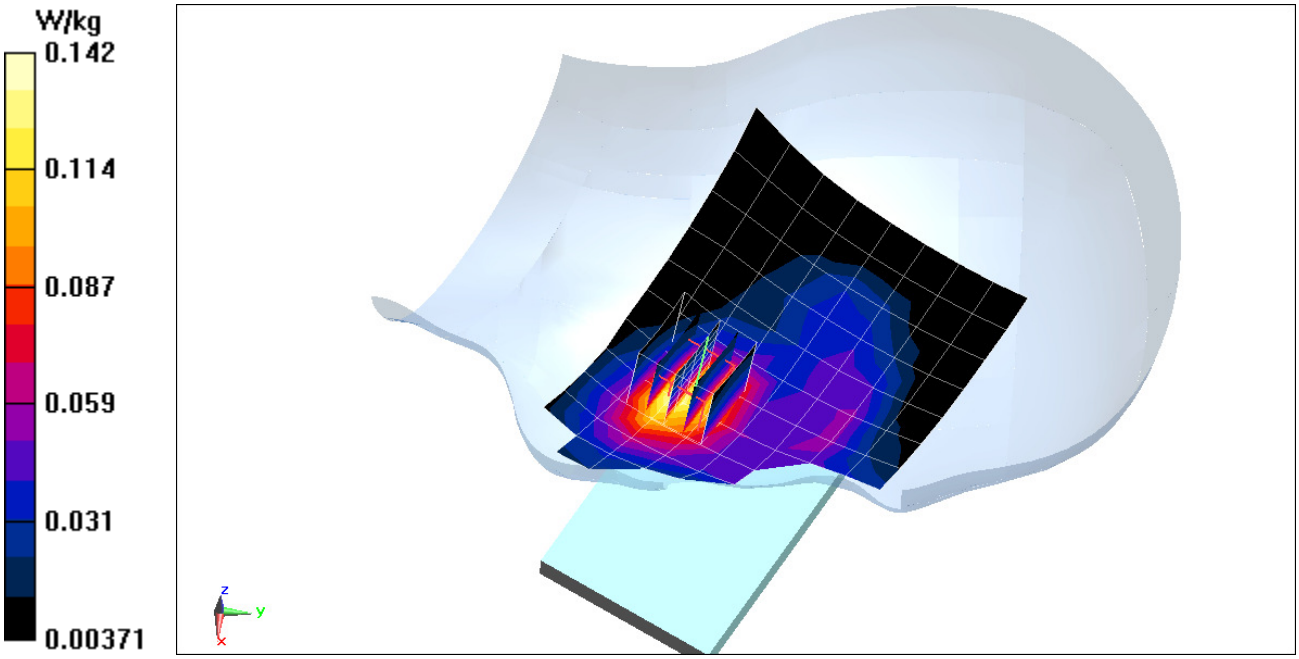
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.362 S/m; ε_r = 39.097; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3213; ConvF(5.23, 5.23, 5.23); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, 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 = 9.837 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.123 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EAD

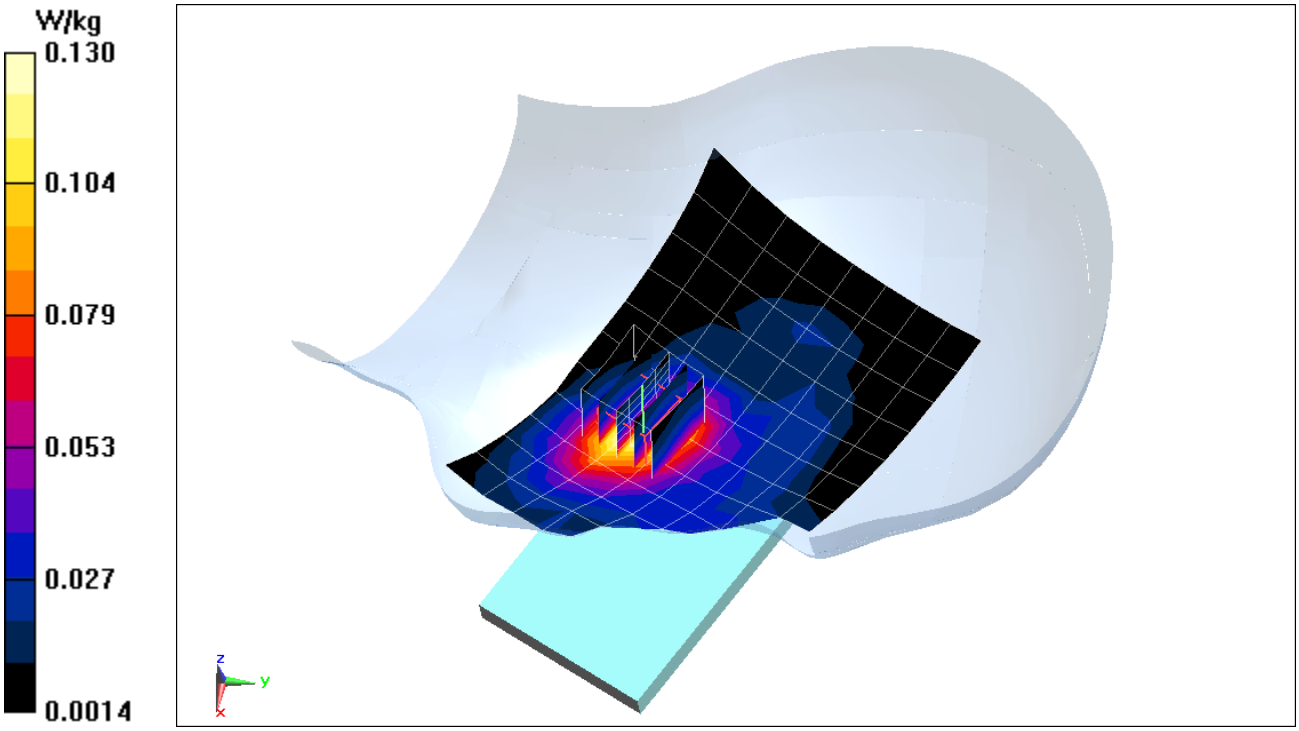
Communication System: UID 0, GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1910 MHz; σ = 1.436 S/m; ε_r = 39.827; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 02-14-2017; Ambient Temp: 23.5°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3209; ConvF(5.14, 5.14, 5.14); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 1900, Left Head, Cheek, High.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 = 9.289 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.174 W/kg
SAR(1 g) = 0.114 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EAD

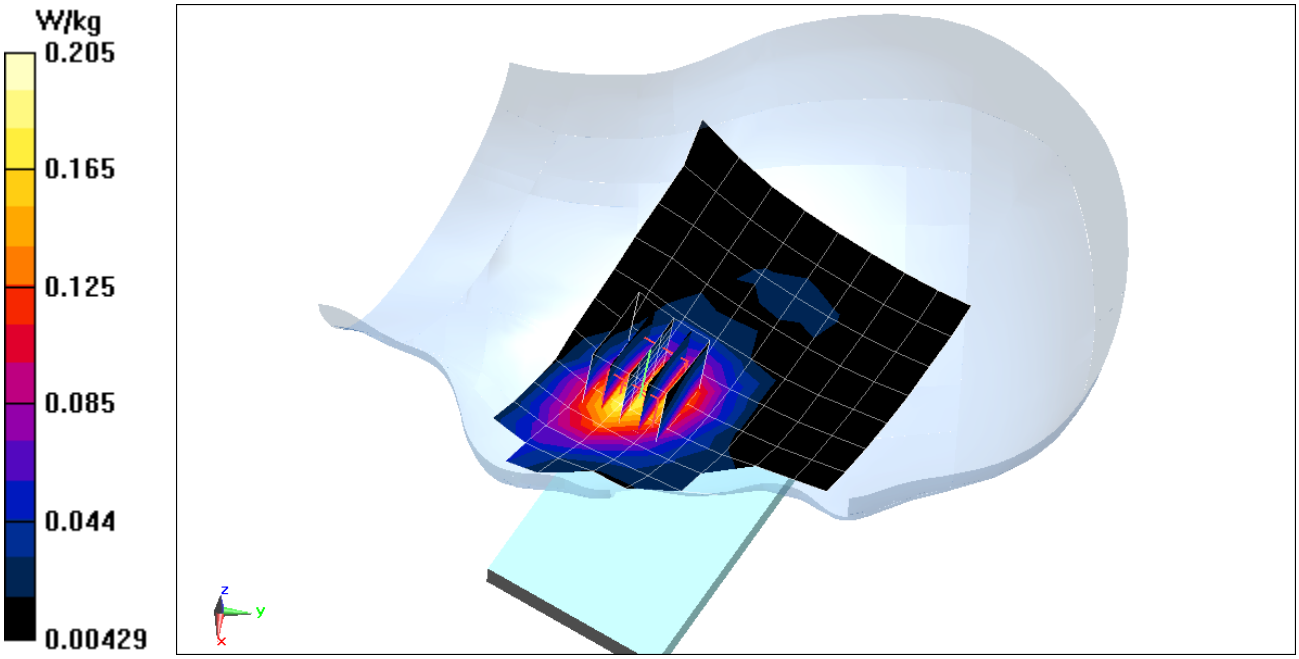
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.408 S/m; ε_r = 38.733; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 12-31-2016; Ambient Temp: 23.6°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.55 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.171 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

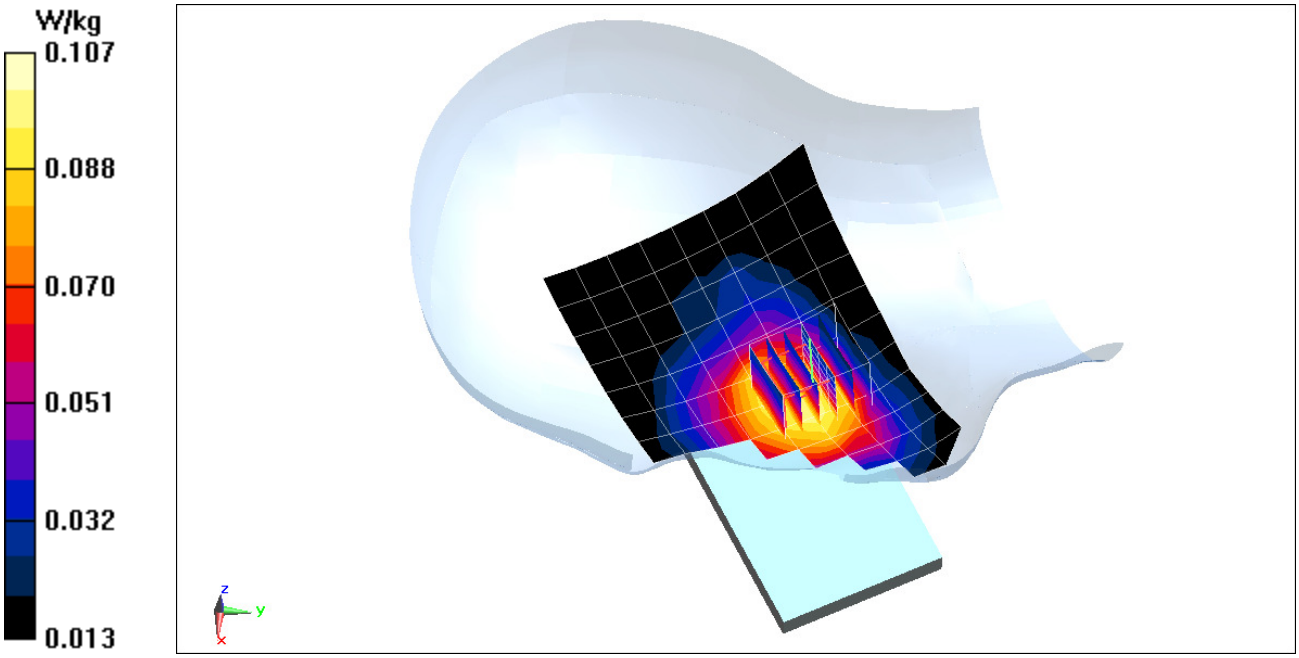
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.857 S/m; ε_r = 42.446; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-06-2017; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(10.73, 10.73, 10.73); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 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 = 10.72 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.090 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

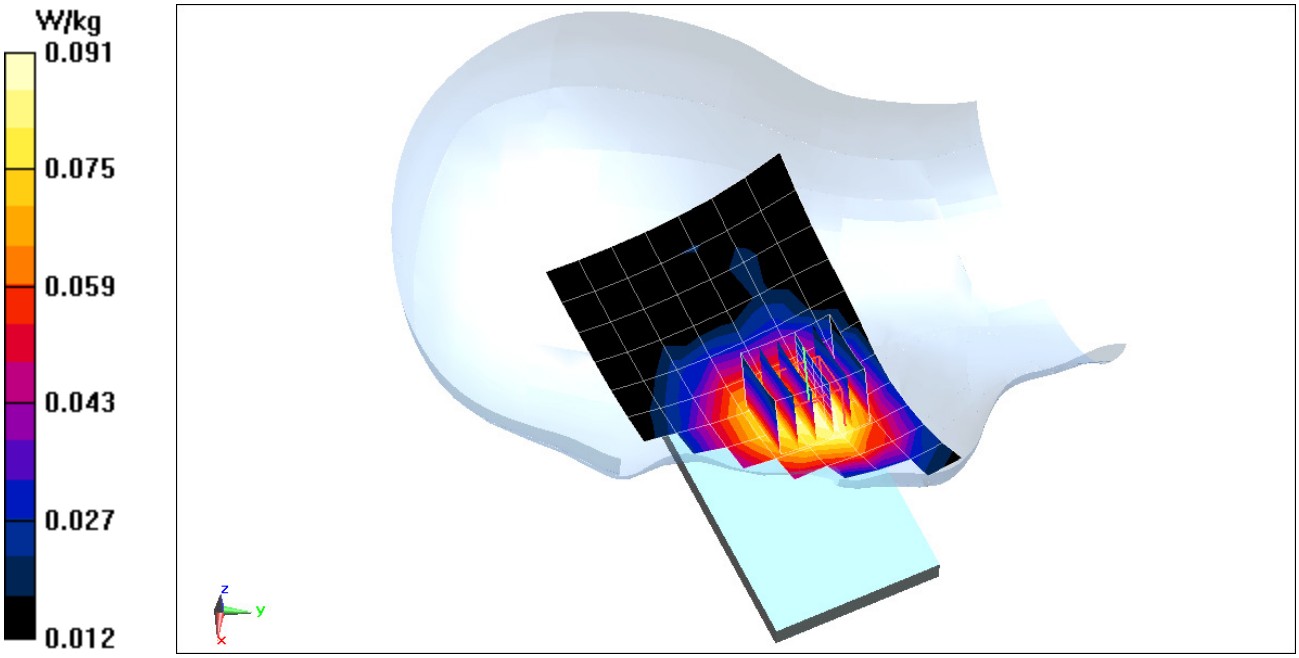
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.924 S/m; ε_r = 41.425; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-06-2017; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(10.73, 10.73, 10.73); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.983 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.0980 W/kg
SAR(1 g) = 0.078 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

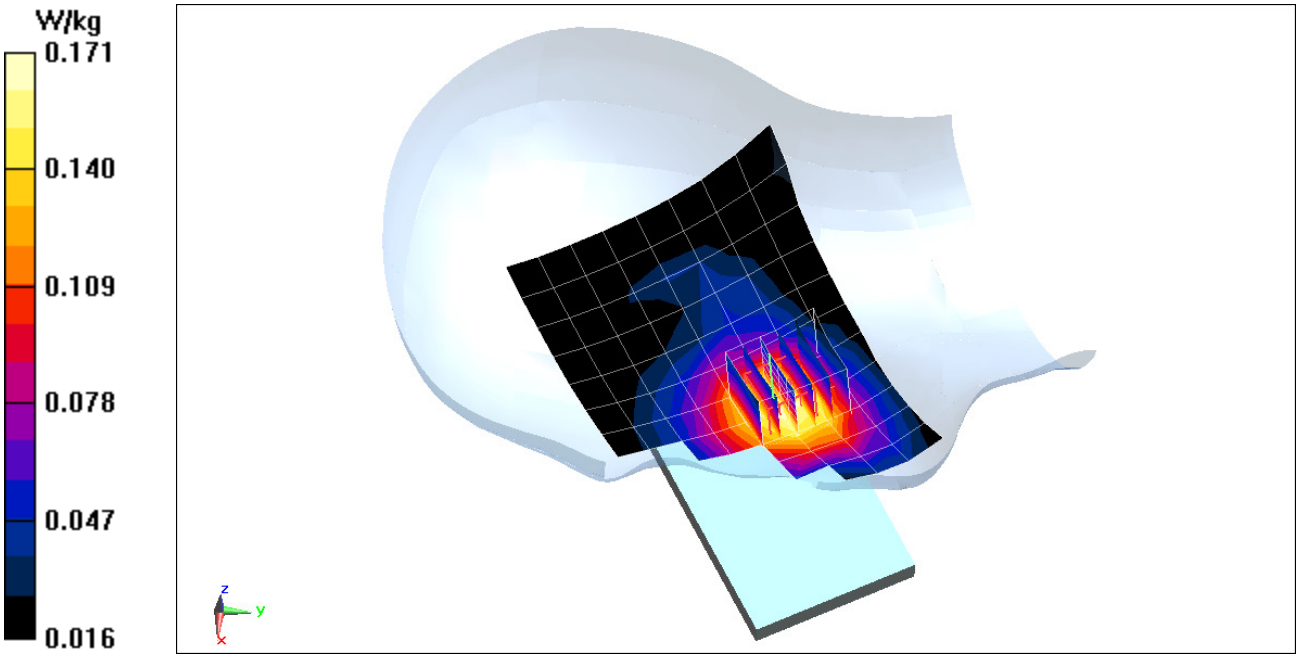
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 0.908$ S/m; $\varepsilon_r = 41.655$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 01-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Right Head, Cheek, Mid.ch,
15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.41 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.160 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF5

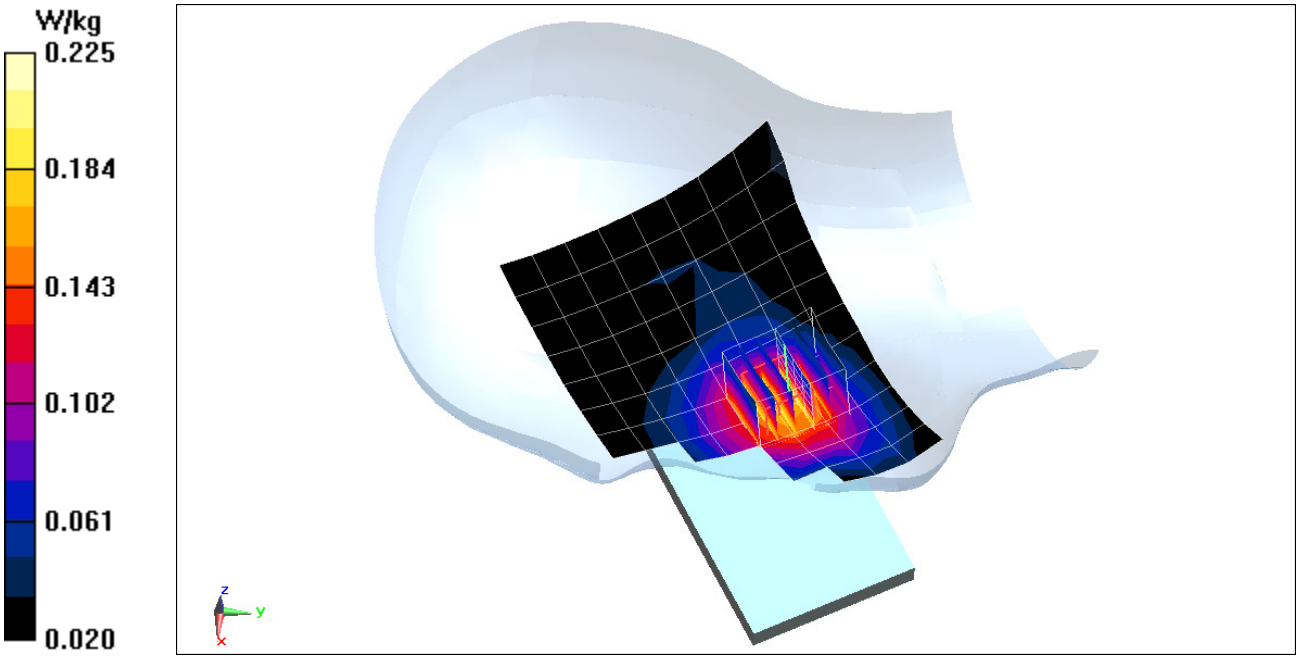
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.5$ MHz; $\sigma = 0.917$ S/m; $\varepsilon_r = 43.225$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 01-23-2017; Ambient Temp: 21.4°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell.), Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.78 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.210 W/kg
SAR(1 g) = 0.170 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

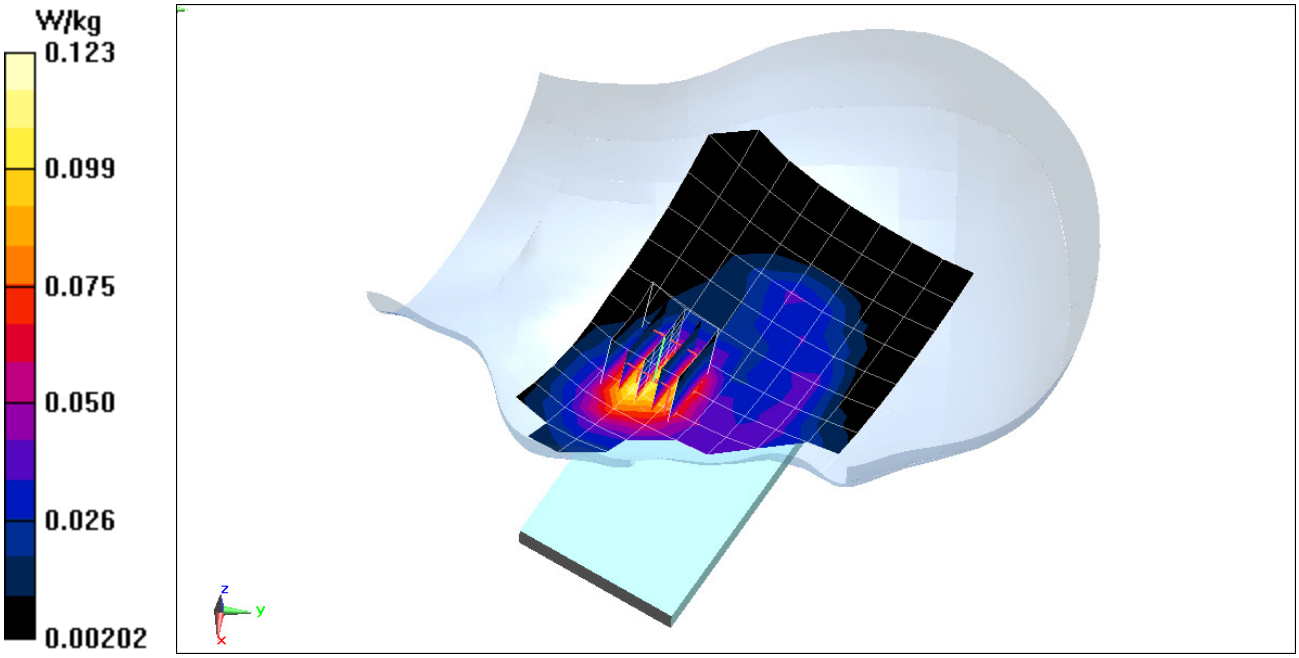
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
$f = 1745$ MHz; $\sigma = 1.374$ S/m; $\varepsilon_r = 39.03$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 12-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3213; ConvF(5.23, 5.23, 5.23); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 66 (AWS), 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 = 9.739 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.160 W/kg
SAR(1 g) = 0.103 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EAD

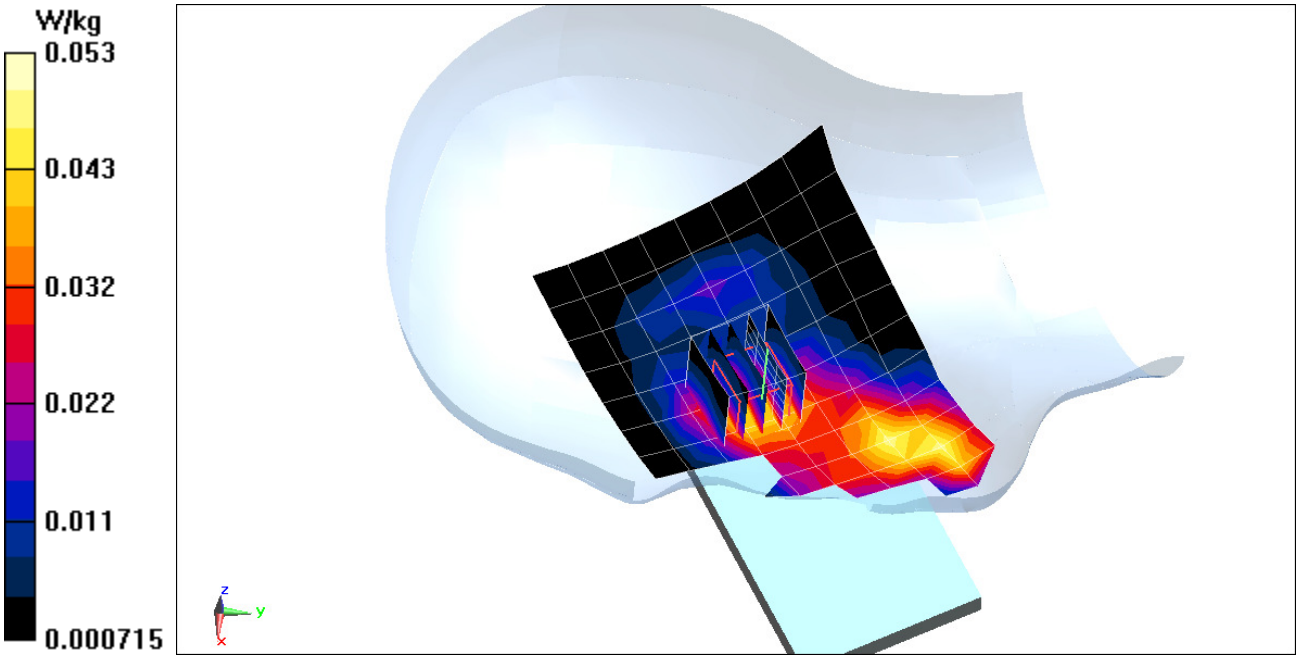
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.453 S/m; ε_r = 38.444; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 02-06-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Right Head, Cheek, High.ch,
20 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 = 8.713 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.133 W/kg
SAR(1 g) = 0.088 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E80

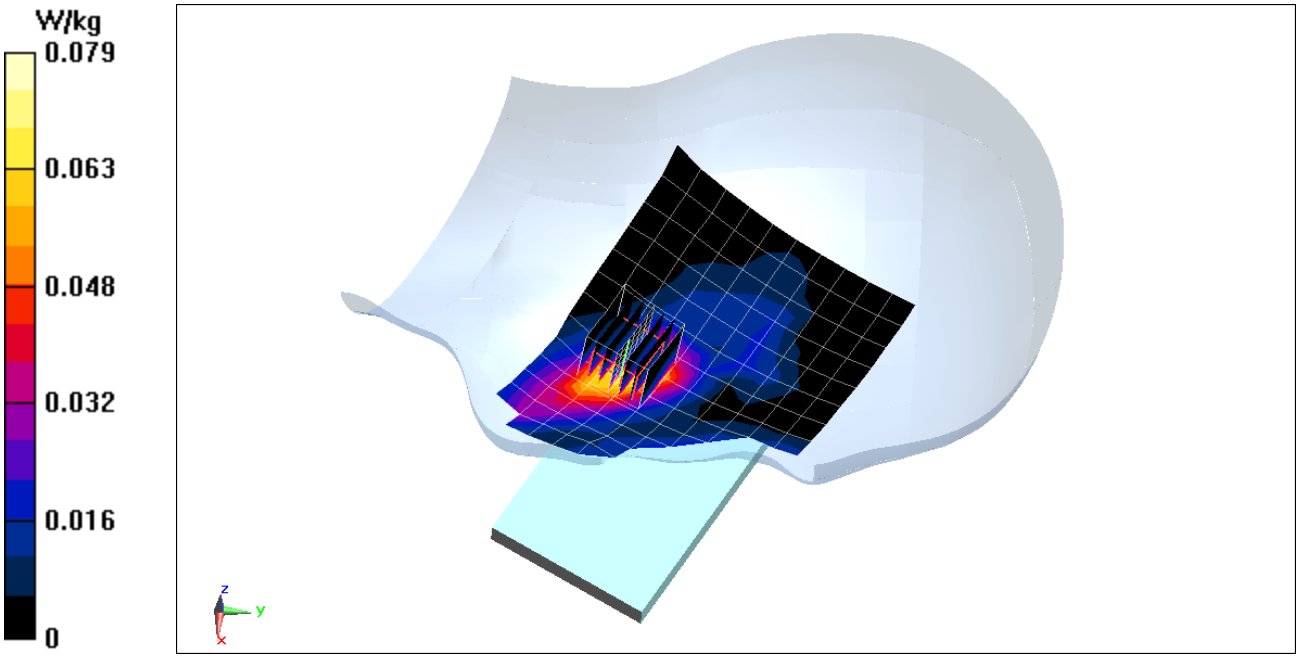
Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Head Medium parameters used:
f = 2550 MHz; σ = 1.99 S/m; ε_r = 38.788; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-10-2017; Ambient Temp: 23.6°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.41, 4.41, 4.41); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.470 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.064 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

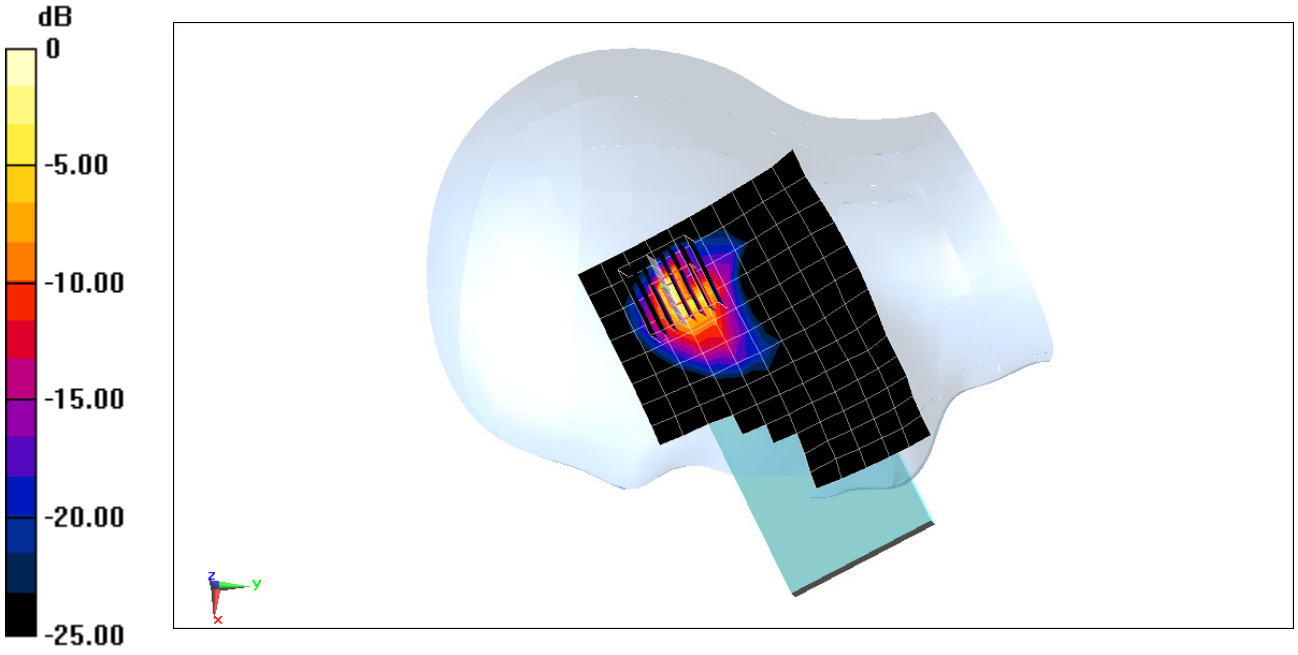
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2437$ MHz; $\sigma = 1.84$ S/m; $\varepsilon_r = 39.213$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 01-13-2017; Ambient Temp: 21.9°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3287; ConvF(4.54, 4.54, 4.54); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.33 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.597 W/kg



0 dB = 0.785 W/kg = -1.05 dBW/kg

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

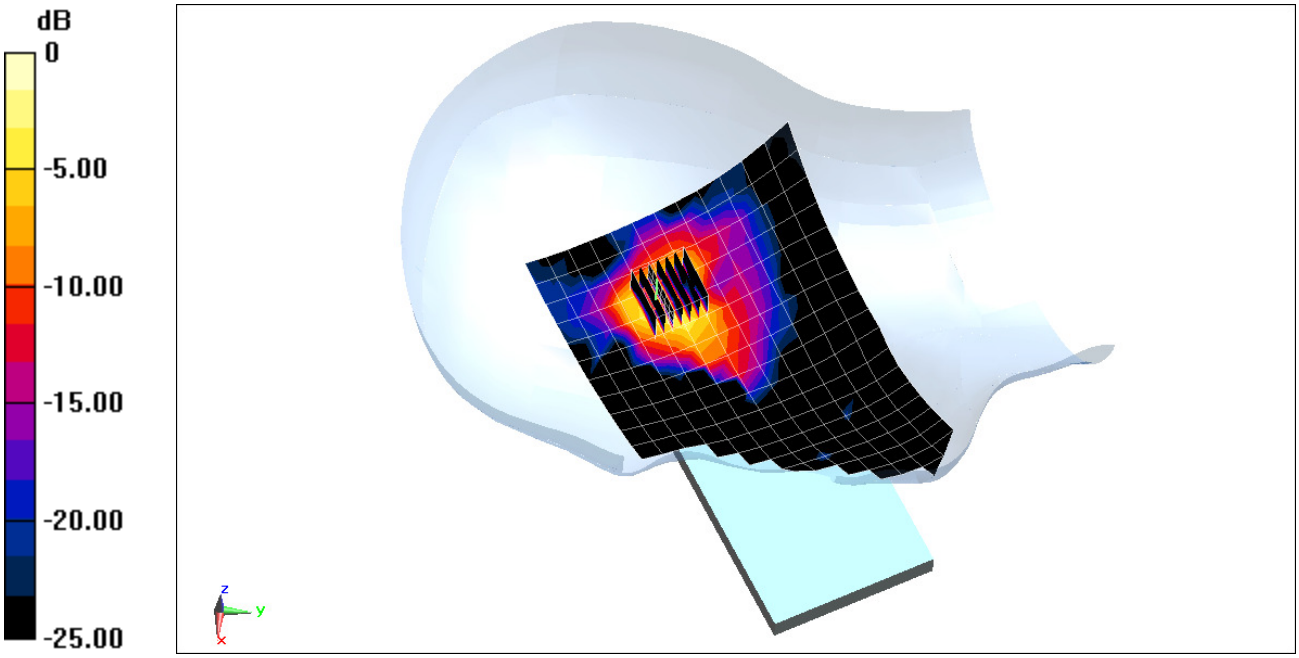
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5745 MHz; σ = 5.202 S/m; ε_r = 34.896; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-06-2017; Ambient Temp: 21.5°C; Tissue Temp: 20.5°C

Probe: EX3DV4 - SN7357; ConvF(4.65, 4.65, 4.65); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, U-NII-3, 20 MHz Bandwidth,
Right Head, Cheek, Ch 149, 6 Mbps, Antenna 2

Area Scan (13x22x1): 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 = 4.429 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 0.546 W/kg



0 dB = 1.45 W/kg = 1.61 dBW/kg

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

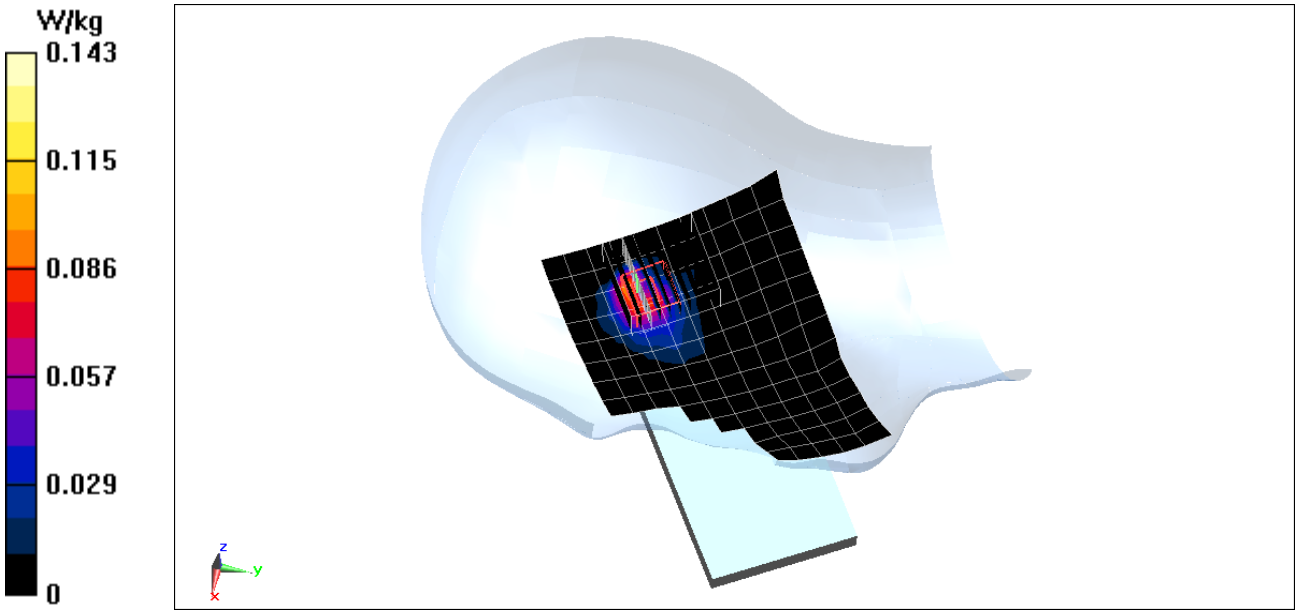
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.3020
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.859 S/m; ε_r = 38.197; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-22-2017; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3287; ConvF(4.54, 4.54, 4.54); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Head SAR, Ch 39, 2Mbps, Right Cheek

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (10x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.510 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.103 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

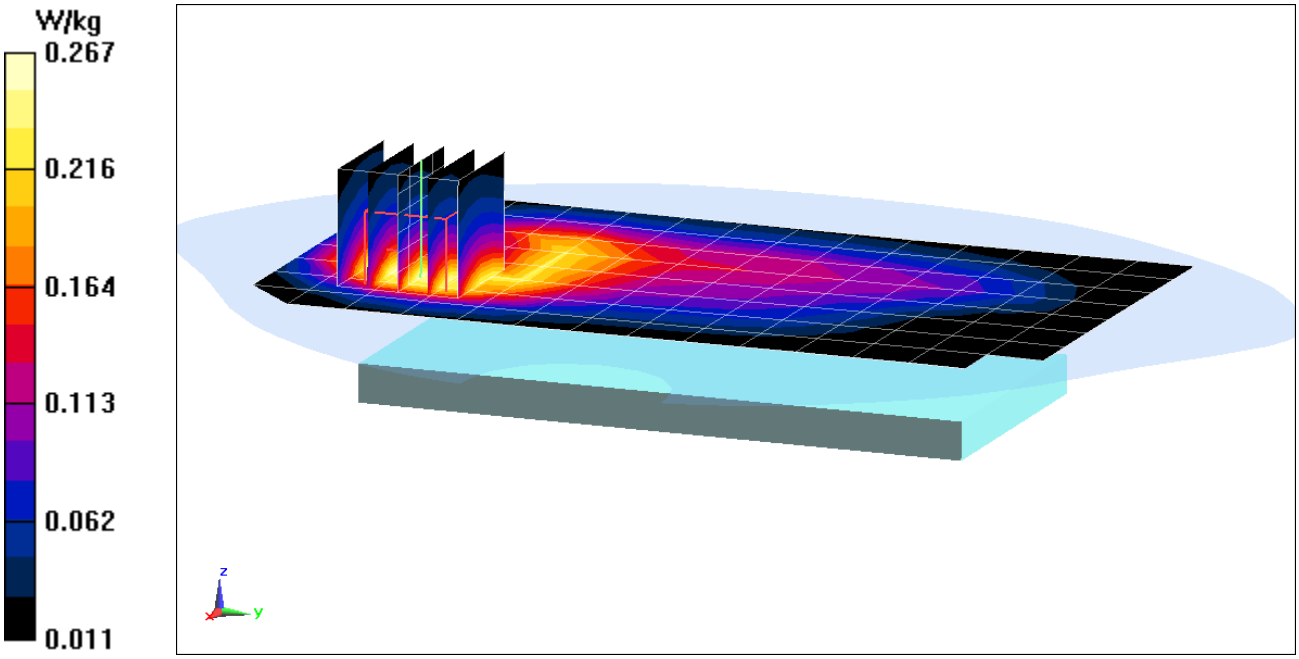
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.992$ S/m; $\varepsilon_r = 53.692$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.96 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.355 W/kg
SAR(1 g) = 0.228 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

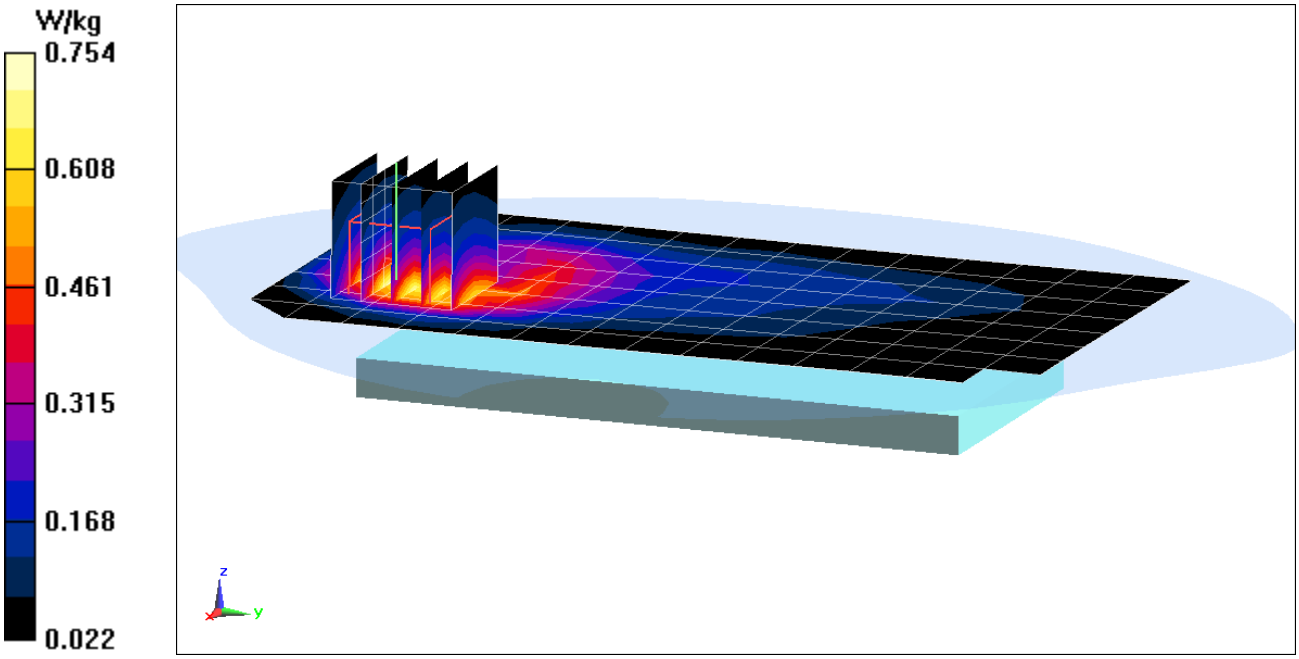
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.992$ S/m; $\varepsilon_r = 53.692$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.13 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.624 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF5

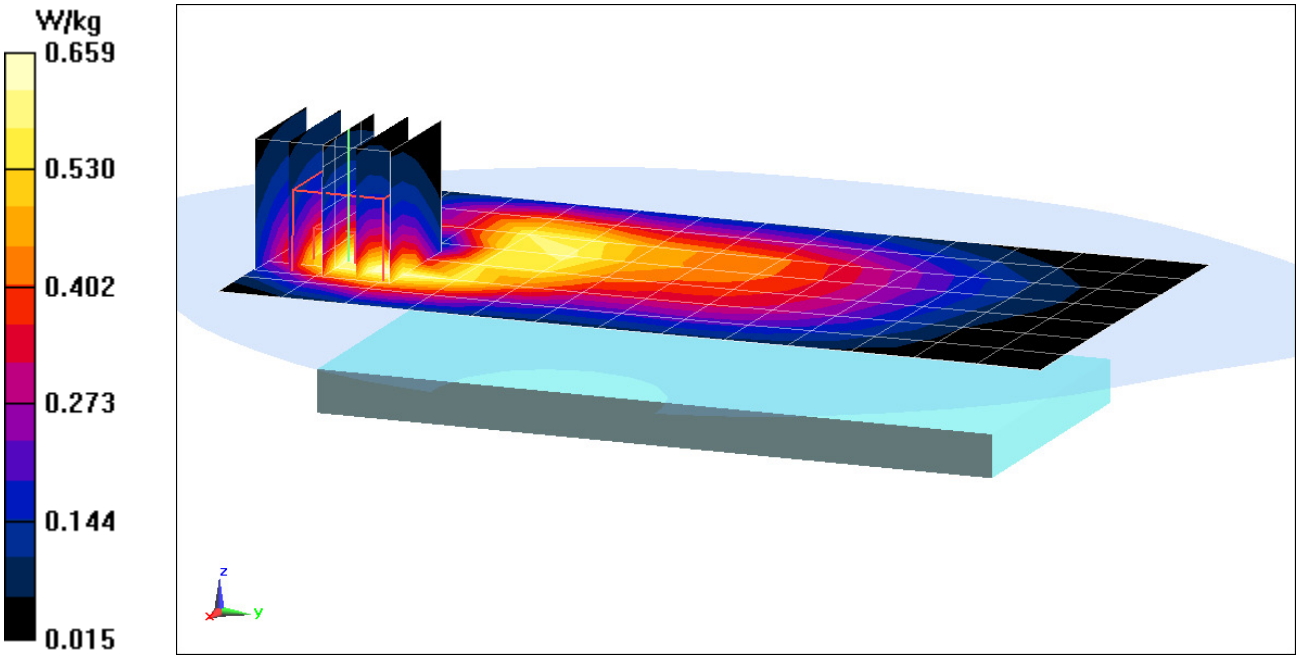
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.992 S/m; ε_r = 53.692; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.99 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.868 W/kg
SAR(1 g) = 0.553 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF5

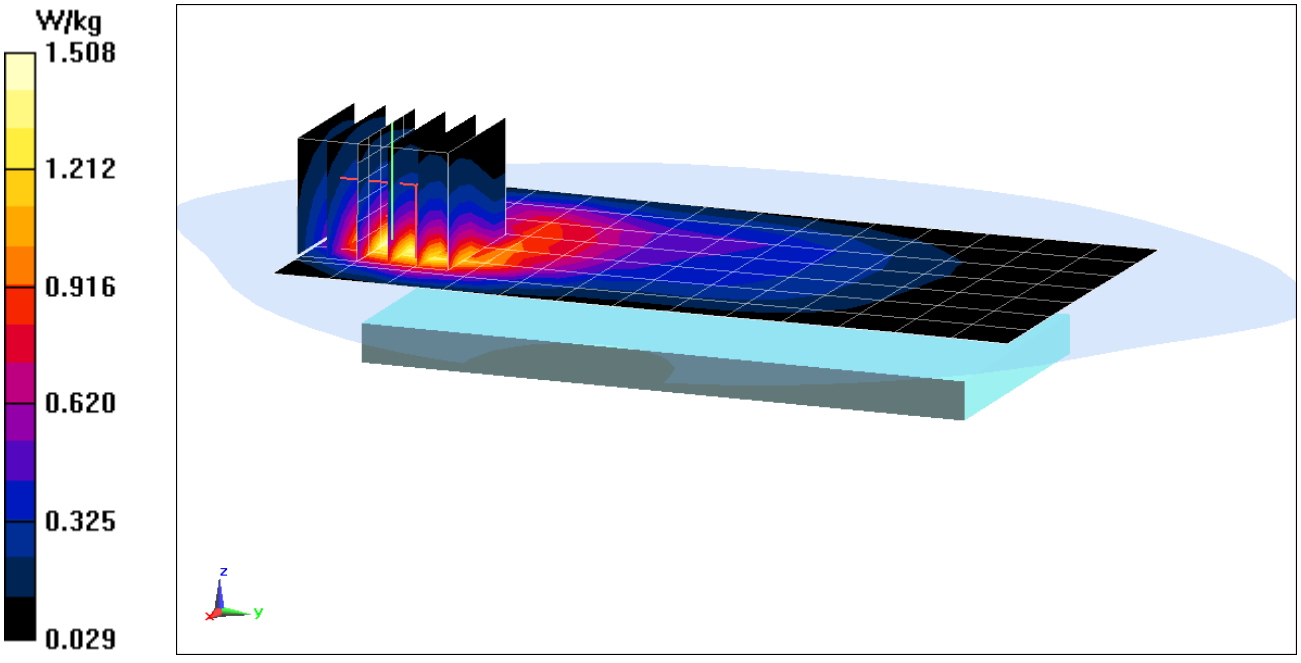
Communication System: UID 0, UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 846.6$ MHz; $\sigma = 1.002$ S/m; $\varepsilon_r = 53.629$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.11 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.07 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

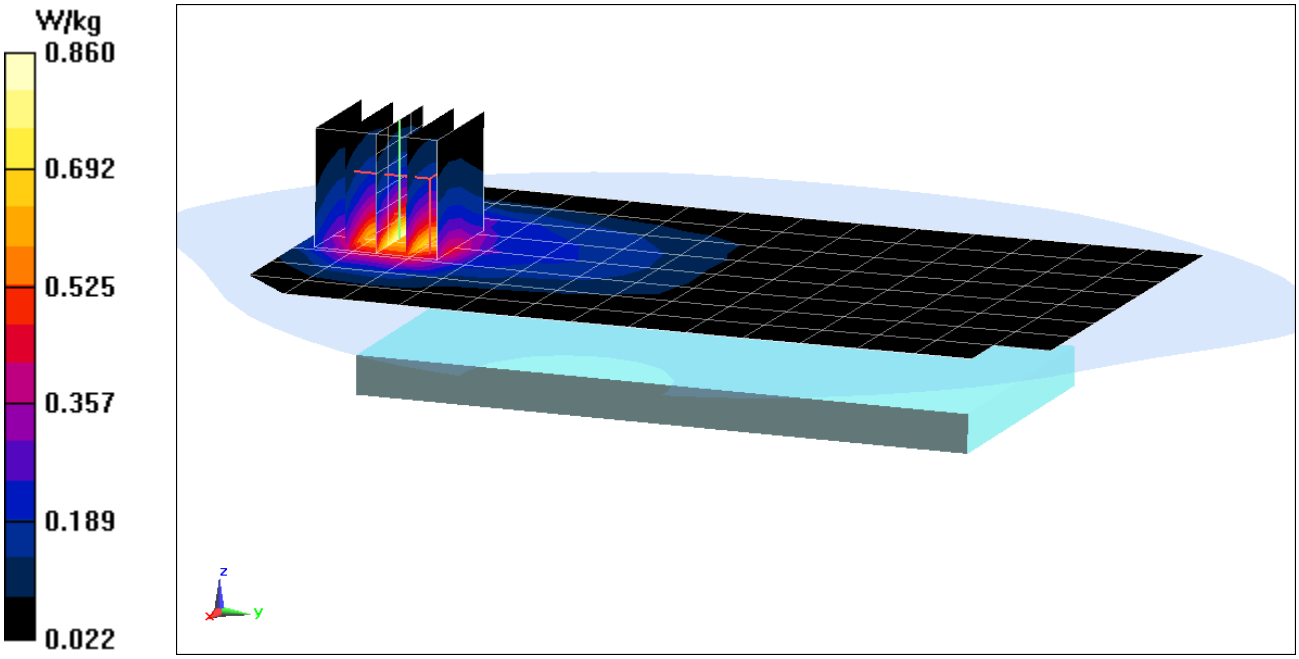
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.502 S/m; ε_r = 52.869; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Back side, High.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 = 23.42 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.716 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

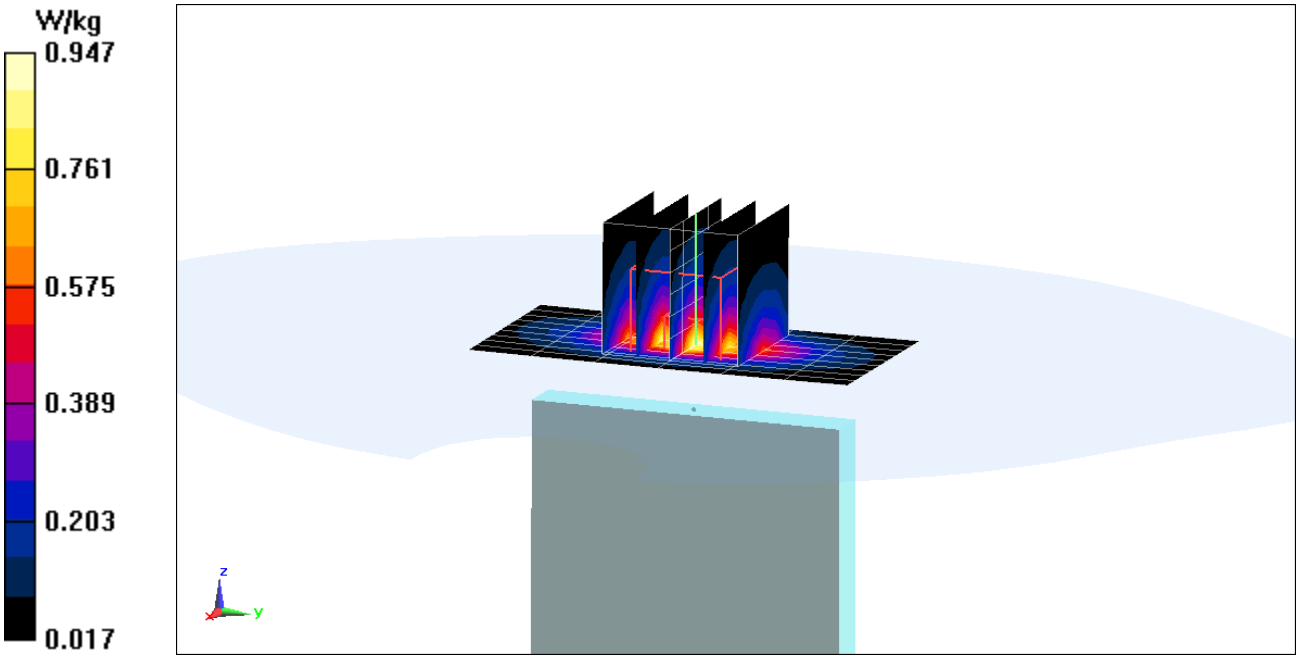
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.502 S/m; ε_r = 52.869; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Bottom Edge, High.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 = 24.47 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.764 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

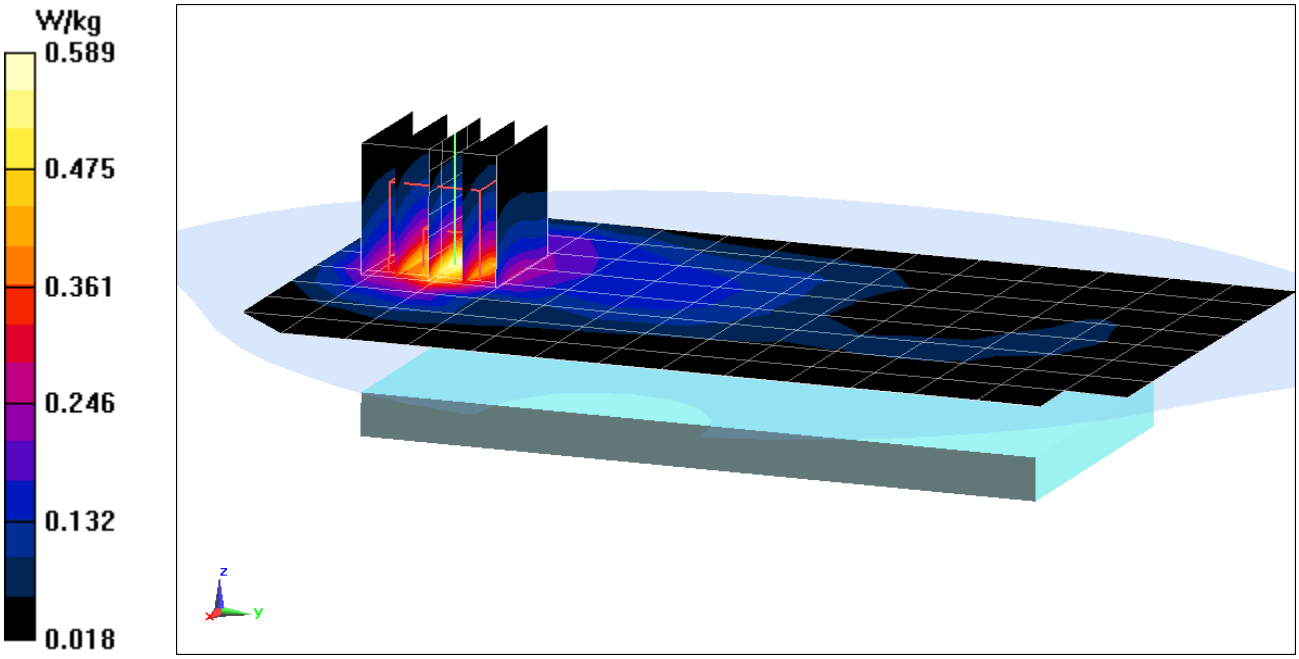
Communication System: UID 0, GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.584 S/m; ε_r = 51.581; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.80 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.687 W/kg
SAR(1 g) = 0.412 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

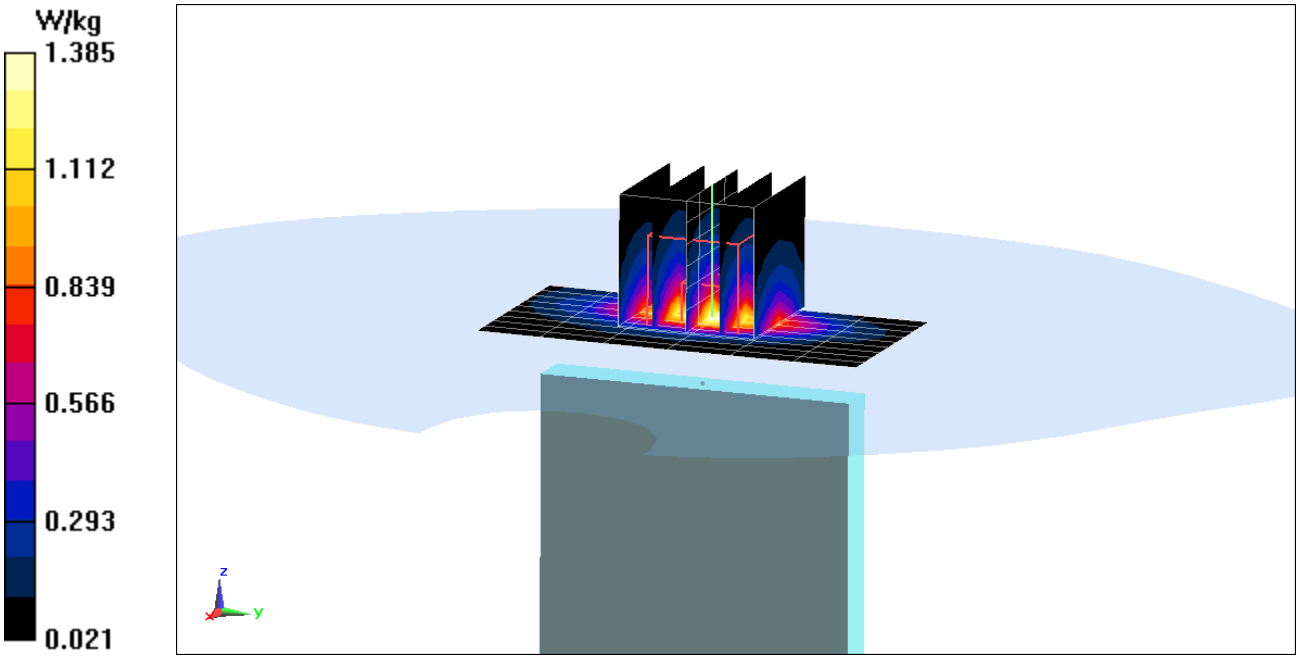
Communication System: UID 0, GSM GPRS; 1 Tx slot; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.584 S/m; ε_r = 51.581; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Body SAR, Bottom Edge, High.ch, 1 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 = 25.50 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 0.918 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

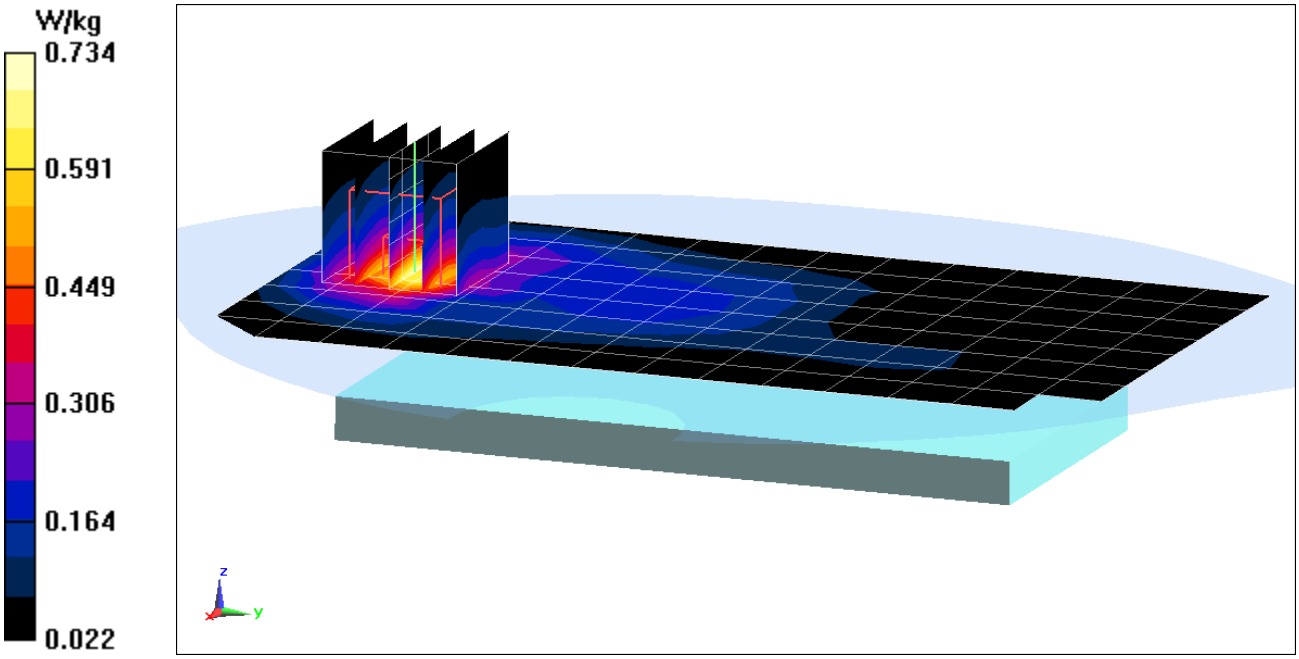
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.525 S/m; ε_r = 52.359; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-04-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.46 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.853 W/kg
SAR(1 g) = 0.512 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

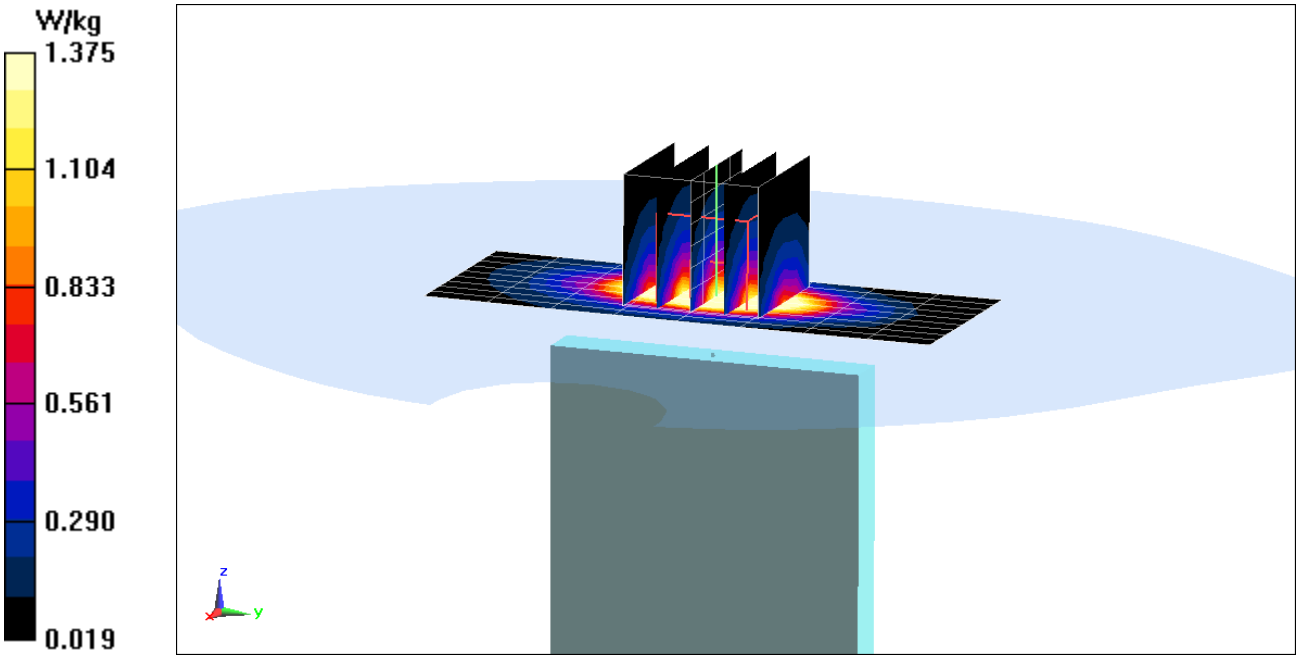
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.525 S/m; ε_r = 52.359; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-04-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.34 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.929 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

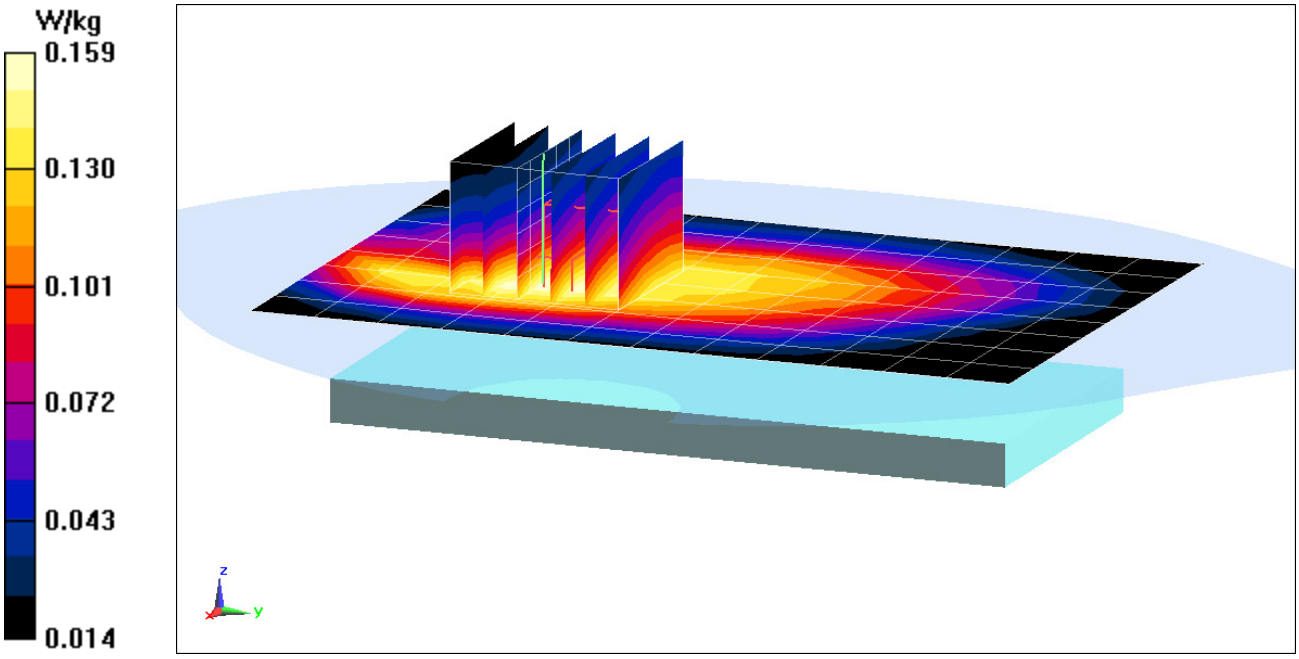
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.92 S/m; ε_r = 55.766; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-03-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.84 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.184 W/kg
SAR(1 g) = 0.142 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

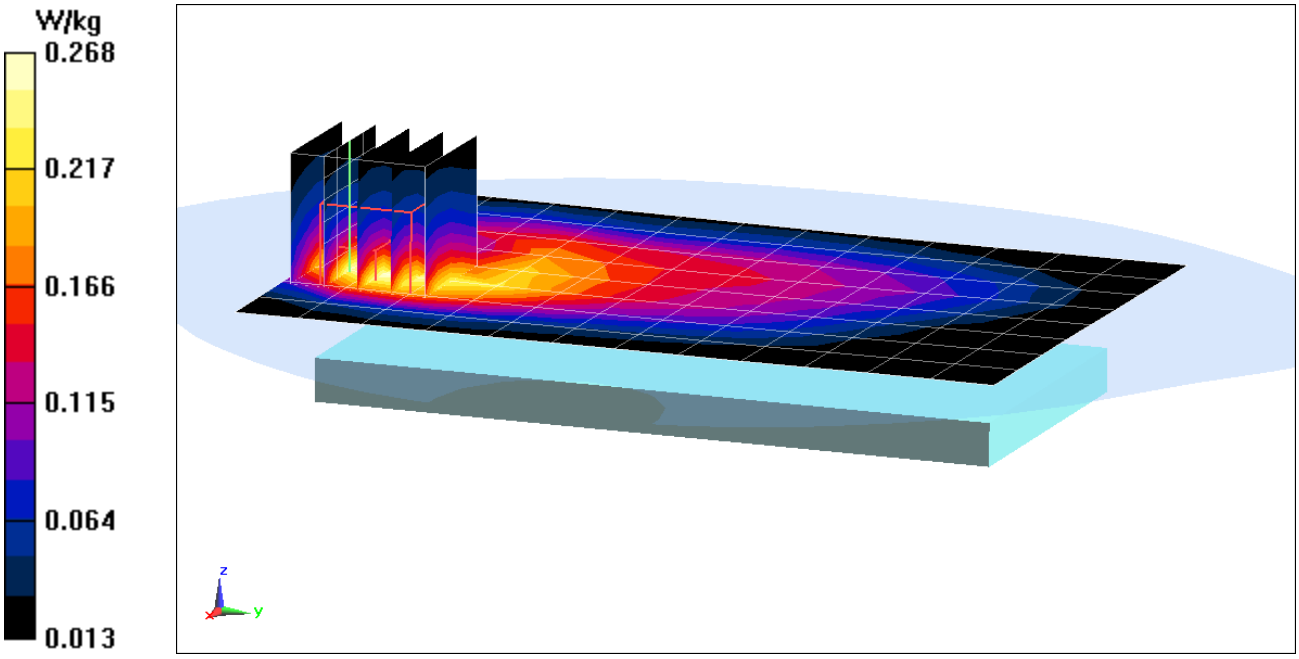
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.92 S/m; ε_r = 55.766; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.22 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.370 W/kg
SAR(1 g) = 0.225 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

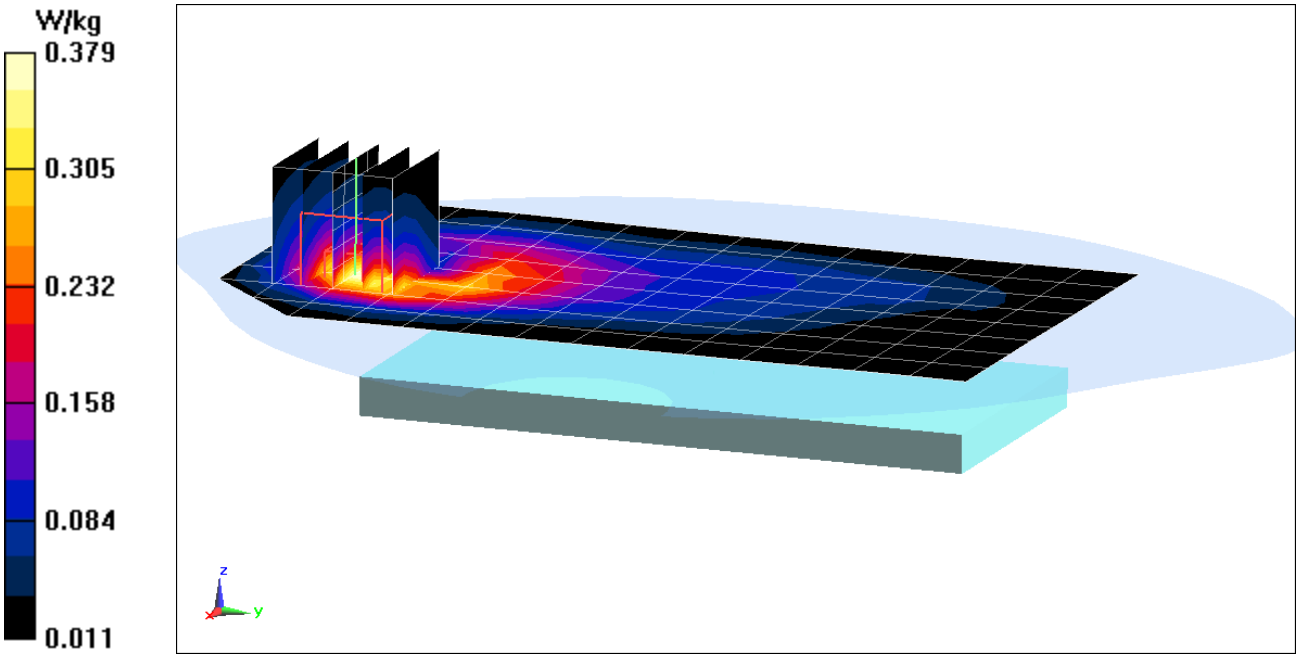
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.983 S/m; ε_r = 54.524; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.104 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.157 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

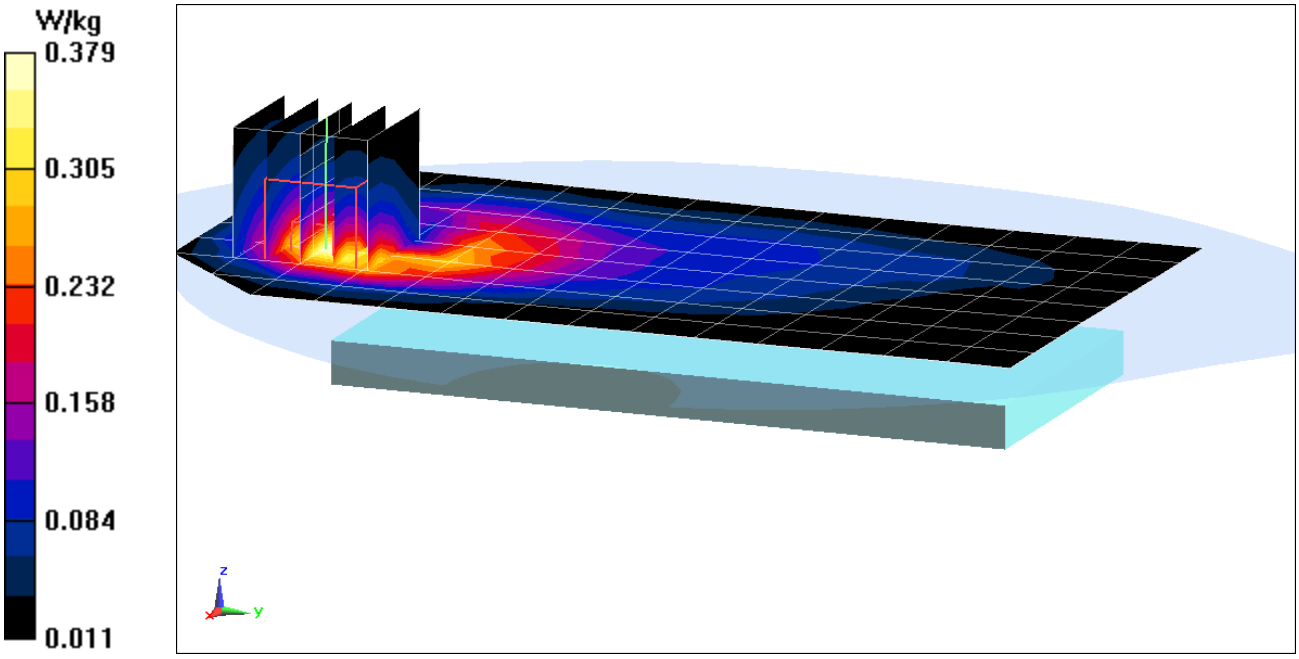
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.996 S/m; ε_r = 54.933; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-03-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB,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 = 18.78 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.516 W/kg
SAR(1 g) = 0.309 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

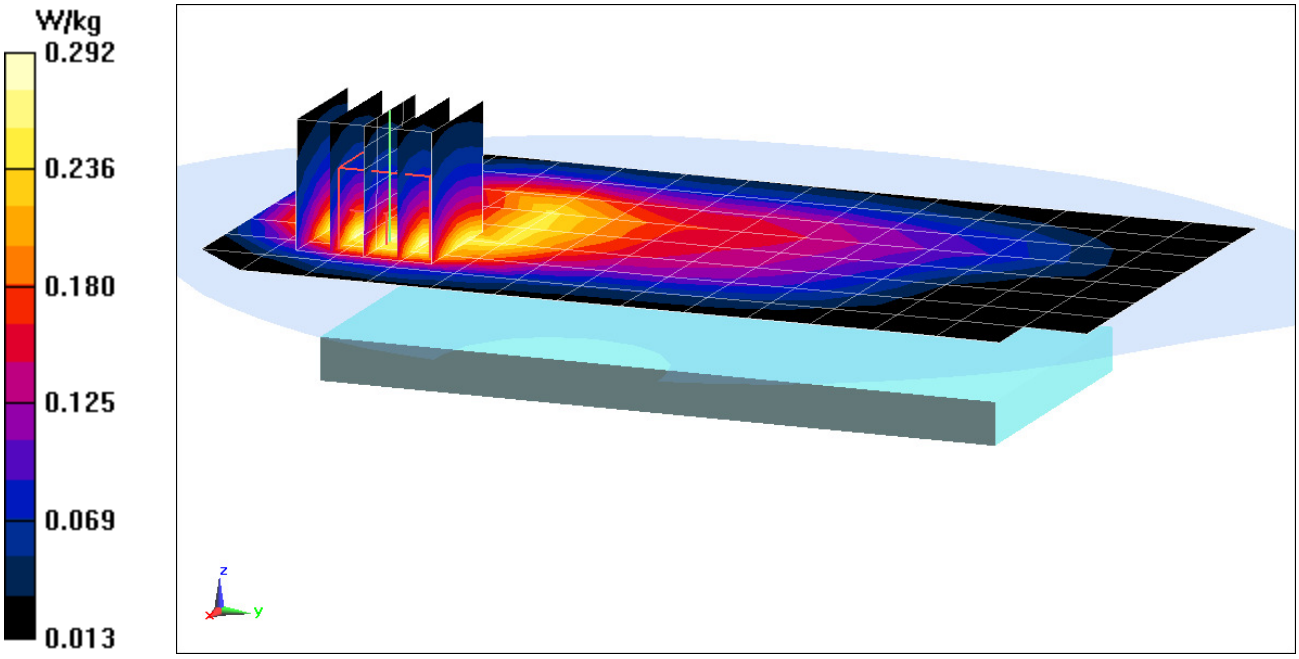
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 0.987$ S/m; $\varepsilon_r = 53.729$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Body SAR, Back side, Mid.ch,
15 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 = 16.62 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.250 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

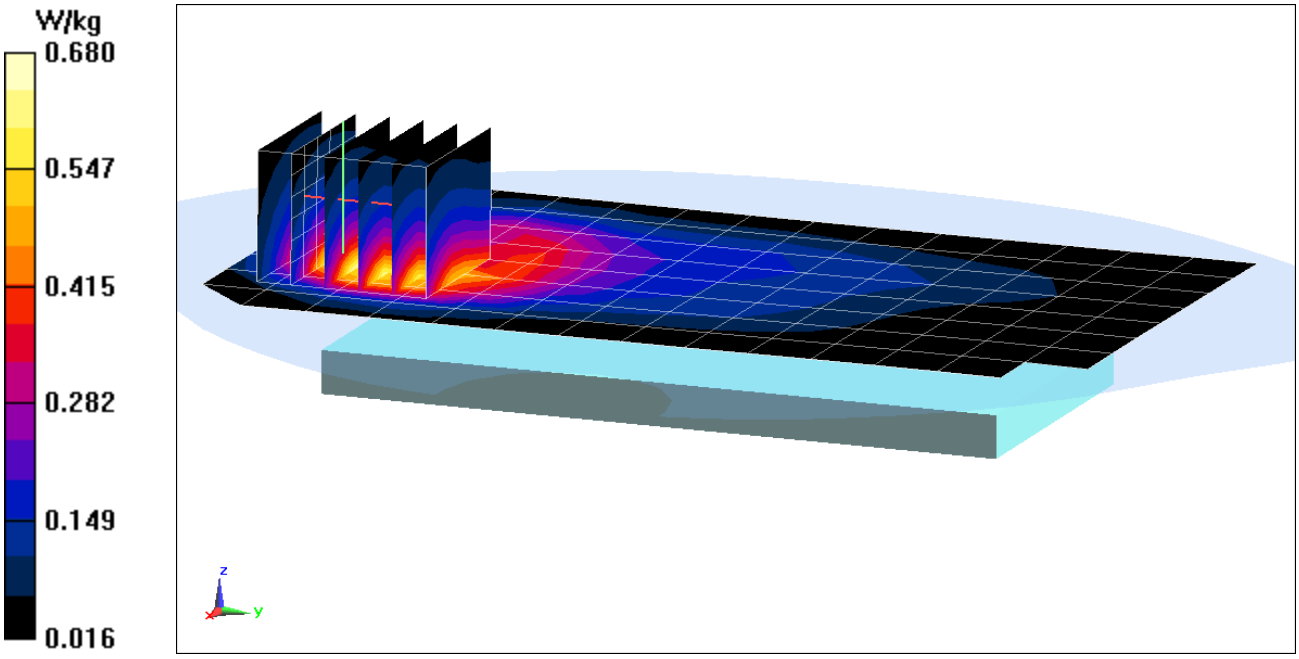
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.987 S/m; ε_r = 53.729; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Body SAR, Back side, Mid.ch,
15 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 = 24.26 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.952 W/kg
SAR(1 g) = 0.561 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

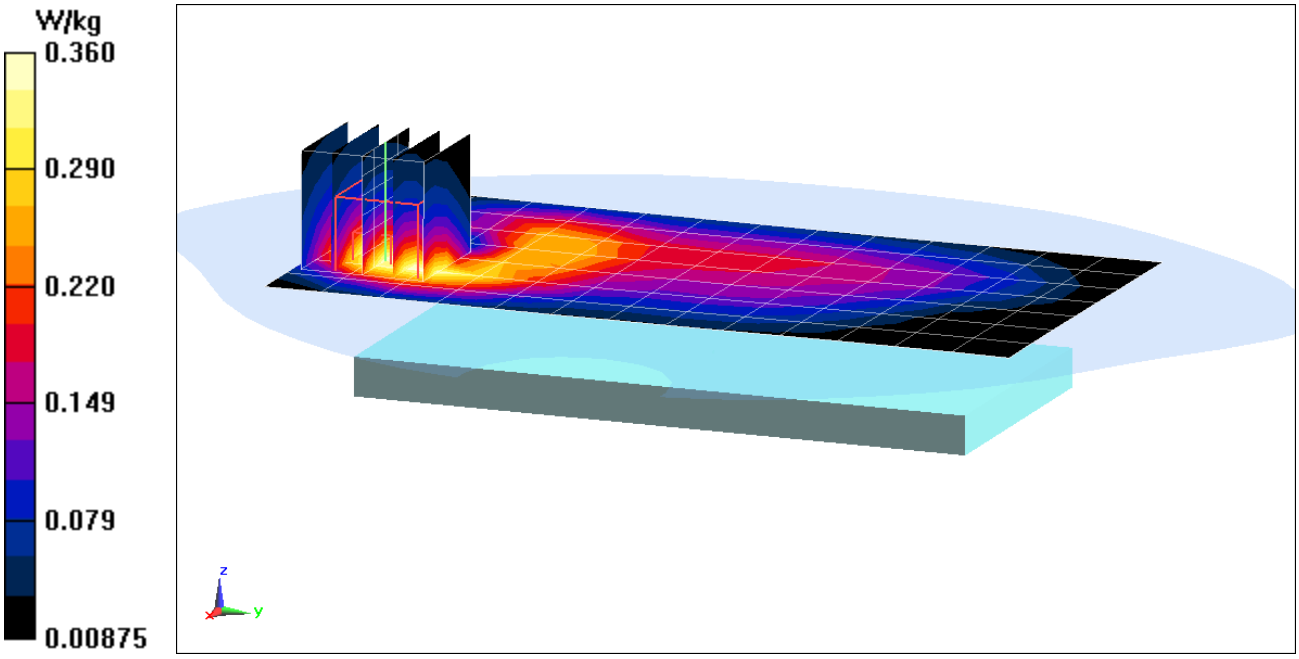
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.992 S/m; ε_r = 53.693; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.43 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.472 W/kg
SAR(1 g) = 0.304 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

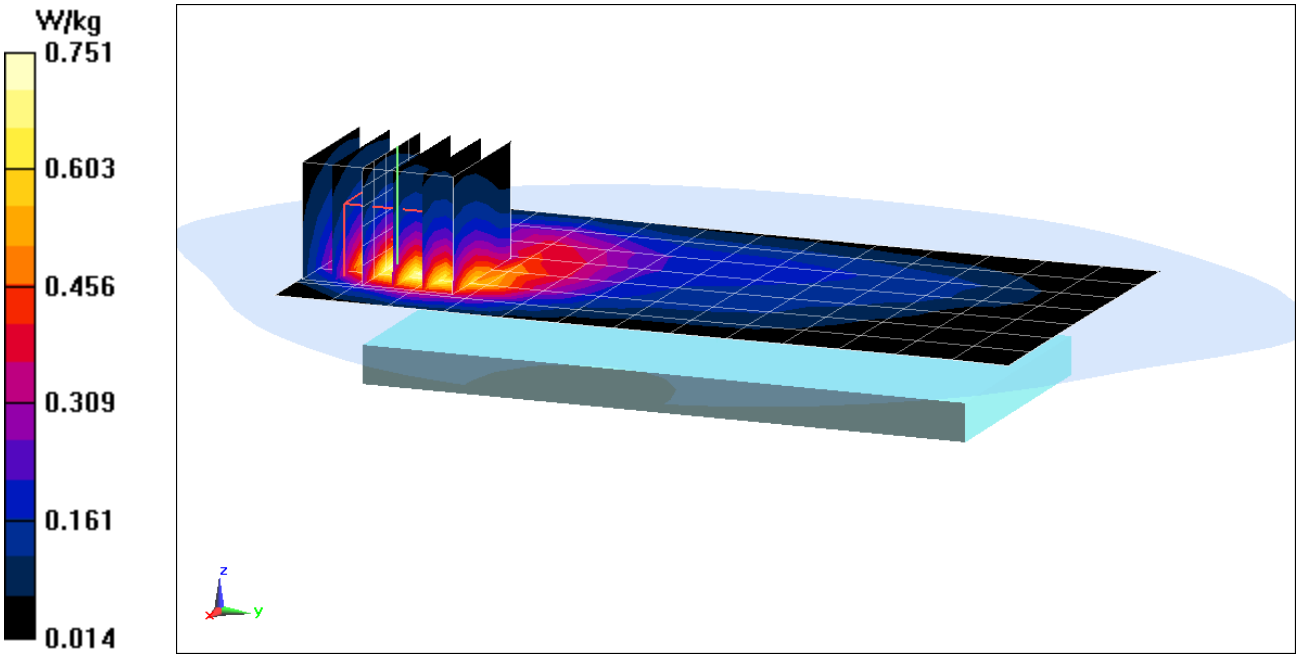
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.992 S/m; ε_r = 53.693; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.36 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.619 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

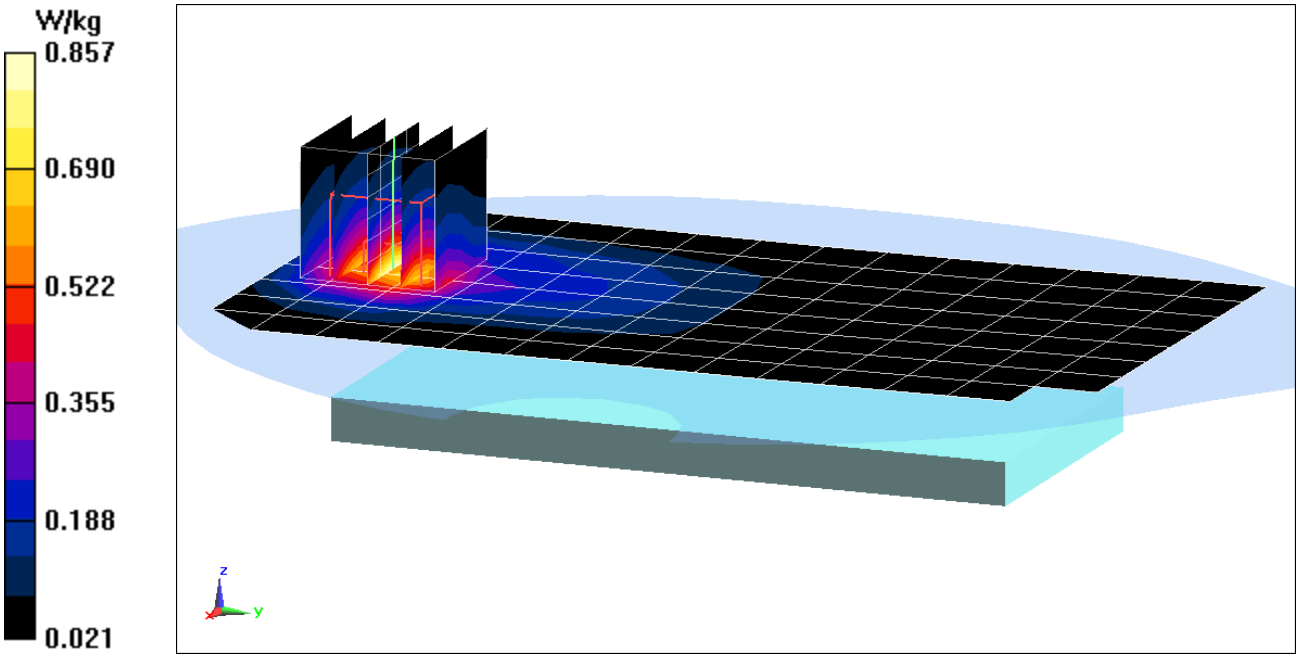
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
$f = 1770$ MHz; $\sigma = 1.524$ S/m; $\varepsilon_r = 52.767$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 66 (AWS), Body SAR, Back side, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 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 = 23.27 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.707 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

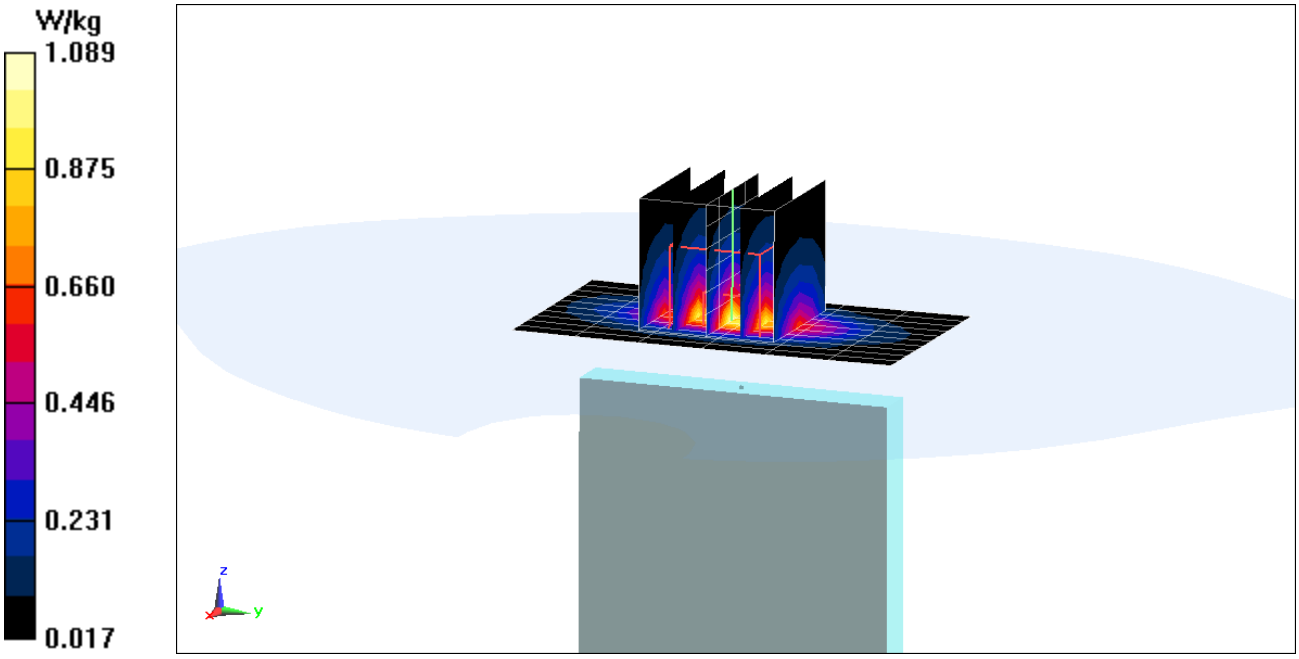
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1770 MHz; σ = 1.524 S/m; ε_r = 52.767; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 66 (AWS), Body SAR, Bottom Edge, High.ch,
20 MHz Bandwidth, QPSK, 50 RB, 0 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 = 26.16 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.863 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

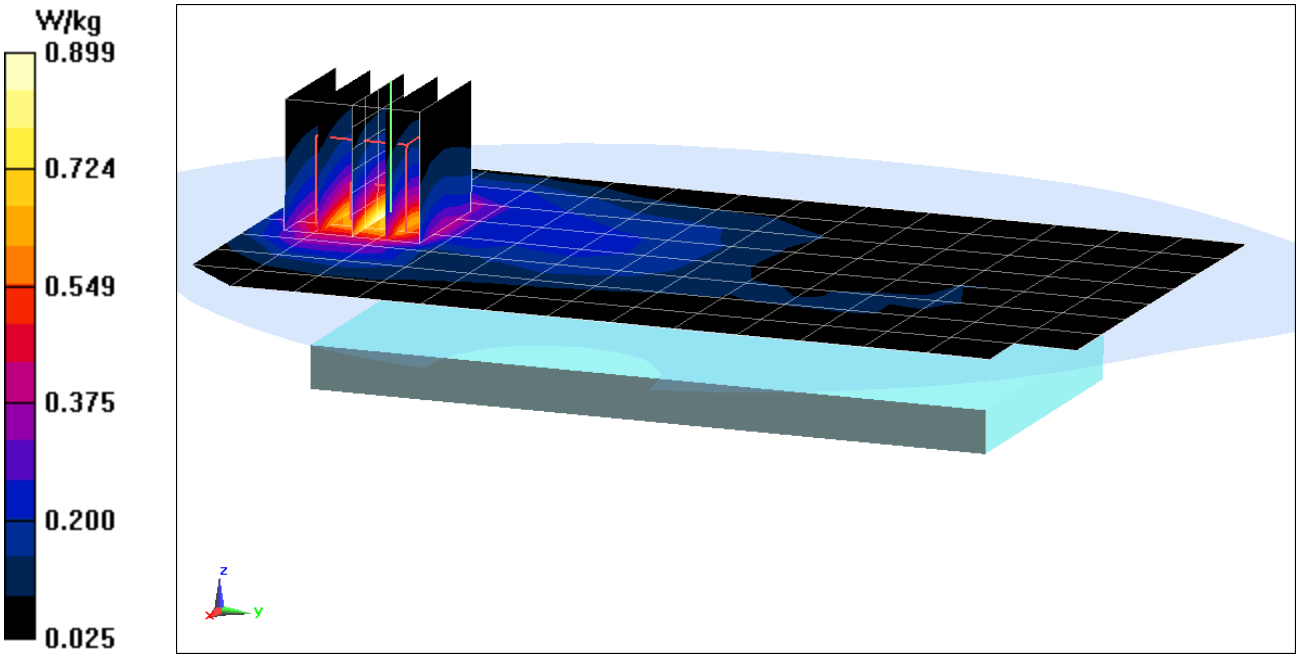
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.579 S/m; ε_r = 51.609; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Back side, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 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 = 20.97 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.633 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

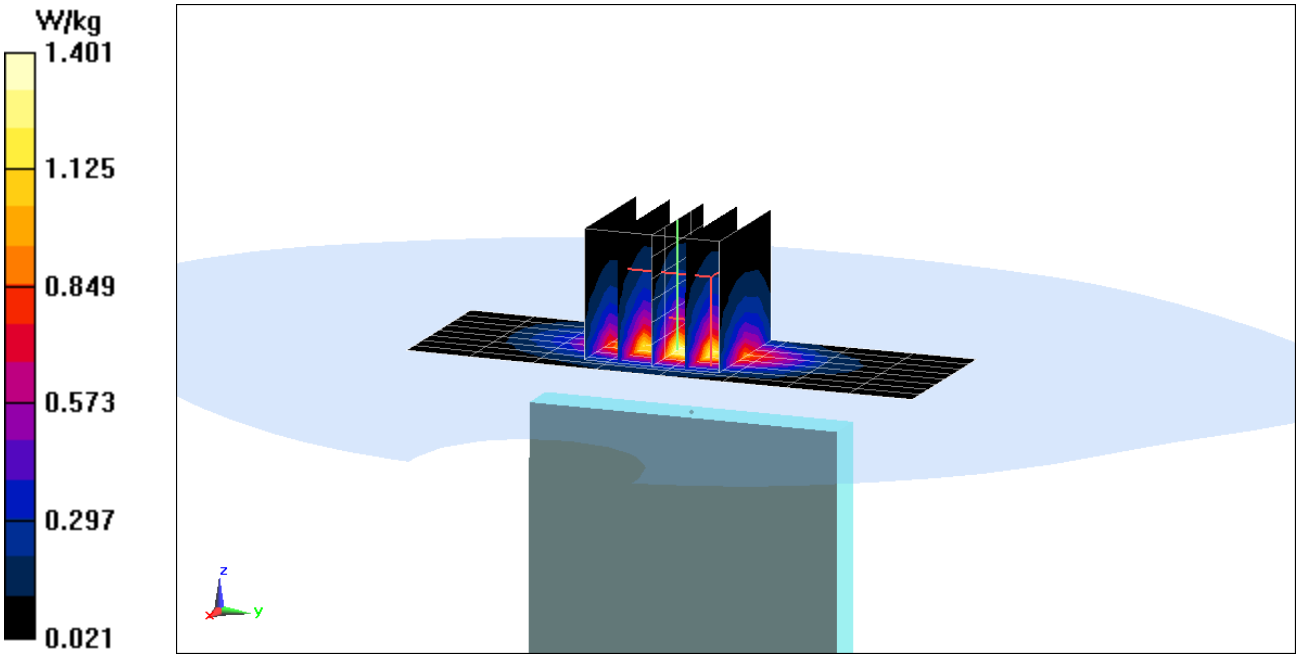
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
$f = 1905$ MHz; $\sigma = 1.551$ S/m; $\varepsilon_r = 52.292$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-04-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Bottom Edge, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 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 = 25.41 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.918 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

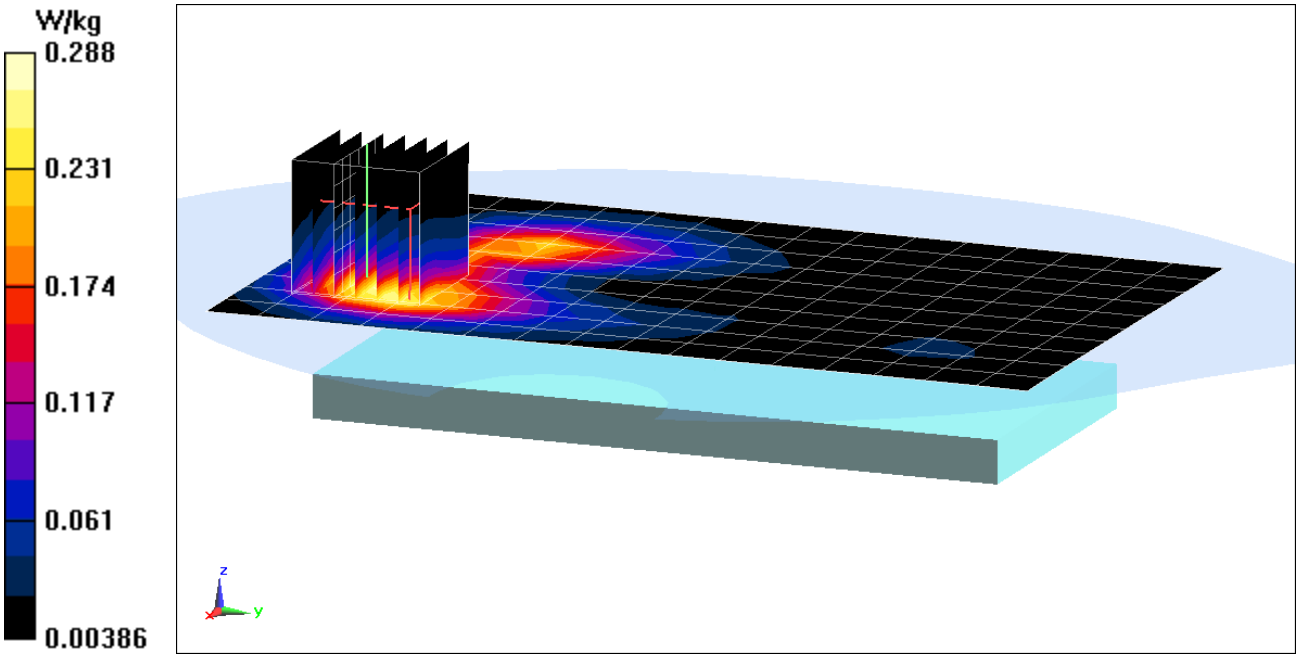
Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used:
f = 2550 MHz; σ = 2.091 S/m; ε_r = 50.813; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(6.94, 6.94, 6.94); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.665 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.363 W/kg
SAR(1 g) = 0.186 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

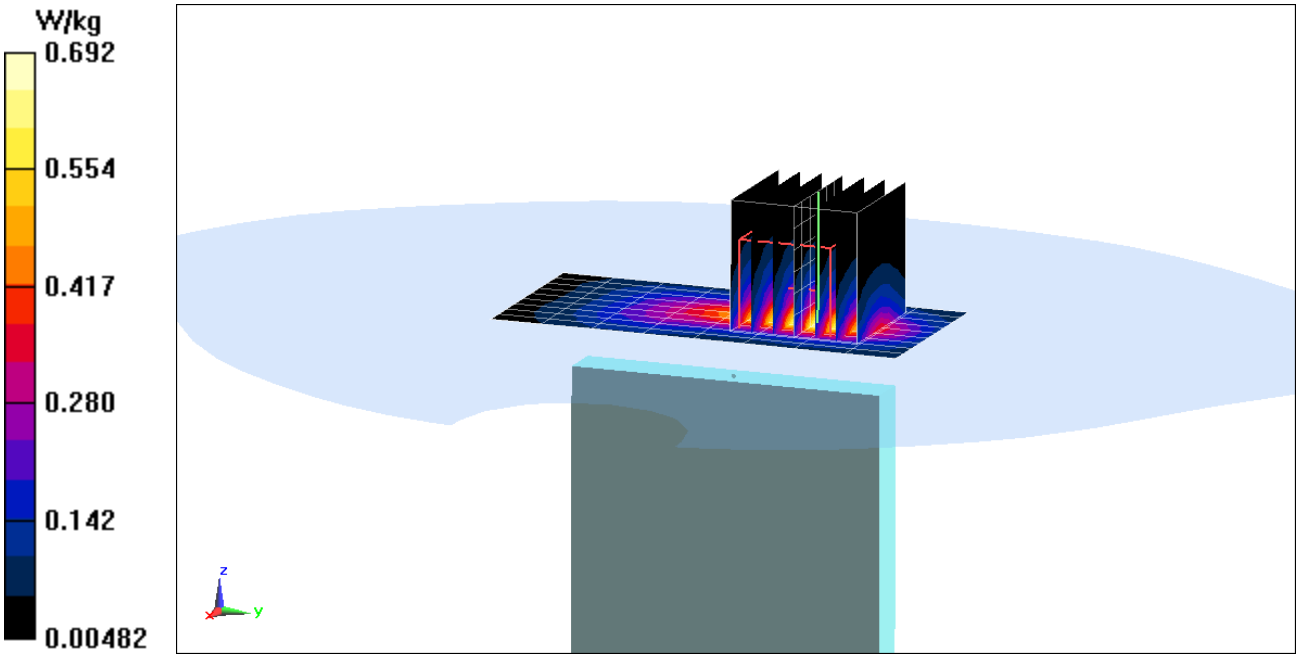
Communication System: UID 0, LTE Band 41; Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used:
f = 2550 MHz; σ = 2.091 S/m; ε_r = 50.813; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(6.94, 6.94, 6.94); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Body SAR, Bottom Edge, Low-Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.03 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.417 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

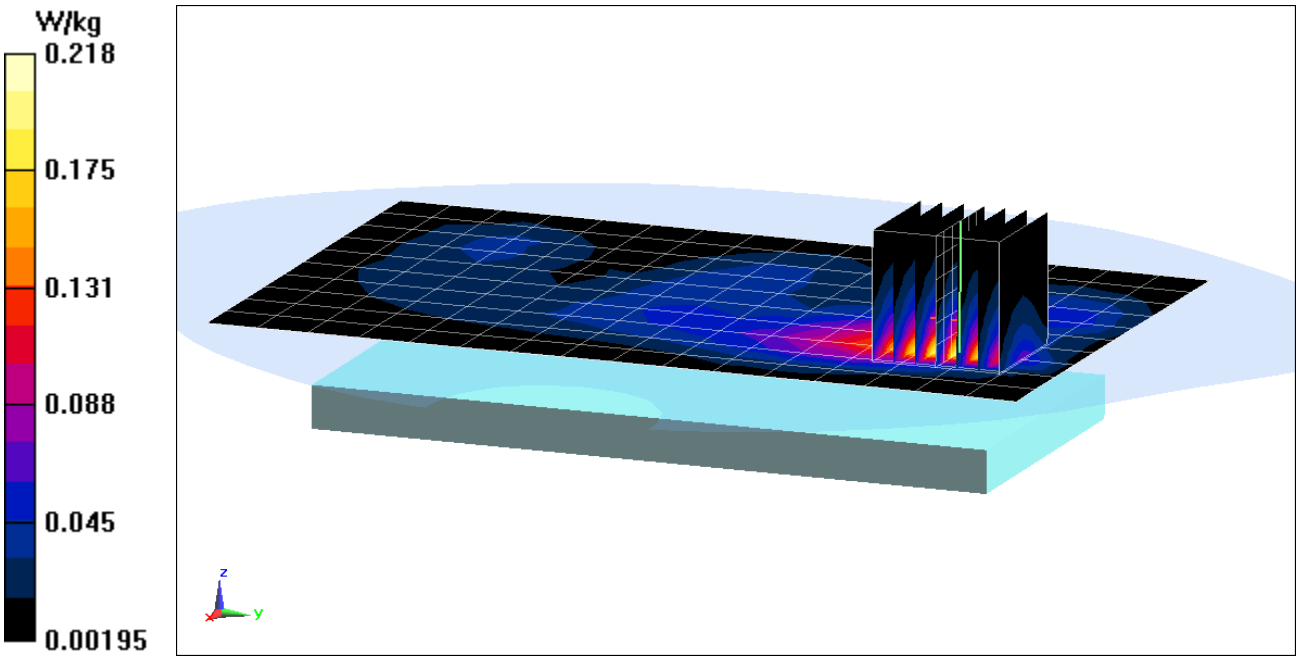
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.911 S/m; ε_r = 51.292; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 1, 1 Mbps, Back Side, Antenna 2

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.128 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.138 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07D04

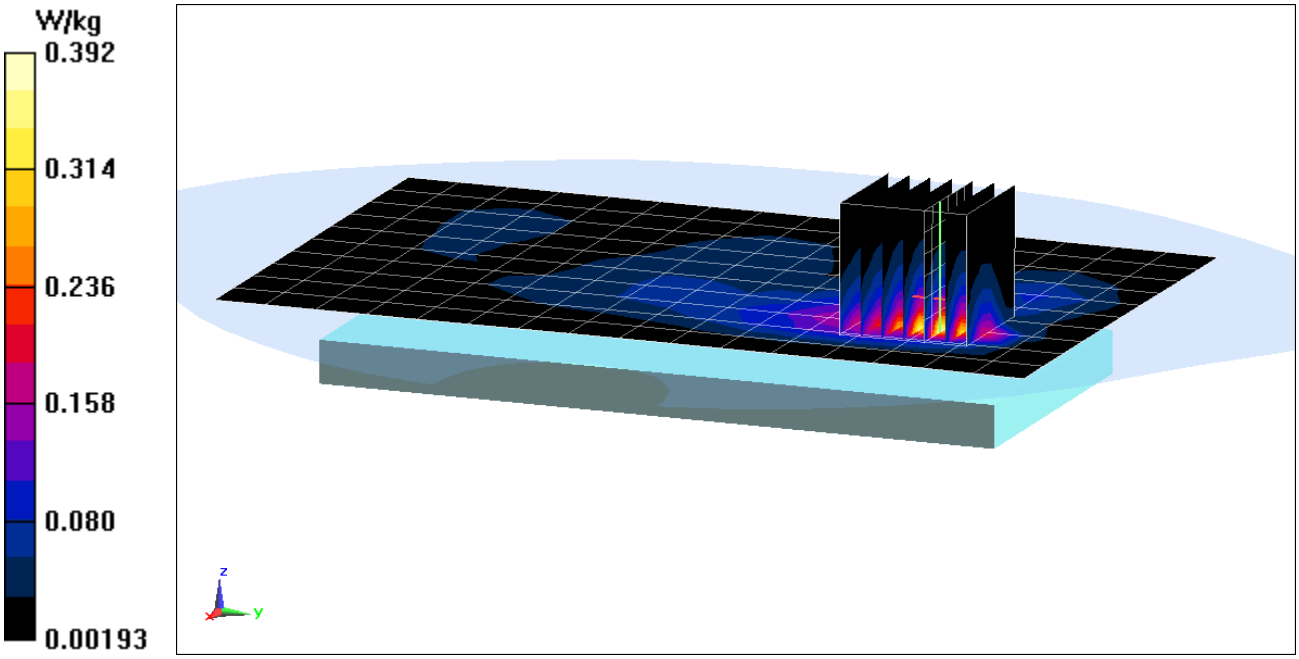
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
$f = 2412$ MHz; $\sigma = 1.911$ S/m; $\varepsilon_r = 51.292$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 1, 1 Mbps, Back Side, Antenna 2

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.91 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.494 W/kg
SAR(1 g) = 0.230 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

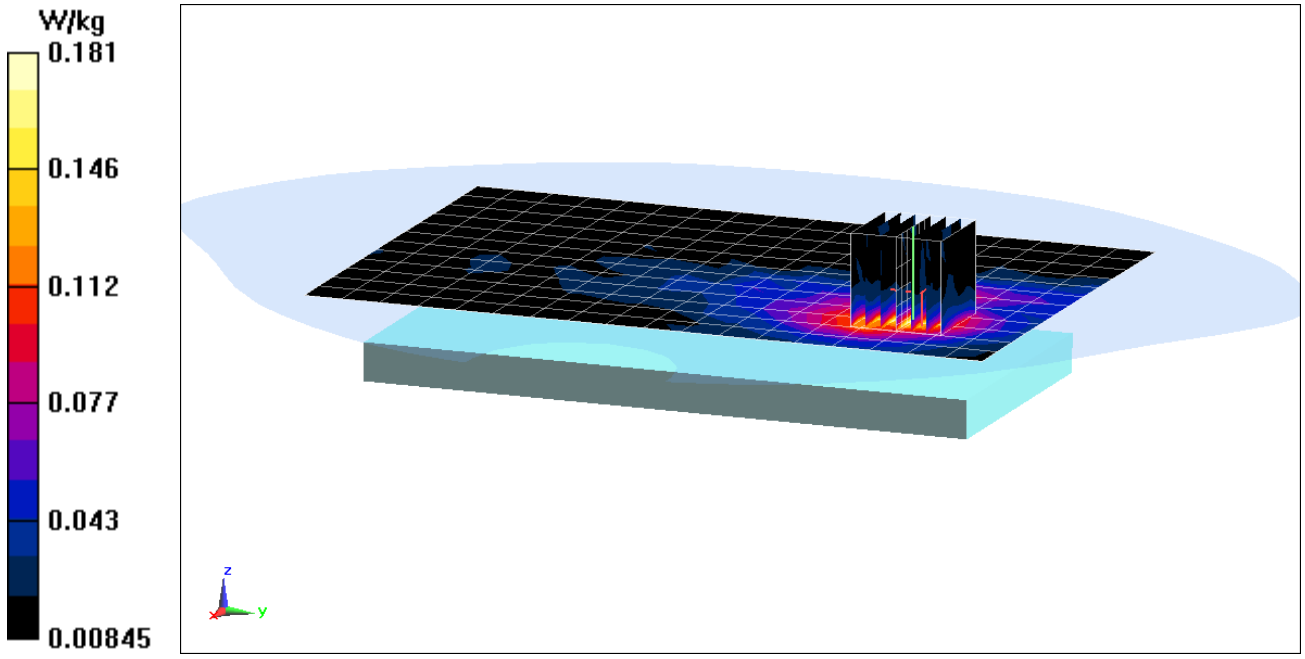
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5825 MHz; σ = 6.219 S/m; ε_r = 46.703; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, UNII-3, 20 MHz Bandwidth,
Body SAR, Ch 165, 6 Mbps, Back Side, Antenna 2

Area Scan (13x19x1): 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 = 3.872 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.088 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

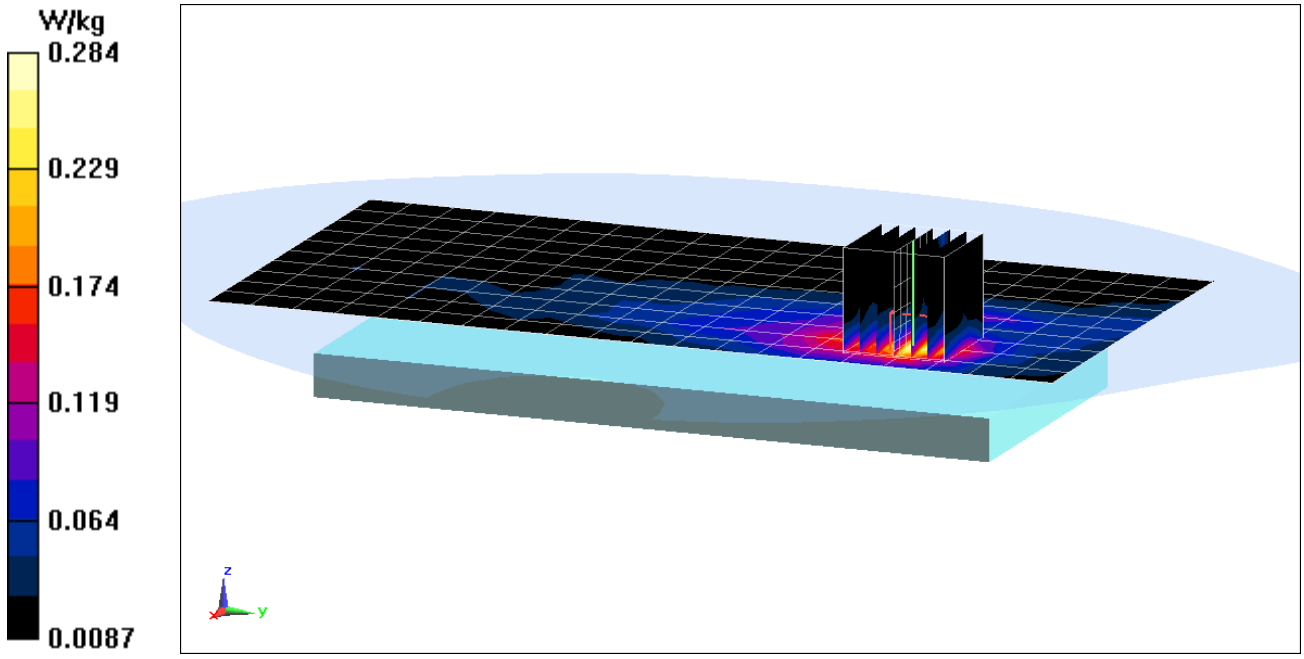
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5825 MHz; σ = 6.219 S/m; ε_r = 46.703; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, UNII-3, 20 MHz Bandwidth,
Body SAR, Ch 165, 6 Mbps, Back Side, Antenna 2

Area Scan (11x21x1): 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 = 4.915 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.449 W/kg
SAR(1 g) = 0.131 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

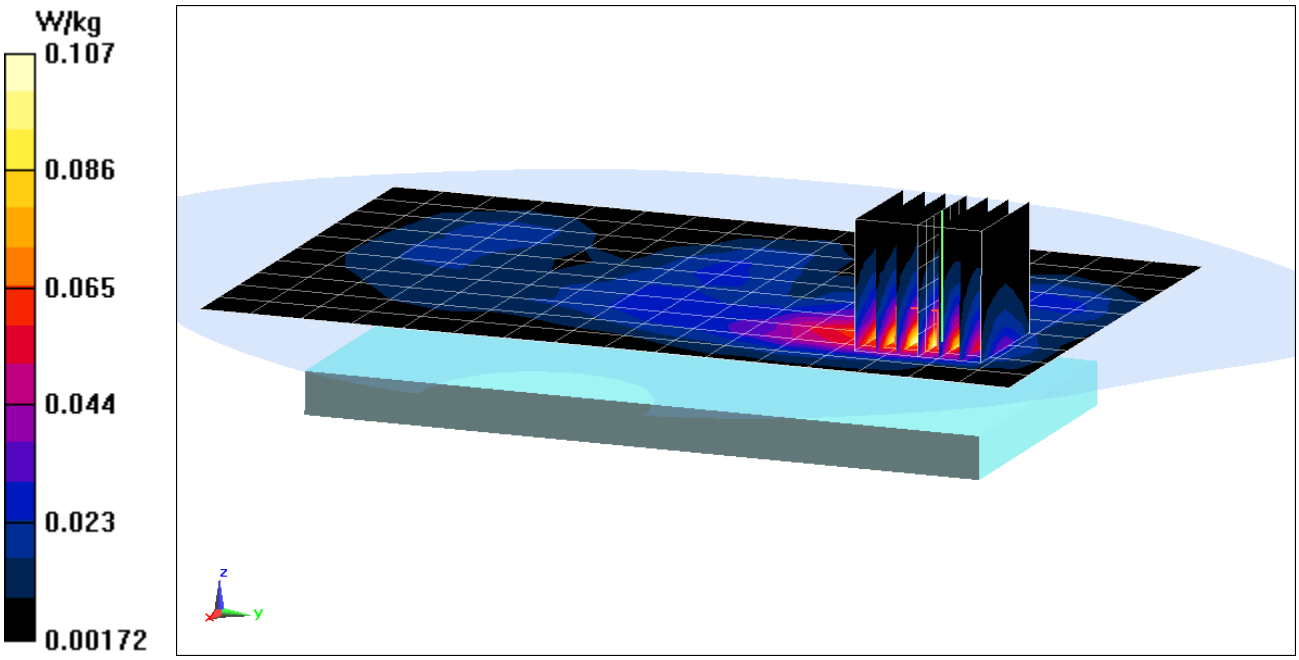
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.3020
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.948 S/m; ε_r = 51.169; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: 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 = 6.326 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.070 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

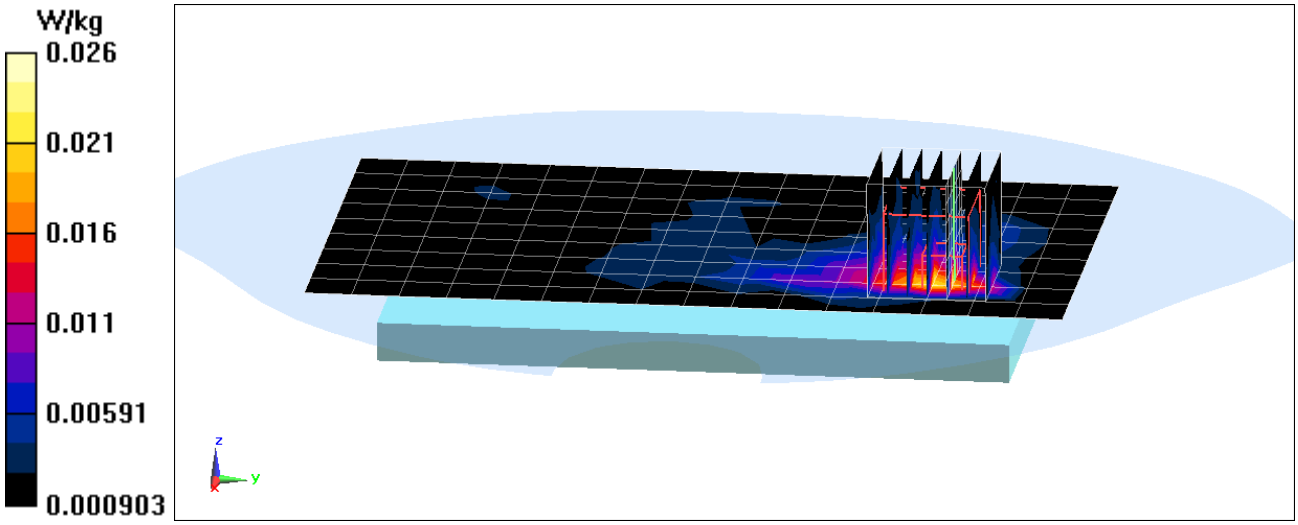
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.3020
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.961 S/m; ε_r = 51.39; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-24-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Body SAR, Ch 39, 2 Mbps, Back Side

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.029 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.0320 W/kg
SAR(1 g) = 0.016 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07CF0

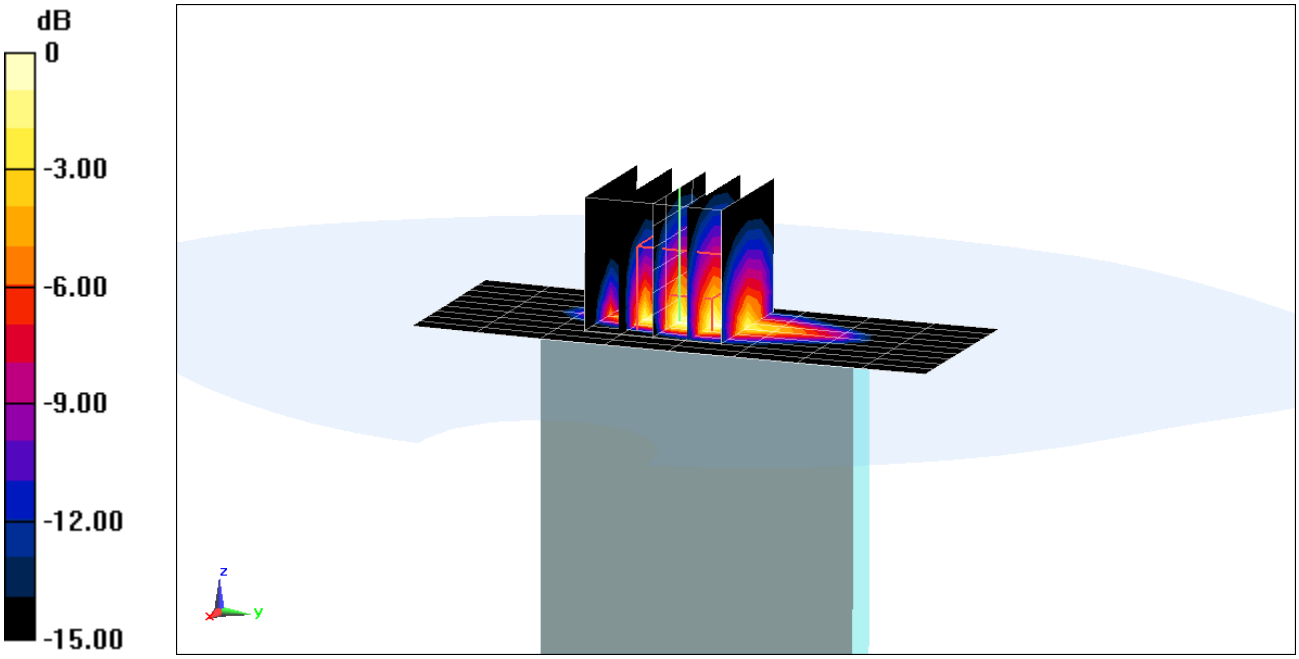
Communication System: UID 0, UMTS; Frequency: 1712.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1712.4 MHz; σ = 1.455 S/m; ε_r = 52.945; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Phablet SAR, Bottom Edge, Low.ch

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 59.19 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 8.36 W/kg
SAR(10 g) = 1.77 W/kg



0 dB = 5.67 W/kg = 7.54 dBW/kg

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EA5

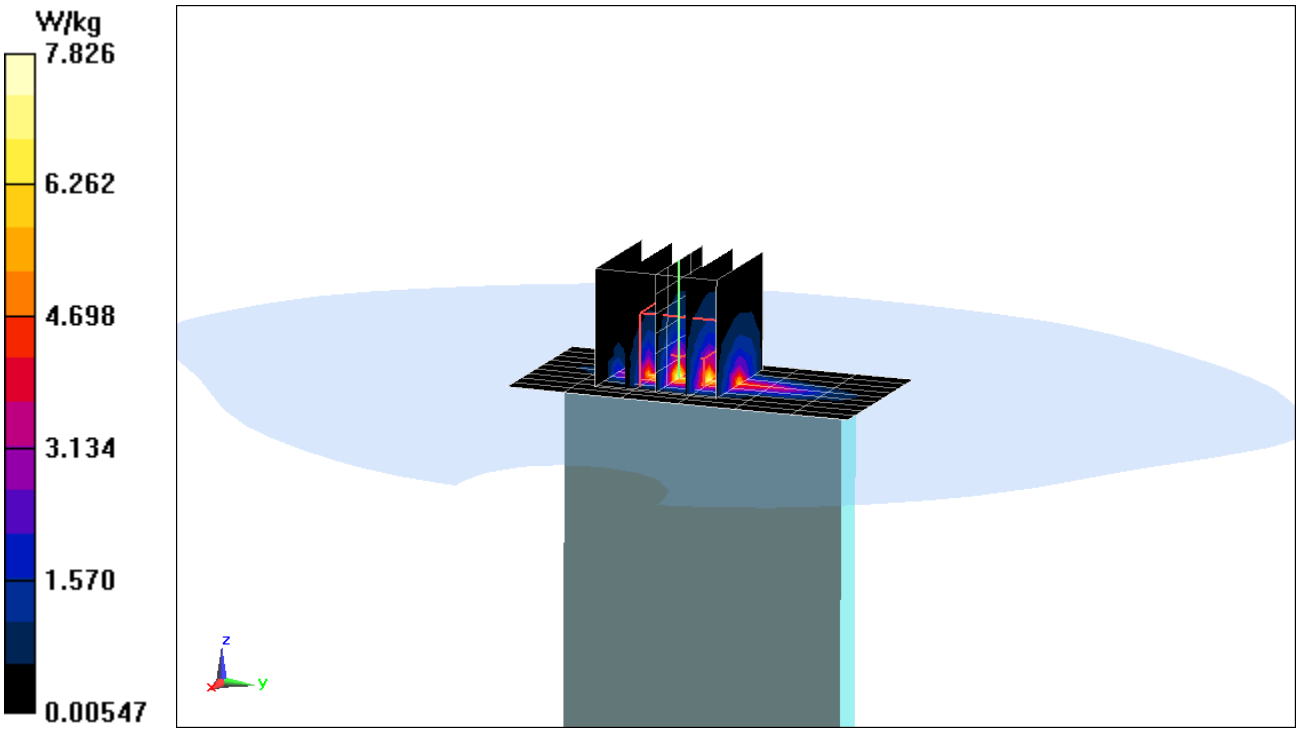
Communication System: UID 0, GSM; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used (interpolated):
f = 1850.2 MHz; σ = 1.51 S/m; ε_r = 54.996; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-13-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3334; ConvF(4.91, 4.91, 4.91); Calibrated: 11/15/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 11/11/2016
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GSM 1900, Phablet SAR, Bottom Edge, Mid.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 = 67.42 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(10 g) = 2.41 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

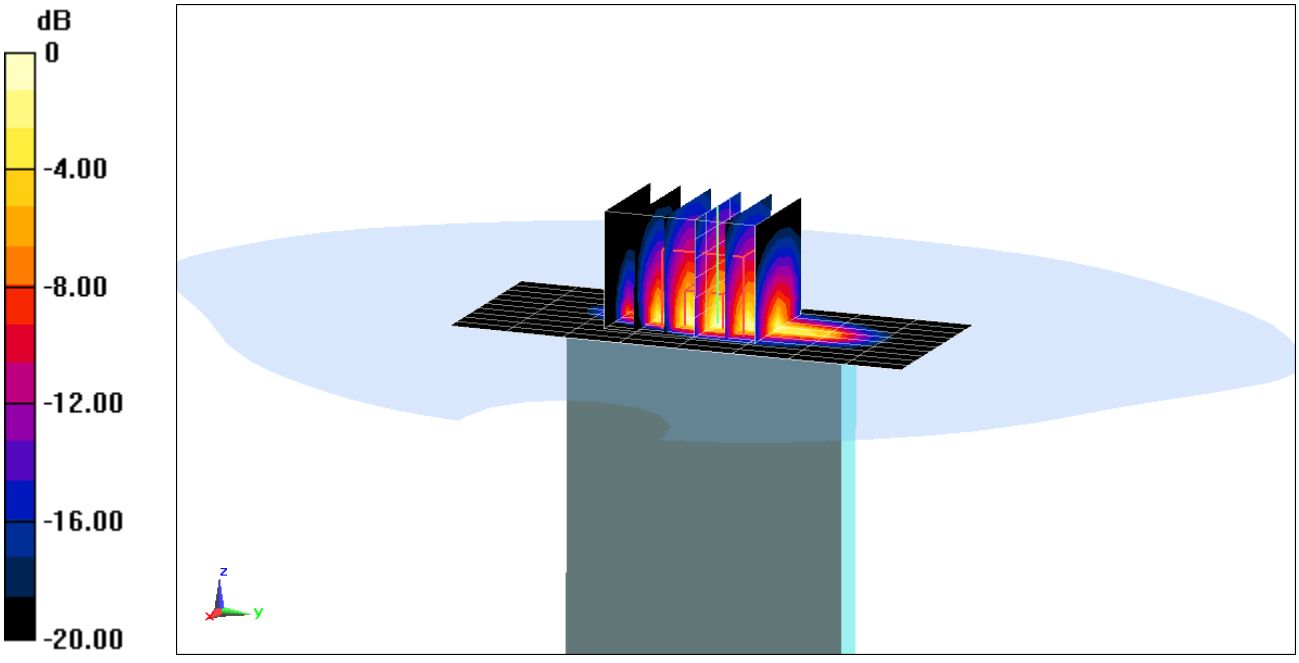
Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1852.4 MHz; σ = 1.493 S/m; ε_r = 52.439; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-04-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Phablet SAR, Bottom Edge, Low.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 = 53.44 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 9.09 W/kg
SAR(10 g) = 1.75 W/kg



0 dB = 7.51 W/kg = 8.76 dBW/kg

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

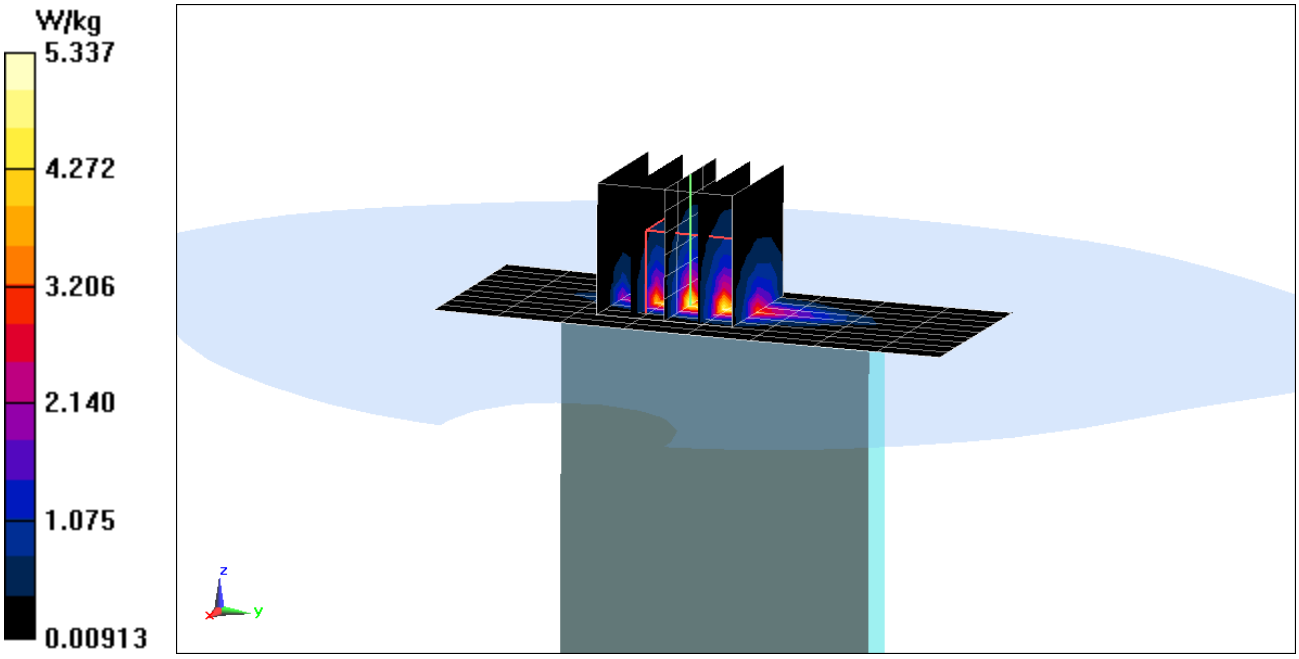
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.493 S/m; ε_r = 52.892; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 66 (AWS), Phablet SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 50 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 = 57.42 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 7.91 W/kg
SAR(10 g) = 1.61 W/kg



DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

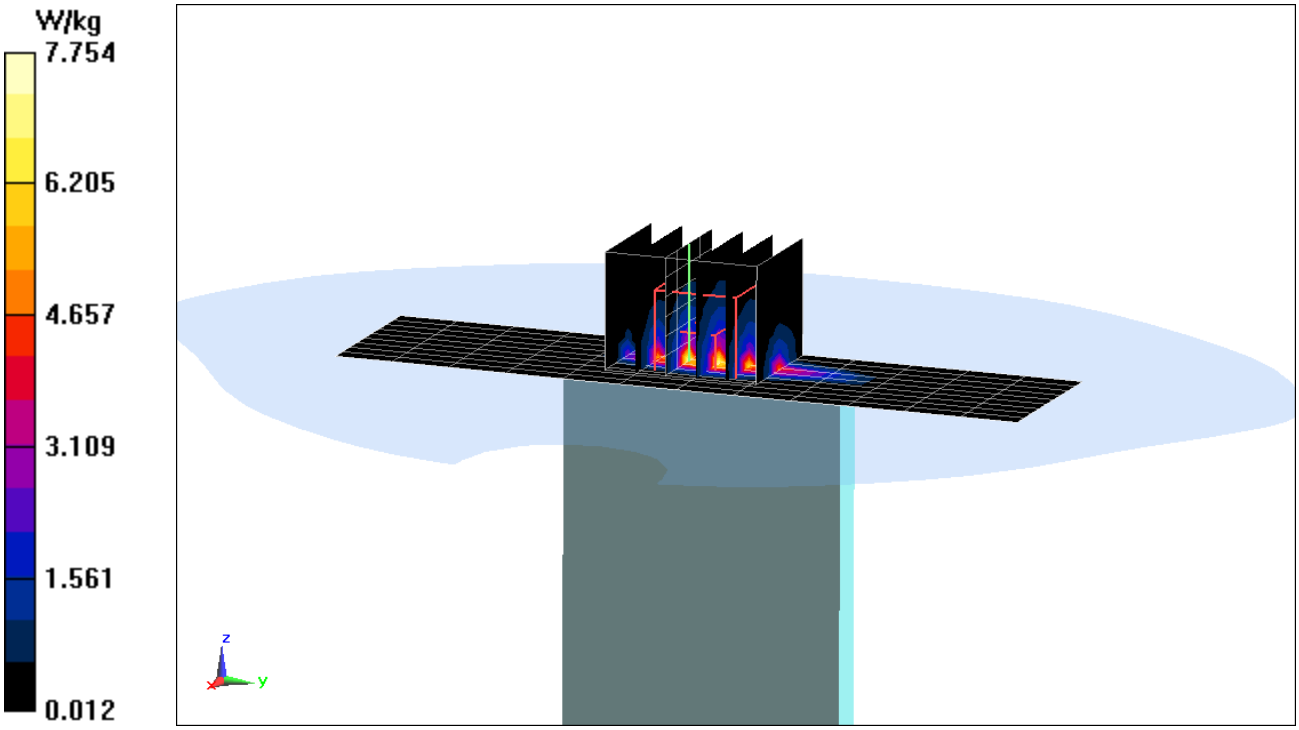
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.532 S/m; ε_r = 51.817; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.28 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 9.87 W/kg
SAR(10 g) = 1.8 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07E7A

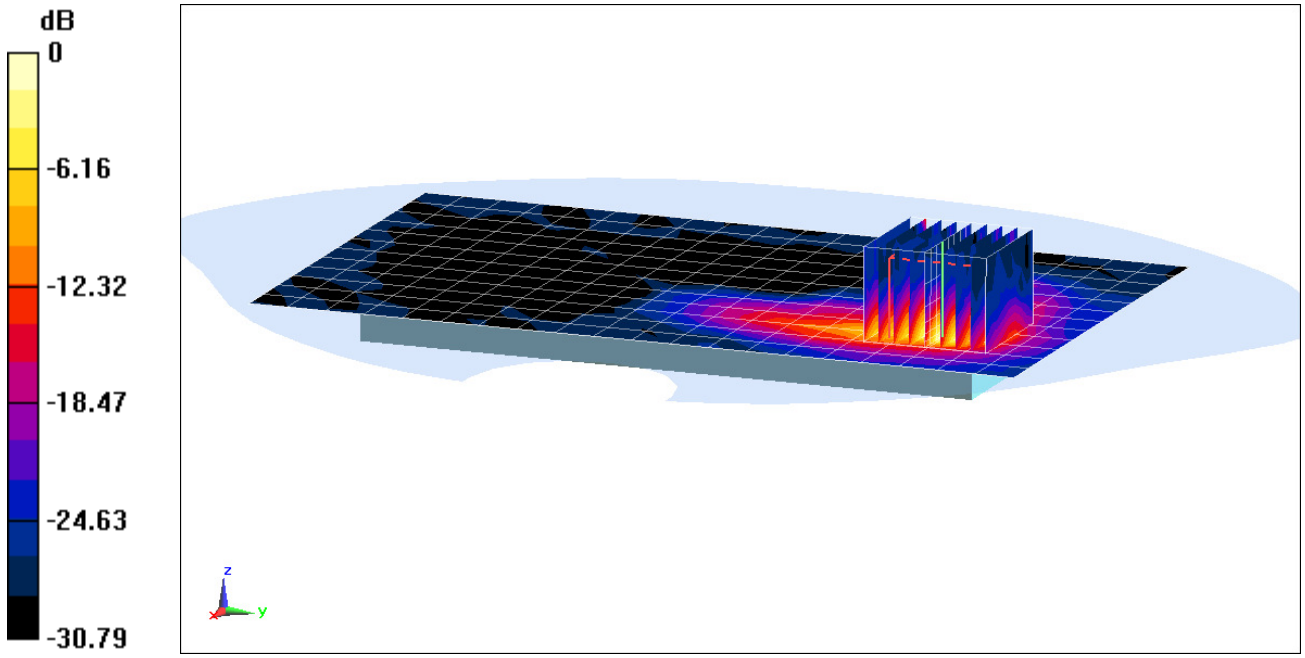
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.93 S/m; ε_r = 47.091; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(3.63, 3.63, 3.63); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, U-NII-2C, 20 MHz Bandwidth,
Phablet SAR, Ch 120, 6 Mbps, Back Side, Antenna 2

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 24.47 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 14.1 W/kg
SAR(10 g) = 0.696 W/kg



0 dB = 8.03 W/kg = 9.05 dBW/kg

DUT: A3LSMG955F; Type: Portable Handset; Serial: 07EB0

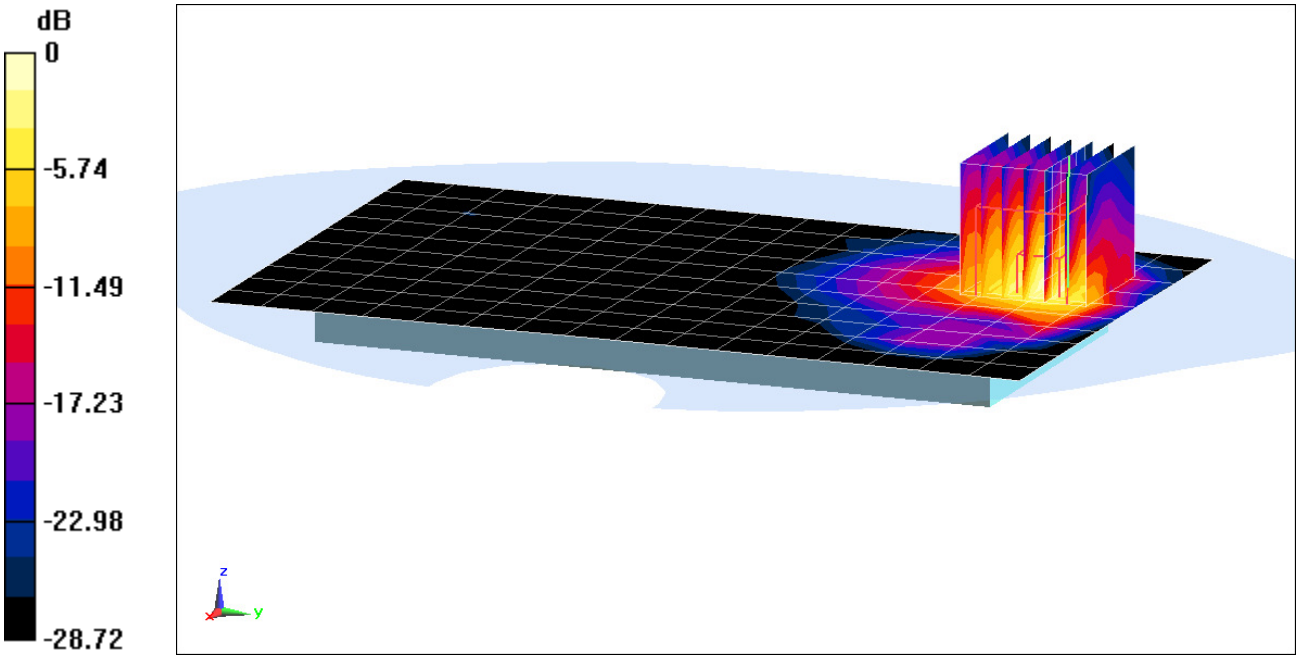
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.3020
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.948 S/m; ε_r = 51.169; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Phablet SAR, Ch 39, 1 Mbps, Front 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 = 26.56 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(10 g) = 0.428 W/kg



0 dB = 2.18 W/kg = 3.38 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

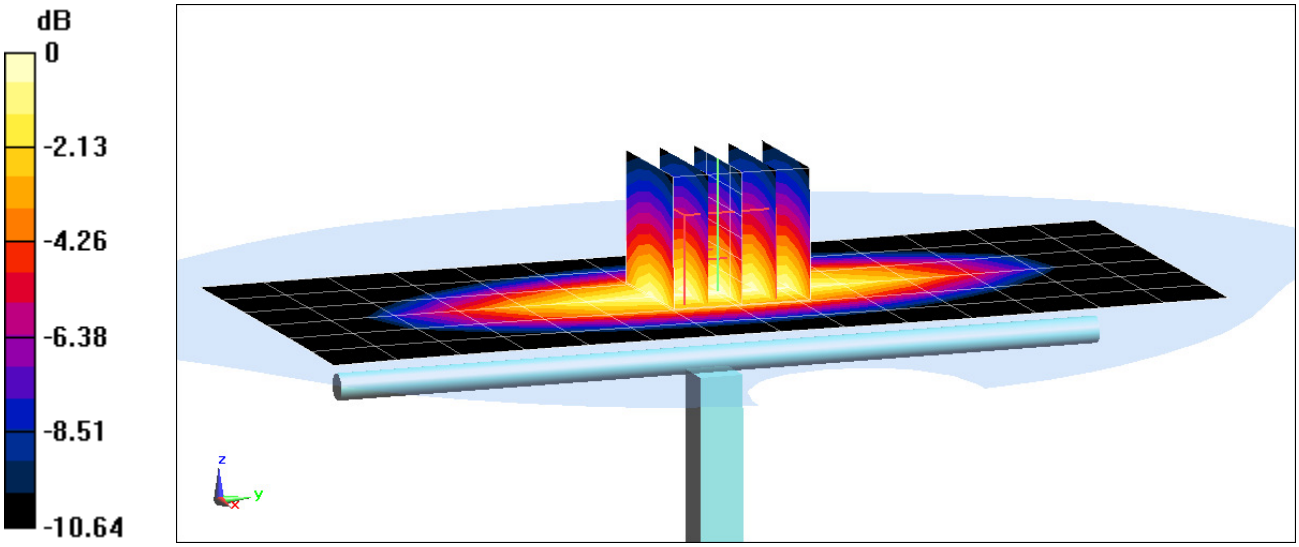
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.895 S/m; ε_r = 41.856; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-06-2017; Ambient Temp: 23.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(10.73, 10.73, 10.73); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 1.53 W/kg
Deviation(1 g) = -6.93%



0 dB = 2.05 W/kg = 3.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

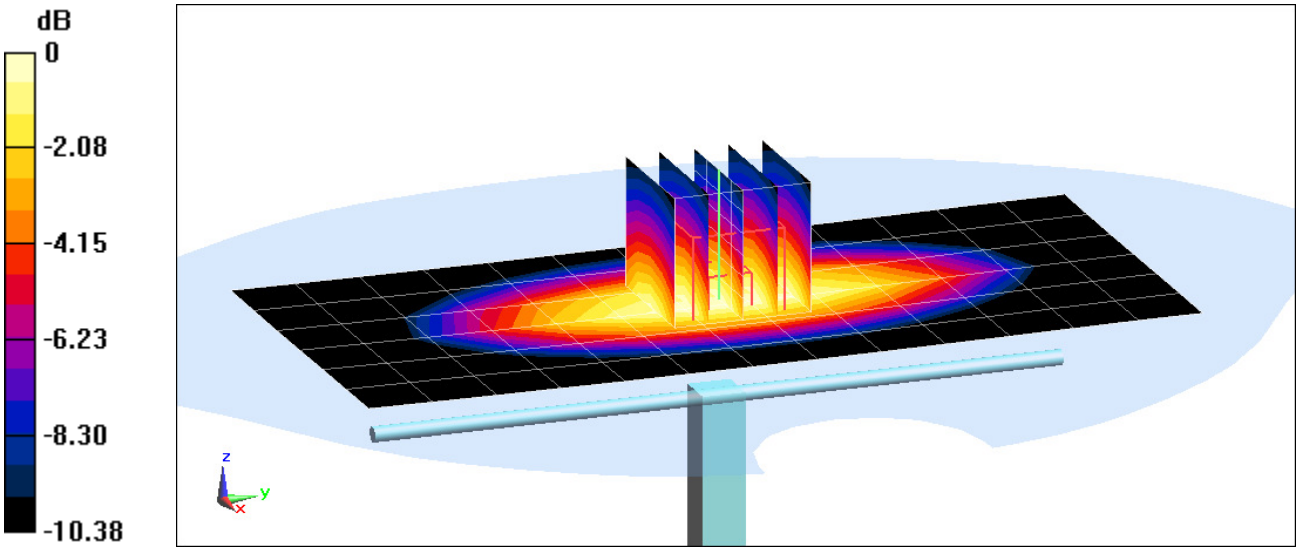
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.911 S/m; ε_r = 41.612; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.63 W/kg
SAR(1 g) = 1.85 W/kg
Deviation(1 g) = -0.75%



0 dB = 2.15 W/kg = 3.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

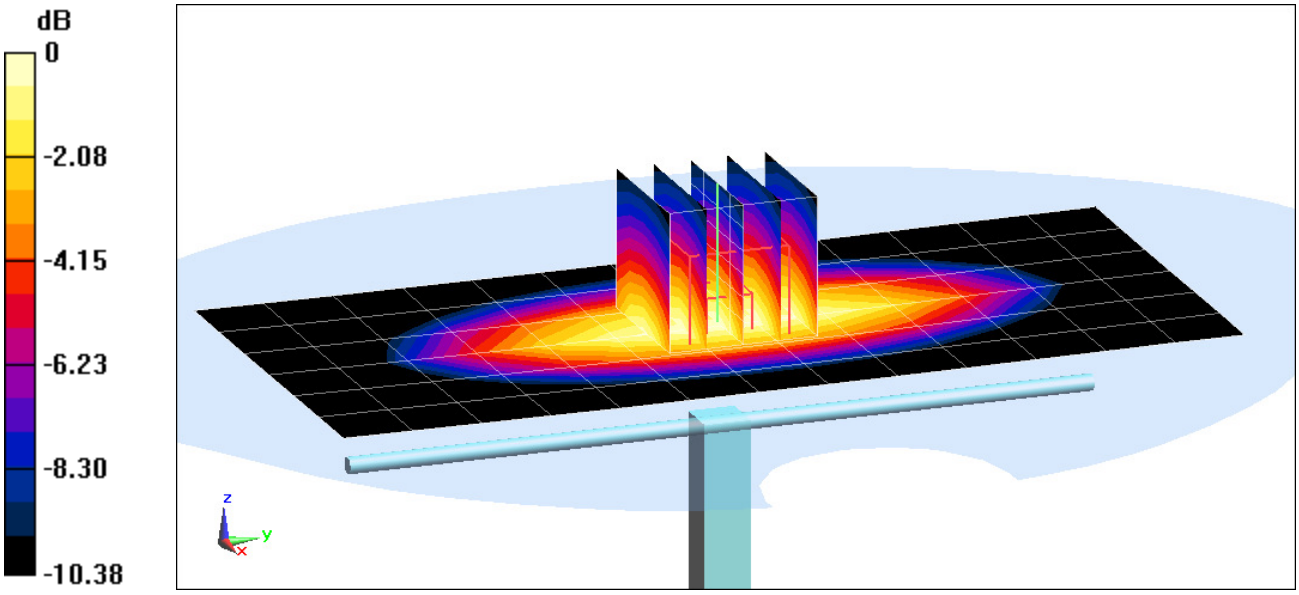
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.916 S/m; ε_r = 43.244; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-23-2017; Ambient Temp: 21.4°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.75 W/kg
SAR(1 g) = 1.93 W/kg
Deviation(1 g) = 5.70%



0 dB = 2.25 W/kg = 3.52 dBW/kg

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

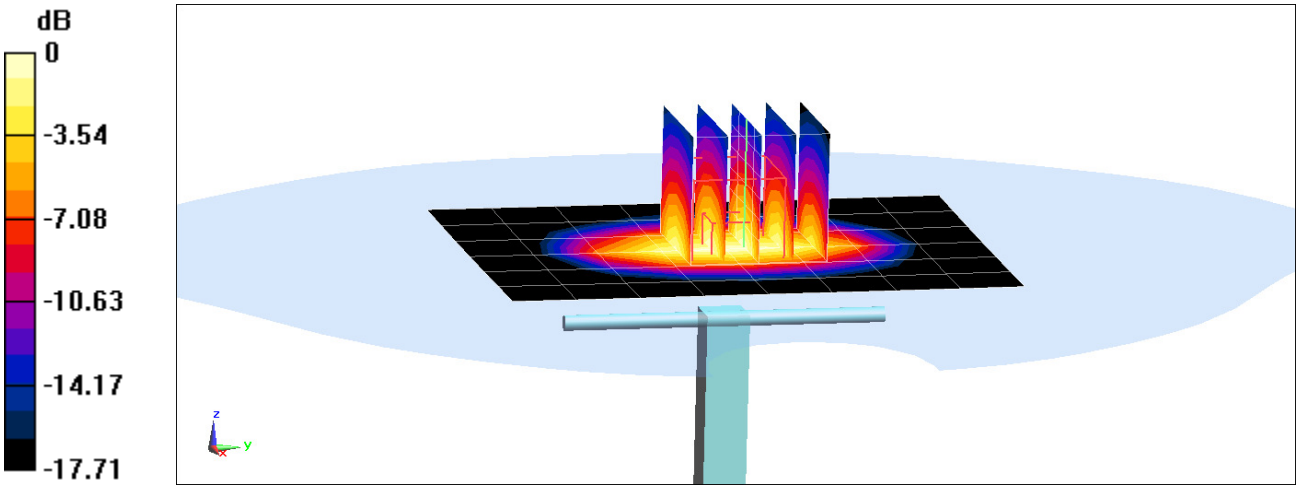
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.379 S/m; ε_r = 39.004; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-30-2016; Ambient Temp: 22.8°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3213; ConvF(5.23, 5.23, 5.23); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.56 W/kg
SAR(1 g) = 3.60 W/kg
Deviation(1 g) = -0.55%



0 dB = 4.48 W/kg = 6.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

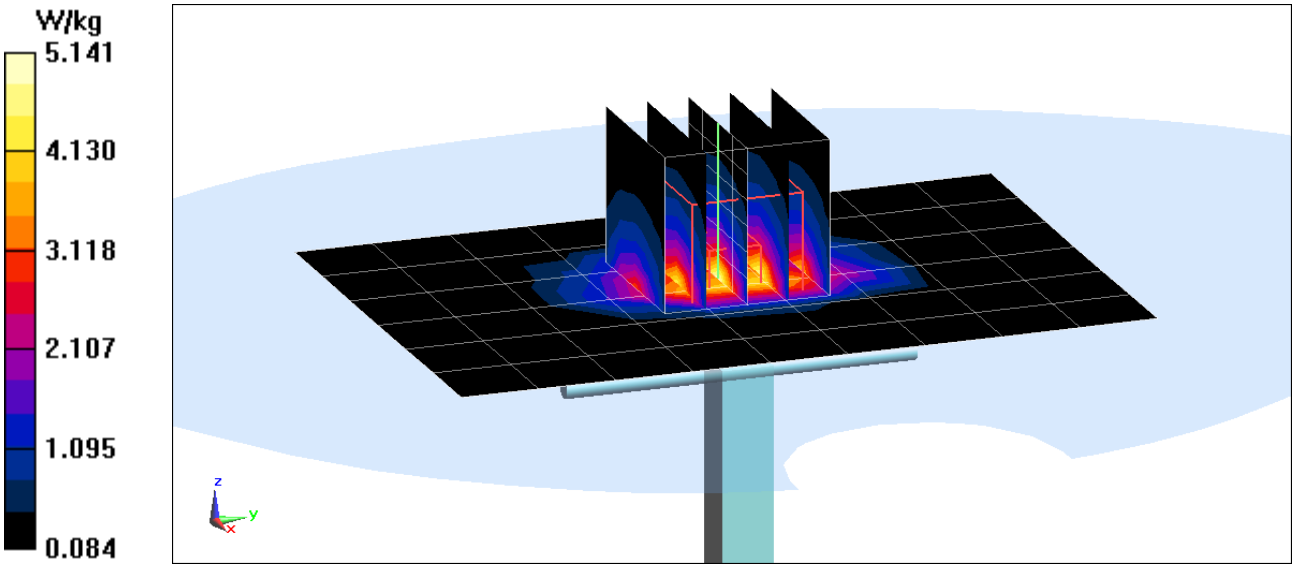
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.448 S/m; ε_r = 38.462; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-06-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.1°C

Probe: ES3DV3 - SN3287; ConvF(5.27, 5.27, 5.27); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.68 W/kg
SAR(1 g) = 4.16 W/kg
Deviation(1 g) = 3.74%



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

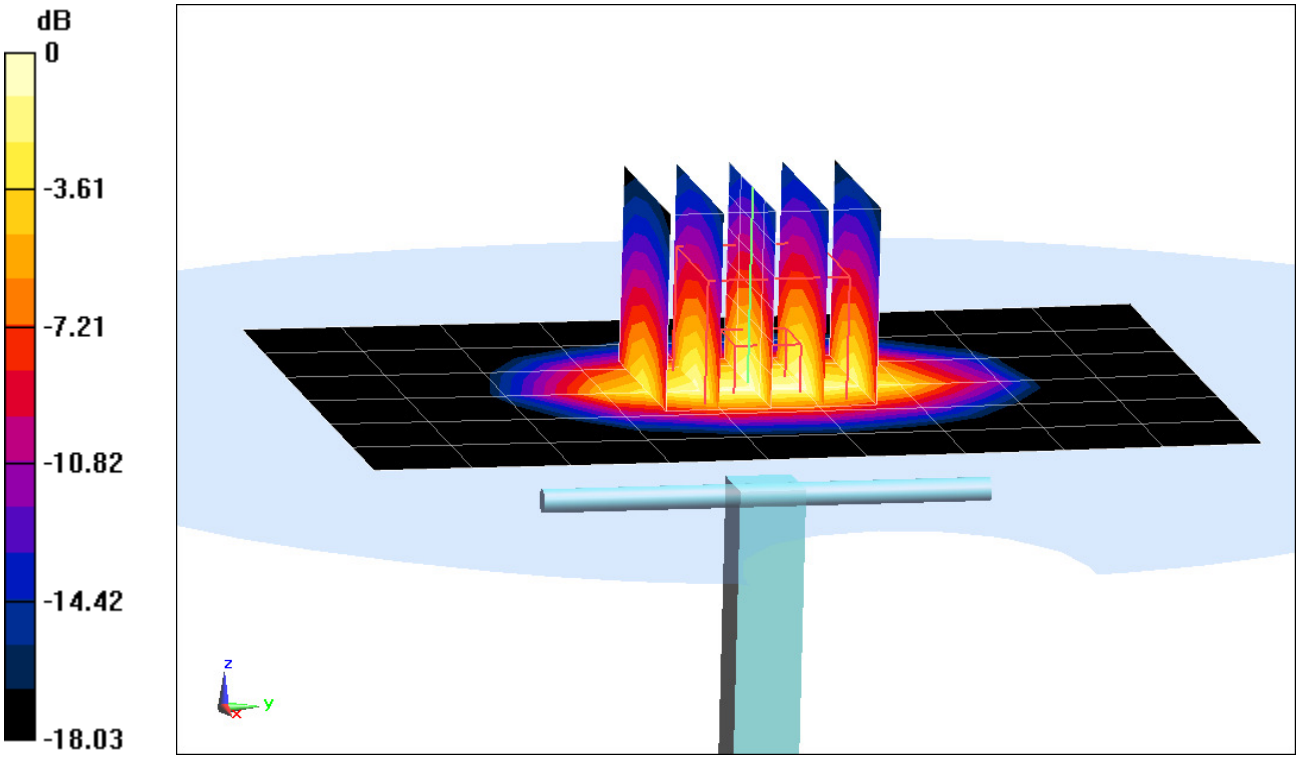
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.425 S/m; ε_r = 39.87; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-14-2017; Ambient Temp: 23.5°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3209; ConvF(5.14, 5.14, 5.14); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.41 W/kg
SAR(1 g) = 4.03 W/kg
Deviation(1 g) = 0.50%



0 dB = 5.12 W/kg = 7.09 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

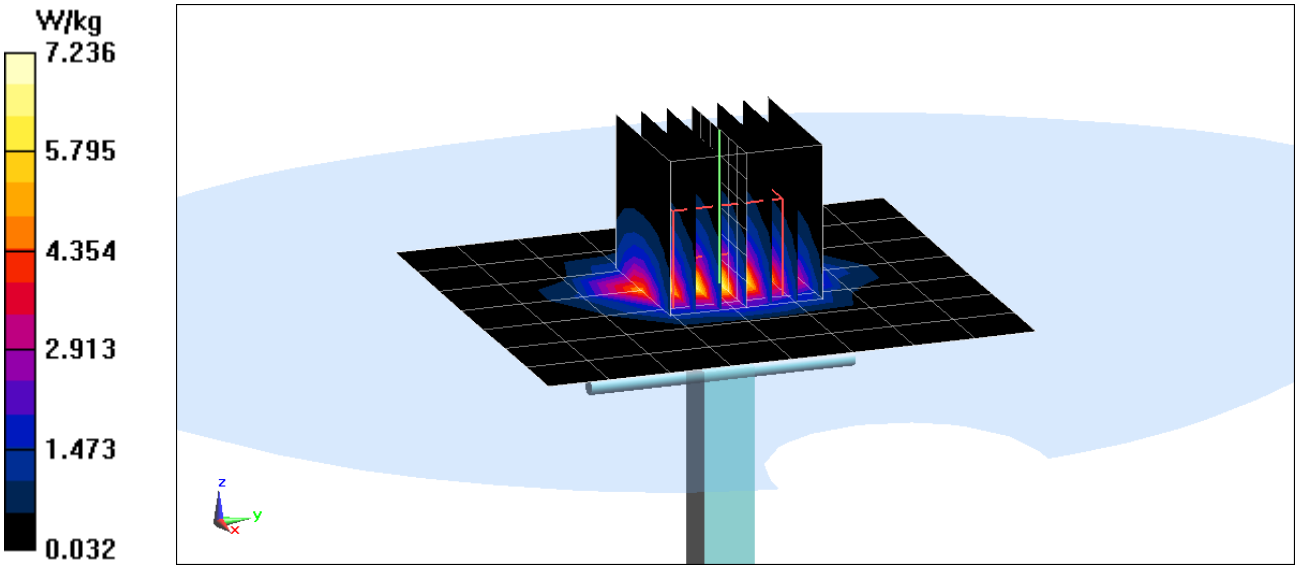
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.856 S/m; ε_r = 39.156; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-13-2017; Ambient Temp: 21.9°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3287; ConvF(4.54, 4.54, 4.54); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.7 W/kg
SAR(1 g) = 5.54 W/kg
Deviation(1 g) = 6.33%



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

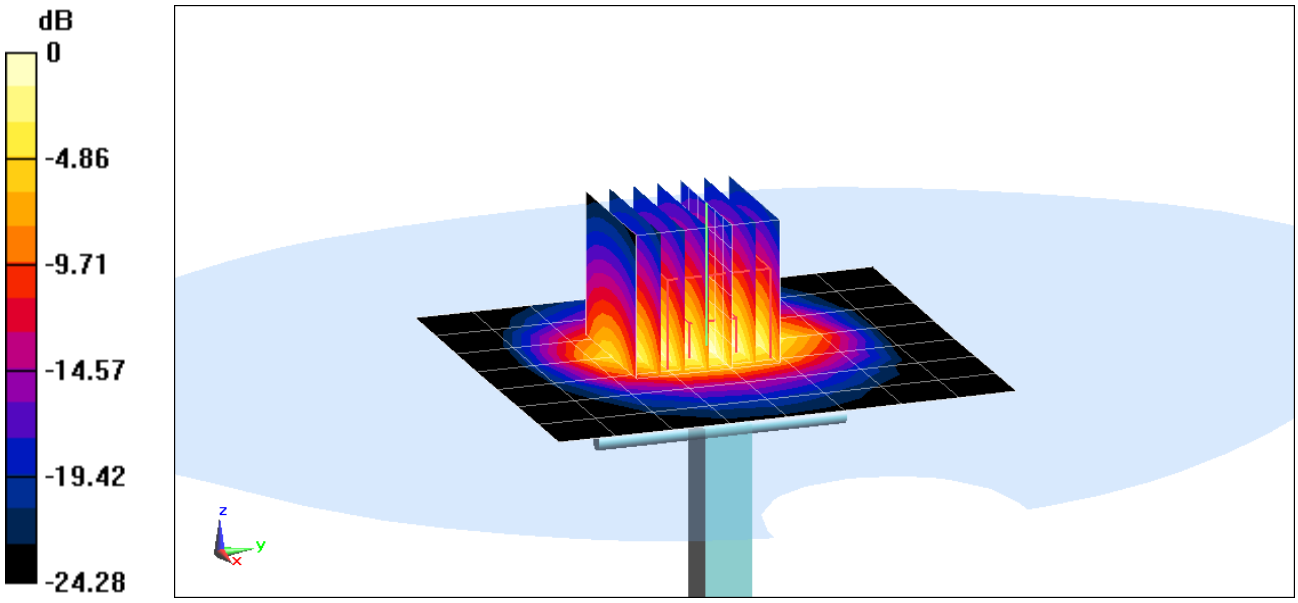
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.869 S/m; ε_r = 38.155; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-22-2017; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3287; ConvF(4.54, 4.54, 4.54); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.9 W/kg
SAR(1 g) = 5.64 W/kg
Deviation(1 g) = 6.82%



0 dB = 7.52 W/kg = 8.76 dBW/kg

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

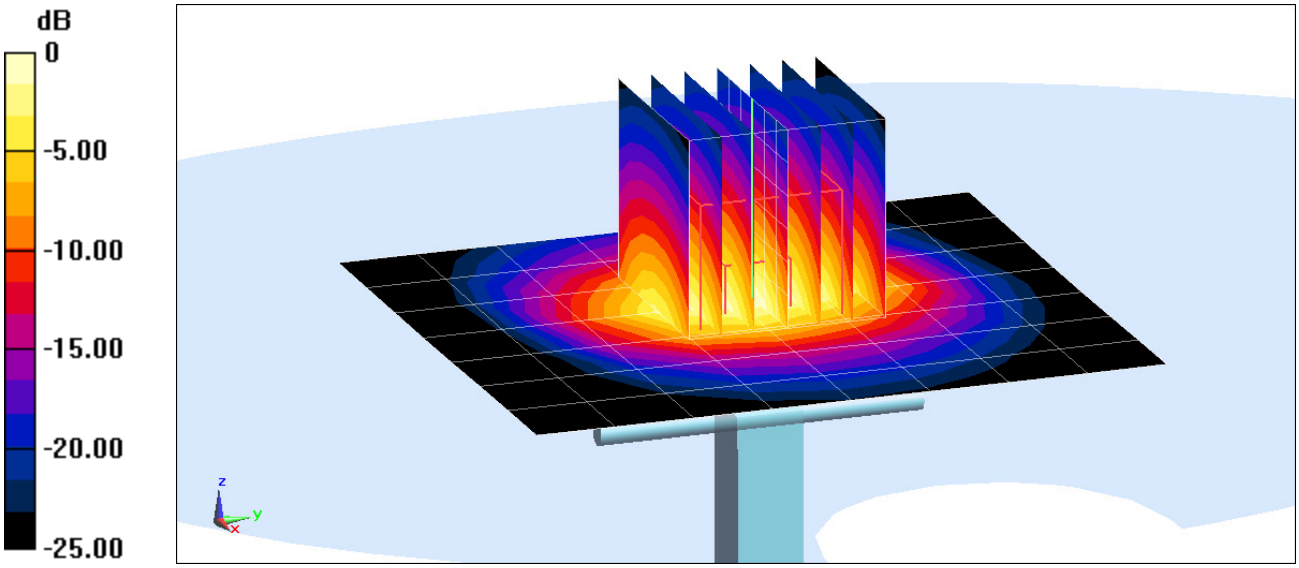
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; σ = 2.053 S/m; ε_r = 38.501; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-10-2017; Ambient Temp: 23.6°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3287; ConvF(4.41, 4.41, 4.41); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 5.88 W/kg
Deviation(1 g) = 4.44%



0 dB = 7.93 W/kg = 8.99 dBW/kg

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

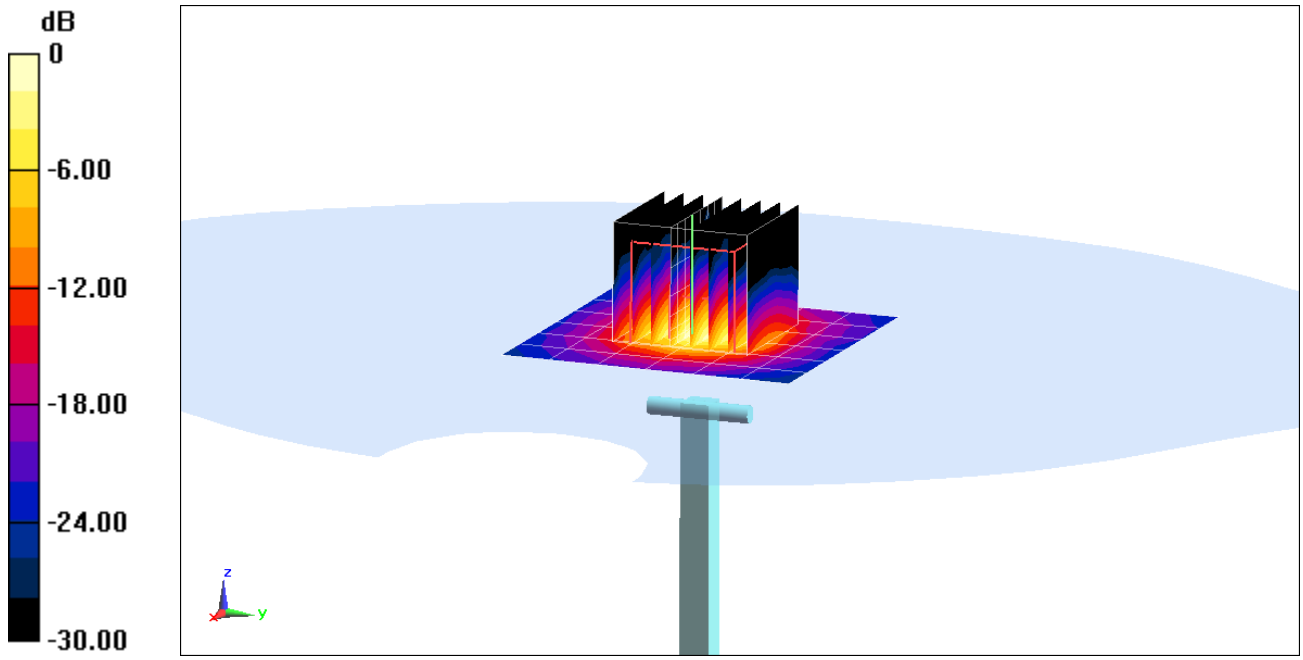
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
$f = 5250$ MHz; $\sigma = 4.674$ S/m; $\varepsilon_r = 35.612$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2017; Ambient Temp: 21.5°C; Tissue Temp: 20.5°C

Probe: EX3DV4 - SN7357; ConvF(5.1, 5.1, 5.1); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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) = 15.9 W/kg
SAR(1 g) = 3.85 W/kg
Deviation(1 g) = -2.41%



0 dB = 9.47 W/kg = 9.76 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

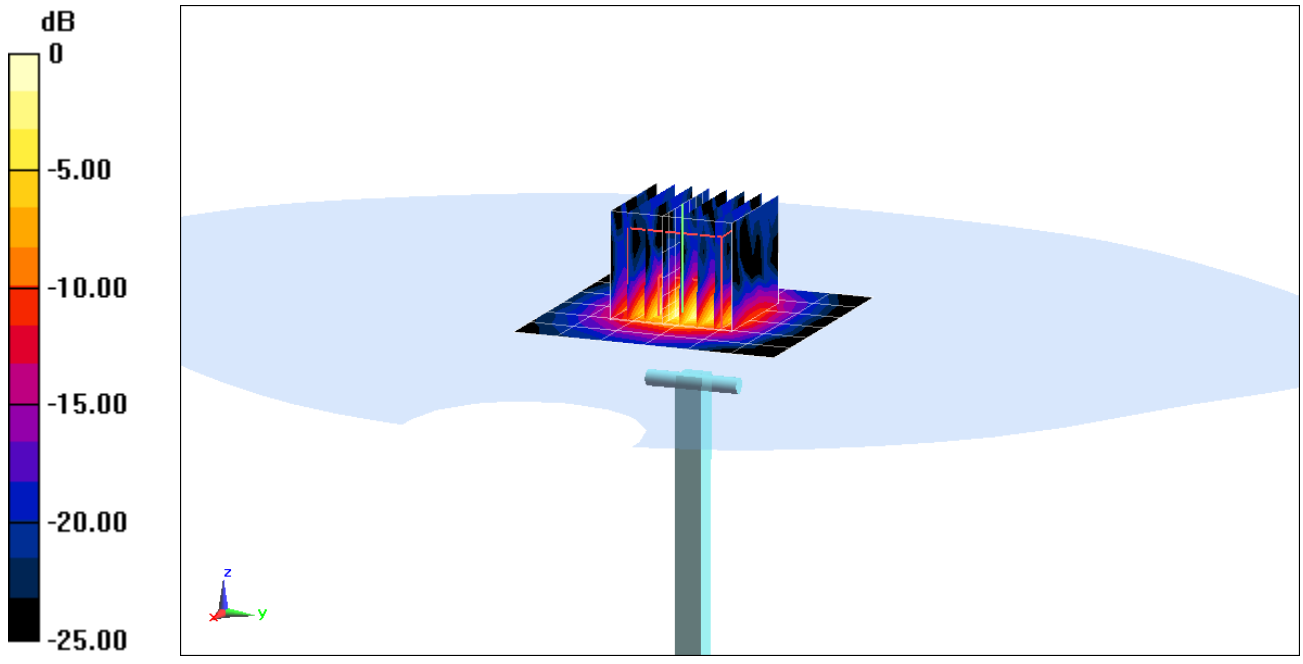
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5600 MHz; σ = 5.037 S/m; ε_r = 35.11; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2017; Ambient Temp: 21.5°C; Tissue Temp: 20.5°C

Probe: EX3DV4 - SN7357; ConvF(4.41, 4.41, 4.41); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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) = 15.9 W/kg
SAR(1 g) = 3.84 W/kg
Deviation(1 g) = -8.13%



0 dB = 9.46 W/kg = 9.76 dBW/kg

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

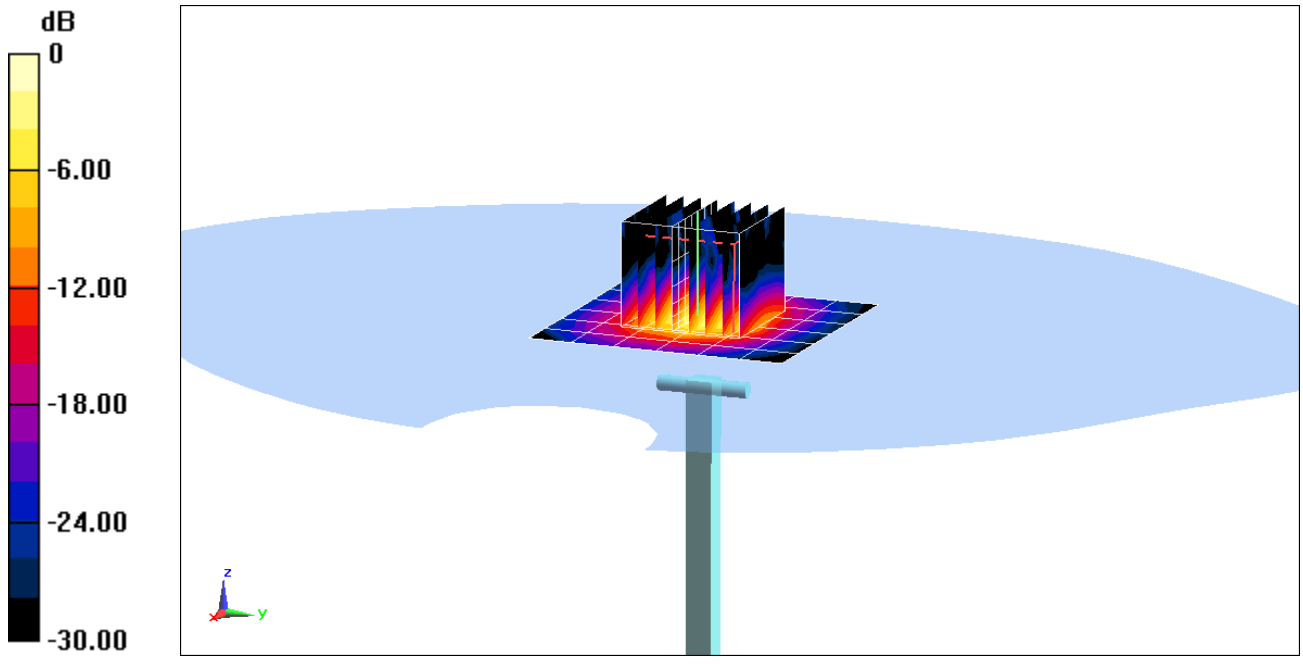
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
$f = 5750$ MHz; $\sigma = 5.204$ S/m; $\varepsilon_r = 34.896$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-06-2017; Ambient Temp: 21.5°C; Tissue Temp: 20.5°C

Probe: EX3DV4 - SN7357; ConvF(4.65, 4.65, 4.65); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/19/2016
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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) = 17.1 W/kg
SAR(1 g) = 3.96 W/kg
Deviation(1 g) = 0.13%



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

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1161

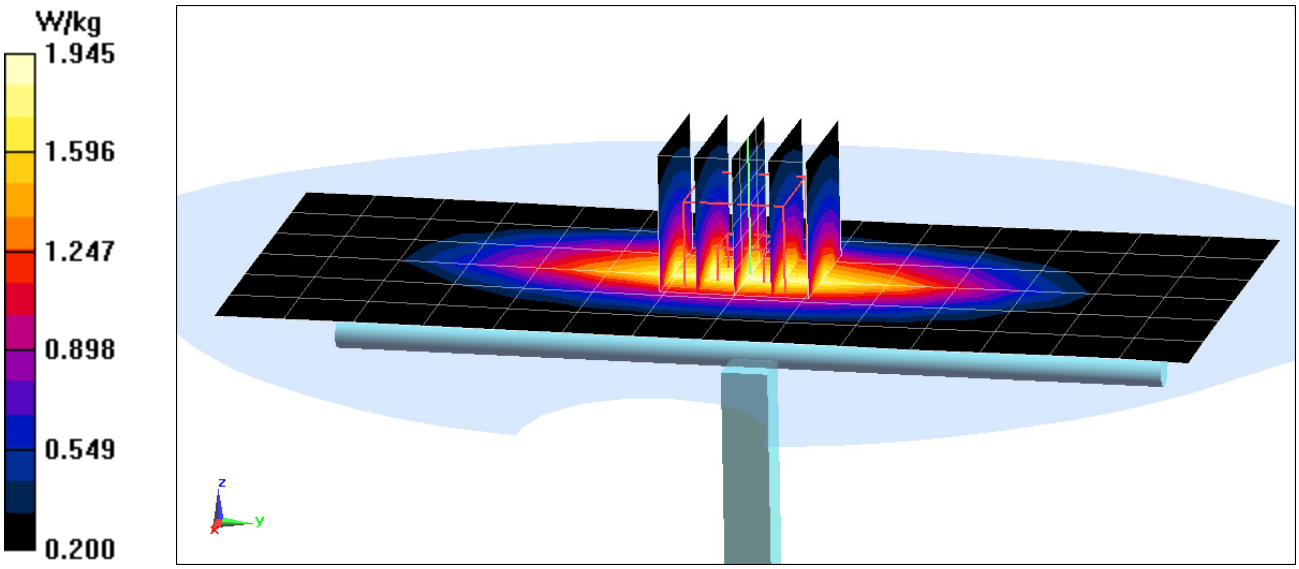
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.962 S/m; ε_r = 55.28; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-03-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.43 W/kg
SAR(1 g) = 1.68 W/kg
Deviation(1 g) = -0.36%



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

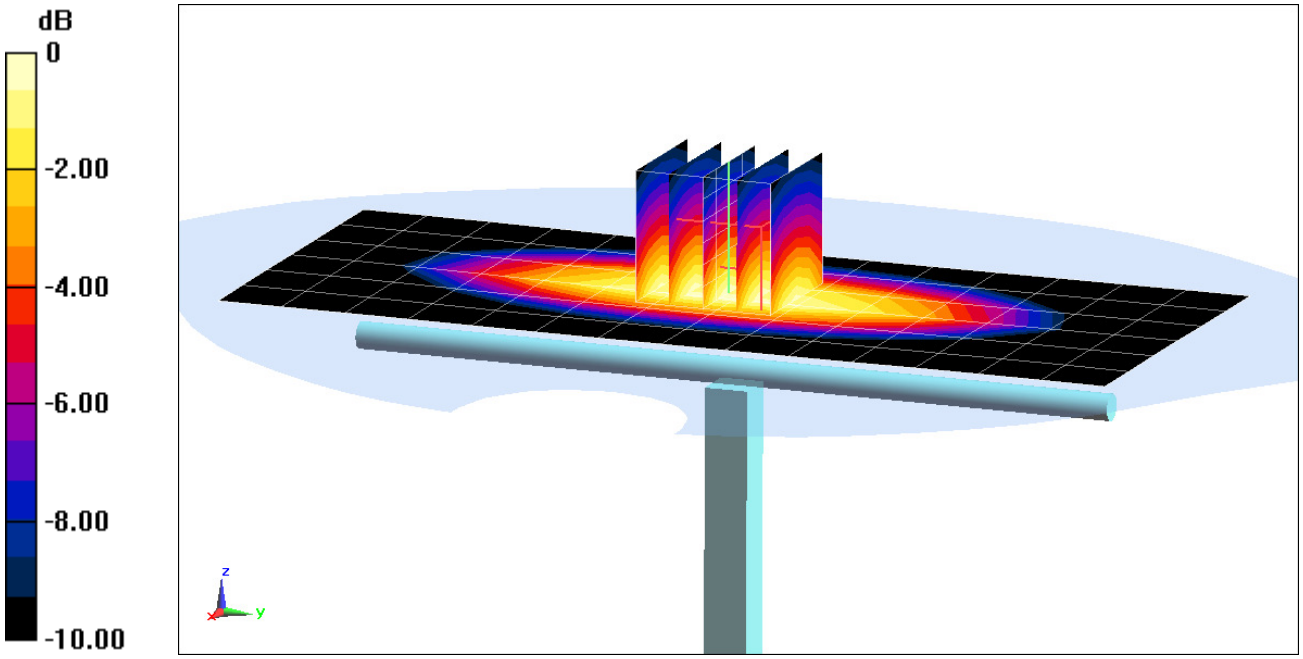
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.951 S/m; ε_r = 54.848; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3332; ConvF(6.7, 6.7, 6.7); Calibrated: 8/25/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/15/2016
Phantom: SAM Left; Type: SAM; Serial: 1688
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.45 W/kg
SAR(1 g) = 1.67 W/kg
Deviation(1 g) = -2.45%



0 dB = 1.95 W/kg = 2.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

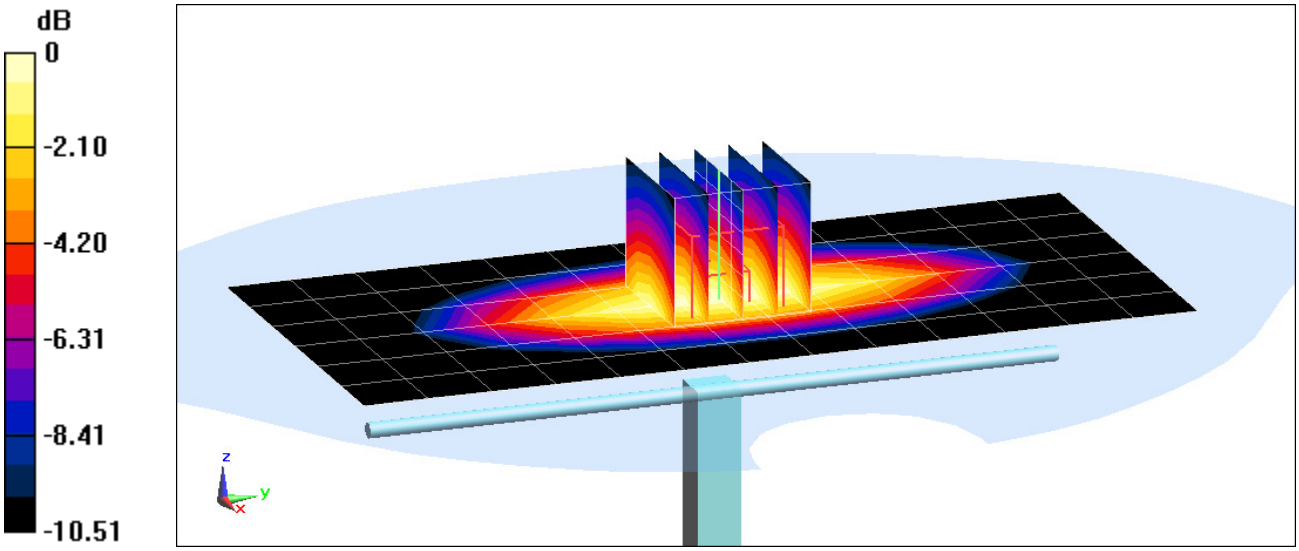
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.99 S/m; ε_r = 53.702; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-11-2017; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.96 W/kg
SAR(1 g) = 2.01 W/kg
Deviation(1 g) = 5.79%



0 dB = 2.35 W/kg = 3.71 dBW/kg

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

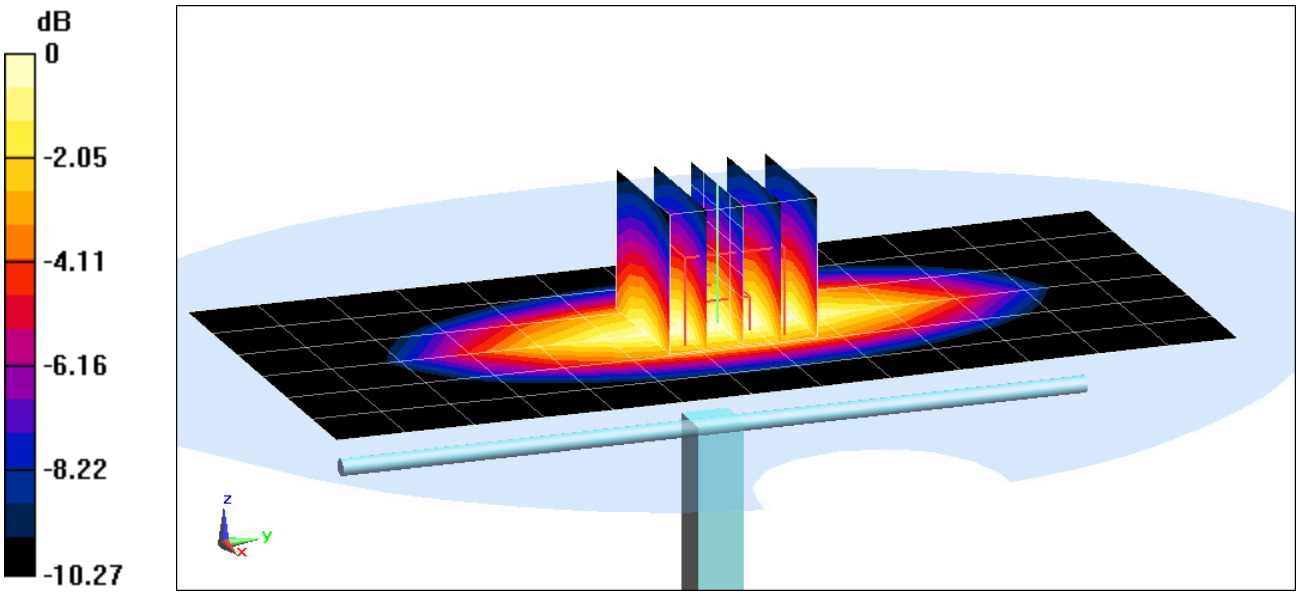
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.004 S/m; ε_r = 56.44; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-26-2017; Ambient Temp: 22.8°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3319; ConvF(6.04, 6.04, 6.04); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.99 W/kg
SAR(1 g) = 2.02 W/kg
Deviation(1 g) = 5.54%



0 dB = 2.36 W/kg = 3.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

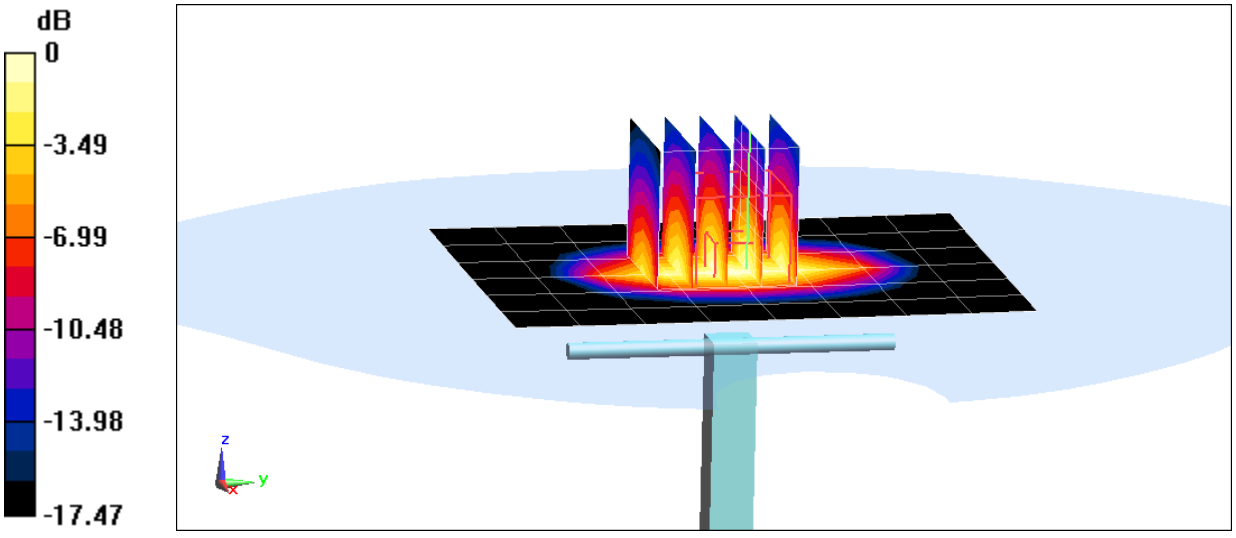
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.499 S/m; ε_r = 52.884; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.47 W/kg
SAR(1 g) = 3.69 W/kg; SAR(10 g) = 1.96 W/kg
Deviation(1 g) = -0.54%; Deviation(10 g) = -0.51%



0 dB = 4.56 W/kg = 6.59 dBW/kg

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

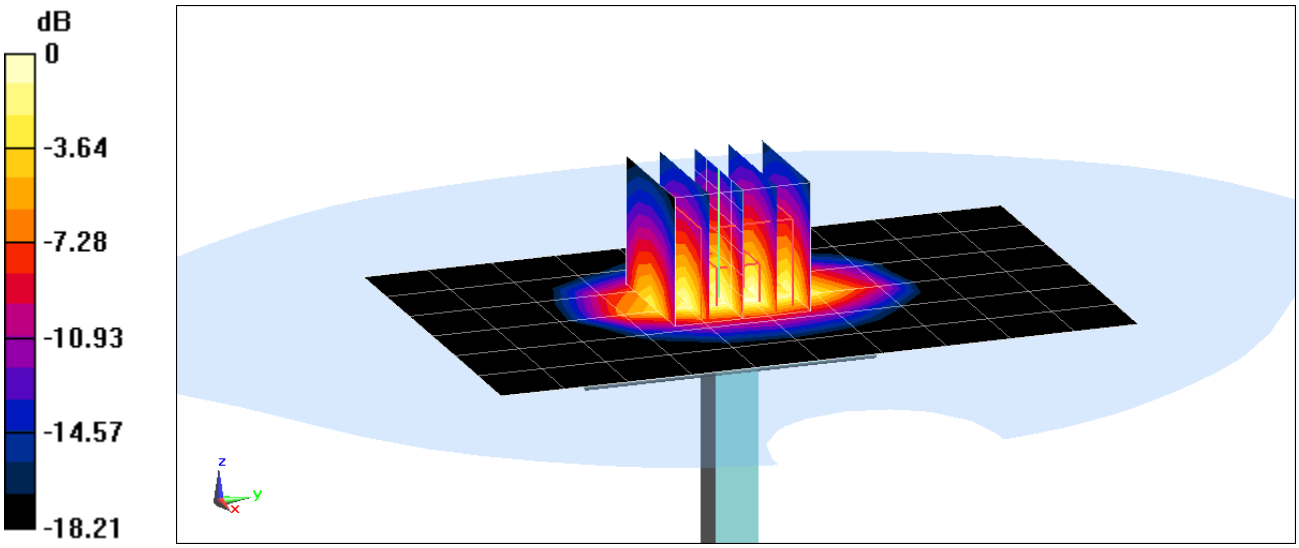
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.574 S/m; ε_r = 51.637; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-09-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.47, 7.47, 7.47); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.76 W/kg
SAR(1 g) = 4.23 W/kg; SAR(10 g) = 2.17 W/kg
Deviation(1 g) = 6.02%; Deviation(10 g) = 2.84%



0 dB = 6.50 W/kg = 8.13 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

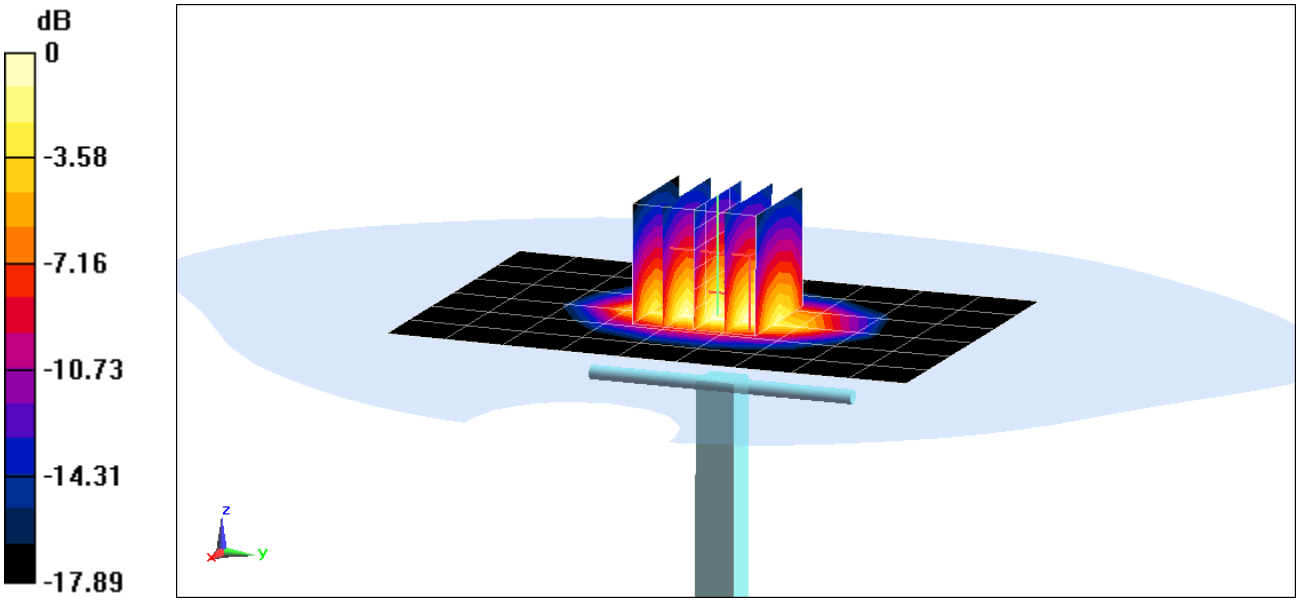
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.569 S/m; ε_r = 54.817; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-13-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3334; ConvF(4.91, 4.91, 4.91); Calibrated: 11/15/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 11/11/2016
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.50 W/kg
SAR(10 g) = 2.18 W/kg
Deviation(10 g) = 5.31%



0 dB = 5.34 W/kg = 7.28 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

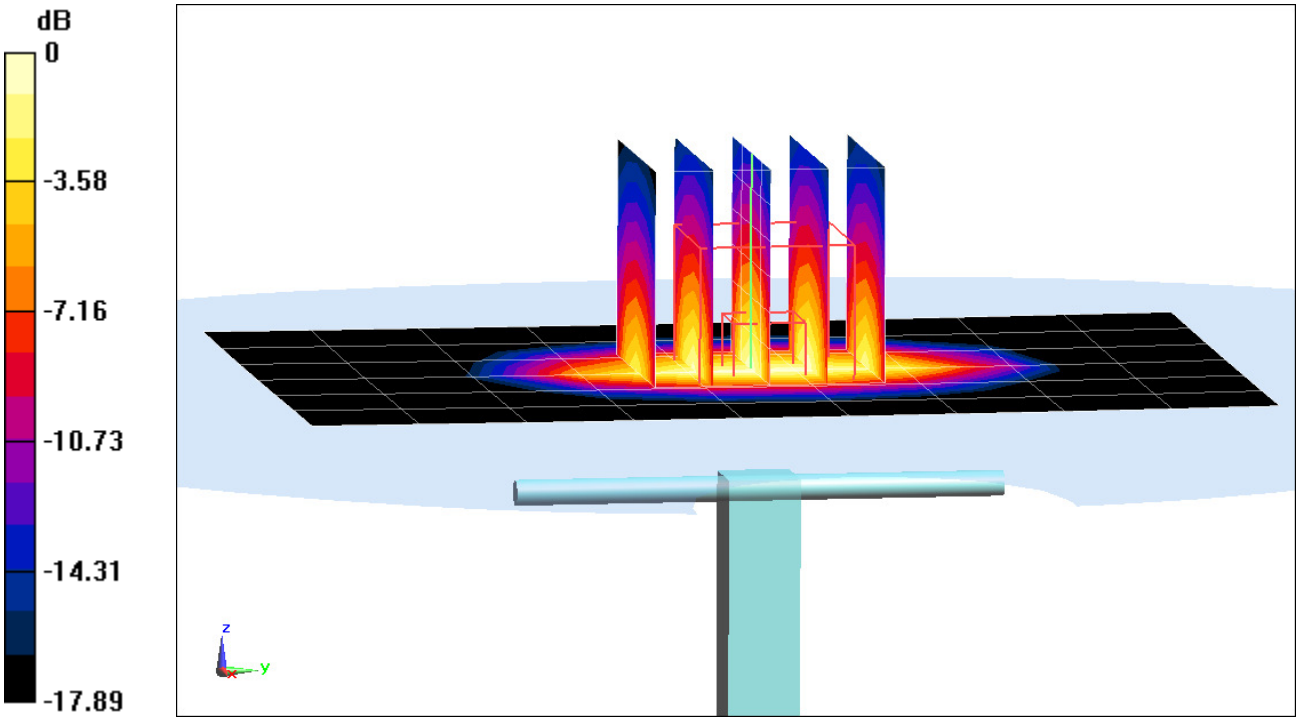
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.559 S/m; ε_r = 52.825; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-15-2017; Ambient Temp: 23.2°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3334; ConvF(4.91, 4.91, 4.91); Calibrated: 11/15/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 11/11/2016
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.20 W/kg
SAR(1 g) = 4.01 W/kg
Deviation(1 g) = 2.56%



0 dB = 5.07 W/kg = 7.05 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

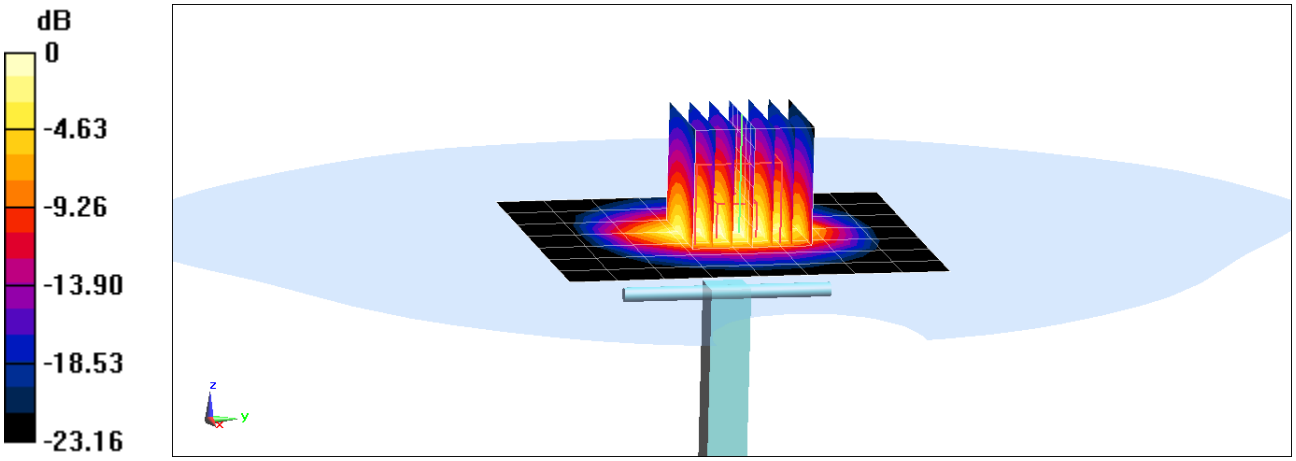
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.96 S/m; ε_r = 51.131; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.7 W/kg
SAR(1 g) = 5.11 W/kg; SAR(10 g) = 2.34 W/kg
Deviation(1 g) = 0.59%; Deviation(10 g) = -1.68%



0 dB = 8.53 W/kg = 9.31 dBW/kg

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

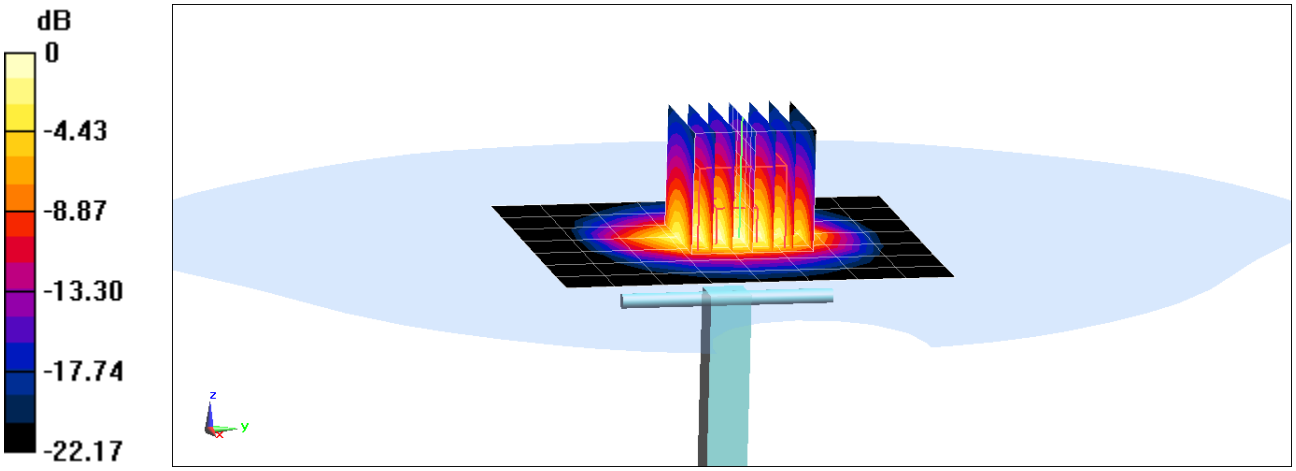
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.973 S/m; ε_r = 51.355; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-24-2017; Ambient Temp: 24.0°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.1 W/kg
SAR(1 g) = 4.94 W/kg
Deviation(1 g) = -2.76%



0 dB = 8.19 W/kg = 9.13 dBW/kg

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1071

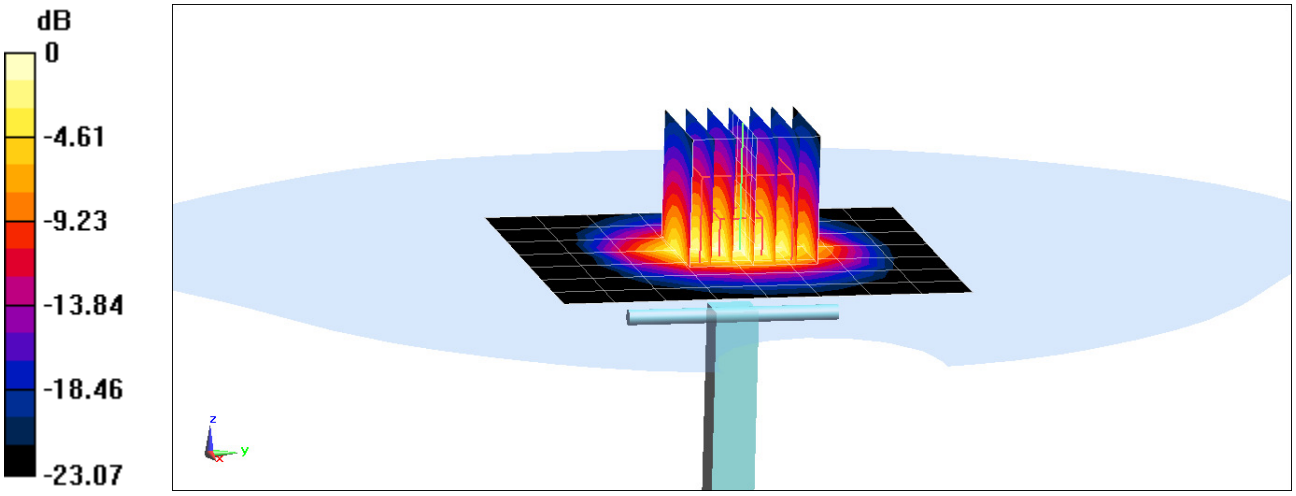
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.159 S/m; ε_r = 50.581; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(6.94, 6.94, 6.94); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.0 W/kg
SAR(1 g) = 5.63 W/kg
Deviation(1 g) = 3.87%



0 dB = 9.62 W/kg = 9.83 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

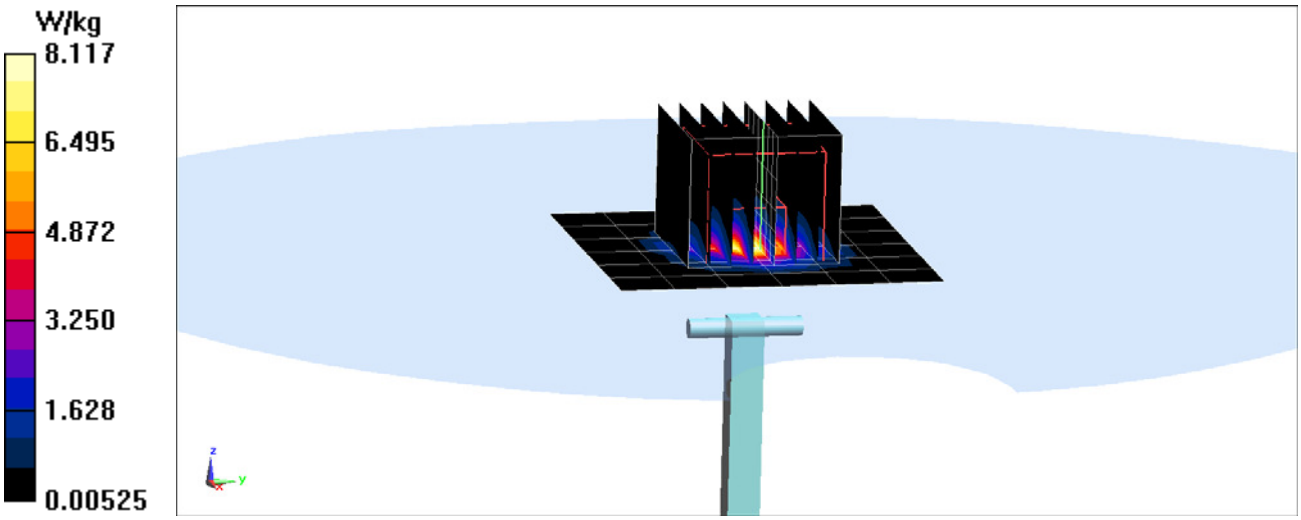
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.463 S/m; ε_r = 47.697; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 3.4 W/kg; SAR(10 g) = 0.957 W/kg
Deviation(1 g) =-9.09%; Deviation(10 g) = -8.86%



DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

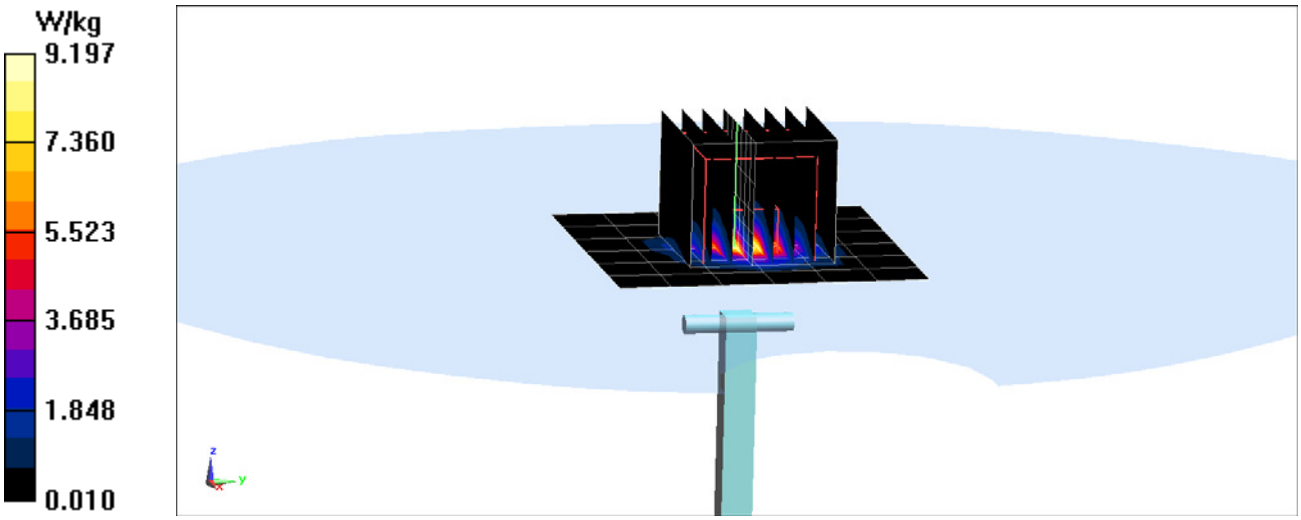
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.93 S/m; ε_r = 47.091; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(3.63, 3.63, 3.63); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 3.87 W/kg; SAR(10 g) = 1.09 W/kg
Deviation(1 g) = 0.52%; Deviation(10 g) = 1.40%



DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

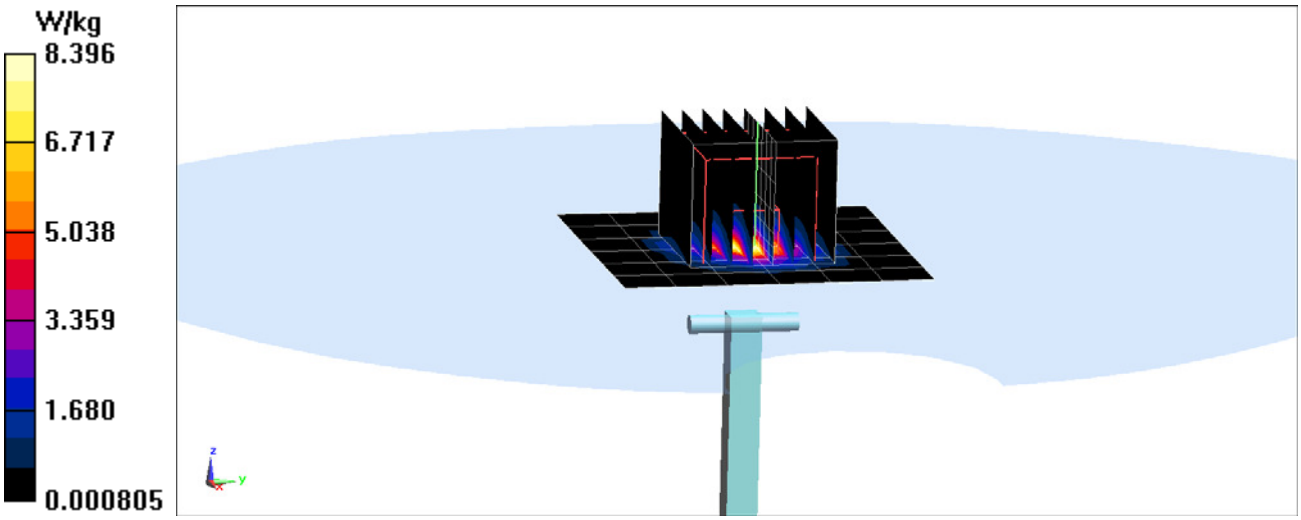
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.14 S/m; ε_r = 46.877; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-14-2017; Ambient Temp: 21.6°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.4 W/kg
SAR(1 g) = 3.46 W/kg; SAR(10 g) = 0.974 W/kg
Deviation(1 g) = -8.22%; Deviation(10 g) = -6.79%



APPENDIX C: PROBE CALIBRATION

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

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

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

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D750V3-1054_Mar16

CALIBRATION CERTIFICATE

Object D750V3 - SN:1054

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

BN
03/30/2016

Calibration date: March 16, 2016

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	31-Dec-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: March 16, 2016

Calibration Laboratory of
Schmid & Partner
Engineering AG
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, "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	41.9 ± 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	2.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.22 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.41 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	54.7 ± 6 %	0.98 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.56 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.44 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	54.2 Ω - 0.9 jΩ
Return Loss	- 27.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.1 Ω - 2.3 jΩ
Return Loss	- 32.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 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: 16.03.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

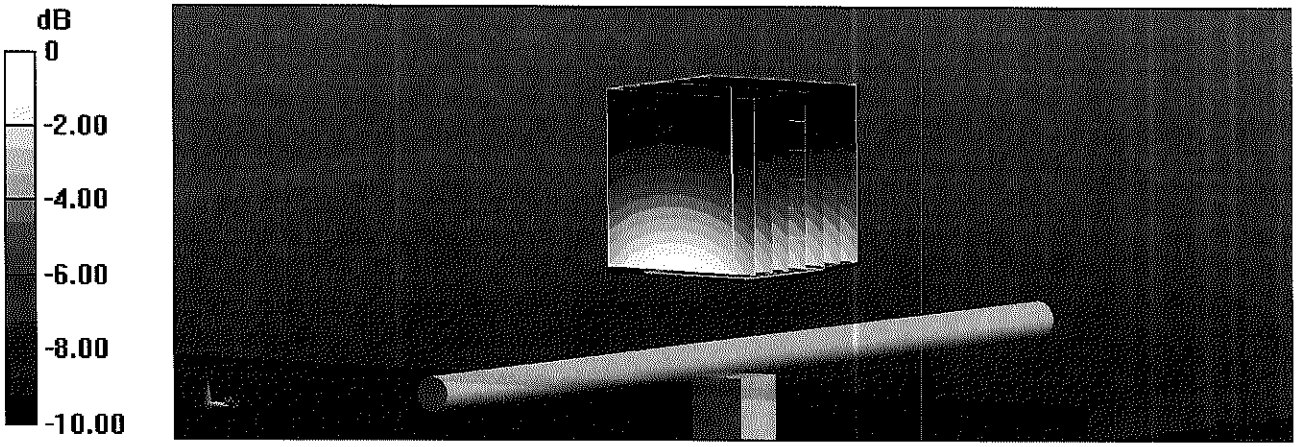
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 41.9; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.28, 10.28, 10.28); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom Type: QD000P49AA
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

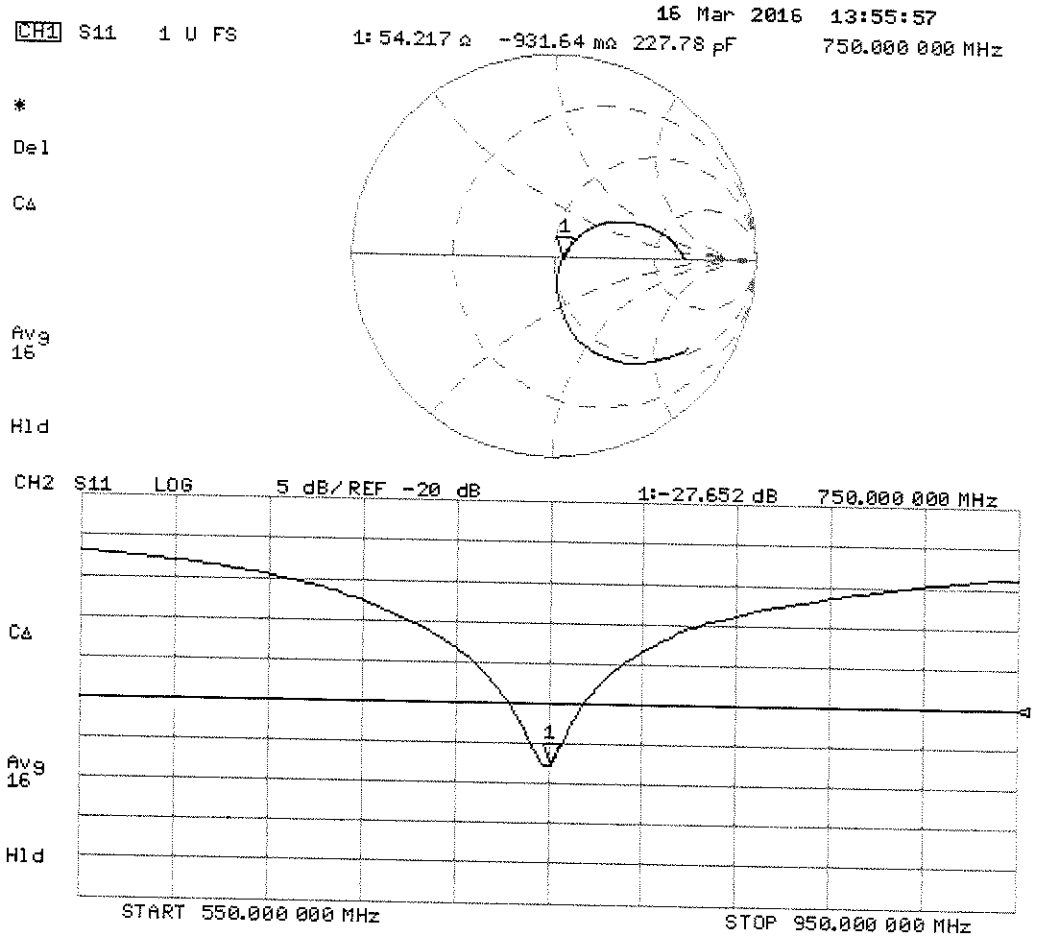
Dipole Calibration for Head Tissue EX-Probe/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.13 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.14 W/kg
SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.78 W/kg



0 dB = 2.78 W/kg = 4.44 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.03.2016

Test Laboratory: SPEAG, Zurich, Switzerland

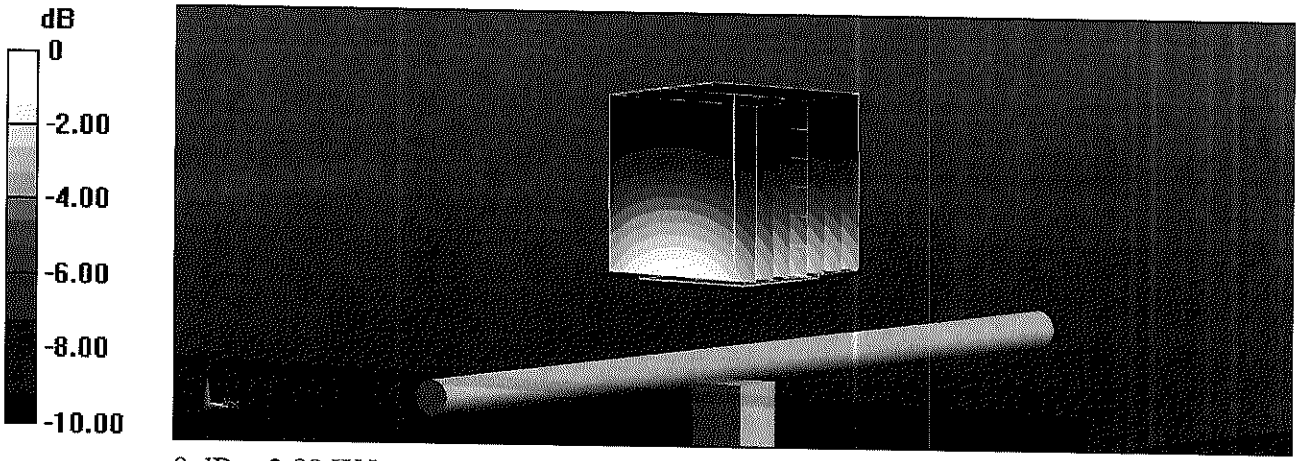
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.98 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

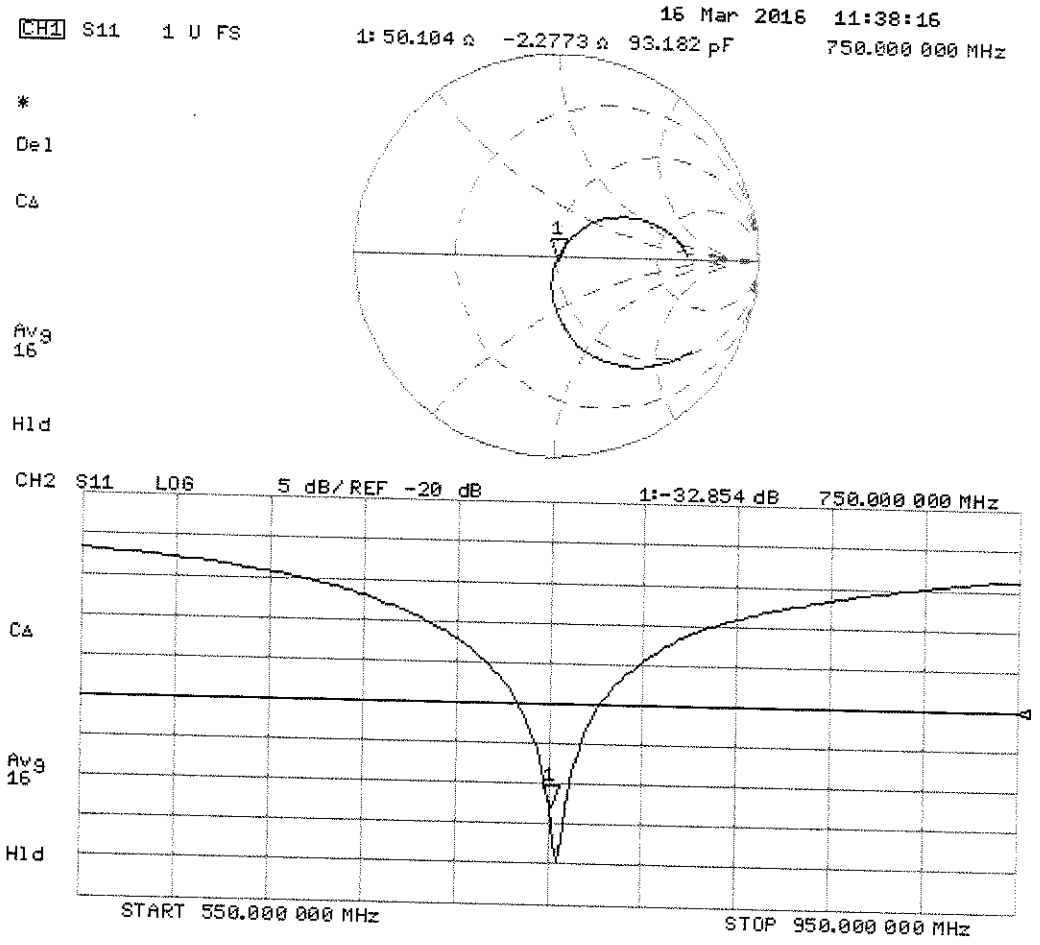
- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom Type: QD000P49AA
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue EX-Probe/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.90 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.24 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.89 W/kg



0 dB = 2.89 W/kg = 4.61 dBW/kg

Impedance Measurement Plot for Body TSL



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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d133_Jul16

CALIBRATION CERTIFICATE

Object D835V2 - SN:4d133

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

Calibration date: July 14, 2016

BN ✓
07/27/2016

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	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: July 14, 2016

Calibration Laboratory of
Schmid & Partner
Engineering AG
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

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	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	40.6 ± 6 %	0.94 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	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.32 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 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	54.9 ± 6 %	1.01 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	2.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.50 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.20 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	50.5 Ω - 5.1 jΩ
Return Loss	- 25.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.4 Ω - 7.5 jΩ
Return Loss	- 21.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.395 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

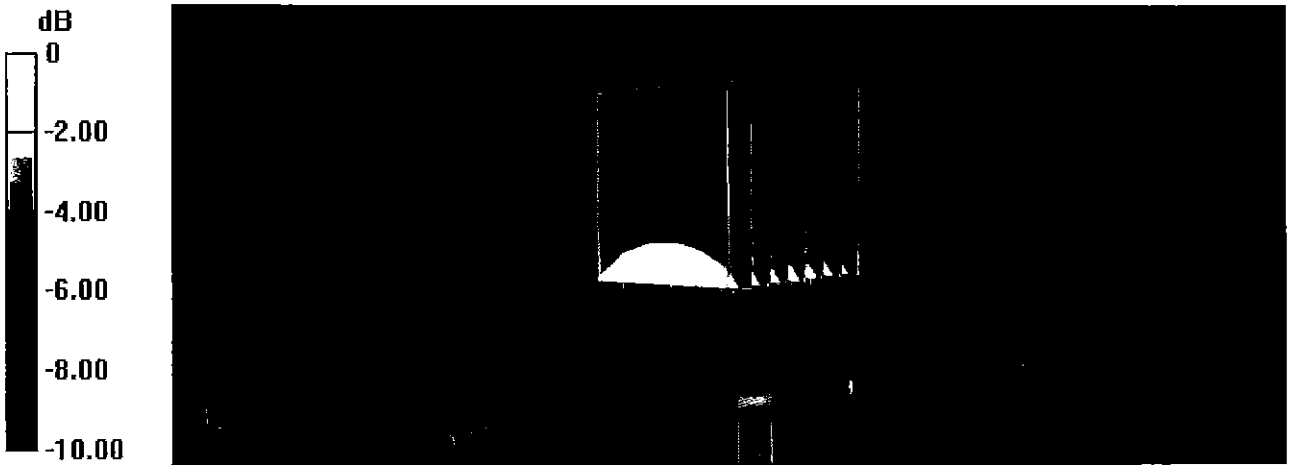
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

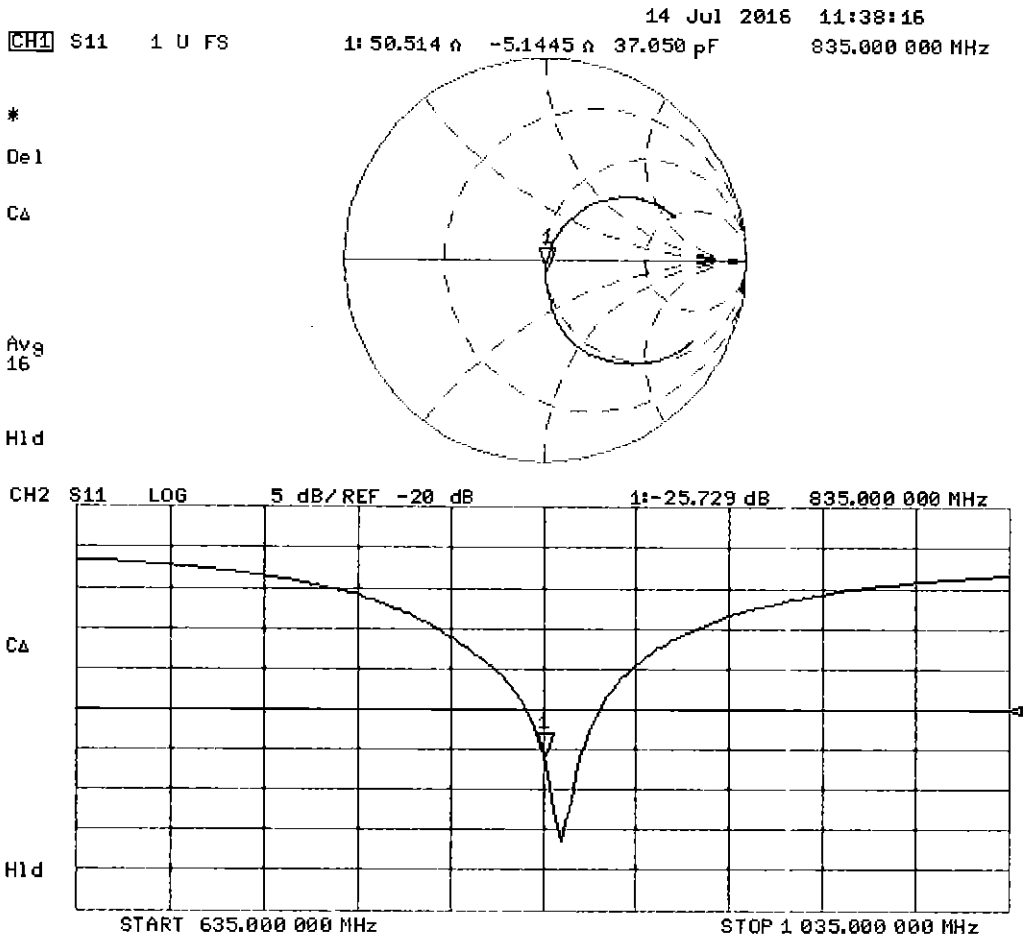
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.36 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

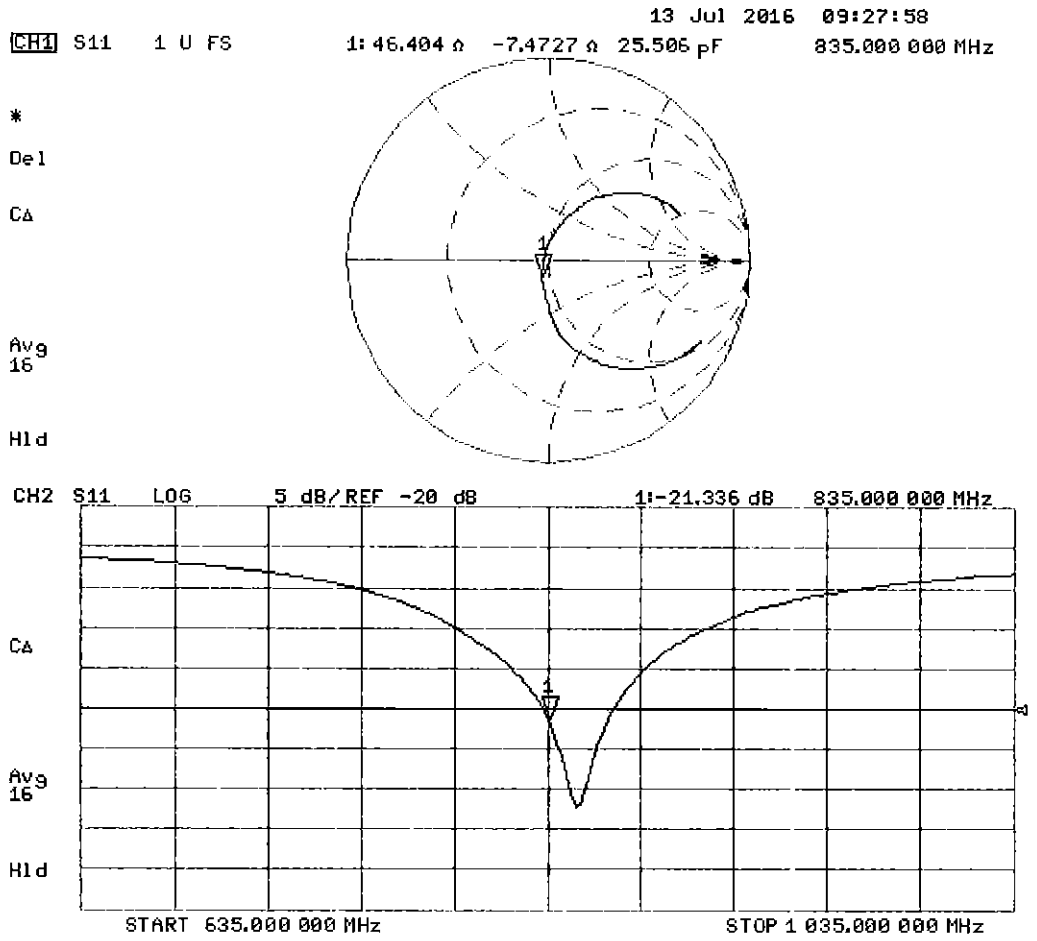
- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

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 = 59.93 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.59 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



Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d047_Jul16

CALIBRATION CERTIFICATE

Object D835V2 - SN:4d047

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

BN✓
7/16/2016

Calibration date: July 13, 2016

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	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: July 13, 2016

Calibration Laboratory of
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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, "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	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	40.6 ± 6 %	0.94 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	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.13 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.95 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	54.9 ± 6 %	1.01 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	**9.57 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.24 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	49.8 Ω - 5.9 jΩ
Return Loss	- 24.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 8.2 jΩ
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	None 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	August 16, 2006

DASY5 Validation Report for Head TSL

Date: 13.07.201

Test Laboratory: SPEAG, Zurich, Switzerland

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

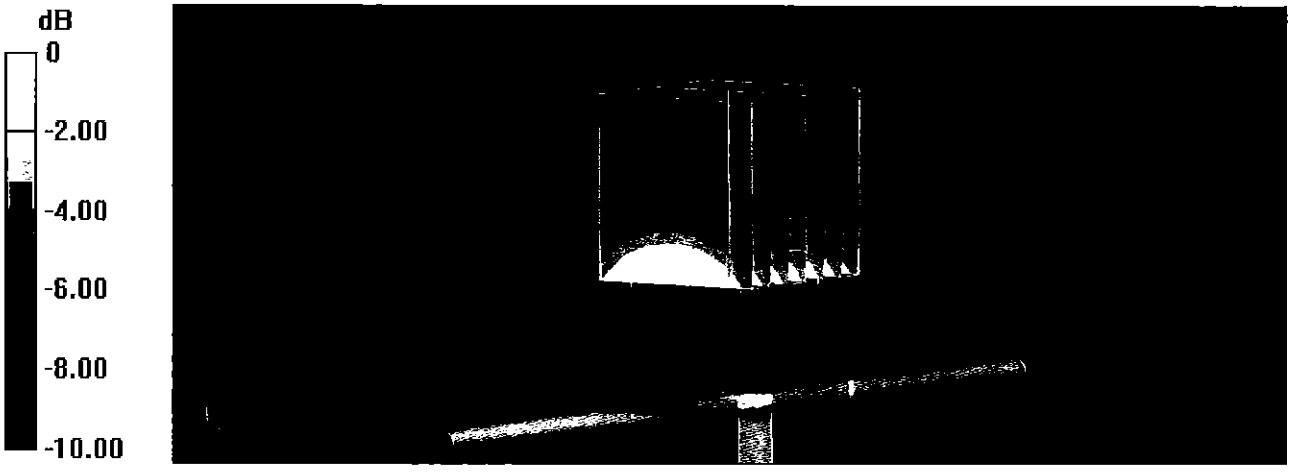
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

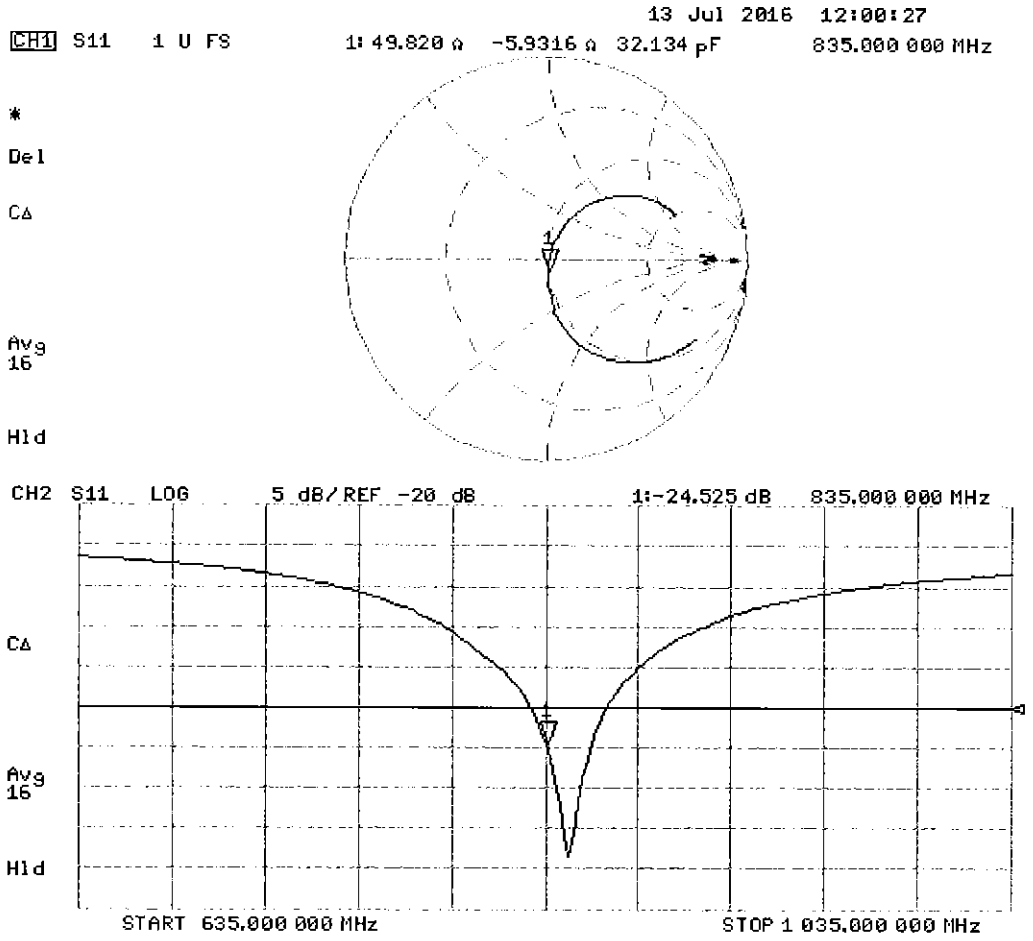
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.98 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 3.17 W/kg



0 dB = 3.17 W/kg = 5.01 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

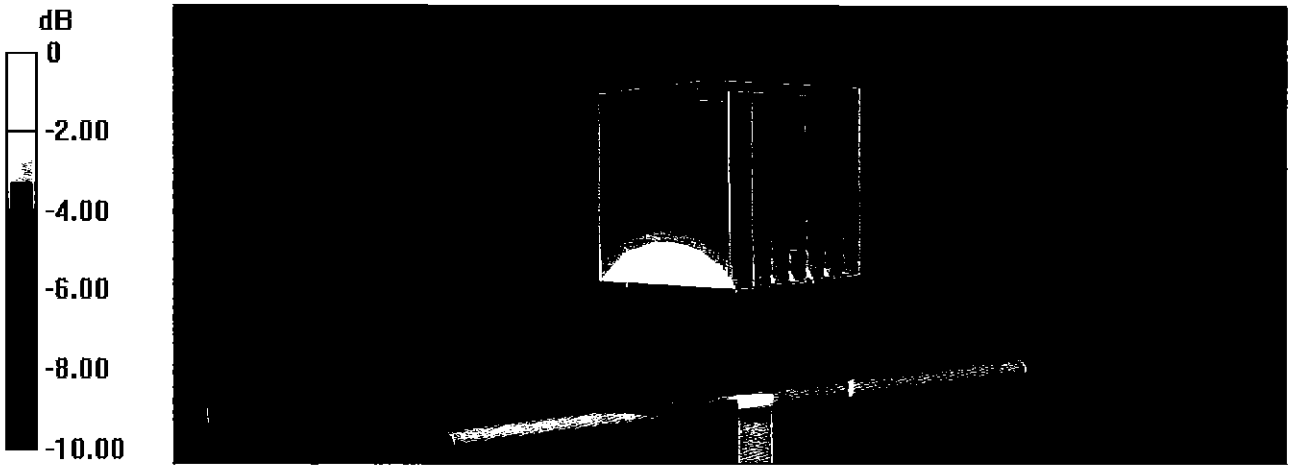
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

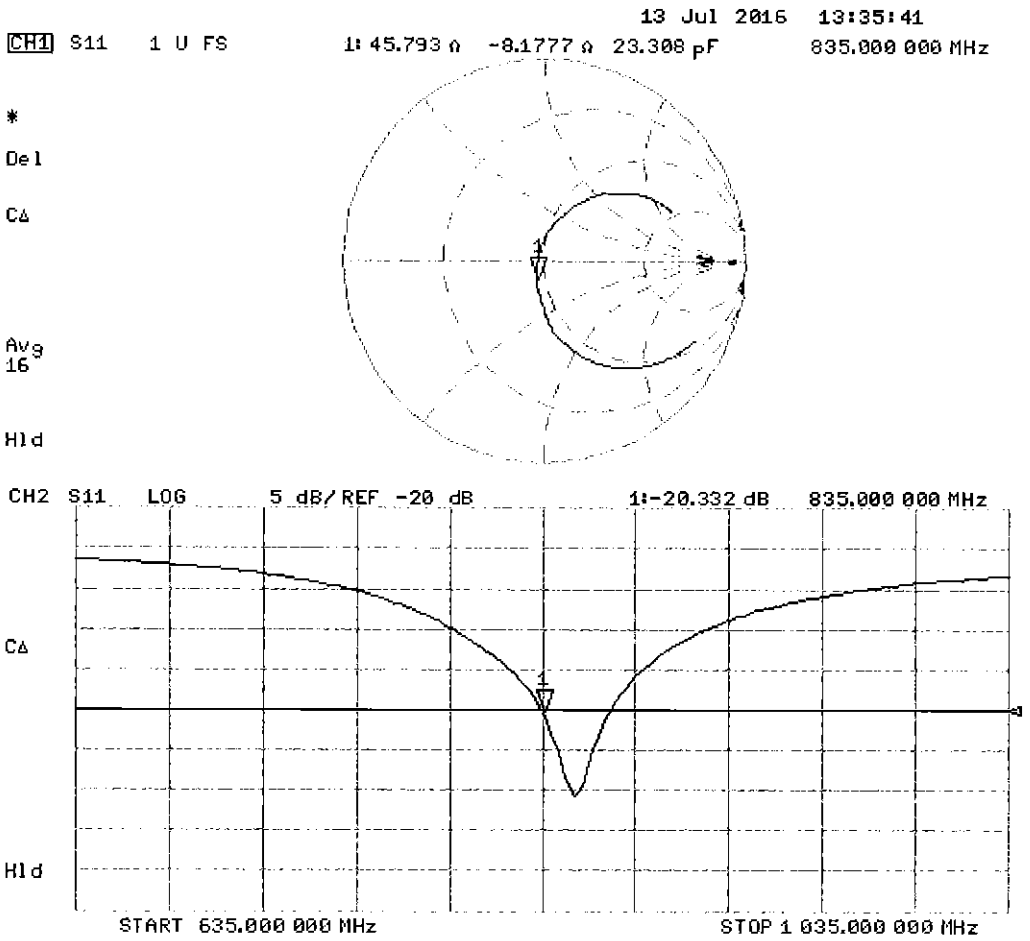
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.88 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.27 W/kg



0 dB = 3.27 W/kg = 5.15 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
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

Client **PC Test**

Certificate No: D1750V2-1148_May16

CALIBRATION CERTIFICATE

Object	D1750V2 - SN: 1148
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 09, 2016

BN ✓
5/17/2016

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-15 (No. EX3-7349_Dec15)	Dec-16
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: May 11, 2016

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	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.7 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.78 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.1 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	53.8 ± 6 %	1.50 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.30 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.93 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.7 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	49.9 Ω - 0.7 jΩ
Return Loss	- 43.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω - 1.4 jΩ
Return Loss	- 27.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.221 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 30, 2014

DASY5 Validation Report for Head TSL

Date: 09.05.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1148

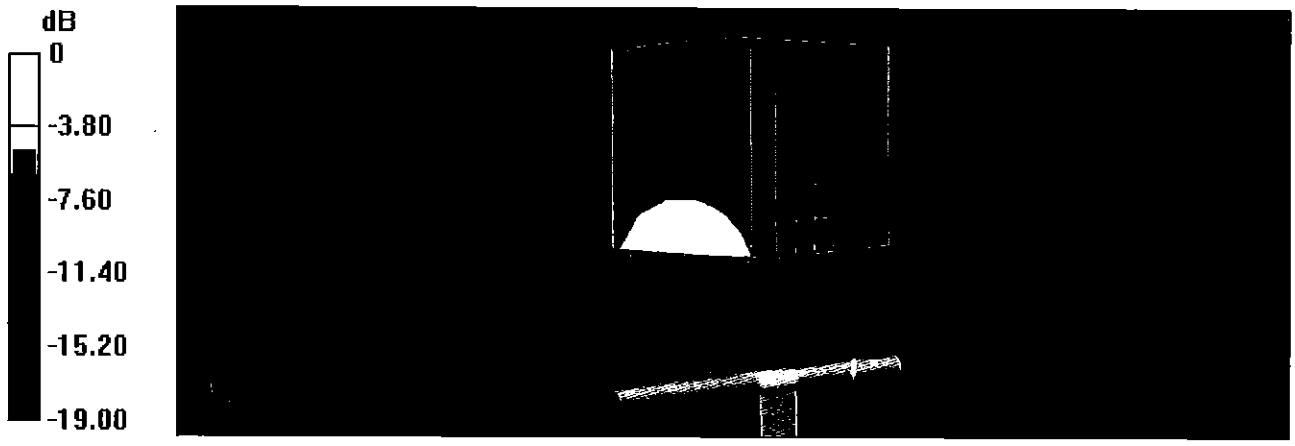
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.54, 8.54, 8.54); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

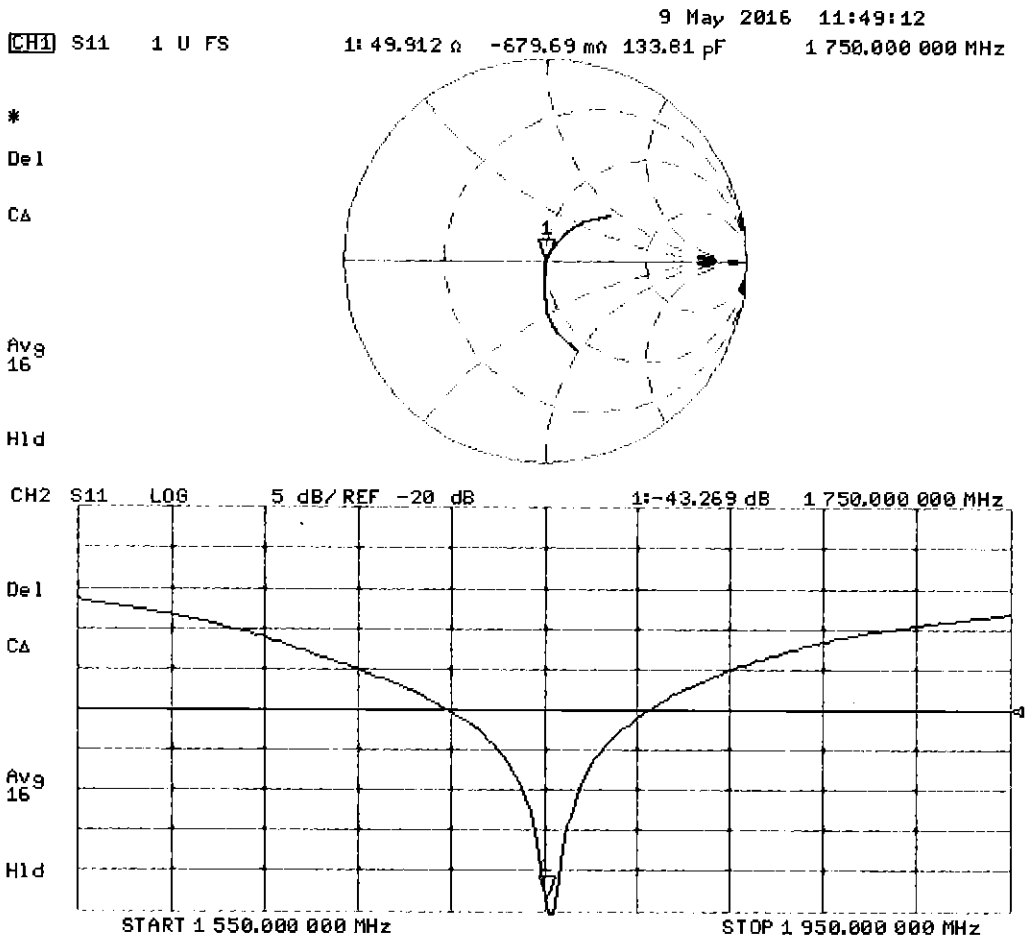
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.5 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.03 W/kg; SAR(10 g) = 4.78 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 Head TSL



DASY5 Validation Report for Body TSL

Date: 09.05.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1148

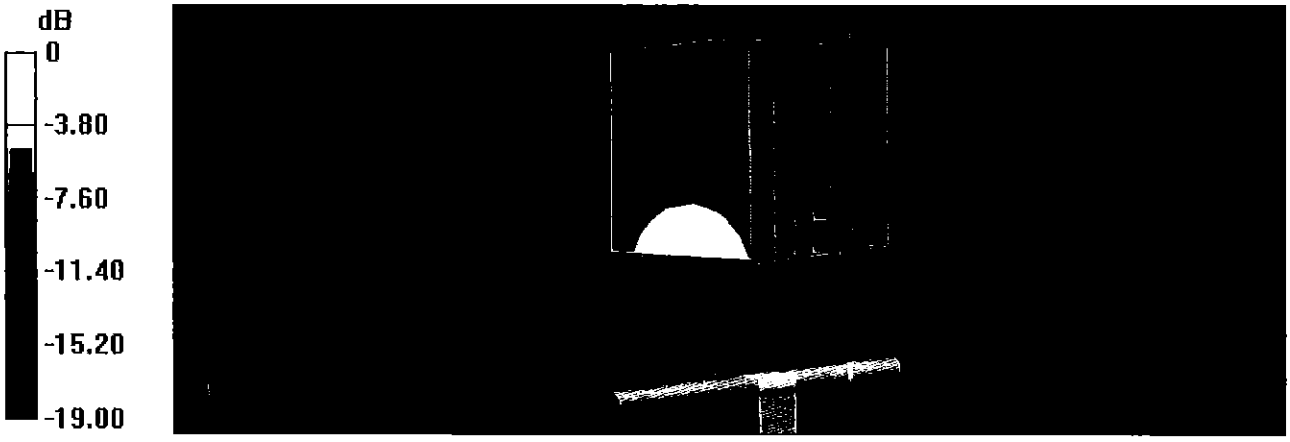
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.5 S/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

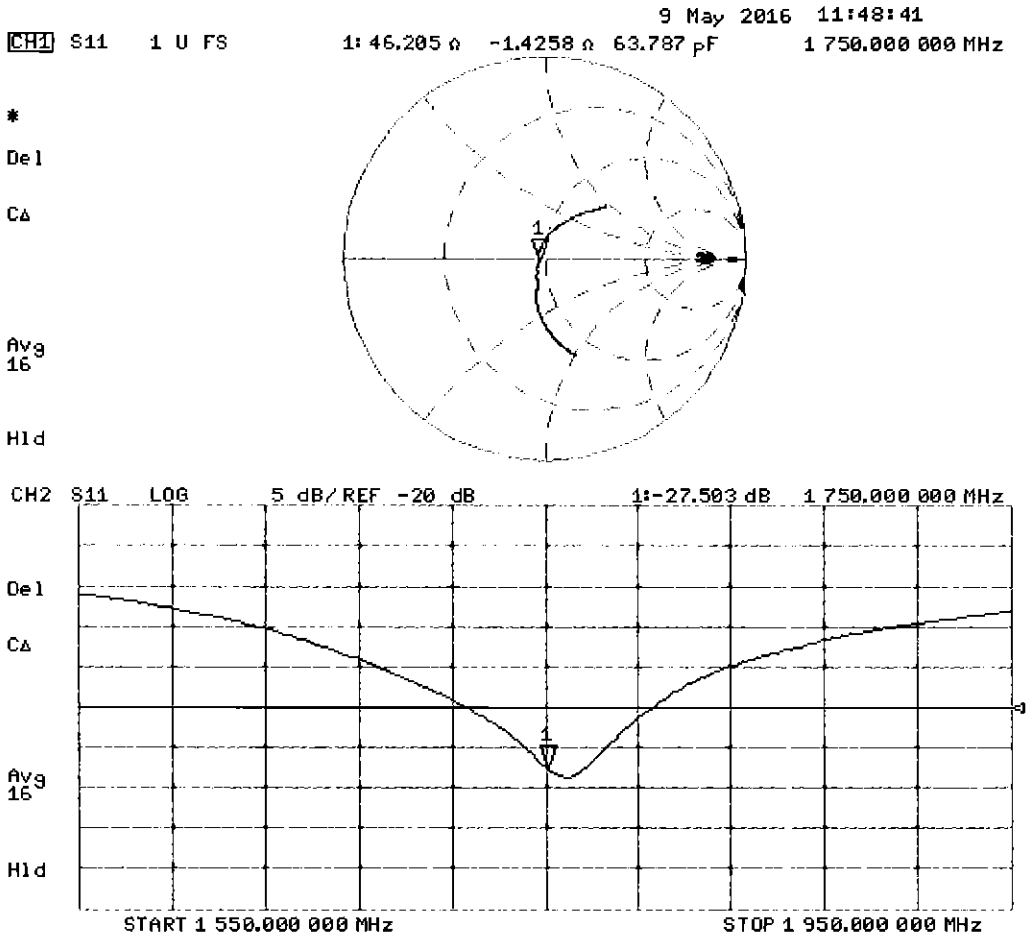
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.0 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.3 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.49 dBW/kg

Impedance Measurement Plot for Body TSL



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

S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d149_Jul16

CALIBRATION CERTIFICATE

Object D1900V2 - SN:5d149

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

Calibration date: July 15, 2016

BNV
07/27/2016

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	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 19, 2016

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	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.96 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	5.23 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.7 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.95 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.28 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.1 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	52.4 Ω + 5.5 jΩ
Return Loss	- 24.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.6 Ω + 7.0 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 15.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

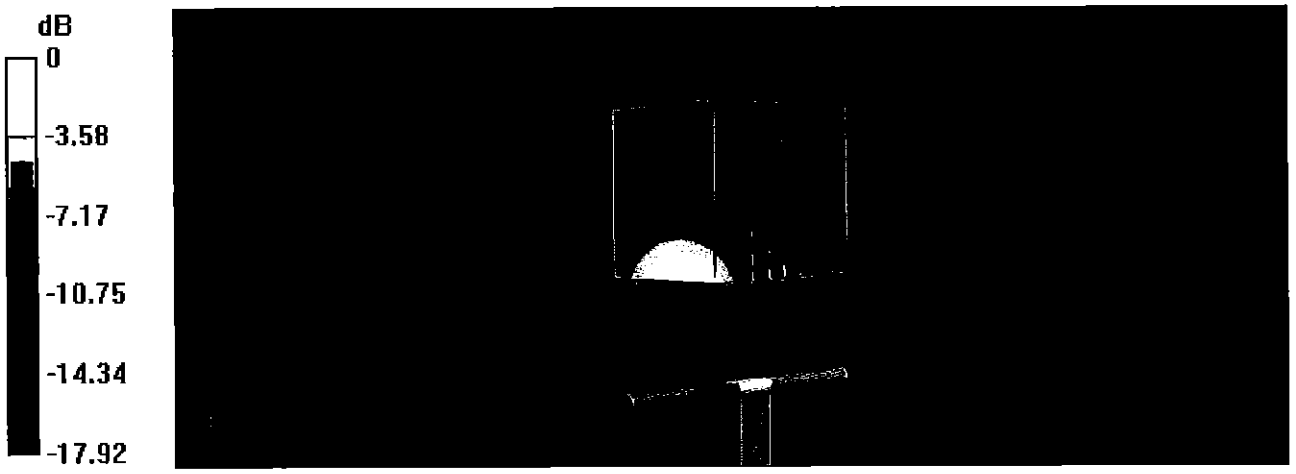
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.99, 7.99, 7.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

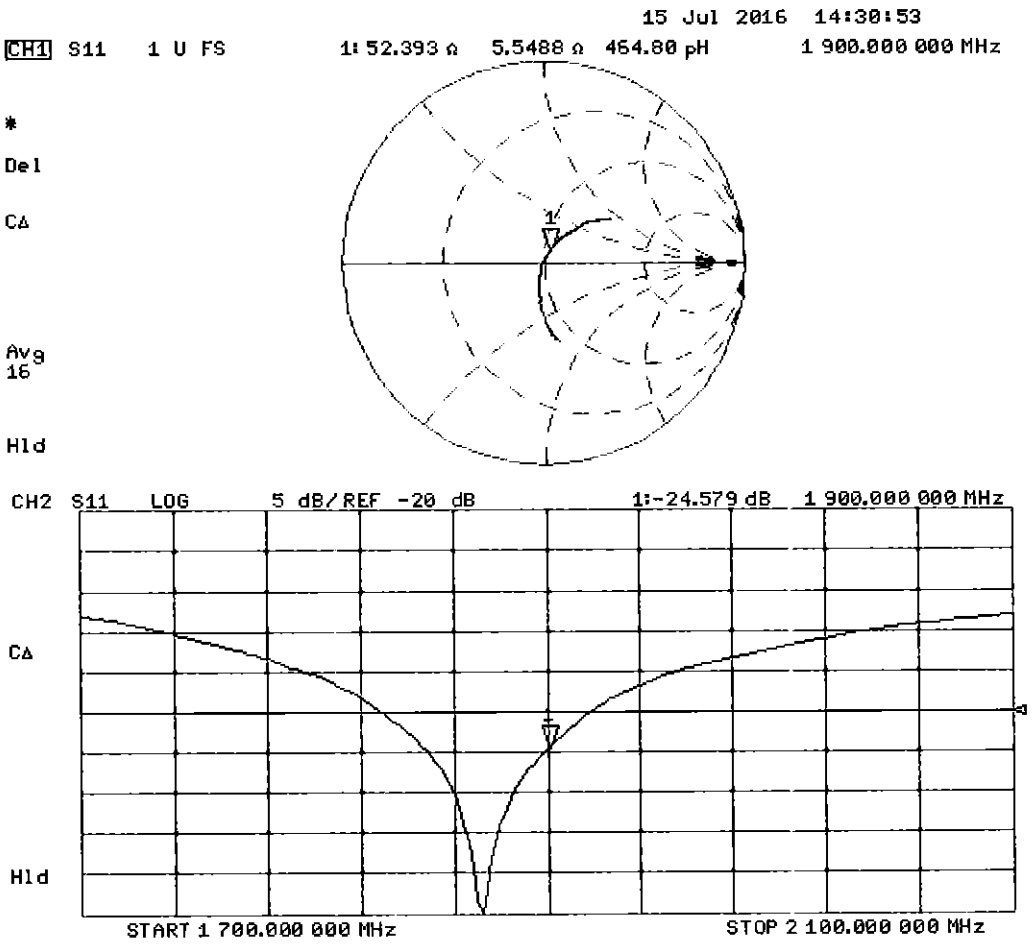
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.5 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 9.96 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.90 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

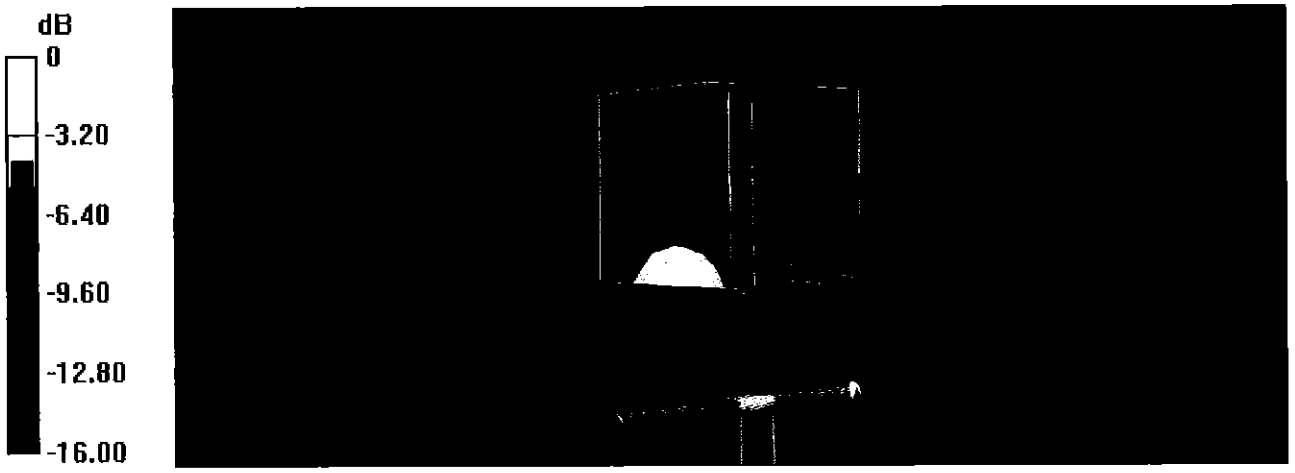
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.51 S/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7372)

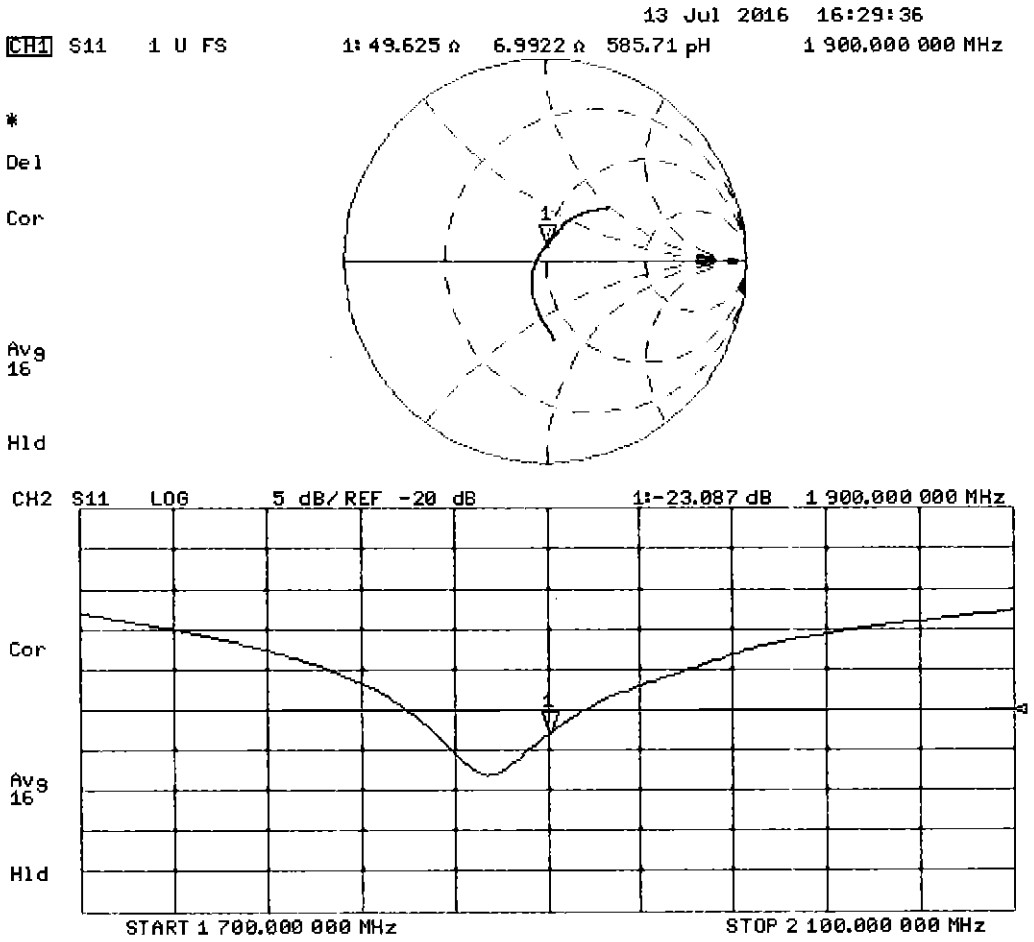
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.9 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.28 W/kg
Maximum value of SAR (measured) = 14.9 W/kg



0 dB = 14.9 W/kg = 11.73 dBW/kg

Impedance Measurement Plot for Body TSL



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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d080_Jul16

CALIBRATION CERTIFICATE

Object D1900V2 - SN:5d080

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

BN ✓ 7/16/2016

Calibration date: July 08, 2016

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	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: July 13, 2016

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	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.76 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.7 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.75 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.7 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 + 5.3 jΩ
Return Loss	- 25.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω + 6.8 jΩ
Return Loss	- 22.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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	June 28, 2006

DASY5 Validation Report for Head TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d080

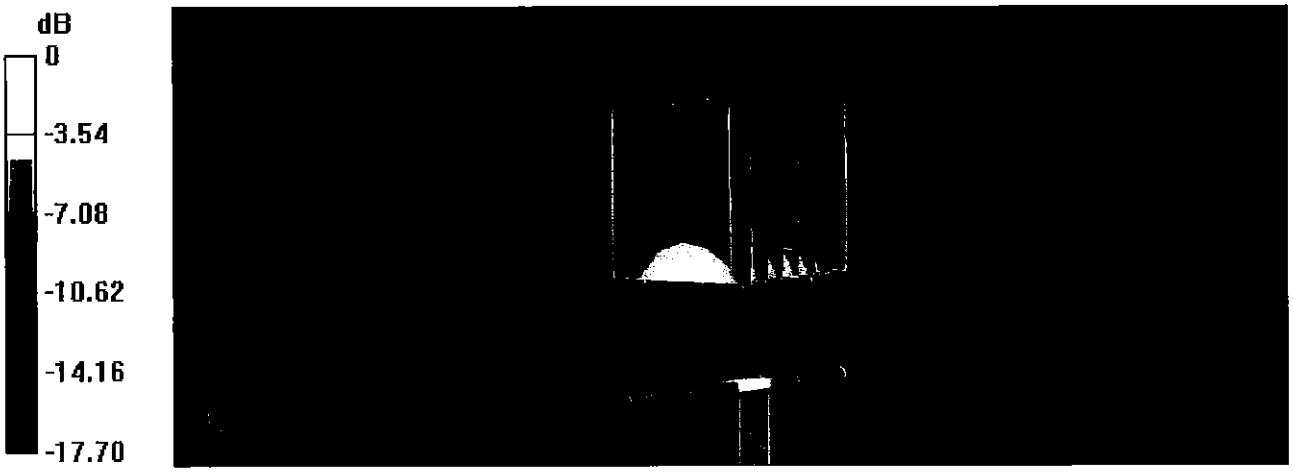
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.99, 7.99, 7.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

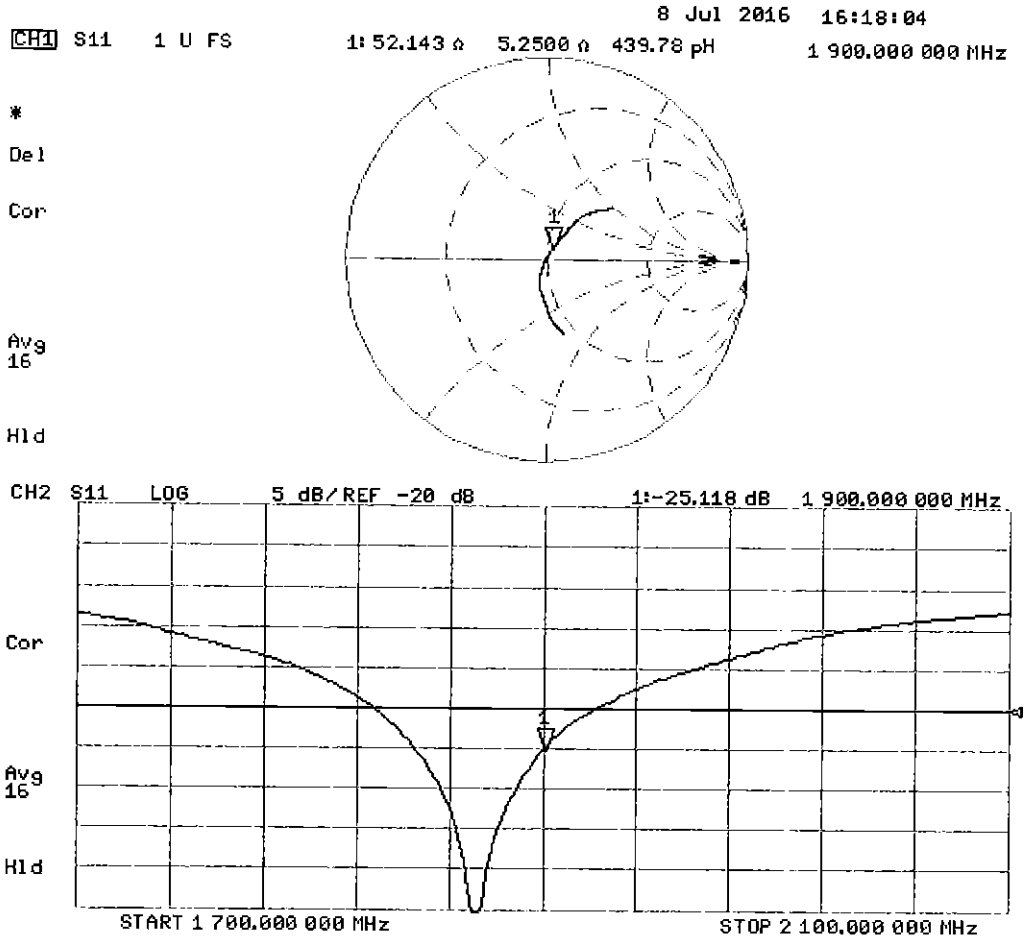
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.6 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 9.76 W/kg; SAR(10 g) = 5.1 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d080

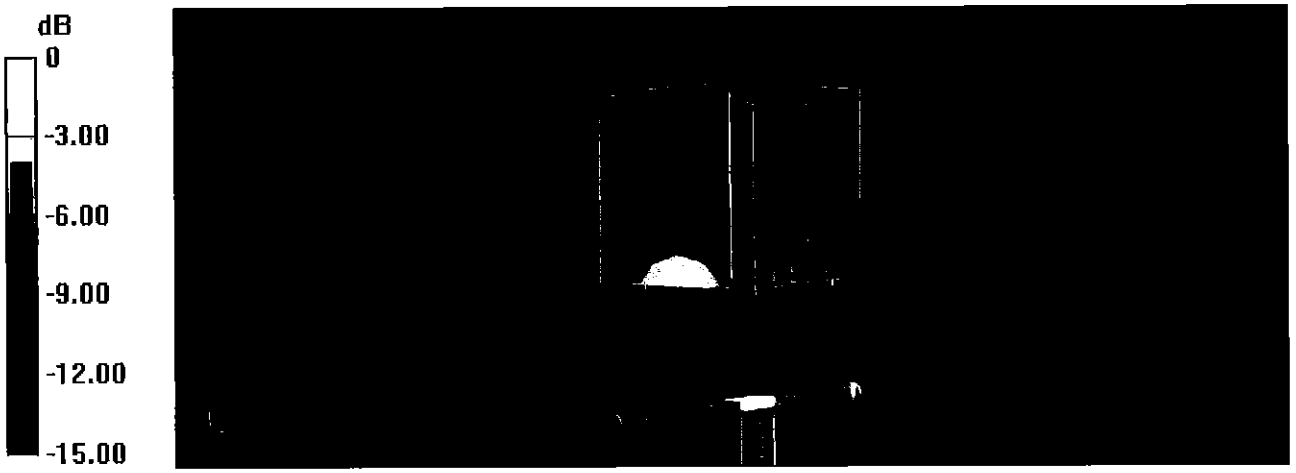
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.51 S/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

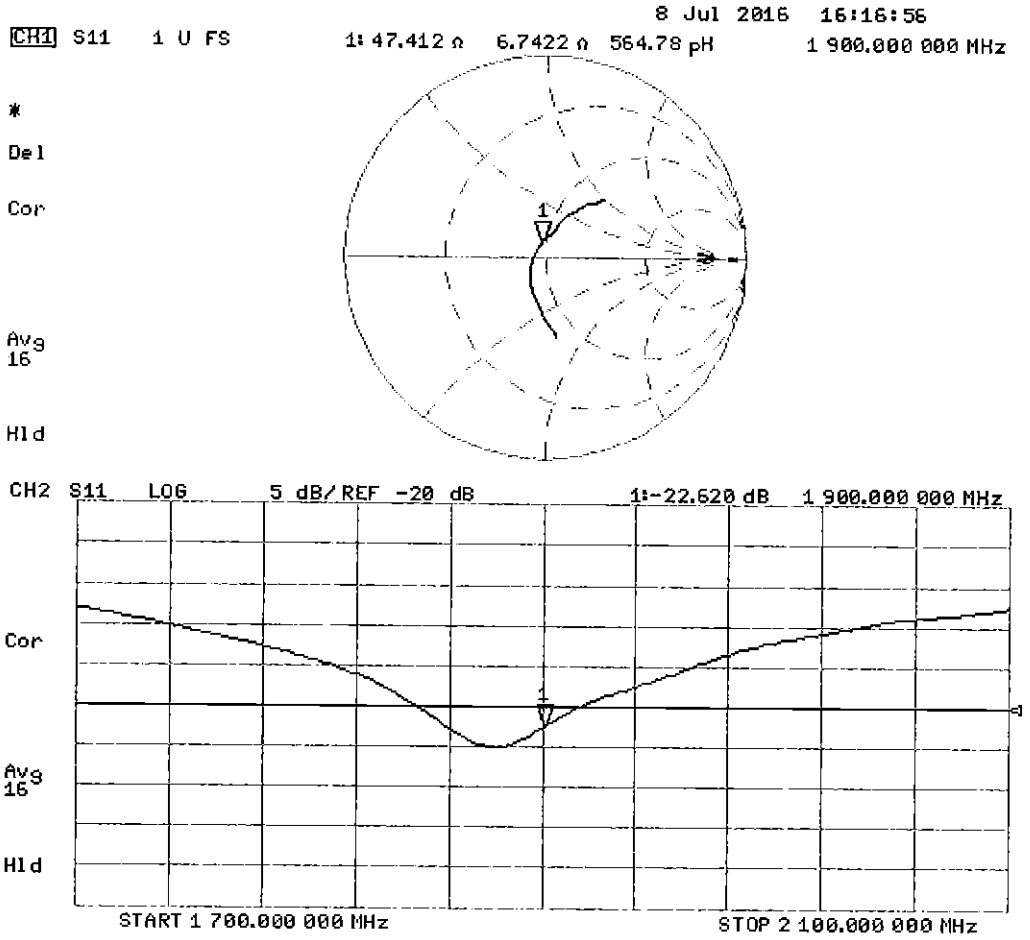
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.1 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 9.75 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
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: D2450V2-797_Sep16

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:797
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 13, 2016

BNV 09-28-2016

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	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: September 13, 2016

Calibration Laboratory of
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Engineering AG
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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, "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	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.9 ± 6 %	1.88 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	**52.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.6 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	51.6 ± 6 %	2.04 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	**50.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.13 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	53.8 Ω + 6.0 jΩ
Return Loss	- 23.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.8 Ω + 8.0 jΩ
Return Loss	- 22.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 24, 2006

DASY5 Validation Report for Head TSL

Date: 13.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

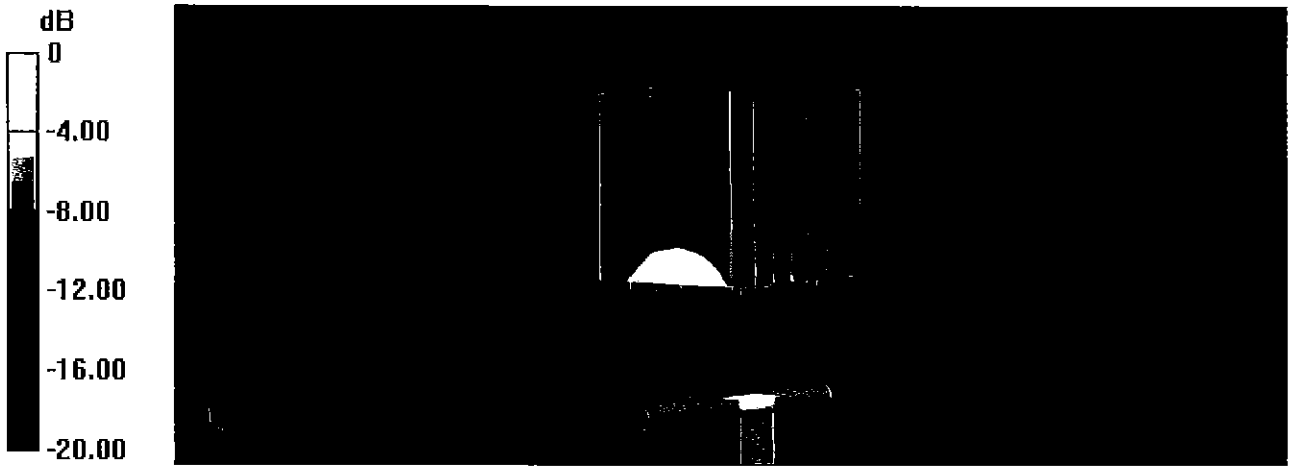
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.88 S/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.72, 7.72, 7.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

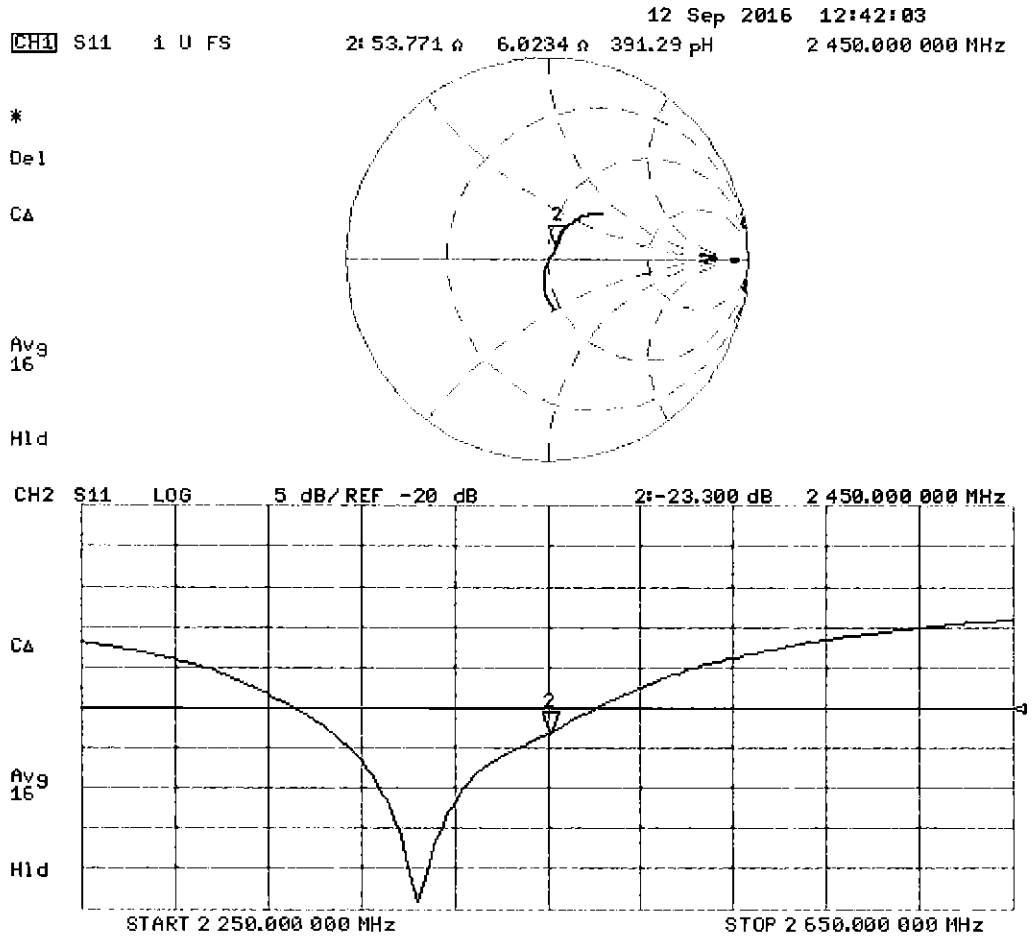
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 113.4 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 26.9 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR (measured) = 21.9 W/kg



0 dB = 21.9 W/kg = 13.40 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

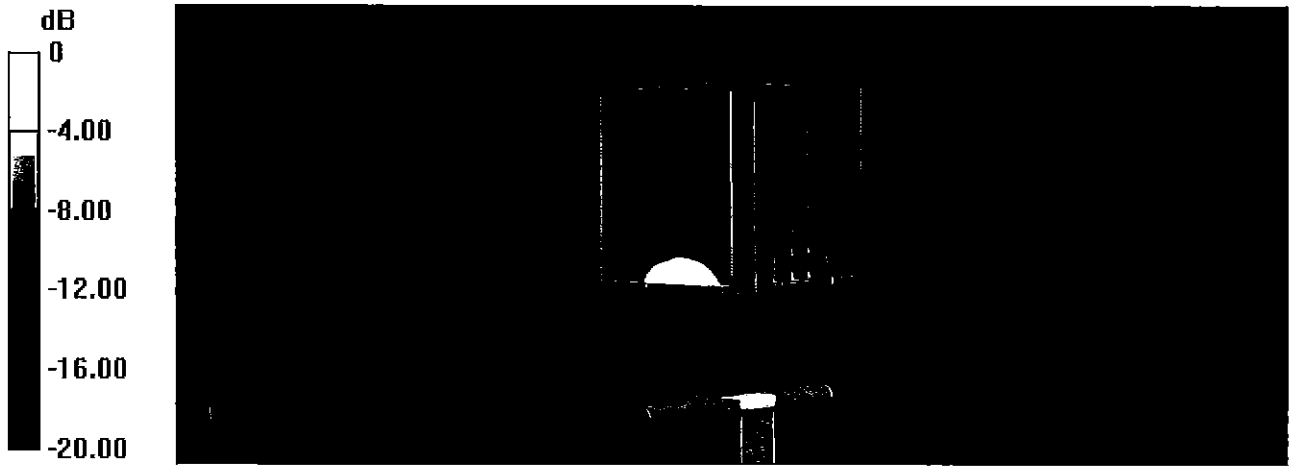
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 S/m; ε_r = 51.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.79, 7.79, 7.79); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

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 = 106.5 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 25.6 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 6.13 W/kg
Maximum value of SAR (measured) = 21.2 W/kg



0 dB = 21.2 W/kg = 13.26 dBW/kg

Impedance Measurement Plot for Body TSL