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SAR EVALUATION REPORT

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

Date of Testing:
09/7/17 - 09/28/17
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M1709080250-01-R1.A3L

FCC ID: A3LSMG892U

APPLICANT: SAMSUNG ELECTRONICS CO., LTD.

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-G892U

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	CDMA/EVDO BC10 (§90S)	817.90 - 823.10 MHz	0.26	0.31	0.63	N/A
PCE	CDMA/EVDO BC0 (§22H)	824.70 - 848.31 MHz	0.26	0.39	0.73	N/A
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.21	0.54	0.67	2.60
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	< 0.1	0.23	0.17	0.76
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.24	0.96	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.14	0.21	0.36	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.33	0.77	0.69	2.61
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.18	0.79	0.71	2.63
PCE	LTE Band 71	665.5 - 695.5 MHz	0.14	0.32	0.43	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.17	0.30	0.47	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	0.24	0.34	0.47	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.20	0.25	0.45	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.30	0.86	0.79	2.42
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	0.16	0.54	0.63	2.75
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 7	2502.5 - 2567.5 MHz	0.13	0.37	0.83	2.13
PCE	LTE Band 38	2572.5 - 2617.5 MHz	0.11	0.21	0.72	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.13	0.47	1.08	2.18
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.97	0.15	0.37	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.35	0.12	N/A	0.85
NII	U-NII-2C	5500 - 5720 MHz	0.41	0.13	N/A	0.76
NII	U-NII-3	5745 - 5825 MHz	0.49	0.22	0.28	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.50	< 0.1	0.13	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.25	1.31	1.58	3.94

Note: This revised Test Report (S/N: 1M1709080250-01-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

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T A B L E O F C O N T E N T S

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 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 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz
MST	Data	555 Hz - 8.33 kHz

1.2 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions 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 a fixed level power reduction mechanism for GSM 850 and 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	**33.5**	**33.5**	**31.5**	**30.0**	**28.0**	**27.5**	**25.5**	**24.0**	**22.5**
	Nominal	**33.0**	**33.0**	**31.0**	**29.5**	**27.5**	**27.0**	**25.0**	**23.5**	**22.0**
GSM/GPRS/EDGE 1900	Maximum	**31.5**	**31.5**	**28.5**	**27.5**	**25.5**	**26.5**	**24.5**	**23.0**	**21.5**
	Nominal	**31.0**	**31.0**	**28.0**	**27.0**	**25.0**	**26.0**	**24.0**	**22.5**	**21.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**24.0**	**23.5**	**23.5**	**23.5**
	Nominal	**23.5**	**23.0**	**23.0**	**23.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.5**	**24.0**	**24.0**	**24.0**
	Nominal	**24.0**	**23.5**	**23.5**	**23.5**
UMTS Band 2 (1900 MHz)	Maximum	**25.0**	**24.5**	**24.5**	**24.5**
	Nominal	**24.5**	**24.0**	**24.0**	**24.0**

Mode / Band		Modulated Average (dBm)
CDMA/EVDO BC10 (§90S)	Maximum	**25.5**
	Nominal	**25.0**
CDMA/EVDO BC0 (§22H)	Maximum	**25.5**
	Nominal	**25.0**
PCS CDMA/EVDO	Maximum	**25.5**
	Nominal	**25.0**

Mode / Band		Modulated Average (dBm)
LTE Band 71	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 12	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 17	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 13	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 26 (Cell)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 5 (Cell)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 66 (AWS)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 4 (AWS)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 25 (PCS)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 2 (PCS)	Maximum	**25.0**
	Nominal	**24.5**
LTE Band 7	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 38	Maximum	**23.5**
	Nominal	**23.0**
LTE Band 41 (PC3)	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 41 (PC2)	Maximum	**27.0**
	Nominal	**26.5**

1.3.2 Reduced PCE Power – Hotspot Mode Activated

Mode / Band		Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slots	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**27.5**	**26.5**	**23.5**	**21.5**	**27.5**	**25.5**	**22.5**	**21.5**
	Nominal	**27.0**	**26.0**	**23.0**	**21.0**	**27.0**	**25.0**	**22.0**	**21.0**

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

Mode / Band		Modulated Average (dBm)
PCS CDMA/EVDO	Maximum	**20.5**
	Nominal	**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**
LTE Band 7	Maximum	**20.5**
	Nominal	**20.0**
LTE Band 41 (PC3)	Maximum	**22.5**
	Nominal	**22.0**
LTE Band 41 (PC2)	Maximum	**22.5**
	Nominal	**22.0**

1.3.3 Reduced PCE Power – Grip Sensor Activated

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	**27.5**	**27.5**	**26.5**	**23.5**	**21.5**	**27.5**	**25.5**	**22.5**	**21.5**
	Nominal	**27.0**	**27.0**	**26.0**	**23.0**	**21.0**	**27.0**	**25.0**	**22.0**	**21.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 4 (1750 MHz)	Maximum	**21.0**	**21.0**	**21.0**	**20.5**
	Nominal	**20.5**	**20.5**	**20.5**	**20.0**
UMTS Band 2 (1900 MHz)	Maximum	**21.5**	**21.5**	**21.5**	**20.5**
	Nominal	**21.0**	**21.0**	**21.0**	**20.0**

Mode / Band		Modulated Average (dBm)
PCS CDMA/EVDO	Maximum	**21.5**
	Nominal	**21.0**

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	**22.0**
	Nominal	**21.5**
LTE Band 2 (PCS)	Maximum	**22.0**
	Nominal	**21.5**
LTE Band 7	Maximum	**20.5**
	Nominal	**20.0**
LTE Band 41 (PC3)	Maximum	**22.5**
	Nominal	**22.0**
LTE Band 41 (PC2)	Maximum	**22.5**
	Nominal	**22.0**

1.3.4 Reduced PCE Power – Proximity Sensor Activated

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	**27.5**	**27.5**	**26.5**	**23.5**	**21.5**	**27.5**	**25.5**	**22.5**	**21.5**
	Nominal	**27.0**	**27.0**	**26.0**	**23.0**	**21.0**	**27.0**	**25.0**	**22.0**	**21.0**

1.3.5 Maximum Bluetooth and SISO and MIMO WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**20.5**
	Nominal	**20.0**
IEEE 802.11g (2.4 GHz)	Maximum	**17.5 (Ch 1, 11: 15.5)**
	Nominal	**17.0 (Ch 1, 11: 15.0)**
IEEE 802.11n (2.4 GHz)	Maximum	**17.5 (Ch 1, 11: 15.5)**
	Nominal	**17.0 (Ch 1, 11: 15.0)**

Mode / Band		Modulated Average - Single Tx Chain (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	**17.5**		
	Nominal	**17.0**		
IEEE 802.11n (5 GHz)	Maximum	**17.5**	**16.5**	
	Nominal	**17.0**	**16.0**	
IEEE 802.11ac (5 GHz)	Maximum	**17.5**	**16.5**	**15.5**
	Nominal	**17.0**	**16.0**	**15.0**

Mode / Band		Modulated Average - MIMO (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11g (2.4 GHz)	Maximum	**20.5 (Ch 1, 11: 17.5)**		
	Nominal	**20.0 (Ch 1, 11: 17.0)**		
IEEE 802.11n (2.4 GHz)	Maximum	**20.5 (Ch 1, 11: 17.5)**		
	Nominal	**20.0 (Ch 1, 11: 17.0)**		
IEEE 802.11a (5 GHz)	Maximum	**20.5**		
	Nominal	**20.0**		
IEEE 802.11n (5 GHz)	Maximum	**20.5**	**19.5**	
	Nominal	**20.0**	**19.0**	
IEEE 802.11ac (5 GHz)	Maximum	**20.5**	**19.5**	**18.5**
	Nominal	**20.0**	**19.0**	**18.0**

Mode / Band		Modulated Average - Single Tx Chain (dBm)
Bluetooth (1 Mbps)	Maximum	**14.5**
	Nominal	**14.0**
Bluetooth (EDR)	Maximum	**8.0**
	Nominal	**7.5**
Bluetooth LE	Maximum	**9.0**
	Nominal	**8.5**

1.3.6 Reduced SISO and MIMO WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11g (2.4 GHz)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (2.4 GHz)	Maximum	**13.5**
	Nominal	**13.0**

Mode / Band		Modulated Average - Single Tx Chain (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	**15.5**		
	Nominal	**15.0**		
IEEE 802.11n (5 GHz)	Maximum	**15.5**	**15.5**	
	Nominal	**15.0**	**15.0**	
IEEE 802.11ac (5 GHz)	Maximum	**15.5**	**15.5**	**15.5**
	Nominal	**15.0**	**15.0**	**15.0**

Mode / Band		Modulated Average - MIMO (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11g (2.4 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11n (2.4 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11a (5 GHz)	Maximum	**18.5**		
	Nominal	**18.0**		
IEEE 802.11n (5 GHz)	Maximum	**18.5**	**18.5**	
	Nominal	**18.0**	**18.0**	
IEEE 802.11ac (5 GHz)	Maximum	**18.5**	**18.5**	**18.5**
	Nominal	**18.0**	**18.0**	**18.0**

1.3.7 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 Ch. 1, 11: C	2.4 GHz: b,g,n 5 GHz: a,n,ac
	2	-	A	B Ch. 1, 11: C	-	
	2	A	-	B Ch. 1, 11: C	-	
	2	-	A	-	B Ch. 1, 11: C	
	3	A	A	B Ch. 1, 11: C	-	2.4 GHz: b, g, n 5 GHz: n, ac, a (CDD + STBC only)
	3	A	A	-	B Ch. 1, 11: C	
	3	A	-	B Ch. 1, 11: C	B Ch. 1, 11: C	2.4 GHz: n, g (CDD + STBC only) 5 GHz: a, n, ac
	3	-	A	B Ch. 1, 11: C	B Ch. 1, 11: C	
	4	A	A	B Ch. 1, 11: C	B Ch. 1, 11: C	2.4 GHz: n, g (CDD + STBC only) 5 GHz: n, ac, a (CDD + STBC only)

A = 15.0 dBm
B = 17.0 dBm
C = 14.0 dBm
(Upper tolerance: target + 0.5 dB)

1.3.8 Reduced 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 = 13.0 dBm
B = 9.5 dBm
(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
EVDO BC10 (§90S)	Yes	Yes	No	Yes	Yes	Yes
EVDO BC0 (§22H)	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	Yes	Yes
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 71	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 66 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 7	Yes	Yes	No	Yes	No	Yes
LTE Band 38	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operations are disabled.

1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be 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.

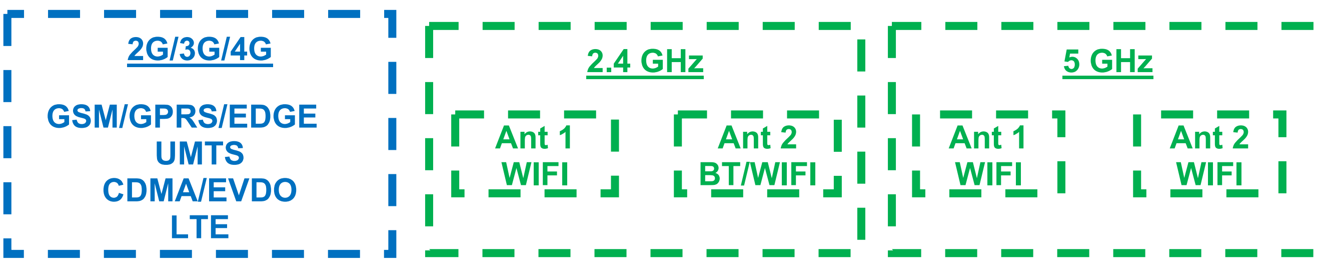

Figure 1-1
Simultaneous Transmission Paths

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.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	1x CDMA voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
4	1x CDMA voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^BT Tethering applications are considered.
5	1x CDMA voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	1x CDMA voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
7	1x CDMA voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
9	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
10	GSM voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
11	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^BT Tethering applications are considered.
12	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
13	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
14	GSM voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
15	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
16	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
17	UMTS + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
18	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^BT Tethering applications are considered.
19	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
20	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
21	UMTS + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
22	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
23	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
24	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
25	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^BT Tethering applications are considered.
26	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
27	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
28	LTE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
29	CDMA/EVDO data + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
30	CDMA/EVDO data + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
31	CDMA/EVDO data + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
32	CDMA/EVDO data + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	*-Pre-installed VOIP applications are considered. ^BT Tethering applications are considered.
33	CDMA/EVDO data + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
34	CDMA/EVDO data + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
35	CDMA/EVDO data + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
36	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	Yes	
37	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
38	GPRS/EDGE + 2.4 GHz WI-FI + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
39	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^BT Tethering applications are considered.
40	GPRS/EDGE + 2.4 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
41	GPRS/EDGE + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
42	GPRS/EDGE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	

1. Bluetooth cannot transmit simultaneously with WLAN.
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 2x2 MIMO Tx for WLAN. 802.11a/g/n/ac supports CDD and STBC and 802.11n/ac additionally supports SDM.
7. This device supports VOLTE.
8. This device supports VoWIFI.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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

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

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 Bluetooth, 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.

CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1x Advanced was not more than 0.25 dB higher than the maximum powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg per FCC KDB Publication 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

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

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

This device supports downlink 4x4 MIMO operations for LTE Bands 2, 4, 25 and 66 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 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 both Power Class 2 (PC2) and Power Class 3 (PC3) for LTE Band 41. Per May 2017 TCB Workshop Notes, SAR tests were performed with Power Class 3 (given the specific UL/DL limitations for Power Class 2). Additionally, SAR testing for the Power Class 2 condition was evaluated for the highest configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 14.2).

Since the supported frequency span for LTE B17 falls completely within the supported frequency span for LTE B12, LTE B12 has a higher target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B12.

Since the supported frequency span for LTE B5 (Cell) falls completely within the supported frequency span for LTE B26 (Cell), LTE B26 (Cell) has a higher target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B26 (Cell).

This device supports both LTE B66 (AWS) and LTE B4 (AWS). Since the supported frequency span for LTE B4 (AWS) falls completely within the supported frequency span for LTE B66 (AWS), both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B66 (AWS).

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

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.

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)
- May 2017 TCB Workshop Notes (LTE Band 41 Power Class 2, LTE 4x4 DL MIMO)

1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 11.

2 LTE INFORMATION

LTE Information					
FCC ID	A3LSMG892U				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 71 (665.5 - 695.5 MHz)				
	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 7 (2502.5 - 2567.5 MHz)				
	LTE Band 38 (2572.5 - 2617.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 71: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	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 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 38: 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 71: 5 MHz	665.5 (133147)		680.5 (133297)	695.5 (133447)	
LTE Band 71: 10 MHz	668 (133172)		680.5 (133297)	693 (133422)	
LTE Band 71: 15 MHz	670.5 (133197)		680.5 (133297)	690.5 (133397)	
LTE Band 71: 20 MHz	673 (133222)		680.5 (133297)	688 (133372)	
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)		1745 (132322)	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 7: 5 MHz	2502.5 (20775)		2535 (21100)	2567.5 (21425)	
LTE Band 7: 10 MHz	2505 (20800)		2535 (21100)	2565 (21400)	
LTE Band 7: 15 MHz	2507.5 (20825)		2535 (21100)	2562.5 (21375)	
LTE Band 7: 20 MHz	2510 (20850)		2535 (21100)	2560 (21350)	
LTE Band 38: 5 MHz	2572.5 (37775)		2595 (38000)	2617.5 (38225)	
LTE Band 38: 10 MHz	2575 (37800)		2595 (38000)	2615 (38200)	
LTE Band 38: 15 MHz	2577.5 (37825)		2595 (38000)	2612.5 (38175)	
LTE Band 38: 20 MHz	2580 (37850)		2595 (38000)	2610 (38150)	
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 Additional Information	LTE Release 14 Information, and This device does not support full CA features on 3GG Release 14. It supports carriers aggregation and downlink MIMO, LAA, and LTE-U features as shown in Section 9 and Appendix G and H. All other uplink communications are identical to the Release 8 specifications. Uplink Communications are done on the PCC unless otherwise specified. The following LTE Release 14 features are not supported: Relay, HetNet, Enhanced eICIC, MDH, eMBMS, Cross-carrier scheduling, Enhanced SC-FDMA.				

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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:

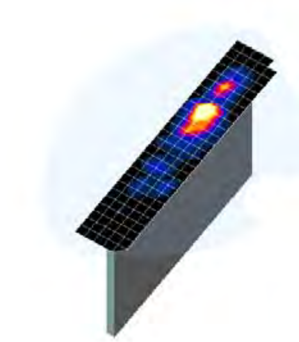

Figure 4-1
Sample SAR Area Scan

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].

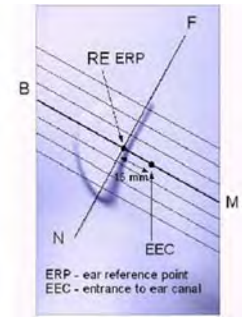

Figure 5-1
Close-Up Side view of ERP

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

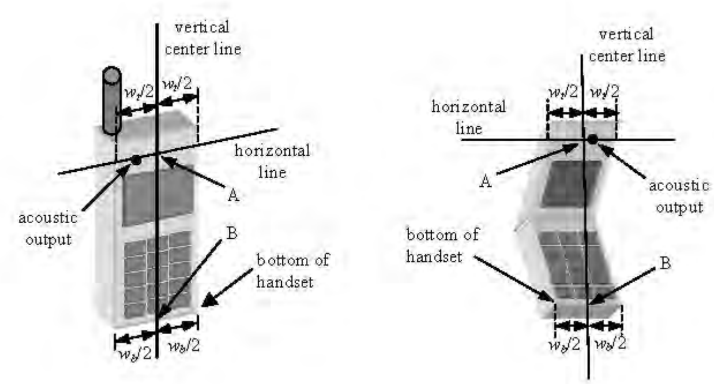

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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.

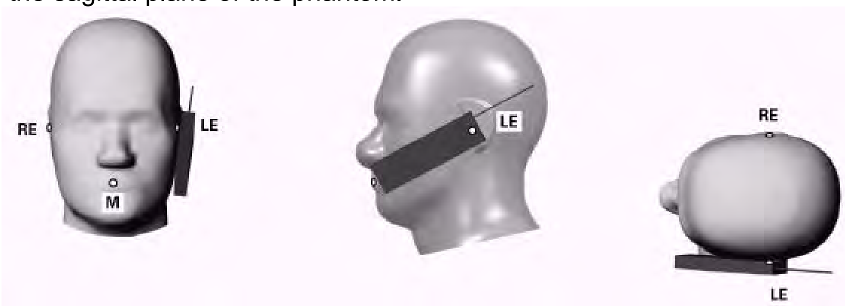

Figure 6-1 Front, Side and Top View of Cheek Position

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

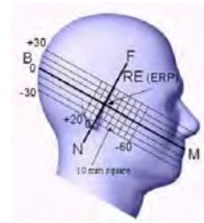

Figure 6-3
Side view w/ relevant markings

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

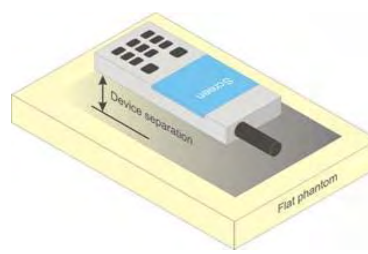

Figure 6-4
Sample Body-Worn Diagram

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

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.
Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 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 I.

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 CDMA2000

The following procedures were performed according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

8.4.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.” Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the “All Up” condition.

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 8-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 8-2 was applied.

Table 8-1
Parameters for Max. Power for RC1

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 8-2
Parameters for Max. Power for RC3

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-86
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

5. FCHs were configured at full rate for maximum SAR with “All Up” power control bits.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at fullrate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest reported SAR in RC3.

Head SAR is additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.4.5 for EVDO Rev. A configuration parameters.

8.4.3 Body-worn SAR Measurements

SAR for body-worn exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), with FCH at full rate and SCH0 enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

8.4.4 Body-worn SAR Measurements for EVDO Devices

For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied to Rev. A, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode.

When SAR is required for EVDO Rev. A, SAR is measured with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations, using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or 1x RTT RC3, as appropriate.

8.4.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode; otherwise, SAR is measured for Rev. A using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

For Ev-Do data devices that also support 1x RTT voice and/or data operations, the 3G SAR test reduction procedure is applied to 1x RTT RC3 and RC1 with Ev-Do Rev. 0 and Rev. A as the respective primary modes. Otherwise, the ‘Body-Worn Accessory SAR’ procedures in the ‘3GPP2 CDMA 2000 1x Handsets’ section are applied.

8.4.6 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers are measured using SO75 with RC8 on the uplink and RC11 on the downlink per FCC KDB Publication 941225 D01v03r01. Smart blanking is disabled for all measurements. The EUT is configured with forward power control Mode 000 and reverse power control at 400 bps. Conducted powers are measured on an Agilent 8960 Series 10 Wireless Communications Test Set, Model E5515C using the CDMA2000 1x Advanced application, Option E1962B-410.

The 3G SAR test reduction procedure is applied to the 1x-Advanced transmission mode with 1x RTT RC3 as the primary mode. When SAR measurement is required, the 1x-Advanced power measurement configurations are used. The1x Advanced SAR procedures are applied separately to head, body-worn accessory and other exposure conditions.

8.5 SAR Measurement Conditions for UMTS

8.5.1 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.

8.5.2 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.

8.5.3 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.

8.5.4 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.

8.5.5 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.

8.5.6 SAR Measurement Conditions for DC-HSDPA

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

8.6 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).

8.6.1 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.

8.6.2 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.

8.6.3 A-MPR

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

8.6.4 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.

8.6.5 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.

8.6.6 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.

8.7 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.

8.7.1 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.

8.7.2 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.

8.7.3 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.

8.7.4 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.

8.7.5 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.

8.7.6 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.

8.7.7 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 8.7.6). When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.7.8 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.

8.7.9 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.

9.1 CDMA Conducted Powers

Table 9-1
Maximum Conducted Powers

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	24.17	24.19	24.20	24.17	24.16	24.16	23.98
Cellular	1013	22H	824.7	24.69	24.70	24.72	24.67	24.67	24.66	24.48
	384	22H	836.52	24.58	24.46	24.58	24.53	24.52	24.52	24.33
	777	22H	848.31	24.60	24.59	24.62	24.56	24.57	24.54	24.38
PCS	25	24E	1851.25	24.50	24.54	24.57	24.53	24.56	24.38	24.33
	600	24E	1880	24.54	24.49	24.61	24.57	24.59	24.41	24.37
	1175	24E	1908.75	24.18	24.24	24.25	24.24	24.25	24.22	24.03

Table 9-2
Reduced Conducted Powers – Hotspot Mode Active

Band	Channel	Rule Part	Frequency	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	24E	1851.25	19.80	19.78	19.81	19.82
	600	24E	1880	19.84	19.85	19.82	19.86
	1175	24E	1908.75	19.96	20.02	20.01	20.00

Table 9-3
Reduced Conducted Powers – Grip Sensor Active

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	24E	1851.25	20.77	20.80	20.85	20.80	20.81	20.83	20.81
	600	24E	1880	20.82	20.85	20.95	20.85	20.84	20.85	20.85
	1175	24E	1908.75	20.99	21.02	21.05	21.01	20.99	21.02	21.00

Note:

1. RC1 is only applicable for IS-95 compatibility. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v06 4.1.g), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.
2. CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1X Advanced was not more than 0.25 dB higher than the maximum powers for 1X.

Figure 9-1
Power Measurement Setup

9.2 GSM Conducted Powers

Table 9-4
Maximum Conducted Power

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	32.67	32.67	30.72	**29.23**	27.13	26.78	24.89	23.42	21.72
	190	32.79	32.75	30.79	**29.35**	27.22	26.81	24.92	23.33	21.78
	251	33.03	33.03	30.85	**29.48**	27.38	27.03	24.74	23.43	21.97
GSM 1900	512	30.60	30.63	27.66	**26.52**	24.26	25.75	23.68	22.06	20.58
	661	30.83	30.84	27.81	**26.69**	24.51	25.97	23.85	22.24	20.75
	810	30.87	30.88	27.91	**26.77**	24.60	26.10	23.96	22.28	20.85

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	23.64	23.64	24.70	**24.97**	24.12	17.75	18.87	19.16	18.71
	190	23.76	23.72	24.77	**25.09**	24.21	17.78	18.90	19.07	18.77
	251	24.00	24.00	24.83	**25.22**	24.37	18.00	18.72	19.17	18.96
GSM 1900	512	21.57	21.60	21.64	**22.26**	21.25	16.72	17.66	17.80	17.57
	661	21.80	21.81	21.79	**22.43**	21.50	16.94	17.83	17.98	17.74
	810	21.84	21.85	21.89	**22.51**	21.59	17.07	17.94	18.02	17.84

GSM 850	Frame Avg.Targets:	23.97	23.97	24.98	**25.24**	24.49	17.97	18.98	19.24	18.99
GSM 1900		21.97	21.97	21.98	**22.74**	21.99	16.97	17.98	18.24	17.99

Table 9-5
Reduced Conducted Powers – Hotspot Mode Active

Maximum Burst-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	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	26.66	**25.52**	22.38	20.40	26.78	24.55	21.71	20.30
	190	26.59	**25.44**	22.31	20.19	26.75	24.56	21.66	20.32
	251	26.55	**25.47**	22.27	20.13	26.82	24.65	21.77	20.35

Calculated Maximum Frame-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	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	17.63	**19.50**	18.12	17.39	17.75	18.53	17.45	17.29
	190	17.56	**19.42**	18.05	17.18	17.72	18.54	17.40	17.31
	251	17.52	**19.45**	18.01	17.12	17.79	18.63	17.51	17.34
GSM 850	Frame Avg.Targets:	17.97	**19.98**	18.74	17.99	17.97	18.98	17.74	17.99

Table 9-6
Reduced Conducted Powers – Grip Sensor/Proximity Sensor Active

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	26.95	26.99	**25.52**	22.38	20.40	26.78	24.55	21.71	20.30
	190	26.98	27.01	**25.44**	22.31	20.19	26.75	24.56	21.66	20.32
	251	27.01	27.07	**25.47**	22.27	20.13	26.82	24.65	21.77	20.35

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	17.92	17.96	**19.50**	18.12	17.39	17.75	18.53	17.45	17.29
	190	17.95	17.98	**19.42**	18.05	17.18	17.72	18.54	17.40	17.31
	251	17.98	18.04	**19.45**	18.01	17.12	17.79	18.63	17.51	17.34
GSM 850	Frame Avg.Targets:	17.97	17.97	**19.98**	18.74	17.99	17.97	18.98	17.74	17.99

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

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

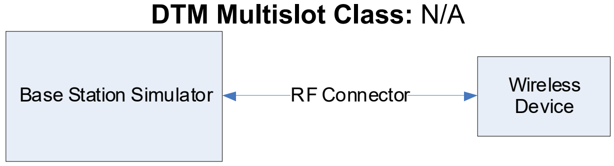

Figure 9-2
Power Measurement Setup

9.3 UMTS Conducted Powers

Table 9-7
Maximum Conducted Power

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.73	23.68	23.52	24.22	24.49	24.50	24.22	24.43	24.47	-
99		12.2 kbps AMR	23.67	23.56	23.39	24.21	24.48	24.49	24.15	24.41	24.44	-
6	HSDPA	Subtest 1	23.22	22.74	23.28	23.55	23.38	23.85	24.21	23.68	23.77	0
6		Subtest 2	23.24	22.71	23.37	23.61	23.42	23.87	24.31	23.74	23.80	0
6		Subtest 3	22.73	22.21	22.85	23.12	22.93	23.39	23.80	23.25	23.27	0.5
6		Subtest 4	22.72	22.25	22.88	23.11	22.93	23.39	23.78	23.25	23.33	0.5
6	HSUPA	Subtest 1	23.33	22.71	23.44	23.71	23.54	23.95	24.31	23.85	23.90	0
6		Subtest 2	21.26	20.81	21.44	21.78	21.54	22.02	22.35	21.87	21.98	2
6		Subtest 3	21.30	20.83	21.45	22.73	22.52	23.00	23.38	22.90	22.97	1
6		Subtest 4	21.13	20.65	21.28	21.81	21.52	22.00	22.16	21.86	21.97	2
6		Subtest 5	23.32	22.77	23.43	23.67	23.48	23.95	24.32	23.77	23.84	0
8	DC-HSDPA	Subtest 1	23.16	22.56	23.31	23.66	23.92	23.99	24.50	24.01	24.19	0
8		Subtest 2	23.16	22.58	23.28	23.66	23.93	23.98	24.48	23.97	24.18	0
8		Subtest 3	22.65	22.08	22.79	23.16	23.56	23.64	24.03	23.44	23.66	0.5
8		Subtest 4	22.55	22.07	22.85	23.30	23.56	23.63	24.06	23.48	23.71	0.5

Table 9-8
Reduced Conducted Powers – Hotspot Mode Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	19.84	20.18	20.04	19.91	19.86	19.99	-
99		12.2 kbps AMR	19.74	20.18	20.05	19.90	19.86	19.97	-
6	HSDPA	Subtest 1	19.40	19.24	19.74	19.31	19.00	19.48	0
6		Subtest 2	19.41	19.25	19.75	19.35	19.02	19.46	0
6		Subtest 3	18.87	18.57	19.24	18.85	18.51	18.98	0.5
6		Subtest 4	18.91	18.56	19.25	18.81	18.53	19.00	0.5
6	HSUPA	Subtest 1	19.41	19.25	19.61	19.37	19.01	19.41	0
6		Subtest 2	17.33	17.15	17.60	17.29	17.02	17.31	2
6		Subtest 3	18.38	18.09	18.63	18.31	18.02	18.38	1
6		Subtest 4	17.31	17.11	17.65	17.31	16.98	17.41	2
6		Subtest 5	19.38	19.01	19.72	19.30	18.99	19.34	0
8	DC-HSDPA	Subtest 1	19.34	18.91	19.60	19.19	19.31	19.34	0
8		Subtest 2	19.28	18.87	19.58	19.21	19.28	19.26	0
8		Subtest 3	18.77	18.41	19.08	18.72	18.74	18.76	0.5
8		Subtest 4	18.78	18.39	19.10	18.75	18.76	18.79	0.5

Table 9-9
Reduced Conducted Powers – Grip Sensor Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	20.22	20.67	20.53	20.91	20.86	21.09	-
99		12.2 kbps AMR	20.32	20.66	20.52	20.90	20.85	21.08	-
6	HSDPA	Subtest 1	19.79	19.53	20.08	20.22	19.89	20.33	0
6		Subtest 2	19.77	19.51	20.11	20.22	19.89	20.37	0
6		Subtest 3	19.29	19.01	19.59	19.71	19.38	19.85	0.5
6		Subtest 4	19.27	19.00	19.61	19.70	19.40	19.87	0.5
6	HSUPA	Subtest 1	19.76	19.56	20.14	20.26	19.95	20.42	0
6		Subtest 2	17.91	17.66	18.17	18.21	17.93	18.42	2
6		Subtest 3	18.89	18.62	19.16	19.26	18.95	19.44	1
6		Subtest 4	17.92	17.66	18.18	18.21	17.94	18.43	2
6		Subtest 5	19.92	19.60	20.17	20.24	19.92	20.39	0
8	DC-HSDPA	Subtest 1	20.06	20.04	20.25	20.49	20.13	20.48	0
8		Subtest 2	20.03	20.05	20.26	20.48	20.15	20.49	0
8		Subtest 3	19.60	19.58	19.80	19.99	19.67	20.00	0.5
8		Subtest 4	19.60	19.56	19.78	20.00	19.66	19.98	0.5

DC-HSDPA considerations

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

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

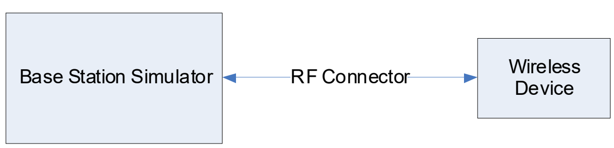

Figure 9-3
Power Measurement Setup

9.4 LTE Conducted Powers

9.4.1 LTE Band 71

Table 9-10
LTE Band 71 Conducted Powers - 20 MHz Bandwidth

LTE Band 71 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 133297 (680.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.83**	0	0
	1	50	24.67		0
	1	99	24.49		0
	50	0	**23.78**	0-1	1
	50	25	23.71		1
	50	50	23.60		1
	100	0	23.67		1
16QAM	1	0	24.00	0-1	1
	1	50	23.96		1
	1	99	23.84		1
	50	0	22.81	0-2	2
	50	25	22.73		2
	50	50	22.65		2
	100	0	22.63		2
64QAM	1	0	23.00	0-2	2
	1	50	22.96		2
	1	99	22.84		2
	50	0	21.86	0-3	3
	50	25	21.83		3
	50	50	21.79		3
	100	0	21.78		3

Note: LTE Band 71 at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-11
LTE Band 71 Conducted Powers - 15 MHz Bandwidth

LTE Band 71 15 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 133297 (680.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.72	0	0
	1	36	24.78		0
	1	74	24.64		0
	36	0	23.79	0-1	1
	36	18	23.70		1
	36	37	23.59		1
	75	0	23.60		1
16QAM	1	0	23.95	0-1	1
	1	36	23.85		1
	1	74	23.67		1
	36	0	22.70	0-2	2
	36	18	22.64		2
	36	37	22.54		2
	75	0	22.57		2
64QAM	1	0	22.97	0-2	2
	1	36	22.89		2
	1	74	22.69		2
	36	0	21.75	0-3	3
	36	18	21.74		3
	36	37	21.62		3
	75	0	21.54		3

Note: LTE Band 71 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 71 Conducted Powers - 10 MHz Bandwidth

LTE Band 71 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 133172 (668.0 MHz) Conducted Power [dBm]	Mid Channel 133297 (680.5 MHz) Conducted Power [dBm]	High Channel 133422 (693.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.00	24.61	24.31	0	0
	1	25	24.36	24.52	24.22		0
	1	49	24.29	24.44	24.12		0
	25	0	23.58	23.71	23.39	0-1	1
	25	12	23.52	23.67	23.33		1
	25	25	23.52	23.58	23.29		1
	50	0	23.53	23.56	23.35		1
16QAM	1	0	23.20	23.97	23.48	0-1	1
	1	25	23.61	23.88	23.41		1
	1	49	23.53	23.84	23.33		1
	25	0	22.57	22.69	22.38	0-2	2
	25	12	22.56	22.65	22.37		2
	25	25	22.51	22.62	22.31		2
	50	0	22.59	22.72	22.39		2
64QAM	1	0	22.07	23.00	22.38	0-2	2
	1	25	22.49	22.98	22.30		2
	1	49	22.37	22.81	22.16		2
	25	0	21.69	21.72	21.46	0-3	3
	25	12	21.68	21.70	21.47		3
	25	25	21.61	21.65	21.44		3
	50	0	21.55	21.71	21.41		3

Table 9-13
LTE Band 71 Conducted Powers - 5 MHz Bandwidth

LTE Band 71 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 133147 (665.5 MHz)	Mid Channel 133297 (680.5 MHz)	High Channel 133447 (695.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.00	24.63	24.17	0	0
	1	12	24.62	24.57	24.09		0
	1	24	24.60	24.53	24.08		0
	12	0	23.39	23.62	23.18	0-1	1
	12	6	23.63	23.60	23.20		1
	12	13	23.60	23.61	23.17		1
	25	0	23.61	23.57	23.18		1
16QAM	1	0	23.39	24.00	23.56	0-1	1
	1	12	23.95	23.94	23.51		1
	1	24	23.90	23.94	23.49		1
	12	0	22.45	22.65	22.21	0-2	2
	12	6	22.68	22.67	22.23		2
	12	13	22.64	22.64	22.20		2
	25	0	22.66	22.68	22.24		2
64QAM	1	0	22.24	23.00	22.65	0-2	2
	1	12	22.79	22.98	22.68		2
	1	24	22.73	22.95	22.64		2
	12	0	21.46	21.69	21.25	0-3	3
	12	6	21.71	21.71	21.25		3
	12	13	21.62	21.67	21.21		3
	25	0	21.67	21.61	21.14		3

9.4.2 LTE Band 12

Table 9-14
LTE Band 12 Conducted Powers - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.05**	0	0
	1	25	23.97		0
	1	49	23.90		0
	25	0	**23.03**	0-1	1
	25	12	23.01		1
	25	25	22.94		1
	50	0	22.97		1
16QAM	1	0	23.12	0-1	1
	1	25	23.05		1
	1	49	22.93		1
	25	0	22.05	0-2	2
	25	12	22.02		2
	25	25	21.94		2
	50	0	21.98		2
64QAM	1	0	22.17	0-2	2
	1	25	22.13		2
	1	49	22.02		2
	25	0	21.07	0-3	3
	25	12	21.06		3
	25	25	20.96		3
	50	0	21.03		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 9-15
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	24.06	24.08	23.95	0	0
	1	12	23.93	24.15	24.15		0
	1	24	23.99	24.00	24.00		0
	12	0	23.00	23.23	23.04	0-1	1
	12	6	22.97	23.23	23.22		1
	12	13	22.98	23.13	23.42		1
	25	0	22.95	23.15	23.21		1
16QAM	1	0	23.28	23.27	23.29	0-1	1
	1	12	23.15	23.36	23.47		1
	1	24	23.22	23.21	23.35		1
	12	0	21.98	22.22	22.03	0-2	2
	12	6	21.96	22.25	22.22		2
	12	13	21.98	22.15	22.42		2
	25	0	21.82	22.16	22.24		2
64QAM	1	0	22.02	22.21	22.27	0-2	2
	1	12	22.07	22.18	22.21		2
	1	24	21.97	22.00	22.07		2
	12	0	21.13	21.23	21.26	0-3	3
	12	6	21.14	21.27	21.26		3
	12	13	21.09	21.20	21.25		3
	25	0	21.08	21.23	21.23		3

Table 9-16
LTE Band 12 Conducted Powers - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.84	23.93	24.19	0	0
	1	7	23.94	24.03	24.22		0
	1	14	23.81	23.89	23.91		0
	8	0	22.94	23.07	23.20	0-1	1
	8	4	22.95	23.03	23.23		1
	8	7	22.87	23.05	23.22		1
	15	0	22.95	23.02	23.20		1
16QAM	1	0	23.11	23.31	23.34	0-1	1
	1	7	23.15	23.43	23.37		1
	1	14	23.04	23.28	23.06		1
	8	0	22.00	22.11	22.27	0-2	2
	8	4	21.98	22.11	22.30		2
	8	7	21.94	22.10	22.26		2
	15	0	21.90	22.00	22.22		2
64QAM	1	0	21.96	22.20	22.36	0-2	2
	1	7	21.99	22.31	22.51		2
	1	14	21.94	22.20	22.27		2
	8	0	20.93	21.20	21.25	0-3	3
	8	4	20.95	21.23	21.38		3
	8	7	20.90	21.18	21.25		3
	15	0	20.91	21.20	21.38		3

Table 9-17
LTE Band 12 Conducted Powers -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.98	24.34	24.23	0	0
	1	2	24.03	24.39	24.29		0
	1	5	23.94	24.31	24.22		0
	3	0	24.00	24.33	24.23		0
	3	2	24.05	24.33	24.31		0
	3	3	24.00	24.30	24.25		0
	6	0	23.04	23.33	23.29	0-1	1
16QAM	1	0	23.23	23.21	23.36	0-1	1
	1	2	23.29	23.25	23.41		1
	1	5	23.26	23.16	23.34		1
	3	0	22.92	23.35	23.31		1
	3	2	23.02	23.39	23.38		1
	3	3	22.96	23.37	23.28		1
	6	0	22.12	22.49	22.38	0-2	2
64QAM	1	0	21.93	22.65	22.38	0-2	2
	1	2	21.96	22.72	22.41		2
	1	5	21.94	22.59	22.31		2
	3	0	22.00	22.46	22.47		2
	3	2	22.06	22.51	22.49		2
	3	3	22.01	22.46	22.50		2
	6	0	21.10	21.40	21.53	0-3	3

9.4.3 LTE Band 13

Table 9-18
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	**23.83**	0	0
	1	25	23.70		0
	1	49	23.60		0
	25	0	**22.87**	0-1	1
	25	12	22.81		1
	25	25	22.70		1
	50	0	22.77		1
16QAM	1	0	22.91	0-1	1
	1	25	22.81		1
	1	49	22.68		1
	25	0	21.85	0-2	2
	25	12	21.81		2
	25	25	21.73		2
	50	0	21.81		2
64QAM	1	0	22.01	0-2	2
	1	25	21.87		2
	1	49	21.81		2
	25	0	20.86	0-3	3
	25	12	20.83		3
	25	25	20.75		3
	50	0	20.81		3

Table 9-19
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	23.42	0	0
	1	12	23.78		0
	1	24	23.75		0
	12	0	22.85	0-1	1
	12	6	22.67		1
	12	13	22.58		1
	25	0	22.51		1
16QAM	1	0	22.35	0-1	1
	1	12	22.32		1
	1	24	22.28		1
	12	0	21.84	0-2	2
	12	6	21.86		2
	12	13	21.64		2
	25	0	21.44		2
64QAM	1	0	21.39	0-2	2
	1	12	21.34		2
	1	24	21.44		2
	12	0	20.78	0-3	3
	12	6	20.79		3
	12	13	20.77		3
	25	0	20.60		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.

9.4.4 LTE Band 26 (Cell)

Table 9-20
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	**24.33**	0	0
	1	36	24.20		0
	1	74	24.03		0
	36	0	**23.29**	0-1	1
	36	18	23.25		1
	36	37	23.19		1
	75	0	23.22		1
16QAM	1	0	23.42	0-1	1
	1	36	23.33		1
	1	74	23.15		1
	36	0	22.30	0-2	2
	36	18	22.24		2
	36	37	22.13		2
	75	0	22.23		2
64QAM	1	0	22.55	0-2	2
	1	36	22.39		2
	1	74	22.19		2
	36	0	21.30	0-3	3
	36	18	21.28		3
	36	37	21.17		3
	75	0	21.21		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 9-21
LTE Band 26 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26740 (819.0 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 26990 (844.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.51	24.72	24.60	0	0
	1	25	24.59	24.64	24.58		0
	1	49	24.57	24.56	24.51		0
	25	0	23.31	23.20	23.13	0-1	1
	25	12	23.29	23.21	23.12		1
	25	25	23.25	23.13	23.05		1
	50	0	23.26	23.19	23.10		1
16QAM	1	0	23.07	23.01	22.97	0-1	1
	1	25	23.00	22.92	22.93		1
	1	49	22.93	22.92	22.86		1
	25	0	22.30	22.21	22.17	0-2	2
	25	12	22.34	22.22	22.14		2
	25	25	22.24	22.12	22.07		2
	50	0	22.26	22.18	22.11		2
64QAM	1	0	22.19	22.11	22.08	0-2	2
	1	25	22.16	22.09	22.16		2
	1	49	22.17	22.07	22.05		2
	25	0	21.16	21.04	21.02	0-3	3
	25	12	21.18	21.09	20.91		3
	25	25	21.08	21.07	20.87		3
	50	0	21.19	21.19	20.90		3

Table 9-22
LTE Band 26 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26715 (816.5 MHz)	26865 (831.5 MHz)	27015 (846.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.31	24.66	24.61	0	0
	1	12	24.41	24.62	24.58		0
	1	24	24.30	24.59	24.50		0
	12	0	23.06	23.18	23.07	0-1	1
	12	6	23.02	23.19	23.08		1
	12	13	23.02	23.15	23.03		1
	25	0	22.99	23.18	23.06		1
16QAM	1	0	23.14	23.04	22.84	0-1	1
	1	12	23.12	23.06	22.94		1
	1	24	23.06	22.97	23.06		1
	12	0	22.20	22.22	22.10	0-2	2
	12	6	22.19	22.22	22.11		2
	12	13	22.19	22.18	22.06		2
	25	0	22.21	22.14	22.04		2
64QAM	1	0	22.28	22.18	22.13	0-2	2
	1	12	22.24	22.18	22.10		2
	1	24	22.29	22.05	22.05		2
	12	0	21.29	21.05	21.05	0-3	3
	12	6	21.28	21.05	20.81		3
	12	13	21.29	21.02	20.95		3
	25	0	21.26	20.99	21.01		3

Table 9-23
LTE Band 26 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26705 (815.5 MHz)	26865 (831.5 MHz)	27025 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.32	24.63	24.53	0	0
	1	7	24.32	24.69	24.61		0
	1	14	24.31	24.57	24.49		0
	8	0	23.07	23.15	23.05	0-1	1
	8	4	23.17	23.16	23.06		1
	8	7	23.19	23.12	23.01		1
	15	0	23.17	23.13	23.01		1
16QAM	1	0	23.19	23.08	22.96	0-1	1
	1	7	23.21	23.16	23.09		1
	1	14	23.10	23.17	23.04		1
	8	0	22.28	22.18	22.03	0-2	2
	8	4	22.26	22.19	22.07		2
	8	7	22.28	22.14	22.04		2
	15	0	22.27	22.16	22.04		2
64QAM	1	0	22.31	22.16	21.93	0-2	2
	1	7	22.31	22.24	22.17		2
	1	14	22.28	22.01	21.96		2
	8	0	21.28	21.08	20.91	0-3	3
	8	4	21.29	21.04	20.85		3
	8	7	21.23	21.03	20.92		3
	15	0	21.26	21.14	21.02		3

Table 9-24
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	24.55	24.54	24.47	0	0
	1	2	24.61	24.58	24.51		0
	1	5	24.56	24.52	24.45		0
	3	0	24.59	24.46	24.44		0
	3	2	24.63	24.48	24.46		0
	3	3	24.60	24.47	24.39		0
	6	0	23.57	23.43	23.41	0-1	1
16QAM	1	0	23.69	23.38	23.35	0-1	1
	1	2	23.77	23.46	23.39		1
	1	5	23.70	23.37	23.33		1
	3	0	23.57	23.53	23.47		1
	3	2	23.62	23.56	23.54		1
	3	3	23.56	23.54	23.47		1
	6	0	22.72	22.62	22.61	0-2	2
64QAM	1	0	22.73	22.83	22.75	0-2	2
	1	2	22.80	22.94	22.84		2
	1	5	22.69	22.80	22.75		2
	3	0	22.81	22.64	22.58		2
	3	2	22.81	22.70	22.65		2
	3	3	22.78	22.65	22.56		2
	6	0	21.83	21.51	21.45	0-3	3

9.4.5 LTE Band 66 (AWS)

Table 9-25
LTE Band 66 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.60	**24.90**	24.74	0	0
	1	50	24.40	24.67	24.55		0
	1	99	24.41	24.59	24.54		0
	50	0	23.55	**23.83**	23.70	0-1	1
	50	25	23.50	23.73	23.67		1
	50	50	23.44	23.70	23.62		1
	100	0	23.53	23.77	23.66		1
16QAM	1	0	23.66	23.98	23.85	0-1	1
	1	50	23.50	23.80	23.63		1
	1	99	23.50	23.75	23.70		1
	50	0	22.59	22.83	22.72	0-2	2
	50	25	22.51	22.76	22.64		2
	50	50	22.50	22.68	22.59		2
	100	0	22.49	22.80	22.67		2
64QAM	1	0	22.69	23.00	22.96	0-2	2
	1	50	22.59	22.80	22.68		2
	1	99	22.60	22.76	22.75		2
	50	0	21.57	21.89	21.75	0-3	3
	50	25	21.51	21.79	21.69		3
	50	50	21.50	21.71	21.65		3
	100	0	21.51	21.80	21.66		3

Table 9-26
LTE Band 66 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132047 (1717.5 MHz)	132322 (1745.0 MHz)	132597 (1772.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.55	24.63	24.67	0	0
	1	36	24.37	24.50	24.58		0
	1	74	24.36	24.47	24.62		0
	36	0	23.39	23.76	23.66	0-1	1
	36	18	23.34	23.62	23.66		1
	36	37	23.28	23.58	23.62		1
	75	0	23.29	23.56	23.72		1
16QAM	1	0	23.71	23.91	23.84	0-1	1
	1	36	23.64	23.98	23.67		1
	1	74	23.65	23.99	23.77		1
	36	0	22.40	22.66	22.71	0-2	2
	36	18	22.38	22.59	22.70		2
	36	37	22.38	22.56	22.68		2
	75	0	22.34	22.62	22.67		2
64QAM	1	0	22.66	22.86	22.85	0-2	2
	1	36	22.60	22.71	22.71		2
	1	74	22.66	22.75	22.77		2
	36	0	21.34	21.68	21.74	0-3	3
	36	18	21.33	21.64	21.76		3
	36	37	21.29	21.60	21.73		3
	75	0	21.35	21.62	21.70		3

Table 9-27
LTE Band 66 (AWS) 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	24.27	24.53	24.64	0	0
	1	25	24.26	24.47	24.61		0
	1	49	24.22	24.45	24.63		0
	25	0	23.35	23.61	23.66	0-1	1
	25	12	23.35	23.58	23.69		1
	25	25	23.31	23.51	23.70		1
	50	0	23.32	23.55	23.68		1
16QAM	1	0	23.53	23.99	23.75	0-1	1
	1	25	23.49	24.00	23.72		1
	1	49	23.49	23.98	23.75		1
	25	0	22.37	22.61	22.71	0-2	2
	25	12	22.37	22.56	22.73		2
	25	25	22.39	22.60	22.70		2
	50	0	22.41	22.58	22.70		2
64QAM	1	0	22.25	22.80	22.78	0-2	2
	1	25	22.15	22.74	22.71		2
	1	49	22.14	22.73	22.78		2
	25	0	21.45	21.65	21.79	0-3	3
	25	12	21.42	21.63	21.78		3
	25	25	21.41	21.62	21.80		3
	50	0	21.41	21.61	21.74		3

Table 9-28
LTE Band 66 (AWS) 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	24.22	24.49	24.65	0	0
	1	12	24.21	24.46	24.56		0
	1	24	24.22	24.47	24.61		0
	12	0	23.24	23.57	23.63	0-1	1
	12	6	23.24	23.53	23.61		1
	12	13	23.19	23.48	23.60		1
	25	0	23.19	23.52	23.68		1
16QAM	1	0	23.46	23.70	23.80	0-1	1
	1	12	23.41	23.65	23.72		1
	1	24	23.45	23.69	23.75		1
	12	0	22.24	22.58	22.71	0-2	2
	12	6	22.23	22.55	22.69		2
	12	13	22.20	22.53	22.68		2
	25	0	22.25	22.58	22.66		2
64QAM	1	0	22.40	22.56	22.81	0-2	2
	1	12	22.34	22.49	22.76		2
	1	24	22.37	22.52	22.78		2
	12	0	21.34	21.54	21.75	0-3	3
	12	6	21.36	21.54	21.76		3
	12	13	21.31	21.55	21.72		3
	25	0	21.24	21.54	21.68		3

Table 9-29
LTE Band 66 (AWS) 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	24.13	24.48	24.64	0	0
	1	7	24.23	24.57	24.72		0
	1	14	24.15	24.46	24.63		0
	8	0	23.20	23.52	23.66	0-1	1
	8	4	23.25	23.55	23.62		1
	8	7	23.21	23.51	23.66		1
	15	0	23.20	23.54	23.66		1
16QAM	1	0	23.43	24.00	23.75	0-1	1
	1	7	23.58	23.99	23.81		1
	1	14	23.51	23.99	23.70		1
	8	0	22.33	22.61	22.64	0-2	2
	8	4	22.25	22.63	22.63		2
	8	7	22.20	22.65	22.62		2
	15	0	22.24	22.58	22.67		2
64QAM	1	0	22.12	22.76	22.75	0-2	2
	1	7	22.18	22.84	22.83		2
	1	14	22.05	22.72	22.74		2
	8	0	21.23	21.68	21.62	0-3	3
	8	4	21.24	21.67	21.63		3
	8	7	21.19	21.65	21.59		3
	15	0	21.25	21.59	21.80		3

Table 9-30
LTE Band 66 (AWS) 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)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.09	24.44	24.66	0	0
	1	2	24.15	24.48	24.71		0
	1	5	24.10	24.42	24.65		0
	3	0	24.23	24.38	24.60		0
	3	2	24.26	24.40	24.63		0
	3	3	24.27	24.35	24.60		0
	6	0	23.25	23.39	23.54	0-1	1
16QAM	1	0	23.43	23.32	23.53	0-1	1
	1	2	23.49	23.35	23.56		1
	1	5	23.45	23.25	23.50		1
	3	0	23.12	23.43	23.61		1
	3	2	23.18	23.50	23.71		1
	3	3	23.12	23.46	23.66		1
	6	0	22.30	22.54	22.73	0-2	2
64QAM	1	0	22.16	22.70	22.90	0-2	2
	1	2	22.16	22.89	23.00		2
	1	5	22.13	22.69	22.89		2
	3	0	22.25	22.65	22.76		2
	3	2	22.29	22.71	22.83		2
	3	3	22.26	22.66	22.79		2
	6	0	21.30	21.50	21.71	0-3	3

Table 9-31
LTE Band 66 (AWS) Reduced Conducted Powers - 20 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

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	20.64	20.91	**20.96**	0	0
	1	50	20.41	20.69	20.74		0
	1	99	20.36	20.66	20.78		0
	50	0	20.59	20.87	**20.95**	0-1	0
	50	25	20.51	20.78	20.87		0
	50	50	20.42	20.72	20.82		0
	100	0	20.51	20.79	20.89		0
16QAM	1	0	20.78	21.00	20.99	0-1	0
	1	50	20.62	20.88	20.97		0
	1	99	20.61	20.85	20.99		0
	50	0	20.58	20.83	20.95	0-2	0
	50	25	20.51	20.80	20.84		0
	50	50	20.42	20.71	20.83		0
	100	0	20.49	20.77	20.90		0
64QAM	1	0	20.80	21.00	20.97	0-2	0
	1	50	20.63	20.83	21.00		0
	1	99	20.54	20.80	20.93		0
	50	0	20.65	20.88	20.94	0-3	0
	50	25	20.54	20.81	20.92		0
	50	50	20.52	20.73	20.86		0
	100	0	20.53	20.79	20.91		0

Table 9-32
LTE Band 66 (AWS) Reduced Conducted Powers - 15 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

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	20.38	20.70	20.67	0	0
	1	36	20.20	20.46	20.52		0
	1	74	20.14	20.39	20.51		0
	36	0	20.32	20.61	20.66	0-1	0
	36	18	20.28	20.52	20.63		0
	36	37	20.19	20.49	20.56		0
	75	0	20.27	20.58	20.62		0
16QAM	1	0	20.53	20.88	20.93	0-1	0
	1	36	20.43	20.69	20.69		0
	1	74	20.37	20.63	20.75		0
	36	0	20.31	20.63	20.68	0-2	0
	36	18	20.27	20.56	20.65		0
	36	37	20.20	20.48	20.61		0
	75	0	20.24	20.54	20.62		0
64QAM	1	0	20.41	20.70	20.76	0-2	0
	1	36	20.23	20.47	20.62		0
	1	74	20.16	20.41	20.61		0
	36	0	20.30	20.60	20.68	0-3	0
	36	18	20.25	20.53	20.64		0
	36	37	20.18	20.46	20.61		0
	75	0	20.25	20.55	20.62		0

Table 9-33
LTE Band 66 (AWS) Reduced Conducted Powers - 10 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

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	20.23	20.50	20.56	0	0
	1	25	20.14	20.38	20.48		0
	1	49	20.07	20.29	20.44		0
	25	0	20.22	20.49	20.55	0-1	0
	25	12	20.23	20.46	20.55		0
	25	25	20.17	20.39	20.49		0
	50	0	20.21	20.42	20.53		0
16QAM	1	0	20.40	20.66	20.70	0-1	0
	1	25	20.33	20.59	20.67		0
	1	49	20.33	20.56	20.68		0
	25	0	20.25	20.50	20.54	0-2	0
	25	12	20.24	20.47	20.56		0
	25	25	20.15	20.38	20.51		0
	50	0	20.19	20.45	20.54		0
64QAM	1	0	20.22	20.50	20.59	0-2	0
	1	25	20.19	20.45	20.55		0
	1	49	20.16	20.33	20.48		0
	25	0	20.23	20.48	20.56	0-3	0
	25	12	20.22	20.43	20.53		0
	25	25	20.16	20.39	20.51		0
	50	0	20.20	20.44	20.53		0

Table 9-34
LTE Band 66 (AWS) Reduced Conducted Powers - 5 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

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	20.07	20.37	20.44	0	0
	1	12	20.03	20.29	20.43		0
	1	24	20.00	20.25	20.40		0
	12	0	20.05	20.36	20.48	0-1	0
	12	6	20.09	20.35	20.46		0
	12	13	20.05	20.30	20.43		0
	25	0	20.04	20.34	20.44		0
16QAM	1	0	20.27	20.58	20.63	0-1	0
	1	12	20.19	20.52	20.67		0
	1	24	20.17	20.49	20.62		0
	12	0	20.09	20.37	20.50	0-2	0
	12	6	20.11	20.40	20.51		0
	12	13	20.06	20.35	20.46		0
	25	0	20.06	20.33	20.46		0
64QAM	1	0	20.08	20.41	20.49	0-2	0
	1	12	20.06	20.37	20.47		0
	1	24	20.03	20.33	20.46		0
	12	0	20.04	20.34	20.46	0-3	0
	12	6	20.05	20.34	20.45		0
	12	13	20.01	20.29	20.41		0
	25	0	20.06	20.33	20.47		0

Table 9-35
LTE Band 66 (AWS) Reduced Conducted Powers - 3 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

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	20.00	20.29	20.41	0	0
	1	7	20.09	20.40	20.54		0
	1	14	19.97	20.25	20.38		0
	8	0	20.02	20.36	20.47	0-1	0
	8	4	20.05	20.35	20.46		0
	8	7	20.05	20.32	20.46		0
	15	0	20.02	20.33	20.44		0
16QAM	1	0	20.16	20.53	20.67	0-1	0
	1	7	20.28	20.69	20.72		0
	1	14	20.17	20.51	20.64		0
	8	0	20.08	20.41	20.51	0-2	0
	8	4	20.10	20.42	20.53		0
	8	7	20.06	20.38	20.51		0
	15	0	20.02	20.32	20.45		0
64QAM	1	0	20.00	20.38	20.48	0-2	0
	1	7	20.18	20.44	20.58		0
	1	14	20.03	20.34	20.46		0
	8	0	20.04	20.34	20.45	0-3	0
	8	4	20.05	20.38	20.48		0
	8	7	20.02	20.32	20.43		0
	15	0	20.03	20.33	20.44		0

Table 9-36
LTE Band 66 (AWS) Reduced Conducted Powers -1.4 MHz Bandwidth– Hotspot Mode/Grip Sensor Active

LTE Band 66 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.95	20.24	20.37	0	0
	1	2	20.01	20.31	20.45		0
	1	5	19.93	20.22	20.37		0
	3	0	19.97	20.28	20.38		0
	3	2	20.02	20.23	20.43		0
	3	3	19.96	20.26	20.41		0
	6	0	19.98	20.28	20.40	0-1	0
16QAM	1	0	20.17	20.51	20.62	0-1	0
	1	2	20.22	20.56	20.69		0
	1	5	20.19	20.48	20.62		0
	3	0	20.09	20.40	20.53		0
	3	2	20.14	20.46	20.59		0
	3	3	20.02	20.39	20.54		0
	6	0	20.04	20.35	20.48	0-2	0
64QAM	1	0	19.96	20.27	20.43	0-2	0
	1	2	20.05	20.36	20.49		0
	1	5	19.91	20.24	20.43		0
	3	0	20.07	20.34	20.44		0
	3	2	20.08	20.38	20.52		0
	3	3	20.04	20.32	20.42		0
	6	0	19.92	20.23	20.35	0-3	0

9.4.6 LTE Band 25 (PCS)

Table 9-37
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.26	24.32	**24.41**	0	0
	1	50	23.95	24.10	24.12		0
	1	99	23.92	24.05	24.11		0
	50	0	23.22	23.24	**23.29**	0-1	1
	50	25	23.11	23.15	23.20		1
	50	50	23.04	23.12	23.12		1
	100	0	23.12	23.20	23.25		1
16QAM	1	0	23.31	23.44	23.47	0-1	1
	1	50	23.10	23.20	23.21		1
	1	99	23.09	23.18	23.16		1
	50	0	22.18	22.23	22.28	0-2	2
	50	25	22.07	22.18	22.21		2
	50	50	22.04	22.13	22.17		2
	100	0	22.12	22.17	22.22		2
64QAM	1	0	22.46	22.56	22.60	0-2	2
	1	50	22.16	22.29	22.32		2
	1	99	22.12	22.28	22.39		2
	50	0	21.18	21.35	21.32	0-3	3
	50	25	21.15	21.27	21.25		3
	50	50	21.05	21.23	21.20		3
	100	0	21.14	21.28	21.27		3

Table 9-38
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.44	24.13	24.44	0	0
	1	36	24.24	24.05	24.23		0
	1	74	24.25	24.45	24.14		0
	36	0	23.16	23.09	23.25	0-1	1
	36	18	23.11	23.31	23.20		1
	36	37	23.02	23.25	23.20		1
	75	0	23.09	23.22	23.22		1
16QAM	1	0	23.09	23.15	23.45	0-1	1
	1	36	22.84	23.00	22.89		1
	1	74	22.83	22.98	22.93		1
	36	0	22.19	22.36	22.28	0-2	2
	36	18	22.12	22.30	22.22		2
	36	37	22.04	22.28	22.20		2
	75	0	22.09	22.31	22.22		2
64QAM	1	0	22.22	22.40	22.35	0-2	2
	1	36	22.01	22.28	22.13		2
	1	74	22.01	22.26	22.16		2
	36	0	21.17	21.39	21.29	0-3	3
	36	18	21.15	21.33	21.22		3
	36	37	21.08	21.23	21.18		3
	75	0	21.11	21.32	21.24		3

Table 9-39
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.12	24.29	24.41	0	0
	1	25	24.03	24.23	24.35		0
	1	49	24.00	24.22	24.33		0
	25	0	23.03	23.33	23.22	0-1	1
	25	12	22.98	23.32	23.21		1
	25	25	22.94	23.23	23.16		1
	50	0	22.98	23.28	23.20		1
16QAM	1	0	23.14	22.97	23.40	0-1	1
	1	25	23.04	23.04	23.30		1
	1	49	23.03	23.01	23.34		1
	25	0	22.01	22.32	22.23	0-2	2
	25	12	22.01	22.33	22.22		2
	25	25	21.93	22.22	22.18		2
	50	0	22.01	22.27	22.18		2
64QAM	1	0	22.24	22.36	22.50	0-2	2
	1	25	21.89	22.21	22.38		2
	1	49	21.82	22.17	22.46		2
	25	0	21.07	21.33	21.23	0-3	3
	25	12	21.03	21.31	21.22		3
	25	25	20.97	21.26	21.19		3
	50	0	21.01	21.32	21.24		3

Table 9-40
LTE Band 25 (PCS) 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	23.99	24.33	24.27	0	0
	1	12	23.92	24.23	24.25		0
	1	24	23.92	24.18	24.28		0
	12	0	23.00	23.25	23.27	0-1	1
	12	6	23.00	23.28	23.31		1
	12	13	22.94	23.22	23.22		1
	25	0	22.99	23.24	23.27		1
16QAM	1	0	23.02	23.12	23.34	0-1	1
	1	12	22.94	23.05	22.98		1
	1	24	22.97	22.98	23.01		1
	12	0	22.04	22.24	22.32	0-2	2
	12	6	22.04	22.33	22.22		2
	12	13	21.98	22.27	22.21		2
	25	0	21.97	22.26	22.26		2
64QAM	1	0	22.43	22.34	22.71	0-2	2
	1	12	21.95	22.27	22.69		2
	1	24	21.90	22.29	22.70		2
	12	0	21.03	21.31	21.28	0-3	3
	12	6	21.03	21.31	21.28		3
	12	13	20.96	21.28	21.27		3
	25	0	20.98	21.31	21.28		3

Table 9-41
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.06	24.25	24.23	0	0
	1	7	24.12	24.34	24.33		0
	1	14	24.02	24.22	24.19		0
	8	0	23.13	23.34	23.30	0-1	1
	8	4	23.11	23.35	23.30		1
	8	7	23.11	23.31	23.25		1
	15	0	23.11	23.33	23.29		1
16QAM	1	0	23.35	23.78	23.37	0-1	1
	1	7	23.39	23.88	23.50		1
	1	14	23.29	23.77	23.31		1
	8	0	22.11	22.46	22.28	0-2	2
	8	4	22.09	22.41	22.27		2
	8	7	22.11	22.46	22.24		2
	15	0	22.11	22.35	22.30		2
64QAM	1	0	22.06	22.56	22.40	0-2	2
	1	7	22.09	22.60	22.47		2
	1	14	21.99	22.49	22.39		2
	8	0	21.13	21.47	21.26	0-3	3
	8	4	21.17	21.50	21.25		3
	8	7	21.14	21.48	21.26		3
	15	0	21.17	21.40	21.47		3

Table 9-42
LTE Band 25 (PCS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 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	24.00	24.18	24.10	0	0
	1	2	24.04	24.25	24.16		0
	1	5	23.95	24.16	24.04		0
	3	0	24.02	24.20	24.18		0
	3	2	24.06	24.25	24.21		0
	3	3	24.04	24.22	24.18		0
	6	0	23.03	23.25	23.23	0-1	1
16QAM	1	0	23.25	23.31	23.41	0-1	1
	1	2	23.31	23.37	23.43		1
	1	5	23.27	23.32	23.41		1
	3	0	22.96	23.24	23.09		1
	3	2	23.03	23.28	23.11		1
	3	3	23.00	23.21	23.06		1
	6	0	22.12	22.32	22.28	0-2	2
64QAM	1	0	21.78	22.31	22.10	0-2	2
	1	2	21.82	22.40	22.12		2
	1	5	21.78	22.31	22.13		2
	3	0	22.08	22.43	22.18		2
	3	2	22.09	22.47	22.24		2
	3	3	22.07	22.41	22.20		2
	6	0	21.01	21.50	21.29	0-3	3

Table 9-43
Reduced LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.19	**20.24**	20.06	0	0
	1	50	19.93	20.00	19.78		0
	1	99	19.89	19.93	19.76		0
	50	0	20.16	**20.20**	19.96	0-1	0
	50	25	20.04	20.14	19.91		0
	50	50	19.95	20.02	19.82		0
	100	0	20.03	20.12	19.93		0
16QAM	1	0	20.40	20.50	20.28	0-1	0
	1	50	20.22	20.24	20.07		0
	1	99	20.17	20.16	19.98		0
	50	0	20.13	20.22	20.01	0-2	0
	50	25	20.05	20.14	19.91		0
	50	50	20.00	20.04	19.84		0
	100	0	20.06	20.13	19.94		0
64QAM	1	0	20.37	20.42	20.23	0-2	0
	1	50	20.18	20.22	19.96		0
	1	99	20.09	20.13	19.93		0
	50	0	20.18	20.23	20.04	0-3	0
	50	25	20.09	20.16	19.95		0
	50	50	20.03	20.10	19.88		0
	100	0	20.08	20.16	19.96		0

Table 9-44
Reduced LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.07	20.16	19.92	0	0
	1	36	19.87	19.95	19.72		0
	1	74	19.79	19.88	19.72		0
	36	0	19.98	20.12	19.87	0-1	0
	36	18	19.95	20.02	19.86		0
	36	37	19.87	20.00	19.79		0
	75	0	19.95	20.15	19.80		0
16QAM	1	0	20.33	20.41	20.22	0-1	0
	1	36	20.17	20.20	20.05		0
	1	74	20.07	20.12	20.04		0
	36	0	20.02	20.12	19.91	0-2	0
	36	18	19.97	20.05	19.86		0
	36	37	19.93	19.98	19.82		0
	75	0	19.95	20.04	19.86		0
64QAM	1	0	20.16	20.21	20.00	0-2	0
	1	36	19.94	20.04	19.79		0
	1	74	19.82	19.96	19.82		0
	36	0	20.01	20.10	19.93	0-3	0
	36	18	19.96	20.05	19.86		0
	36	37	19.89	19.98	19.82		0
	75	0	19.97	20.04	19.86		0

Table 9-45
Reduced LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.03	20.14	19.92	0	0
	1	25	19.86	19.91	19.71		0
	1	49	19.75	19.92	19.68		0
	25	0	19.94	20.12	19.87	0-1	0
	25	12	19.91	20.05	19.87		0
	25	25	19.87	19.99	19.79		0
	50	0	19.99	20.14	19.84		0
16QAM	1	0	20.32	20.43	20.21	0-1	0
	1	25	20.20	20.21	20.04		0
	1	49	20.08	20.16	20.05		0
	25	0	19.99	20.09	19.92	0-2	0
	25	12	19.99	20.03	19.87		0
	25	25	19.97	20.01	19.80		0
	50	0	19.91	20.08	19.82		0
64QAM	1	0	20.20	20.24	20.00	0-2	0
	1	25	19.92	20.04	19.81		0
	1	49	19.83	20.00	19.81		0
	25	0	20.04	20.11	19.90	0-3	0
	25	12	19.93	20.07	19.84		0
	25	25	19.88	20.02	19.79		0
	50	0	19.97	20.05	19.88		0

Table 9-46
Reduced LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.04	20.11	19.88	0	0
	1	12	19.90	19.95	19.72		0
	1	24	19.78	19.88	19.66		0
	12	0	19.95	20.14	19.83	0-1	0
	12	6	19.92	20.02	19.86		0
	12	13	19.85	19.98	19.80		0
	25	0	20.03	20.17	19.81		0
16QAM	1	0	20.30	20.41	20.18	0-1	0
	1	12	20.19	20.24	20.03		0
	1	24	20.10	20.19	20.01		0
	12	0	19.95	20.08	19.91	0-2	0
	12	6	19.99	20.01	19.83		0
	12	13	19.94	20.05	19.78		0
	25	0	19.88	20.11	19.83		0
64QAM	1	0	20.24	20.25	20.04	0-2	0
	1	12	19.90	20.02	19.81		0
	1	24	19.80	19.96	19.83		0
	12	0	20.02	20.09	19.89	0-3	0
	12	6	19.95	20.09	19.86		0
	12	13	19.89	20.03	19.79		0
	25	0	19.98	20.07	19.85		0

Table 9-47
Reduced LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.05	20.08	19.85	0	0
	1	7	19.90	19.96	19.70		0
	1	14	19.80	19.91	19.70		0
	8	0	19.94	20.16	19.85	0-1	0
	8	4	19.95	20.04	19.82		0
	8	7	19.82	19.97	19.78		0
	15	0	20.07	20.14	19.81		0
16QAM	1	0	20.30	20.45	20.19	0-1	0
	1	7	20.16	20.26	20.00		0
	1	14	20.07	20.18	19.98		0
	8	0	19.95	20.12	19.92	0-2	0
	8	4	20.03	19.97	19.87		0
	8	7	19.96	20.03	19.74		0
	15	0	19.86	20.13	19.81		0
64QAM	1	0	20.27	20.24	20.04	0-2	0
	1	7	19.94	20.05	19.77		0
	1	14	19.78	19.94	19.87		0
	8	0	20.01	20.05	19.93	0-3	0
	8	4	19.91	20.12	19.89		0
	8	7	19.88	20.06	19.82		0
	15	0	19.97	20.06	19.82		0

Table 9-48
Reduced LTE Band 25 (PCS) Conducted Powers - 1.4 MHz Bandwidth – Hotspot Mode Active

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 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	19.74	19.86	19.72	0	0
	1	2	19.79	19.94	19.81		0
	1	5	19.69	19.84	19.72		0
	3	0	19.76	19.89	19.75		0
	3	2	19.81	19.93	19.80		0
	3	3	19.75	19.88	19.75		0
	6	0	19.78	19.90	19.77	0-1	0
16QAM	1	0	19.94	20.18	20.04	0-1	0
	1	2	20.02	20.22	20.14		0
	1	5	20.03	20.11	20.01		0
	3	0	19.92	20.04	19.94		0
	3	2	19.96	20.09	19.99		0
	3	3	19.90	20.02	19.93		0
	6	0	19.88	20.00	19.86	0-2	0
64QAM	1	0	19.84	19.96	19.83	0-2	0
	1	2	19.89	19.98	19.88		0
	1	5	19.81	19.90	19.82		0
	3	0	19.86	19.95	19.83		0
	3	2	19.88	19.98	19.86		0
	3	3	19.81	19.94	19.80		0
	6	0	19.76	19.87	19.76	0-3	0

Table 9-49
Reduced LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.65	**21.74**	21.54	0	0
	1	50	21.44	21.48	21.26		0
	1	99	21.36	21.45	21.24		0
	50	0	21.59	**21.67**	21.48	0-1	0
	50	25	21.51	21.59	21.38		0
	50	50	21.48	21.52	21.32		0
	100	0	21.54	21.59	21.39		0
16QAM	1	0	21.90	22.00	21.77	0-1	0
	1	50	21.70	21.72	21.53		0
	1	99	21.62	21.68	21.47		0
	50	0	21.64	21.71	21.49	0-2	0
	50	25	21.55	21.61	21.40		0
	50	50	21.50	21.55	21.32		0
	100	0	21.57	21.63	21.42		0
64QAM	1	0	21.85	21.90	21.71	0-2	0
	1	50	21.61	21.65	21.46		0
	1	99	21.58	21.59	21.44		0
	50	0	21.65	21.73	21.52	0-3	0
	50	25	21.59	21.63	21.44		0
	50	50	21.54	21.57	21.37		0
	100	0	21.57	21.63	21.44		0

Table 9-50
Reduced LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.71	21.71	21.55	0	0
	1	36	21.50	21.59	21.34		0
	1	74	21.44	21.50	21.36		0
	36	0	21.63	21.71	21.51	0-1	0
	36	18	21.56	21.66	21.46		0
	36	37	21.52	21.56	21.40		0
	75	0	21.58	21.65	21.46		0
16QAM	1	0	21.95	21.98	21.76	0-1	0
	1	36	21.75	21.85	21.63		0
	1	74	21.65	21.76	21.60		0
	36	0	21.70	21.73	21.53	0-2	0
	36	18	21.61	21.68	21.49		0
	36	37	21.57	21.61	21.44		0
	75	0	21.60	21.66	21.48		0
64QAM	1	0	21.81	21.81	21.63	0-2	0
	1	36	21.60	21.67	21.45		0
	1	74	21.52	21.61	21.42		0
	36	0	21.66	21.71	21.54	0-3	0
	36	18	21.61	21.67	21.47		0
	36	37	21.52	21.60	21.41		0
	75	0	21.62	21.65	21.49		0

Table 9-51
Reduced LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.72	21.74	21.55	0	0
	1	25	21.51	21.61	21.33		0
	1	49	21.48	21.54	21.37		0
	25	0	21.61	21.69	21.54	0-1	0
	25	12	21.58	21.70	21.42		0
	25	25	21.55	21.59	21.39		0
	50	0	21.61	21.69	21.49		0
16QAM	1	0	21.91	21.96	21.76	0-1	0
	1	25	21.76	21.88	21.62		0
	1	49	21.64	21.77	21.58		0
	25	0	21.70	21.74	21.53	0-2	0
	25	12	21.64	21.68	21.45		0
	25	25	21.59	21.60	21.41		0
	50	0	21.64	21.62	21.51		0
64QAM	1	0	21.85	21.80	21.62	0-2	0
	1	25	21.57	21.64	21.42		0
	1	49	21.51	21.61	21.46		0
	25	0	21.63	21.74	21.53	0-3	0
	25	12	21.65	21.63	21.49		0
	25	25	21.50	21.64	21.41		0
	50	0	21.66	21.65	21.50		0

Table 9-52
Reduced LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.72	21.75	21.51	0	0
	1	12	21.52	21.64	21.35		0
	1	24	21.49	21.56	21.36		0
	12	0	21.60	21.68	21.50	0-1	0
	12	6	21.62	21.74	21.42		0
	12	13	21.54	21.58	21.40		0
	25	0	21.65	21.72	21.52		0
16QAM	1	0	21.94	21.94	21.75	0-1	0
	1	12	21.80	21.90	21.65		0
	1	24	21.67	21.78	21.54		0
	12	0	21.71	21.77	21.54	0-2	0
	12	6	21.64	21.64	21.43		0
	12	13	21.55	21.56	21.43		0
	25	0	21.67	21.61	21.47		0
64QAM	1	0	21.88	21.81	21.62	0-2	0
	1	12	21.56	21.64	21.41		0
	1	24	21.47	21.62	21.43		0
	12	0	21.67	21.78	21.55	0-3	0
	12	6	21.61	21.63	21.49		0
	12	13	21.48	21.67	21.45		0
	25	0	21.68	21.64	21.53		0

Table 9-53
Reduced LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.71	21.76	21.48	0	0
	1	7	21.54	21.63	21.38		0
	1	14	21.45	21.57	21.33		0
	8	0	21.59	21.72	21.47	0-1	0
	8	4	21.62	21.74	21.42		0
	8	7	21.58	21.54	21.43		0
	15	0	21.63	21.75	21.54		0
16QAM	1	0	21.96	21.94	21.72	0-1	0
	1	7	21.81	21.87	21.67		0
	1	14	21.68	21.81	21.52		0
	8	0	21.72	21.79	21.56	0-2	0
	8	4	21.63	21.62	21.44		0
	8	7	21.57	21.52	21.41		0
	15	0	21.71	21.60	21.47		0
64QAM	1	0	21.85	21.82	21.60	0-2	0
	1	7	21.59	21.63	21.45		0
	1	14	21.48	21.58	21.39		0
	8	0	21.64	21.79	21.58	0-3	0
	8	4	21.57	21.59	21.47		0
	8	7	21.45	21.66	21.48		0
	15	0	21.64	21.64	21.57		0

Table 9-54
Reduced LTE Band 25 (PCS) Conducted Powers -1.4 MHz Bandwidth – Grip Sensor Active

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.33	21.51	21.36	0	0
	1	2	21.36	21.56	21.44		0
	1	5	21.29	21.47	21.36		0
	3	0	21.29	21.52	21.38		0
	3	2	21.34	21.54	21.40		0
	3	3	21.27	21.51	21.36		0
	6	0	21.28	21.52	21.38	0-1	0
16QAM	1	0	21.55	21.80	21.56	0-1	0
	1	2	21.63	21.85	21.70		0
	1	5	21.52	21.77	21.58		0
	3	0	21.43	21.68	21.53		0
	3	2	21.49	21.71	21.59		0
	3	3	21.43	21.67	21.51		0
	6	0	21.38	21.60	21.46	0-2	0
64QAM	1	0	21.32	21.59	21.38	0-2	0
	1	2	21.37	21.63	21.47		0
	1	5	21.27	21.52	21.37		0
	3	0	21.34	21.53	21.44		0
	3	2	21.35	21.58	21.47		0
	3	3	21.29	21.55	21.39		0
	6	0	21.26	21.49	21.36	0-3	0

9.4.7 LTE Band 7

Table 9-55
LTE Band 7 Conducted Powers - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**23.10**	22.94	22.81	0	0
	1	50	22.96	22.80	22.70		0
	1	99	22.85	22.80	22.67		0
	50	0	**22.08**	21.91	21.79	0-1	1
	50	25	22.02	21.88	21.75		1
	50	50	21.96	21.81	21.70		1
	100	0	22.01	21.84	21.72		1
16QAM	1	0	22.25	22.05	21.95	0-1	1
	1	50	22.05	21.90	21.82		1
	1	99	22.02	21.83	21.73		1
	50	0	21.09	20.90	20.78	0-2	2
	50	25	21.04	20.86	20.72		2
	50	50	20.96	20.82	20.71		2
	100	0	21.07	20.85	20.75		2
64QAM	1	0	21.26	21.08	21.12	0-2	2
	1	50	21.10	20.96	20.78		2
	1	99	21.10	20.93	20.85		2
	50	0	20.11	19.91	19.81	0-3	3
	50	25	20.04	19.86	19.79		3
	50	50	20.05	19.85	19.75		3
	100	0	20.02	19.81	19.75		3

Table 9-56
LTE Band 7 Conducted Powers - 15 MHz Bandwidth

LTE Band 7 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20825 (2507.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21375 (2562.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.28	22.89	22.78	0	0
	1	36	23.12	22.75	22.71		0
	1	74	23.12	22.77	22.74		0
	36	0	22.11	21.84	21.78	0-1	1
	36	18	22.07	21.85	21.82		1
	36	37	22.02	21.82	21.79		1
	75	0	22.05	21.81	21.77		1
16QAM	1	0	22.47	22.14	21.91	0-1	1
	1	36	22.37	22.31	21.84		1
	1	74	22.35	22.32	21.83		1
	36	0	21.14	20.87	20.85	0-2	2
	36	18	21.11	20.88	20.83		2
	36	37	21.09	20.89	20.79		2
	75	0	21.07	20.84	20.83		2
64QAM	1	0	21.43	21.07	20.98	0-2	2
	1	36	21.40	20.99	20.91		2
	1	74	21.36	21.01	20.89		2
	36	0	20.11	19.93	19.90	0-3	3
	36	18	20.05	19.91	19.91		3
	36	37	20.04	19.89	19.87		3
	75	0	20.16	19.86	19.85		3

Table 9-57
LTE Band 7 Conducted Powers - 10 MHz Bandwidth

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20800 (2505.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21400 (2565.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.05	22.78	22.77	0	0
	1	25	22.98	22.75	22.71		0
	1	49	22.97	22.73	22.68		0
	25	0	22.03	21.81	21.80	0-1	1
	25	12	22.06	21.82	21.80		1
	25	25	22.02	21.81	21.79		1
	50	0	22.07	21.83	21.80		1
16QAM	1	0	22.14	22.04	22.05	0-1	1
	1	25	22.10	22.01	21.98		1
	1	49	22.09	22.02	21.97		1
	25	0	21.07	20.89	20.83	0-2	2
	25	12	21.08	20.89	20.85		2
	25	25	21.08	20.88	20.81		2
	50	0	21.04	20.85	20.79		2
64QAM	1	0	20.91	20.59	20.53	0-2	2
	1	25	20.87	20.57	20.51		2
	1	49	20.86	20.54	20.47		2
	25	0	20.14	19.90	19.81	0-3	3
	25	12	20.16	19.91	19.82		3
	25	25	20.15	19.88	19.81		3
	50	0	20.07	19.89	19.85		3

Table 9-58
LTE Band 7 Conducted Powers - 5 MHz Bandwidth

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20775 (2502.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21425 (2567.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.08	22.73	22.80	0	0
	1	12	23.10	22.74	22.81		0
	1	24	23.07	22.73	22.80		0
	12	0	22.14	21.83	21.78	0-1	1
	12	6	22.15	21.85	21.80		1
	12	13	22.15	21.82	21.79		1
	25	0	22.13	21.80	21.76		1
16QAM	1	0	22.32	21.93	22.07	0-1	1
	1	12	22.31	21.97	22.02		1
	1	24	22.29	21.93	22.05		1
	12	0	21.13	20.81	20.76	0-2	2
	12	6	21.17	20.83	20.78		2
	12	13	21.15	20.82	20.79		2
	25	0	21.17	20.81	20.79		2
64QAM	1	0	21.06	20.72	21.08	0-2	2
	1	12	21.07	20.71	21.09		2
	1	24	21.07	20.70	21.06		2
	12	0	20.12	19.80	19.89	0-3	3
	12	6	20.19	19.79	19.91		3
	12	13	20.14	19.78	19.89		3
	25	0	20.18	19.80	19.76		3

Table 9-59
LTE Band 7 Reduced Conducted Powers - 20 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.27	**20.28**	20.07	0	0
	1	50	20.19	20.19	19.99		0
	1	99	20.21	20.21	19.95		0
	50	0	20.26	**20.29**	20.09	0-1	0
	50	25	20.27	20.28	20.10		0
	50	50	20.21	20.26	20.03		0
	100	0	20.23	20.27	20.07		0
16QAM	1	0	20.19	20.47	20.39	0-1	0
	1	50	20.19	20.40	20.35		0
	1	99	20.14	20.40	20.22		0
	50	0	20.30	20.27	20.07	0-2	0
	50	25	20.27	20.24	20.06		0
	50	50	20.25	20.22	20.01		0
	100	0	20.22	20.25	20.04		0
64QAM	1	0	20.45	20.37	20.28	0-2	0
	1	50	20.41	20.29	20.18		0
	1	99	20.45	20.36	20.16		0
	50	0	20.26	20.33	20.12	0-3	0
	50	25	20.29	20.32	20.11		0
	50	50	20.23	20.30	20.09		0
	100	0	20.27	20.29	20.09		0

Table 9-60
LTE Band 7 Reduced Conducted Powers - 15 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 7 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20825 (2507.5 MHz)	21100 (2535.0 MHz)	21375 (2562.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.28	20.36	20.33	0	0
	1	36	20.19	20.20	20.16		0
	1	74	20.16	20.17	20.21		0
	36	0	20.29	20.29	20.29	0-1	0
	36	18	20.31	20.27	20.26		0
	36	37	20.27	20.23	20.22		0
	75	0	20.26	20.32	20.24		0
16QAM	1	0	20.36	20.43	20.34	0-1	0
	1	36	20.41	20.26	20.26		0
	1	74	20.30	20.24	20.25		0
	36	0	20.31	20.31	20.28	0-2	0
	36	18	20.31	20.29	20.27		0
	36	37	20.26	20.22	20.24		0
	75	0	20.28	20.27	20.25		0
64QAM	1	0	20.48	20.49	20.33	0-2	0
	1	36	20.42	20.37	20.31		0
	1	74	20.41	20.36	20.25		0
	36	0	20.35	20.30	20.23	0-3	0
	36	18	20.32	20.28	20.23		0
	36	37	20.29	20.25	20.17		0
	75	0	20.30	20.26	20.12		0

Table 9-61
LTE Band 7 Reduced Conducted Powers - 10 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20800 (2505.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21400 (2565.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.38	20.34	20.26	0	0
	1	25	20.33	20.29	20.18		0
	1	49	20.28	20.22	20.10		0
	25	0	20.39	20.33	20.23	0-1	0
	25	12	20.39	20.34	20.27		0
	25	25	20.35	20.29	20.20		0
	50	0	20.35	20.31	20.24		0
16QAM	1	0	20.45	20.42	20.30	0-1	0
	1	25	20.50	20.37	20.26		0
	1	49	20.41	20.28	20.23		0
	25	0	20.39	20.33	20.22	0-2	0
	25	12	20.40	20.34	20.25		0
	25	25	20.34	20.27	20.20		0
	50	0	20.35	20.29	20.23		0
64QAM	1	0	20.49	20.48	20.43	0-2	0
	1	25	20.47	20.46	20.40		0
	1	49	20.49	20.40	20.35		0
	25	0	20.43	20.36	20.29	0-3	0
	25	12	20.44	20.36	20.28		0
	25	25	20.40	20.30	20.21		0
	50	0	20.43	20.33	20.26		0

Table 9-62
LTE Band 7 Reduced Conducted Powers - 5 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20775 (2502.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21425 (2567.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.29	20.26	20.18	0	0
	1	12	20.30	20.25	20.17		0
	1	24	20.24	20.23	20.10		0
	12	0	20.33	20.30	20.26	0-1	0
	12	6	20.37	20.32	20.27		0
	12	13	20.31	20.28	20.22		0
	25	0	20.32	20.28	20.21		0
16QAM	1	0	20.43	20.35	20.21	0-1	0
	1	12	20.34	20.36	20.24		0
	1	24	20.36	20.31	20.24		0
	12	0	20.33	20.29	20.23	0-2	0
	12	6	20.37	20.31	20.25		0
	12	13	20.32	20.27	20.18		0
	25	0	20.34	20.30	20.21		0
64QAM	1	0	20.50	20.43	20.43	0-2	0
	1	12	20.49	20.42	20.37		0
	1	24	20.46	20.42	20.31		0
	12	0	20.44	20.37	20.29	0-3	0
	12	6	20.44	20.36	20.29		0
	12	13	20.41	20.34	20.26		0
	25	0	20.37	20.31	20.25		0

9.4.8 LTE Band 38

Table 9-63
LTE Band 38 Conducted Powers - 20 MHz Bandwidth

LTE Band 38 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 38000 (2595.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**22.74**	0	0
	1	50	22.48		0
	1	99	22.47		0
	50	0	**21.66**	0-1	1
	50	25	21.62		1
	50	50	21.55		1
	100	0	21.58		1
16QAM	1	0	21.92	0-1	1
	1	50	21.71		1
	1	99	21.61		1
	50	0	20.59	0-2	2
	50	25	20.61		2
	50	50	20.57		2
	100	0	20.56		2
64QAM	1	0	20.85	0-2	2
	1	50	20.68		2
	1	99	20.67		2
	50	0	19.60	0-3	3
	50	25	19.57		3
	50	50	19.51		3
	100	0	19.52		3

Note: LTE Band 38 at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-64
LTE Band 38 Conducted Powers - 15 MHz Bandwidth

LTE Band 38 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 37825 (2577.5 MHz)	Mid Channel 38000 (2595.0 MHz)	High Channel 38174 (2612.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.06	22.79	22.96	0	0
	1	36	22.88	22.63	22.82		0
	1	74	22.79	22.51	22.71		0
	36	0	21.98	21.81	21.89	0-1	1
	36	18	21.90	21.79	21.84		1
	36	37	21.86	21.69	21.74		1
	75	0	21.86	21.71	21.79		1
16QAM	1	0	22.04	21.94	21.99	0-1	1
	1	36	21.88	21.76	21.79		1
	1	74	21.82	21.70	21.75		1
	36	0	20.97	20.84	20.89	0-2	2
	36	18	20.93	20.82	20.83		2
	36	37	20.85	20.72	20.75		2
	75	0	20.91	20.77	20.81		2
64QAM	1	0	20.80	20.65	20.69	0-2	2
	1	36	20.67	20.50	20.49		2
	1	74	20.63	20.40	20.40		2
	36	0	20.06	19.86	19.86	0-3	3
	36	18	20.01	19.82	19.83		3
	36	37	19.94	19.71	19.72		3
	75	0	20.03	19.83	19.83		3

Table 9-65
LTE Band 38 Conducted Powers - 10 MHz Bandwidth

LTE Band 38 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37800 (2575.0 MHz)	38000 (2595.0 MHz)	38199 (2615.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.01	22.84	22.98	0	0
	1	25	22.89	22.76	22.89		0
	1	49	22.85	22.70	22.85		0
	25	0	21.95	21.79	21.96	0-1	1
	25	12	21.94	21.77	21.87		1
	25	25	21.88	21.72	21.86		1
	50	0	21.94	21.75	21.92		1
16QAM	1	0	22.00	21.86	22.01	0-1	1
	1	25	21.88	21.78	21.93		1
	1	49	21.84	21.74	21.88		1
	25	0	20.94	20.76	20.95	0-2	2
	25	12	20.90	20.73	20.89		2
	25	25	20.86	20.68	20.82		2
	50	0	20.90	20.79	20.89		2
64QAM	1	0	20.75	20.62	20.70	0-2	2
	1	25	20.66	20.50	20.56		2
	1	49	20.62	20.42	20.46		2
	25	0	20.06	19.88	20.00	0-3	3
	25	12	20.06	19.87	19.93		3
	25	25	20.01	19.79	19.90		3
	50	0	20.01	19.81	19.94		3

Table 9-66
LTE Band 38 Conducted Powers - 5 MHz Bandwidth

LTE Band 38 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			37775 (2572.5 MHz)	38000 (2595.0 MHz)	38224 (2617.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.02	22.80	22.98	0	0
	1	12	23.00	22.75	22.90		0
	1	24	22.96	22.69	22.92		0
	12	0	22.02	21.70	21.82	0-1	1
	12	6	22.00	21.72	21.88		1
	12	13	21.96	21.67	21.87		1
	25	0	21.99	21.71	21.91		1
16QAM	1	0	22.07	21.85	21.89	0-1	1
	1	12	22.02	21.77	21.85		1
	1	24	22.01	21.75	21.80		1
	12	0	21.01	20.73	21.02	0-2	2
	12	6	20.98	20.74	20.97		2
	12	13	20.94	20.67	20.96		2
	25	0	20.93	20.65	20.88		2
64QAM	1	0	20.78	20.52	20.60	0-2	2
	1	12	20.76	20.47	20.51		2
	1	24	20.74	20.47	20.50		2
	12	0	20.11	19.83	19.91	0-3	3
	12	6	20.13	19.85	19.93		3
	12	13	20.07	19.81	19.88		3
	25	0	20.10	19.82	19.89		3

9.4.9 LTE Band 41

Table 9-67
LTE Band 41 Power Class 3 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	23.04	22.95	22.72	22.64	22.82	0	0
	1	50	23.08	22.80	22.52	22.54	22.64		0
	1	99	**23.18**	22.83	22.50	22.51	22.54		0
	50	0	**22.11**	21.88	21.58	21.59	21.69	0-1	1
	50	25	22.10	21.85	21.55	21.54	21.65		1
	50	50	22.05	21.80	21.53	21.50	21.57		1
	100	0	22.09	21.82	21.51	21.54	21.65		1
16QAM	1	0	22.41	22.18	21.88	21.88	22.00	0-1	1
	1	50	22.28	22.02	21.74	21.75	21.83		1
	1	99	22.27	21.99	21.58	21.73	21.76		1
	50	0	21.12	20.90	20.52	20.59	20.68	0-2	2
	50	25	21.08	20.87	20.55	20.55	20.63		2
	50	50	21.08	20.80	20.50	20.60	20.61		2
	100	0	21.13	20.90	20.56	20.70	20.68		2
64QAM	1	0	21.38	21.12	20.85	20.90	20.96	0-2	2
	1	50	21.27	21.11	20.69	20.82	20.84		2
	1	99	21.31	21.03	20.62	20.79	20.72		2
	50	0	20.23	19.99	19.56	19.72	19.73	0-3	3
	50	25	20.19	19.96	19.53	19.70	19.69		3
	50	50	20.15	19.91	19.51	19.67	19.63		3
	100	0	20.15	19.95	19.52	19.65	19.67		3

Table 9-68
LTE Band 41 Power Class 3 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	23.03	22.87	22.70	22.69	22.93	0	0
	1	36	23.05	22.74	22.64	22.59	22.94		0
	1	74	23.17	22.67	22.57	22.67	22.81		0
	36	0	22.08	21.64	21.65	21.64	21.86	0-1	1
	36	18	22.07	21.61	21.75	21.59	21.83		1
	36	37	22.02	21.59	21.61	21.55	21.78		1
	75	0	22.06	21.66	21.67	21.60	21.94		1
16QAM	1	0	22.42	21.94	21.94	21.93	22.21	0-1	1
	1	36	22.25	21.80	21.81	21.80	22.03		1
	1	74	22.28	21.64	21.79	21.78	21.97		1
	36	0	21.09	20.58	20.65	20.64	20.88	0-2	2
	36	18	21.08	20.61	20.61	20.60	20.85		2
	36	37	21.00	20.56	20.66	20.65	20.78		2
	75	0	21.10	20.62	20.76	20.75	20.88		2
64QAM	1	0	21.33	20.91	20.96	20.95	21.10	0-2	2
	1	36	21.24	20.75	20.88	20.87	21.09		2
	1	74	21.28	20.68	20.85	20.84	21.01		2
	36	0	20.20	19.62	19.78	19.84	19.97	0-3	3
	36	18	20.16	19.59	19.76	19.75	19.94		3
	36	37	20.15	19.59	19.73	19.72	19.97		3
	75	0	20.12	19.58	19.71	19.70	19.93		3

Table 9-69
LTE Band 41 Power Class 3 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.01	22.75	22.67	22.74	22.97	0	0
	1	25	23.10	22.68	22.71	22.54	22.82		0
	1	49	23.11	22.53	22.61	22.64	22.85		0
	25	0	22.13	21.61	21.62	21.60	21.90	0-1	1
	25	12	22.12	21.58	21.57	21.57	21.87		1
	25	25	22.07	21.56	21.61	21.55	21.82		1
	50	0	22.11	21.54	21.59	21.53	21.84		1
16QAM	1	0	21.99	21.91	21.91	21.90	22.20	0-1	1
	1	25	22.03	21.77	21.78	21.76	22.04		1
	1	49	22.08	21.61	21.76	21.60	22.01		1
	25	0	21.14	20.55	20.62	20.54	20.92	0-2	2
	25	12	21.10	20.58	20.58	20.57	20.89		2
	25	25	21.08	20.53	20.63	20.59	20.82		2
	50	0	21.15	20.59	20.73	20.58	20.92		2
64QAM	1	0	21.40	20.88	20.93	20.87	21.14	0-2	2
	1	25	21.29	20.72	20.85	20.71	21.13		2
	1	49	21.33	20.65	20.82	20.64	21.05		2
	25	0	20.25	19.59	19.75	19.58	20.01	0-3	3
	25	12	20.21	19.56	19.73	19.64	19.98		3
	25	25	20.16	19.54	19.70	19.66	19.93		3
	50	0	20.17	19.55	19.68	19.54	19.97		3

Table 9-70
LTE Band 41 Power Class 3 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	22.90	22.87	22.74	22.69	22.88	0	0
	1	12	22.69	22.64	22.54	22.59	22.74		0
	1	24	22.74	22.58	22.53	22.54	22.79		0
	12	0	21.74	21.60	21.61	21.64	21.64	0-1	1
	12	6	21.70	21.57	21.58	21.59	21.61		1
	12	13	21.69	21.55	21.56	21.55	21.59		1
	25	0	21.70	21.67	21.54	21.59	21.67		1
16QAM	1	0	22.05	21.90	21.91	21.93	21.94	0-1	1
	1	12	21.88	21.76	21.77	21.81	21.80		1
	1	24	21.81	21.60	21.61	21.78	21.64		1
	12	0	20.73	20.54	20.58	20.64	20.58	0-2	2
	12	6	20.68	20.57	20.58	20.60	20.61		2
	12	13	20.66	20.52	20.53	20.65	20.56		2
	25	0	20.73	20.58	20.59	20.75	20.62		2
64QAM	1	0	21.01	20.87	20.88	20.95	20.91	0-2	2
	1	12	20.89	20.71	20.72	20.87	20.75		2
	1	24	20.77	20.64	20.65	20.84	20.68		2
	12	0	19.78	19.58	19.59	19.77	19.62	0-3	3
	12	6	19.74	19.66	19.56	19.75	19.59		3
	12	13	19.68	19.58	19.66	19.72	19.57		3
	25	0	19.72	19.68	19.55	19.70	19.58		3

Table 9-71
LTE Band 41 Power Class 2 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	**25.75**	25.40	25.12	25.37	25.54	0	0
	1	50	25.71	25.29	25.04	25.21	25.44		0
	1	99	25.74	25.34	25.05	25.18	25.37		0
	50	0	**24.64**	24.42	24.18	24.37	24.45	0-1	1
	50	25	24.63	24.38	24.15	24.36	24.43		1
	50	50	24.60	24.37	24.11	24.30	24.38		1
	100	0	24.61	24.39	24.12	24.30	24.40		1
16QAM	1	0	25.35	24.81	24.58	24.79	25.27	0-1	1
	1	50	25.26	24.72	24.50	24.64	25.04		1
	1	99	25.30	24.76	24.52	24.59	25.06		1
	50	0	23.73	23.43	23.20	23.36	23.55	0-2	2
	50	25	23.74	23.37	23.16	23.34	23.52		2
	50	50	23.70	23.36	23.12	23.28	23.45		2
	100	0	23.66	23.40	23.19	23.40	23.43		2
64QAM	1	0	24.03	23.86	23.57	23.85	23.81	0-2	2
	1	50	23.99	23.74	23.46	23.63	23.68		2
	1	99	24.01	23.75	23.48	23.60	23.70		2
	50	0	22.69	22.50	22.28	22.49	22.51	0-3	3
	50	25	22.64	22.48	22.24	22.44	22.45		3
	50	50	22.61	22.45	22.19	22.36	22.39		3
	100	0	22.66	22.41	22.17	22.37	22.44		3

Table 9-72
LTE Band 41 Power Class 2 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	25.71	25.36	25.08	25.33	25.50	0	0
	1	36	25.67	25.31	25.05	25.17	25.40		0
	1	74	25.70	25.30	25.06	25.17	25.51		0
	36	0	24.65	24.38	24.14	24.33	24.41	0-1	1
	36	18	24.59	24.34	24.11	24.32	24.39		1
	36	37	24.64	24.35	24.07	24.30	24.34		1
	75	0	24.57	24.35	24.08	24.28	24.36		1
16QAM	1	0	25.31	24.77	24.54	24.75	25.01	0-1	1
	1	36	25.22	24.68	24.46	24.60	25.00		1
	1	74	25.26	24.72	24.48	24.55	25.02		1
	36	0	23.69	23.39	23.16	23.32	23.51	0-2	2
	36	18	23.70	23.33	23.12	23.30	23.48		2
	36	37	23.66	23.32	23.08	23.24	23.41		2
	75	0	23.68	23.36	23.15	23.36	23.39		2
64QAM	1	0	23.99	23.82	23.53	23.81	23.77	0-2	2
	1	36	23.95	23.70	23.42	23.59	23.64		2
	1	74	23.97	23.75	23.45	23.56	23.66		2
	36	0	22.65	22.46	22.21	22.45	22.47	0-3	3
	36	18	22.60	22.44	22.20	22.40	22.41		3
	36	37	22.61	22.37	22.17	22.32	22.35		3
	75	0	22.62	22.41	22.15	22.33	22.40		3

Table 9-73
LTE Band 41 Power Class 2 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	25.70	25.48	25.07	25.32	25.49	0	0
	1	25	25.66	25.24	25.11	25.16	25.39		0
	1	49	25.69	25.29	25.13	25.17	25.44		0
	25	0	24.62	24.37	24.13	24.32	24.46	0-1	1
	25	12	24.68	24.33	24.10	24.31	24.38		1
	25	25	24.61	24.41	24.06	24.25	24.33		1
	50	0	24.59	24.40	24.07	24.25	24.35		1
16QAM	1	0	25.30	24.76	24.53	24.74	25.00	0-1	1
	1	25	25.21	24.67	24.45	24.59	24.99		1
	1	49	25.25	24.75	24.47	24.54	25.01		1
	25	0	23.68	23.38	23.15	23.31	23.50	0-2	2
	25	12	23.69	23.32	23.11	23.30	23.47		2
	25	25	23.65	23.31	23.07	23.25	23.40		2
	50	0	23.61	23.35	23.14	23.35	23.38		2
64QAM	1	0	23.98	23.81	23.52	23.80	23.76	0-2	2
	1	25	23.94	23.69	23.41	23.58	23.63		2
	1	49	23.96	23.70	23.43	23.55	23.65		2
	25	0	22.64	22.45	22.23	22.44	22.46	0-3	3
	25	12	22.59	22.43	22.19	22.39	22.40		3
	25	25	22.57	22.40	22.14	22.31	22.51		3
	50	0	22.61	22.36	22.12	22.32	22.39		3

Table 9-74
LTE Band 41 Power Class 2 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	25.71	25.37	25.11	25.34	25.51	0	0
	1	12	25.68	25.26	25.18	25.18	25.41		0
	1	24	25.71	25.31	25.02	25.31	25.50		0
	12	0	24.61	24.41	24.15	24.34	24.45	0-1	1
	12	6	24.60	24.35	24.12	24.33	24.40		1
	12	13	24.66	24.34	24.08	24.33	24.38		1
	25	0	24.58	24.36	24.09	24.27	24.37		1
16QAM	1	0	25.32	24.78	24.55	24.76	25.24	0-1	1
	1	12	25.23	24.69	24.47	24.61	25.01		1
	1	24	25.27	24.73	24.49	24.56	25.03		1
	12	0	23.70	23.40	23.17	23.33	23.52	0-2	2
	12	6	23.71	23.34	23.24	23.31	23.49		2
	12	13	23.67	23.38	23.09	23.25	23.42		2
	25	0	23.63	23.37	23.16	23.37	23.40		2
64QAM	1	0	23.99	23.83	23.54	23.82	23.78	0-2	2
	1	12	23.96	23.71	23.43	23.60	23.65		2
	1	24	23.98	23.72	23.45	23.57	23.67		2
	12	0	22.66	22.47	22.25	22.46	22.48	0-3	3
	12	6	22.60	22.41	22.21	22.41	22.41		3
	12	13	22.65	22.42	22.16	22.33	22.55		3
	25	0	22.63	22.38	22.14	22.34	22.40		3

Table 9-75
LTE Band 41 Power Class 3 Reduced Conducted Powers - 20 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 20 MHzBandwidth									
Modulation	**RB Size**	**RB Offset**	**Low Channel**	**Low-Mid Channel**	**Mid Channel**	**Mid-High Channel**	**High Channel**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
			39750 (2506.0 MHz)	**40185 (2549.5 MHz)**	**40620 (2593.0 MHz)**	**41055 (2636.5 MHz)**	**41490 (2680.0 MHz)**		
			Conducted Power [dBm]						
QPSK	1	0	21.10	21.42	21.62	21.32	**21.78**	0	0
	1	50	20.95	21.20	21.37	21.03	21.50		0
	1	99	20.94	21.19	21.30	20.96	21.53		0
	50	0	21.09	21.36	21.55	21.29	**21.77**	0-1	0
	50	25	21.04	21.32	21.49	21.16	21.66		0
	50	50	21.01	21.28	21.39	21.07	21.53		0
	100	0	21.05	21.33	21.46	21.17	21.71		0
16QAM	1	0	21.30	21.61	21.82	21.52	22.07	0-1	0
	1	50	21.17	21.42	21.62	21.26	21.88		0
	1	99	21.13	21.35	21.50	21.16	21.81		0
	50	0	21.10	21.37	21.59	21.26	21.83	0-2	0
	50	25	21.08	21.32	21.53	21.14	21.78		0
	50	50	21.03	21.27	21.45	21.02	21.72		0
	100	0	21.05	21.33	21.51	21.16	21.77		0
64QAM	1	0	20.83	21.14	21.31	21.04	21.59	0-2	0
	1	50	20.66	20.96	21.10	20.79	21.40		0
	1	99	20.67	20.90	20.99	20.71	21.33		0
	50	0	20.10	20.38	20.61	20.24	20.86	0-3	1
	50	25	20.08	20.32	20.52	20.16	20.79		1
	50	50	20.03	20.28	20.44	20.06	20.74		1
	100	0	20.08	20.33	20.54	20.15	20.80		1

Table 9-76
LTE Band 41 Power Class 3 Reduced Conducted Powers - 15 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 15 MHzBandwidth									
Modulation	**RB Size**	**RB Offset**	**Low Channel**	**Low-Mid Channel**	**Mid Channel**	**Mid-High Channel**	**High Channel**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
			39750 (2506.0 MHz)	**40185 (2549.5 MHz)**	**40620 (2593.0 MHz)**	**41055 (2636.5 MHz)**	**41490 (2680.0 MHz)**		
			Conducted Power [dBm]						
QPSK	1	0	21.11	21.42	21.60	21.28	21.70	0	0
	1	36	21.00	21.27	21.45	21.05	21.57		0
	1	74	20.98	21.21	21.35	20.98	21.51		0
	36	0	21.07	21.37	21.57	21.22	21.65	0-1	0
	36	18	21.08	21.34	21.51	21.17	21.63		0
	36	37	21.04	21.27	21.43	21.09	21.56		0
	75	0	21.05	21.29	21.46	21.14	21.60		0
16QAM	1	0	21.30	21.59	21.81	21.47	21.93	0-1	0
	1	36	21.21	21.44	21.65	21.30	21.81		0
	1	74	21.19	21.39	21.57	21.23	21.75		0
	36	0	21.09	21.35	21.56	21.21	21.69	0-2	0
	36	18	21.07	21.30	21.53	21.15	21.67		0
	36	37	21.04	21.28	21.46	21.08	21.59		0
	75	0	21.06	21.32	21.51	21.14	21.65		0
64QAM	1	0	20.89	21.11	21.33	21.03	21.47	0-2	0
	1	36	20.74	20.99	21.18	20.86	21.32		0
	1	74	20.72	20.96	21.07	20.77	21.29		0
	36	0	20.08	20.31	20.57	20.19	20.69	0-3	1
	36	18	20.06	20.28	20.52	20.15	20.65		1
	36	37	20.01	20.22	20.44	20.07	20.58		1
	75	0	20.08	20.31	20.55	20.16	20.69		1

Table 9-77
LTE Band 41 Power Class 3 Reduced Conducted Powers - 10 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.07	21.36	21.56	21.17	21.63	0	0
	1	25	21.04	21.29	21.46	21.08	21.57		0
	1	49	21.01	21.24	21.39	21.01	21.53		0
	25	0	21.07	21.35	21.53	21.19	21.65	0-1	0
	25	12	21.08	21.32	21.52	21.18	21.62		0
	25	25	21.03	21.28	21.45	21.09	21.57		0
	50	0	21.04	21.32	21.50	21.16	21.63		0
16QAM	1	0	21.23	21.53	21.75	21.38	21.88	0-1	0
	1	25	21.20	21.45	21.67	21.30	21.81		0
	1	49	21.16	21.38	21.58	21.23	21.74		0
	25	0	21.02	21.26	21.50	21.11	21.61	0-2	0
	25	12	21.00	21.24	21.47	21.11	21.61		0
	25	25	20.97	21.20	21.41	21.02	21.54		0
	50	0	21.06	21.32	21.53	21.17	21.68		0
64QAM	1	0	20.83	21.12	21.29	20.98	21.42	0-2	0
	1	25	20.76	21.03	21.19	20.87	21.33		0
	1	49	20.74	20.99	21.11	20.81	21.30		0
	25	0	20.12	20.36	20.61	20.22	20.74	0-3	1
	25	12	20.11	20.36	20.60	20.24	20.74		1
	25	25	20.08	20.35	20.50	20.14	20.68		1
	50	0	20.07	20.33	20.56	20.16	20.67		1

Table 9-78
LTE Band 41 Power Class 3 Reduced Conducted Powers - 5 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.03	21.31	21.49	21.14	21.60	0	0
	1	12	21.02	21.27	21.44	21.08	21.58		0
	1	24	21.00	21.21	21.38	21.02	21.53		0
	12	0	21.03	21.31	21.49	21.16	21.62	0-1	0
	12	6	21.06	21.33	21.50	21.17	21.62		0
	12	13	21.02	21.28	21.46	21.08	21.57		0
	25	0	21.03	21.29	21.46	21.13	21.59		0
16QAM	1	0	21.22	21.47	21.70	21.36	21.83	0-1	0
	1	12	21.22	21.44	21.66	21.31	21.82		0
	1	24	21.19	21.42	21.63	21.26	21.79		0
	12	0	21.01	21.27	21.51	21.11	21.63	0-2	0
	12	6	21.03	21.26	21.50	21.12	21.62		0
	12	13	21.00	21.24	21.44	21.07	21.58		0
	25	0	20.98	21.21	21.43	21.06	21.58		0
64QAM	1	0	20.75	21.04	21.19	20.91	21.39	0-2	0
	1	12	20.73	21.00	21.16	20.86	21.32		0
	1	24	20.74	21.01	21.14	20.84	21.31		0
	12	0	20.08	20.33	20.57	20.19	20.67	0-3	1
	12	6	20.10	20.34	20.57	20.19	20.69		1
	12	13	20.07	20.30	20.51	20.15	20.65		1
	25	0	20.10	20.33	20.55	20.18	20.64		1

Table 9-79
LTE Band 41 Power Class 2 Reduced Conducted Powers - 20 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.19	21.46	21.75	21.37	**21.76**	0	0
	1	50	21.05	21.31	21.51	21.10	21.58		0
	1	99	21.04	21.26	21.49	21.00	21.52		0
	50	0	21.11	21.39	21.63	21.29	**21.68**	0-1	0
	50	25	21.09	21.34	21.56	21.20	21.61		0
	50	50	21.05	21.29	21.46	21.11	21.56		0
	100	0	21.08	21.37	21.58	21.20	21.62		0
16QAM	1	0	21.57	21.83	22.15	21.78	22.16	0-1	0
	1	50	21.41	21.64	21.90	21.50	21.97		0
	1	99	21.37	21.60	21.79	21.42	21.93		0
	50	0	21.17	21.44	21.67	21.31	21.74	0-2	0
	50	25	21.13	21.36	21.59	21.23	21.68		0
	50	50	21.08	21.30	21.49	21.15	21.61		0
	100	0	21.12	21.37	21.61	21.23	21.68		0
64QAM	1	0	21.18	21.50	21.70	21.42	21.79	0-2	0
	1	50	21.03	21.31	21.49	21.14	21.61		0
	1	99	21.02	21.26	21.38	21.07	21.55		0
	50	0	21.16	21.46	21.65	21.33	21.73	0-3	0
	50	25	21.17	21.39	21.59	21.27	21.66		0
	50	50	21.09	21.35	21.50	21.16	21.61		0
	100	0	21.15	21.42	21.57	21.17	21.67		0

Table 9-80
LTE Band 41 Power Class 2 Reduced Conducted Powers - 15 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.11	21.43	21.65	21.28	21.74	0	0
	1	36	21.07	21.30	21.54	21.09	21.61		0
	1	74	21.06	21.31	21.42	21.01	21.57		0
	36	0	21.06	21.36	21.55	21.22	21.66	0-1	0
	36	18	21.05	21.35	21.53	21.20	21.63		0
	36	37	21.03	21.27	21.45	21.10	21.60		0
	75	0	21.04	21.30	21.49	21.14	21.62		0
16QAM	1	0	21.48	21.77	22.03	21.69	22.13	0-1	0
	1	36	21.42	21.63	21.89	21.51	22.02		0
	1	74	21.40	21.61	21.82	21.46	21.98		0
	36	0	21.09	21.35	21.60	21.17	21.70	0-2	0
	36	18	21.06	21.31	21.56	21.19	21.69		0
	36	37	21.01	21.27	21.49	21.09	21.64		0
	75	0	21.07	21.31	21.54	21.16	21.67		0
64QAM	1	0	21.14	21.44	21.64	21.34	21.77	0-2	0
	1	36	21.04	21.32	21.48	21.17	21.65		0
	1	74	21.03	21.29	21.40	21.09	21.60		0
	36	0	21.09	21.38	21.56	21.25	21.69	0-3	0
	36	18	21.08	21.35	21.52	21.21	21.66		0
	36	37	21.04	21.31	21.46	21.13	21.59		0
	75	0	21.09	21.37	21.54	21.15	21.67		0

Table 9-81
LTE Band 41 Power Class 2 Reduced Conducted Powers - 10 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.03	21.39	21.53	21.28	21.69	0	0
	1	25	21.03	21.33	21.47	21.14	21.61		0
	1	49	20.98	21.30	21.37	21.08	21.56		0
	25	0	21.07	21.35	21.54	21.22	21.65	0-1	0
	25	12	21.08	21.35	21.52	21.19	21.63		0
	25	25	21.03	21.26	21.46	21.12	21.58		0
	50	0	21.04	21.32	21.50	21.17	21.63		0
16QAM	1	0	21.45	21.74	21.99	21.64	22.09	0-1	0
	1	25	21.41	21.68	21.89	21.53	22.00		0
	1	49	21.36	21.60	21.78	21.43	21.94		0
	25	0	21.02	21.28	21.51	21.13	21.63	0-2	0
	25	12	21.03	21.27	21.52	21.13	21.62		0
	25	25	20.98	21.21	21.43	21.05	21.56		0
	50	0	21.07	21.33	21.55	21.18	21.67		0
64QAM	1	0	21.10	21.38	21.56	21.28	21.71	0-2	0
	1	25	21.03	21.32	21.45	21.17	21.66		0
	1	49	21.03	21.24	21.42	21.11	21.61		0
	25	0	21.17	21.45	21.63	21.11	21.77	0-3	0
	25	12	21.16	21.46	21.60	21.14	21.76		0
	25	25	21.11	21.39	21.53	21.09	21.68		0
	50	0	21.11	21.38	21.55	21.13	21.67		0

Table 9-82
LTE Band 41 Power Class 2 Reduced Conducted Powers - 5 MHz Bandwidth – Hotspot Mode/Grip Sensor Active

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.04	21.32	21.52	21.10	21.60	0	0
	1	12	21.06	21.34	21.53	21.08	21.64		0
	1	24	21.01	21.28	21.46	21.02	21.55		0
	12	0	21.00	21.31	21.50	21.17	21.62	0-1	0
	12	6	21.02	21.33	21.52	21.18	21.64		0
	12	13	21.01	21.26	21.45	21.14	21.56		0
	25	0	21.02	21.30	21.48	21.15	21.59		0
16QAM	1	0	21.40	21.66	21.90	21.54	22.01	0-1	0
	1	12	21.39	21.67	21.92	21.52	22.04		0
	1	24	21.40	21.66	21.87	21.47	21.99		0
	12	0	21.05	21.30	21.53	21.14	21.64	0-2	0
	12	6	21.08	21.33	21.55	21.16	21.67		0
	12	13	21.03	21.27	21.50	21.10	21.60		0
	25	0	20.97	21.24	21.45	21.09	21.59		0
64QAM	1	0	21.04	21.34	21.49	21.22	21.65	0-2	0
	1	12	21.02	21.31	21.42	21.16	21.61		0
	1	24	21.00	21.29	21.42	21.13	21.57		0
	12	0	21.12	21.40	21.57	21.26	21.70	0-3	0
	12	6	21.15	21.43	21.59	21.29	21.71		0
	12	13	21.10	21.39	21.55	21.19	21.66		0
	25	0	21.11	21.41	21.56	21.19	21.69		0

9.4.10 LTE Carrier Aggregation Conducted Powers

Table 9-83
LTE Band 12 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-12A (1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	24.02	24.15
CA_4A-12A (1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B4	20	2175	2132.5	24.06	24.15
CA_12A-66A (2)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B66	20	66786	2145	24.04	24.15

Table 9-84
LTE Band 12 Three Component Carrier Maximum Conducted Powers

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	24.01	24.15
CA_4A-4A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	24.00	24.15
CA_12A-66A-66A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	24.01	24.15
CA_12A-66C	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	24.02	24.15
CA_2A-4A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.98	24.15
CA_2A-12A-66A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	24.00	24.15

Table 9-85
LTE Band 5 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-5A	LTE B5	10	20475	831.5	QPSK	1	0	2475	876.5	LTE B2	20	900	1960	23.29	23.19
CA_4A-5A (1)	LTE B5	10	20475	831.5	QPSK	1	0	2475	876.5	LTE B4	20	2175	2132.5	23.32	23.19

Table 9-86
LTE Band 4 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-4A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B2	20	900	1960	24.86	24.90
CA_4A-4A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B4	20	2050	2120	24.78	24.90
CA_4A-5A (1)	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B5	10	2525	881.5	24.83	24.90
CA_4A-12A (1)	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B12	10	5095	737.5	24.89	24.90

Table 9-87
LTE Band 4 Three Component Carrier Maximum Conducted Powers

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-4A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	24.87	24.90
CA_2A-4A-4A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B4	20	2050	2120	LTE B2	20	900	1960	24.85	24.90
CA_4A-4A-12A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B4	20	2050	2120	LTE B12	10	5095	737.5	24.88	24.90
CA_2A-4A-12A	LTE B4	20	20300	1745	QPSK	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	24.82	24.90

Table 9-88
LTE Band 4 Two Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-4A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	20.91	21.00
CA_4A-4A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	21.00	21.00
CA_4A-5A (1)	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B5	10	2525	881.5	20.97	21.00
CA_4A-12A (1)	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B12	10	5095	737.5	20.99	21.00

Table 9-89
LTE Band 4 Three Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-4A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	20.79	21.00
CA_2A-4A-4A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B2	20	900	1960	20.75	21.00
CA_4A-4A-12A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B12	10	5095	737.5	20.82	21.00
CA_2A-4A-12A	LTE B4	20	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	20.78	21.00

Table 9-90
LTE Band 66 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-66A	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B2	20	900	1960	24.86	24.90
CA_12A-66A (2)	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B12	10	5095	737.5	24.87	24.90
CA_66A-66A	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	67236	2190	24.96	24.90
CA_66B	LTE B66	15	132597	1772.5	QPSK	1	0	67061	2172.5	LTE B66	5	66968	2163.2	24.83	24.67
CA_66C	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	66588	2125.2	24.90	24.90

Table 9-91
LTE Band 66 Three Component Carrier Maximum Conducted Powers

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-66A-66A	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	24.92	24.90
CA_2A-66C	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	66588	2125.2	LTE B2	20	900	1960	24.90	24.90
CA_12A-66A-66A	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	67236	2190	LTE B12	10	5095	737.5	24.92	24.90
CA_12A-66C	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	66588	2125.2	LTE B12	10	5095	737.5	24.91	24.90
CA_2A-12A-66A	LTE B66	20	132322	1745	QPSK	1	0	66786	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	24.94	24.90

Table 9-92
LTE Band 66 Two Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-66A	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B2	20	900	1960	20.95	21.00
CA_12A-66A (2)	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B12	10	5095	737.5	20.99	21.00
CA_66A-66A	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	67236	2190	20.97	21.00
CA_66B	LTE B66	15	132597	1772.5	16QAM	1	0	67061	2172.5	LTE B66	5	66968	2163.2	21.00	20.93
CA_66C	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	66588	2125.2	20.98	21.00

Table 9-93
LTE Band 66 Three Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-66A-66A	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	20.82	21.00
CA_2A-66C	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	66588	2125.2	LTE B2	20	900	1960	20.83	21.00
CA_12A-66A-66A	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B12	10	5095	737.5	20.79	21.00
CA_12A-66C	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B66	20	66588	2125.2	LTE B12	10	5095	737.5	20.77	21.00
CA_2A-12A-66A	LTE B66	20	132322	1745	16QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	20.76	21.00

Table 9-94
LTE Band 2 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B2	20	700	1940	24.41	24.45
CA_2A-4A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B4	20	2175	2132.5	24.43	24.45
CA_2A-5A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B5	10	2525	881.5	24.41	24.45
CA_2A-12A (1)	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B12	10	5095	737.5	24.42	24.45
CA_2A-66A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B66	20	66786	2145	24.41	24.45

Table 9-95
LTE Band 2 Three Component Carrier Maximum Conducted Powers

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-4A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	24.35	24.45
CA_2A-4A-4A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	24.39	24.45
CA_2A-2A-12A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B2	20	700	1940	LTE B12	10	5095	737.5	24.36	24.45
CA_2A-66A-66A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	24.40	24.45
CA_2A-66C	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	24.38	24.45
CA_2A-4A-12A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	24.40	24.45
CA_2A-12A-66A	LTE B2	15	18925	1882.5	QPSK	1	74	925	1962.5	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	24.37	24.45

Table 9-96
LTE Band 2 Two Component Carrier Reduced Conducted Powers – Hotspot Mode Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	20.49	20.50
CA_2A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	20.46	20.50
CA_2A-5A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B5	10	2525	881.5	20.48	20.50
CA_2A-12A (1)	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B12	10	5095	737.5	20.47	20.50
CA_2A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	20.49	20.50

Table 9-97
LTE Band 2 Three Component Carrier Reduced Conducted Powers – Hotspot Mode Active

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	20.29	20.50
CA_2A-4A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	20.27	20.50
CA_2A-2A-12A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	LTE B12	10	5095	737.5	20.30	20.50
CA_2A-66A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	20.27	20.50
CA_2A-66C	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	20.29	20.50
CA_2A-4A-12A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	20.26	20.50
CA_2A-12A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	20.28	20.50

Table 9-98
LTE Band 2 Two Component Carrier Reduced Conducted Powers – Grip Sensor Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	21.96	22.00
CA_2A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	21.93	22.00
CA_2A-5A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B5	10	2525	881.5	21.95	22.00
CA_2A-12A (1)	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B12	10	5095	737.5	21.93	22.00
CA_2A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	21.94	22.00

Table 9-99
LTE Band 2 Three Component Carrier Reduced Conducted Powers – Grip Sensor Active

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	21.70	22.00
CA_2A-4A-4A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	21.65	22.00
CA_2A-2A-12A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B2	20	700	1940	LTE B12	10	5095	737.5	21.69	22.00
CA_2A-66A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	21.72	22.00
CA_2A-66C	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	21.70	22.00
CA_2A-4A-12A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	21.74	22.00
CA_2A-12A-66A	LTE B2	20	18925	1882.5	16QAM	1	0	925	1962.5	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	21.68	22.00

Table 9-100
LTE Band 25 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_25A-25A (1)	LTE B25	15	26365	1882.5	QPSK	1	74	8365	1962.5	LTE B25	20	8140	1940	24.36	24.45

Table 9-101
LTE Band 25 Two Component Carrier Reduced Conducted Powers – Hotspot Mode Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_25A-25A (1)	LTE B25	20	26365	1882.5	16QAM	1	0	8365	1962.5	LTE B25	20	8140	1940	20.17	20.50

Table 9-102
LTE Band 25 Two Component Carrier Reduced Conducted Powers – Grip Sensor Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_25A-25A (1)	LTE B25	20	26365	1882.5	16QAM	1	0	8365	1962.5	LTE B25	20	8140	1940	21.90	22.00

Table 9-103
LTE Band 41 Two Component Carrier Maximum Conducted Powers

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	LTE B41	20	39948	2525.8	23.20	23.18
CA_41C (1) (PC2)	LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	39948	2525.8	25.64	25.75

Table 9-104
LTE Band 41 Three Component Carrier Maximum Conducted Powers

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41D	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	LTE B41	20	39948	2525.8	LTE B41	20	40146	2545.6	23.13	23.18
CA_41D (PC2)	LTE B41	20	39750	2506	QPSK	1	0	39750	2506	LTE B41	20	39948	2525.8	LTE B41	20	40146	2545.6	25.75	25.75

Table 9-105
LTE Band 41 Two Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	21.96	22.07
CA_41C (1) (PC2)	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	22.08	22.16

Table 9-106
LTE Band 41 Three Component Carrier Reduced Conducted Powers – Hotspot Mode/Grip Sensor Active

	PCC									SCC 1				SCC 2				Power	
Combination	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 with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41D	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	22.04	22.07
CA_41D (PC2)	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	22.02	22.16

Notes:

1. 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. Per FCC guidance, LTE Band 26 standalone powers were used to select measurement configurations for LTE Band 5, LTE Band 66 standalone powers were used to select measurement configurations for LTE Band 4, and LTE Band 25 standalone powers were used to select measurement configurations for LTE Band 2.
4. 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.

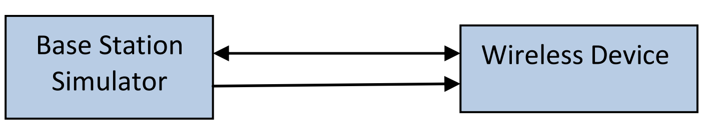

Figure 9-4
Power Measurement Setup

9.4.11 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-107
LTE Uplink Carrier Aggregation Conducted Powers

Power State	Combination	PCC							SCC							Power	
		PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE ULCA Tx. Power (dBm)	LTE Single Carrier Target Power (dBm)
Max	CA_41C (1)	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.86	24.00
Hotspot Active	CA_41C (1)	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	21.90	22.00
Grip Sensor Active	CA_41C (1)	LTE B41	20	41055	2636.5	QPSK	50	0	LTE B41	20	40857	2616.7	QPSK	50	50	21.83	22.00

Table 9-108
LTE Uplink Carrier Aggregation with 41C Uplink and 41D Downlink Conducted Powers

Power State	Combination	PCC							SCC1							SCC2				Power		
		PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE CA_41C ULCA Tx. Power with CA_41D DL CA Enabled (dBm)	LTE CA_41C ULCA Tx. Power (dBm)	LTE Single Carrier Target Power (dBm)
Max	CA_41C (1) UL with CA_41D DL	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	LTE B41	20	40146	2545.6	23.75	23.86	24.00
Hotspot Active	CA_41C (1) UL with CA_41D DL	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	21.88	21.90	22.00
Grip Sensor Active	CA_41C (1) UL with CA_41D DL	LTE B41	20	41055	2636.5	QPSK	50	0	LTE B41	20	40857	2616.7	QPSK	50	50	LTE B41	20	41253	2656.3	21.85	21.83	22.00

Notes:

1. This device supports uplink carrier aggregation for LTE CA_41C with a maximum of two 20 MHz component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
3. Uplink carrier aggregation is only possible when the device is operating with Power Class 3 for LTE Band 41.
4. Per FCC Guidance, additional SAR measurements for LTE ULCA for CA_41C uplink with CA_41D DLCA active were not required since the maximum output power for this configuration was not >0.25dB higher than the maximum output power for ULCA with CA_41D DLCA inactive.

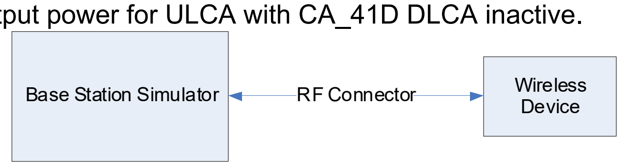

Figure 9-5
Power Measurement Setup

9.5 WLAN Conducted Powers

Table 9-109
2.4 GHz WLAN Maximum Average RF Power – Antenna 1

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	**19.85**	15.07	15.01
2437	6	19.45	16.58	17.31
2462	11	19.74	14.90	14.67

Table 9-110
2.4 GHz WLAN Maximum Average RF Power – Antenna 2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	19.61	15.12	14.92
2437	6	**19.92**	17.31	17.25
2462	11	19.47	14.96	14.78

Table 9-111
2.4 GHz WLAN Reduced Average RF Power – Antenna 1 (Held-to-ear)

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	**13.32**	13.42	12.12
2437	6	12.90	12.86	12.51
2462	11	13.31	13.15	11.79

Table 9-112
2.4 GHz WLAN Reduced Average RF Power – Antenna 2 (Held-to-ear)

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	13.22	13.36	13.04
2437	6	**13.49**	12.77	13.04
2462	11	13.24	13.32	13.01

Table 9-113
2.4 GHz WLAN Reduced Average RF Power – MIMO 802.11n (Held-to-ear)

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	12.12	13.04	15.61
2437	6	**12.51**	**13.04**	**15.79**
2462	11	11.79	13.01	15.45

Table 9-114
5 GHz WLAN Maximum Average RF Power – Antenna 1

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	17.10	16.80	16.78
5200	40	16.86	16.81	16.89
5220	44	17.09	16.80	16.82
5240	48	16.77	16.79	16.74
5260	52	16.51	16.51	16.54
5280	56	**16.56**	16.43	16.48
5300	60	16.53	16.40	16.43
5320	64	16.41	16.36	16.37
5500	100	**17.23**	17.23	17.27
5600	120	17.18	17.10	17.12
5620	124	17.17	17.13	17.10
5720	144	17.07	17.10	17.11
5745	149	16.89	16.94	16.81
5785	157	**16.90**	16.97	16.89
5825	165	16.87	16.96	16.98

Table 9-115
5 GHz WLAN Maximum Average RF Power – Antenna 2

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	16.56	16.54	16.57
5200	40	16.67	16.63	16.63
5220	44	16.62	16.67	16.65
5240	48	16.69	16.69	16.72
5260	52	**16.98**	16.91	16.92
5280	56	16.85	16.88	16.99
5300	60	16.93	16.90	16.88
5320	64	16.91	16.95	16.94
5500	100	16.59	16.52	16.52
5600	120	16.68	16.68	16.64
5620	124	**16.81**	16.62	16.68
5720	144	16.66	16.63	16.69
5745	149	17.09	17.10	17.07
5785	157	17.05	17.05	17.00
5825	165	**17.09**	17.11	17.07

Table 9-116
5 GHz WLAN Reduced Average RF Power – Antenna 1 (Held-to-ear)

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	15.15
5290	58	**14.90**
5530	106	14.44
5610	122	**14.52**
5690	138	14.44
5775	155	**14.36**

Table 9-117
5 GHz WLAN Reduced Average RF Power – Antenna 2 (Held-to-ear)

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	14.95
5290	58	**15.39**
5530	106	15.29
5610	122	**15.33**
5690	138	15.25
5775	155	**15.47**

Table 9-118
Maximum Output Powers During Conditions with 2.4 GHz and 5 GHz WLAN

5GHz (80MHz) Conducted Power [dBm]			
802.11ac			
Freq [MHz]	Channel	ANT1	ANT2
5210	42	15.15	14.95
5290	58	**14.90**	**15.39**
5530	106	14.44	15.29
5610	122	**14.52**	**15.33**
5690	138	14.44	15.25
5775	155	**14.36**	**15.47**

Table 9-119
Reduced Output Powers During Conditions with 2.4 GHz and 5 GHz WLAN

2.4GHz Conducted Power [dBm]			
802.11n			
Freq [MHz]	Channel	ANT1	ANT2
2412	1	9.17	8.78
2437	6	**9.71**	**9.61**
2462	11	9.12	10.00

5GHz (80MHz) Conducted Power [dBm]			
802.11ac			
Freq [MHz]	Channel	ANT1	ANT2
5210	42	13.05	12.96
5290	58	**13.11**	**12.81**
5530	106	**12.96**	**13.49**
5610	122	13.01	13.31
5690	138	12.71	12.91
5775	155	**12.87**	**13.46**

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.

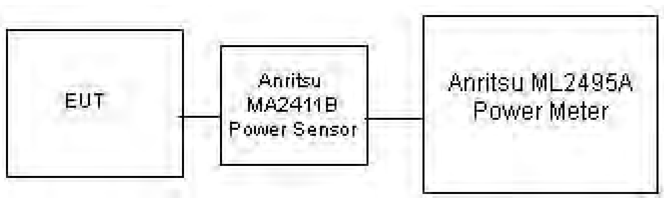

Figure 9-6
Power Measurement Setup for Bandwidths < 50 MHz

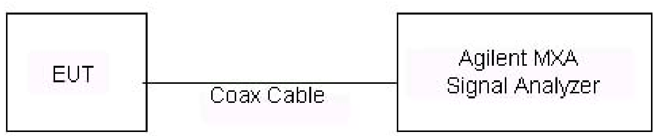

Figure 9-7
Power Measurement Setup for Bandwidths > 50 MHz

9.6 Bluetooth Conducted Powers

Table 9-120
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	12.43	17.497
2441	1.0	39	**14.33**	27.075
2480	1.0	78	13.57	22.750
2402	2.0	0	6.10	4.074
2441	2.0	39	7.56	5.703
2480	2.0	78	7.14	5.175
2402	3.0	0	6.23	4.200
2441	3.0	39	7.67	5.846
2480	3.0	78	6.88	4.879

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

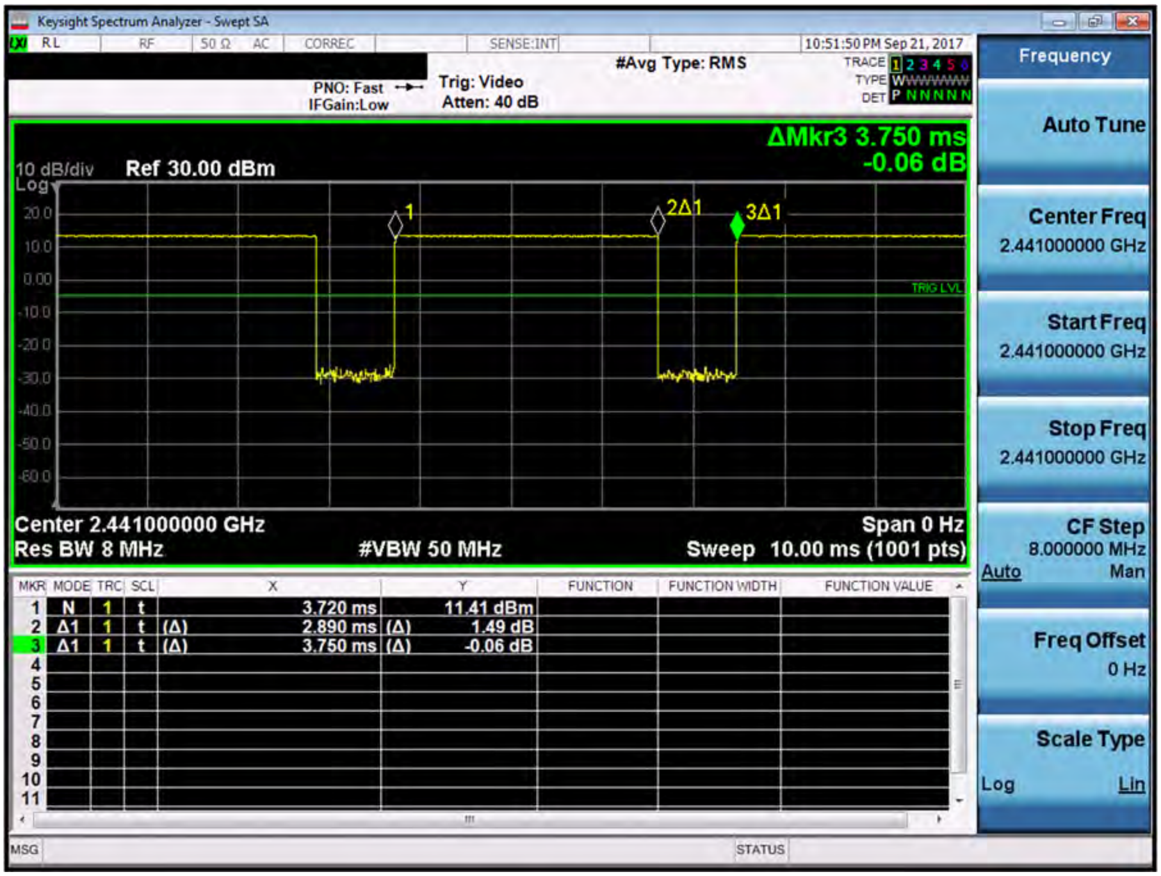

Figure 9-8

Bluetooth Transmission Plot

Equation 9-1
Bluetooth Duty Cycle Calculation

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

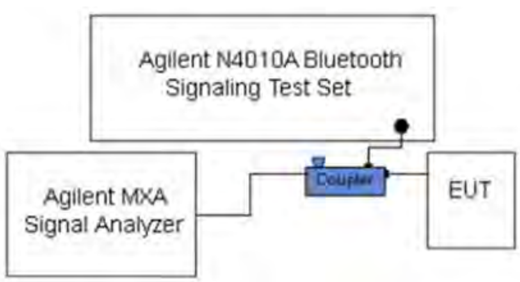

Figure 9-9

Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
9/11/2017	750H	20.7	680	0.864	43.945	0.888	42.305	-2.70%	3.88%
			695	0.869	43.883	0.889	42.227	-2.25%	3.92%
			700	0.871	43.870	0.889	42.201	-2.02%	3.95%
			710	0.875	43.837	0.890	42.149	-1.69%	4.00%
			740	0.886	43.744	0.893	41.994	-0.78%	4.17%
			755	0.892	43.688	0.894	41.916	-0.22%	4.23%
			770	0.897	43.634	0.895	41.838	0.22%	4.29%
			785	0.902	43.588	0.896	41.760	0.67%	4.38%
9/14/2017	850H	21.0	820	0.904	43.594	0.899	41.578	0.56%	4.85%
			835	0.919	43.391	0.900	41.500	2.11%	4.56%
			850	0.936	43.167	0.916	41.500	2.18%	4.02%
9/27/2017	835H	21.0	820	0.906	42.785	0.899	41.578	0.78%	2.90%
			835	0.921	42.574	0.900	41.500	2.33%	2.59%
			850	0.936	42.369	0.916	41.500	2.18%	2.09%
9/18/2017	1750H	20.7	1710	1.358	38.695	1.348	40.142	0.74%	-3.60%
			1750	1.398	38.520	1.371	40.079	1.97%	-3.89%
			1790	1.439	38.320	1.394	40.016	3.23%	-4.24%
9/25/2017	1750H	20.8	1710	1.350	38.908	1.348	40.142	0.15%	-3.07%
			1750	1.389	38.728	1.371	40.079	1.31%	-3.37%
			1790	1.429	38.530	1.394	40.016	2.51%	-3.71%
9/18/2017	1900H	22.8	1850	1.379	40.032	1.400	40.000	-1.50%	0.08%
			1880	1.410	39.885	1.400	40.000	0.71%	-0.29%
			1910	1.442	39.764	1.400	40.000	3.00%	-0.59%
9/17/2017	2450H	23.0	2400	1.809	39.060	1.756	39.289	3.02%	-0.58%
			2450	1.866	38.867	1.800	39.200	3.67%	-0.85%
			2500	1.924	38.643	1.855	39.136	3.72%	-1.26%
			2550	1.984	38.475	1.909	39.073	3.93%	-1.53%
9/20/2017	2450H	22.6	2400	1.799	39.403	1.756	39.289	2.45%	0.29%
			2450	1.856	39.236	1.800	39.200	3.11%	0.09%
			2500	1.914	39.054	1.855	39.136	3.18%	-0.21%
			2550	1.962	38.850	1.909	39.073	2.78%	-0.57%
9/25/2017	2450H- 2600H	22.8	2400	1.791	39.072	1.756	39.289	1.99%	-0.55%
			2450	1.846	38.907	1.800	39.200	2.56%	-0.75%
			2500	1.901	38.725	1.855	39.136	2.48%	-1.05%
			2550	1.960	38.548	1.909	39.073	2.67%	-1.34%
			2600	2.015	38.348	1.964	39.009	2.60%	-1.69%
09/11/2017	5200H-5800H	20.0	5240	4.566	35.580	4.696	35.940	-2.77%	-1.00%
			5260	4.585	35.566	4.717	35.917	-2.80%	-0.98%
			5280	4.610	35.516	4.737	35.894	-2.68%	-1.05%
			5300	4.624	35.500	4.758	35.871	-2.82%	-1.03%
			5520	4.847	35.164	4.983	35.620	-2.73%	-1.28%
			5540	4.865	35.145	5.004	35.597	-2.78%	-1.27%
			5600	4.938	35.061	5.065	35.529	-2.51%	-1.32%
			5620	4.951	35.023	5.086	35.506	-2.65%	-1.36%
			5745	5.091	34.858	5.214	35.363	-2.36%	-1.43%
			5765	5.113	34.807	5.234	35.340	-2.31%	-1.51%
			5785	5.130	34.761	5.255	35.317	-2.38%	-1.57%

Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
9/18/2017	750B	23.5	680	0.911	57.825	0.958	55.804	-4.91%	3.62%
			695	0.923	57.687	0.959	55.745	-3.75%	3.48%
			700	0.928	57.641	0.959	55.726	-3.23%	3.44%
			710	0.937	57.553	0.960	55.687	-2.40%	3.35%
			740	0.963	57.299	0.963	55.570	0.00%	3.11%
			755	0.978	57.163	0.964	55.512	1.45%	2.97%
			770	0.992	57.020	0.965	55.453	2.80%	2.83%
			785	1.007	56.879	0.966	55.395	4.24%	2.68%
9/11/2017	835B	20.8	820	0.948	53.970	0.969	55.258	-2.17%	-2.33%
			835	0.964	53.816	0.970	55.200	-0.62%	-2.51%
			850	0.979	53.672	0.988	55.154	-0.91%	-2.69%
9/14/2017	835B	21.1	820	0.950	53.168	0.969	55.258	-1.96%	-3.78%
			835	0.966	52.937	0.970	55.200	-0.41%	-4.10%
			850	0.976	52.840	0.988	55.154	-1.21%	-4.20%
9/7/2017	1750B	20.5	1710	1.474	52.061	1.463	53.537	0.75%	-2.76%
			1750	1.517	51.907	1.488	53.432	1.95%	-2.85%
			1790	1.562	51.722	1.514	53.326	3.17%	-3.01%
9/11/2017	1750B	21.0	1710	1.463	52.087	1.463	53.537	0.00%	-2.71%
			1750	1.510	51.935	1.488	53.432	1.48%	-2.80%
			1790	1.559	51.783	1.514	53.326	2.97%	-2.89%
9/14/2017	1750B	21.4	1710	1.439	52.839	1.463	53.537	-1.64%	-1.30%
			1750	1.481	52.680	1.488	53.432	-0.47%	-1.41%
			1790	1.524	52.542	1.514	53.326	0.66%	-1.47%
9/25/2017	1750B	21.0	1710	1.438	53.937	1.463	53.537	-1.71%	0.75%
			1750	1.462	53.879	1.488	53.432	-1.75%	0.84%
			1790	1.488	53.825	1.514	53.326	-1.72%	0.94%
9/10/2017	1900B	23.5	1850	1.501	52.543	1.520	53.300	-1.25%	-1.42%
			1880	1.536	52.458	1.520	53.300	1.05%	-1.58%
			1910	1.571	52.363	1.520	53.300	3.36%	-1.76%
9/12/2017	1900B	23.0	1850	1.511	52.450	1.520	53.300	-0.59%	-1.59%
			1880	1.547	52.359	1.520	53.300	1.78%	-1.77%
			1910	1.583	52.271	1.520	53.300	4.14%	-1.93%
9/12/2017	2450B	22.0	2400	1.954	51.351	1.902	52.767	2.73%	-2.68%
			2450	2.026	51.152	1.950	52.700	3.90%	-2.94%
			2500	2.089	50.973	2.021	52.636	3.36%	-3.16%
			2550	2.163	50.749	2.092	52.573	3.39%	-3.47%
9/17/2017	2450B - 2600B	22.6	2400	1.970	51.990	1.902	52.767	3.58%	-1.47%
			2450	2.037	51.813	1.950	52.700	4.46%	-1.68%
			2500	2.105	51.607	2.021	52.636	4.16%	-1.95%
			2550	2.178	51.428	2.092	52.573	4.11%	-2.18%
			2600	2.244	51.216	2.163	52.509	3.74%	-2.46%
			2650	2.319	51.025	2.234	52.445	3.80%	-2.71%
			2700	2.388	50.825	2.305	52.382	3.60%	-2.97%
9/20/2017	2450B	22.8	2400	1.958	52.235	1.902	52.767	2.94%	-1.01%
			2450	2.027	52.046	1.950	52.700	3.95%	-1.24%
			2500	2.093	51.849	2.021	52.636	3.56%	-1.50%
			2550	2.162	51.658	2.092	52.573	3.35%	-1.74%
9/23/2017	2600B	23.4	2500	2.095	51.654	2.021	52.636	3.66%	-1.87%
			2550	2.161	51.483	2.092	52.573	3.30%	-2.07%
			2600	2.231	51.272	2.163	52.509	3.14%	-2.36%
			2650	2.298	51.084	2.234	52.445	2.86%	-2.60%
			2700	2.370	50.886	2.305	52.382	2.82%	-2.86%
9/28/2017	2600B	23.5	2500	2.072	51.719	2.021	52.636	2.52%	-1.74%
			2550	2.138	51.555	2.092	52.573	2.20%	-1.94%
			2600	2.208	51.342	2.163	52.509	2.08%	-2.22%
09/11/2017	5200B-5800B	21.6	5240	5.461	47.687	5.346	48.960	2.15%	-2.60%
			5260	5.502	47.642	5.369	48.933	2.48%	-2.64%
			5280	5.516	47.629	5.393	48.906	2.28%	-2.61%
			5300	5.538	47.599	5.416	48.879	2.25%	-2.62%
			5500	5.801	47.189	5.650	48.607	2.67%	-2.92%
			5600	5.945	47.043	5.766	48.471	3.10%	-2.95%
			5620	5.963	47.029	5.790	48.444	2.99%	-2.92%
			5745	6.165	46.861	5.936	48.275	3.86%	-2.93%
			5765	6.181	46.803	5.959	48.248	3.73%	-2.99%
			5785	6.207	46.762	5.982	48.220	3.76%	-3.02%
			5825	6.267	46.712	6.029	48.166	3.95%	-3.02%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

10.2 Test System Verification

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

Table 10-3
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
G	750	HEAD	09/11/2017	22.5	20.7	0.200	1161	3332	1.510	8.170	7.550	-7.59%
H	850	HEAD	09/14/2017	21.5	21.0	0.200	1009	7410	2.000	10.000	10.000	0.00%
H	835	HEAD	09/27/2017	23.2	21.2	0.200	4d180	7410	1.980	9.260	9.900	6.91%
I	1750	HEAD	09/18/2017	20.3	20.7	0.100	1150	3213	3.640	36.100	36.400	0.83%
G	1750	HEAD	09/25/2017	21.7	21.8	0.100	1092	3332	3.760	36.400	37.600	3.30%
E	1900	HEAD	09/18/2017	22.8	22.5	0.100	5d026	3319	4.100	39.300	41.000	4.33%
H	2450	HEAD	09/17/2017	20.9	21.0	0.100	981	7410	5.050	52.800	50.500	-4.36%
E	2450	HEAD	09/20/2017	22.5	22.6	0.100	981	3319	5.320	52.800	53.200	0.76%
E	2450	HEAD	09/25/2017	22.5	22.5	0.100	981	3319	5.400	52.800	54.000	2.27%
E	2600	HEAD	09/25/2017	22.5	22.5	0.100	1126	3319	5.770	56.400	57.700	2.30%
H	5250	HEAD	09/11/2017	20.0	20.0	0.050	1191	3914	3.700	78.900	74.000	-6.21%
H	5600	HEAD	09/11/2017	20.0	20.0	0.050	1191	3914	4.030	83.600	80.600	-3.59%
H	5750	HEAD	09/11/2017	20.0	20.0	0.050	1191	3914	3.940	79.100	78.800	-0.38%
J	750	BODY	09/18/2017	21.4	22.4	0.200	1034	3209	1.840	8.710	9.200	5.63%
I	835	BODY	09/11/2017	20.1	21.2	0.200	4d132	3213	1.860	9.800	9.300	-5.10%
I	835	BODY	09/14/2017	20.7	21.1	0.200	4d047	3213	1.930	9.570	9.650	0.84%
J	1750	BODY	09/11/2017	20.1	21.0	0.100	1150	3209	3.560	36.500	35.600	-2.47%
J	1750	BODY	09/14/2017	20.4	21.4	0.100	1148	3209	3.670	37.000	36.700	-0.81%
D	1750	BODY	09/25/2017	22.3	21.0	0.100	1092	3288	3.620	37.000	36.200	-2.16%
K	1900	BODY	09/10/2017	21.8	23.5	0.100	5d080	7406	4.120	39.100	41.200	5.37%
K	1900	BODY	09/12/2017	21.9	23.0	0.100	5d180	7406	4.060	39.500	40.600	2.78%
E	2450	BODY	09/12/2017	22.0	22.0	0.100	719	3319	5.070	50.100	50.700	1.20%
K	2450	BODY	09/17/2017	22.1	22.1	0.100	981	7406	5.350	50.800	53.500	5.31%
K	2450	BODY	09/20/2017	22.3	21.7	0.100	719	7406	5.160	50.100	51.600	2.99%
K	2600	BODY	09/17/2017	22.1	22.1	0.100	1126	7406	5.620	54.300	56.200	3.50%
K	2600	BODY	09/23/2017	21.7	22.0	0.100	1004	7406	5.500	55.300	55.000	-0.54%
K	2600	BODY	09/28/2017	22.7	22.1	0.100	1126	7406	5.500	54.300	55.000	1.29%
D	5250	BODY	09/11/2017	21.1	20.7	0.050	1237	3589	3.690	76.900	73.800	-4.03%
D	5600	BODY	09/11/2017	21.1	20.7	0.050	1237	3589	4.000	78.500	80.000	1.91%
D	5750	BODY	09/11/2017	21.1	20.7	0.050	1237	3589	3.670	77.100	73.400	-4.80%

Table 10-4
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
I	835	BODY	09/14/2017	20.7	21.1	0.200	4d047	3213	1.280	6.240	6.400	2.56%
I	1750	BODY	09/07/2017	20.3	20.5	0.100	1092	3213	2.060	19.800	20.600	4.04%
J	1750	BODY	09/11/2017	20.1	21.0	0.100	1150	3209	1.890	19.500	18.900	-3.08%
K	1900	BODY	09/12/2017	21.9	23.0	0.100	5d180	7406	2.080	20.900	20.800	-0.48%
K	2450	BODY	09/17/2017	22.1	22.1	0.100	981	7406	2.410	23.800	24.100	1.26%
K	2600	BODY	09/17/2017	22.1	22.1	0.100	1126	7406	2.440	24.400	24.400	0.00%
K	2600	BODY	09/23/2017	21.7	22.0	0.100	1004	7406	2.390	24.900	23.900	-4.02%
D	5250	BODY	09/11/2017	21.1	20.7	0.050	1237	3589	1.030	21.500	20.600	-4.19%
D	5600	BODY	09/11/2017	21.1	20.7	0.050	1237	3589	1.110	22.100	22.200	0.45%

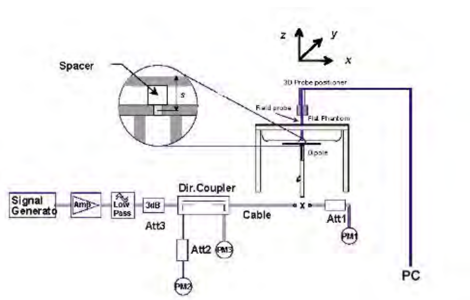

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
CDMA BC10 (§90S) 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)	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	25.5	24.19	0.02	Right	Cheek	47	20951	1:1	0.189	1.352	0.256	A1
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	25.5	24.19	0.01	Right	Tilt	47	20951	1:1	0.131	1.352	0.177	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	25.5	24.19	0.05	Left	Cheek	47	20951	1:1	0.133	1.352	0.180	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	25.5	24.19	0.03	Left	Tilt	47	20951	1:1	0.111	1.352	0.150	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.5	23.98	0.06	Right	Cheek	47	20951	1:1	0.180	1.419	0.255	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.5	23.98	-0.06	Right	Tilt	47	20951	1:1	0.081	1.419	0.115	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.5	23.98	0.01	Left	Cheek	47	20951	1:1	0.141	1.419	0.200	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.5	23.98	0.09	Left	Tilt	47	20951	1:1	0.067	1.419	0.095	
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
CDMA BC0 (§22H) 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)	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	25.5	24.46	-0.10	Right	Cheek	47	20951	1:1	0.204	1.271	0.259	A2
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	25.5	24.46	-0.07	Right	Tilt	47	20951	1:1	0.132	1.271	0.168	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	25.5	24.46	0.05	Left	Cheek	47	20951	1:1	0.129	1.271	0.164	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	25.5	24.46	-0.01	Left	Tilt	47	20951	1:1	0.107	1.271	0.136	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.5	24.33	0.12	Right	Cheek	47	20951	1:1	0.198	1.309	0.259	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.5	24.33	0.00	Right	Tilt	47	20951	1:1	0.092	1.309	0.120	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.5	24.33	0.06	Left	Cheek	47	20951	1:1	0.134	1.309	0.175	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.5	24.33	0.12	Left	Tilt	47	20951	1:1	0.083	1.309	0.109	
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
PCS CDMA 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)	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	24.49	0.16	Right	Cheek	30	20084	1:1	0.168	1.262	0.212	A3
1880.00	600	PCS CDMA	RC3 / SO55	25.5	24.49	-0.04	Right	Tilt	30	20084	1:1	0.092	1.262	0.116	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	24.49	-0.02	Left	Cheek	30	20084	1:1	0.148	1.262	0.187	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	24.49	0.04	Left	Tilt	30	20084	1:1	0.080	1.262	0.101	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	24.37	0.02	Right	Cheek	30	20084	1:1	0.143	1.297	0.185	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	24.37	0.08	Right	Tilt	30	20084	1:1	0.084	1.297	0.109	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	24.37	-0.10	Left	Cheek	30	20084	1:1	0.136	1.297	0.176	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	24.37	0.01	Left	Tilt	30	20084	1:1	0.084	1.297	0.109	
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 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	27.5	26.98	0.17	Right	Cheek	19649	1:8.3	0.037	1.127	0.042	A4
836.60	190	GSM 850	GSM	27.5	26.98	0.14	Right	Tilt	19649	1:8.3	0.018	1.127	0.020	
836.60	190	GSM 850	GSM	27.5	26.98	-0.01	Left	Cheek	19649	1:8.3	0.027	1.127	0.030	
836.60	190	GSM 850	GSM	27.5	26.98	-0.13	Left	Tilt	19649	1:8.3	0.019	1.127	0.021	
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
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	31.5	30.83	0.09	Right	Cheek	20209	1:8.3	0.063	1.167	0.074	A5
1880.00	661	GSM 1900	GSM	31.5	30.83	0.18	Right	Tilt	20209	1:8.3	0.029	1.167	0.034	
1880.00	661	GSM 1900	GSM	31.5	30.83	0.01	Left	Cheek	20209	1:8.3	0.059	1.167	0.069	
1880.00	661	GSM 1900	GSM	31.5	30.83	0.12	Left	Tilt	20209	1:8.3	0.029	1.167	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 11-6
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	24.0	23.68	0.02	Right	Cheek	47	20209	1:1	0.133	1.076	0.143	A6
836.60	4183	UMTS 850	RMC	24.0	23.68	0.00	Right	Tilt	47	20209	1:1	0.065	1.076	0.070	
836.60	4183	UMTS 850	RMC	24.0	23.68	0.03	Left	Cheek	47	20209	1:1	0.097	1.076	0.104	
836.60	4183	UMTS 850	RMC	24.0	23.68	0.00	Left	Tilt	47	20209	1:1	0.069	1.076	0.074	
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
UMTS 1750 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)	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	0.10	Right	Cheek	31	20951	1:1	0.212	1.002	0.212	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	0.11	Right	Tilt	31	20951	1:1	0.133	1.002	0.133	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	0.10	Left	Cheek	31	20951	1:1	0.333	1.002	**0.334**	A7
1732.40	1412	UMTS 1750	RMC	24.5	24.49	0.03	Left	Tilt	31	20951	1:1	0.106	1.002	0.106	
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
UMTS 1900 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)	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.04	Right	Cheek	29	20209	1:1	0.153	1.140	0.174	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.03	Right	Tilt	29	20209	1:1	0.097	1.140	0.111	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.05	Left	Cheek	29	20209	1:1	0.159	1.140	0.181	A8
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.10	Left	Tilt	29	20209	1:1	0.076	1.140	0.087	
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 71 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)	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	-0.06	0	Right	Cheek	31	QPSK	1	0	20951	1:1	0.124	1.040	0.129	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.03	1	Right	Cheek	31	QPSK	50	0	20951	1:1	0.100	1.052	0.105	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.00	0	Right	Tilt	31	QPSK	1	0	20951	1:1	0.059	1.040	0.061	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.02	1	Right	Tilt	31	QPSK	50	0	20951	1:1	0.044	1.052	0.046	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.21	0	Left	Cheek	31	QPSK	1	0	20951	1:1	0.131	1.040	0.136	A9
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.04	1	Left	Cheek	31	QPSK	50	0	20951	1:1	0.106	1.052	0.112	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.14	0	Left	Tilt	31	QPSK	1	0	20951	1:1	0.054	1.040	0.056	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.13	1	Left	Tilt	31	QPSK	50	0	20951	1:1	0.047	1.052	0.049	
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 12 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)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.18	0	Right	Cheek	15	QPSK	1	0	20951	1:1	0.139	1.245	0.173	A10
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.01	1	Right	Cheek	15	QPSK	25	0	20951	1:1	0.105	1.250	0.131	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.07	0	Right	Tilt	15	QPSK	1	0	20951	1:1	0.053	1.245	0.066	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.14	1	Right	Tilt	15	QPSK	25	0	20951	1:1	0.044	1.250	0.055	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.10	0	Left	Cheek	15	QPSK	1	0	20951	1:1	0.138	1.245	0.172	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.01	1	Left	Cheek	15	QPSK	25	0	20951	1:1	0.109	1.250	0.136	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.20	0	Left	Tilt	15	QPSK	1	0	20951	1:1	0.070	1.245	0.087	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.17	1	Left	Tilt	15	QPSK	25	0	20951	1:1	0.054	1.250	0.068	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-11
LTE Band 13 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)	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	0.02	0	Right	Cheek	68	QPSK	1	0	20951	1:1	0.203	1.167	0.237	A11
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.01	1	Right	Cheek	68	QPSK	25	0	20951	1:1	0.164	1.156	0.190	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.13	0	Right	Tilt	68	QPSK	1	0	20951	1:1	0.108	1.167	0.126	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.00	1	Right	Tilt	68	QPSK	25	0	20951	1:1	0.089	1.156	0.103	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.02	0	Left	Cheek	68	QPSK	1	0	20951	1:1	0.141	1.167	0.165	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.07	1	Left	Cheek	68	QPSK	25	0	20951	1:1	0.114	1.156	0.132	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.13	0	Left	Tilt	68	QPSK	1	0	20951	1:1	0.088	1.167	0.103	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	-0.01	1	Left	Tilt	68	QPSK	25	0	20951	1:1	0.069	1.156	0.080	
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 26 (Cell) Head SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.		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) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	0.06	0	Right	Cheek	47	QPSK	1	0	20209	1:1	0.168	1.167	0.196	A12
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.01	1	Right	Cheek	47	QPSK	36	0	20209	1:1	0.132	1.178	0.155	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	0.00	0	Right	Tilt	47	QPSK	1	0	20209	1:1	0.083	1.167	0.097	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.02	1	Right	Tilt	47	QPSK	36	0	20209	1:1	0.066	1.178	0.078	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	0.01	0	Left	Cheek	47	QPSK	1	0	20209	1:1	0.142	1.167	0.166	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.02	1	Left	Cheek	47	QPSK	36	0	20209	1:1	0.108	1.178	0.127	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	0.02	0	Left	Tilt	47	QPSK	1	0	20209	1:1	0.074	1.167	0.086	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.09	1	Left	Tilt	47	QPSK	36	0	20209	1:1	0.057	1.178	0.067	

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
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.		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) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	0.05	0	Right	Cheek	31	QPSK	1	0	20951	1:1	0.230	1.023	0.235	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.02	1	Right	Cheek	31	QPSK	50	0	20951	1:1	0.178	1.040	0.185	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	0.03	0	Right	Tilt	31	QPSK	1	0	20951	1:1	0.157	1.023	0.161	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.06	1	Right	Tilt	31	QPSK	50	0	20951	1:1	0.120	1.040	0.125	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	0.05	0	Left	Cheek	31	QPSK	1	0	20951	1:1	0.293	1.023	0.300	A13
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.06	1	Left	Cheek	31	QPSK	50	0	20951	1:1	0.229	1.040	0.238	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	0.01	0	Left	Tilt	31	QPSK	1	0	20951	1:1	0.154	1.023	0.158	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.06	1	Left	Tilt	31	QPSK	50	0	20951	1:1	0.117	1.040	0.122	

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
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	0.00	0	Right	Cheek	15	QPSK	1	0	20084	1:1	0.143	1.146	0.164	A14
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.03	1	Right	Cheek	15	QPSK	50	0	20084	1:1	0.101	1.178	0.119	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	0.19	0	Right	Tilt	15	QPSK	1	0	20084	1:1	0.074	1.146	0.085	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	0.07	1	Right	Tilt	15	QPSK	50	0	20084	1:1	0.055	1.178	0.065	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	0.14	0	Left	Cheek	15	QPSK	1	0	20084	1:1	0.129	1.146	0.148	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	0.04	1	Left	Cheek	15	QPSK	50	0	20084	1:1	0.088	1.178	0.104	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.01	0	Left	Tilt	15	QPSK	1	0	20084	1:1	0.061	1.146	0.070	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	0.10	1	Left	Tilt	15	QPSK	50	0	20084	1:1	0.041	1.178	0.048	

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

Table 11-15
LTE Band 7 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	0.08	0	Right	Cheek	QPSK	1	0	20084	1:1	0.085	1.096	0.093	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	0.03	1	Right	Cheek	QPSK	50	0	20084	1:1	0.070	1.102	0.077	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	-0.14	0	Right	Tilt	QPSK	1	0	20084	1:1	0.084	1.096	0.092	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	-0.03	1	Right	Tilt	QPSK	50	0	20084	1:1	0.063	1.102	0.069	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	0.03	0	Left	Cheek	QPSK	1	0	20084	1:1	0.118	1.096	0.129	A15
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	0.06	1	Left	Cheek	QPSK	50	0	20084	1:1	0.096	1.102	0.106	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	0.00	0	Left	Tilt	QPSK	1	0	20084	1:1	0.048	1.096	0.053	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	0.04	1	Left	Tilt	QPSK	50	0	20084	1:1	0.038	1.102	0.042	
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
LTE Band 38 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	0.06	0	Right	Cheek	QPSK	1	0	20514	1:1.58	0.082	1.191	0.098	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.02	1	Right	Cheek	QPSK	50	0	20514	1:1.58	0.068	1.213	0.082	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	-0.13	0	Right	Tilt	QPSK	1	0	20514	1:1.58	0.057	1.191	0.068	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.14	1	Right	Tilt	QPSK	50	0	20514	1:1.58	0.046	1.213	0.056	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	-0.02	0	Left	Cheek	QPSK	1	0	20514	1:1.58	0.090	1.191	0.107	A16
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.06	1	Left	Cheek	QPSK	50	0	20514	1:1.58	0.071	1.213	0.086	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	0.12	0	Left	Tilt	QPSK	1	0	20514	1:1.58	0.044	1.191	0.052	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.18	1	Left	Tilt	QPSK	50	0	20514	1:1.58	0.031	1.213	0.038	
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 11-17
LTE Band 41 Head SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.12	0	Right	Cheek	QPSK	1	99	20514	1:1.58	0.073	1.355	0.099	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	0.03	1	Right	Cheek	QPSK	50	0	20514	1:1.58	0.054	1.377	0.074	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.10	0	Right	Tilt	QPSK	1	99	20514	1:1.58	0.057	1.355	0.077	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	0.08	1	Right	Tilt	QPSK	50	0	20514	1:1.58	0.039	1.377	0.054	
2 CC Uplink, Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	24.5	23.86	0.05	0	Left	Cheek	QPSK	1	99	20514	1:1.58	0.100	1.159	0.116	A17
	SCC	2525.80	39948	Low	LTE Band 41	20								1	0						
1 CC Uplink, Power Class 2	N/A	2506.00	39750	Low	LTE Band 41	20	27.0	25.74	-0.17	0	Left	Cheek	QPSK	1	99	20514	1:2.31	0.097	1.337	0.130	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	0.00	0	Left	Cheek	QPSK	1	99	20514	1:1.58	0.079	1.355	0.107	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	0.09	1	Left	Cheek	QPSK	50	0	20514	1:1.58	0.060	1.377	0.083	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	0.02	0	Left	Tilt	QPSK	1	99	20514	1:1.58	0.030	1.355	0.041	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	-0.03	1	Left	Tilt	QPSK	50	0	20514	1:1.58	0.025	1.377	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 11-18
DTS SISO Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	13.5	13.32	0.19	Right	Cheek	1	18518	1	98.9	0.229	0.128	1.042	1.011	0.135	
2412	1	802.11b	DSSS	22	13.5	13.32	0.11	Right	Tilt	1	18518	1	98.9	0.226	-	1.042	1.011	-	
2412	1	802.11b	DSSS	22	13.5	13.32	0.13	Left	Cheek	1	18518	1	98.9	0.144	-	1.042	1.011	-	
2412	1	802.11b	DSSS	22	13.5	13.32	0.16	Left	Tilt	1	18518	1	98.9	0.171	-	1.042	1.011	-	
2412	1	802.11b	DSSS	22	13.5	13.22	0.04	Right	Cheek	2	18518	1	98.9	1.080	0.739	1.067	1.011	0.797	
2437	6	802.11b	DSSS	22	13.5	13.49	-0.10	Right	Cheek	2	18518	1	98.9	1.071	0.721	1.002	1.011	0.730	
2462	11	802.11b	DSSS	22	13.5	13.24	-0.16	Right	Cheek	2	18518	1	98.9	1.000	0.901	1.062	1.011	0.967	A18
2437	6	802.11b	DSSS	22	13.5	13.49	-0.10	Right	Tilt	2	18518	1	98.9	0.688	0.428	1.002	1.011	0.434	
2437	6	802.11b	DSSS	22	13.5	13.49	-0.13	Left	Cheek	2	18518	1	98.9	0.415	0.356	1.002	1.011	0.361	
2437	6	802.11b	DSSS	22	13.5	13.49	0.05	Left	Tilt	2	18518	1	98.9	0.309	-	1.002	1.011	-	
2462	11	802.11b	DSSS	22	13.5	13.24	-0.12	Right	Cheek	2	18518	1	98.9	0.904	0.833	1.062	1.011	0.894	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram											

Blue entry represents variability data.

Table 11-19
DTS MIMO Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	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	13.5	12.12	13.04	0.19	Right	Cheek	MIMO	00318	13	93.5	0.872	0.619	1.374	1.070	0.910	
2437	6	802.11n	OFDM	20	13.5	12.51	13.04	0.17	Right	Cheek	MIMO	00318	13	93.5	0.924	0.601	1.256	1.070	0.808	
2462	11	802.11n	OFDM	20	13.5	11.79	13.01	0.19	Right	Cheek	MIMO	00318	13	93.5	0.720	0.506	1.483	1.070	0.803	
2437	6	802.11n	OFDM	20	13.5	12.51	13.04	0.12	Right	Tilt	MIMO	00318	13	93.5	0.600	0.380	1.256	1.070	0.511	
2437	6	802.11n	OFDM	20	13.5	12.51	13.04	0.15	Left	Cheek	MIMO	00318	13	93.5	0.368	-	1.256	1.070	-	
2437	6	802.11n	OFDM	20	13.5	12.51	13.04	0.16	Left	Tilt	MIMO	00318	13	93.5	0.171	-	1.256	1.070	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

To achieve the 16.5 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.5 dBm.

Table 11-20
DTS MIMO Head SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	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)	
2437	6	802.11n	OFDM	20	10.0	9.71	9.61	-0.13	Right	Cheek	MIMO	18518	13	93.5	0.523	0.392	1.094	1.070	0.459	
2437	6	802.11n	OFDM	20	10.0	9.71	9.61	0.17	Right	Tilt	MIMO	18518	13	93.5	0.355	0.270	1.094	1.070	0.316	
2437	6	802.11n	OFDM	20	10.0	9.71	9.61	-0.01	Left	Cheek	MIMO	18518	13	93.5	0.194	0.195	1.094	1.070	0.228	
2437	6	802.11n	OFDM	20	10.0	9.71	9.61	0.06	Left	Tilt	MIMO	18518	13	93.5	0.106	-	1.094	1.070	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

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

Table 11-21
NII SISO Head SAR

MEASUREMENT RESULTS

FREQUENCY MHz	FREQUENCY Ch.	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 W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
5290	58	802.11ac	OFDM	80	15.5	14.90	0.11	Right	Cheek	1	18518	29.3	94.5	0.433	0.282	1.148	1.058	0.343	
5290	58	802.11ac	OFDM	80	15.5	14.90	0.16	Right	Tilt	1	18518	29.3	94.5	0.292	-	1.148	1.058	-	
5290	58	802.11ac	OFDM	80	15.5	14.90	-0.14	Left	Cheek	1	18518	29.3	94.5	0.388	-	1.148	1.058	-	
5290	58	802.11ac	OFDM	80	15.5	14.90	0.08	Left	Tilt	1	18518	29.3	94.5	0.124	-	1.148	1.058	-	
5290	58	802.11ac	OFDM	80	15.5	15.39	0.15	Right	Cheek	2	18518	29.3	94.6	0.489	0.319	1.026	1.057	0.346	
5290	58	802.11ac	OFDM	80	15.5	15.39	-0.20	Right	Tilt	2	18518	29.3	94.6	0.346	-	1.026	1.057	-	
5290	58	802.11ac	OFDM	80	15.5	15.39	0.12	Left	Cheek	2	18518	29.3	94.6	0.378	-	1.026	1.057	-	
5290	58	802.11ac	OFDM	80	15.5	15.39	0.16	Left	Tilt	2	18518	29.3	94.6	0.235	-	1.026	1.057	-	
5610	122	802.11ac	OFDM	80	15.5	14.52	0.10	Right	Cheek	1	18518	29.3	94.5	0.435	0.307	1.253	1.058	0.407	
5610	122	802.11ac	OFDM	80	15.5	14.52	0.17	Right	Tilt	1	18518	29.3	94.5	0.373	0.209	1.253	1.058	0.277	
5610	122	802.11ac	OFDM	80	15.5	14.52	0.10	Left	Cheek	1	18518	29.3	94.5	0.324	-	1.253	1.058	-	
5610	122	802.11ac	OFDM	80	15.5	14.52	0.16	Left	Tilt	1	18518	29.3	94.5	0.333	-	1.253	1.058	-	
5610	122	802.11ac	OFDM	80	15.5	15.33	0.12	Right	Cheek	2	18518	29.3	94.6	0.668	0.354	1.040	1.057	0.389	
5610	122	802.11ac	OFDM	80	15.5	15.33	0.18	Right	Tilt	2	18518	29.3	94.6	0.441	-	1.040	1.057	-	
5610	122	802.11ac	OFDM	80	15.5	15.33	0.16	Left	Cheek	2	18518	29.3	94.6	0.563	-	1.040	1.057	-	
5610	122	802.11ac	OFDM	80	15.5	15.33	0.12	Left	Tilt	2	18518	29.3	94.6	0.407	-	1.040	1.057	-	
5775	155	802.11ac	OFDM	80	15.5	14.36	0.12	Right	Cheek	1	18518	29.3	94.5	0.450	-	1.300	1.058	-	
5775	155	802.11ac	OFDM	80	15.5	14.36	0.16	Right	Tilt	1	18518	29.3	94.5	0.476	-	1.300	1.058	-	
5775	155	802.11ac	OFDM	80	15.5	14.36	0.19	Left	Cheek	1	18518	29.3	94.5	0.301	-	1.300	1.058	-	
5775	155	802.11ac	OFDM	80	15.5	14.36	0.18	Left	Tilt	1	18518	29.3	94.5	0.486	0.250	1.300	1.058	0.344	
5775	155	802.11ac	OFDM	80	15.5	15.47	0.16	Right	Cheek	2	18518	29.3	94.6	0.708	0.457	1.007	1.057	**0.486**	A19
5775	155	802.11ac	OFDM	80	15.5	15.47	0.10	Right	Tilt	2	18518	29.3	94.6	0.667	0.299	1.007	1.057	0.318	
5775	155	802.11ac	OFDM	80	15.5	15.47	0.10	Left	Cheek	2	18518	29.3	94.6	0.660	-	1.007	1.057	-	
5775	155	802.11ac	OFDM	80	15.5	15.47	0.17	Left	Tilt	2	18518	29.3	94.6	0.539	-	1.007	1.057	-	

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 11-22
NII MIMO Head SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS

FREQUENCY MHz	FREQUENCY Ch.	Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	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 W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
5290	58	802.11ac	OFDM	80	13.5	13.11	12.81	0.19	Right	Cheek	MIMO	18518	58.5	91.0	0.512	0.177	1.172	1.099	0.228	
5290	58	802.11ac	OFDM	80	13.5	13.11	12.81	0.14	Right	Tilt	MIMO	18518	58.5	91.0	0.345	-	1.172	1.099	-	
5290	58	802.11ac	OFDM	80	13.5	13.11	12.81	0.15	Left	Cheek	MIMO	18518	58.5	91.0	0.309	-	1.172	1.099	-	
5290	58	802.11ac	OFDM	80	13.5	13.11	12.81	0.14	Left	Tilt	MIMO	18518	58.5	91.0	0.177	-	1.172	1.099	-	
5530	106	802.11ac	OFDM	80	13.5	12.96	13.49	0.13	Right	Cheek	MIMO	18518	58.5	91.0	0.798	0.375	1.132	1.099	0.467	
5530	106	802.11ac	OFDM	80	13.5	12.96	13.49	0.12	Right	Tilt	MIMO	18518	58.5	91.0	0.522	0.258	1.132	1.099	0.321	
5530	106	802.11ac	OFDM	80	13.5	12.96	13.49	0.15	Left	Cheek	MIMO	18518	58.5	91.0	0.419	-	1.132	1.099	-	
5530	106	802.11ac	OFDM	80	13.5	12.96	13.49	0.15	Left	Tilt	MIMO	18518	58.5	91.0	0.222	-	1.132	1.099	-	
5775	155	802.11ac	OFDM	80	13.5	12.87	13.46	0.13	Right	Cheek	MIMO	18518	58.5	91.0	0.827	0.416	1.156	1.099	0.529	
5775	155	802.11ac	OFDM	80	13.5	12.87	13.46	0.10	Right	Tilt	MIMO	18518	58.5	91.0	0.669	0.301	1.156	1.099	0.382	
5775	155	802.11ac	OFDM	80	13.5	12.87	13.46	0.10	Left	Cheek	MIMO	18518	58.5	91.0	0.543	-	1.156	1.099	-	
5775	155	802.11ac	OFDM	80	13.5	12.87	13.46	0.18	Left	Tilt	MIMO	18518	58.5	91.0	0.476	-	1.156	1.099	-	

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

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

Table 11-23
Bluetooth 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)	
2441.00	39	Bluetooth	FHSS	14.5	14.33	-0.07	Right	Cheek	00318	1	77.1	0.369	1.040	1.297	**0.498**	A20
2441.00	39	Bluetooth	FHSS	14.5	14.33	0.03	Right	Tilt	00318	1	77.1	0.192	1.040	1.297	0.259	
2441.00	39	Bluetooth	FHSS	14.5	14.33	0.02	Left	Cheek	00318	1	77.1	0.127	1.040	1.297	0.171	
2441.00	39	Bluetooth	FHSS	14.5	14.33	0.02	Left	Tilt	00318	1	77.1	0.078	1.040	1.297	0.105	
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 11-24
GSM/UMTS/CDMA 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)	
820.10	564	CDMA BC10 (§90S)	TDSO / SO32	25.5	24.16	0.01	15 mm	47	20951	N/A	1:1	back	0.227	1.361	0.309	A21
836.52	384	CDMA BC0 (§22H)	TDSO / SO32	25.5	24.52	0.02	15 mm	47	20951	N/A	1:1	back	0.312	1.253	0.391	A23
1880.00	600	PCS CDMA	TDSO / SO32	25.5	24.59	0.01	15 mm	15	20209	N/A	1:1	back	0.436	1.233	0.538	A25
836.60	190	GSM 850	GSM	33.5	32.79	-0.01	15 mm	N/A	20514	1	1:8.3	back	0.192	1.178	0.226	A27
1880.00	661	GSM 1900	GSM	31.5	30.83	0.02	15 mm	N/A	20209	1	1:8.3	back	0.208	1.167	0.243	A29
836.60	4183	UMTS 850	RMC	24.0	23.68	0.00	15 mm	47	20209	N/A	1:1	back	0.198	1.076	0.213	A31
1712.40	1312	UMTS 1750	RMC	24.5	24.22	-0.05	15 mm	31	20084	N/A	1:1	back	0.671	1.067	0.716	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.01	15 mm	31	20084	N/A	1:1	back	0.712	1.002	0.713	
1752.60	1513	UMTS 1750	RMC	24.5	24.50	0.06	15 mm	31	20084	N/A	1:1	back	0.765	1.000	0.765	A33
1852.40	9262	UMTS 1900	RMC	25.0	24.22	0.00	15 mm	30	20951	N/A	1:1	back	0.660	1.197	0.790	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.03	15 mm	30	20951	N/A	1:1	back	0.651	1.140	0.742	
1907.60	9538	UMTS 1900	RMC	25.0	24.47	0.03	15 mm	30	20951	N/A	1:1	back	0.670	1.130	0.757	A35
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-25
LTE 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)	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.01	0	15	20951	QPSK	1	0	15 mm	back	1:1	0.303	1.040	0.315	A37
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.01	1	15	20951	QPSK	50	0	15 mm	back	1:1	0.235	1.052	0.247	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	-0.02	0	15	20951	QPSK	1	0	15 mm	back	1:1	0.244	1.245	0.304	A39
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	-0.03	1	15	20951	QPSK	25	0	15 mm	back	1:1	0.197	1.250	0.246	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.02	0	68	20951	QPSK	1	0	15 mm	back	1:1	0.290	1.167	0.338	A41
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.02	1	68	20951	QPSK	25	0	15 mm	back	1:1	0.232	1.156	0.268	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.03	0	47	20209	QPSK	1	0	15 mm	back	1:1	0.217	1.167	0.253	A43
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	-0.02	1	47	20209	QPSK	36	0	15 mm	back	1:1	0.182	1.178	0.214	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.60	-0.09	0	30	20084	QPSK	1	0	15 mm	back	1:1	0.758	1.096	0.831	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.03	0	30	20084	QPSK	1	0	15 mm	back	1:1	0.836	1.023	**0.855**	A45
1770.00	132572	High	LTE Band 66 (AWS)	20	25.0	24.74	-0.01	0	30	20084	QPSK	1	0	15 mm	back	1:1	0.794	1.062	0.843	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	-0.01	1	30	20084	QPSK	50	0	15 mm	back	1:1	0.658	1.040	0.684	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.77	0.00	1	30	20084	QPSK	100	0	15 mm	back	1:1	0.638	1.054	0.672	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.02	0	30	20084	QPSK	1	0	15 mm	back	1:1	0.825	1.023	0.844	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	0.01	0	15	20514	QPSK	1	0	15 mm	back	1:1	0.475	1.146	0.544	A47
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.04	1	15	20514	QPSK	50	0	15 mm	back	1:1	0.358	1.178	0.422	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	0.03	0	N/A	20084	QPSK	1	0	15 mm	back	1:1	0.333	1.096	0.365	A49
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	-0.01	1	N/A	20084	QPSK	50	0	15 mm	back	1:1	0.270	1.102	0.298	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	0.10	0	N/A	20951	QPSK	1	0	15 mm	back	1:1.58	0.173	1.191	0.206	A51
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.07	1	N/A	20951	QPSK	50	0	15 mm	back	1:1.58	0.135	1.213	0.164	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram										

Blue entry represents variability data.

Table 11-26
LTE Band 41 Body-Worn SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink, Power Class 2	N/A	2506.00	39750	Low	LTE Band 41	20	27.0	25.74	0.02	0	20514	QPSK	1	99	15 mm	back	1:2.31	0.353	1.337	0.472	A53
2 CC Uplink, Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	24.5	23.86	-0.01	0	20514	QPSK	1	99	15 mm	back	1:1.58	0.307	1.159	0.356	
	SCC	2525.80	39948	Low	LTE Band 41	20							1	0							
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	0.02	0	20514	QPSK	1	99	15 mm	back	1:1.58	0.261	1.355	0.354	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	0.01	1	20514	QPSK	50	0	15 mm	back	1:1.58	0.179	1.377	0.246	
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
DTS Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	20.5	19.85	0.08	15 mm	1	20456	1	back	98.9	0.081	0.056	1.161	1.011	0.066	
2437	6	802.11b	DSSS	22	20.5	19.92	0.17	15 mm	2	20456	1	back	98.9	0.171	0.130	1.143	1.011	**0.150**	A55
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
NII SISO 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)	
5280	56	802.11a	OFDM	20	17.5	16.56	0.14	15 mm	1	20084	6	back	98.9	0.098	0.037	1.242	1.011	0.046	
5260	52	802.11a	OFDM	20	17.5	16.98	0.13	15 mm	2	20084	6	back	99.2	0.242	0.107	1.127	1.008	0.122	
5500	100	802.11a	OFDM	20	17.5	17.23	0.20	15 mm	1	20084	6	back	98.9	0.280	0.117	1.064	1.011	0.126	
5620	124	802.11a	OFDM	20	17.5	16.81	0.13	15 mm	2	20084	6	back	99.2	0.280	0.104	1.172	1.008	0.123	
5785	157	802.11a	OFDM	20	17.5	16.90	0.15	15 mm	1	20084	6	back	98.9	0.472	0.191	1.148	1.011	0.222	A57
5825	165	802.11a	OFDM	20	17.5	17.09	0.16	15 mm	2	20084	6	back	99.2	0.273	0.108	1.099	1.008	0.120	
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
NII MIMO Body-Worn SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	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	15.5	14.90	15.39	0.13	15 mm	MIMO	20084	58.5	back	91.0	0.210	0.072	1.148	1.099	0.091	
5610	122	802.11ac	OFDM	80	15.5	14.52	15.33	0.19	15 mm	MIMO	20084	58.5	back	91.0	0.377	0.132	1.253	1.099	0.182	
5775	155	802.11ac	OFDM	80	15.5	14.36	15.47	0.10	15 mm	MIMO	20084	58.5	back	91.0	0.437	0.165	1.300	1.099	0.236	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram											

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

Table 11-30
Bluetooth 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	14.5	14.33	0.10	15 mm	20456	1	back	77.1	0.023	1.040	1.297	0.031	A59
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 11-31
GPRS/UMTS/CDMA 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)	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.5	24.16	0.02	10 mm	47	20951	N/A	1:1	back	0.346	1.361	0.471	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.5	24.16	-0.02	10 mm	47	20951	N/A	1:1	front	0.465	1.361	0.633	A22
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.5	24.16	-0.08	10 mm	47	20951	N/A	1:1	bottom	0.253	1.361	0.344	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.5	24.16	0.01	10 mm	47	20951	N/A	1:1	right	0.328	1.361	0.446	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.5	24.16	-0.05	10 mm	47	20951	N/A	1:1	left	0.143	1.361	0.195	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.52	0.03	10 mm	47	20951	N/A	1:1	back	0.411	1.253	0.515	
824.70	1013	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.66	-0.03	10 mm	47	20951	N/A	1:1	front	0.467	1.213	0.566	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.52	-0.02	10 mm	47	20951	N/A	1:1	front	0.580	1.253	0.727	A24
848.31	777	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.54	0.00	10 mm	47	20951	N/A	1:1	front	0.523	1.247	0.652	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.52	-0.02	10 mm	47	20951	N/A	1:1	bottom	0.293	1.253	0.367	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.52	-0.03	10 mm	47	20951	N/A	1:1	right	0.398	1.253	0.499	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.5	24.52	0.01	10 mm	47	20951	N/A	1:1	left	0.138	1.253	0.173	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.5	19.82	-0.02	10 mm	15	19649	N/A	1:1	back	0.331	1.169	0.387	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.5	19.82	0.02	10 mm	15	19649	N/A	1:1	front	0.330	1.169	0.386	
1851.25	25	PCS CDMA	EVDO Rev. 0	20.5	19.81	0.01	10 mm	15	19649	N/A	1:1	bottom	0.572	1.172	0.670	A26
1880.00	600	PCS CDMA	EVDO Rev. 0	20.5	19.82	-0.05	10 mm	15	19649	N/A	1:1	bottom	0.555	1.169	0.649	
1908.75	1175	PCS CDMA	EVDO Rev. 0	20.5	20.01	-0.03	10 mm	15	19649	N/A	1:1	bottom	0.548	1.119	0.613	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.5	19.82	-0.09	10 mm	15	19649	N/A	1:1	right	0.087	1.169	0.102	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.5	19.82	0.09	10 mm	15	19649	N/A	1:1	left	0.061	1.169	0.071	
836.60	190	GSM 850	GPRS	26.5	25.44	-0.20	10 mm	N/A	19219	2	1:4.15	back	0.130	1.276	0.166	A28
836.60	190	GSM 850	GPRS	26.5	25.44	-0.08	10 mm	N/A	19219	2	1:4.15	front	0.124	1.276	0.158	
836.60	190	GSM 850	GPRS	26.5	25.44	0.00	10 mm	N/A	19219	2	1:4.15	bottom	0.081	1.276	0.103	
836.60	190	GSM 850	GPRS	26.5	25.44	0.00	10 mm	N/A	19219	2	1:4.15	right	0.114	1.276	0.145	
836.60	190	GSM 850	GPRS	26.5	25.44	-0.06	10 mm	N/A	19219	2	1:4.15	left	0.037	1.276	0.047	
1880.00	661	GSM 1900	GPRS	27.5	26.69	0.08	10 mm	N/A	20209	3	1:2.76	back	0.497	1.205	0.599	
1880.00	661	GSM 1900	GPRS	27.5	26.69	-0.03	10 mm	N/A	20209	3	1:2.76	front	0.543	1.205	0.654	
1850.20	512	GSM 1900	GPRS	27.5	26.52	-0.03	10 mm	N/A	20209	3	1:2.76	bottom	0.768	1.253	0.962	
1880.00	661	GSM 1900	GPRS	27.5	26.69	-0.03	10 mm	N/A	20209	3	1:2.76	bottom	0.777	1.205	0.936	A30
1909.80	810	GSM 1900	GPRS	27.5	26.77	-0.01	10 mm	N/A	20209	3	1:2.76	bottom	0.761	1.183	0.900	
1880.00	661	GSM 1900	GPRS	27.5	26.69	0.05	10 mm	N/A	20209	3	1:2.76	right	0.074	1.205	0.089	
1880.00	661	GSM 1900	GPRS	27.5	26.69	0.04	10 mm	N/A	20209	3	1:2.76	left	0.074	1.205	0.089	
836.60	4183	UMTS 850	RMC	24.0	23.68	0.01	10 mm	47	20209	N/A	1:1	back	0.331	1.076	0.356	A32
836.60	4183	UMTS 850	RMC	24.0	23.68	0.03	10 mm	47	20209	N/A	1:1	front	0.323	1.076	0.348	
836.60	4183	UMTS 850	RMC	24.0	23.68	-0.02	10 mm	47	20209	N/A	1:1	bottom	0.212	1.076	0.228	
836.60	4183	UMTS 850	RMC	24.0	23.68	0.00	10 mm	47	20209	N/A	1:1	right	0.276	1.076	0.297	
836.60	4183	UMTS 850	RMC	24.0	23.68	0.00	10 mm	47	20209	N/A	1:1	left	0.098	1.076	0.105	
1732.40	1412	UMTS 1750	RMC	20.5	20.18	-0.03	10 mm	31	19649	N/A	1:1	back	0.511	1.076	0.550	
1732.40	1412	UMTS 1750	RMC	20.5	20.18	0.04	10 mm	31	19649	N/A	1:1	front	0.509	1.076	0.548	
1712.40	1312	UMTS 1750	RMC	20.5	19.84	-0.07	10 mm	31	19649	N/A	1:1	bottom	0.464	1.164	0.540	
1732.40	1412	UMTS 1750	RMC	20.5	20.18	-0.03	10 mm	31	19649	N/A	1:1	bottom	0.643	1.076	0.692	A34
1752.60	1513	UMTS 1750	RMC	20.5	20.04	-0.04	10 mm	31	19649	N/A	1:1	bottom	0.621	1.112	0.691	
1732.40	1412	UMTS 1750	RMC	20.5	20.18	-0.12	10 mm	31	19649	N/A	1:1	right	0.066	1.076	0.071	
1732.40	1412	UMTS 1750	RMC	20.5	20.18	0.01	10 mm	31	19649	N/A	1:1	left	0.091	1.076	0.098	
1880.00	9400	UMTS 1900	RMC	20.5	19.86	-0.01	10 mm	30	19649	N/A	1:1	back	0.385	1.159	0.446	
1880.00	9400	UMTS 1900	RMC	20.5	19.86	0.04	10 mm	30	19649	N/A	1:1	front	0.291	1.159	0.337	
1852.40	9262	UMTS 1900	RMC	20.5	19.91	-0.01	10 mm	30	19649	N/A	1:1	bottom	0.618	1.146	0.708	A36
1880.00	9400	UMTS 1900	RMC	20.5	19.86	0.00	10 mm	30	19649	N/A	1:1	bottom	0.586	1.159	0.679	
1907.60	9538	UMTS 1900	RMC	20.5	19.99	0.01	10 mm	30	19649	N/A	1:1	bottom	0.568	1.125	0.639	
1880.00	9400	UMTS 1900	RMC	20.5	19.86	0.07	10 mm	30	19649	N/A	1:1	right	0.077	1.159	0.089	
1880.00	9400	UMTS 1900	RMC	20.5	19.86	0.00	10 mm	30	19649	N/A	1:1	left	0.059	1.159	0.068	
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 71 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)	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.00	0	15	20951	QPSK	1	0	10 mm	back	1:1	0.413	1.040	0.430	A38
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	-0.03	1	15	20951	QPSK	50	0	10 mm	back	1:1	0.323	1.052	0.340	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.01	0	15	20951	QPSK	1	0	10 mm	front	1:1	0.374	1.040	0.389	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.02	1	15	20951	QPSK	50	0	10 mm	front	1:1	0.290	1.052	0.305	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	0.00	0	15	20951	QPSK	1	0	10 mm	bottom	1:1	0.172	1.040	0.179	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	-0.04	1	15	20951	QPSK	50	0	10 mm	bottom	1:1	0.132	1.052	0.139	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	-0.05	0	15	20951	QPSK	1	0	10 mm	right	1:1	0.184	1.040	0.191	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.02	1	15	20951	QPSK	50	0	10 mm	right	1:1	0.151	1.052	0.159	
680.50	133297	Mid	LTE Band 71	20	25.0	24.83	-0.07	0	15	20951	QPSK	1	0	10 mm	left	1:1	0.180	1.040	0.187	
680.50	133297	Mid	LTE Band 71	20	24.0	23.78	0.00	1	15	20951	QPSK	50	0	10 mm	left	1:1	0.145	1.052	0.153	
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
LTE Band 12 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)	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	-0.04	0	15	20951	QPSK	1	0	10 mm	back	1:1	0.376	1.245	0.468	A40
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	-0.04	1	15	20951	QPSK	25	0	10 mm	back	1:1	0.305	1.250	0.381	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	-0.02	0	15	20951	QPSK	1	0	10 mm	front	1:1	0.316	1.245	0.393	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.00	1	15	20951	QPSK	25	0	10 mm	front	1:1	0.256	1.250	0.320	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.00	0	15	20951	QPSK	1	0	10 mm	bottom	1:1	0.142	1.245	0.177	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	-0.03	1	15	20951	QPSK	25	0	10 mm	bottom	1:1	0.116	1.250	0.145	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	-0.03	0	15	20951	QPSK	1	0	10 mm	right	1:1	0.275	1.245	0.342	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.02	1	15	20951	QPSK	25	0	10 mm	right	1:1	0.228	1.250	0.285	
707.50	23095	Mid	LTE Band 12	10	25.0	24.05	0.01	0	15	20951	QPSK	1	0	10 mm	left	1:1	0.148	1.245	0.184	
707.50	23095	Mid	LTE Band 12	10	24.0	23.03	0.05	1	15	20951	QPSK	25	0	10 mm	left	1:1	0.120	1.250	0.150	
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
LTE Band 13 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)	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	0.00	0	68	20951	QPSK	1	0	10 mm	back	1:1	0.394	1.167	0.460	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.02	1	68	20951	QPSK	25	0	10 mm	back	1:1	0.314	1.156	0.363	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	0.01	0	68	20951	QPSK	1	0	10 mm	front	1:1	0.404	1.167	0.471	A42
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.00	1	68	20951	QPSK	25	0	10 mm	front	1:1	0.322	1.156	0.372	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.07	0	68	20951	QPSK	1	0	10 mm	bottom	1:1	0.223	1.167	0.260	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	-0.01	1	68	20951	QPSK	25	0	10 mm	bottom	1:1	0.174	1.156	0.201	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	-0.04	0	68	20951	QPSK	1	0	10 mm	right	1:1	0.270	1.167	0.315	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	-0.06	1	68	20951	QPSK	25	0	10 mm	right	1:1	0.219	1.156	0.253	
782.00	23230	Mid	LTE Band 13	10	24.5	23.83	0.04	0	68	20951	QPSK	1	0	10 mm	left	1:1	0.167	1.167	0.195	
782.00	23230	Mid	LTE Band 13	10	23.5	22.87	0.03	1	68	20951	QPSK	25	0	10 mm	left	1:1	0.134	1.156	0.155	
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 11-35
LTE Band 26 (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)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.01	0	47	20209	QPSK	1	0	10 mm	back	1:1	0.367	1.167	0.428	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.00	1	47	20209	QPSK	36	0	10 mm	back	1:1	0.297	1.178	0.350	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.01	0	47	20209	QPSK	1	0	10 mm	front	1:1	0.382	1.167	0.446	A44
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	0.00	1	47	20209	QPSK	36	0	10 mm	front	1:1	0.315	1.178	0.371	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.03	0	47	20209	QPSK	1	0	10 mm	bottom	1:1	0.245	1.167	0.286	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	-0.05	1	47	20209	QPSK	36	0	10 mm	bottom	1:1	0.188	1.178	0.221	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.03	0	47	20209	QPSK	1	0	10 mm	right	1:1	0.284	1.167	0.331	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	-0.05	1	47	20209	QPSK	36	0	10 mm	right	1:1	0.247	1.178	0.291	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.33	-0.02	0	47	20209	QPSK	1	0	10 mm	left	1:1	0.146	1.167	0.170	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.29	-0.02	1	47	20209	QPSK	36	0	10 mm	left	1:1	0.119	1.178	0.140	
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 11-36
LTE Band 66 (AWS) 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)	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	-0.03	0	30	19649	QPSK	1	0	10 mm	back	1:1	0.578	1.009	0.583	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.01	0	30	19649	QPSK	50	0	10 mm	back	1:1	0.576	1.012	0.583	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	0.01	0	30	19649	QPSK	1	0	10 mm	front	1:1	0.575	1.009	0.580	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	0.02	0	30	19649	QPSK	50	0	10 mm	front	1:1	0.568	1.012	0.575	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	-0.05	0	30	19649	QPSK	1	0	10 mm	bottom	1:1	0.765	1.009	0.772	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	20.59	-0.03	0	30	19649	QPSK	50	0	10 mm	bottom	1:1	0.690	1.099	0.758	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.87	-0.03	0	30	19649	QPSK	50	0	10 mm	bottom	1:1	0.721	1.030	0.743	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.01	0	30	19649	QPSK	50	0	10 mm	bottom	1:1	0.784	1.012	0.793	A46
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	0.01	0	30	19649	QPSK	1	0	10 mm	right	1:1	0.074	1.009	0.075	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	0.02	0	30	19649	QPSK	50	0	10 mm	right	1:1	0.072	1.012	0.073	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	-0.08	0	30	19649	QPSK	1	0	10 mm	left	1:1	0.118	1.009	0.119	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.03	0	30	19649	QPSK	50	0	10 mm	left	1:1	0.114	1.012	0.115	
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 11-37
LTE Band 25 (PCS) 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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.24	-0.03	0	15	19649	QPSK	1	0	10 mm	back	1:1	0.317	1.062	0.337	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.20	-0.01	0	15	19649	QPSK	50	0	10 mm	back	1:1	0.310	1.072	0.332	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.24	0.01	0	15	19649	QPSK	1	0	10 mm	front	1:1	0.320	1.062	0.340	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.20	0.03	0	15	19649	QPSK	50	0	10 mm	front	1:1	0.309	1.072	0.331	
1860.00	26140	Low	LTE Band 25 (PCS)	20	20.5	20.19	-0.13	0	15	19649	QPSK	1	0	10 mm	bottom	1:1	0.536	1.074	0.576	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.24	-0.04	0	15	19649	QPSK	1	0	10 mm	bottom	1:1	0.592	1.062	0.629	A48
1905.00	26590	High	LTE Band 25 (PCS)	20	20.5	20.06	-0.07	0	15	19649	QPSK	1	0	10 mm	bottom	1:1	0.552	1.107	0.611	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.20	0.00	0	15	19649	QPSK	50	0	10 mm	bottom	1:1	0.581	1.072	0.623	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.24	-0.03	0	15	19649	QPSK	1	0	10 mm	right	1:1	0.111	1.062	0.118	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.20	-0.07	0	15	19649	QPSK	50	0	10 mm	right	1:1	0.110	1.072	0.118	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.24	-0.11	0	15	19649	QPSK	1	0	10 mm	left	1:1	0.108	1.062	0.115	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.5	20.20	-0.14	0	15	19649	QPSK	50	0	10 mm	left	1:1	0.090	1.072	0.096	
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 11-38
LTE Band 7 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)	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	-0.03	0	19649	QPSK	1	0	10 mm	back	1:1	0.327	1.052	0.344	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	-0.09	0	19649	QPSK	50	0	10 mm	back	1:1	0.333	1.050	0.350	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	0.04	0	19649	QPSK	1	0	10 mm	front	1:1	0.399	1.052	0.420	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	0.09	0	19649	QPSK	50	0	10 mm	front	1:1	0.406	1.050	0.426	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	-0.07	0	19649	QPSK	1	0	10 mm	bottom	1:1	0.714	1.052	0.751	
2510.00	20850	Low	LTE Band 7	20	20.5	20.27	-0.02	0	19649	QPSK	50	25	10 mm	bottom	1:1	0.657	1.054	0.692	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	0.00	0	19649	QPSK	50	0	10 mm	bottom	1:1	0.718	1.050	0.754	
2560.00	21350	High	LTE Band 7	20	20.5	20.10	-0.04	0	19649	QPSK	50	25	10 mm	bottom	1:1	0.758	1.096	0.831	A50
2535.00	21100	Mid	LTE Band 7	20	20.5	20.27	-0.04	0	19649	QPSK	100	0	10 mm	bottom	1:1	0.717	1.054	0.756	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	-0.02	0	19649	QPSK	1	0	10 mm	left	1:1	0.203	1.052	0.214	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	-0.01	0	19649	QPSK	50	0	10 mm	left	1:1	0.205	1.050	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 11-39
LTE Band 38 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)	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	0.03	0	20951	QPSK	1	0	10 mm	back	1:1.58	0.301	1.191	0.358	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	-0.01	1	20951	QPSK	50	0	10 mm	back	1:1.58	0.238	1.213	0.289	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	-0.03	0	20951	QPSK	1	0	10 mm	front	1:1.58	0.378	1.191	0.450	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	-0.03	1	20951	QPSK	50	0	10 mm	front	1:1.58	0.295	1.213	0.358	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	-0.04	0	20951	QPSK	1	0	10 mm	bottom	1:1.58	0.602	1.191	0.717	A52
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	-0.05	1	20951	QPSK	50	0	10 mm	bottom	1:1.58	0.480	1.213	0.582	
2595.00	38000	Mid	LTE Band 38	20	23.5	22.74	0.06	0	20951	QPSK	1	0	10 mm	left	1:1.58	0.266	1.191	0.317	
2595.00	38000	Mid	LTE Band 38	20	22.5	21.66	0.02	1	20951	QPSK	50	0	10 mm	left	1:1.58	0.213	1.213	0.258	
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 11-40
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	0.01	0	19219	QPSK	1	0	10 mm	back	1:1.58	0.427	1.180	0.504	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.01	0	19219	QPSK	50	0	10 mm	back	1:1.58	0.430	1.183	0.509	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	-0.03	0	19219	QPSK	1	0	10 mm	front	1:1.58	0.307	1.180	0.362	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.01	0	19219	QPSK	50	0	10 mm	front	1:1.58	0.302	1.183	0.357	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.5	21.10	-0.03	0	19219	QPSK	1	0	10 mm	bottom	1:1.58	0.730	1.380	1.007	
1 CC Uplink, Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.42	-0.08	0	19219	QPSK	1	0	10 mm	bottom	1:1.58	0.774	1.282	0.992	
1 CC Uplink, Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.5	21.62	-0.01	0	19219	QPSK	1	0	10 mm	bottom	1:1.58	0.727	1.225	0.891	
1 CC Uplink, Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.32	0.00	0	19219	QPSK	1	0	10 mm	bottom	1:1.58	0.773	1.312	1.014	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	0.01	0	19219	QPSK	1	0	10 mm	bottom	1:1.58	0.758	1.180	0.894	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.5	21.09	-0.02	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.736	1.384	1.019	
1 CC Uplink, Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.36	0.02	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.788	1.300	1.024	
1 CC Uplink, Power Class 2	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.39	-0.04	0	19219	QPSK	50	0	10 mm	bottom	1:2.31	0.536	1.291	0.692	
2 CC Uplink, Power Class 3	PCC	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.90	-0.07	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.936	1.148	1.075	A54
	SCC	2529.70	39987	Low-Mid	LTE Band 41	20							50	50							
1 CC Uplink, Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.5	21.55	0.03	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.730	1.245	0.909	
1 CC Uplink, Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.29	0.04	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.768	1.321	1.015	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	0.00	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.760	1.183	0.899	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.71	-0.12	0	19219	QPSK	100	0	10 mm	bottom	1:1.58	0.765	1.199	0.917	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	-0.03	0	19219	QPSK	1	0	10 mm	left	1:1.58	0.222	1.180	0.262	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.02	0	19219	QPSK	50	0	10 mm	left	1:1.58	0.229	1.183	0.271	
2 CC Uplink, Power Class 3	PCC	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.90	-0.02	0	19219	QPSK	50	0	10 mm	bottom	1:1.58	0.934	1.148	1.072	
	SCC	2529.70	39987	Low-Mid	LTE Band 41	20							50	50							
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

Blue entry represents variability data.

Table 11-41
WLAN Hotspot SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.	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 W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
2412	1	802.11b	DSSS	22	20.5	19.85	-0.15	10 mm	1	20456	1	back	98.9	0.182	-	1.161	1.011	-	
2412	1	802.11b	DSSS	22	20.5	19.85	0.14	10 mm	1	20456	1	front	98.9	0.112	-	1.161	1.011	-	
2412	1	802.11b	DSSS	22	20.5	19.85	0.11	10 mm	1	20456	1	top	98.9	0.260	0.172	1.161	1.011	0.202	
2412	1	802.11b	DSSS	22	20.5	19.85	0.11	10 mm	1	20456	1	left	98.9	0.057	-	1.161	1.011	-	
2437	6	802.11b	DSSS	22	20.5	19.92	0.13	10 mm	2	20456	1	back	98.9	0.443	-	1.143	1.011	-	
2437	6	802.11b	DSSS	22	20.5	19.92	0.04	10 mm	2	20456	1	front	98.9	0.498	0.316	1.143	1.011	**0.365**	A56
2437	6	802.11b	DSSS	22	20.5	19.92	0.02	10 mm	2	20456	1	top	98.9	0.221	-	1.143	1.011	-	
2437	6	802.11b	DSSS	22	20.5	19.92	0.05	10 mm	2	20456	1	left	98.9	0.196	-	1.143	1.011	-	
5785	157	802.11a	OFDM	20	17.5	16.90	0.20	10 mm	1	20084	6	back	98.9	0.601	0.245	1.148	1.011	**0.284**	A58
5785	157	802.11a	OFDM	20	17.5	16.90	0.14	10 mm	1	20084	6	front	98.9	0.141	-	1.148	1.011	-	
5785	157	802.11a	OFDM	20	17.5	16.90	0.00	10 mm	1	20084	6	top	98.9	0.280	-	1.148	1.011	-	
5785	157	802.11a	OFDM	20	17.5	16.90	0.11	10 mm	1	20084	6	left	98.9	0.028	-	1.148	1.011	-	
5825	165	802.11a	OFDM	20	17.5	17.09	0.18	10 mm	2	20084	6	back	99.2	0.337	0.145	1.099	1.008	0.161	
5825	165	802.11a	OFDM	20	17.5	17.09	0.10	10 mm	2	20084	6	front	99.2	0.149	-	1.099	1.008	-	
5825	165	802.11a	OFDM	20	17.5	17.09	0.01	10 mm	2	20084	6	top	99.2	0.202	-	1.099	1.008	-	
5825	165	802.11a	OFDM	20	17.5	17.09	-0.12	10 mm	2	20084	6	left	99.2	0.080	-	1.099	1.008	-	

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

Table 11-42
NII MIMO Hotspot SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.	Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	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 W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
5775	155	802.11ac	OFDM	80	15.5	14.36	15.47	0.19	10 mm	MIMO	20084	58.5	back	91.0	0.627	0.240	1.300	1.099	0.343	
5775	155	802.11ac	OFDM	80	15.5	14.36	15.47	0.16	10 mm	MIMO	20084	58.5	front	91.0	0.104	0.053	1.300	1.099	0.076	
5775	155	802.11ac	OFDM	80	15.5	14.36	15.47	0.09	10 mm	MIMO	20084	58.5	top	91.0	0.260	-	1.300	1.099	-	
5775	155	802.11ac	OFDM	80	15.5	14.36	15.47	0.14	10 mm	MIMO	20084	58.5	left	91.0	0.062	-	1.300	1.099	-	

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

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

Table 11-43
Bluetooth Hotspot SAR

MEASUREMENT RESULTS

FREQUENCY MHz	Ch.	Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
2441	39	Bluetooth	FHSS	14.5	14.33	0.07	10 mm	20456	1	back	77.1	0.071	1.040	1.297	0.096	
2441	39	Bluetooth	FHSS	14.5	14.33	0.05	10 mm	20456	1	front	77.1	0.095	1.040	1.297	**0.128**	A60
2441	39	Bluetooth	FHSS	14.5	14.33	-0.03	10 mm	20456	1	top	77.1	0.031	1.040	1.297	0.042	
2441	39	Bluetooth	FHSS	14.5	14.33	0.05	10 mm	20456	1	left	77.1	0.045	1.040	1.297	0.061	

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

11.4 Standalone Phablet SAR Data

Table 11-44
GPRS/UMTS/CDMA Phablet 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 (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	24.41	-0.07	4 mm	15	20209	N/A	1:1	back	1.010	1.285	1.298	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	24.41	0.01	4 mm	15	20209	N/A	1:1	front	1.070	1.285	1.375	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	24.41	0.01	7 mm	15	20209	N/A	1:1	bottom	1.220	1.285	1.568	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	24.41	0.01	0 mm	15	20209	N/A	1:1	right	0.414	1.285	0.532	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	24.41	-0.07	0 mm	15	20209	N/A	1:1	left	0.361	1.285	0.464	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.5	20.85	-0.01	0 mm	15	19649	N/A	1:1	back	1.370	1.161	1.591	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.5	20.85	0.08	0 mm	15	19649	N/A	1:1	front	1.620	1.161	1.881	
1851.25	25	PCS CDMA	EVDO Rev. 0	21.5	20.83	-0.11	0 mm	15	19649	N/A	1:1	bottom	2.230	1.167	2.602	A61
1880.00	600	PCS CDMA	EVDO Rev. 0	21.5	20.85	-0.14	0 mm	15	19649	N/A	1:1	bottom	2.180	1.161	2.531	
1908.75	1175	PCS CDMA	EVDO Rev. 0	21.5	21.02	-0.11	0 mm	15	19649	N/A	1:1	bottom	2.230	1.117	2.491	
836.60	190	GSM 850	GPRS	30.0	29.35	-0.03	4 mm	N/A	20209	3	1:2.76	back	0.650	1.161	0.755	A62
836.60	190	GSM 850	GPRS	30.0	29.35	0.01	4 mm	N/A	20209	3	1:2.76	front	0.643	1.161	0.747	
836.60	190	GSM 850	GPRS	30.0	29.35	0.01	7 mm	N/A	20209	3	1:2.76	bottom	0.215	1.161	0.250	
836.60	190	GSM 850	GPRS	30.0	29.35	-0.12	0 mm	N/A	20209	3	1:2.76	right	0.264	1.161	0.307	
836.60	190	GSM 850	GPRS	30.0	29.35	-0.03	0 mm	N/A	20209	3	1:2.76	left	0.194	1.161	0.225	
836.60	190	GSM 850	GPRS	26.5	25.44	-0.02	0 mm	N/A	19219	2	1:4.15	back	0.435	1.276	0.555	
836.60	190	GSM 850	GPRS	26.5	25.44	-0.08	0 mm	N/A	19219	2	1:4.15	front	0.464	1.276	0.592	
836.60	190	GSM 850	GPRS	26.5	25.44	-0.11	0 mm	N/A	19219	2	1:4.15	bottom	0.191	1.276	0.244	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.03	4 mm	31	20084	N/A	1:1	back	1.700	1.002	1.703	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.05	4 mm	31	20084	N/A	1:1	front	1.090	1.002	1.092	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.14	7 mm	31	20084	N/A	1:1	bottom	1.160	1.002	1.162	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.09	0 mm	31	20084	N/A	1:1	right	0.389	1.002	0.390	
1732.40	1412	UMTS 1750	RMC	24.5	24.49	-0.09	0 mm	31	20084	N/A	1:1	left	0.427	1.002	0.428	
1732.40	1412	UMTS 1750	RMC	21.0	20.67	0.00	0 mm	31	19219	N/A	1:1	back	1.670	1.079	1.802	
1732.40	1412	UMTS 1750	RMC	21.0	20.67	-0.01	0 mm	31	19219	N/A	1:1	front	1.790	1.079	1.931	
1712.40	1312	UMTS 1750	RMC	21.0	20.22	0.00	0 mm	31	19219	N/A	1:1	bottom	1.810	1.197	2.167	
1732.40	1412	UMTS 1750	RMC	21.0	20.67	-0.01	0 mm	31	19219	N/A	1:1	bottom	2.030	1.079	2.190	
1752.60	1513	UMTS 1750	RMC	21.0	20.53	-0.04	0 mm	31	19219	N/A	1:1	bottom	2.340	1.114	2.607	A63
1880.00	9400	UMTS 1900	RMC	25.0	24.43	-0.06	4 mm	30	20084	N/A	1:1	back	1.250	1.140	1.425	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	0.01	4 mm	30	20084	N/A	1:1	front	1.370	1.140	1.562	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	-0.09	7 mm	30	20084	N/A	1:1	bottom	1.270	1.140	1.448	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	-0.03	0 mm	30	20084	N/A	1:1	right	0.448	1.140	0.511	
1880.00	9400	UMTS 1900	RMC	25.0	24.43	-0.01	0 mm	30	20084	N/A	1:1	left	0.332	1.140	0.378	
1880.00	9400	UMTS 1900	RMC	21.5	20.86	-0.07	0 mm	30	19219	N/A	1:1	back	1.460	1.159	1.692	
1880.00	9400	UMTS 1900	RMC	21.5	20.86	-0.06	0 mm	30	19219	N/A	1:1	front	1.430	1.159	1.657	
1852.40	9262	UMTS 1900	RMC	21.5	20.91	-0.05	0 mm	30	19219	N/A	1:1	bottom	2.180	1.146	2.498	
1880.00	9400	UMTS 1900	RMC	21.5	20.86	-0.10	0 mm	30	19219	N/A	1:1	bottom	2.270	1.159	2.631	
1907.60	9538	UMTS 1900	RMC	21.5	21.09	-0.08	0 mm	30	19219	N/A	1:1	bottom	2.310	1.099	2.539	A64
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 11-45
LTE Band 66 Phablet 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 (10g) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																			
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.01	0	30	20084	QPSK	1	0	4 mm	back	1:1	1.900	1.023	1.944	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.00	1	30	20084	QPSK	50	0	4 mm	back	1:1	1.500	1.040	1.560	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	0.01	0	30	20084	QPSK	1	0	4 mm	front	1:1	1.650	1.023	1.688	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	-0.03	1	30	20084	QPSK	50	0	4 mm	front	1:1	1.310	1.040	1.362	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.01	0	30	20084	QPSK	1	0	7 mm	bottom	1:1	1.670	1.023	1.708	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	0.00	1	30	20084	QPSK	50	0	7 mm	bottom	1:1	1.310	1.040	1.362	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.08	0	30	20084	QPSK	1	0	0 mm	right	1:1	0.373	1.023	0.382	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	-0.06	1	30	20084	QPSK	50	0	0 mm	right	1:1	0.302	1.040	0.314	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	24.90	-0.10	0	30	20084	QPSK	1	0	0 mm	left	1:1	0.503	1.023	0.515	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.83	-0.10	1	30	20084	QPSK	50	0	0 mm	left	1:1	0.399	1.040	0.415	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	-0.09	0	30	19649	QPSK	1	0	0 mm	back	1:1	1.610	1.009	1.624	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.09	0	30	19649	QPSK	50	0	0 mm	back	1:1	1.590	1.012	1.609	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	0.00	0	30	19649	QPSK	1	0	0 mm	front	1:1	1.700	1.009	1.715	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.01	0	30	19649	QPSK	50	0	0 mm	front	1:1	1.710	1.012	1.731	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	20.64	-0.03	0	30	19649	QPSK	1	0	0 mm	bottom	1:1	2.070	1.086	2.248	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.91	-0.05	0	30	19649	QPSK	1	0	0 mm	bottom	1:1	2.180	1.021	2.226	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.96	-0.04	0	30	19649	QPSK	1	0	0 mm	bottom	1:1	2.320	1.009	2.341	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	20.59	-0.04	0	30	19649	QPSK	50	0	0 mm	bottom	1:1	2.090	1.099	2.297	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.87	-0.03	0	30	19649	QPSK	50	0	0 mm	bottom	1:1	2.260	1.030	2.328	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.06	0	30	19649	QPSK	50	0	0 mm	bottom	1:1	2.380	1.012	2.409	A65
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.89	-0.04	0	30	19649	QPSK	100	0	0 mm	bottom	1:1	2.360	1.026	2.421	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.95	-0.03	0	30	19649	QPSK	50	0	0 mm	bottom	1:1	2.370	1.012	2.398	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams												

Blue entry represents variability data.

Table 11-46
LTE Band 25 Phablet 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 (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.04	0	15	20514	QPSK	1	0	4 mm	back	1:1	1.250	1.146	1.433	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.01	1	15	20514	QPSK	50	0	4 mm	back	1:1	0.984	1.178	1.159	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.09	0	15	20514	QPSK	1	0	4 mm	front	1:1	1.410	1.146	1.616	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.12	1	15	20514	QPSK	50	0	4 mm	front	1:1	1.140	1.178	1.343	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.02	0	15	20514	QPSK	1	0	7 mm	bottom	1:1	1.240	1.146	1.421	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.02	1	15	20514	QPSK	50	0	7 mm	bottom	1:1	0.994	1.178	1.171	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.10	0	15	20514	QPSK	1	0	0 mm	right	1:1	0.379	1.146	0.434	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.06	1	15	20514	QPSK	50	0	0 mm	right	1:1	0.274	1.178	0.323	
1905.00	26590	High	LTE Band 25 (PCS)	20	25.0	24.41	-0.17	0	15	20514	QPSK	1	0	0 mm	left	1:1	0.362	1.146	0.415	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.0	23.29	-0.16	1	15	20514	QPSK	50	0	0 mm	left	1:1	0.299	1.178	0.352	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.74	-0.02	0	15	19649	QPSK	1	0	0 mm	back	1:1	1.430	1.062	1.519	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.67	-0.04	0	15	19649	QPSK	50	0	0 mm	back	1:1	1.420	1.079	1.532	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.74	0.02	0	15	19649	QPSK	1	0	0 mm	front	1:1	1.620	1.062	1.720	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.67	0.03	0	15	19649	QPSK	50	0	0 mm	front	1:1	1.590	1.079	1.716	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.65	-0.05	0	15	19649	QPSK	1	0	0 mm	bottom	1:1	2.340	1.084	2.537	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.74	0.02	0	15	19649	QPSK	1	0	0 mm	bottom	1:1	2.480	1.062	2.634	A66
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	21.54	0.00	0	15	19649	QPSK	1	0	0 mm	bottom	1:1	2.460	1.112	2.736	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.59	0.00	0	15	19649	QPSK	50	0	0 mm	bottom	1:1	2.340	1.099	2.572	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.67	-0.04	0	15	19649	QPSK	50	0	0 mm	bottom	1:1	2.470	1.079	2.665	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	21.48	0.00	0	15	19649	QPSK	50	0	0 mm	bottom	1:1	2.440	1.127	2.750	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.59	-0.01	0	15	19649	QPSK	100	0	0 mm	bottom	1:1	2.350	1.099	2.583	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.74	-0.02	0	15	19649	QPSK	1	0	0 mm	bottom	1:1	2.450	1.062	2.602	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams												

Blue entry represents variability data.

Table 11-47
LTE Band 7 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) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																		
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	-0.11	0	20084	QPSK	1	0	4 mm	back	1:1	0.638	1.096	0.699	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	0.01	1	20084	QPSK	50	0	4 mm	back	1:1	0.477	1.102	0.526	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	0.16	0	20084	QPSK	1	0	4 mm	front	1:1	0.878	1.096	0.962	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	0.11	1	20084	QPSK	50	0	4 mm	front	1:1	0.647	1.102	0.713	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	-0.07	0	20084	QPSK	1	0	7 mm	bottom	1:1	1.250	1.096	1.370	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	-0.01	1	20084	QPSK	50	0	7 mm	bottom	1:1	1.010	1.102	1.113	
2510.00	20850	Low	LTE Band 7	20	23.5	23.10	-0.08	0	20084	QPSK	1	0	0 mm	left	1:1	0.797	1.096	0.874	
2510.00	20850	Low	LTE Band 7	20	22.5	22.08	-0.09	1	20084	QPSK	50	0	0 mm	left	1:1	0.643	1.102	0.709	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	0.01	0	19649	QPSK	1	0	0 mm	back	1:1	1.220	1.052	1.283	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	0.01	0	19649	QPSK	50	0	0 mm	back	1:1	1.240	1.050	1.302	
2510.00	20850	Low	LTE Band 7	20	20.5	20.27	-0.14	0	19649	QPSK	1	0	0 mm	front	1:1	1.890	1.054	1.992	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	-0.10	0	19649	QPSK	1	0	0 mm	front	1:1	1.970	1.052	2.072	
2560.00	21350	High	LTE Band 7	20	20.5	20.07	-0.14	0	19649	QPSK	1	0	0 mm	front	1:1	1.930	1.104	2.131	
2510.00	20850	Low	LTE Band 7	20	20.5	20.27	-0.16	0	19649	QPSK	50	25	0 mm	front	1:1	1.890	1.054	1.992	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	-0.02	0	19649	QPSK	50	0	0 mm	front	1:1	1.990	1.050	2.090	A67
2560.00	21350	High	LTE Band 7	20	20.5	20.10	0.12	0	19649	QPSK	50	25	0 mm	front	1:1	1.920	1.096	2.104	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.27	-0.14	0	19649	QPSK	100	0	0 mm	front	1:1	1.900	1.054	2.003	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.28	-0.07	0	19649	QPSK	1	0	0 mm	bottom	1:1	1.590	1.052	1.673	
2535.00	21100	Mid	LTE Band 7	20	20.5	20.29	-0.08	0	19649	QPSK	50	0	0 mm	bottom	1:1	1.510	1.050	1.586	
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 11-48
LTE Band 41 Phablet SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.03	0	20514	QPSK	1	99	4 mm	back	1:1.58	0.476	1.355	0.645	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	-0.01	1	20514	QPSK	50	0	4 mm	back	1:1.58	0.380	1.377	0.523	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.06	0	20514	QPSK	1	99	4 mm	front	1:1.58	0.576	1.355	0.780	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	-0.08	1	20514	QPSK	50	0	4 mm	front	1:1.58	0.463	1.377	0.638	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.01	0	20514	QPSK	1	99	7 mm	bottom	1:1.58	0.668	1.355	0.905	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	-0.03	1	20514	QPSK	50	0	7 mm	bottom	1:1.58	0.538	1.377	0.741	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.5	23.18	-0.08	0	20514	QPSK	1	99	0 mm	left	1:1.58	0.414	1.355	0.561	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.11	-0.09	1	20514	QPSK	50	0	0 mm	left	1:1.58	0.337	1.377	0.464	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	0.04	0	19219	QPSK	1	0	0 mm	back	1:1.58	1.250	1.180	1.475	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.03	0	19219	QPSK	50	0	0 mm	back	1:1.58	1.230	1.183	1.455	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.5	21.10	-0.09	0	19219	QPSK	1	0	0 mm	front	1:1.58	1.280	1.380	1.766	
1 CC Uplink, Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.42	-0.06	0	19219	QPSK	1	0	0 mm	front	1:1.58	1.230	1.282	1.577	
1 CC Uplink, Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.5	21.62	-0.17	0	19219	QPSK	1	0	0 mm	front	1:1.58	1.380	1.225	1.691	
1 CC Uplink, Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.32	-0.11	0	19219	QPSK	1	0	0 mm	front	1:1.58	1.460	1.312	1.916	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	-0.20	0	19219	QPSK	1	0	0 mm	front	1:1.58	1.530	1.180	1.805	
1 CC Uplink, Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.5	21.09	-0.03	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.290	1.384	1.785	
1 CC Uplink, Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.5	21.36	-0.06	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.240	1.300	1.612	
1 CC Uplink, Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.5	21.55	-0.12	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.390	1.245	1.731	
1 CC Uplink, Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.29	-0.19	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.650	1.321	2.180	
1 CC Uplink, Power Class 2	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.29	-0.19	0	19219	QPSK	50	0	0 mm	front	1:2.31	1.090	1.321	1.440	
2 CC Uplink, Power Class 3	PCC	2636.50	41055	Mid-High	LTE Band 41	20	22.5	21.83	-0.07	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.870	1.167	2.182	A68
	SCC	2616.70	40857	Mid-High	LTE Band 41	20							50	50							
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.18	0	19219	QPSK	50	0	0 mm	front	1:1.58	1.500	1.183	1.775	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.71	-0.18	0	19219	QPSK	100	0	0 mm	front	1:1.58	1.610	1.199	1.930	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.78	-0.20	0	19219	QPSK	1	0	0 mm	bottom	1:1.58	1.110	1.180	1.310	
1 CC Uplink, Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.5	21.77	-0.09	0	19219	QPSK	50	0	0 mm	bottom	1:1.58	1.110	1.183	1.313	
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 11-49
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)	
5280	56	802.11a	OFDM	20	17.5	16.56	-0.18	0 mm	1	20084	6	back	98.9	3.200	0.416	1.242	1.011	0.522	
5280	56	802.11a	OFDM	20	17.5	16.56	-0.17	0 mm	1	20084	6	front	98.9	1.420	-	1.242	1.011	-	
5280	56	802.11a	OFDM	20	17.5	16.56	0.00	0 mm	1	20084	6	top	98.9	2.551	-	1.242	1.011	-	
5280	56	802.11a	OFDM	20	17.5	16.56	0.00	0 mm	1	20084	6	left	98.9	0.080	-	1.242	1.011	-	
5260	52	802.11a	OFDM	20	17.5	16.98	0.01	0 mm	2	20084	6	back	99.2	5.899	0.746	1.127	1.008	**0.847**	A69
5260	52	802.11a	OFDM	20	17.5	16.98	0.09	0 mm	2	20084	6	front	99.2	4.043	-	1.127	1.008	-	
5260	52	802.11a	OFDM	20	17.5	16.98	0.19	0 mm	2	20084	6	top	99.2	1.160	-	1.127	1.008	-	
5260	52	802.11a	OFDM	20	17.5	16.98	0.00	0 mm	2	20084	6	left	99.2	0.696	-	1.127	1.008	-	
5500	100	802.11a	OFDM	20	17.5	17.23	-0.13	0 mm	1	20084	6	back	98.9	5.323	0.625	1.064	1.011	0.672	
5500	100	802.11a	OFDM	20	17.5	17.23	-0.14	0 mm	1	20084	6	front	98.9	2.868	-	1.064	1.011	-	
5500	100	802.11a	OFDM	20	17.5	17.23	0.00	0 mm	1	20084	6	top	98.9	5.226	-	1.064	1.011	-	
5500	100	802.11a	OFDM	20	17.5	17.23	0.17	0 mm	1	20084	6	left	98.9	0.122	-	1.064	1.011	-	
5620	124	802.11a	OFDM	20	17.5	16.81	0.05	0 mm	2	20084	6	back	99.2	4.946	0.644	1.172	1.008	0.761	
5620	124	802.11a	OFDM	20	17.5	16.81	-0.17	0 mm	2	20084	6	front	99.2	2.397	-	1.172	1.008	-	
5620	124	802.11a	OFDM	20	17.5	16.81	0.14	0 mm	2	20084	6	top	99.2	2.239	-	1.172	1.008	-	
5620	124	802.11a	OFDM	20	17.5	16.81	0.13	0 mm	2	20084	6	left	99.2	0.501	-	1.172	1.008	-	
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 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg for 1g and 2.0 W/kg for 10g. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 14 for supplemental data.
12. This device utilizes power reduction for some wireless modes and technologies, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.
13. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g and ≤ 2.0 W/kg for 10g 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.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03r01.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO Rev0 and RevA and TDSO / SO32 FCH+SCH SAR tests were not required per the 3G SAR Test Reduction Procedure in FCC KDB Publication 941225 D01v03r01.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01v03r01 procedures for data devices. Wireless Router SAR tests for Subtype 2 of Rev.A and 1x RTT configurations were not required per the 3G SAR Test Reduction Policy in KDB Publication 941225 D01v03r01.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g and ≤ 2.0 W/kg for 10g 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.
6. CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1X Advanced was not more than 0.25 dB higher than the maximum powers for 1X.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g and ≤ 2.0 W/kg for 10g 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 8.6.4.
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 for 1g and > 1.5 W/kg for 10g, 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 Downlink CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. For LTE Band 41, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier

aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

8. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 14 for linearity results.

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 8.7.5 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 8.7.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg 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. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9.6 for the time domain plot and calculation for the duty factor of the device.
2. Head and hotspot Bluetooth SAR was evaluated for BT BR tethering applications.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 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.

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

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

12.3 Head SAR Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Head SAR	CDMA/EVDO BC10 (§90S)	0.256	0.135	0.967	0.391	1.223
	CDMA/EVDO BC0 (§22H)	0.259	0.135	0.967	0.394	**1.226**
	PCS CDMA/EVDO	0.212	0.135	0.967	0.347	1.179
	GSM 850	0.042	0.135	0.967	0.177	1.009
	GSM 1900	0.074	0.135	0.967	0.209	1.041
	UMTS 850	0.143	0.135	0.967	0.278	1.110
	UMTS 1750	0.334	0.135	0.967	0.469	See Table Below
	UMTS 1900	0.181	0.135	0.967	0.316	1.148
	LTE Band 71	0.136	0.135	0.967	0.271	1.103
	LTE Band 12	0.173	0.135	0.967	0.308	1.140
	LTE Band 13	0.237	0.135	0.967	0.372	1.204
	LTE Band 26 (Cell)	0.196	0.135	0.967	0.331	1.163
	LTE Band 66 (AWS)	0.300	0.135	0.967	0.435	See Table Below
	LTE Band 25 (PCS)	0.164	0.135	0.967	0.299	1.131
	LTE Band 7	0.129	0.135	0.967	0.264	1.096
	LTE Band 38	0.107	0.135	0.967	0.242	1.074
	LTE Band 41	0.130	0.135	0.967	0.265	1.097

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	Right Cheek	0.212	0.967	**1.179**
	Right Tilt	0.133	0.434	0.567
	Left Cheek	0.334	0.361	0.695
	Left Tilt	0.106	0.967*	1.073

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	Right Cheek	0.235	0.967	**1.202**
	Right Tilt	0.161	0.434	0.595
	Left Cheek	0.300	0.361	0.661
	Left Tilt	0.158	0.967*	1.125

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO at 13 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.256	0.910	1.166
	CDMA/EVDO BC0 (§22H)	0.259	0.910	1.169
	PCS CDMA/EVDO	0.212	0.910	1.122
	GSM 850	0.042	0.910	0.952
	GSM 1900	0.074	0.910	0.984
	UMTS 850	0.143	0.910	1.053
	UMTS 1750	0.334	0.910	**1.244**
	UMTS 1900	0.181	0.910	1.091
	LTE Band 71	0.136	0.910	1.046
	LTE Band 12	0.173	0.910	1.083
	LTE Band 13	0.237	0.910	1.147
	LTE Band 26 (Cell)	0.196	0.910	1.106
	LTE Band 66 (AWS)	0.300	0.910	1.210
	LTE Band 25 (PCS)	0.164	0.910	1.074
	LTE Band 7	0.129	0.910	1.039
	LTE Band 38	0.107	0.910	1.017
	LTE Band 41	0.130	0.910	1.040

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	CDMA/EVDO BC10 (§90S)	0.256	0.407	0.486	0.663	0.742	1.149
	CDMA/EVDO BC0 (§22H)	0.259	0.407	0.486	0.666	0.745	1.152
	PCS CDMA/EVDO	0.212	0.407	0.486	0.619	0.698	1.105
	GSM 850	0.042	0.407	0.486	0.449	0.528	0.935
	GSM 1900	0.074	0.407	0.486	0.481	0.560	0.967
	UMTS 850	0.143	0.407	0.486	0.550	0.629	1.036
	UMTS 1750	0.334	0.407	0.486	0.741	0.820	**1.227**
	UMTS 1900	0.181	0.407	0.486	0.588	0.667	1.074
	LTE Band 71	0.136	0.407	0.486	0.543	0.622	1.029
	LTE Band 12	0.173	0.407	0.486	0.580	0.659	1.066
	LTE Band 13	0.237	0.407	0.486	0.644	0.723	1.130
	LTE Band 26 (Cell)	0.196	0.407	0.486	0.603	0.682	1.089
	LTE Band 66 (AWS)	0.300	0.407	0.486	0.707	0.786	1.193
	LTE Band 25 (PCS)	0.164	0.407	0.486	0.571	0.650	1.057
	LTE Band 7	0.129	0.407	0.486	0.536	0.615	1.022
	LTE Band 38	0.107	0.407	0.486	0.514	0.593	1.000
	LTE Band 41	0.130	0.407	0.486	0.537	0.616	1.023

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO at 9.5 dBm SAR (W/kg)	5 GHz WLAN MIMO at 13 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	CDMA/EVDO BC10 (§90S)	0.256	0.459	0.529	1.244
	CDMA/EVDO BC0 (§22H)	0.259	0.459	0.529	**1.247**
	PCS CDMA/EVDO	0.212	0.459	0.529	1.200
	GSM 850	0.042	0.459	0.529	1.030
	GSM 1900	0.074	0.459	0.529	1.062
	UMTS 850	0.143	0.459	0.529	1.131
	UMTS 1750	0.334	0.459	0.529	See Table Below
	UMTS 1900	0.181	0.459	0.529	1.169
	LTE Band 71	0.136	0.459	0.529	1.124
	LTE Band 12	0.173	0.459	0.529	1.161
	LTE Band 13	0.237	0.459	0.529	1.225
	LTE Band 26 (Cell)	0.196	0.459	0.529	1.184
	LTE Band 66 (AWS)	0.300	0.459	0.529	See Table Below
	LTE Band 25 (PCS)	0.164	0.459	0.529	1.152
	LTE Band 7	0.129	0.459	0.529	1.117
	LTE Band 38	0.107	0.459	0.529	1.095
	LTE Band 41	0.130	0.459	0.529	1.118

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN MIMO at 9.5 dBm SAR (W/kg)	5 GHz WLAN MIMO at 13 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.212	0.459	0.529	**1.200**
	Right Tilt	0.133	0.316	0.382	0.831
	Left Cheek	0.334	0.228	0.529*	1.091
	Left Tilt	0.106	0.459*	0.529*	1.094

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	2.4 GHz WLAN MIMO at 9.5 dBm SAR (W/kg)	5 GHz WLAN MIMO at 13 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.235	0.459	0.529	**1.223**
	Right Tilt	0.161	0.316	0.382	0.859
	Left Cheek	0.300	0.228	0.529*	1.057
	Left Tilt	0.158	0.459*	0.529*	1.146

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	CDMA/EVDO BC10 (§90S)	0.256	0.498	0.754
	CDMA/EVDO BC0 (§22H)	0.259	0.498	0.757
	PCS CDMA/EVDO	0.212	0.498	0.710
	GSM 850	0.042	0.498	0.540
	GSM 1900	0.074	0.498	0.572
	UMTS 850	0.143	0.498	0.641
	UMTS 1750	0.334	0.498	**0.832**
	UMTS 1900	0.181	0.498	0.679
	LTE Band 71	0.136	0.498	0.634
	LTE Band 12	0.173	0.498	0.671
	LTE Band 13	0.237	0.498	0.735
	LTE Band 26 (Cell)	0.196	0.498	0.694
	LTE Band 66 (AWS)	0.300	0.498	0.798
	LTE Band 25 (PCS)	0.164	0.498	0.662
	LTE Band 7	0.129	0.498	0.627
	LTE Band 38	0.107	0.498	0.605
	LTE Band 41	0.130	0.498	0.628

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	CDMA BC10 (§90S)	0.309	0.066	0.150	0.375	0.459	0.525
	CDMA BC0 (§22H)	0.391	0.066	0.150	0.457	0.541	0.607
	PCS CDMA	0.538	0.066	0.150	0.604	0.688	0.754
	GSM 850	0.226	0.066	0.150	0.292	0.376	0.442
	GSM 1900	0.243	0.066	0.150	0.309	0.393	0.459
	UMTS 850	0.213	0.066	0.150	0.279	0.363	0.429
	UMTS 1750	0.765	0.066	0.150	0.831	0.915	0.981
	UMTS 1900	0.790	0.066	0.150	0.856	0.940	1.006
	LTE Band 71	0.315	0.066	0.150	0.381	0.465	0.531
	LTE Band 12	0.304	0.066	0.150	0.370	0.454	0.520
	LTE Band 13	0.338	0.066	0.150	0.404	0.488	0.554
	LTE Band 26 (Cell)	0.253	0.066	0.150	0.319	0.403	0.469
	LTE Band 66 (AWS)	0.855	0.066	0.150	0.921	1.005	**1.071**
	LTE Band 25 (PCS)	0.544	0.066	0.150	0.610	0.694	0.760
	LTE Band 7	0.365	0.066	0.150	0.431	0.515	0.581
	LTE Band 38	0.206	0.066	0.150	0.272	0.356	0.422
	LTE Band 41	0.472	0.066	0.150	0.538	0.622	0.688

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	CDMA BC10 (§90S)	0.309	0.222	0.123	0.531	0.432	0.654
	CDMA BC0 (§22H)	0.391	0.222	0.123	0.613	0.514	0.736
	PCS CDMA	0.538	0.222	0.123	0.760	0.661	0.883
	GSM 850	0.226	0.222	0.123	0.448	0.349	0.571
	GSM 1900	0.243	0.222	0.123	0.465	0.366	0.588
	UMTS 850	0.213	0.222	0.123	0.435	0.336	0.558
	UMTS 1750	0.765	0.222	0.123	0.987	0.888	1.110
	UMTS 1900	0.790	0.222	0.123	1.012	0.913	1.135
	LTE Band 71	0.315	0.222	0.123	0.537	0.438	0.660
	LTE Band 12	0.304	0.222	0.123	0.526	0.427	0.649
	LTE Band 13	0.338	0.222	0.123	0.560	0.461	0.683
	LTE Band 26 (Cell)	0.253	0.222	0.123	0.475	0.376	0.598
	LTE Band 66 (AWS)	0.855	0.222	0.123	1.077	0.978	**1.200**
	LTE Band 25 (PCS)	0.544	0.222	0.123	0.766	0.667	0.889
	LTE Band 7	0.365	0.222	0.123	0.587	0.488	0.710
	LTE Band 38	0.206	0.222	0.123	0.428	0.329	0.551
	LTE Band 41	0.472	0.222	0.123	0.694	0.595	0.817

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz MIMO and 5 GHz MIMO 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)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Body-Worn	CDMA BC10 (§90S)	0.309	0.066	0.150	0.236	0.761
	CDMA BC0 (§22H)	0.391	0.066	0.150	0.236	0.843
	PCS CDMA	0.538	0.066	0.150	0.236	0.990
	GSM 850	0.226	0.066	0.150	0.236	0.678
	GSM 1900	0.243	0.066	0.150	0.236	0.695
	UMTS 850	0.213	0.066	0.150	0.236	0.665
	UMTS 1750	0.765	0.066	0.150	0.236	1.217
	UMTS 1900	0.790	0.066	0.150	0.236	1.242
	LTE Band 71	0.315	0.066	0.150	0.236	0.767
	LTE Band 12	0.304	0.066	0.150	0.236	0.756
	LTE Band 13	0.338	0.066	0.150	0.236	0.790
	LTE Band 26 (Cell)	0.253	0.066	0.150	0.236	0.705
	LTE Band 66 (AWS)	0.855	0.066	0.150	0.236	**1.307**
	LTE Band 25 (PCS)	0.544	0.066	0.150	0.236	0.996
	LTE Band 7	0.365	0.066	0.150	0.236	0.817
	LTE Band 38	0.206	0.066	0.150	0.236	0.658
	LTE Band 41	0.472	0.066	0.150	0.236	0.924

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	CDMA BC10 (§90S)	0.309	0.031	0.340
	CDMA BC0 (§22H)	0.391	0.031	0.422
	PCS CDMA	0.538	0.031	0.569
	GSM 850	0.226	0.031	0.257
	GSM 1900	0.243	0.031	0.274
	UMTS 850	0.213	0.031	0.244
	UMTS 1750	0.765	0.031	0.796
	UMTS 1900	0.790	0.031	0.821
	LTE Band 71	0.315	0.031	0.346
	LTE Band 12	0.304	0.031	0.335
	LTE Band 13	0.338	0.031	0.369
	LTE Band 26 (Cell)	0.253	0.031	0.284
	LTE Band 66 (AWS)	0.855	0.031	**0.886**
	LTE Band 25 (PCS)	0.544	0.031	0.575
	LTE Band 7	0.365	0.031	0.396
	LTE Band 38	0.206	0.031	0.237
	LTE Band 41	0.472	0.031	0.503

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-9
Simultaneous Transmission Scenario (2.4 GHz 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	EVDO BC10 (§90S)	0.633	0.202	0.365	0.835	0.998	1.200
	EVDO BC0 (§22H)	0.727	0.202	0.365	0.929	1.092	1.294
	PCS EVDO	0.670	0.202	0.365	0.872	1.035	1.237
	GPRS 850	0.166	0.202	0.365	0.368	0.531	0.733
	GPRS 1900	0.962	0.202	0.365	1.164	1.327	**1.529**
	UMTS 850	0.356	0.202	0.365	0.558	0.721	0.923
	UMTS 1750	0.692	0.202	0.365	0.894	1.057	1.259
	UMTS 1900	0.708	0.202	0.365	0.910	1.073	1.275
	LTE Band 71	0.430	0.202	0.365	0.632	0.795	0.997
	LTE Band 12	0.468	0.202	0.365	0.670	0.833	1.035
	LTE Band 13	0.471	0.202	0.365	0.673	0.836	1.038
	LTE Band 26 (Cell)	0.446	0.202	0.365	0.648	0.811	1.013
	LTE Band 66 (AWS)	0.793	0.202	0.365	0.995	1.158	1.360
	LTE Band 25 (PCS)	0.629	0.202	0.365	0.831	0.994	1.196
	LTE Band 7	0.831	0.202	0.365	1.033	1.196	1.398
	LTE Band 38	0.717	0.202	0.365	0.919	1.082	1.284
	LTE Band 41	1.075	0.202	0.365	1.277	1.440	See Table Below

Simult Tx	Configuration	LTE Band 41 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+3
Hotspot SAR	Back	0.509	0.202*	0.365*	**1.217**
	Front	0.362	0.202*	0.365	0.803
	Top	-	0.202	0.365*	0.708
	Bottom	1.075	-	-	1.075
	Left	0.271	0.202*	0.365*	0.979

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	EVDO BC10 (§90S)	0.633	0.284	0.161	0.917	0.794	1.078
	EVDO BC0 (§22H)	0.727	0.284	0.161	1.011	0.888	1.172
	PCS EVDO	0.670	0.284	0.161	0.954	0.831	1.115
	GPRS 850	0.166	0.284	0.161	0.450	0.327	0.611
	GPRS 1900	0.962	0.284	0.161	1.246	1.123	1.407
	UMTS 850	0.356	0.284	0.161	0.640	0.517	0.801
	UMTS 1750	0.692	0.284	0.161	0.976	0.853	1.137
	UMTS 1900	0.708	0.284	0.161	0.992	0.869	1.153
	LTE Band 71	0.430	0.284	0.161	0.714	0.591	0.875
	LTE Band 12	0.468	0.284	0.161	0.752	0.629	0.913
	LTE Band 13	0.471	0.284	0.161	0.755	0.632	0.916
	LTE Band 26 (Cell)	0.446	0.284	0.161	0.730	0.607	0.891
	LTE Band 66 (AWS)	0.793	0.284	0.161	1.077	0.954	1.238
	LTE Band 25 (PCS)	0.629	0.284	0.161	0.913	0.790	1.074
	LTE Band 7	0.831	0.284	0.161	1.115	0.992	1.276
	LTE Band 38	0.717	0.284	0.161	1.001	0.878	1.162
	LTE Band 41	1.075	0.284	0.161	1.359	1.236	**1.520**

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz MIMO and 5 GHz MIMO 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)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	EVDO BC10 (§90S)	0.633	0.202	0.365	0.343	1.543
	EVDO BC0 (§22H)	0.727	0.202	0.365	0.343	See Table Below
	PCS EVDO	0.670	0.202	0.365	0.343	**1.580**
	GPRS 850	0.166	0.202	0.365	0.343	1.076
	GPRS 1900	0.962	0.202	0.365	0.343	See Table Below
	UMTS 850	0.356	0.202	0.365	0.343	1.266
	UMTS 1750	0.692	0.202	0.365	0.343	See Table Below
	UMTS 1900	0.708	0.202	0.365	0.343	See Table Below
	LTE Band 71	0.430	0.202	0.365	0.343	1.340
	LTE Band 12	0.468	0.202	0.365	0.343	1.378
	LTE Band 13	0.471	0.202	0.365	0.343	1.381
	LTE Band 26 (Cell)	0.446	0.202	0.365	0.343	1.356
	LTE Band 66 (AWS)	0.793	0.202	0.365	0.343	See Table Below
	LTE Band 25 (PCS)	0.629	0.202	0.365	0.343	1.539
	LTE Band 7	0.831	0.202	0.365	0.343	See Table Below
	LTE Band 38	0.717	0.202	0.365	0.343	See Table Below
	LTE Band 41	1.075	0.202	0.365	0.343	See Table Below

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.515	0.202*	0.365*	0.343	**1.425**
	Front	0.727	0.202*	0.365	0.076	1.370
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.367	-	-	-	0.367
	Right	0.499	-	-	-	0.499
	Left	0.173	0.202*	0.365*	0.343*	1.083

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.599	0.202*	0.365*	0.343	**1.509**
	Front	0.654	0.202*	0.365	0.076	1.297
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.962	-	-	-	0.962
	Right	0.089	-	-	-	0.089
	Left	0.089	0.202*	0.365*	0.343*	0.999

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.550	0.202*	0.365*	0.343	**1.460**
	Front	0.548	0.202*	0.365	0.076	1.191
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.692	-	-	-	0.692
	Right	0.071	-	-	-	0.071
	Left	0.098	0.202*	0.365*	0.343*	1.008

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.446	0.202*	0.365*	0.343	**1.356**
	Front	0.337	0.202*	0.365	0.076	0.980
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.708	-	-	-	0.708
	Right	0.089	-	-	-	0.089
	Left	0.068	0.202*	0.365*	0.343*	0.978

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.583	0.202*	0.365*	0.343	**1.493**
	Front	0.580	0.202*	0.365	0.076	1.223
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.793	-	-	-	0.793
	Right	0.075	-	-	-	0.075
	Left	0.119	0.202*	0.365*	0.343*	1.029

Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.350	0.202*	0.365*	0.343	**1.260**
	Front	0.426	0.202*	0.365	0.076	1.069
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.831	-	-	-	0.831
	Left	0.215	0.202*	0.365*	0.343*	1.125

Simult Tx	Configuration	LTE Band 38 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.358	0.202*	0.365*	0.343	**1.268**
	Front	0.450	0.202*	0.365	0.076	1.093
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	0.717	-	-	-	0.717
	Left	0.169	0.202*	0.365*	0.343*	1.079

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.509	0.202*	0.365*	0.343	**1.419**
	Front	0.362	0.202*	0.365	0.076	1.005
	Top	-	0.202	0.365*	0.343*	0.910
	Bottom	1.075	-	-	-	1.075
	Left	0.271	0.202*	0.365*	0.343*	1.181

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.633	0.128	0.761
	EVDO BC0 (§22H)	0.727	0.128	0.855
	PCS EVDO	0.670	0.128	0.798
	GPRS 850	0.166	0.128	0.294
	GPRS 1900	0.962	0.128	1.090
	UMTS 850	0.356	0.128	0.484
	UMTS 1750	0.692	0.128	0.820
	UMTS 1900	0.708	0.128	0.836
	LTE Band 71	0.430	0.128	0.558
	LTE Band 12	0.468	0.128	0.596
	LTE Band 13	0.471	0.128	0.599
	LTE Band 26 (Cell)	0.446	0.128	0.574
	LTE Band 66 (AWS)	0.793	0.128	0.921
	LTE Band 25 (PCS)	0.629	0.128	0.757
	LTE Band 7	0.831	0.128	0.959
	LTE Band 38	0.717	0.128	0.845
	LTE Band 41	1.075	0.128	**1.203**

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 – 5 GHz WLAN MIMO (Phablet)

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
Phablet SAR	PCS CDMA	2.602	0.672	0.847	3.274	3.449	See Table Below
	GSM 850	0.755	0.672	0.847	1.427	1.602	2.274
	UMTS 1750	2.607	0.672	0.847	3.279	3.454	See Table Below
	UMTS 1900	2.631	0.672	0.847	3.303	3.478	See Table Below
	LTE Band 66 (AWS)	2.421	0.672	0.847	3.093	3.268	**3.940**
	LTE Band 25 (PCS)	2.750	0.672	0.847	3.422	3.597	See Table Below
	LTE Band 7	2.131	0.672	0.847	2.803	2.978	3.650
	LTE Band 41	2.182	0.672	0.847	2.854	3.029	3.701

Simult Tx	Configuration	PCS EVDO 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+3
Phablet SAR	Back	1.591	0.672	0.847	3.110
	Front	1.881	0.672*	0.847*	**3.400**
	Top	-	0.672*	0.847*	1.519
	Bottom	2.602	-	-	2.602
	Right	0.532	-	-	0.532
	Left	0.464	0.672*	0.847*	1.983

Simult Tx	Configuration	UMTS 1750 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+3
Phablet SAR	Back	1.802	0.672	0.847	3.321
	Front	1.931	0.672*	0.847*	**3.450**
	Top	-	0.672*	0.847*	1.519
	Bottom	2.607	-	-	2.607
	Right	0.390	-	-	0.390
	Left	0.428	0.672*	0.847*	1.947

Simult Tx	Configuration	UMTS 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+3
Phablet SAR	Back	1.692	0.672	0.847	**3.211**
	Front	1.657	0.672*	0.847*	3.176
	Top	-	0.672*	0.847*	1.519
	Bottom	2.631	-	-	2.631
	Right	0.511	-	-	0.511
	Left	0.112	0.672*	0.847*	1.631

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Phablet SAR	Back	1.532	0.672	0.847	3.051
	Front	1.720	0.672*	0.847*	**3.239**
	Top	-	0.672*	0.847*	1.519
	Bottom	2.750	-	-	2.750
	Right	0.434	-	-	0.434
	Left	0.415	0.672*	0.847*	1.934

Notes:

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

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
Head SAR Measurement Variability Results

HEAD VARIABILITY RESULTS														
Band	FREQUENCY		Mode/Band	Service	Side	Test Position	Data Rate (Mbps)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2450	2462.00	11	802.11b, 22 MHz Bandwidth	DSSS , ANT 2	Right	Cheek	1	0.901	0.833	1.08	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 13-2
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	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)	
1750	1745.00	132322	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	15 mm	0.836	0.825	1.01	N/A	N/A	N/A	N/A
2600	2549.50	40185	LTE Band 41, 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	bottom	10 mm	0.936	0.934	1.00	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 13-3
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1770.00	132572	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	bottom	0 mm	2.380	2.370	1.00	N/A	N/A	N/A	N/A
1900	1882.50	26365	LTE Band 25 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	bottom	0 mm	2.480	2.450	1.01	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

13.2 Measurement Uncertainty

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

14 ADDITIONAL TESTING PER FCC GUIDANCE

14.1 Tuner Testing

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

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

Per FCC Guidance, several bands/modes were combined to be treated as a single aggregate band. For CDMA BC0 and BC10, the highest reported SAR configuration per exposure condition was considered for point SAR measurements. Additionally, LTE bands 12/17 and 13 was considered as an aggregated band to select single point measurement configurations. The wireless configuration and exposure condition combinations were divided evenly among the three bands (i.e., the number of required single point measurements (at least 20) apply to the aggregated band). All other bands were treated independently.

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

Table 14-1
UMTS/CDMA Supplemental Head SAR Data

Supplemental Head SAR Data									
UMTS 850		UMTS 1750		UMTS 1900		CDMA BC0		CDMA BC1	
RMC		RMC		RMC		RC3/SO55		RC3/SO55	
Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek	Test Position	Right Cheek	Test Position	Right Cheek
Frequency (MHz)	836.6	Frequency (MHz)	1732.4	Frequency (MHz)	1880	Frequency (MHz)	836.52	Frequency (MHz)	1880
Channel	4183	Channel	1412	Channel	9400	Channel	384	Channel	600
Measured 1g SAR (W/kg)	0.133	Measured 1g SAR (W/kg)	0.333	Measured 1g SAR (W/kg)	0.159	Measured 1g SAR (W/kg)	0.204	Measured 1g SAR (W/kg)	0.168
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 47)	0.179	Auto-tune (State 31)	0.393	Auto-tune (State 29)	0.222	Auto-tune (State 47)	0.247	Auto-tune (State 30)	0.200
Default (State 47)	0.180	Default (State 31)	0.390	Default (State 15)	0.231	Default (State 47)	0.228	Default (State 15)	0.188
State 1	0.025	State 4	0.090	State 4	0.175	State 3	0.069	State 0	0.178
State 5	0.097	State 7	0.180	State 6	0.214	State 6	0.152	State 2	0.062
State 11	0.171	State 10	0.220	State 9	0.230	State 10	0.214	State 5	0.114
State 12	0.175	State 13	0.266	State 14	0.227	State 13	0.226	State 15	0.188
State 18	0.028	State 18	0.070	State 15	0.231	State 19	0.052	State 21	0.145
State 25	0.174	State 24	0.245	State 24	0.236	State 23	0.195	State 22	0.160
State 31	0.126	State 27	0.284	State 26	0.236	State 26	0.220	State 25	0.182
State 32	0.176	State 30	0.392	State 29	0.236	State 30	0.157	State 28	0.195
State 36	0.066	State 31	0.390	State 33	0.057	State 37	0.113	State 33	0.021
State 43	0.165	State 36	0.044	State 42	0.179	State 38	0.139	State 35	0.039
State 47	0.180	State 42	0.147	State 44	0.187	State 41	0.195	State 40	0.094
State 49	0.016	State 45	0.185	State 47	0.195	State 44	0.215	State 43	0.103
State 50	0.026	State 48	0.217	State 52	0.133	State 47	0.228	State 48	0.127
State 53	0.086	State 52	0.056	State 54	0.178	State 51	0.048	State 49	0.029
State 59	0.172	State 55	0.120	State 57	0.193	State 54	0.143	State 53	0.082
State 60	0.172	State 58	0.161	State 61	0.203	State 58	0.211	State 63	0.129
State 64	0.169	State 64	0.293	State 66	0.145	State 65	0.156	State 68	0.188
State 71	0.145	State 70	0.236	State 70	0.190	State 69	0.160	State 71	0.127
State 77	0.127	State 73	0.359	State 72	0.207	State 72	0.215	State 74	0.105
State 78	0.180	State 76	0.361	State 75	0.165	State 79	0.184	State 76	0.187

Table 14-2
LTE Supplemental Head SAR Data

Supplemental Head SAR Data											
LTE Band 71		LTE Band 12		LTE Band 13		LTE Band 26		LTE Band 66		LTE Band 25	
QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 15MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets	
Test Position	Left Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Right Cheek
Frequency (MHz)	680.5	Frequency (MHz)	707.5	Frequency (MHz)	782	Frequency (MHz)	831.5	Frequency (MHz)	1745	Frequency (MHz)	1905
Channel	133297	Channel	23095	Channel	23230	Channel	26865	Channel	132322	Channel	26590
Measured 1g SAR (W/kg)	0.131	Measured 1g SAR (W/kg)	0.139	Measured 1g SAR (W/kg)	0.203	Measured 1g SAR (W/kg)	0.168	Measured 1g SAR (W/kg)	0.293	Measured 1g SAR (W/kg)	0.143
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 31)	0.148	Auto-tune (State 15)	0.141	Auto-tune (State 68)	0.229	Auto-tune (State 47)	0.244	Auto-tune (State 31)	0.428	Auto-tune (State 15)	0.239
Default (State 15)	0.133	Default (State 15)	0.147	Default (State 15)	0.233	Default (State 47)	0.223	Default (State 31)	0.423	Default (State 15)	0.254
State 3	0.022	State 1	0.026	State 2	0.040	State 2	0.055	State 1	0.043	State 3	0.175
State 5	0.039	State 8	0.111	State 14	0.234	State 6	0.151	State 5	0.153	State 8	0.247
State 9	0.081	State 15	0.147	State 15	0.233	State 9	0.204	State 11	0.330	State 10	0.253
State 11	0.090	State 16	0.111	State 22	0.110	State 12	0.222	State 15	0.398	State 14	0.245
State 15	0.133	State 24	0.098	State 34	0.027	State 15	0.230	State 19	0.094	State 15	0.254
State 17	0.006	State 32	0.096	State 40	0.131	State 17	0.025	State 20	0.122	State 16	0.252
State 22	0.042	State 40	0.073	State 54	0.083	State 22	0.144	State 21	0.170	State 20	0.216
State 27	0.102	State 48	0.102	State 62	0.219	State 29	0.207	State 25	0.298	State 23	0.252
State 31	0.144	State 55	0.060	State 68	0.237	State 32	0.200	State 31	0.423	State 28	0.255
State 35	0.014	State 67	0.129	State 79	0.220	State 35	0.057	State 37	0.085	State 34	0.089
State 38	0.034					State 40	0.162	State 39	0.146	State 38	0.169
State 43	0.072					State 47	0.223	State 43	0.213	State 41	0.192
State 47	0.117					State 50	0.031	State 49	0.018	State 46	0.202
State 52	0.017					State 57	0.172	State 53	0.089	State 51	0.126
State 57	0.062					State 60	0.196	State 56	0.194	State 56	0.214
State 63	0.118					State 62	0.192	State 59	0.238	State 62	0.210
State 66	0.099					State 63	0.194	State 65	0.312	State 64	0.197
State 69	0.121					State 68	0.224	State 67	0.182	State 69	0.233
State 76	0.114					State 75	0.192	State 71	0.257	State 74	0.184
State 78	0.100					State 78	0.222	State 77	0.410	State 79	0.215

Table 14-3
UMTS/CDMA Supplemental Body SAR Data

Supplemental Body SAR Data									
UMTS 850		UMTS 1750		UMTS 1900		CDMA BC0		CDMA BC1	
RMC		RMC		RMC		EVDO Rev. 0		EVDO Rev. 0	
Test Position	Back Side	Test Position	Back Side	Test Position	Back Side	Test Position	Front Side	Test Position	Bottom Edge
Spacing	10 mm	Spacing	15 mm	Spacing	15 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	836.6	Frequency (MHz)	1752.6	Frequency (MHz)	1852.4	Frequency (MHz)	836.52	Frequency (MHz)	1851.25
Channel	4183	Channel	1513	Channel	9262	Channel	384	Channel	25
Measured 1g SAR (W/kg)	0.331	Measured 1g SAR (W/kg)	0.765	Measured 1g SAR (W/kg)	0.660	Measured 1g SAR (W/kg)	0.580	Measured 1g SAR (W/kg)	0.572
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 47)	0.511	Auto-tune (State 31)	0.97	Auto-tune (State 30)	0.741	Auto-tune (State 47)	0.775	Auto-tune (State 15)	0.721
Default (State 47)	0.505	Default (State 31)	0.965	Default (State 15)	0.714	Default (State 47)	0.763	Default (State 15)	0.714
State 0	0.511	State 3	0.363	State 1	0.184	State 1	0.130	State 4	0.364
State 3	0.177	State 7	0.678	State 5	0.465	State 8	0.700	State 7	0.540
State 12	0.503	State 9	0.727	State 10	0.622	State 9	0.710	State 11	0.682
State 17	0.053	State 17	0.205	State 15	0.714	State 12	0.757	State 14	0.712
State 20	0.195	State 23	0.800	State 17	0.211	State 15	0.738	State 15	0.714
State 23	0.428	State 27	0.948	State 18	0.299	State 18	0.128	State 16	0.748
State 27	0.463	State 29	0.958	State 21	0.557	State 20	0.278	State 24	0.700
State 32	0.480	State 31	0.965	State 25	0.710	State 29	0.694	State 27	0.732
State 35	0.154	State 35	0.185	State 30	0.741	State 32	0.731	State 31	0.767
State 38	0.313	State 41	0.385	State 36	0.218	State 36	0.290	State 34	0.126
State 41	0.423	State 43	0.416	State 39	0.354	State 46	0.753	State 42	0.339
State 47	0.505	State 45	0.424	State 42	0.395	State 47	0.763	State 45	0.359
State 50	0.079	State 51	0.206	State 48	0.495	State 50	0.112	State 49	0.105
State 51	0.115	State 52	0.263	State 53	0.343	State 56	0.634	State 52	0.244
State 60	0.455	State 55	0.480	State 58	0.465	State 57	0.645	State 55	0.381
State 63	0.410	State 57	0.496	State 60	0.484	State 60	0.692	State 59	0.427
State 66	0.494	State 63	0.501	State 64	0.562	State 64	0.718	State 62	0.415
State 69	0.353	State 69	0.943	State 67	0.340	State 67	0.600	State 70	0.395
State 72	0.481	State 73	0.890	State 71	0.472	State 75	0.603	State 73	0.693
State 78	0.501	State 75	0.438	State 76	0.707	State 78	0.755	State 77	0.762

Table 14-4
LTE Supplemental Body SAR Data

Supplemental Body SAR Data											
LTE Band 71		LTE Band 12		LTE Band 13		LTE Band 26		LTE Band 66		LTE Band 25	
QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 10MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 15MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets		QPSK, 20MHz Bandwidth, 1 RB, 0 RB Offsets	
Test Position	Back Side	Test Position	Back Side	Test Position	Front Side	Test Position	Front Side	Test Position	Back Side	Test Position	Bottom Edge
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	15 mm	Spacing	10 mm
Frequency (MHz)	680.5	Frequency (MHz)	707.5	Frequency (MHz)	782	Frequency (MHz)	831.5	Frequency (MHz)	1745	Frequency (MHz)	1882.5
Channel	133297	Channel	23095	Channel	23230	Channel	26865	Channel	132322	Channel	26365
Measured 1g SAR (W/kg)	0.413	Measured 1g SAR (W/kg)	0.376	Measured 1g SAR (W/kg)	0.404	Measured 1g SAR (W/kg)	0.382	Measured 1g SAR (W/kg)	0.836	Measured 1g SAR (W/kg)	0.592
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 15)	0.583	Auto-tune (State 15)	0.534	Auto-tune (State 68)	0.616	Auto-tune (State 47)	0.530	Auto-tune (State 30)	1.057	Auto-tune (State 15)	0.726
Default (State 15)	0.583	Default (State 15)	0.512	Default (State 15)	0.612	Default (State 47)	0.501	Default (State 31)	1.075	Default (State 15)	0.724
State 2	0.067	State 0	0.457	State 0	0.573	State 4	0.226	State 0	0.840	State 6	0.518
State 7	0.260	State 7	0.346	State 6	0.339	State 8	0.456	State 2	0.163	State 11	0.647
State 12	0.415	State 15	0.512	State 15	0.612	State 13	0.502	State 8	0.656	State 13	0.659
State 15	0.583	State 23	0.309	State 19	0.131	State 16	0.445	State 20	0.285	State 15	0.724
State 18	0.050	State 31	0.407	State 21	0.258	State 21	0.270	State 22	0.486	State 19	0.398
State 19	0.071	State 39	0.228	State 26	0.522	State 28	0.445	State 24	0.689	State 26	0.725
State 25	0.382	State 47	0.456	State 33	0.061	State 33	0.070	State 28	0.816	State 30	0.767
State 29	0.496	State 54	0.176	State 44	0.473	State 34	0.103	State 31	1.075	State 33	0.094
State 36	0.085	State 59	0.336	State 61	0.520	State 39	0.322	State 37	0.200	State 37	0.252
State 39	0.199	State 66	0.455	State 72	0.609	State 45	0.436	State 38	0.269	State 44	0.376
State 42	0.285					State 46	0.492	State 40	0.429	State 46	0.414
State 45	0.349					State 47	0.501	State 46	0.590	State 49	0.115
State 51	0.054					State 56	0.363	State 56	0.468	State 54	0.370
State 55	0.217					State 61	0.429	State 59	0.577	State 58	0.426
State 61	0.447					State 62	0.432	State 65	0.850	State 61	0.444
State 65	0.574					State 67	0.430	State 66	0.448	State 65	0.592
State 68	0.582					State 70	0.495	State 68	0.991	State 72	0.666
State 73	0.576					State 73	0.373	State 71	0.648	State 74	0.370
State 77	0.585					State 74	0.490	State 74	0.534	State 75	0.376
State 79	0.580					State 76	0.505	State 79	0.662	State 77	0.763

14.2 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear. Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes as < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

LTE Band 41 SAR testing with power class 2 at the highest power and available duty factor was additionally performed for the power class 3 configuration with the highest SAR for each exposure condition.

Table 14-5
LTE Band 41 Head Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.50	27.00
Measured Output Power (dBm)	23.18	25.74
Measured SAR (W/kg)	0.079	0.097
Measured Power (mW)	207.97	374.97
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	131.64	162.36
% deviation from expected linearity		**-0.04%**

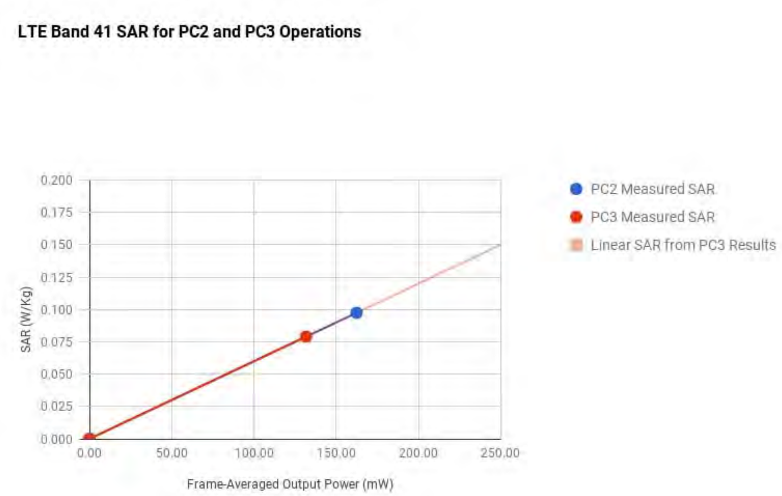

Figure 14-1
LTE Band 41 Head Linearity

Table 14-6
LTE Band 41 Body-Worn Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.50	27.00
Measured Output Power (dBm)	23.18	25.74
Measured SAR (W/kg)	0.261	0.353
Measured Power (mW)	207.97	374.97
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	131.64	162.36
% deviation from expected linearity		**9.66%**

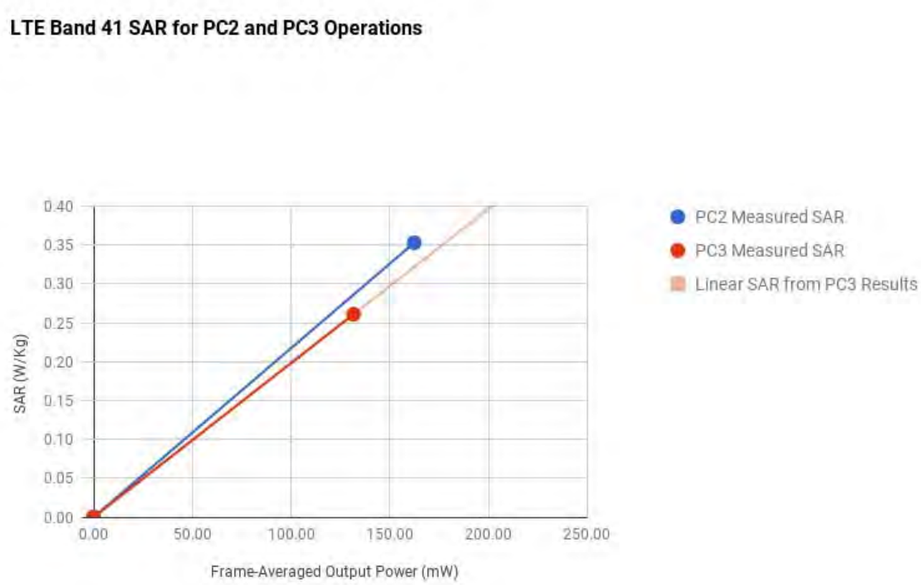

Figure 14-2
LTE Band 41 Body-Worn Linearity

Table 14-7
LTE Band 41 Hotspot Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	22.50	22.50
Measured Output Power (dBm)	21.36	21.39
Measured SAR (W/kg)	0.788	0.536
Measured Power (mW)	136.77	137.72
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	86.58	59.63
% deviation from expected linearity		**-1.25%**

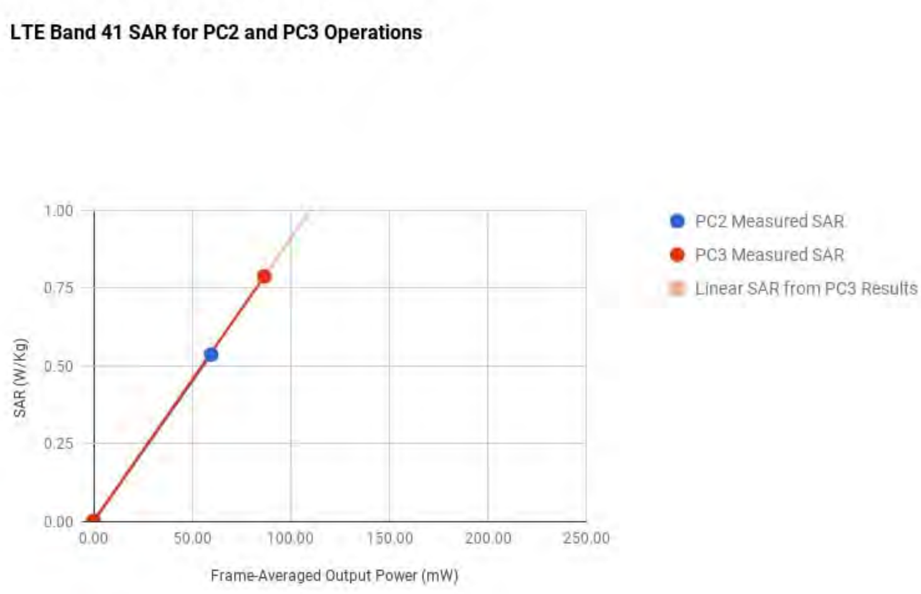

Figure 14-3
LTE Band 41 Hotspot Linearity

Table 14-8
LTE Band 41 Phablet Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	22.50	22.50
Measured Output Power (dBm)	21.29	21.29
Measured SAR (W/kg)	1.65	1.090
Measured Power (mW)	134.59	134.59
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	85.19	58.28
% deviation from expected linearity		**-3.43%**

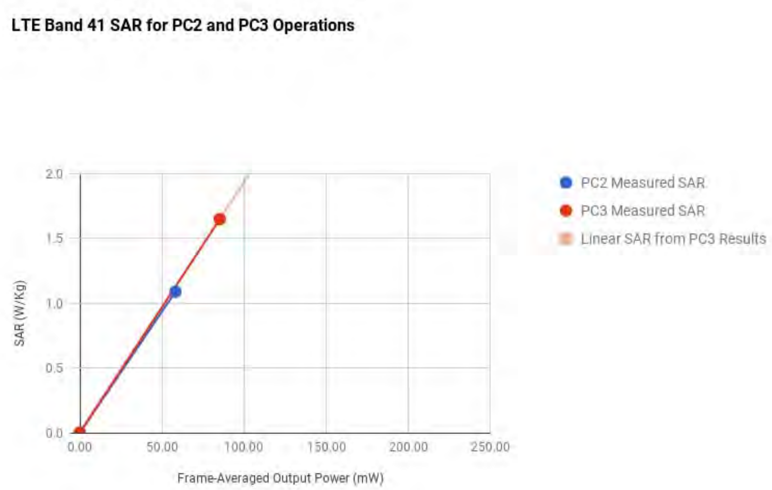

Figure 14-4
LTE Band 41 Phablet Linearity

15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/22/2017	Annual	3/22/2018	MY45470194
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	10/5/2016	Annual	10/5/2017	GB42230325
Agilent	E4438C	ESG Vector Signal Generator	3/24/2017	Biennial	3/24/2019	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	3/23/2017	Annual	3/23/2018	MY47270002
Agilent	E4432B	ESG-D Series Signal Generator	3/24/2017	Annual	3/24/2018	US40053896
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	10/27/2016	Annual	10/27/2017	MY47420603
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/17/2017	Annual	8/17/2018	MY40003841
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Biennial	1/29/2018	GB46310798
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	ML2496A	Power Meter	3/28/2017	Annual	3/28/2018	1351001
Anritsu	ML2496A	Power Meter	4/20/2017	Annual	4/20/2018	1306009
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MT8820C	Radio Communication Analyzer	11/4/2016	Annual	11/4/2017	6201144418
Anritsu	MT8820C	Radio Communication Analyzer	5/23/2017	Annual	5/23/2018	6201240328
Anritsu	MA24106A	USB Power Sensor	6/7/2017	Annual	6/7/2018	1231538
Anritsu	MA24106A	USB Power Sensor	6/7/2017	Annual	6/7/2018	1231535
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261729
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261732
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264162
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264165
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	4/11/2017	Annual	4/11/2018	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	12/12/2016	Annual	12/12/2017	833855/0010
Rohde & Schwarz	CMW500	Radio Communication Tester	10/20/2016	Annual	10/20/2017	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	5/4/2017	Annual	5/4/2018	112347
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/20/2017	Annual	7/20/2018	132885
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/10/2017	Annual	2/10/2018	162125
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
Seekonk	NC-100	Torque Wrench (8" lb)	9/1/2016	Biennial	9/1/2018	21053
Seekonk	NC-100	Torque Wrench (8" lb)	8/30/2016	Biennial	8/30/2018	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
SPEAG	D750V3	750 MHz SAR Dipole	7/13/2016	Biennial	7/13/2018	1161
SPEAG	D850V2	SAR Dipole	8/16/2017	Annual	8/16/2018	1009
SPEAG	D1750V2	1750 MHz SAR Dipole	7/14/2016	Biennial	7/14/2018	1150
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	1092
SPEAG	D1900V2	1900 MHz SAR Dipole	5/10/2017	Annual	5/10/2018	5d026
SPEAG	D2450V2	2450 MHz SAR Dipole	7/25/2016	Biennial	7/25/2018	981
SPEAG	D2600V2	2600 MHz SAR Dipole	7/10/2017	Annual	7/10/2018	1126
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/21/2016	Annual	9/21/2017	1191
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/15/2017	Annual	8/15/2018	1237
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	1034
SPEAG	D835V2	850 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	4d180
SPEAG	D835V2	835 MHz SAR Dipole	1/11/2017	Annual	1/11/2018	4d132
SPEAG	D835V2	835 MHz SAR Dipole	7/13/2016	Biennial	7/13/2018	4d047
SPEAG	D1750V2	SAR Dipole	5/9/2017	Annual	5/9/2018	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	7/8/2016	Biennial	7/8/2018	5d080
SPEAG	D1900V2	SAR Dipole	8/16/2017	Annual	8/16/2018	5d180
SPEAG	D2450V2	2450 MHz SAR Dipole	8/17/2017	Annual	8/17/2018	719
SPEAG	D2600V2	2600 MHz SAR Dipole	4/13/2017	Annual	4/13/2018	1004
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/9/2017	Annual	8/9/2018	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2017	Annual	7/13/2018	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2017	Annual	4/11/2018	1407
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	8/14/2017	Annual	8/14/2018	3332
SPEAG	EX3DV4	SAR Probe	7/17/2017	Annual	7/17/2018	7410
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	EX3DV4	SAR Probe	4/18/2017	Annual	4/18/2018	7406
SPEAG	ES3DV3	SAR Probe	1/13/2017	Annual	1/13/2018	3288

Note: 1. 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.

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

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: A3LSMG892U; Type: Portable Handset; Serial: 20951

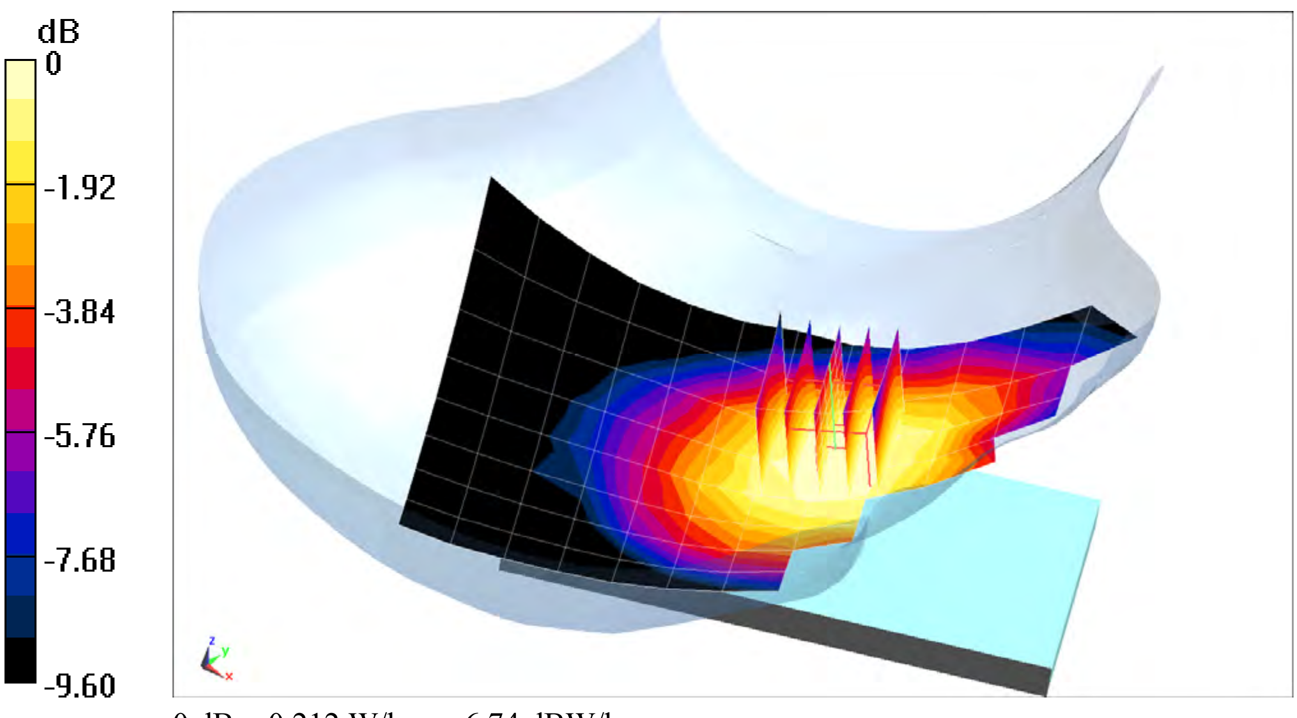
Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.906 S/m; ε_r = 42.784; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-27-2017; Ambient Temp: 23.2°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA BC10, Rule Part 90S, 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 = 14.76 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.222 W/kg
SAR(1 g) = 0.189 W/kg



0 dB = 0.212 W/kg = -6.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

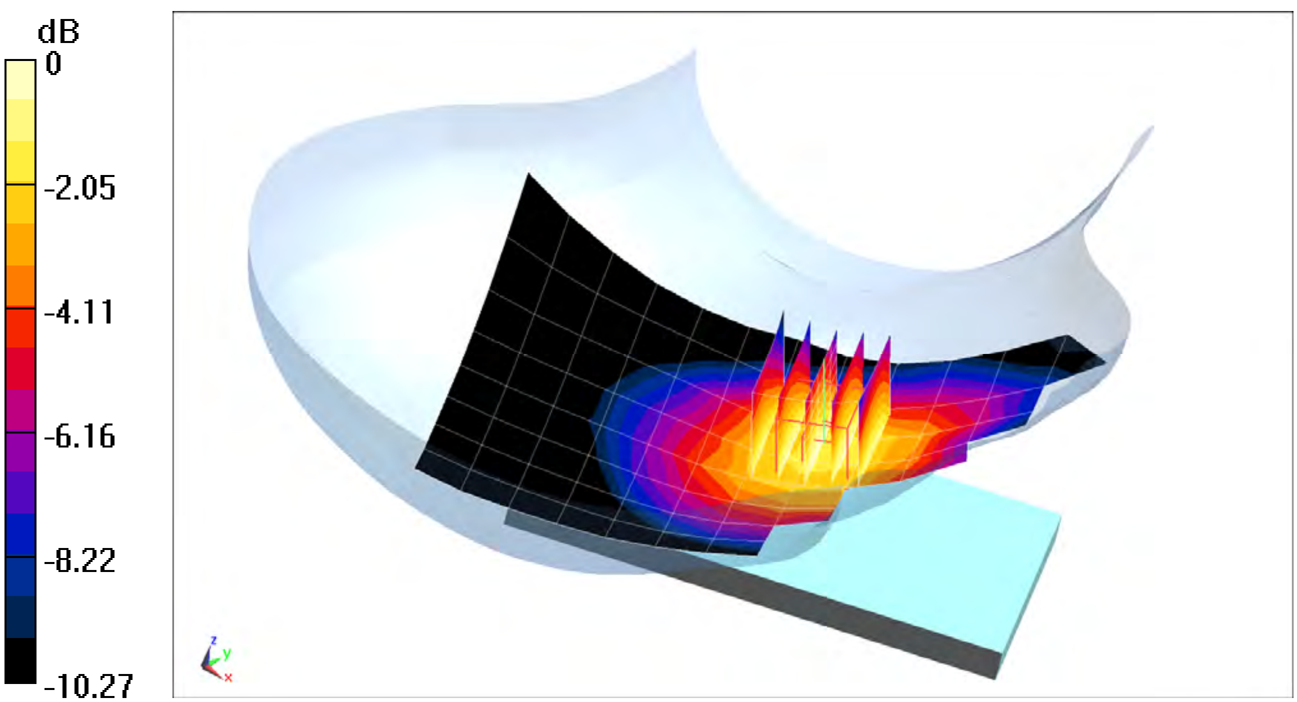
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.923 S/m; ε_r = 42.553; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-27-2017; Ambient Temp: 23.2°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA BC0, Rule Part 22H, 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 = 15.17 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.247 W/kg
SAR(1 g) = 0.204 W/kg



0 dB = 0.231 W/kg = -6.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

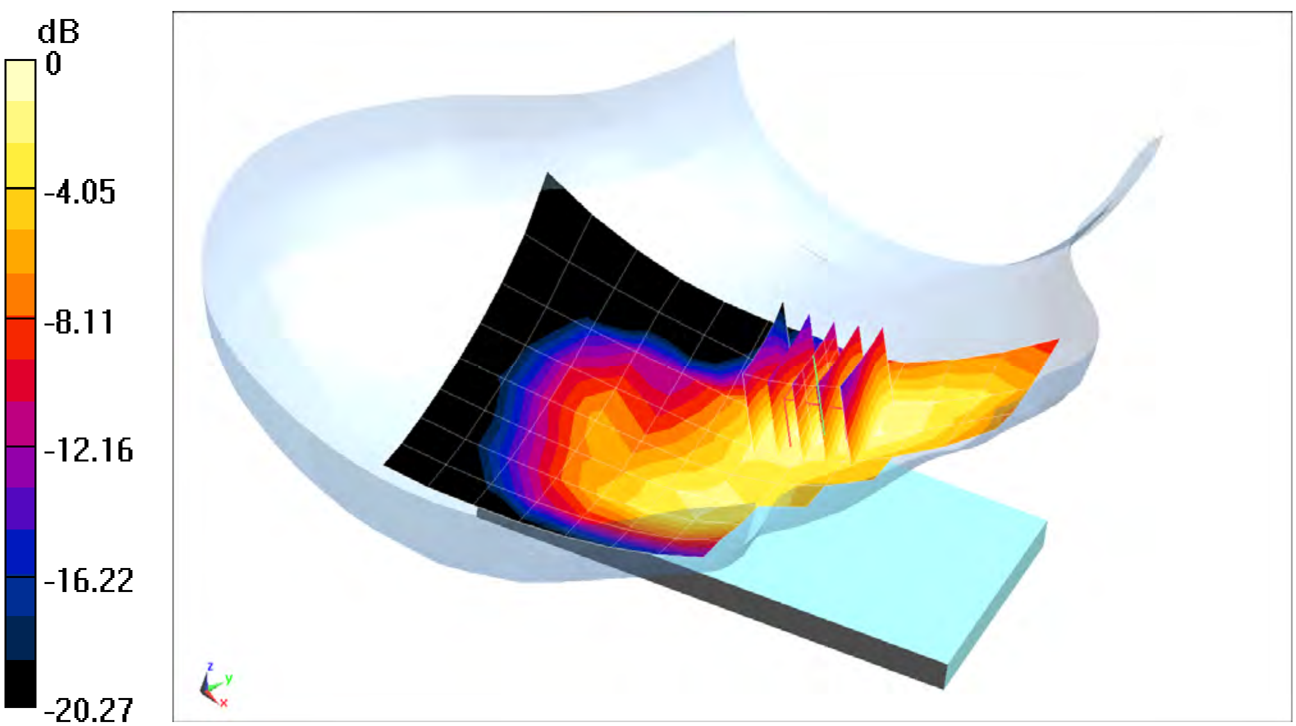
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 S/m; ε_r = 39.885; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-18-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.2, 5.2, 5.2); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: PCS CDMA, Right Head, Cheek, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.43 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.276 W/kg
SAR(1 g) = 0.168 W/kg



0 dB = 0.195 W/kg = -7.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

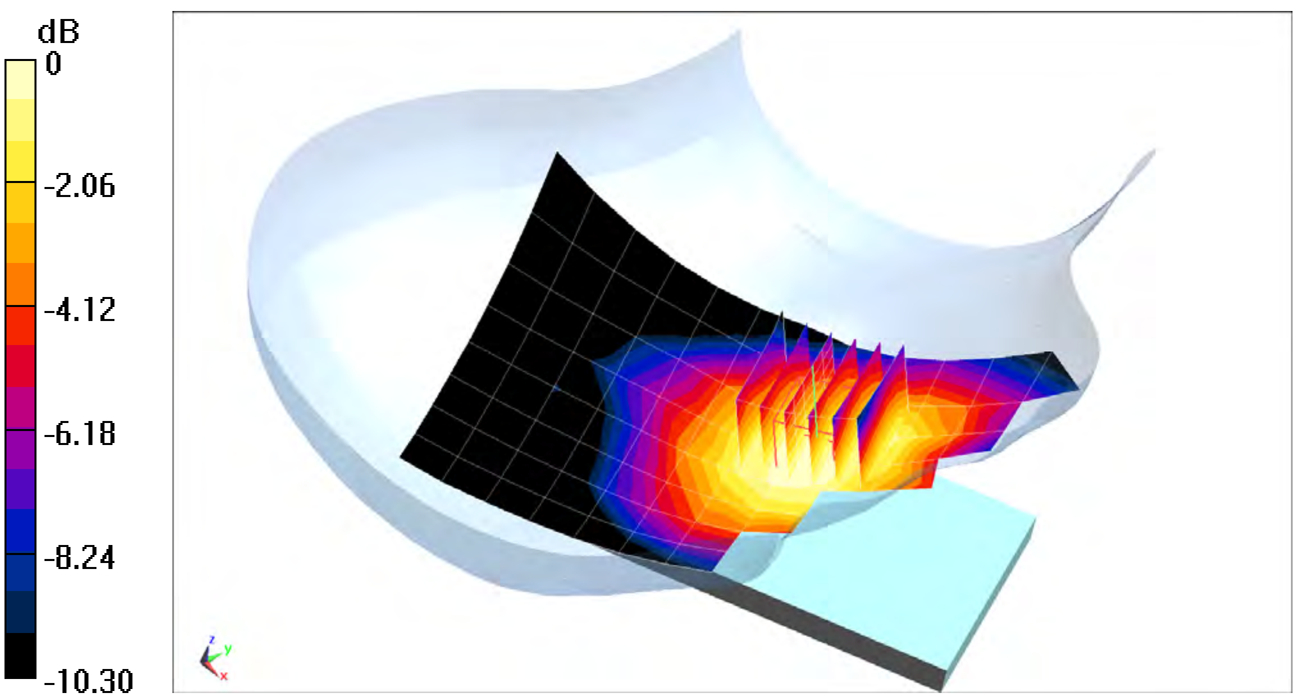
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 850 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.921 S/m; ε_r = 43.367; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-14-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.521 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.0470 W/kg
SAR(1 g) = 0.037 W/kg



0 dB = 0.0423 W/kg = -13.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

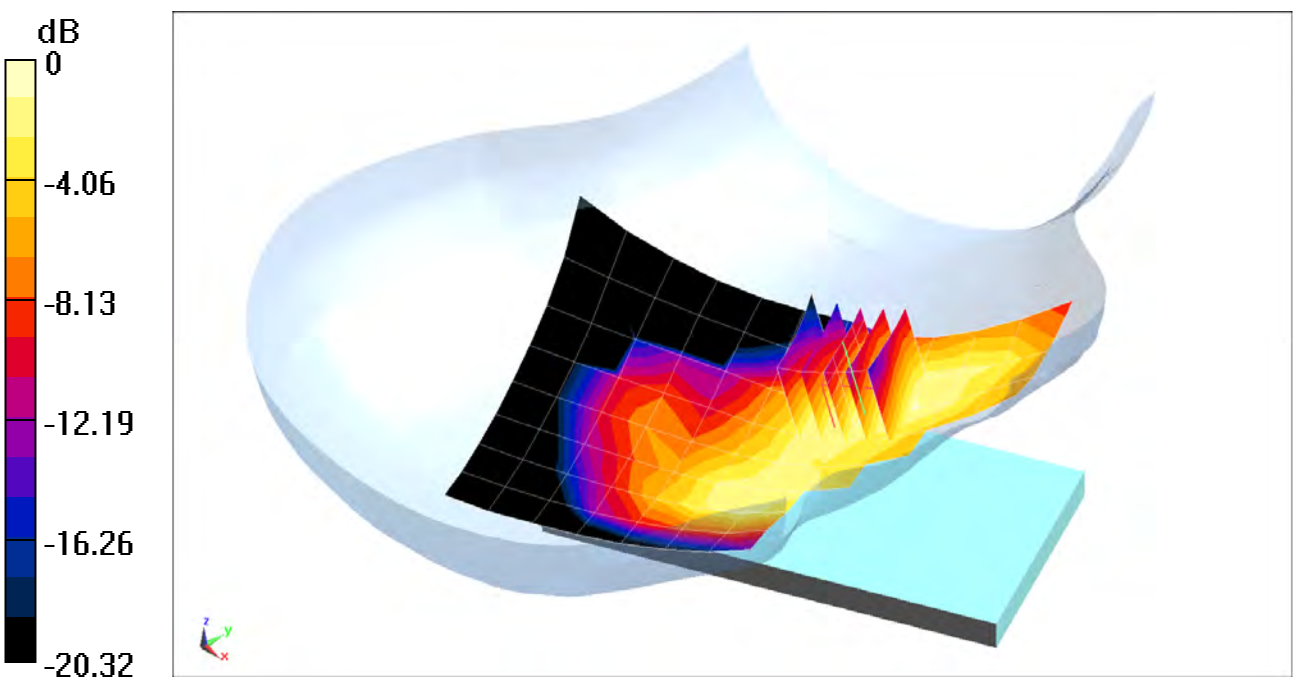
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 S/m; ε_r = 39.885; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-18-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.2, 5.2, 5.2); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: GSM 1900, 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 = 6.984 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.104 W/kg
SAR(1 g) = 0.063 W/kg



0 dB = 0.0723 W/kg = -11.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

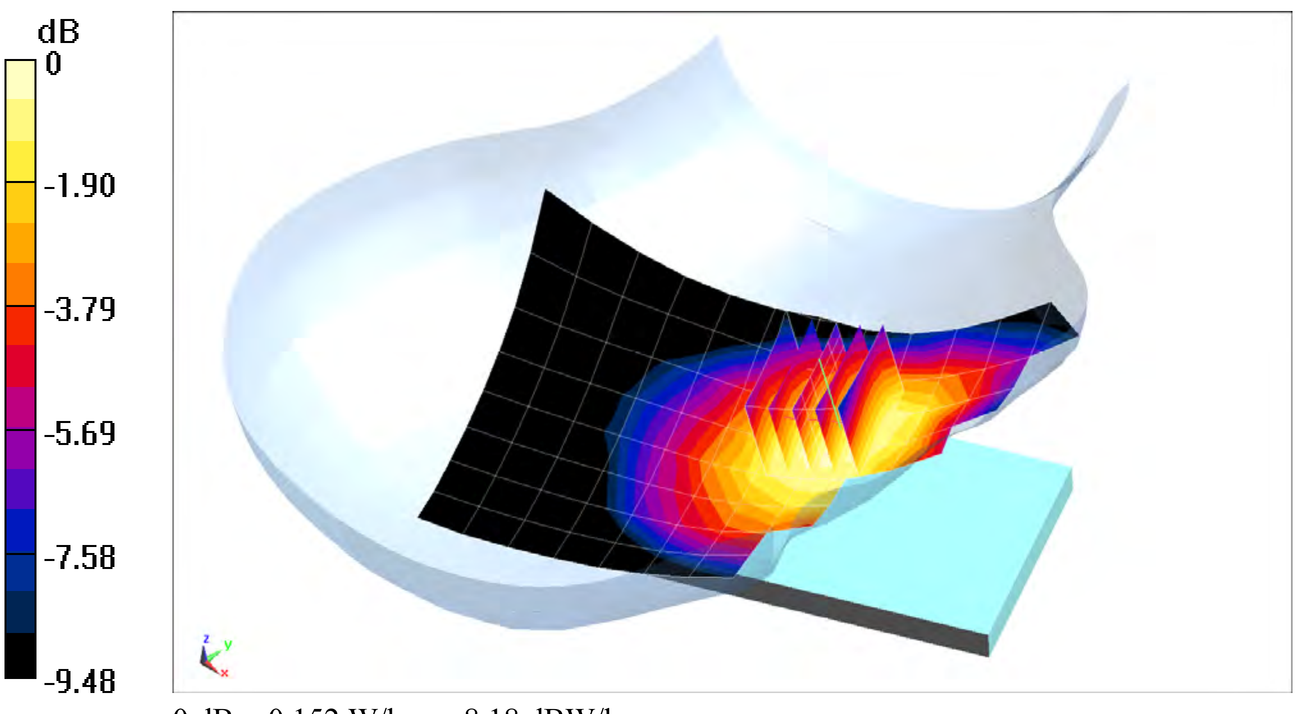
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 850 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.921 S/m; ε_r = 43.367; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-14-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 12.38 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.162 W/kg
SAR(1 g) = 0.133 W/kg



0 dB = 0.152 W/kg = -8.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

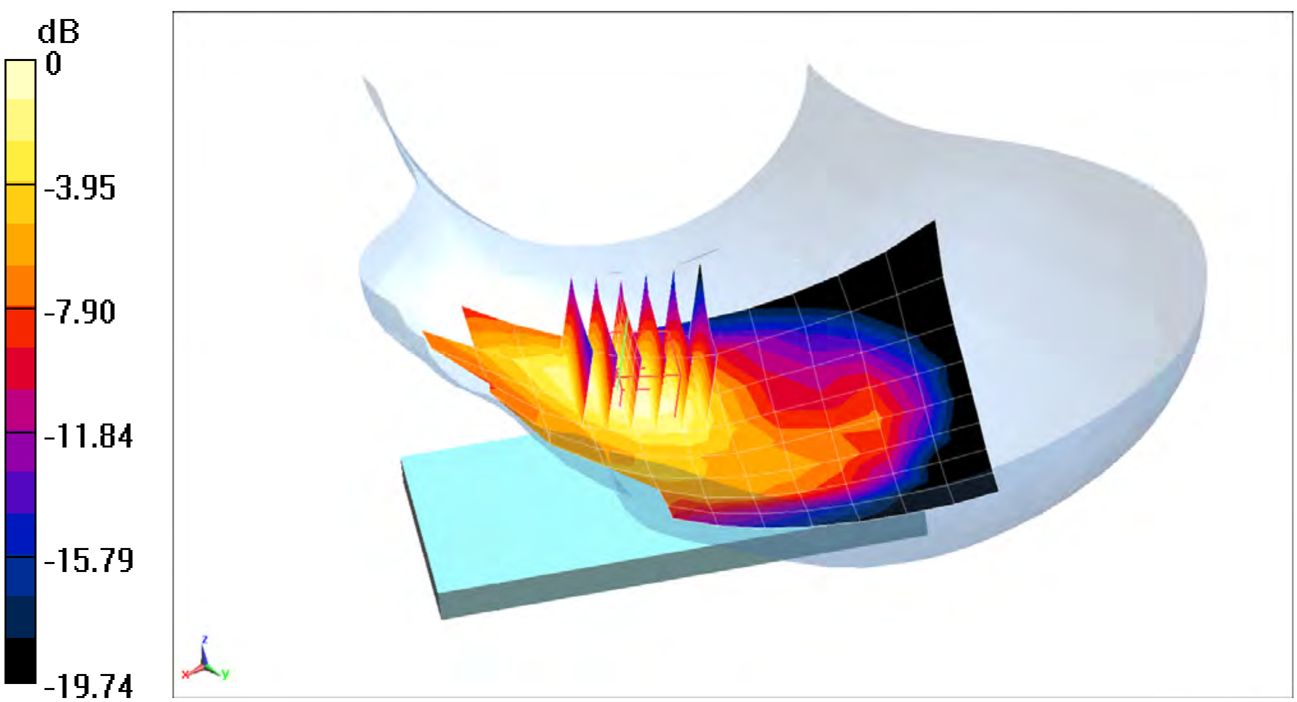
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.372 S/m; ε_r = 38.807; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-25-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3332; ConvF(5.56, 5.56, 5.56); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.20 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.499 W/kg
SAR(1 g) = 0.333 W/kg



0 dB = 0.379 W/kg = -4.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

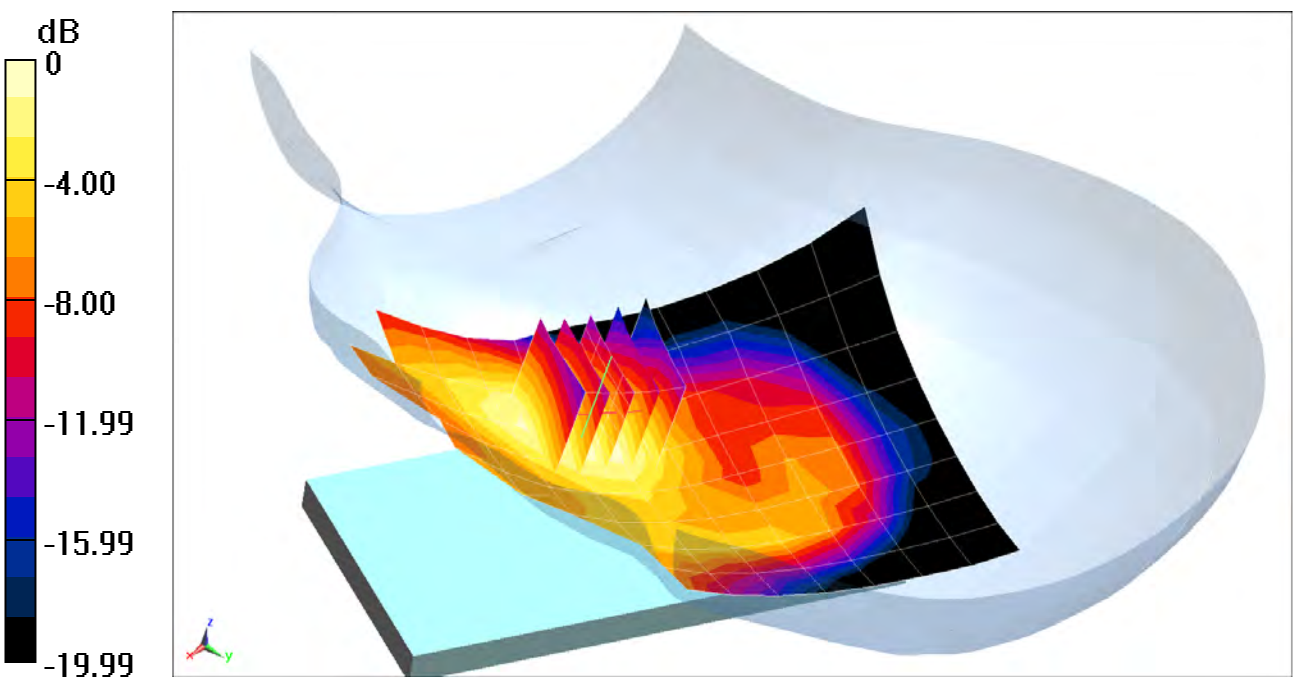
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.41 S/m; ε_r = 39.885; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-18-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.2, 5.2, 5.2); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.18 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.159 W/kg



0 dB = 0.184 W/kg = -7.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

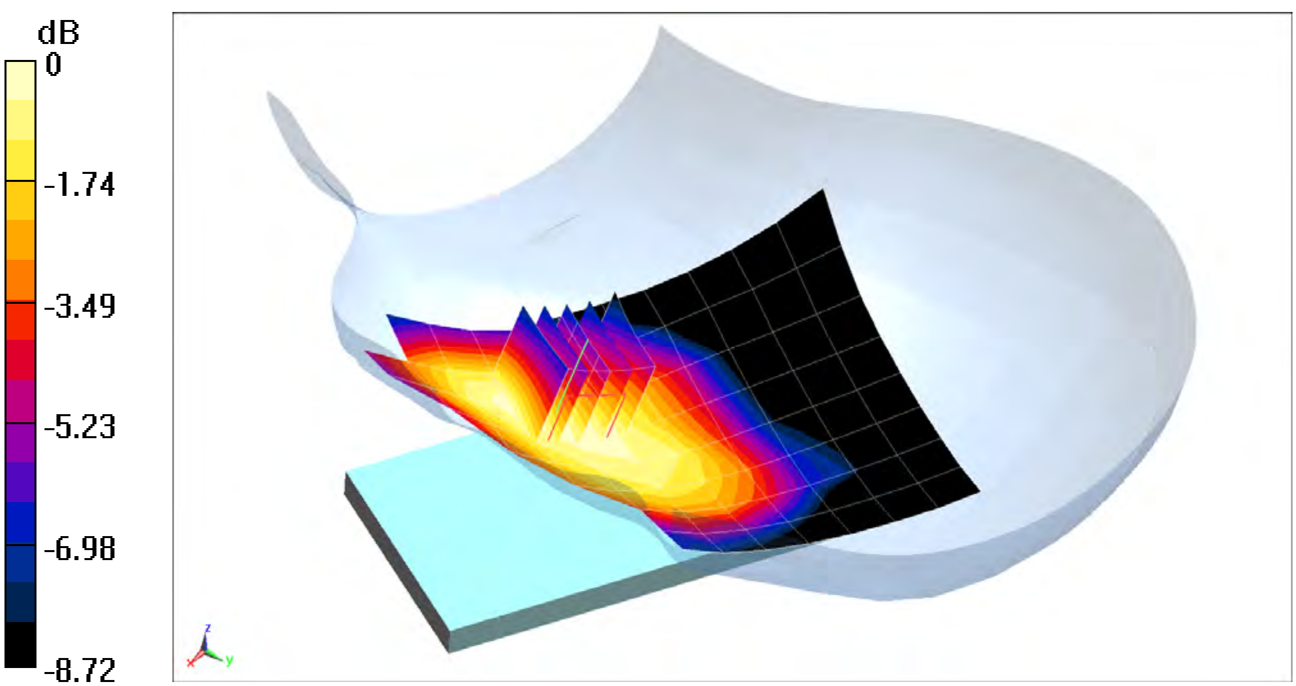
Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Broadband Medium parameters used (interpolated):
f = 680.5 MHz; σ = 0.864 S/m; ε_r = 43.943; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-11-2017; Ambient Temp: 22.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3332; ConvF(6.81, 6.81, 6.81); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 71, Left Head, Cheek, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.25 V/m; Power Drift = 0.21 dB
Peak SAR (extrapolated) = 0.168 W/kg
SAR(1 g) = 0.131 W/kg



0 dB = 0.142 W/kg = -8.48 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

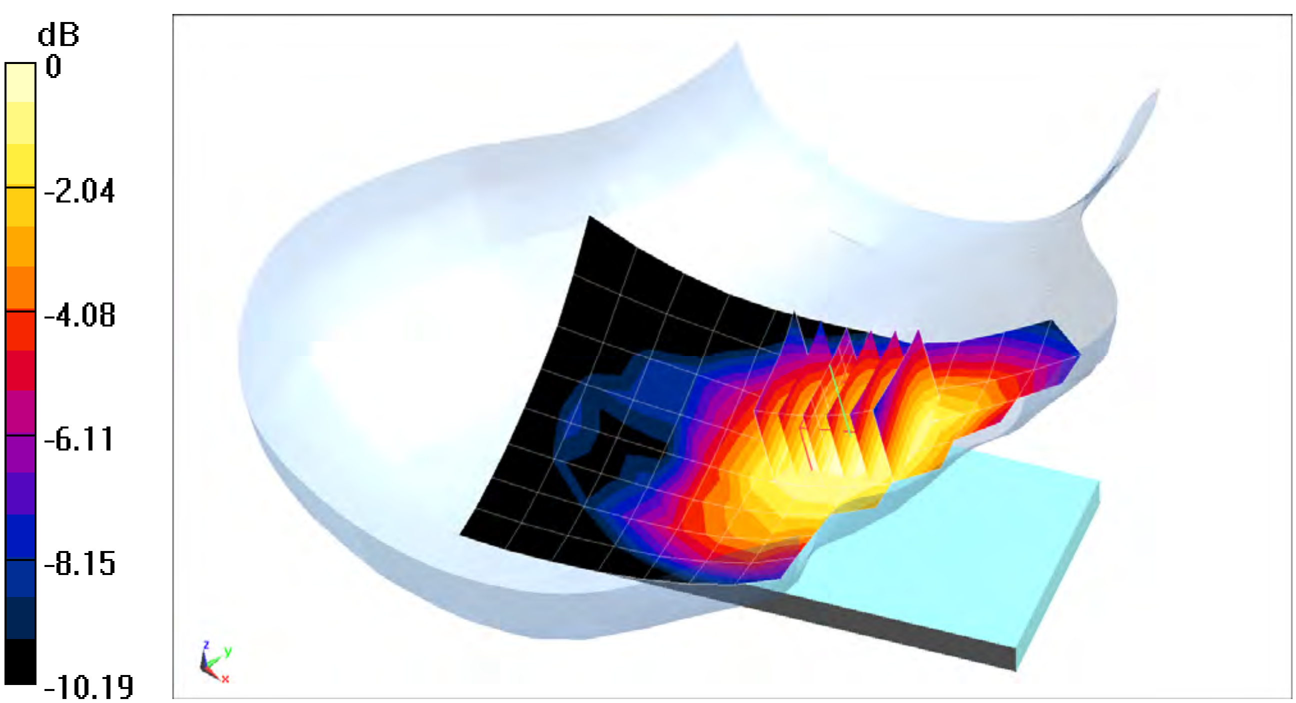
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Broadband Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.874 S/m; ε_r = 43.845; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-11-2017; Ambient Temp: 22.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3332; ConvF(6.81, 6.81, 6.81); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.37 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.139 W/kg



0 dB = 0.149 W/kg = -8.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

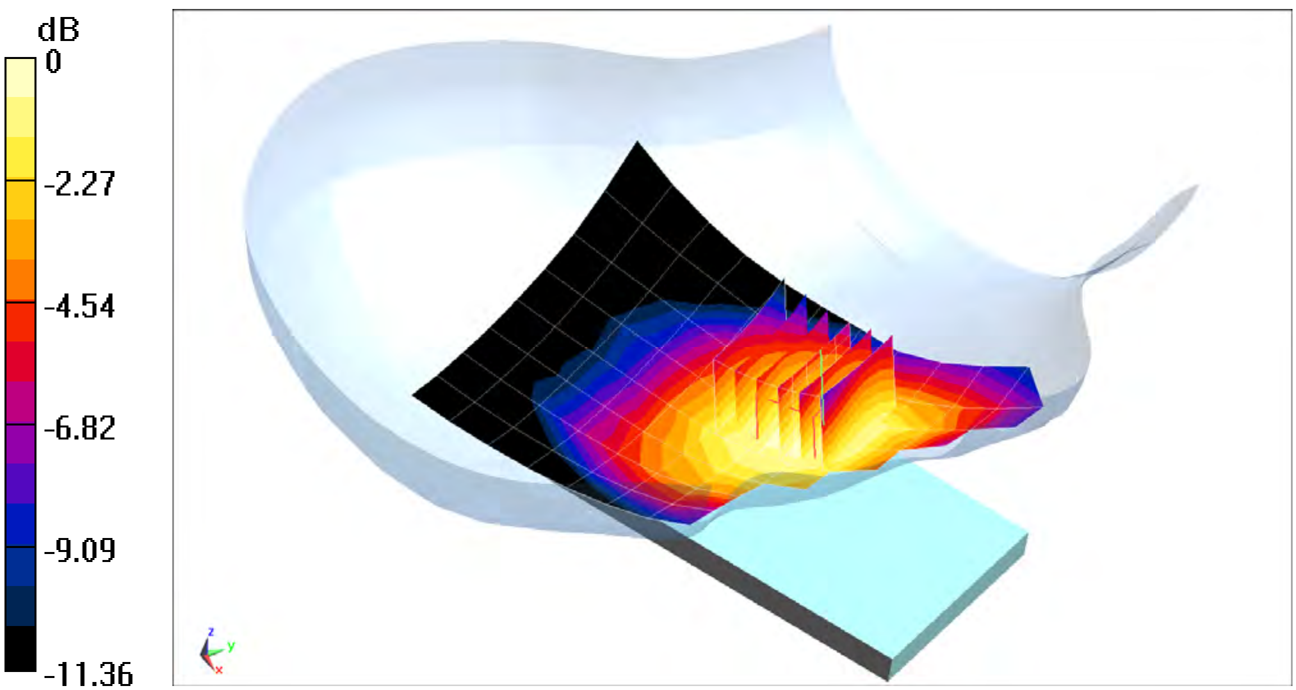
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Broadband Medium parameters used (interpolated):
f = 782 MHz; σ = 0.901 S/m; εr = 43.597; ρ = 1000 kg/m3
Phantom section: Right Section

Test Date: 09-11-2017; Ambient Temp: 22.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3332; ConvF(6.81, 6.81, 6.81); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.11 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.246 W/kg
SAR(1 g) = 0.203 W/kg



0 dB = 0.218 W/kg = -6.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

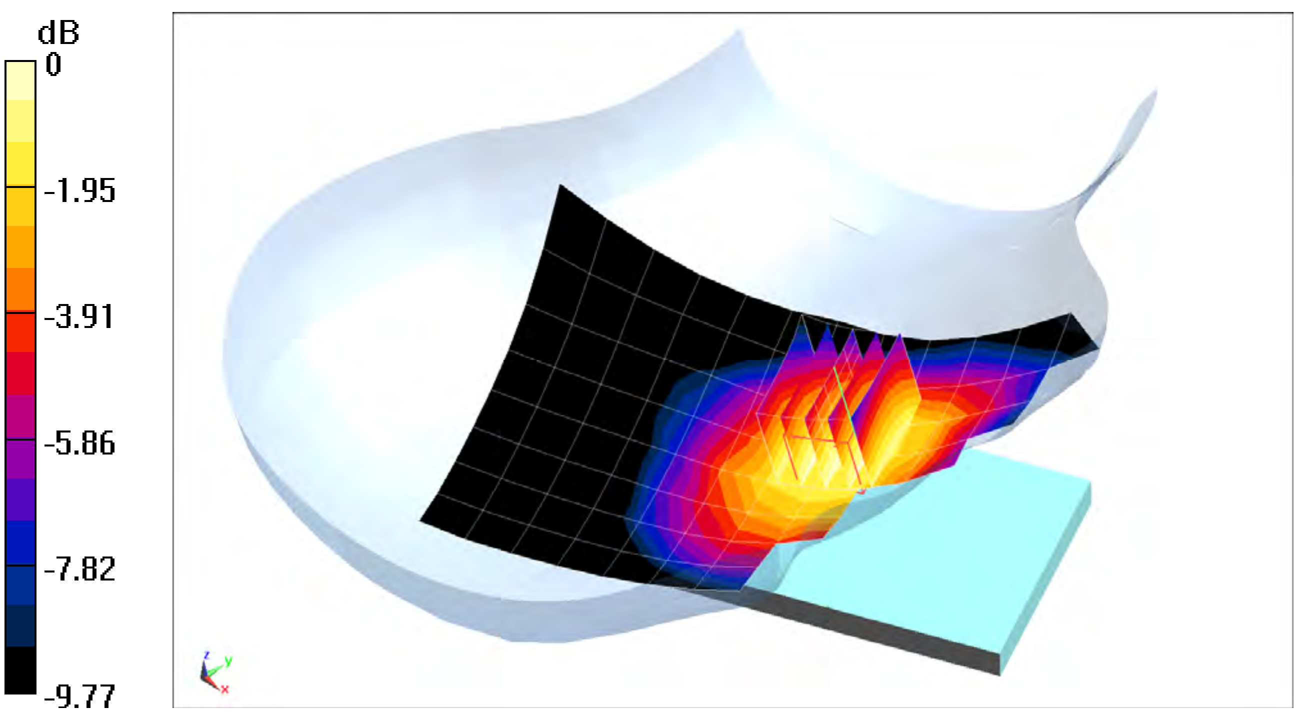
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 850 Head Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.915 S/m; ε_r = 43.438; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-14-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**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 = 14.08 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.168 W/kg



0 dB = 0.189 W/kg = -7.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

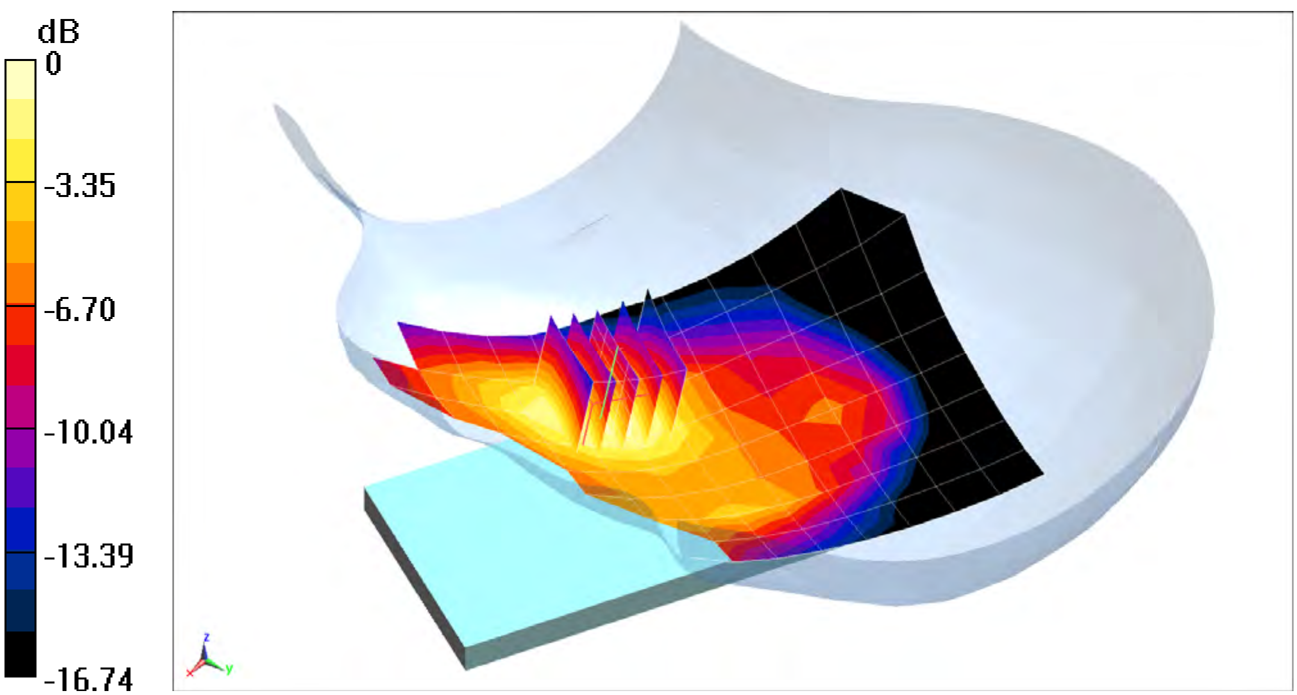
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.393 S/m; ε_r = 38.542; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-18-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3213; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 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 = 16.15 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.446 W/kg
SAR(1 g) = 0.293 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

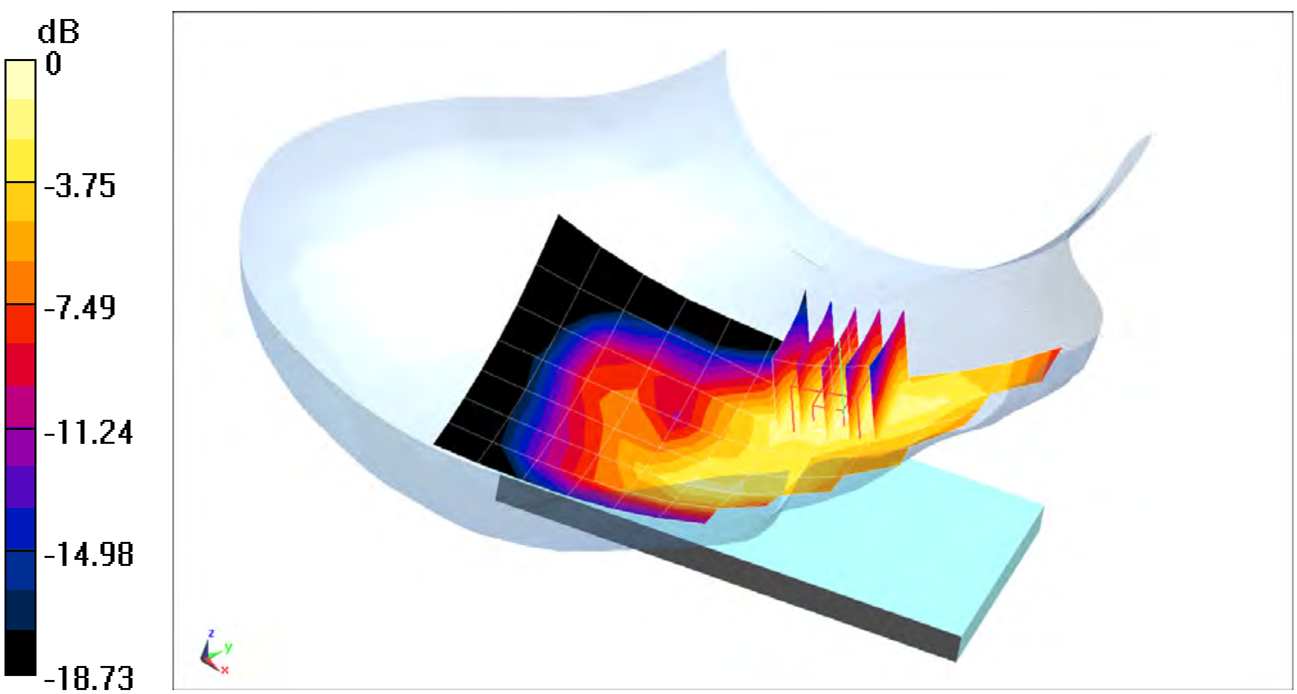
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.437 S/m; ε_r = 39.784; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-18-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.2, 5.2, 5.2); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 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 = 11.26 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.232 W/kg
SAR(1 g) = 0.143 W/kg



0 dB = 0.171 W/kg = -7.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

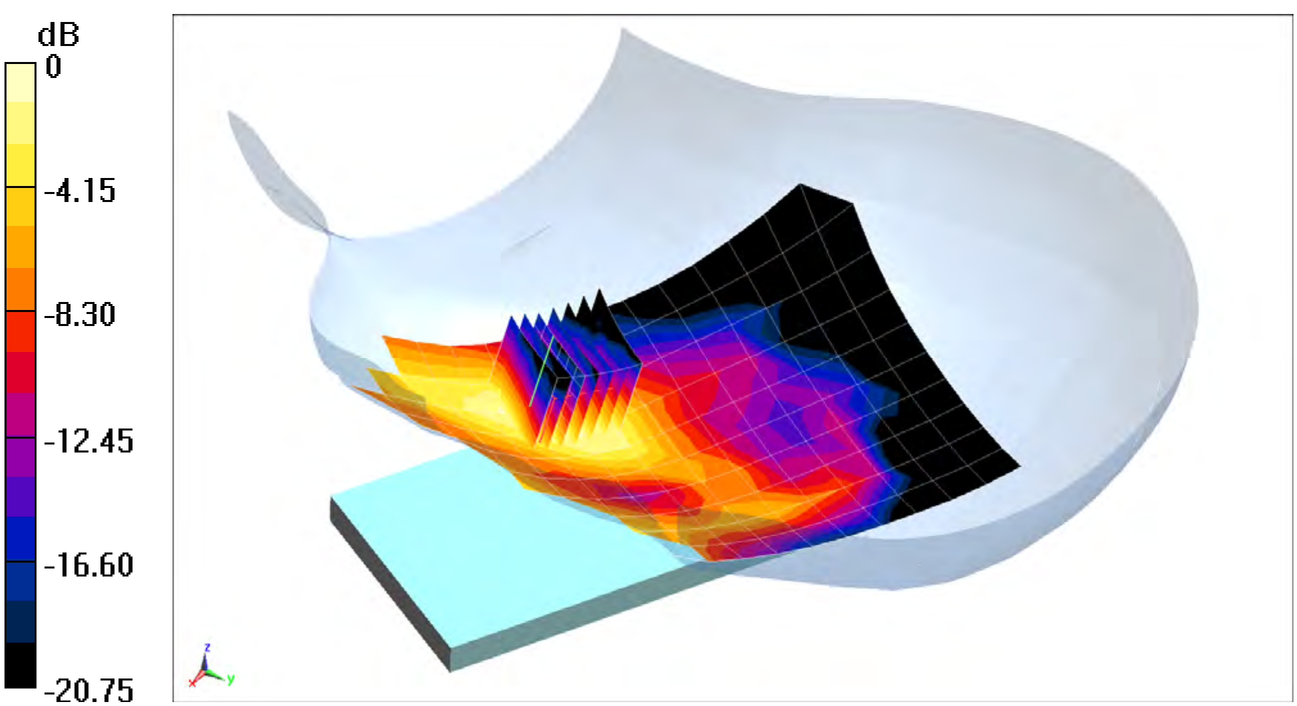
Communication System: UID 0, LTE Band 7; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2510 MHz; σ = 1.936 S/m; ε_r = 38.609; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-17-2017; Ambient Temp: 20.9°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(7.68, 7.68, 7.68); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Left Head, Cheek, Low.ch, QPSK,
20 MHz Bandwidth, 1 RB, 0 RB Offset

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.847 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.234 W/kg
SAR(1 g) = 0.118 W/kg



0 dB = 0.185 W/kg = -7.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20514

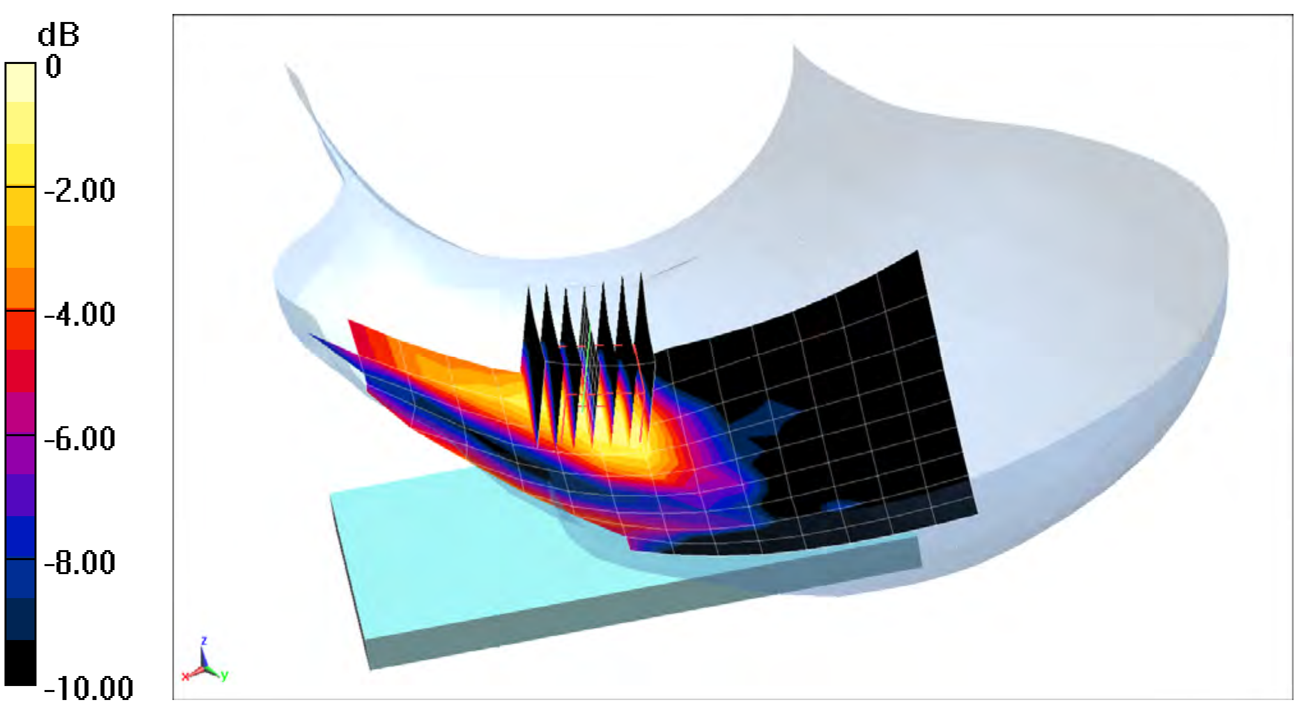
Communication System: UID 0, _LTE Band 38; Frequency: 2595 MHz; Duty Cycle: 1:1.58
Medium: 2600 Head Medium parameters used (interpolated):
f = 2595 MHz; σ = 2.01 S/m; ε_r = 38.368; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-25-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.41, 4.41, 4.41); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 38, Left Head, Cheek, Mid.ch, QPSK,
20 MHz Bandwidth, 1 RB, 0 RB Offset

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.740 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.167 W/kg
SAR(1 g) = 0.090 W/kg



0 dB = 0.112 W/kg = -9.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20514

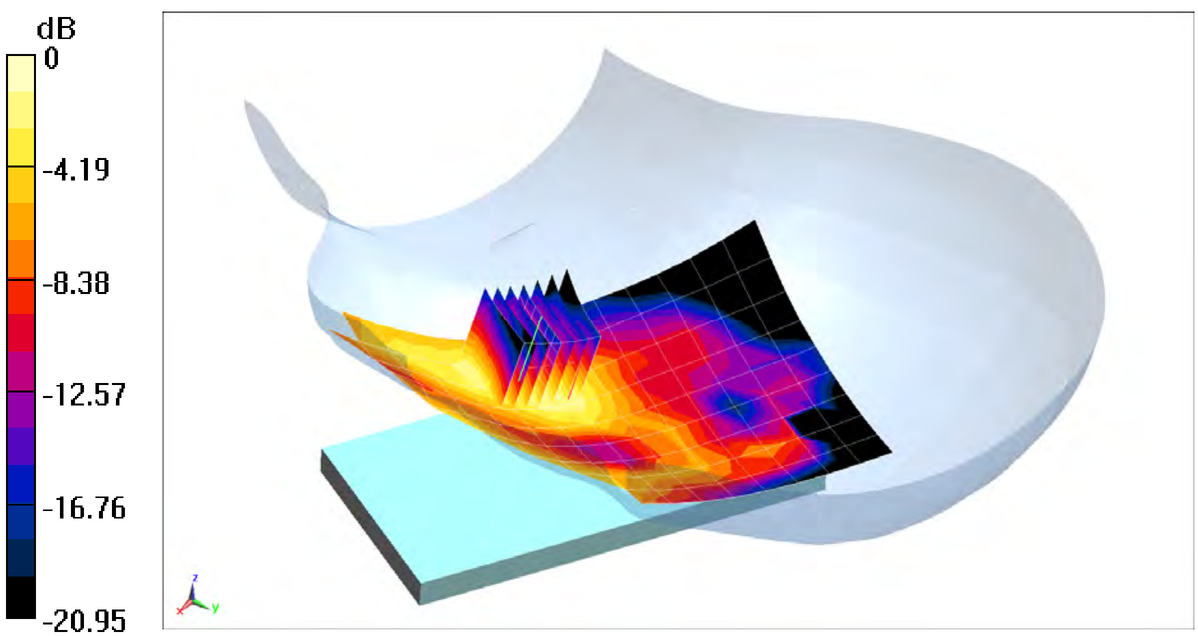
Communication System: UID 0, LTE Band 41 (Class 3); Frequency: 2506 MHz; Duty Cycle: 1:1.58
Medium: 2450 Head Medium parameters used (interpolated):
f = 2506 MHz; σ = 1.92 S/m; ε_r = 39.03; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 09-20-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3319; ConvF(4.6, 4.6, 4.6); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, 2CC Uplink, Left Head, Cheek, Low.ch, 20 MHz Bandwidth
PCC: QPSK, Ch 39750, 1 RB, 99 RB Offset
SCC: QPSK, Ch 39948, 1 RB, 0 RB Offset

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.334 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.100 W/kg



0 dB = 0.129 W/kg = -8.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 18518

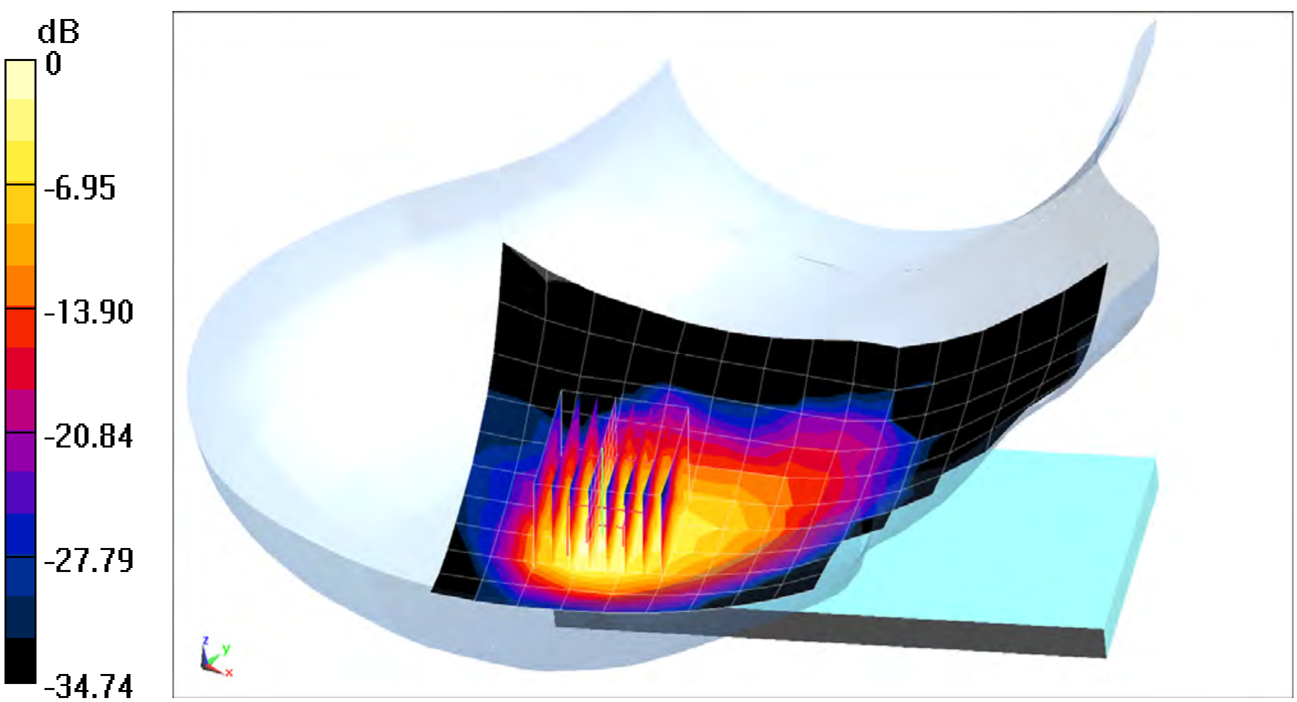
Communication System: UID 0, IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2462 MHz; σ = 1.87 S/m; ε_r = 39.192; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-20-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3319; ConvF(4.6, 4.6, 4.6); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Right Head, Cheek, Antenna 2 Ch 11, 1 Mbps

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.496 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 2.51 W/kg
SAR(1 g) = 0.901 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 18518

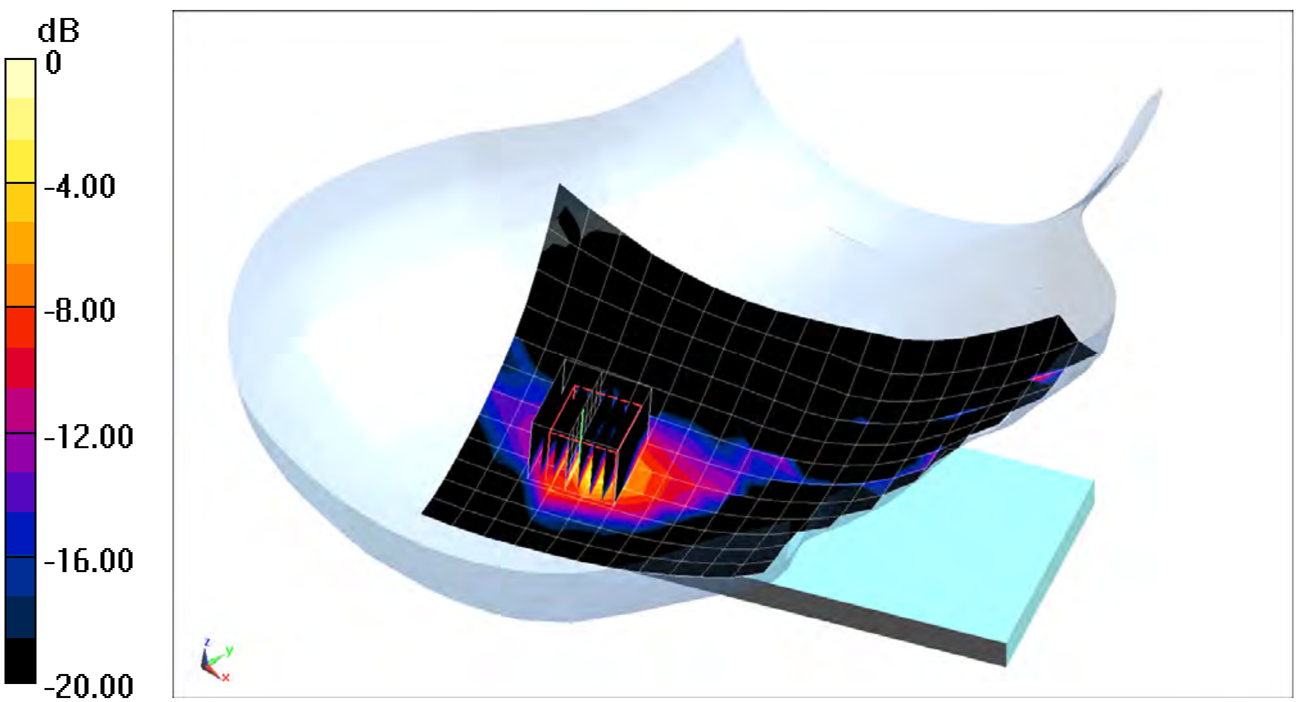
Communication System: UID 0, 802.11ac 5.2-5.8 GHz Band;
Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5775 MHz; σ = 5.122 S/m; ε_r = 34.784; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 09-11-2017; Ambient Temp: 20.0°C; Tissue Temp: 20.0°C

Probe: EX3DV4 - SN3914; ConvF(4.91, 4.91, 4.91); Calibrated: 2/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**Mode: IEEE 802.11ac, U-NII-3, Antenna 2,
80 MHz Bandwidth, Right Head, Cheek, Ch 155, 29.3 Mbps**

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 1.505 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.17 W/kg
SAR(1 g) = 0.457 W/kg



0 dB = 1.17 W/kg = 0.68 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 00318

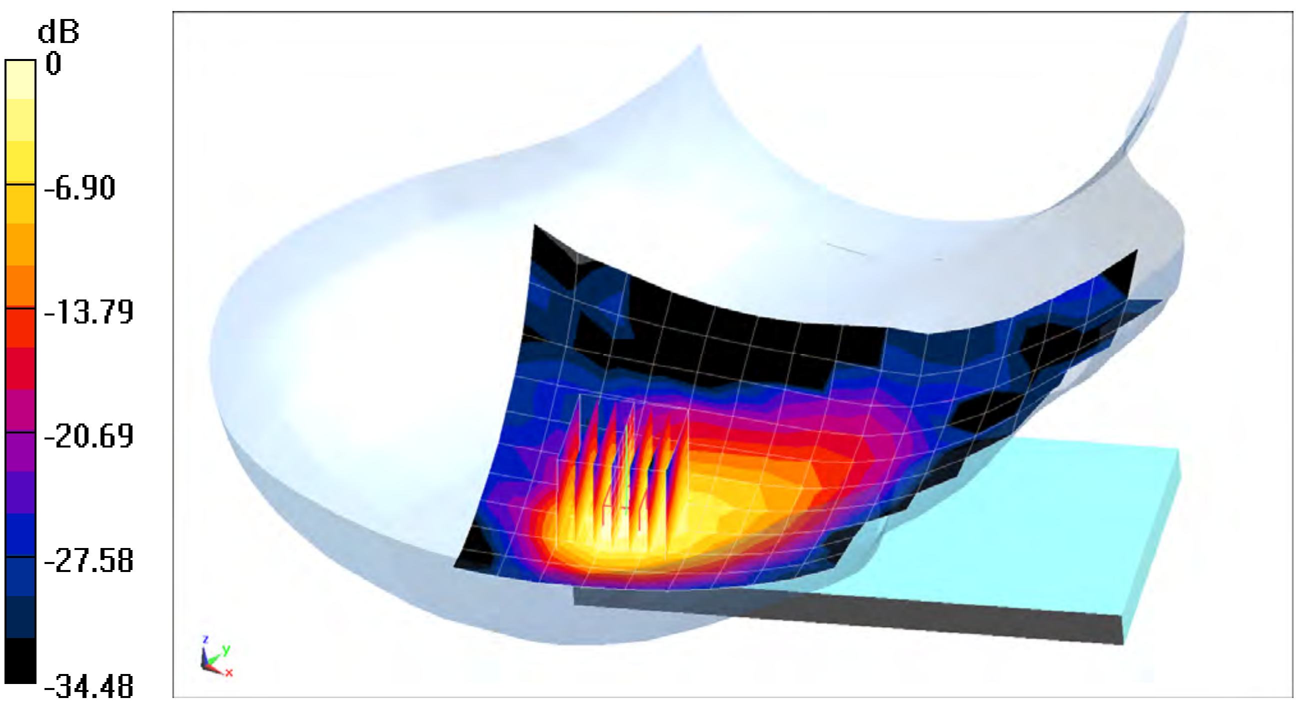
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.836 S/m; ε_r = 38.937; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 9-25-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.6, 4.6, 4.6); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.45 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.785 W/kg
SAR(1 g) = 0.369 W/kg



0 dB = 0.499 W/kg = -3.02 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

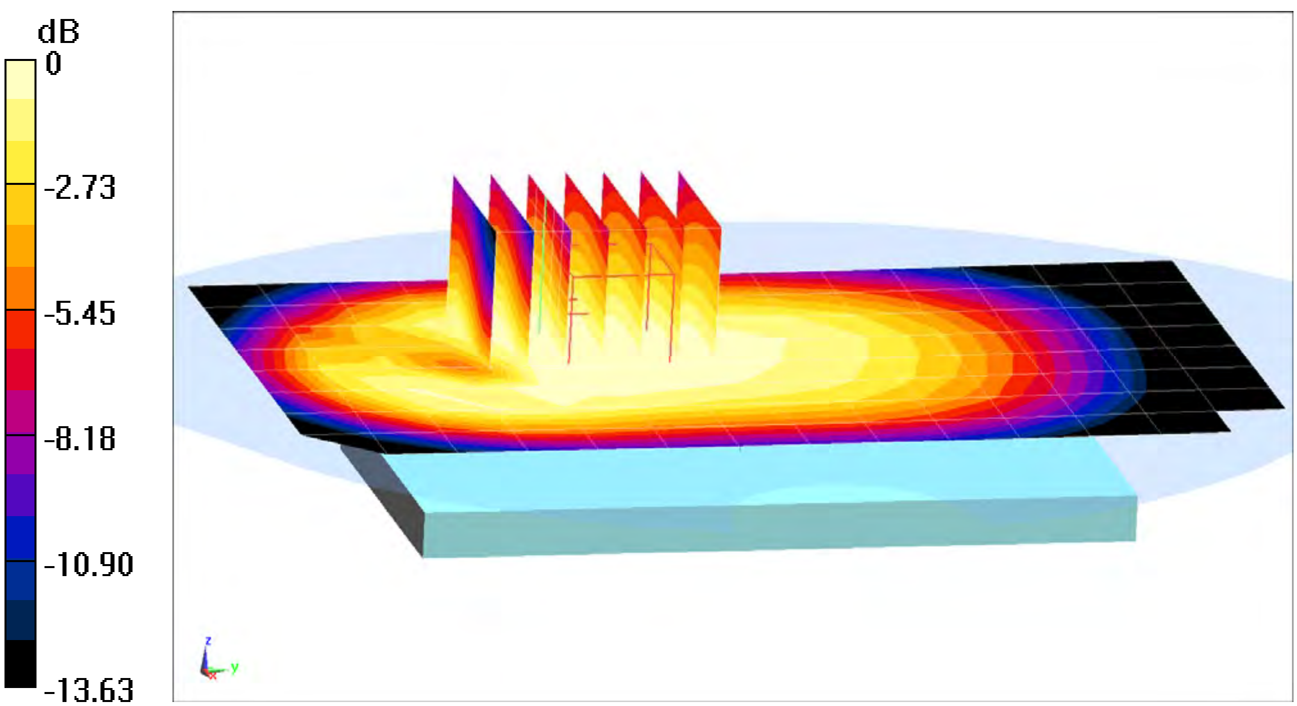
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.95 S/m; ε_r = 53.166; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA BC10, Rule Part 90S, Body SAR, Back side, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.97 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.290 W/kg
SAR(1 g) = 0.227 W/kg



0 dB = 0.248 W/kg = -6.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

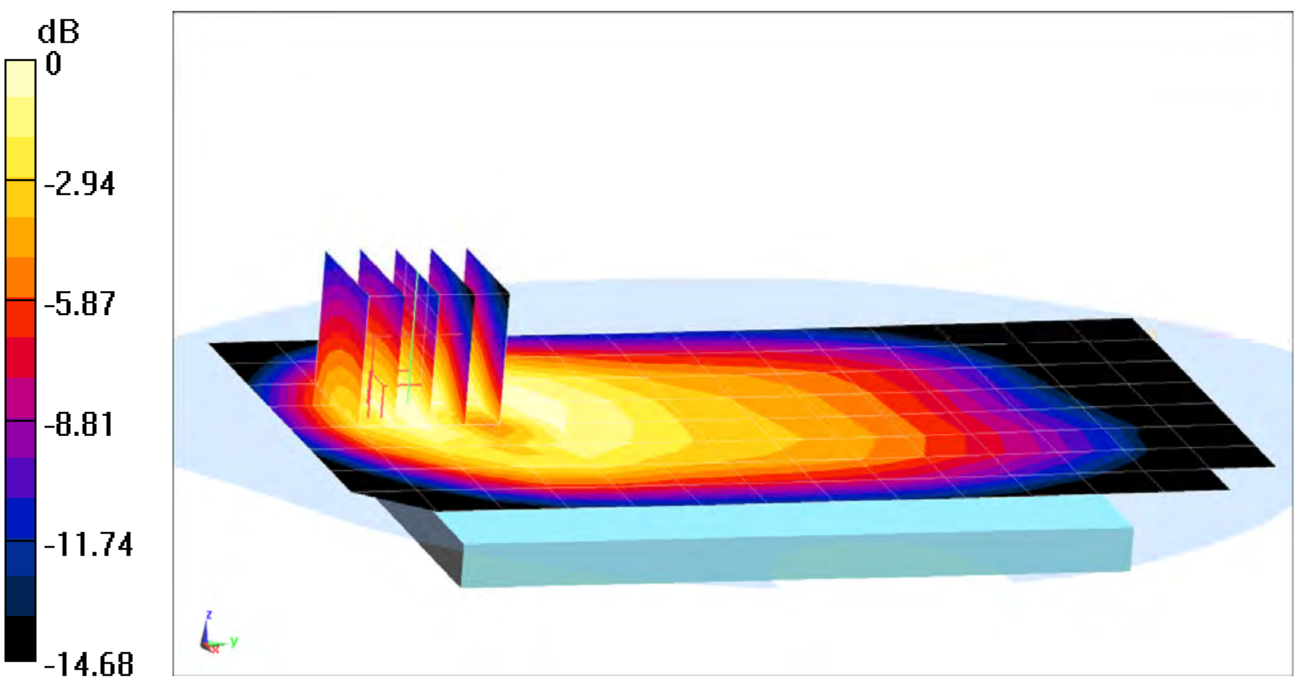
Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 820.1 MHz; σ = 0.95 S/m; ε_r = 53.166; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. EVDO BC10, Rule Part 90S, Body SAR, Front side, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.37 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.791 W/kg
SAR(1 g) = 0.465 W/kg



0 dB = 0.550 W/kg = -2.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

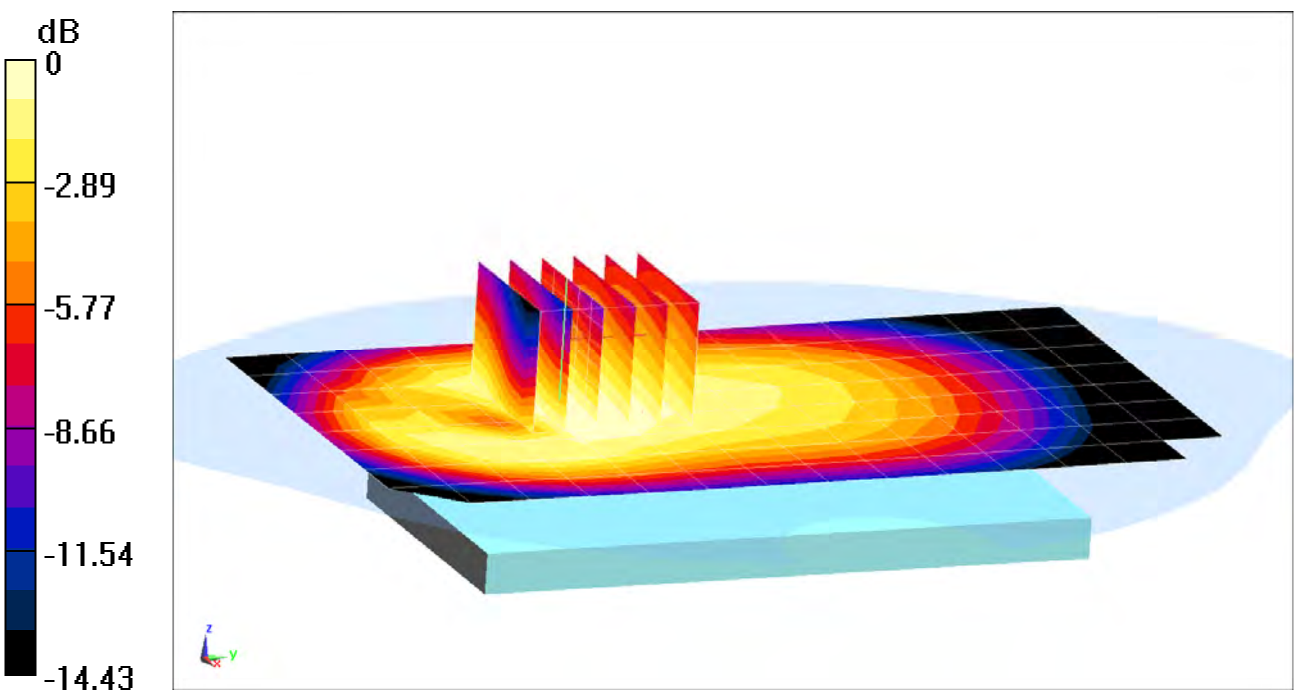
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.967 S/m; ε_r = 52.927; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA, Rule Part 22H, Body SAR, Back side, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.61 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.415 W/kg
SAR(1 g) = 0.312 W/kg



0 dB = 0.346 W/kg = -4.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

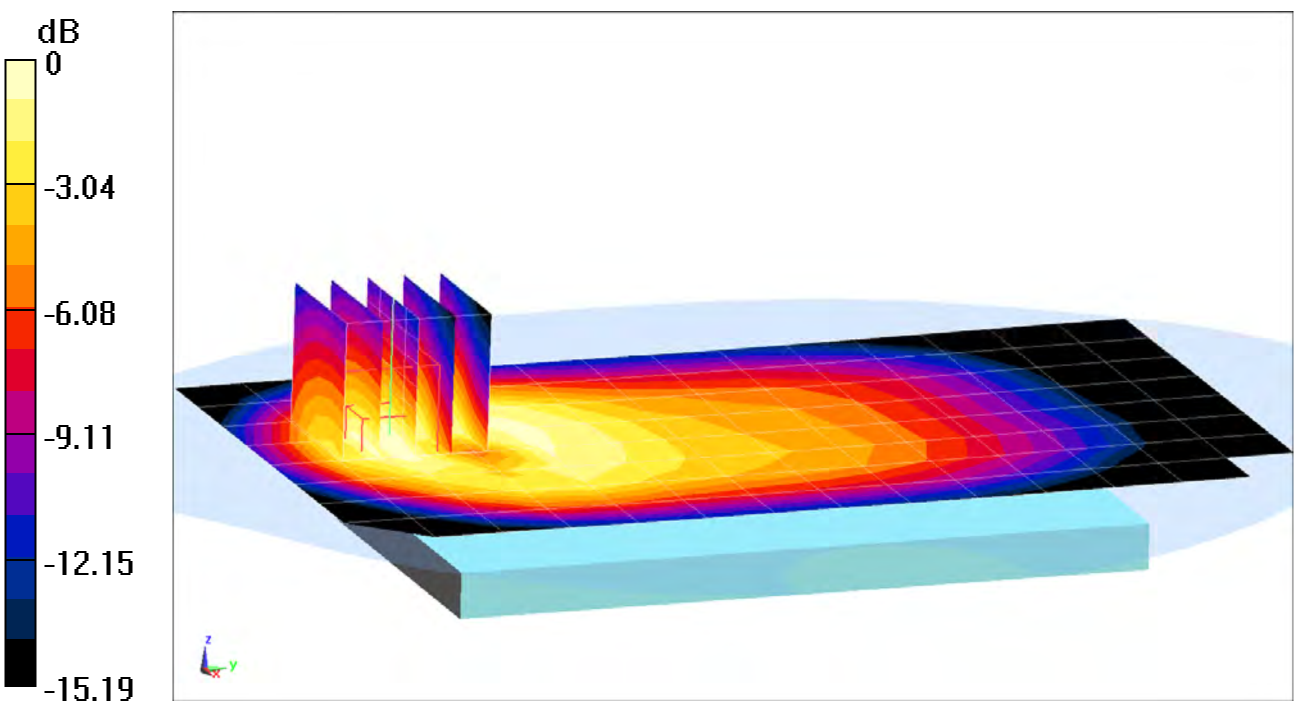
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.967 S/m; ε_r = 52.927; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. EVDO, Rule Part 22H, Body SAR, Front 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 = 25.36 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.580 W/kg



0 dB = 0.677 W/kg = -1.69 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

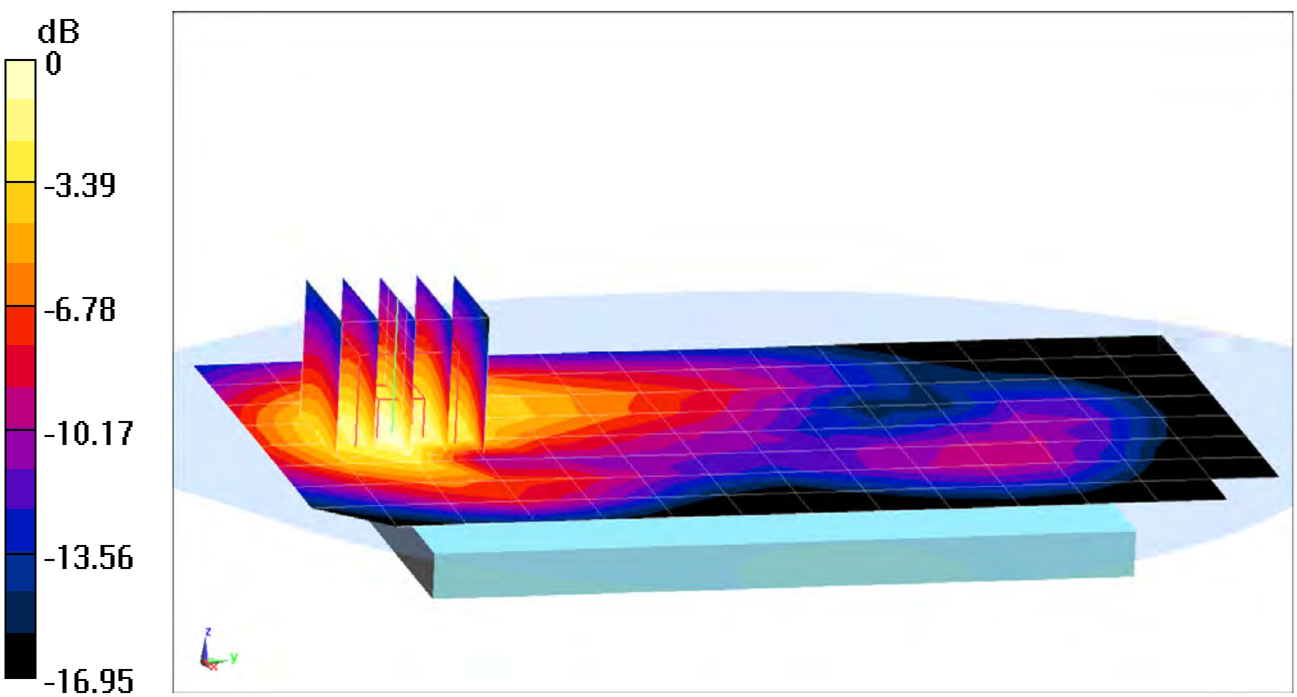
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.547 S/m; ε_r = 52.359; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: PCS CDMA, 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 = 17.44 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.436 W/kg



0 dB = 0.615 W/kg = -2.11 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

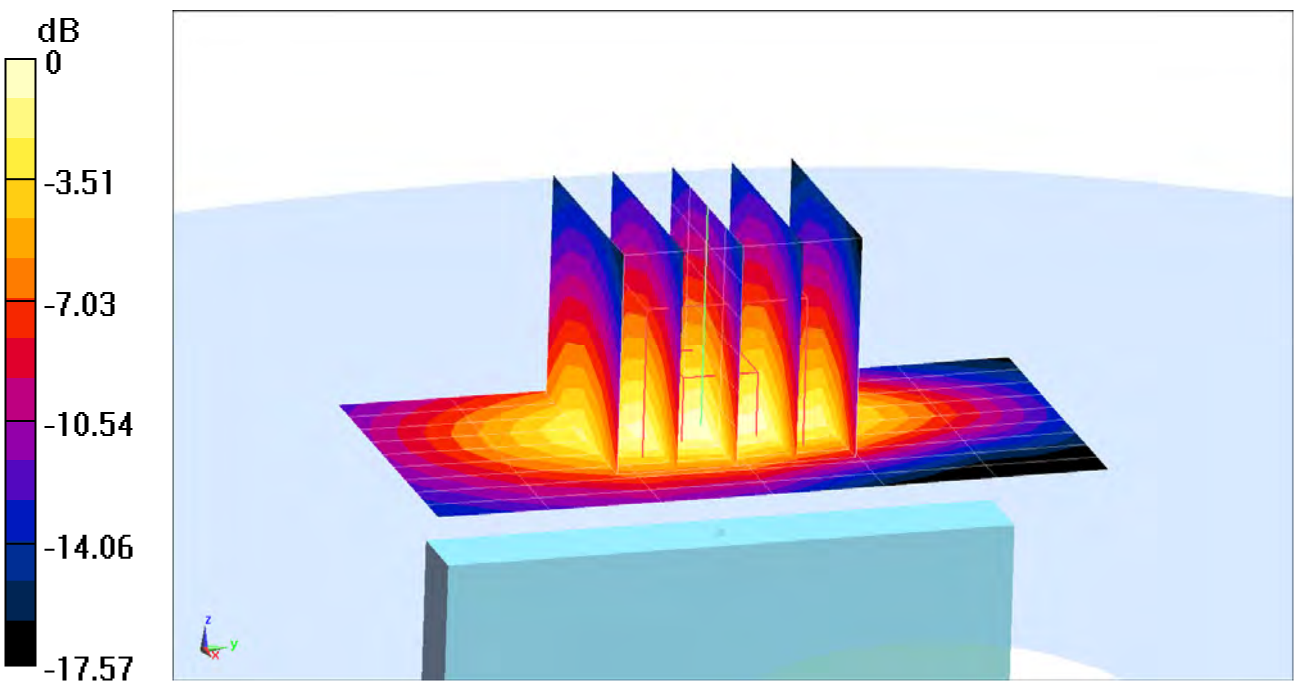
Communication System: UID 0, CDMA, Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.513 S/m; ε_r = 52.446; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: PCS EVDO, Body SAR, Bottom Edge, Low.ch

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.47 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.572 W/kg



0 dB = 0.839 W/kg = -0.76 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20514

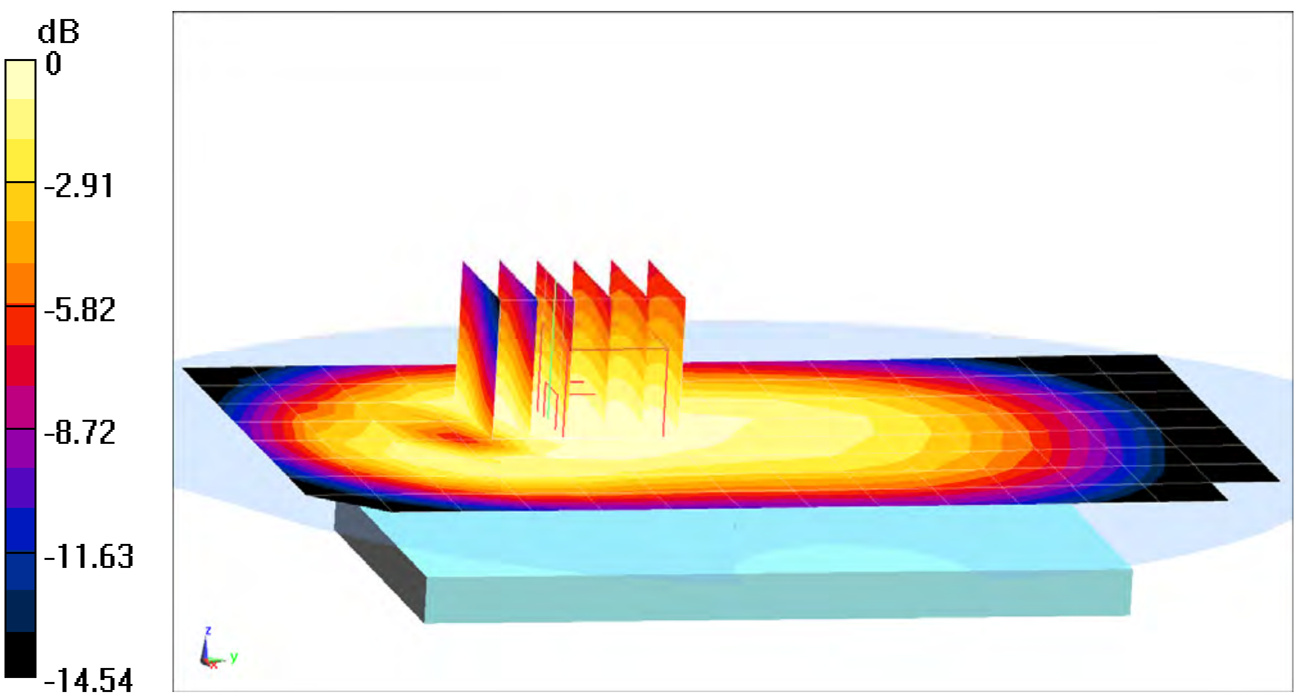
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.966 S/m; ε_r = 53.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.60 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.192 W/kg



0 dB = 0.212 W/kg = -6.74 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19219

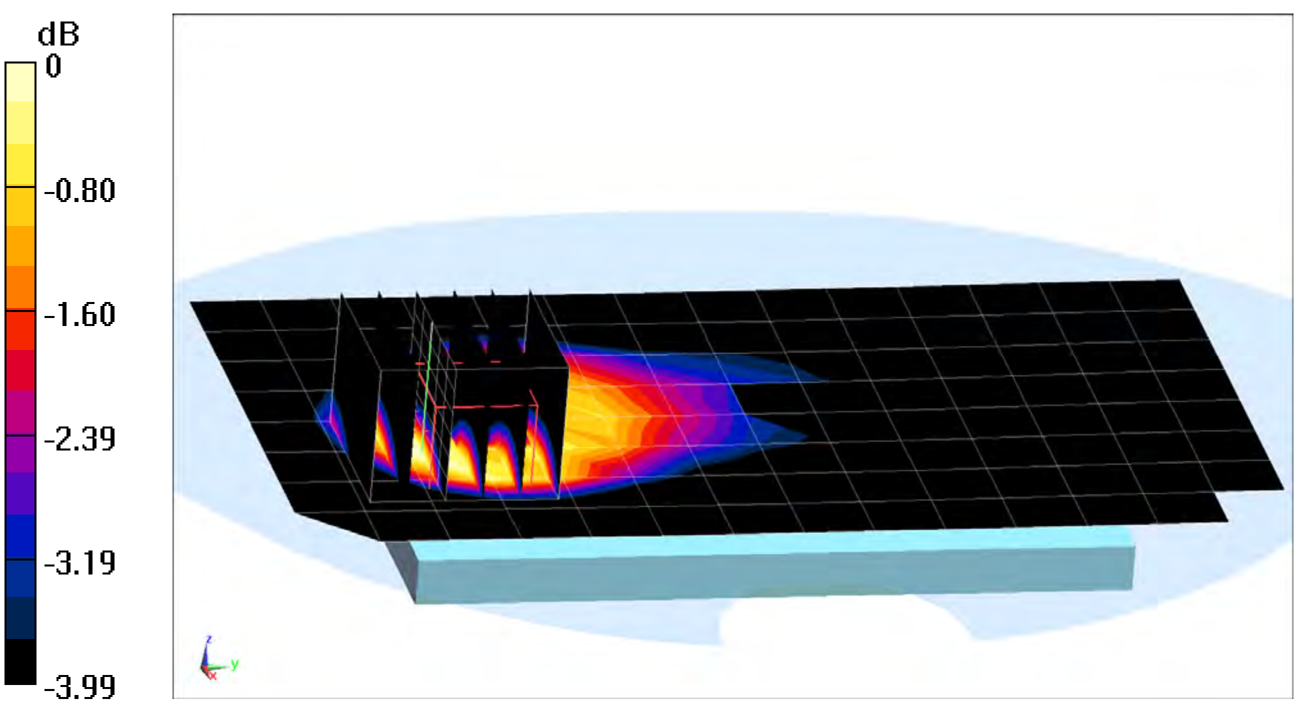
Communication System: UID 0, GSM GPRS; 2 Tx slots;
Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.966 S/m; ε_r = 53.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 2 Tx Slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.53 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.209 W/kg
SAR(1 g) = 0.130 W/kg



0 dB = 0.155 W/kg = -8.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

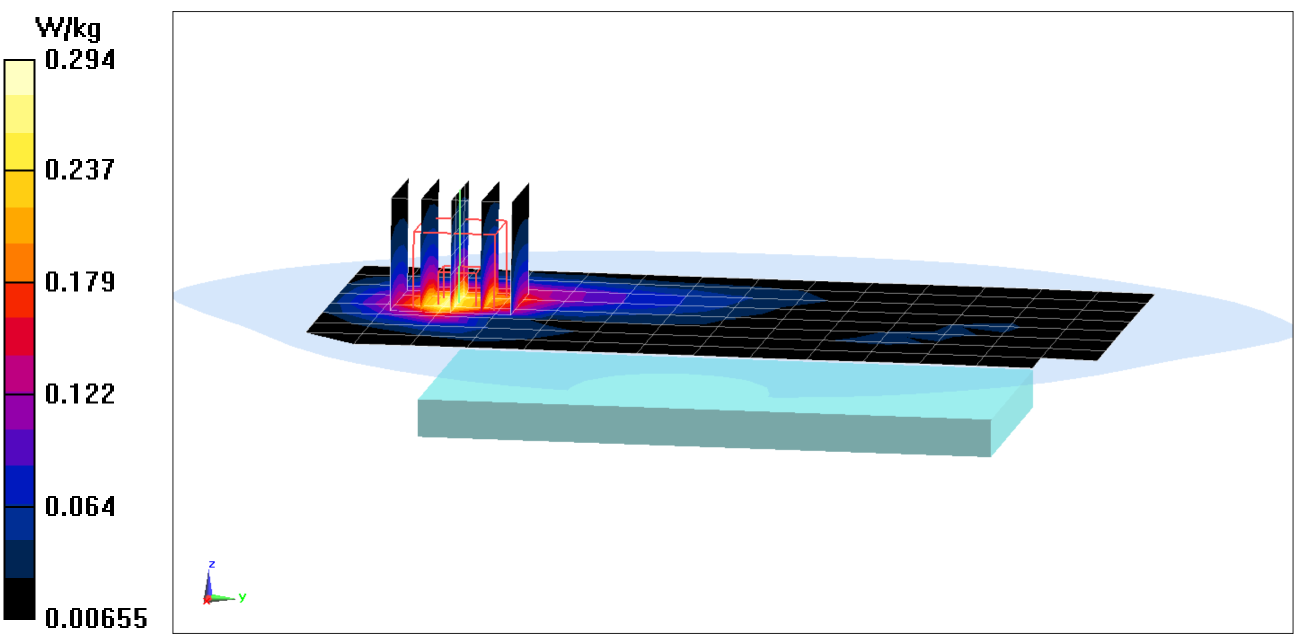
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.458; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-10-2017; Ambient Temp: 21.8°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.09 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.208 W/kg



DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

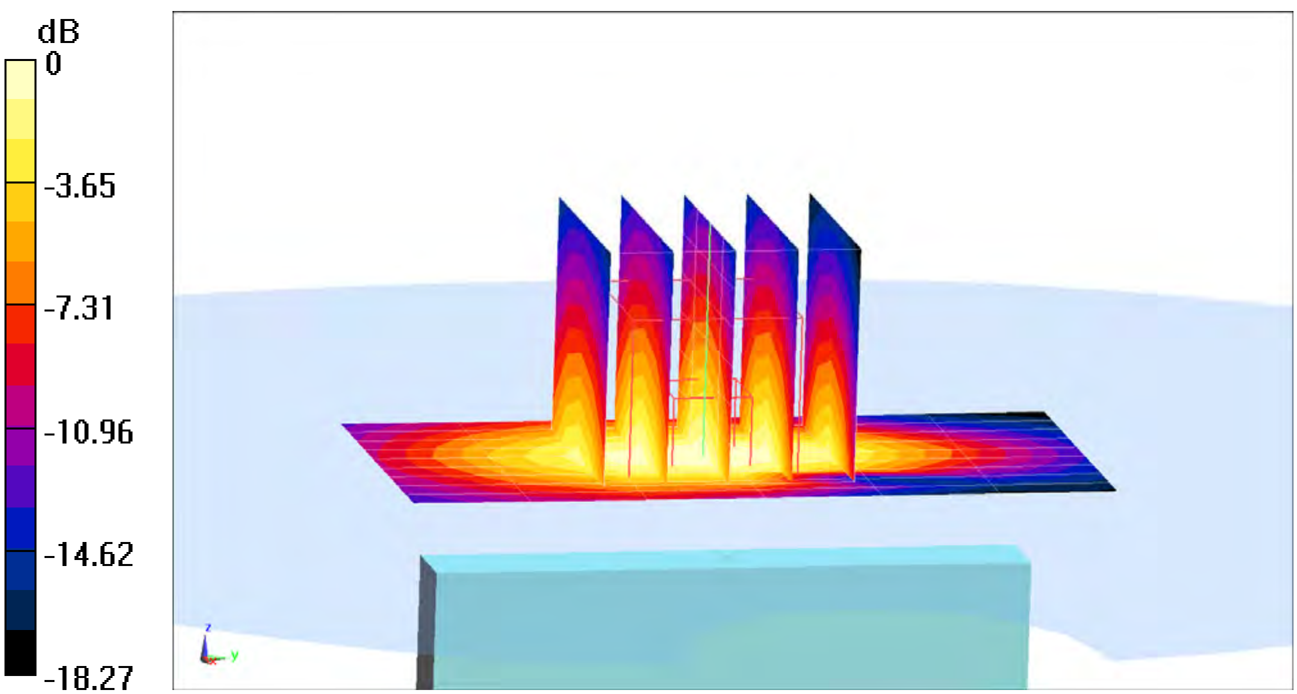
Communication System: UID 0, GSM GPRS; 3 Tx slots
; Frequency: 1880 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.536 S/m; ε_r = 52.458; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-10-2017; Ambient Temp: 21.8°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.67 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.777 W/kg



0 dB = 1.13 W/kg = 0.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

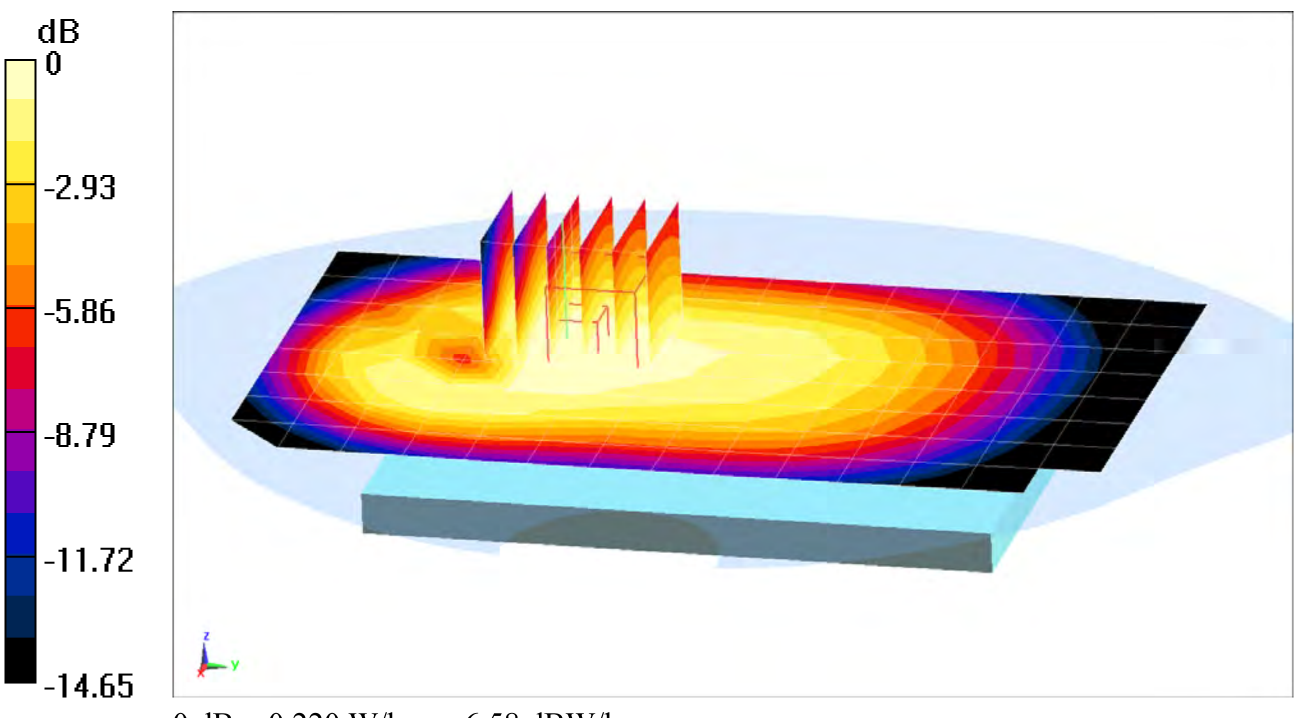
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.966 S/m; ε_r = 53.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.83 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.261 W/kg
SAR(1 g) = 0.198 W/kg



0 dB = 0.220 W/kg = -6.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

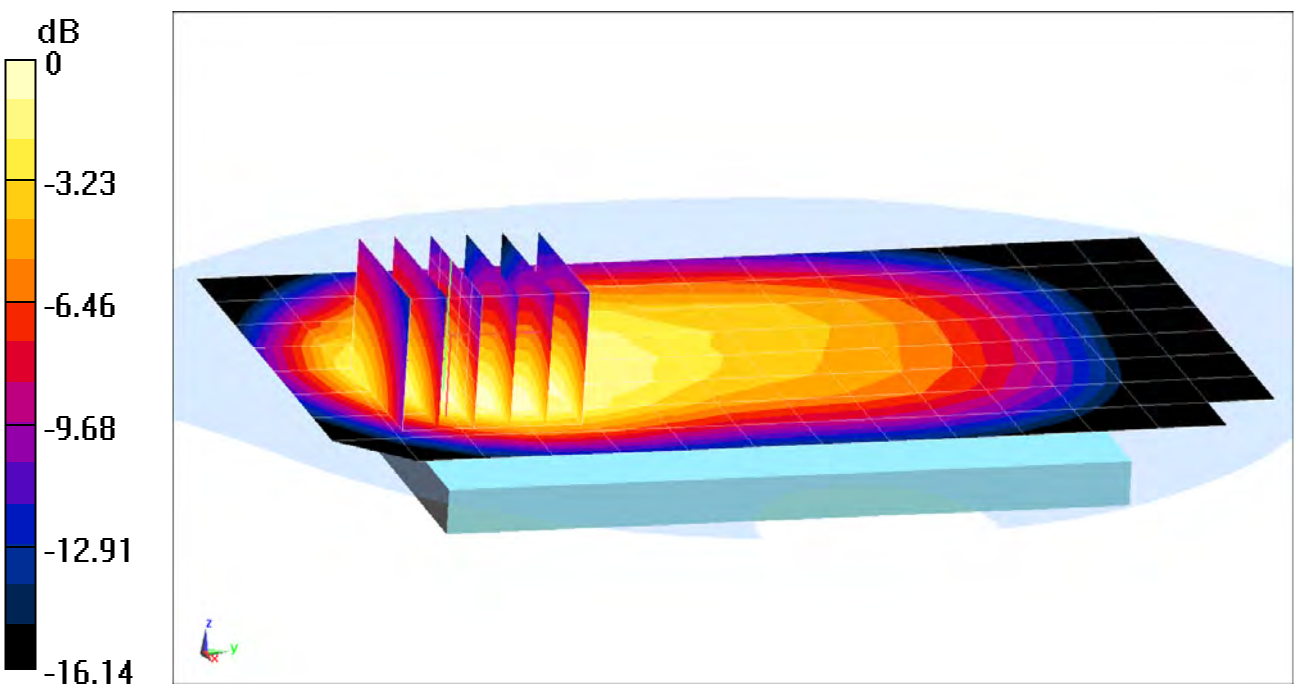
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.966 S/m; ε_r = 53.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.49 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.534 W/kg
SAR(1 g) = 0.331 W/kg



0 dB = 0.391 W/kg = -4.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

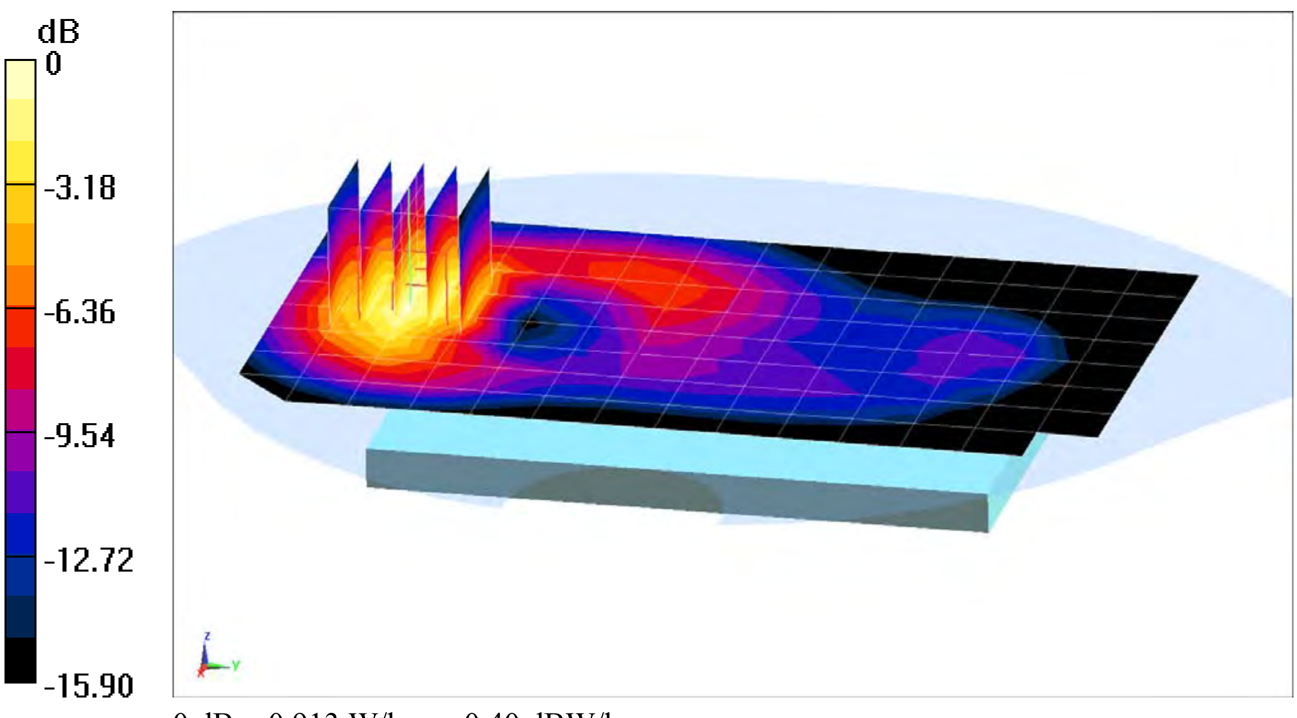
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.484 S/m; ε_r = 52.671; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 20.4°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 23.99 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.765 W/kg



0 dB = 0.913 W/kg = -0.40 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

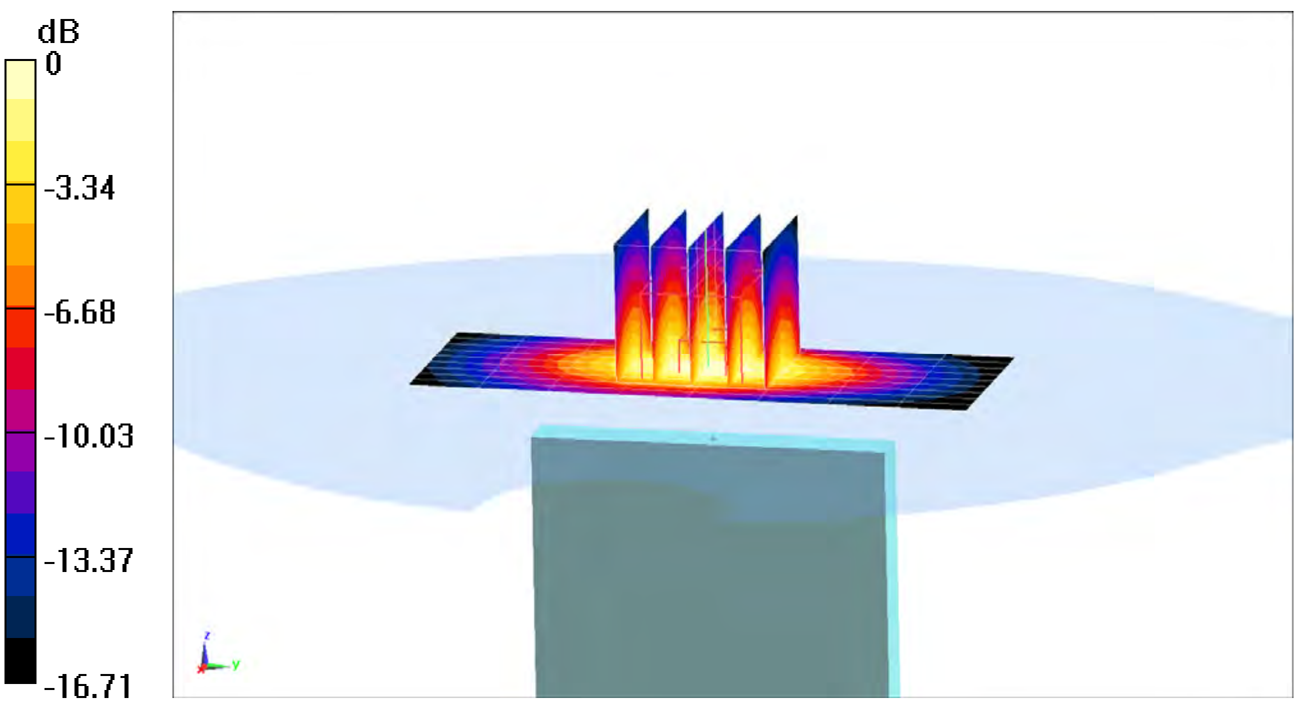
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.489 S/m; ε_r = 52.002; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, 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 = 22.40 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.643 W/kg



0 dB = 0.791 W/kg = -1.02 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

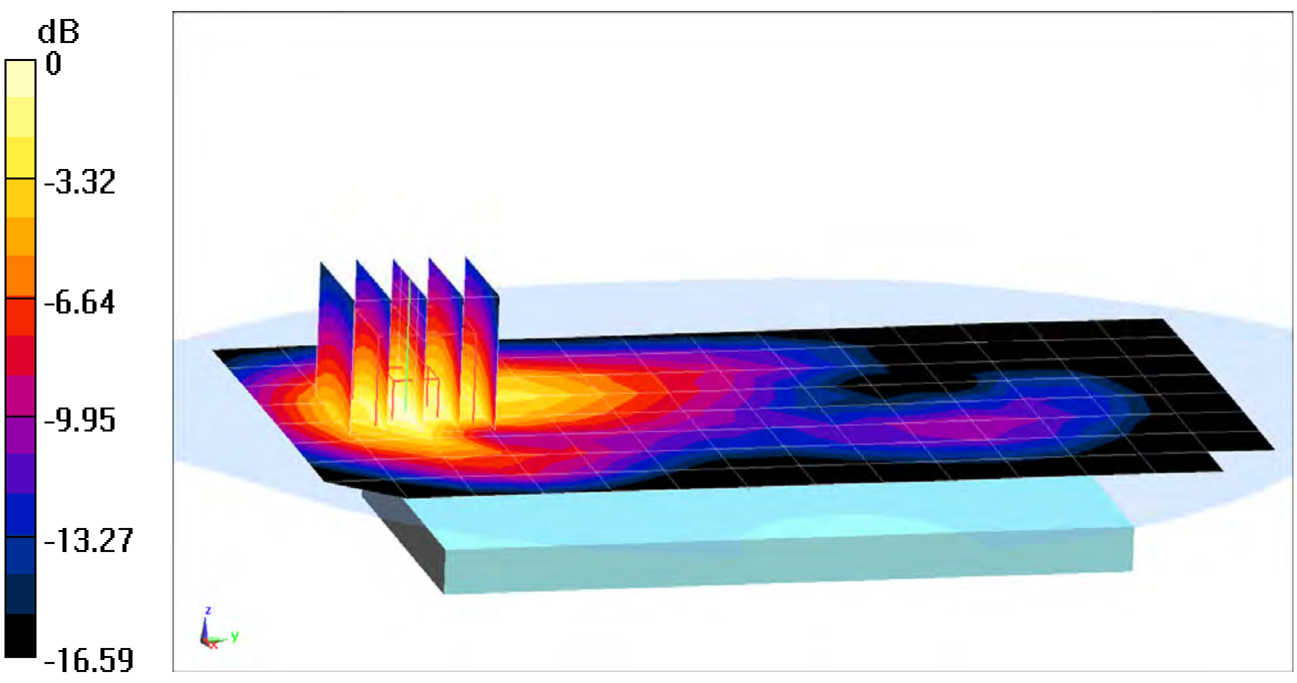
Communication System: UID 0, UMTS; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.568 S/m; ε_r = 52.371; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-10-2017; Ambient Temp: 21.8°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 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 = 21.45 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.670 W/kg



0 dB = 0.950 W/kg = -0.22 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

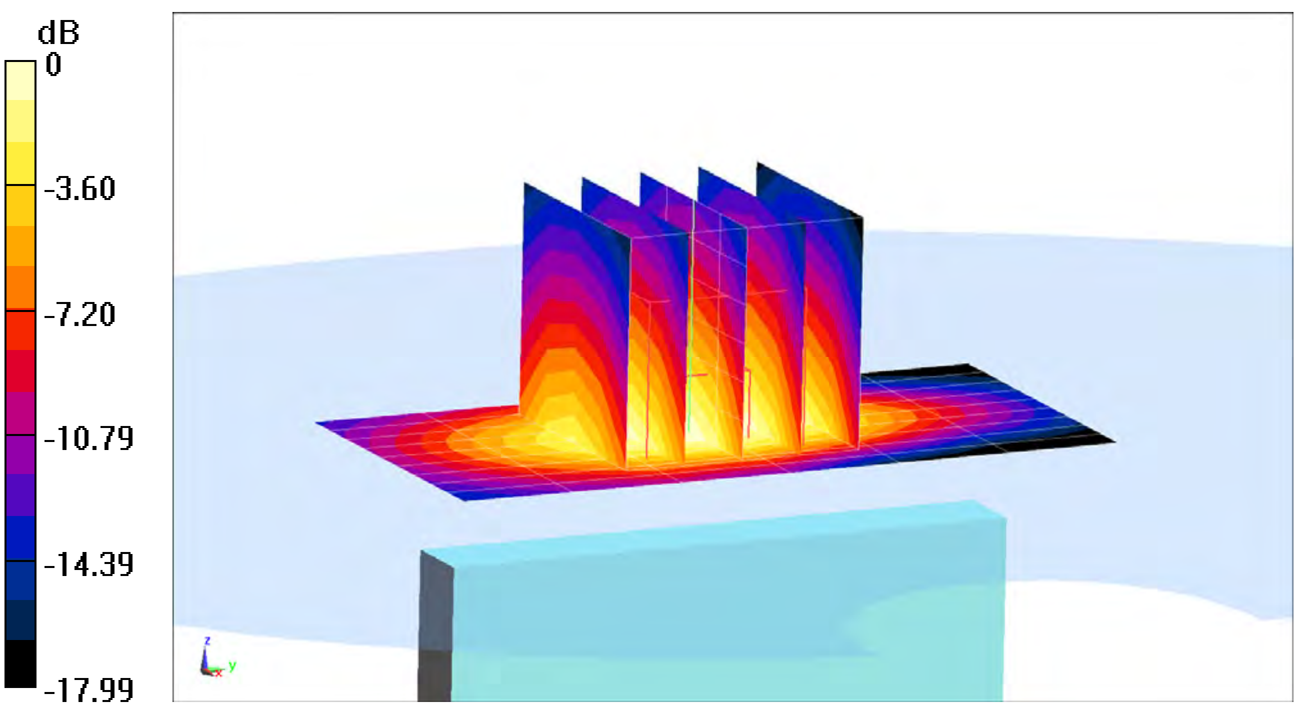
Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1852.4 MHz; σ = 1.504 S/m; ε_r = 52.536; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-10-2017; Ambient Temp: 21.8°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.32 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.618 W/kg



0 dB = 0.904 W/kg = -0.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

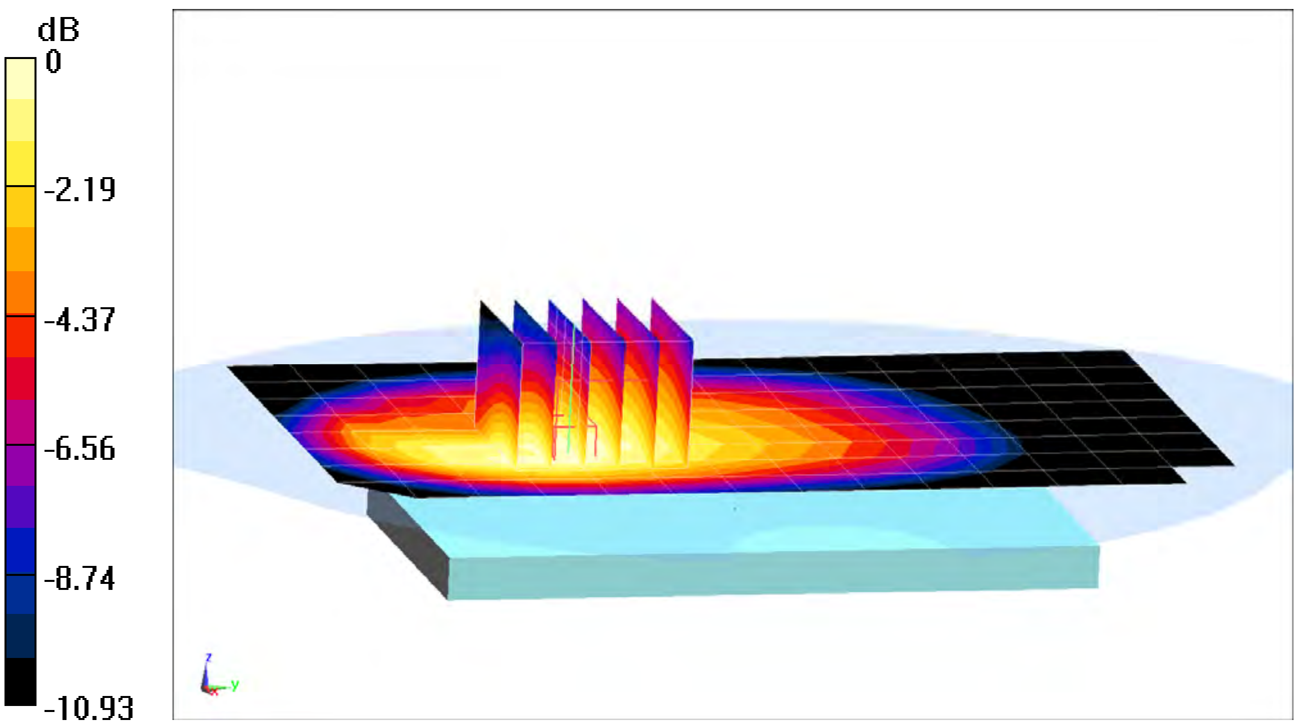
Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 680.5 MHz; σ = 0.911 S/m; ε_r = 57.82; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**Mode: LTE Band 71, Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.97 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.303 W/kg



0 dB = 0.342 W/kg = -4.66 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

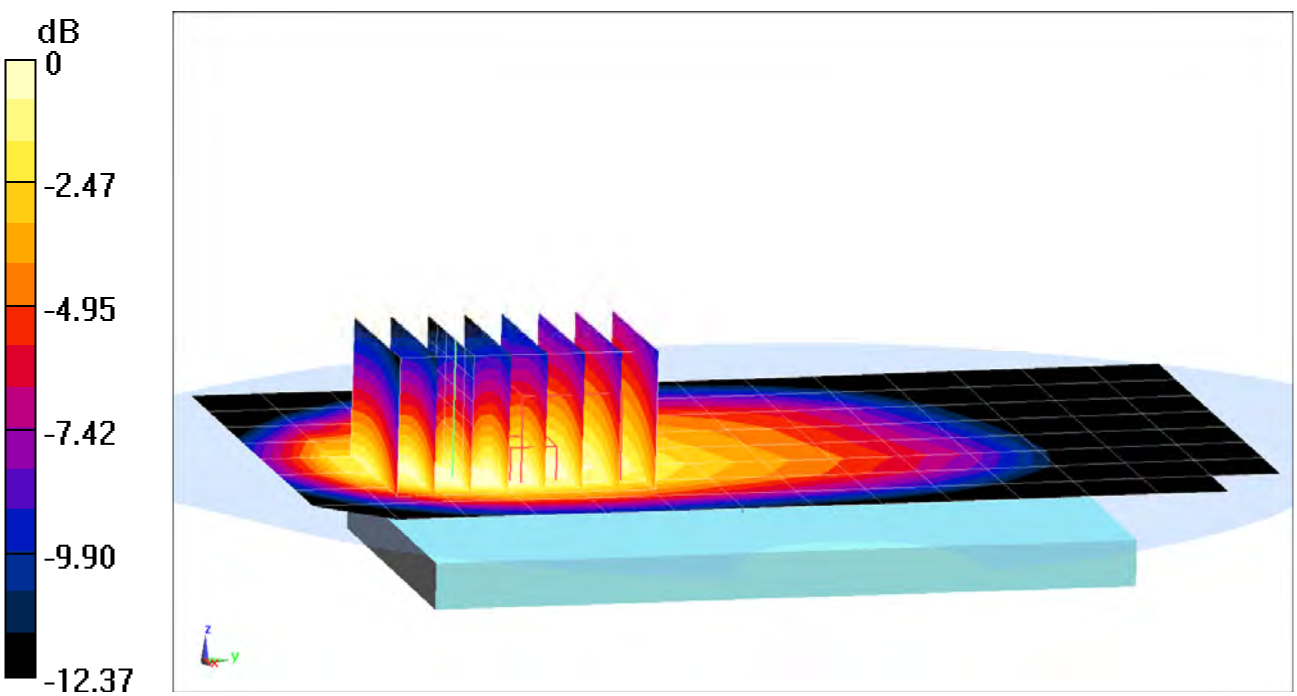
Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
$f = 680.5$ MHz; $\sigma = 0.911$ S/m; $\varepsilon_r = 57.82$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 71, Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.20 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.642 W/kg
SAR(1 g) = 0.413 W/kg



0 dB = 0.478 W/kg = -3.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

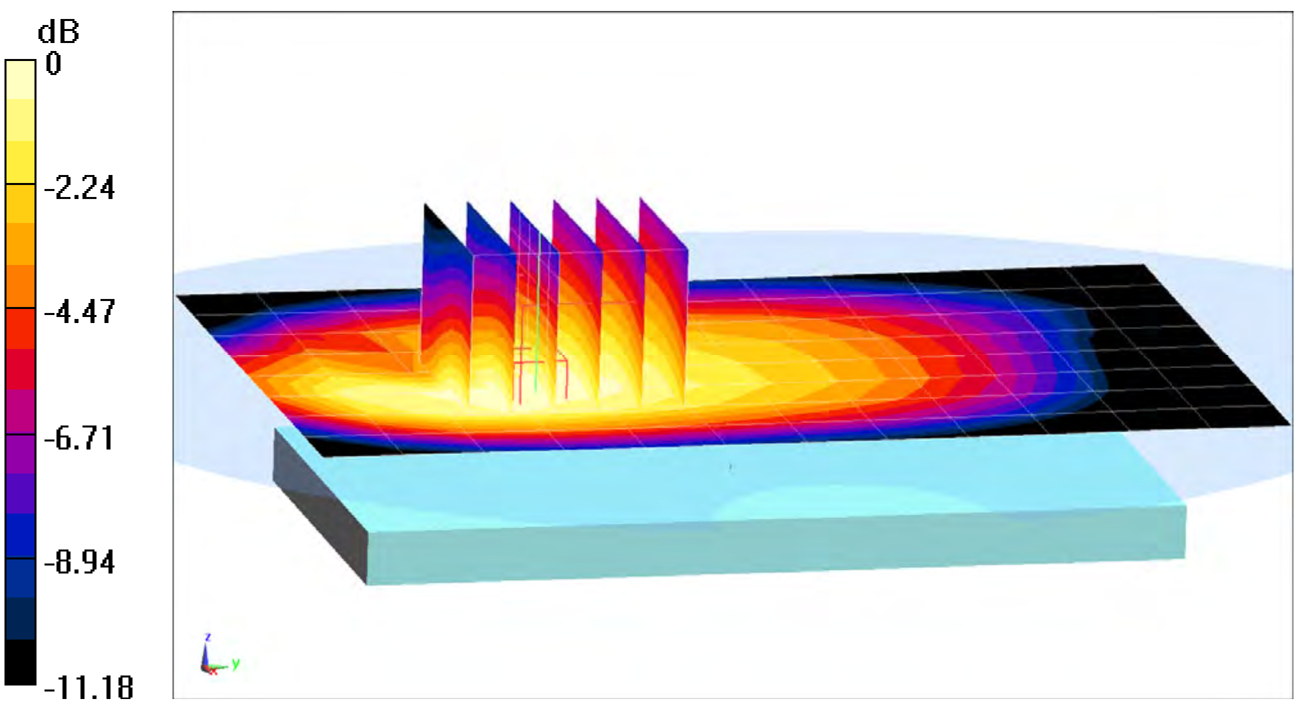
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 S/m; ε_r = 57.575; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 16.81 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.336 W/kg
SAR(1 g) = 0.244 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

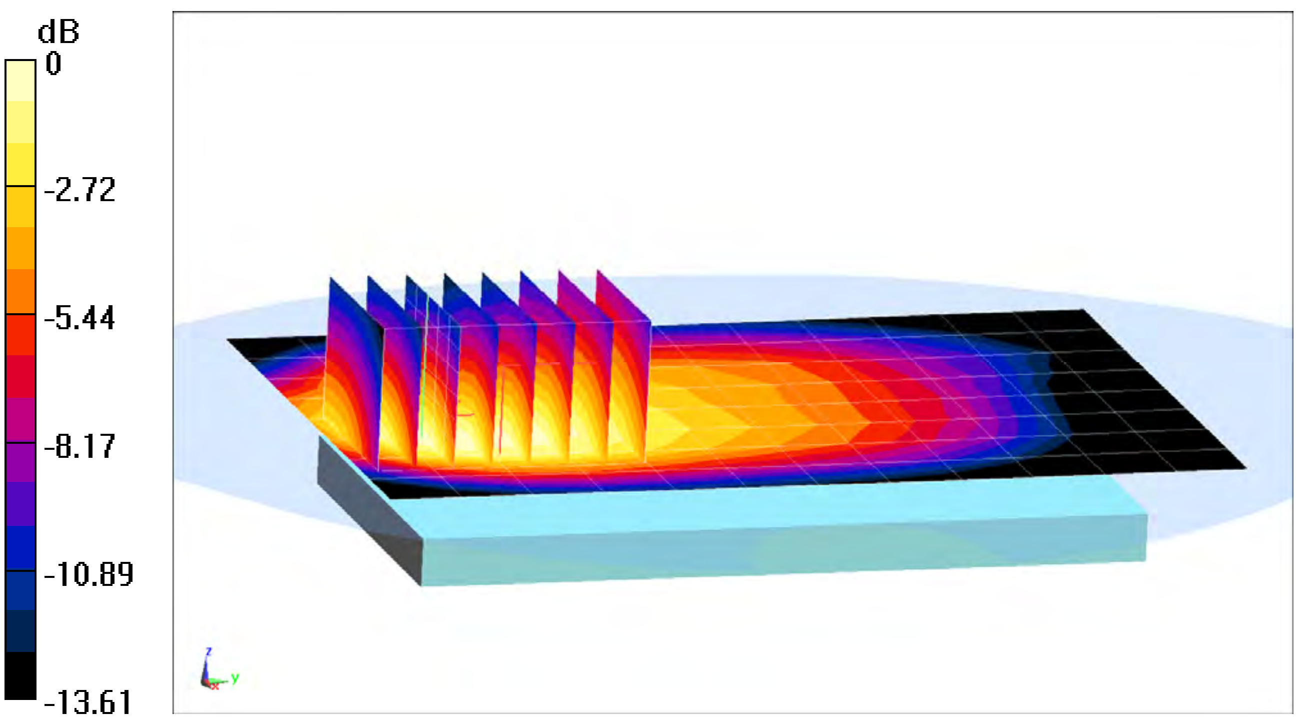
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.935 S/m; ε_r = 57.575; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 (6x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.92 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.594 W/kg
SAR(1 g) = 0.376 W/kg



0 dB = 0.440 W/kg = -3.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

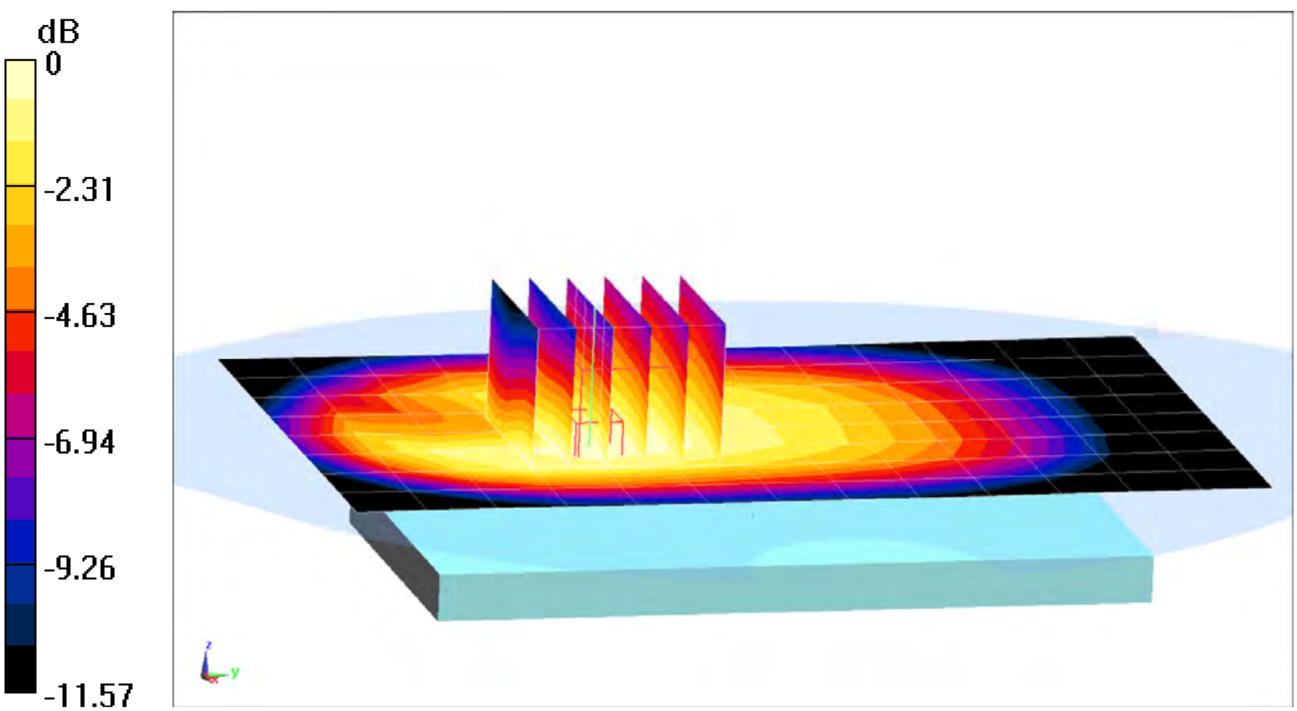
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 1.004 S/m; ε_r = 56.907; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.69 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.391 W/kg
SAR(1 g) = 0.290 W/kg



0 dB = 0.324 W/kg = -4.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

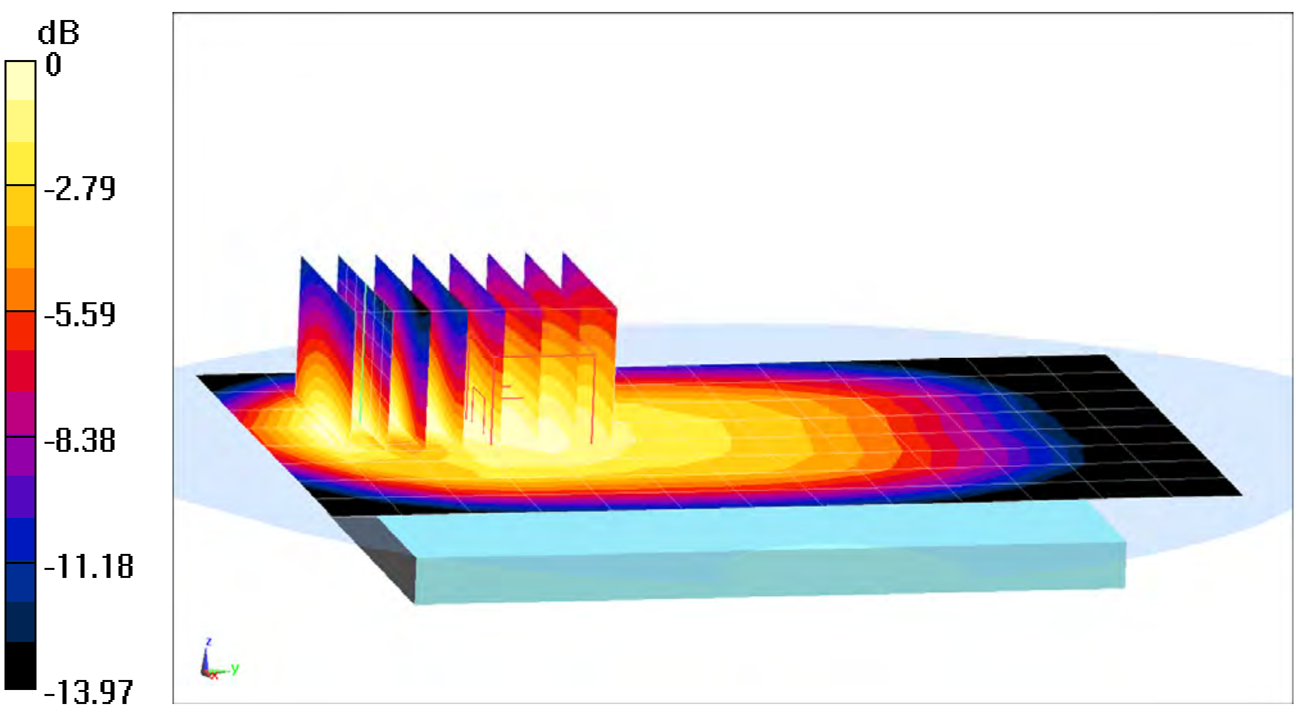
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 1.004 S/m; ε_r = 56.907; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.31 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.646 W/kg
SAR(1 g) = 0.404 W/kg



0 dB = 0.464 W/kg = -3.33 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

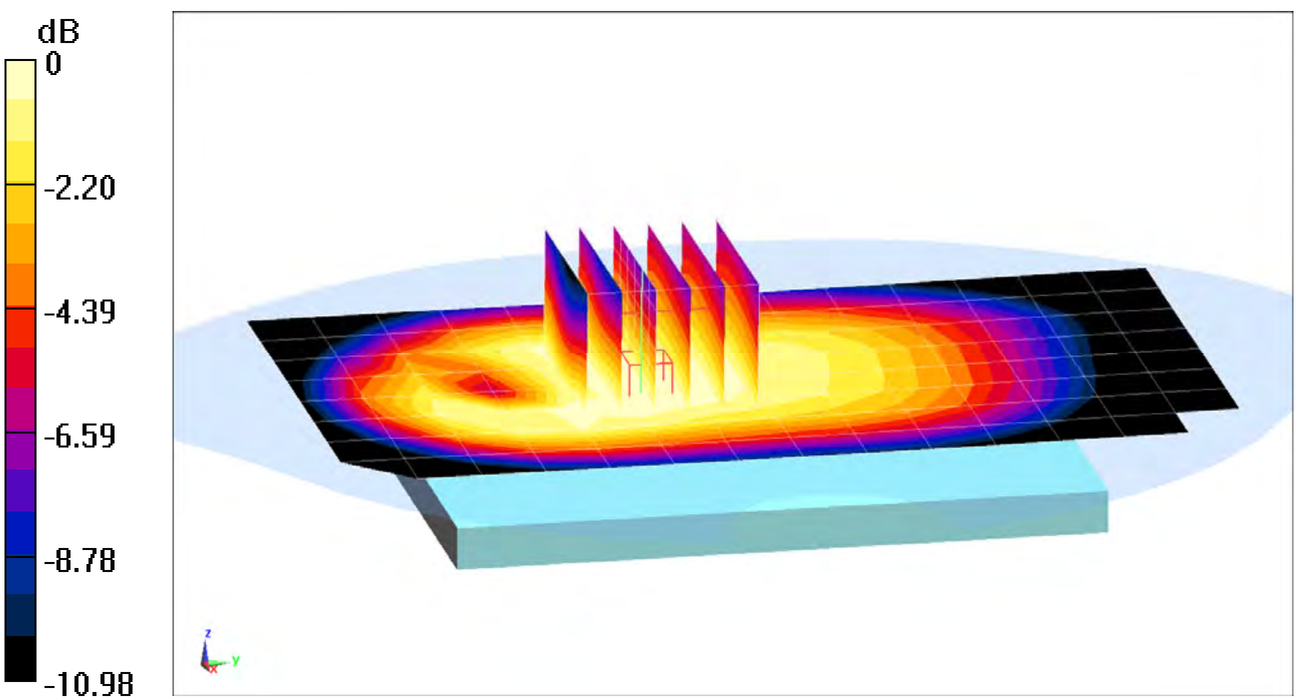
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 831.5$ MHz; $\sigma = 0.96$ S/m; $\varepsilon_r = 53.852$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.60 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.217 W/kg



0 dB = 0.240 W/kg = -6.20 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

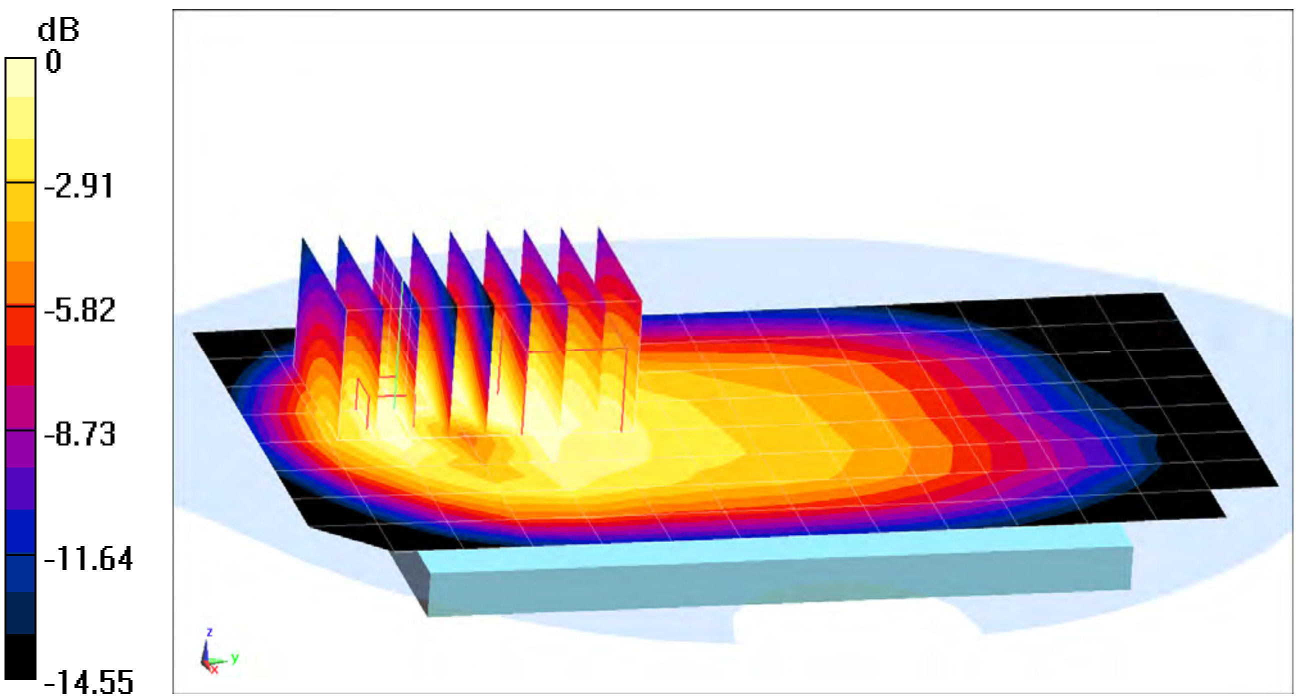
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.96 S/m; ε_r = 53.852; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 26 (Cell.), Body SAR, Front side, Mid.ch,
15 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x9x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.94 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.639 W/kg
SAR(1 g) = 0.382 W/kg



0 dB = 0.454 W/kg = -3.43 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

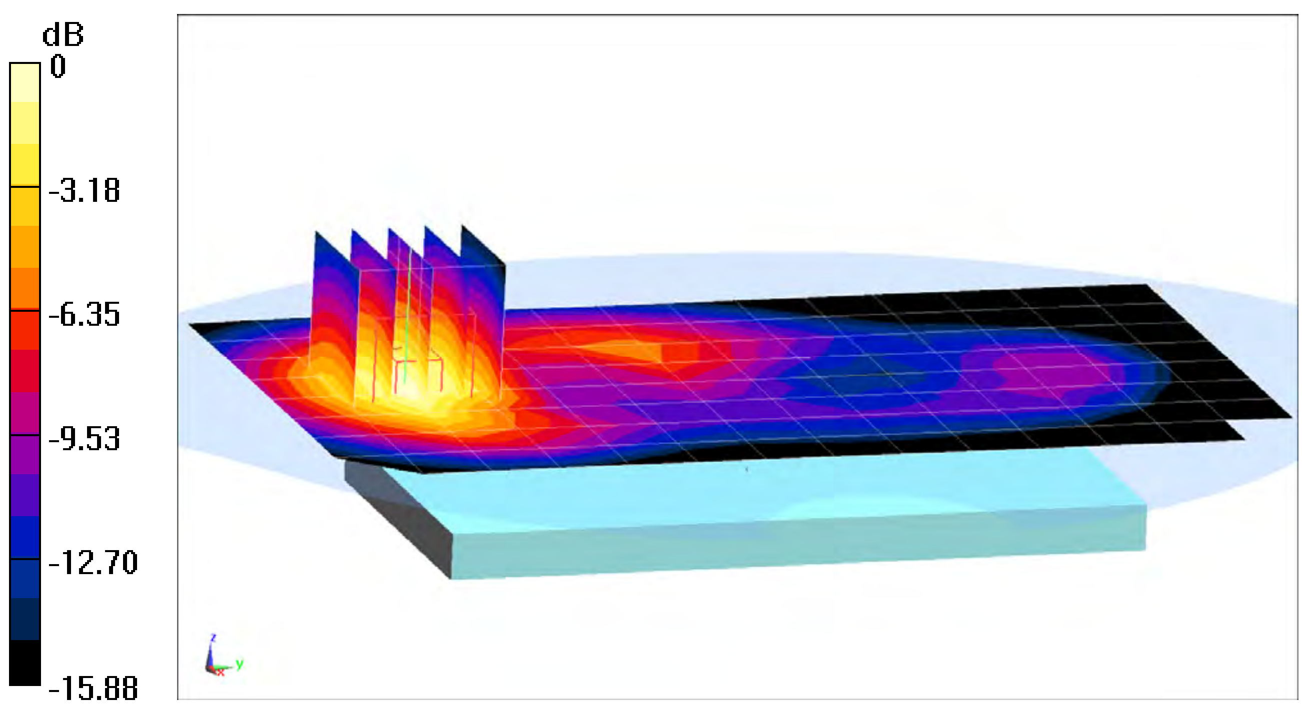
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.476 S/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 20.4°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 66 (AWS), Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.39 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.836 W/kg



0 dB = 0.992 W/kg = -0.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

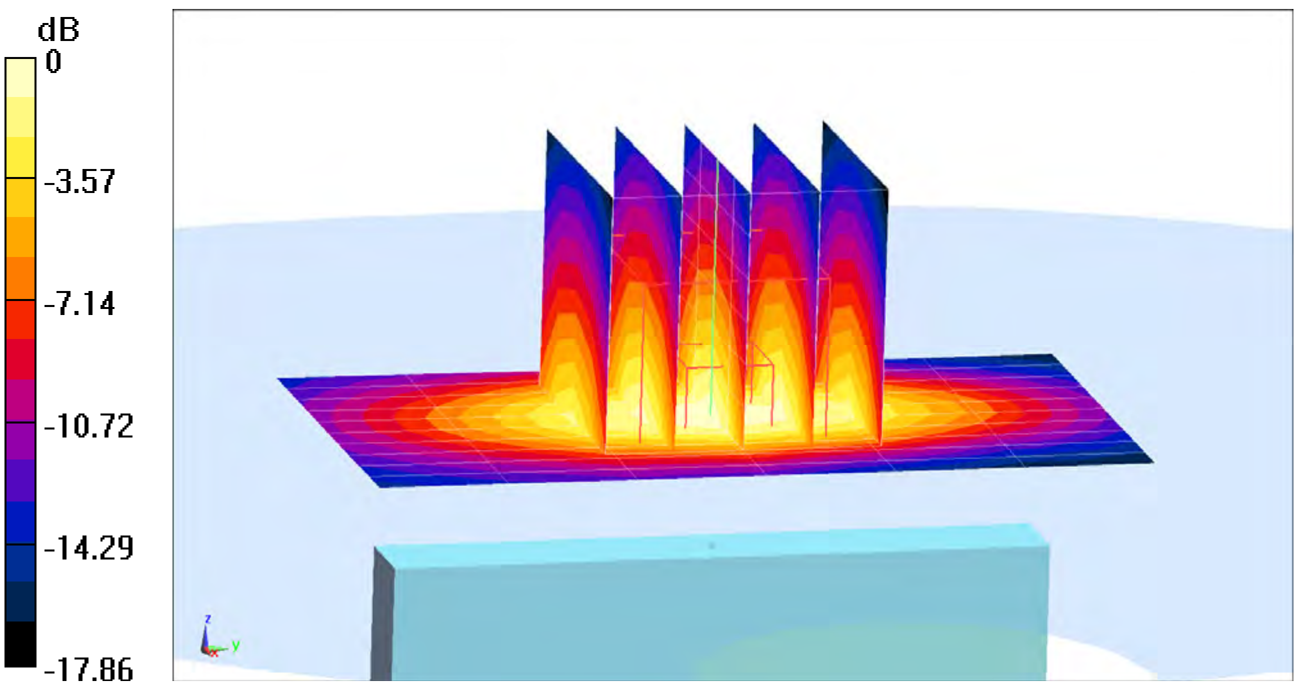
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1770 MHz; σ = 1.535 S/m; ε_r = 51.859; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 24.36 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.784 W/kg



0 dB = 0.969 W/kg = -0.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20514

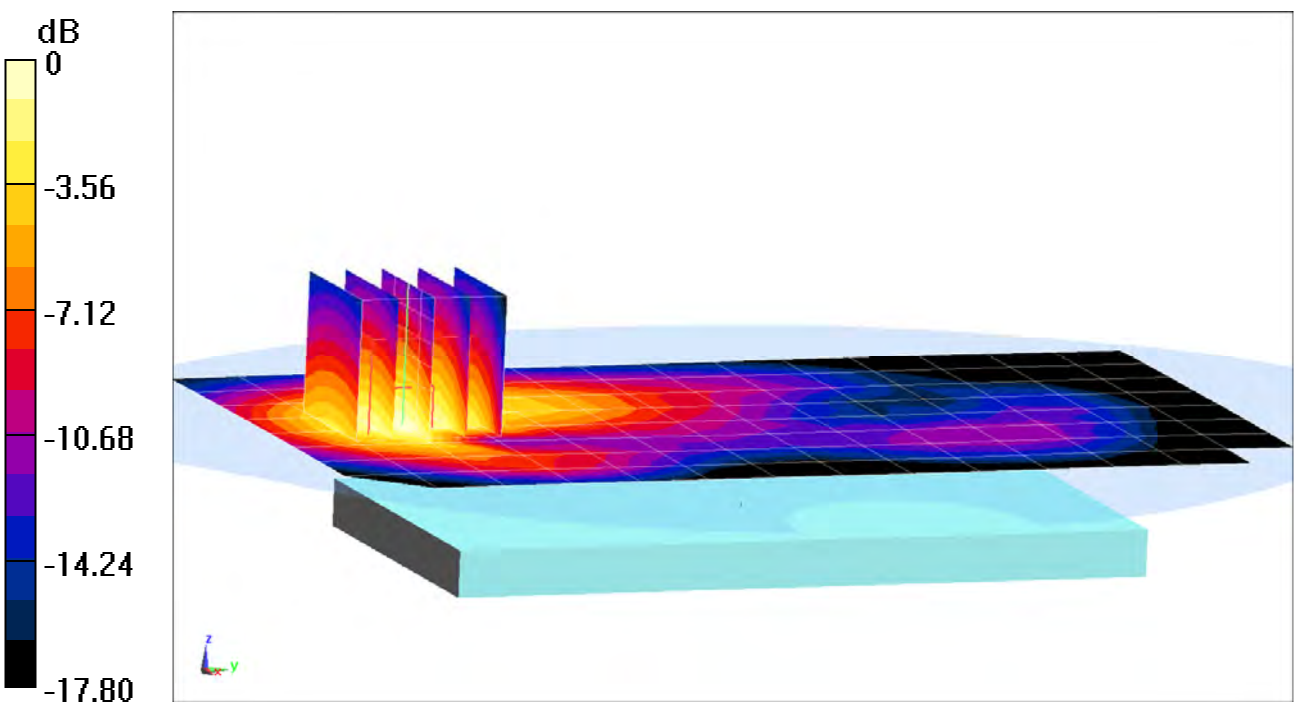
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.577 S/m; ε_r = 52.286; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 18.11 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.787 W/kg
SAR(1 g) = 0.475 W/kg



0 dB = 0.677 W/kg = -1.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

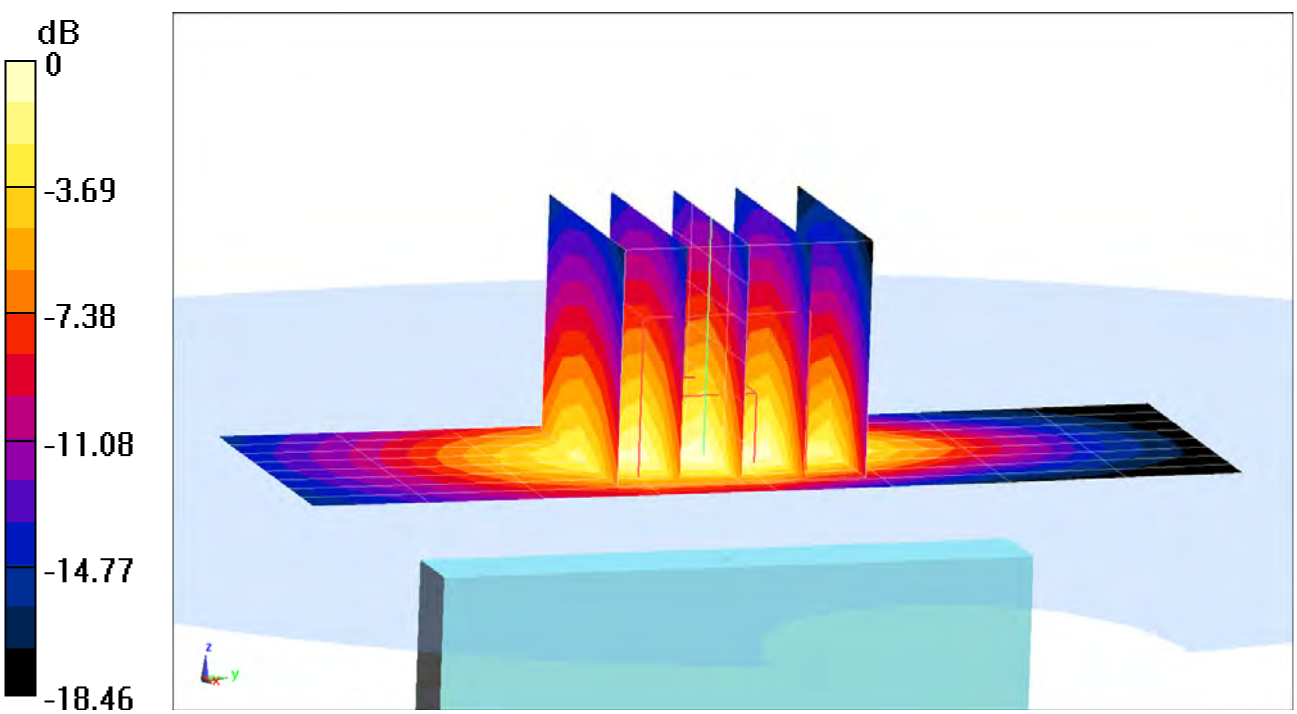
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.55 S/m; ε_r = 52.352; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 25 (PCS), Body SAR, Bottom Edge, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.60 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.592 W/kg



0 dB = 0.882 W/kg = -0.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

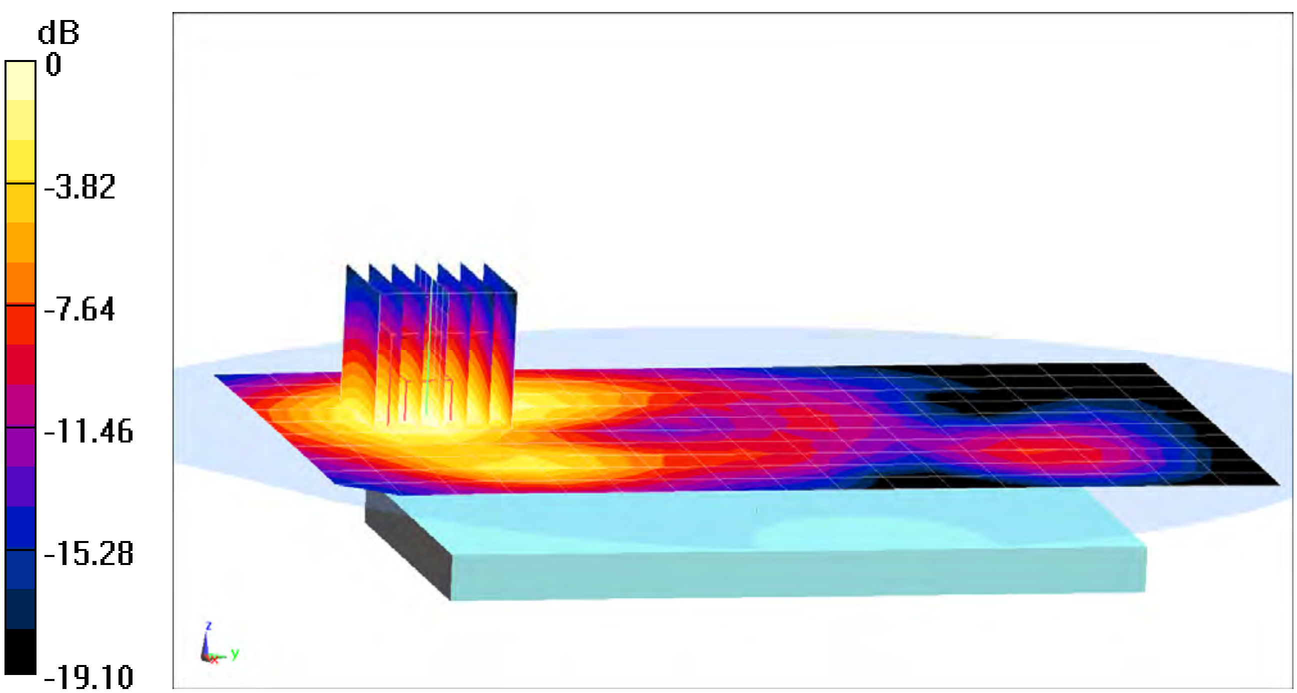
Communication System: UID 0, LTE Band 7; Frequency: 2510 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2510 MHz; σ = 2.107 S/m; ε_r = 51.811; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-20-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Body SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.95 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.633 W/kg
SAR(1 g) = 0.333 W/kg



0 dB = 0.513 W/kg = -2.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

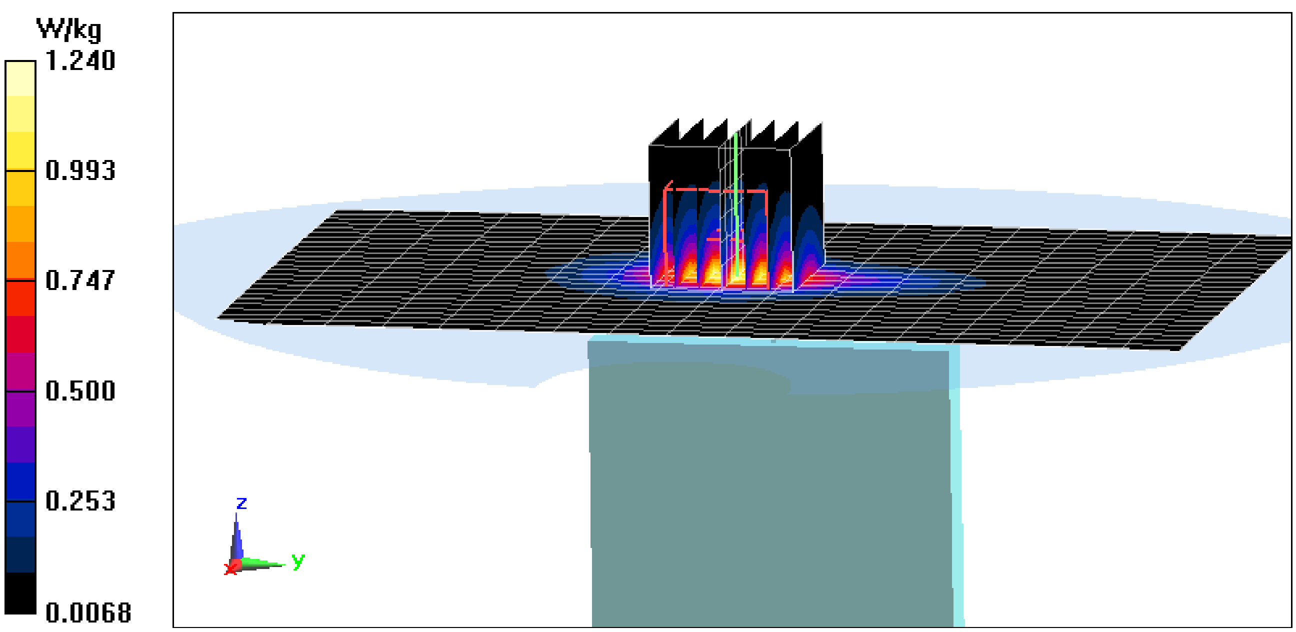
Communication System: UID 0, LTE Band 7; Frequency: 2560 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used (interpolated):
f = 2560 MHz; σ = 2.191 S/m; ε_r = 51.386; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Body SAR, Bottom Edge, High.ch,
20 MHz Bandwidth, QPSK, 50 RB, 25 RB Offset

Area Scan (25x18x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.51 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.758 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

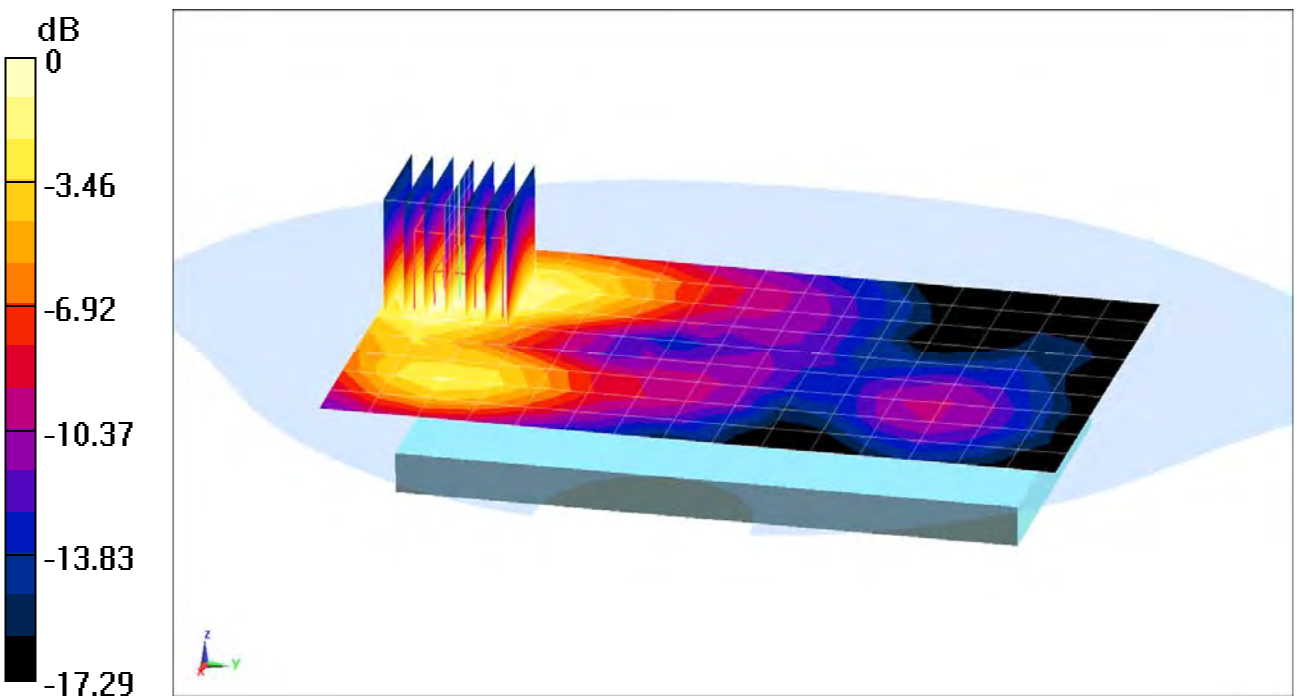
Communication System: UID 0, _LTE Band 38; Frequency: 2595 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2595 MHz; σ = 2.224 S/m; ε_r = 51.293; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-23-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 38, Body SAR, Back side, Mid.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.043 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.331 W/kg
SAR(1 g) = 0.173 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20951

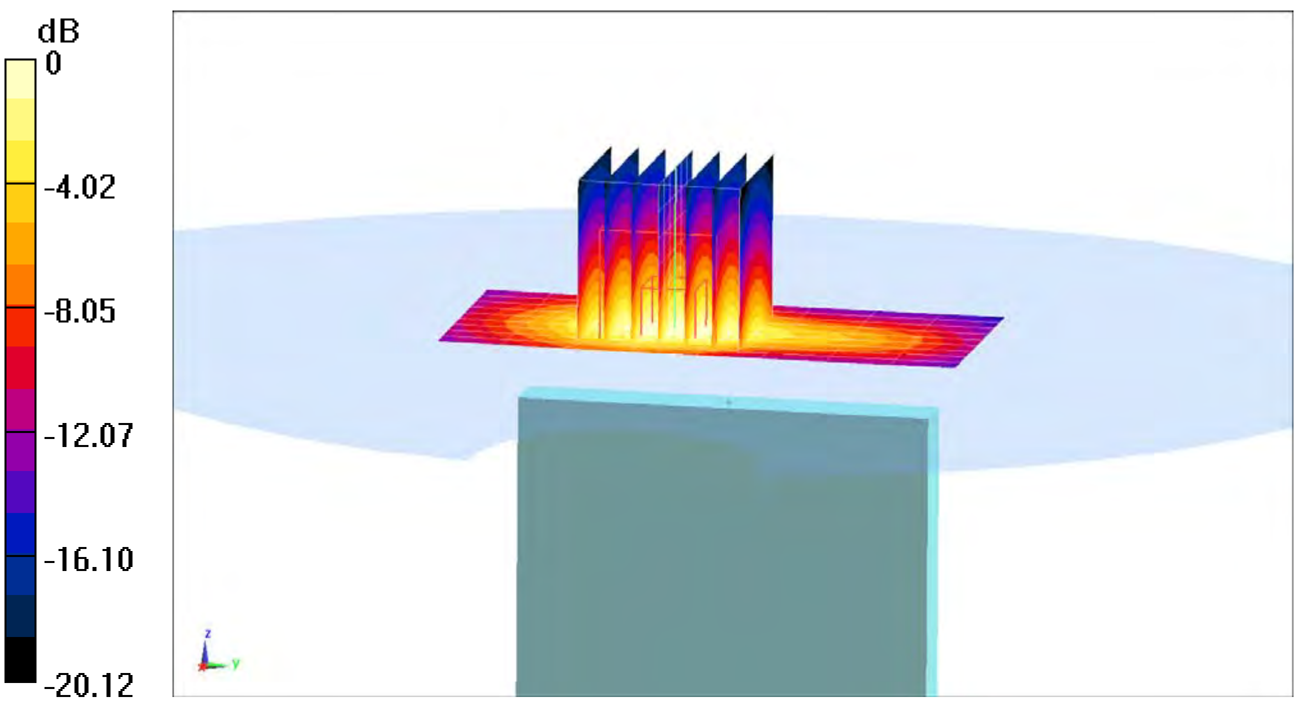
Communication System: UID 0, _LTE Band 38; Frequency: 2595 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2595 MHz; σ = 2.224 S/m; ε_r = 51.293; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-23-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 38, Body SAR, Bottom Edge, 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 = 17.27 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.602 W/kg



0 dB = 0.979 W/kg = -0.09 dBW/kg

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20514

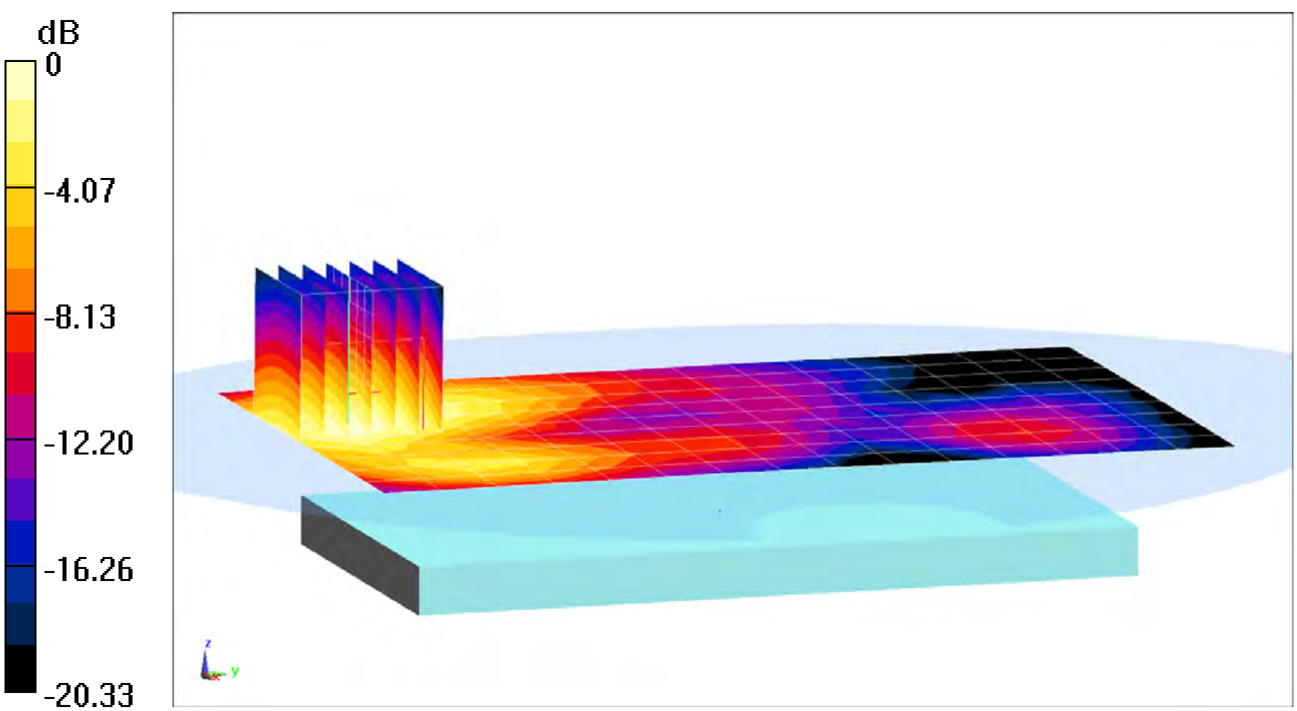
Communication System: UID 0, LTE Band 41 (Class 2);
Frequency: 2506 MHz; Duty Cycle: 1:2.31
Medium: 2450 Body Medium parameters used (interpolated):
f = 2506 MHz; σ = 2.098 S/m; ε_r = 50.946; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 9-12-2017; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.42, 4.42, 4.42); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, 1CC Uplink, Power Class 2, Body SAR, Back side, Low.ch, 20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.98 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.353 W/kg



0 dB = 0.435 W/kg = -3.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19219

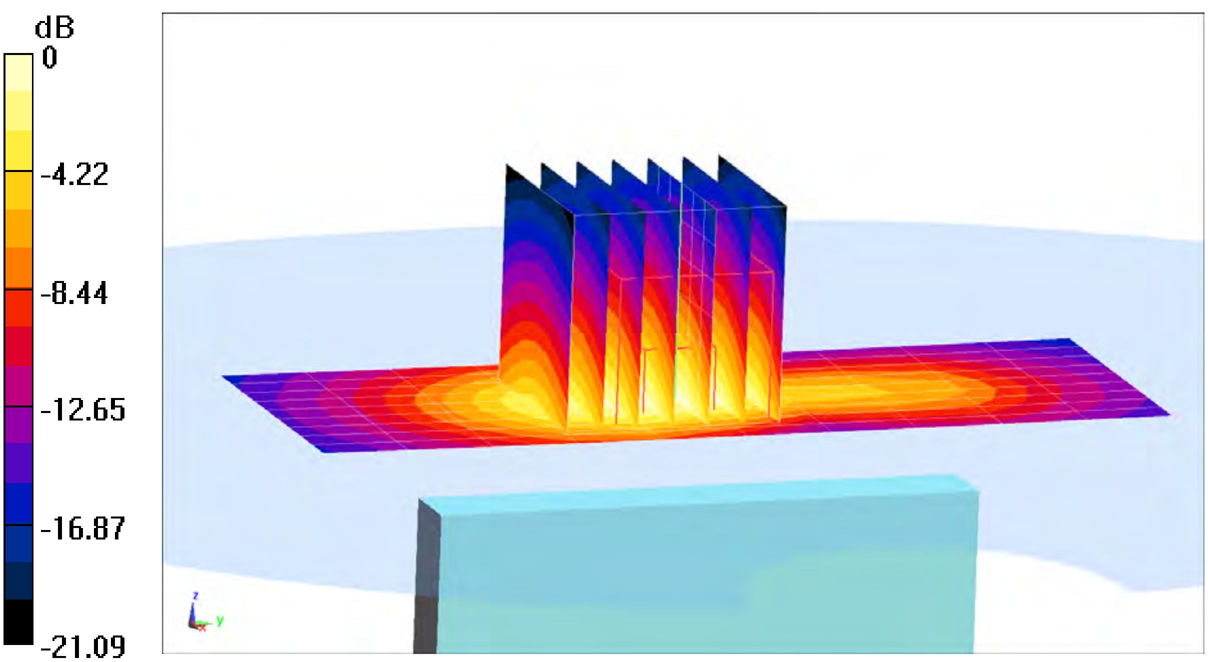
Communication System: UID 0, LTE Band 41 (Class 3);
Frequency: 2549.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used:
f = 2550 MHz; σ = 2.161 S/m; ε_r = 51.483; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-23-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, 2CC Uplink, Body SAR, Bottom Edge, Low-Mid.ch, 20 MHz Bandwidth
PCC: QPSK, Ch 40185, 50 RB, 0 RB Offset
SCC: QPSK, Ch 39987, 50 RB, 50 RB Offset

Area Scan (10x11x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.60 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 0.936 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20456

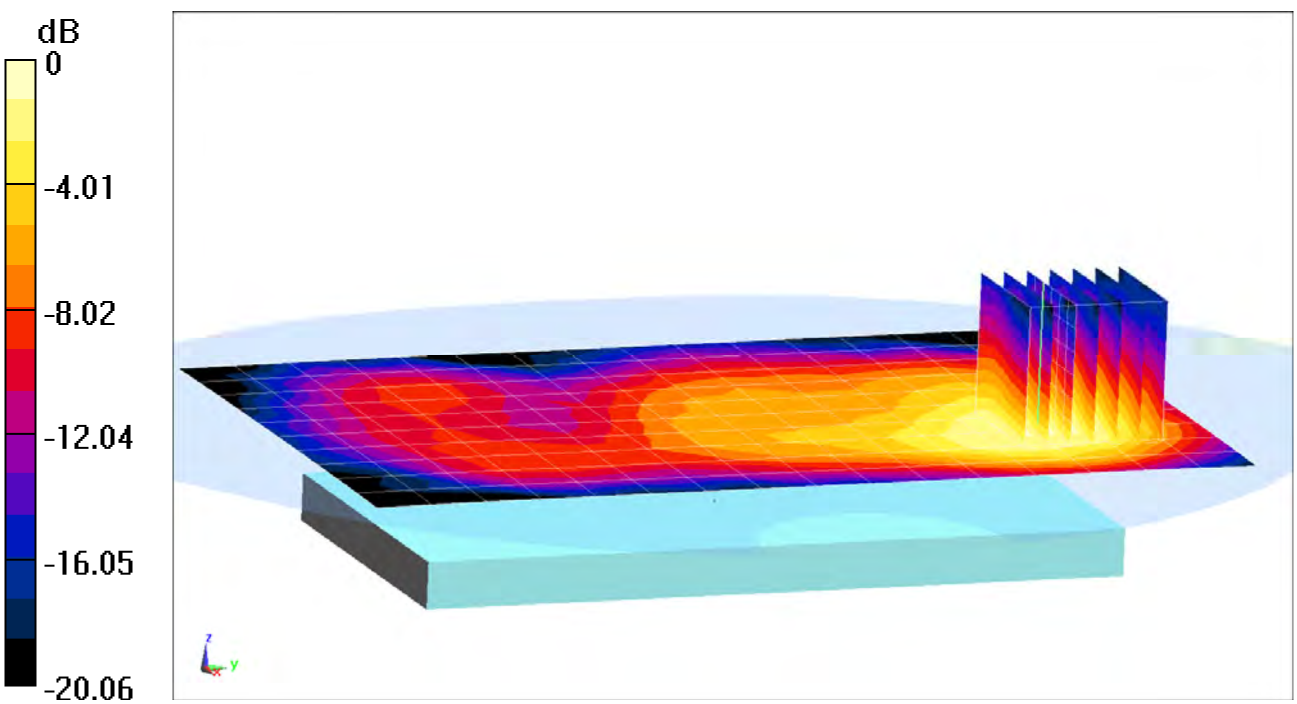
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.02 S/m; ε_r = 51.859; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, Antenna 2,
22 MHz Bandwidth, Body SAR, Ch 6, 1 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.233 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.245 W/kg
SAR(1 g) = 0.130 W/kg



0 dB = 0.199 W/kg = -7.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20456

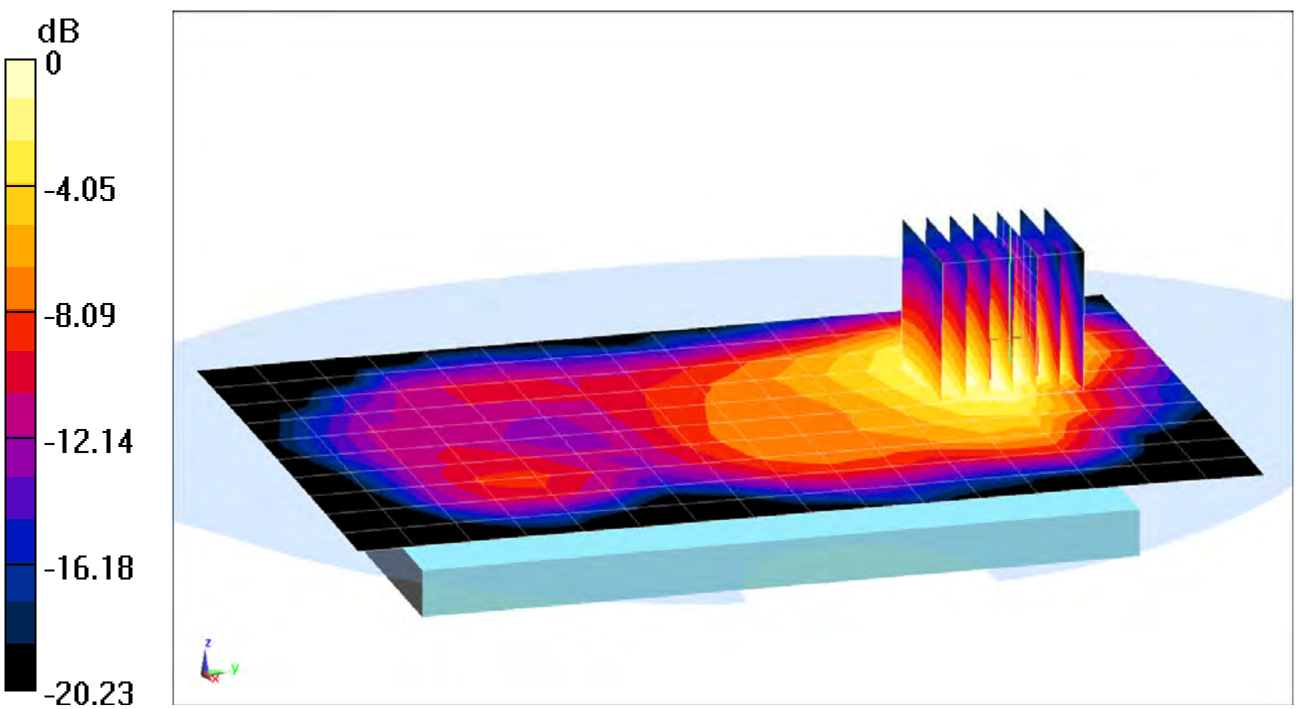
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.02 S/m; ε_r = 51.859; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, Antenna 2,
22 MHz Bandwidth, Body SAR, Ch 6, 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 = 5.596 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.605 W/kg
SAR(1 g) = 0.316 W/kg



0 dB = 0.481 W/kg = -3.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

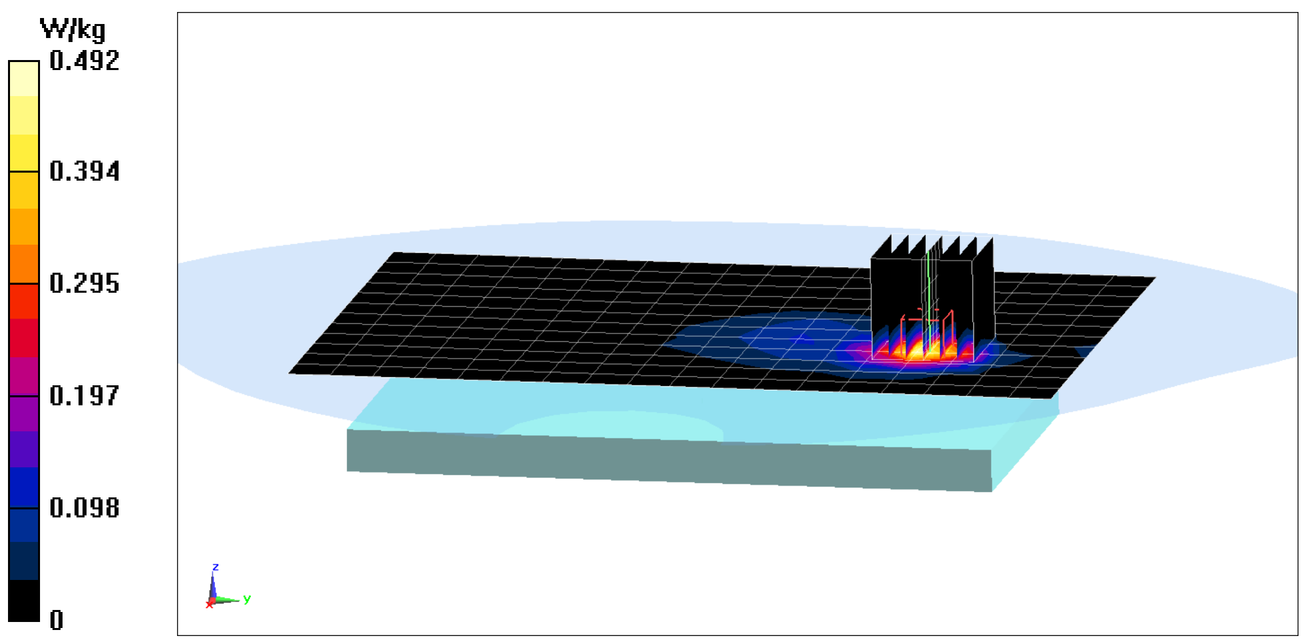
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band;
Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; σ = 6.207 S/m; ε_r = 46.762; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.83, 3.83, 3.83); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11a, UNII-3, Antenna 1,
20 MHz Bandwidth, Body SAR, Ch 157, 6 Mbps, Back Side

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 = 5.599 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.191 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

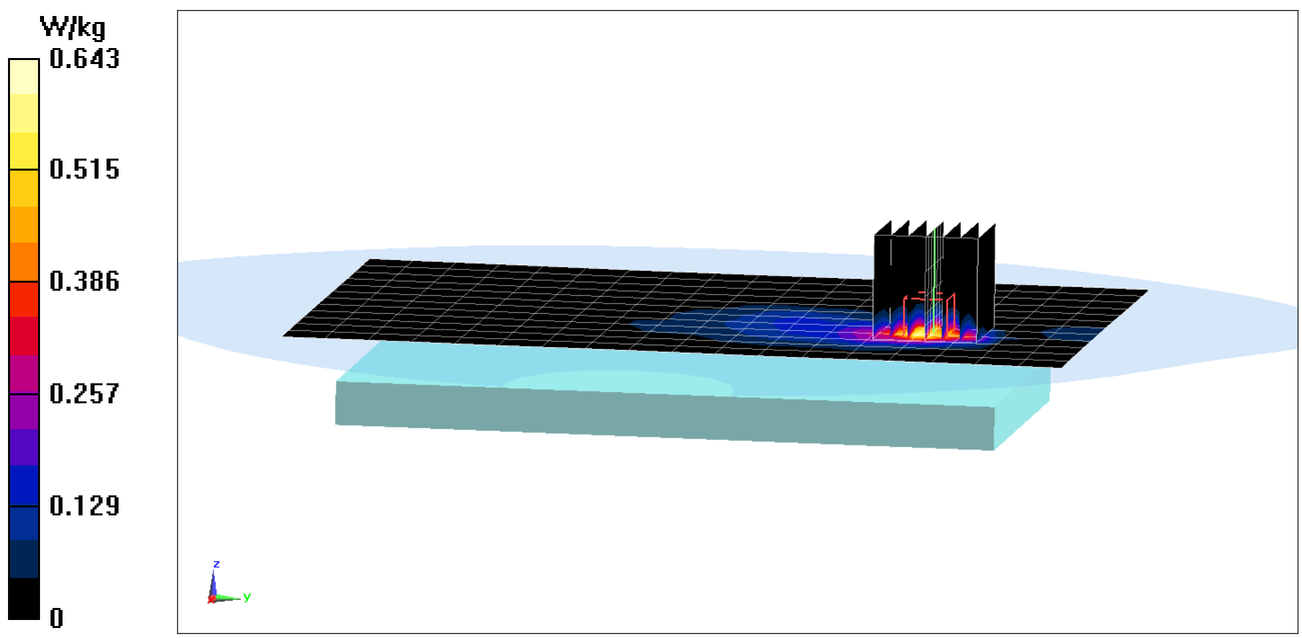
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band;
Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5785 MHz; σ = 6.207 S/m; ε_r = 46.762; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.83, 3.83, 3.83); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11a, UNII-3, Antenna 1,
20 MHz Bandwidth, Body SAR, Ch 157, 6 Mbps, Back Side

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 = 6.577 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.245 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20456

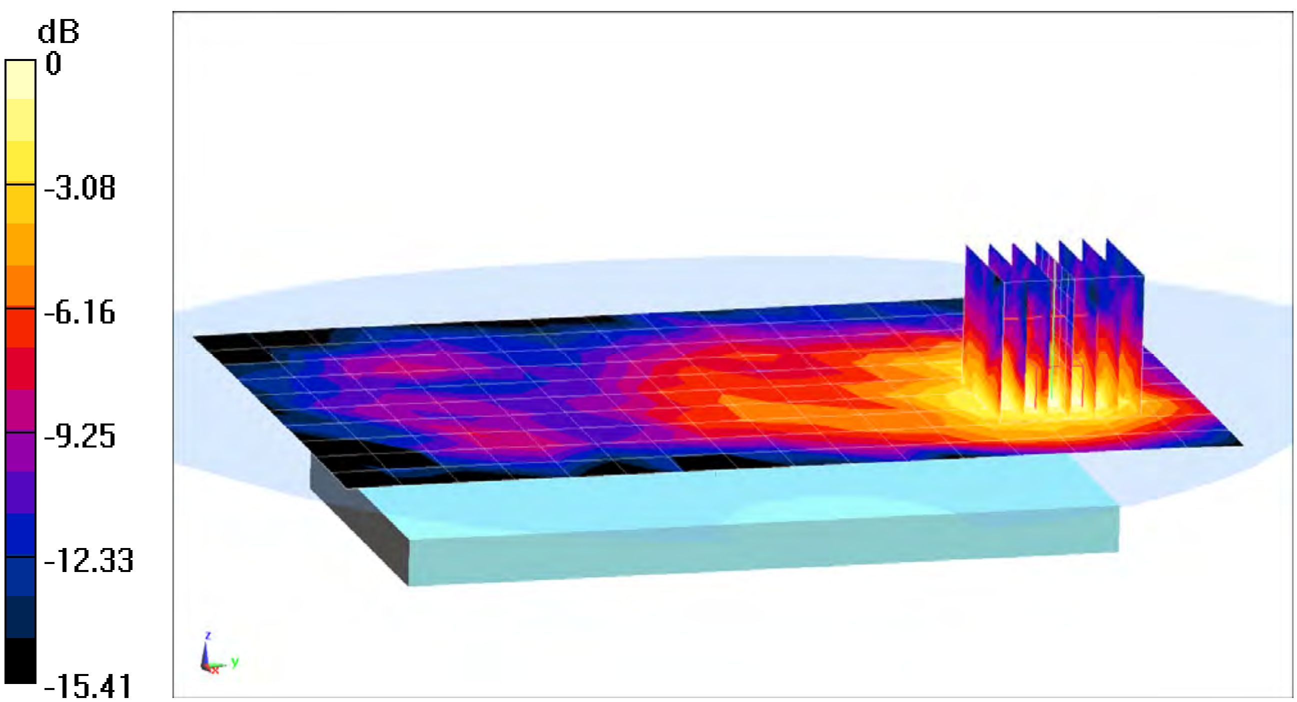
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Body Medium parameters used (interpolated):
$f = 2441$ MHz; $\sigma = 2.025$ S/m; $\varepsilon_r = 51.845$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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 = 3.428 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0480 W/kg
SAR(1 g) = 0.023 W/kg



0 dB = 0.0376 W/kg = -14.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20456

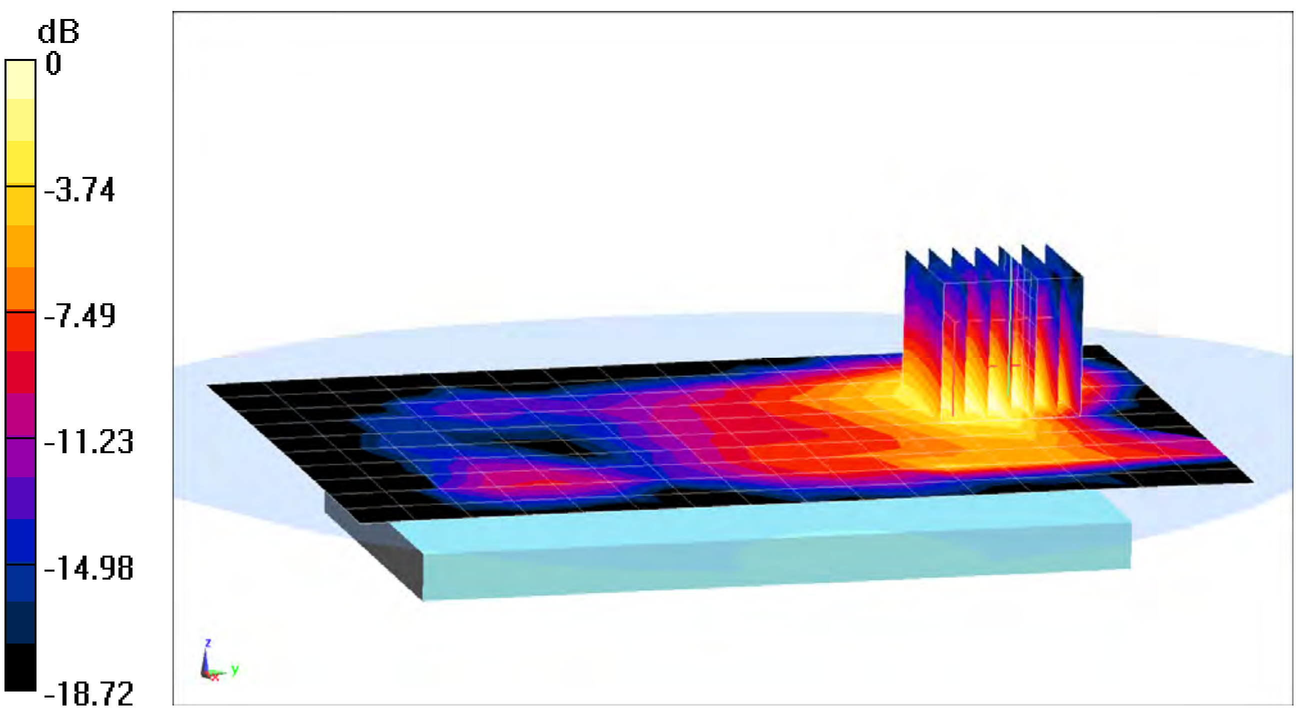
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.297
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.025 S/m; ε_r = 51.845; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Bluetooth, Body 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 = 7.121 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.181 W/kg
SAR(1 g) = 0.095 W/kg



0 dB = 0.142 W/kg = -8.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

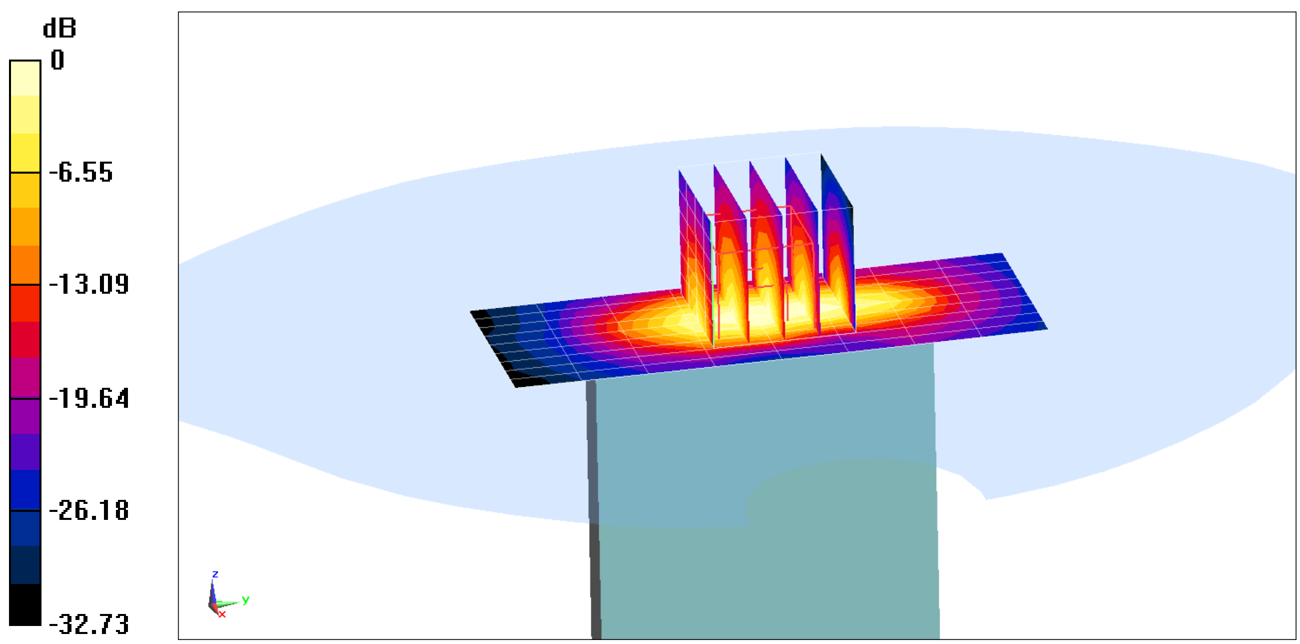
Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.513 S/m; ε_r = 52.446; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: PCS EVDO, 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 = 61.46 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 9.74 W/kg
SAR(10 g) = 2.23 W/kg



0 dB = 8.17 W/kg = 9.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20209

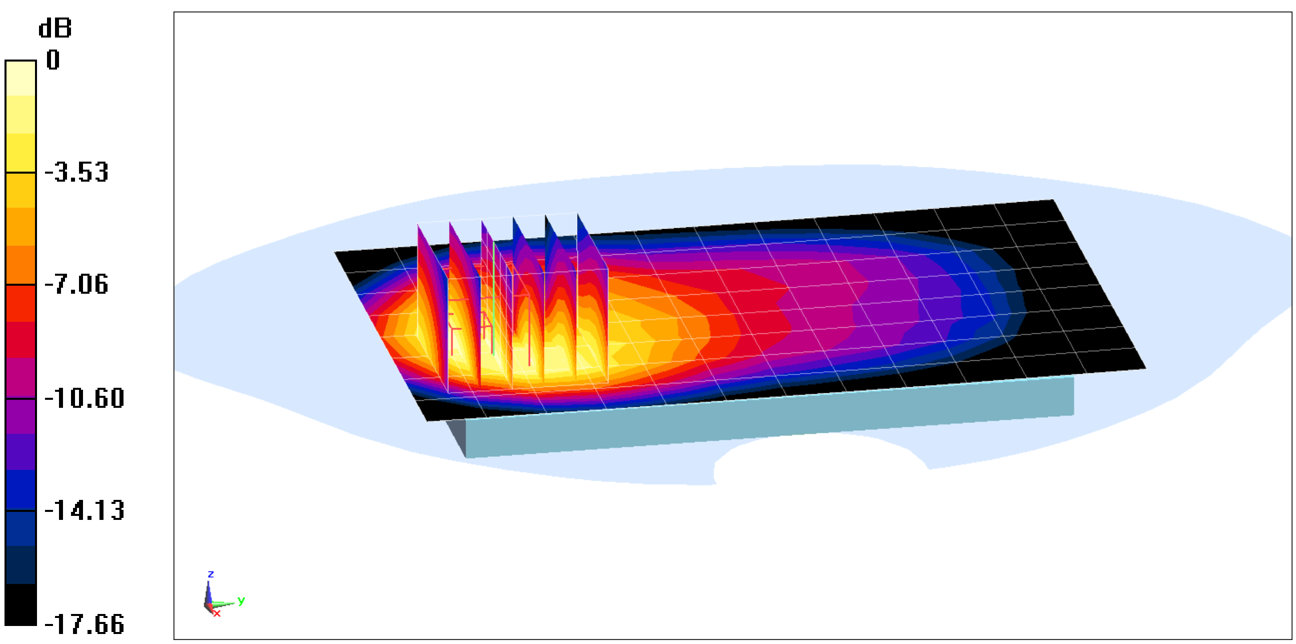
Communication System: UID 0, _GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.967 S/m; ε_r = 52.927; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.4 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.45 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.08 W/kg
SAR(10 g) = 0.650 W/kg



0 dB = 1.37 W/kg = 1.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19219

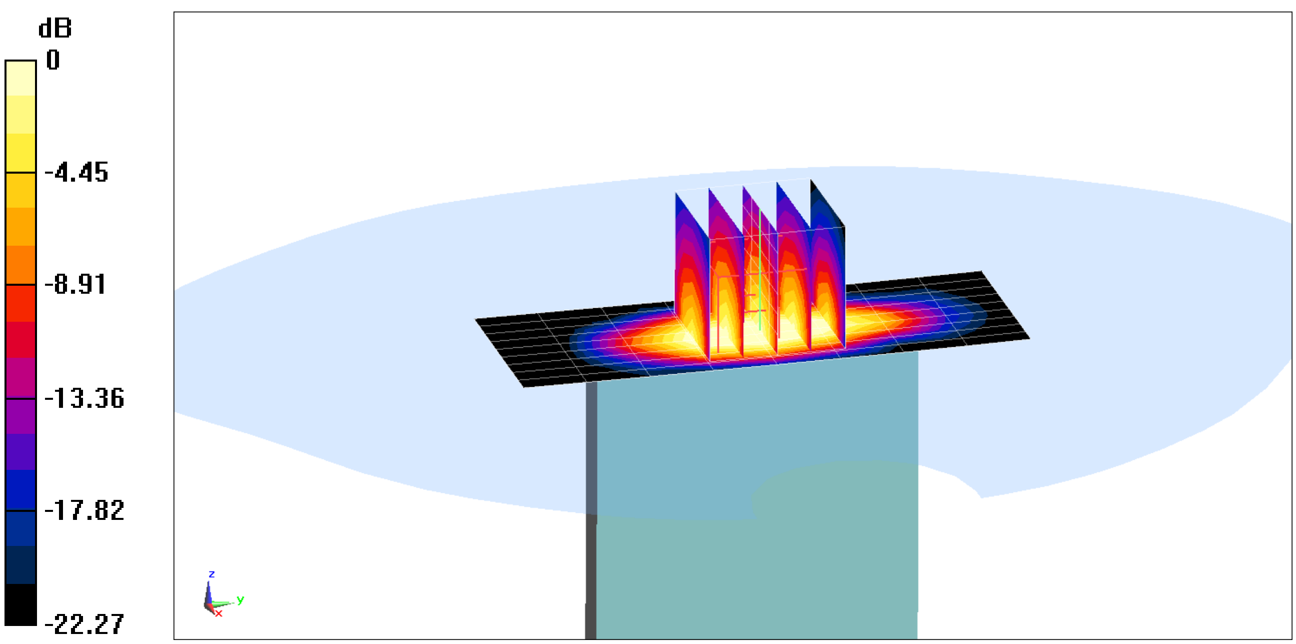
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.52 S/m; ε_r = 51.895; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-07-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3213; ConvF(5.09, 5.09, 5.09); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Phablet SAR, Bottom Edge, High.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 = 63.64 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 9.95 W/kg
SAR(10 g) = 2.34 W/kg



0 dB = 6.80 W/kg = 8.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19219

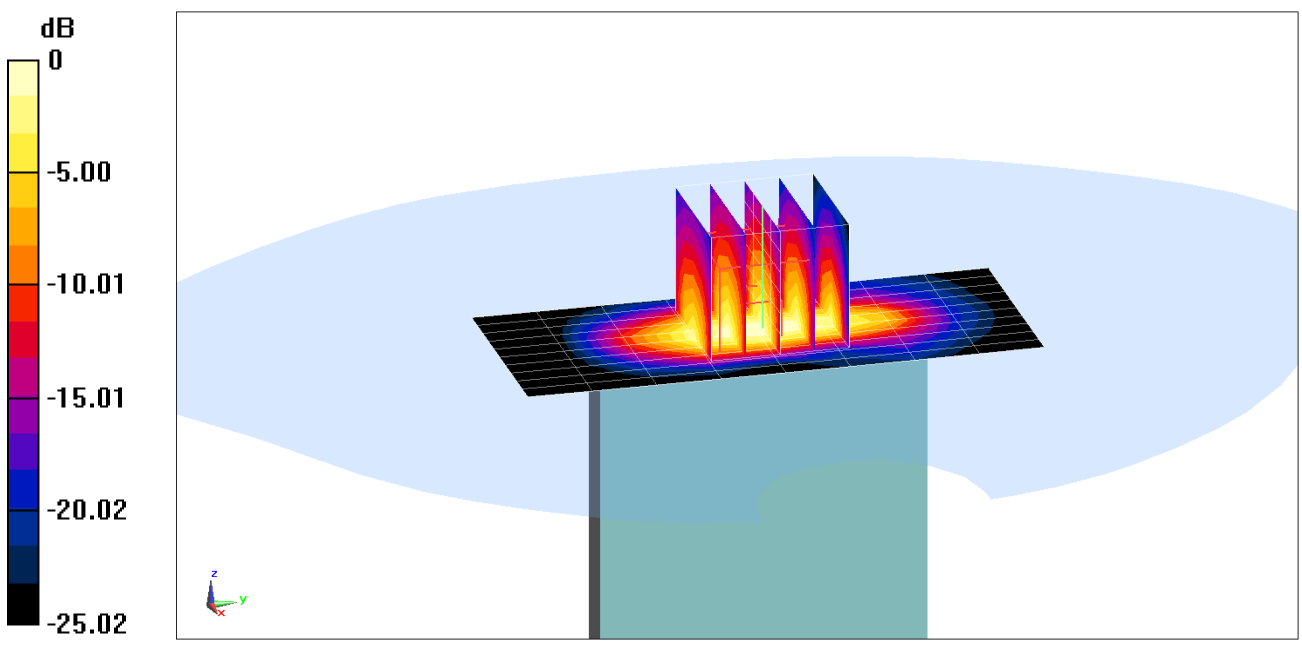
Communication System: UID 0, UMTS; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.58 S/m; ε_r = 52.278; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 61.94 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 10.6 W/kg
SAR(10 g) = 2.31 W/kg



0 dB = 8.82 W/kg = 9.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

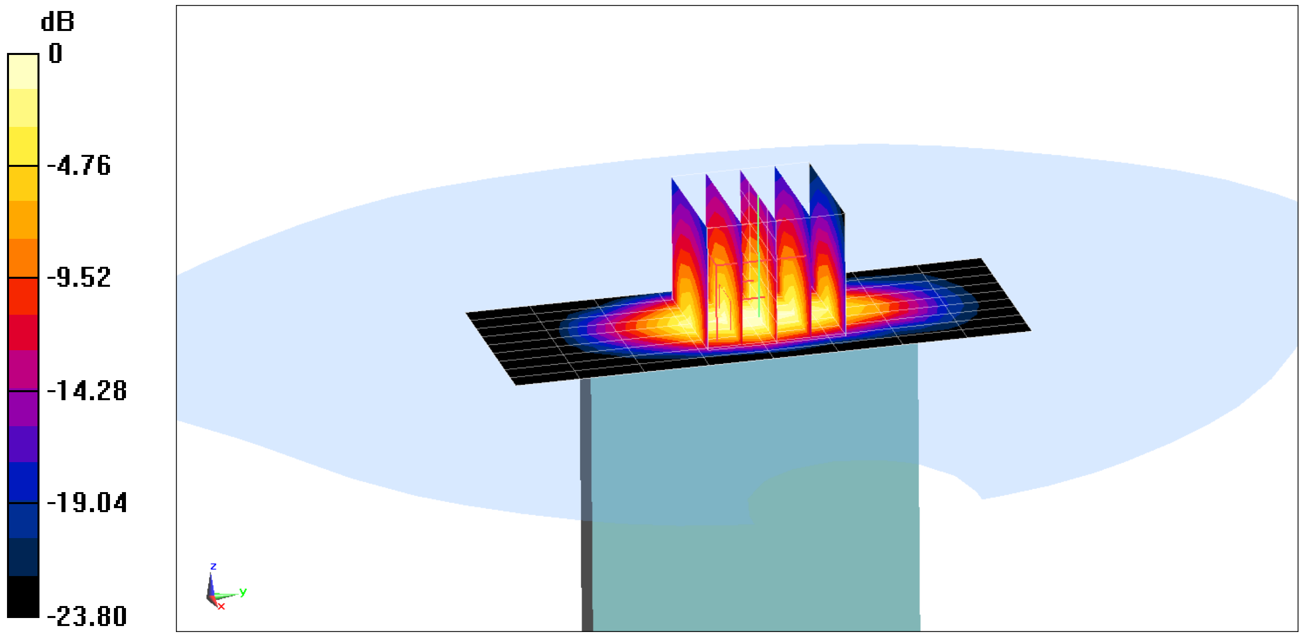
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1770 MHz; σ = 1.535 S/m; ε_r = 51.859; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**Mode: LTE Band 66 (AWS), Phablet SAR, Bottom Edge, High.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 = 64.45 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 10.4 W/kg
SAR(10 g) = 2.38 W/kg



0 dB = 6.99 W/kg = 8.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

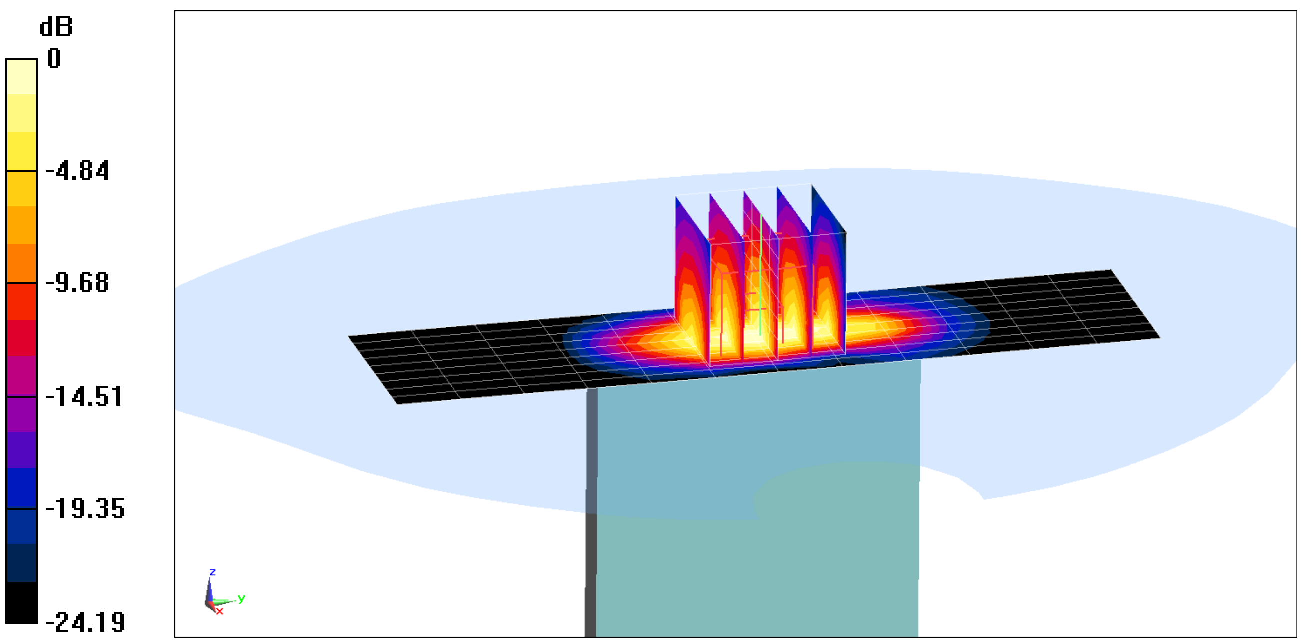
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.55 S/m; ε_r = 52.352; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**Mode: LTE Band 25 (PCS), Phablet SAR, Bottom Edge, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset**

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.95 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 10.7 W/kg
SAR(10 g) = 2.48 W/kg



0 dB = 9.08 W/kg = 9.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19649

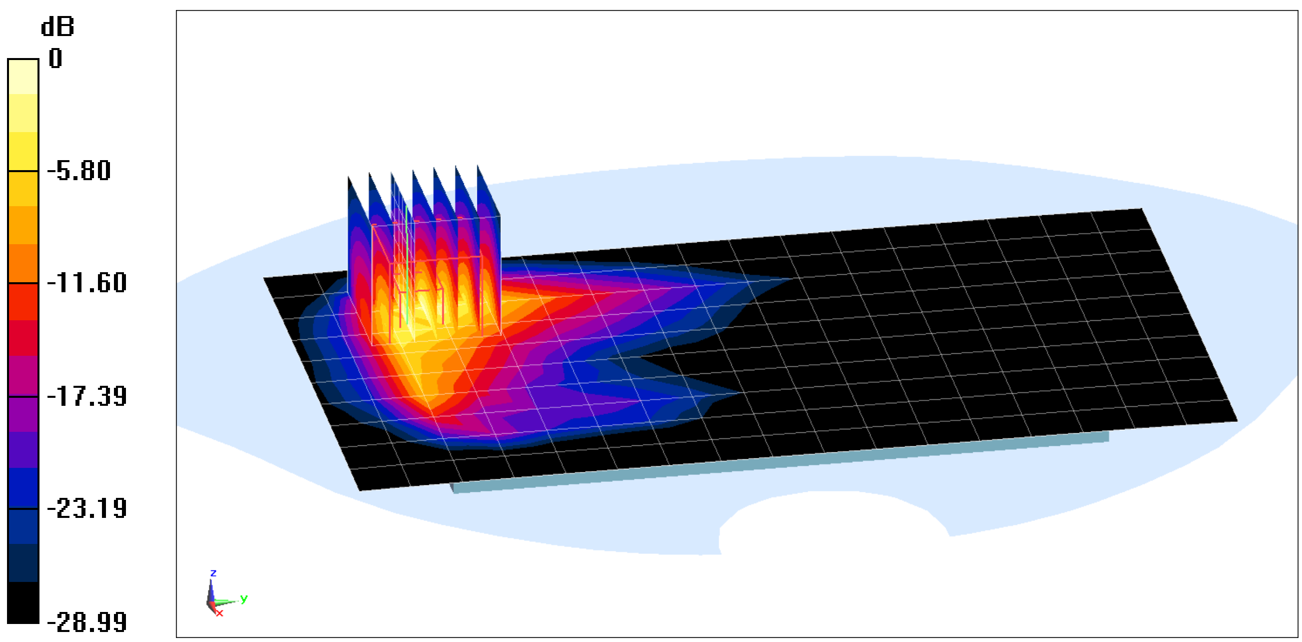
Communication System: UID 0, LTE Band 7; Frequency: 2535 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used (interpolated):
f = 2535 MHz; σ = 2.156 S/m; ε_r = 51.482; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

**Mode: LTE Band 7, Phablet SAR, Front side, Mid.ch,
20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset**

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.60 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 19.2 W/kg
SAR(10 g) = 1.99 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 19219

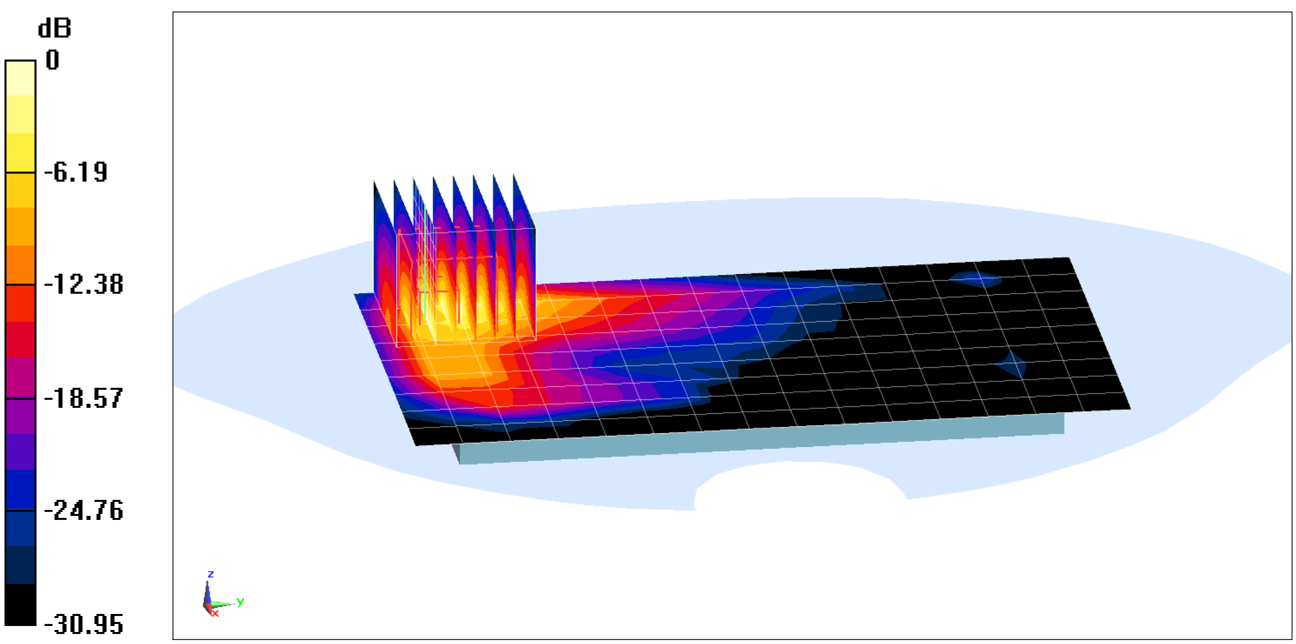
Communication System: UID 0, LTE Band 41; Frequency: 2636.5 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 2.28 S/m; ε_r = 51.135; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-23-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, 2CC Uplink, Phablet SAR, Front side, Mid-High.ch, 20 MHz Bandwidth
PCC: QPSK, Ch 41055, 50 RB, 0 RB Offset
SCC: QPSK, Ch 40857, 50 RB, 50 RB Offset

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 40.87 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 17.6 W/kg
SAR(10 g) = 1.87 W/kg



0 dB = 11.4 W/kg = 10.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG892U; Type: Portable Handset; Serial: 20084

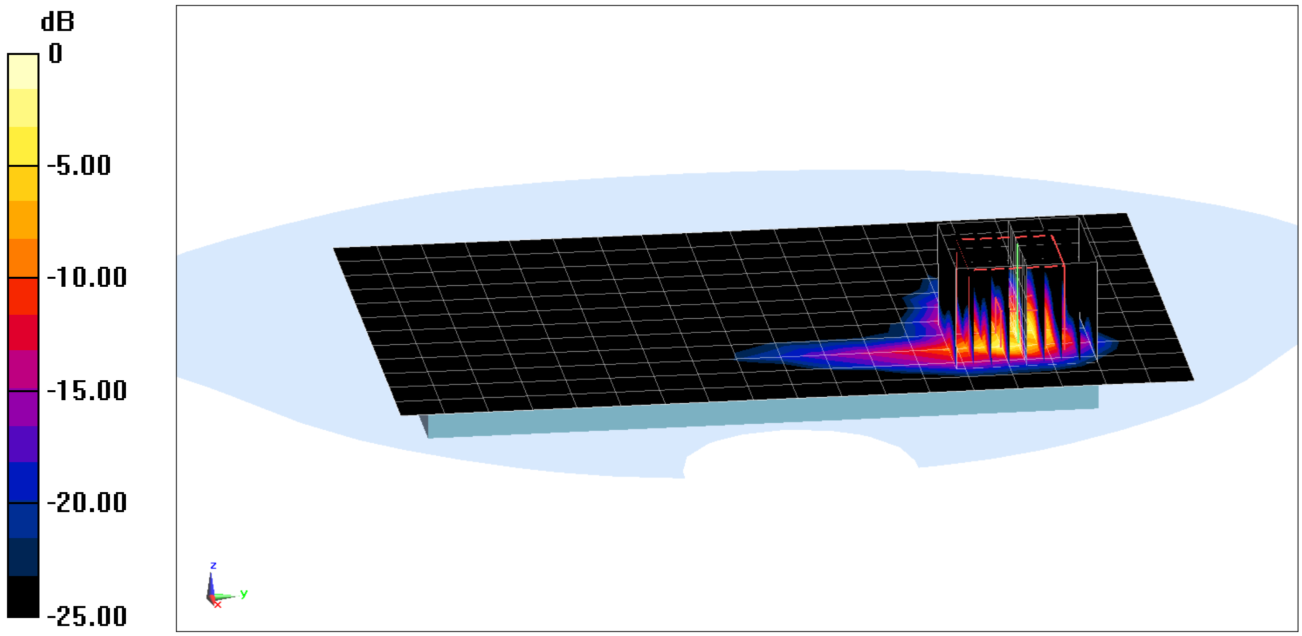
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5260 MHz; $\sigma = 5.502$ S/m; $\varepsilon_r = 47.642$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(4.19, 4.19, 4.19); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11a, U-NII-2A, Antenna 2, 20 MHz Bandwidth, Phablet SAR, Ch 52, 6 Mbps, Back Side

Area Scan (13x19x1): 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 = 28.82 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 17.7 W/kg
SAR(10 g) = 0.746 W/kg



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

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

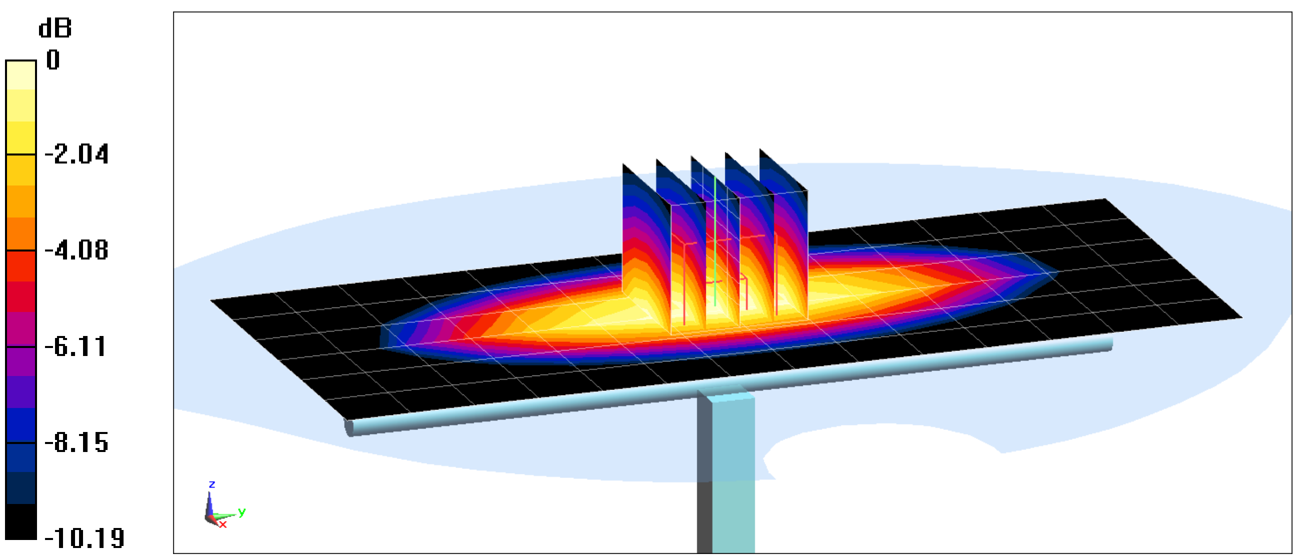
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.89 S/m; ε_r = 43.707; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 22.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3332; ConvF(6.81, 6.81, 6.81); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.18 W/kg
SAR(1 g) = 1.51 W/kg
Deviation(1 g) = -7.59%



0 dB = 1.76 W/kg = 2.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 850 MHz; Type: D850V2; Serial: 1009

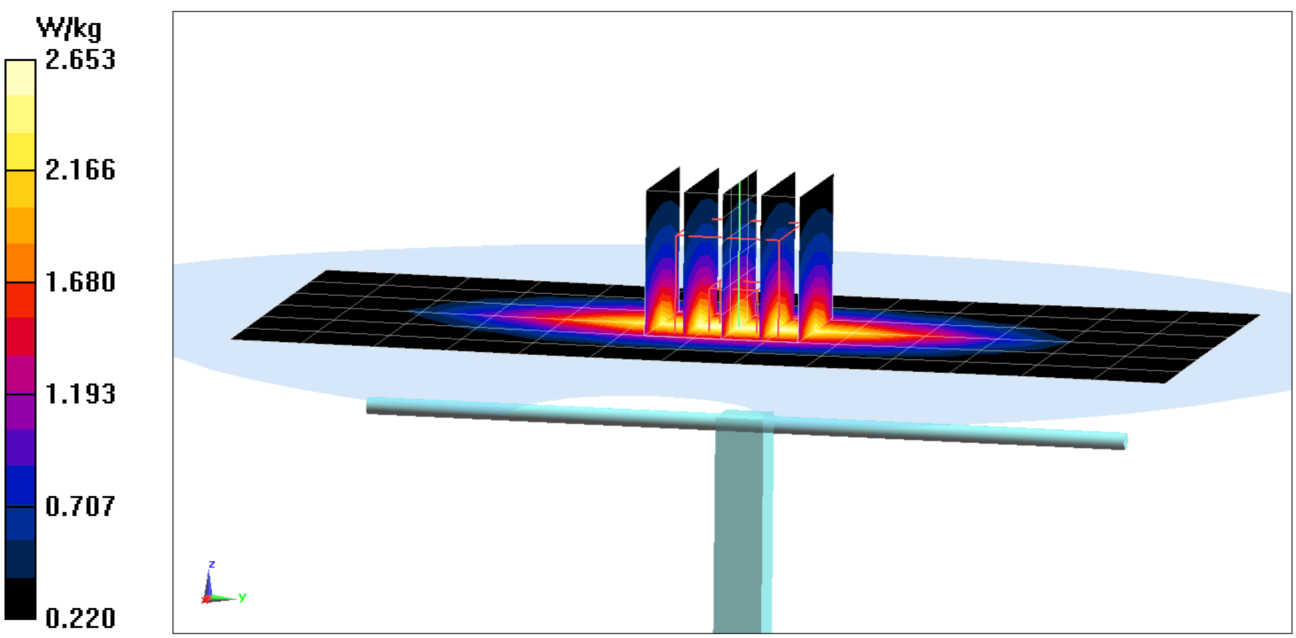
Communication System: UID 0, CW; Frequency: 850 MHz; Duty Cycle: 1:1
Medium: 850 Head Medium parameters used:
f = 850 MHz; σ = 0.936 S/m; ε_r = 43.167; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

850 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) = 2.94 W/kg
SAR(1 g) = 2.00 W/kg
Deviation(1 g) = 0.00%



PCTEST ENGINEERING LABORATORY, INC.

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

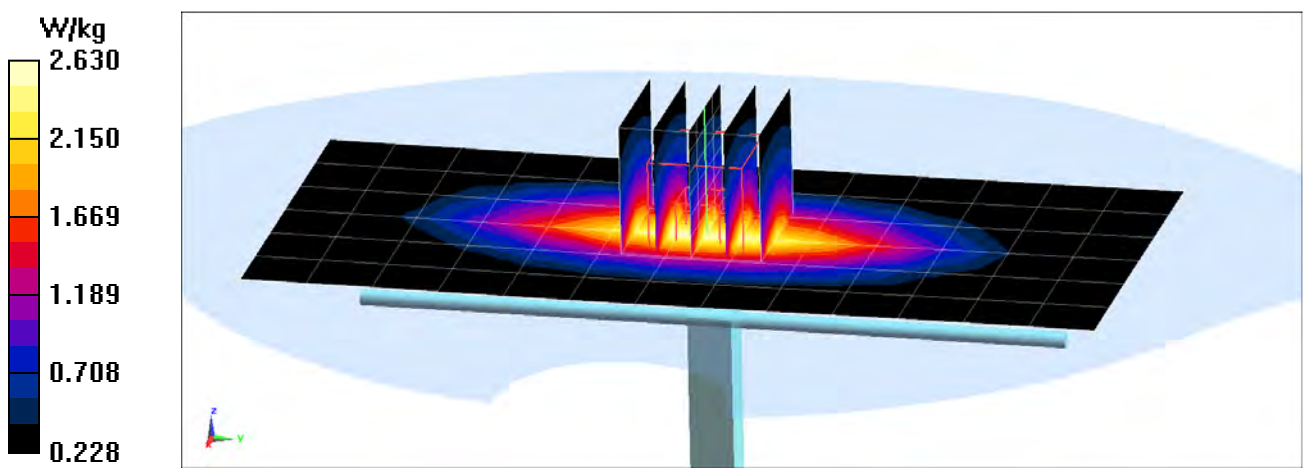
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.921 S/m; ε_r = 42.574; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-27-2017; Ambient Temp: 23.2°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7410; ConvF(10.08, 10.08, 10.08); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.92 W/kg
SAR(1 g) = 1.98 W/kg
Deviation(1 g) = 6.91%



DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

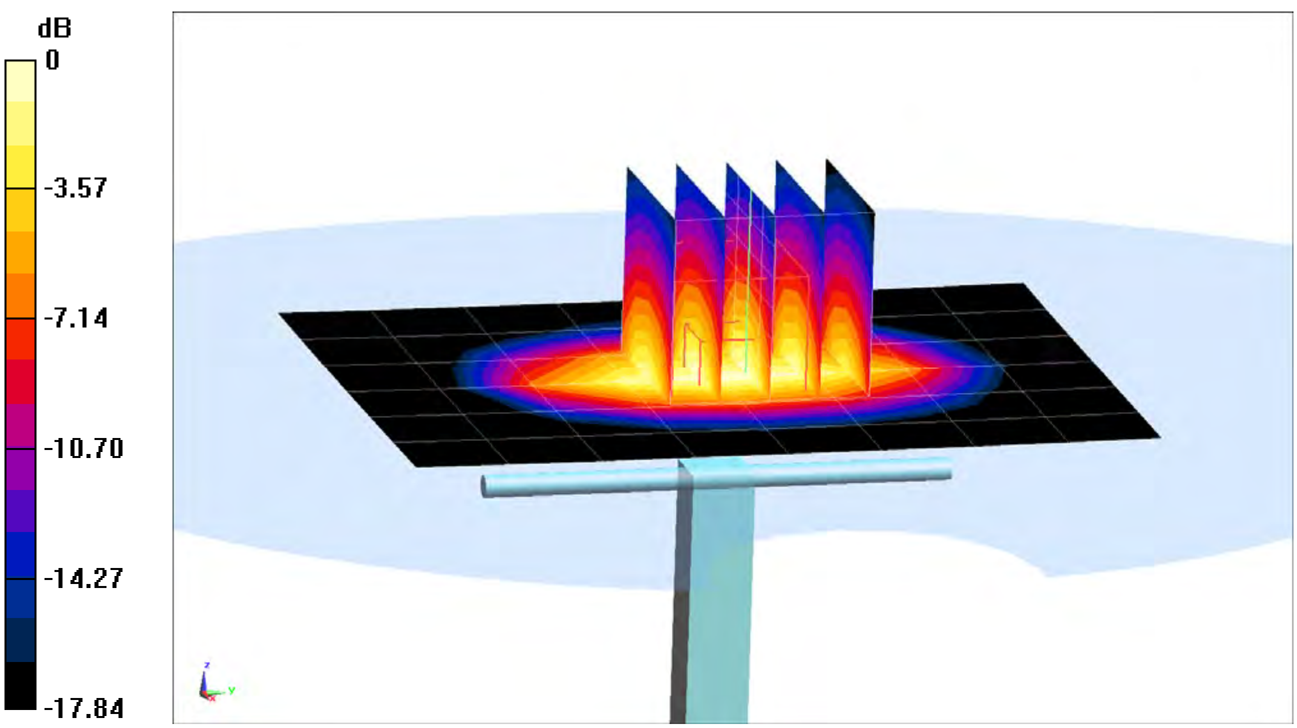
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.398 S/m; ε_r = 38.52; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3213; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 6.66 W/kg
SAR(1 g) = 3.64 W/kg
Deviation(1 g) = 0.83%



0 dB = 4.57 W/kg = 6.60 dBW/kg

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

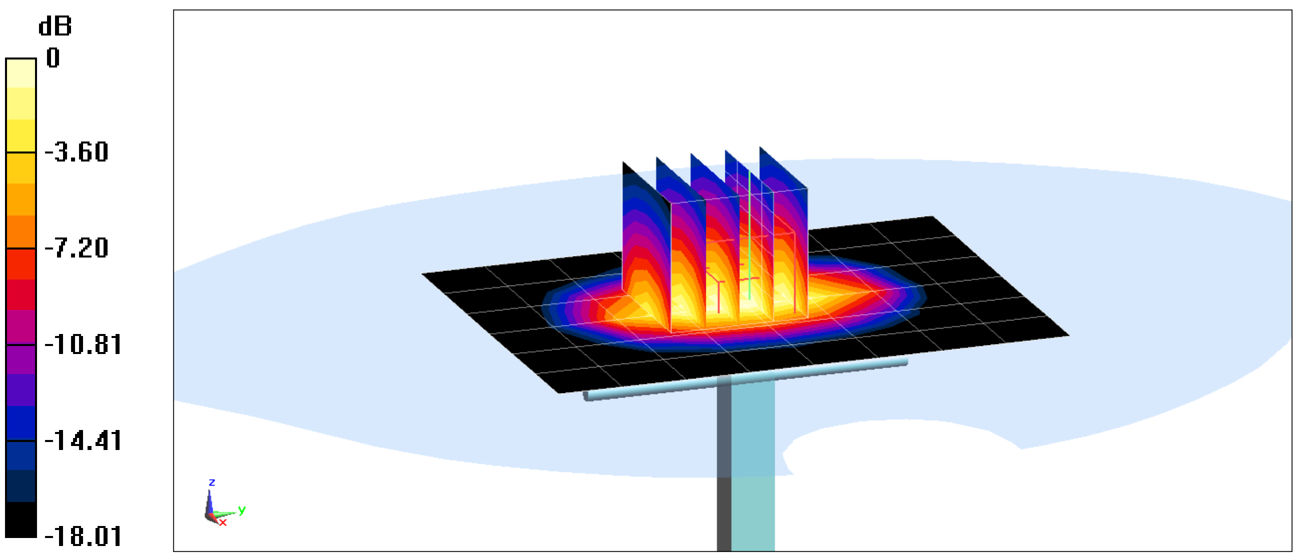
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.389 S/m; ε_r = 38.728; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-25-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3332; ConvF(5.56, 5.56, 5.56); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.79 W/kg
SAR(1 g) = 3.76 W/kg
Deviation(1 g) = 3.30%



0 dB = 4.68 W/kg = 6.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

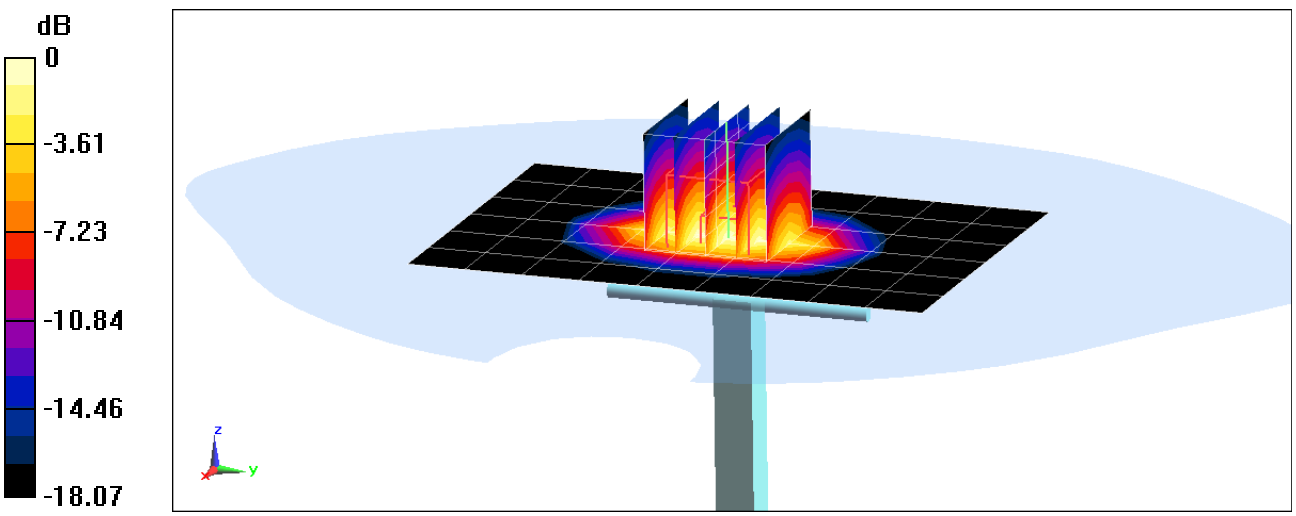
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.431 S/m; ε_r = 39.804; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2017; Ambient Temp: 22.8°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.2, 5.2, 5.2); Calibrated: 03/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 03/08/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.60 W/kg
SAR(1 g) = 4.10 W/kg
Deviation(1 g) = 4.33%



0 dB = 5.23 W/kg = 7.19 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

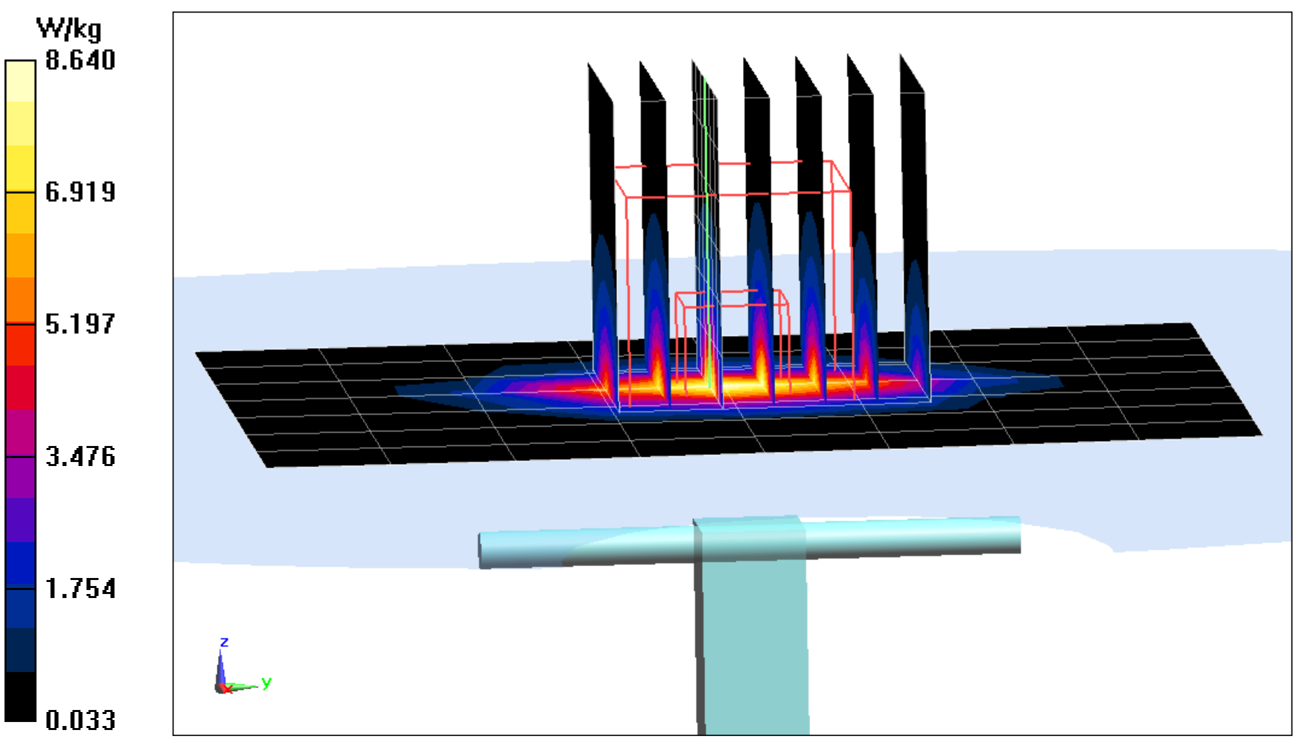
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.866 S/m; ε_r = 38.867; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 20.9°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7410; ConvF(7.68, 7.68, 7.68); Calibrated: 7/17/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/13/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.0 W/kg
SAR(1 g) = 5.05 W/kg
Deviation(1 g) = -4.36%



PCTEST ENGINEERING LABORATORY, INC.

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

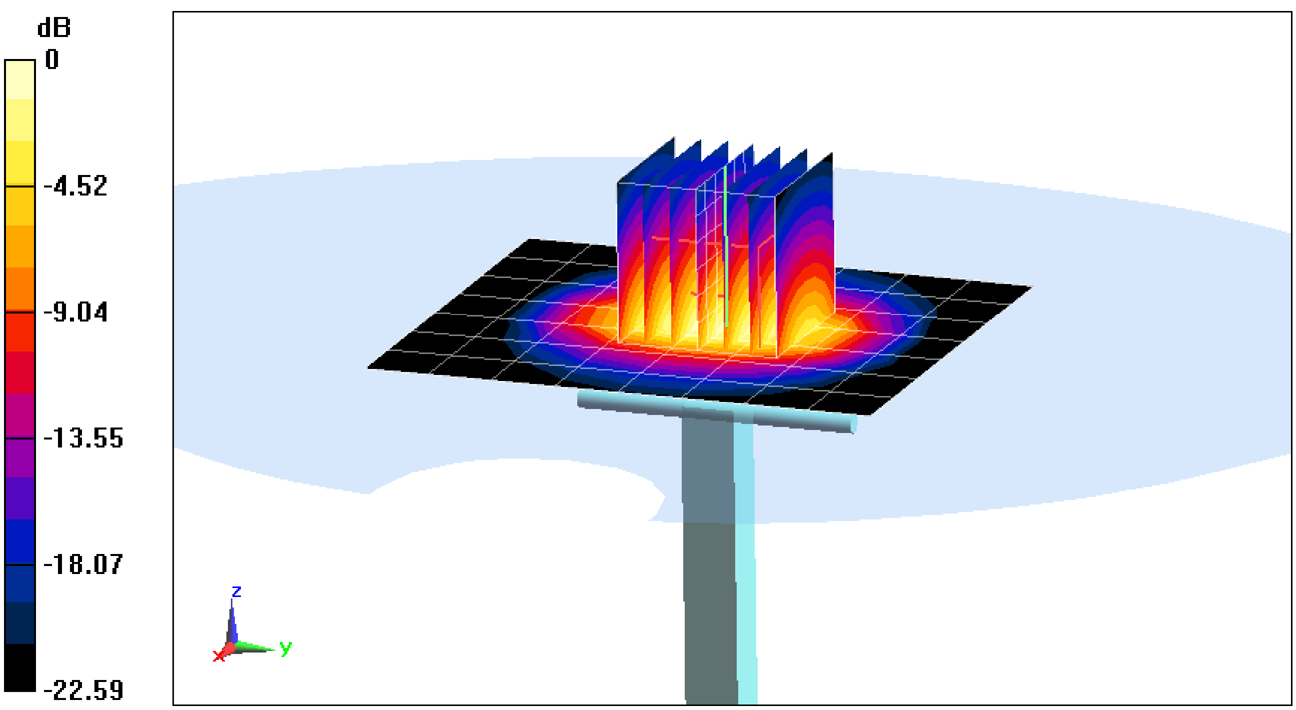
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.846 S/m; ε_r = 38.907; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 9-25-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.6, 4.6, 4.6); Calibrated: 03/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 03/08/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.3 W/kg
SAR(1 g) = 5.40 W/kg
Deviation(1 g) = 2.27%



0 dB = 7.13 W/kg = 8.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

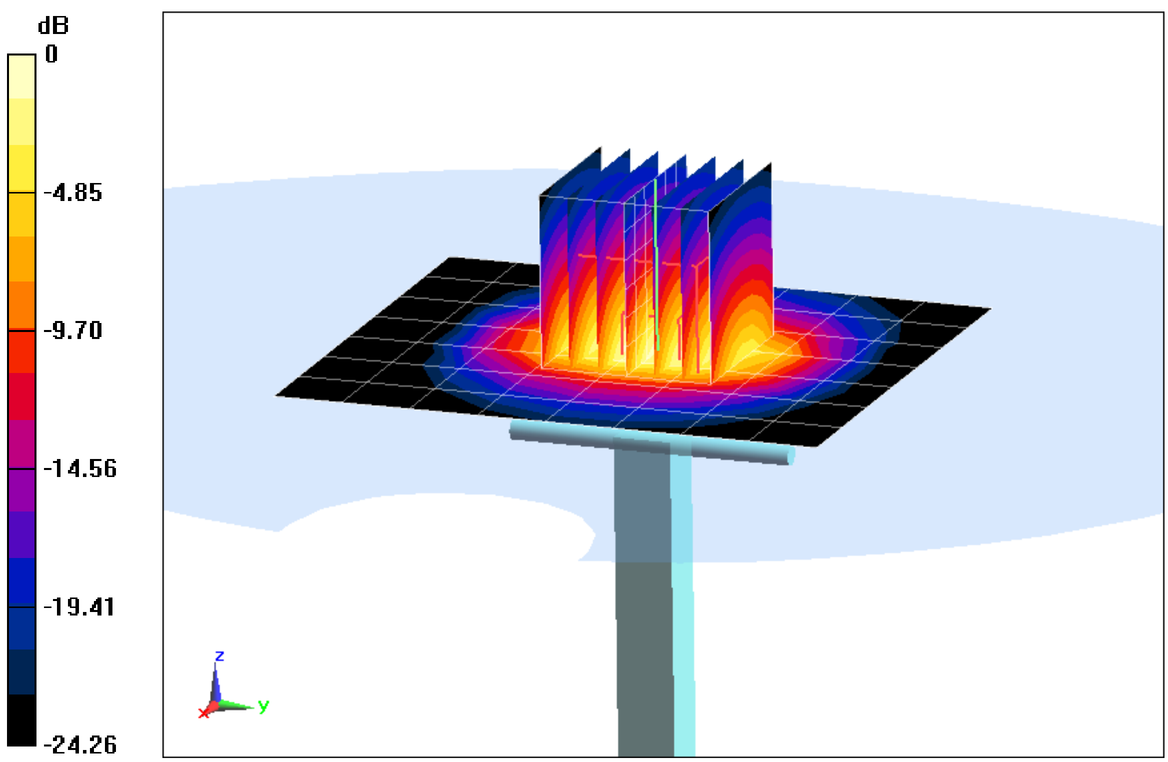
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Head Medium parameters used:
f = 2600 MHz; $\sigma = 2.015$ S/m; $\varepsilon_r = 38.348$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-25-2017; Ambient Temp: 22.5°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(4.41, 4.41, 4.41); Calibrated: 03/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 03/08/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 12.6 W/kg
SAR(1 g) = 5.77 W/kg
Deviation(1 g) = 2.30%



0 dB = 7.61 W/kg = 8.81 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

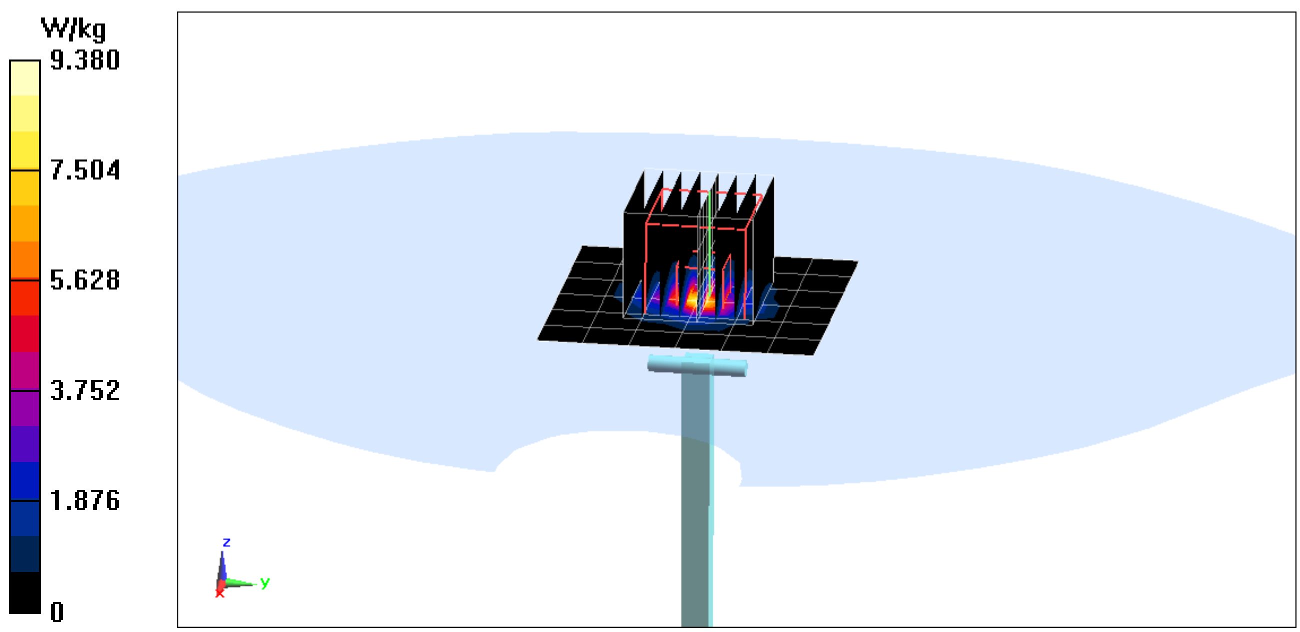
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
$f = 5250$ MHz; $\sigma = 4.575$ S/m; $\varepsilon_r = 35.573$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.0°C; Tissue Temp: 20.0°C

Probe: EX3DV4 - SN3914; ConvF(5.49, 5.49, 5.49); Calibrated: 2/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 3.70 W/kg
Deviation(1 g) = -6.21%



PCTEST ENGINEERING LABORATORY, INC.

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

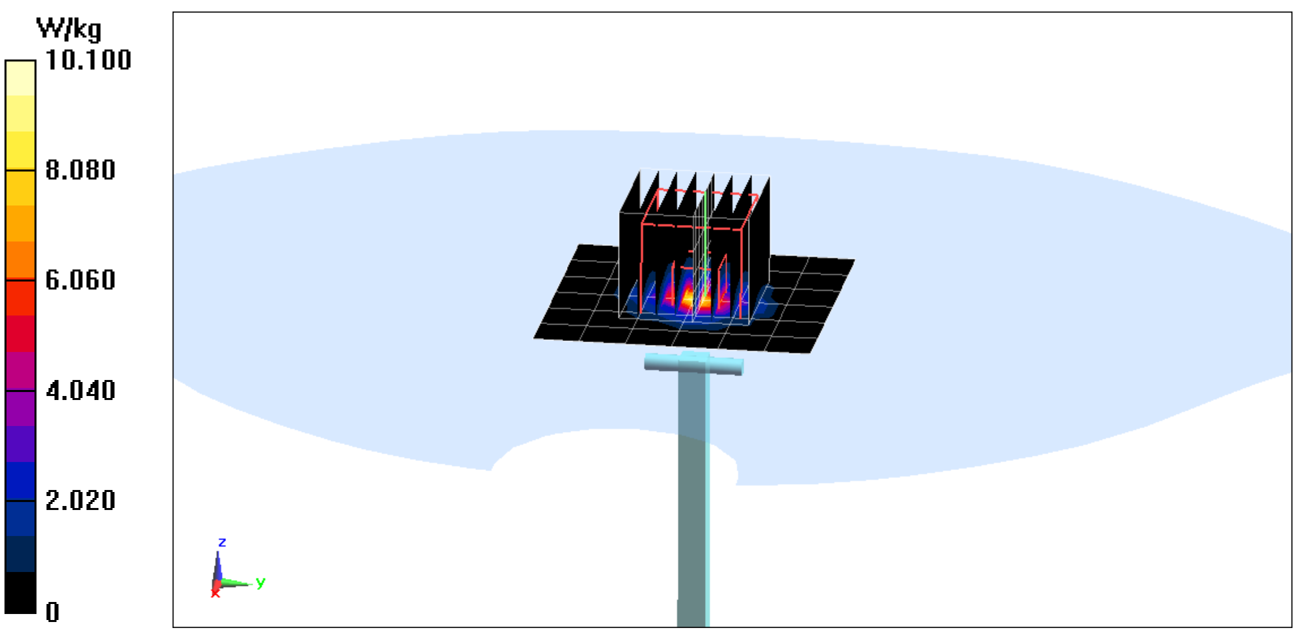
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5600 MHz; σ = 4.938 S/m; ε_r = 35.061; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.0°C; Tissue Temp: 20.0°C

Probe: EX3DV4 - SN3914; ConvF(4.94, 4.94, 4.94); Calibrated: 2/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.0 W/kg
SAR(1 g) = 4.03 W/kg
Deviation(1 g) = -3.59%



PCTEST ENGINEERING LABORATORY, INC.

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

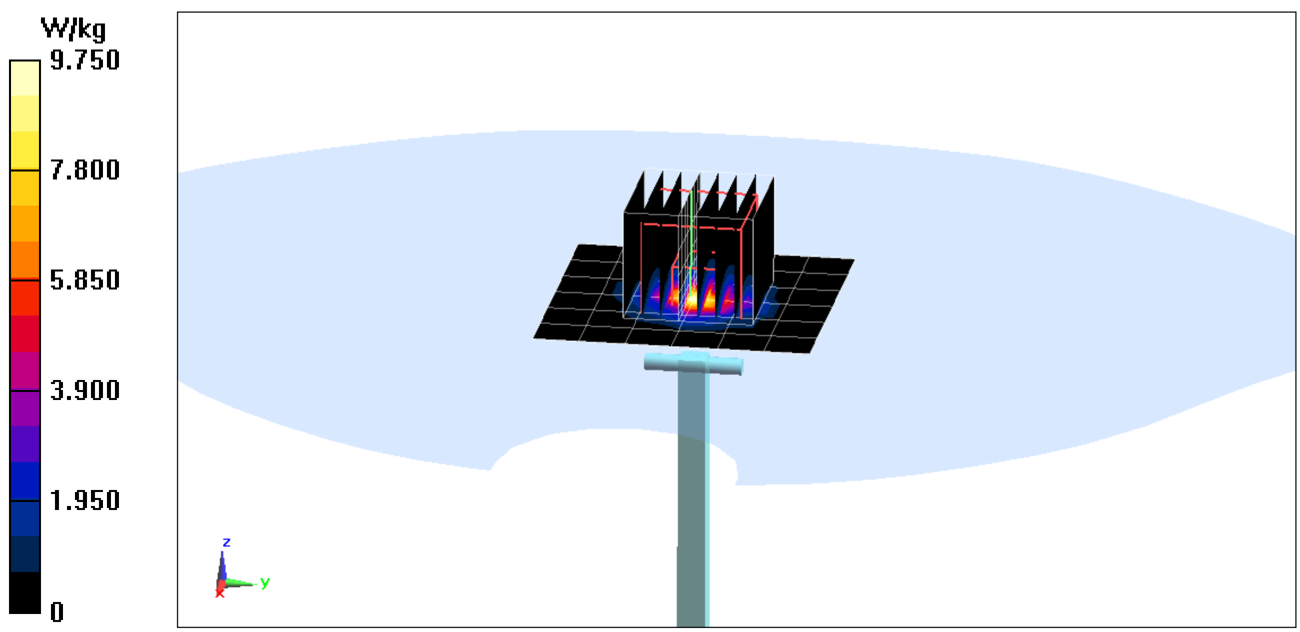
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5750 MHz; σ = 5.097 S/m; ε_r = 34.845; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.0°C; Tissue Temp: 20.0°C

Probe: EX3DV4 - SN3914; ConvF(4.91, 4.91, 4.91); Calibrated: 2/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.1 W/kg
SAR(1 g) = 3.94 W/kg
Deviation(1 g) = -0.38%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1034

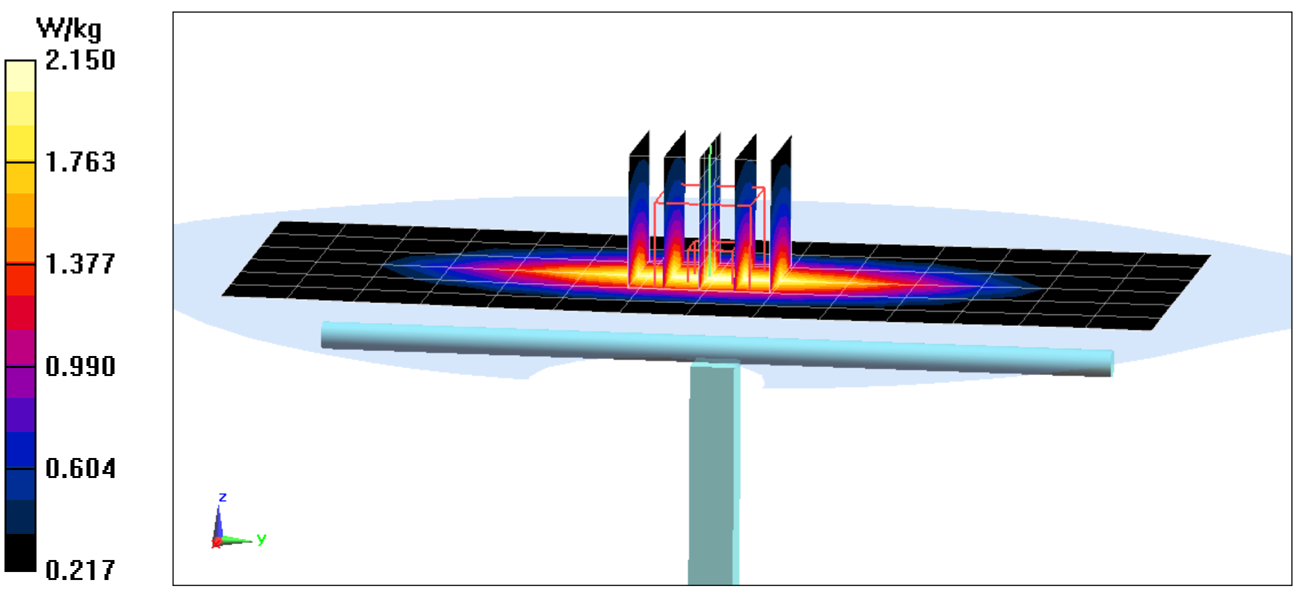
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.973 S/m; ε_r = 57.208; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-18-2017; Ambient Temp: 21.4°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3209; ConvF(6.44, 6.44, 6.44); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0 Left; Type: QD000P40CD; Serial: TP:1692
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.70 W/kg
SAR(1 g) = 1.84 W/kg
Deviation(1 g) = 5.63%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

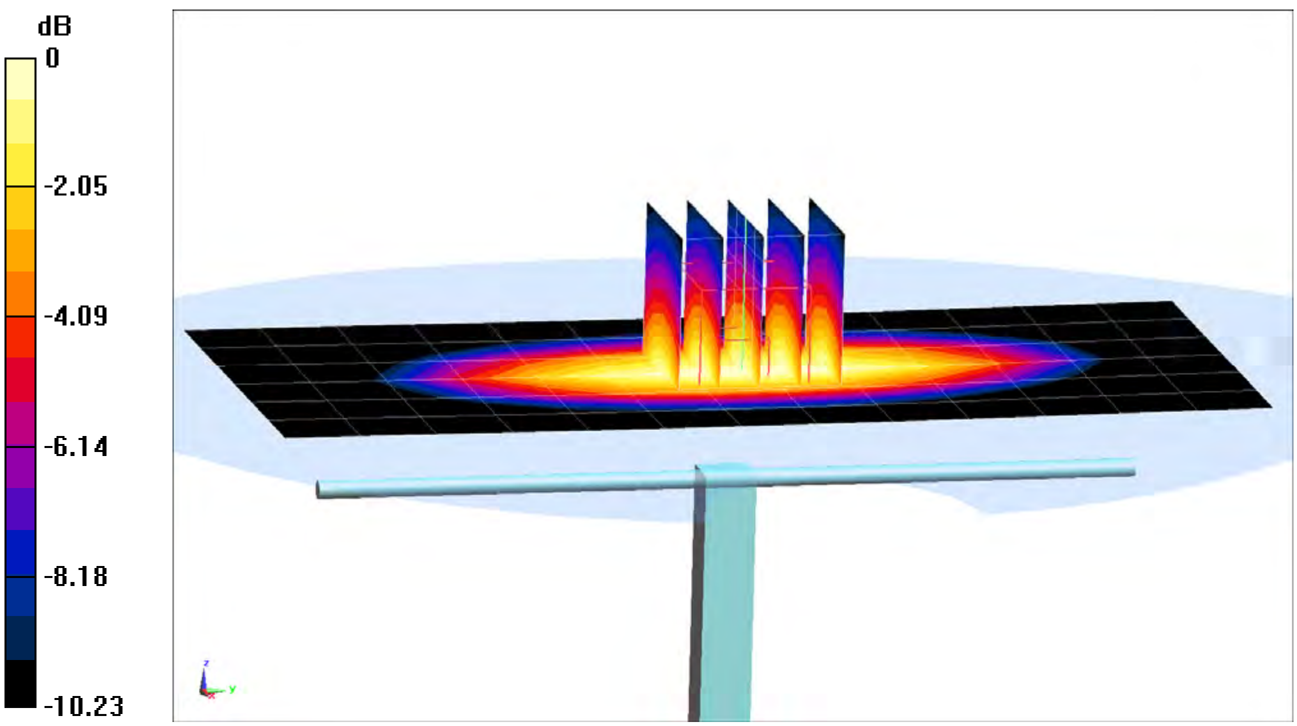
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.964 S/m; ε_r = 53.816; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.74 W/kg
SAR(1 g) = 1.86 W/kg
Deviation(1 g) = -5.10%



0 dB = 2.17 W/kg = 3.36 dBW/kg

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

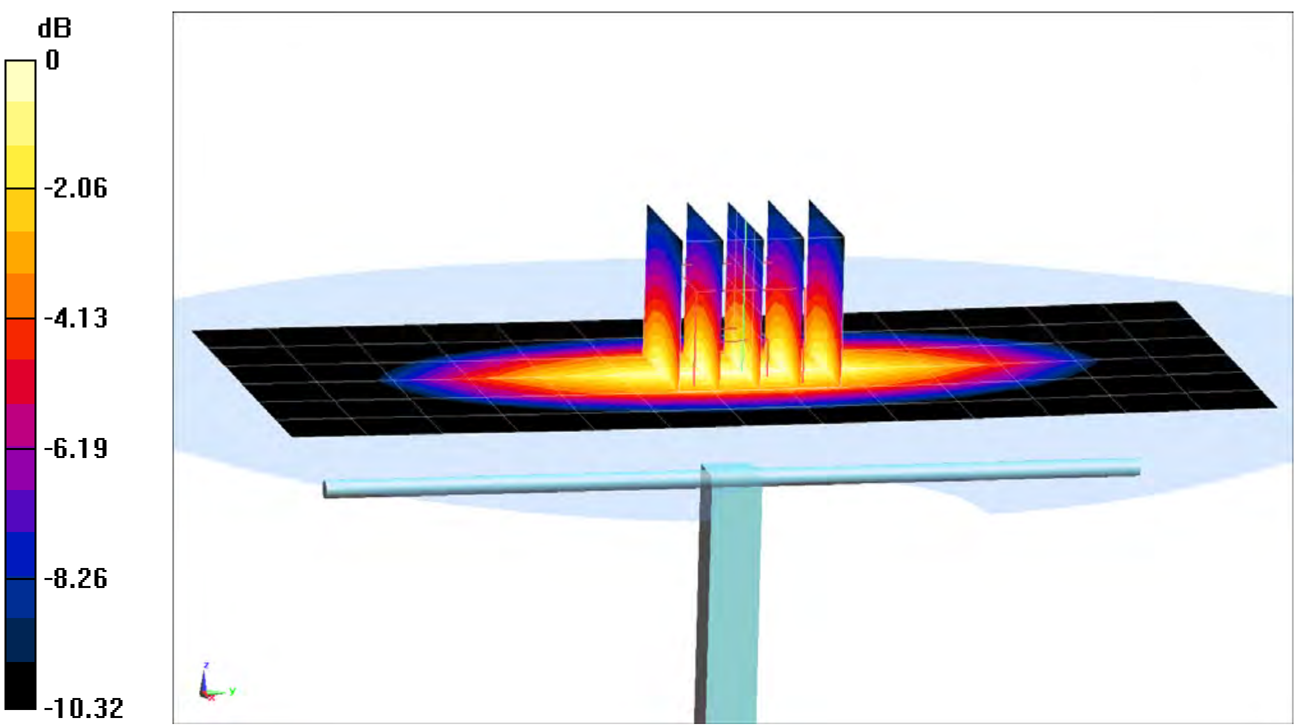
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.966 S/m; ε_r = 52.937; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 09-14-2017; Ambient Temp: 20.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6.28, 6.28, 6.28); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.83 W/kg
SAR(1 g) = 1.93 W/kg; SAR(10 g) = 1.28 W/kg
Deviation(1 g) = 0.84%; Deviation(10 g) = 2.56%



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

PCTEST ENGINEERING LABORATORY, INC.

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

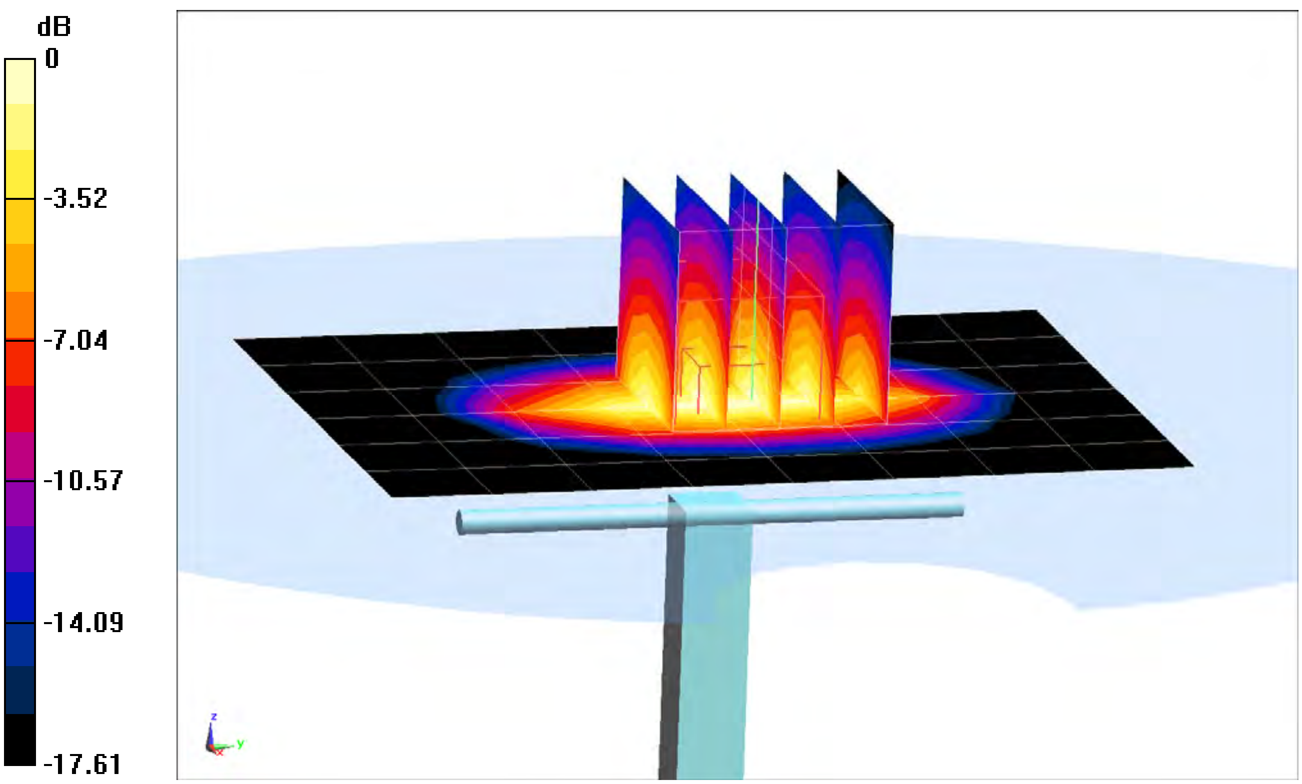
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.517 S/m; ε_r = 51.907; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-07-2017; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3213; ConvF(5.09, 5.09, 5.09); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.92 W/kg
SAR(10 g) = 2.06 W/kg
Deviation(10 g) = 4.04%



0 dB = 4.79 W/kg = 6.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

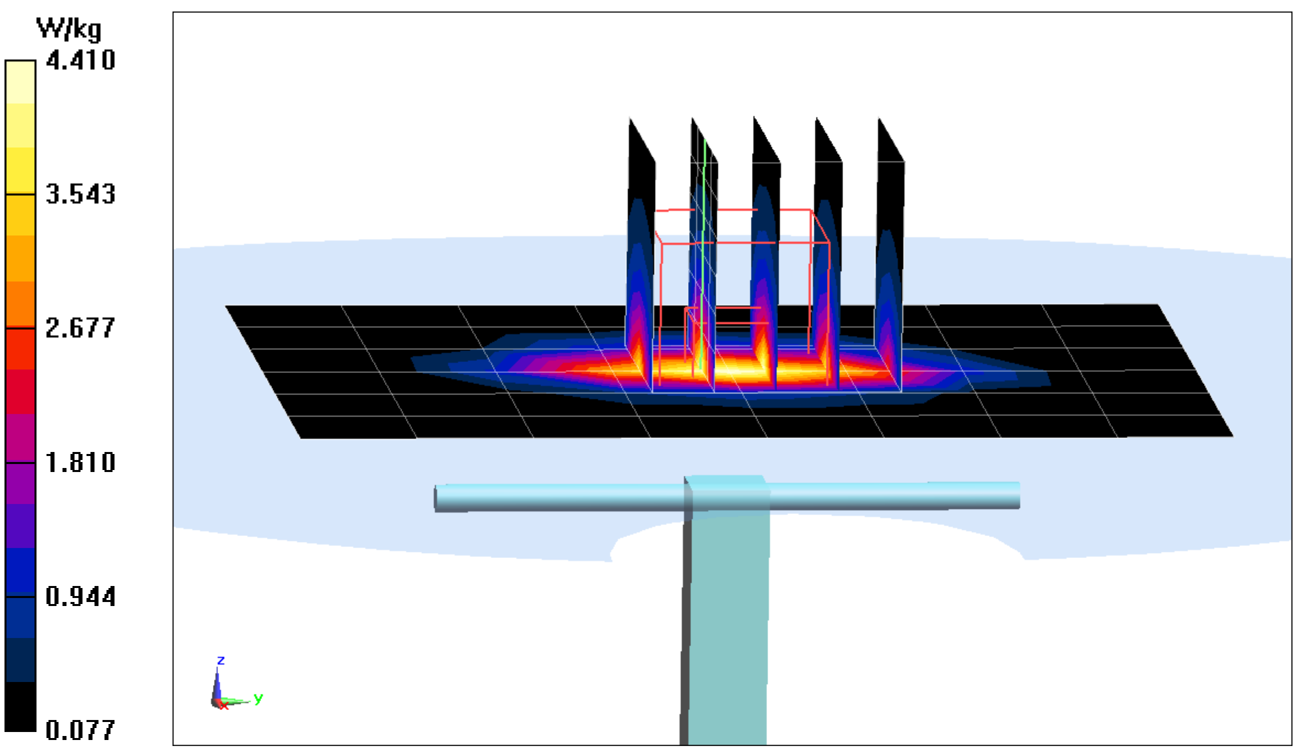
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.51 S/m; ε_r = 51.935; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 20.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.29 W/kg
SAR(1 g) = 3.56 W/kg; SAR(10 g) = 1.89 W/kg
Deviation(1 g) = -2.47%; Deviation(10 g) = -3.08%



PCTEST ENGINEERING LABORATORY, INC.

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

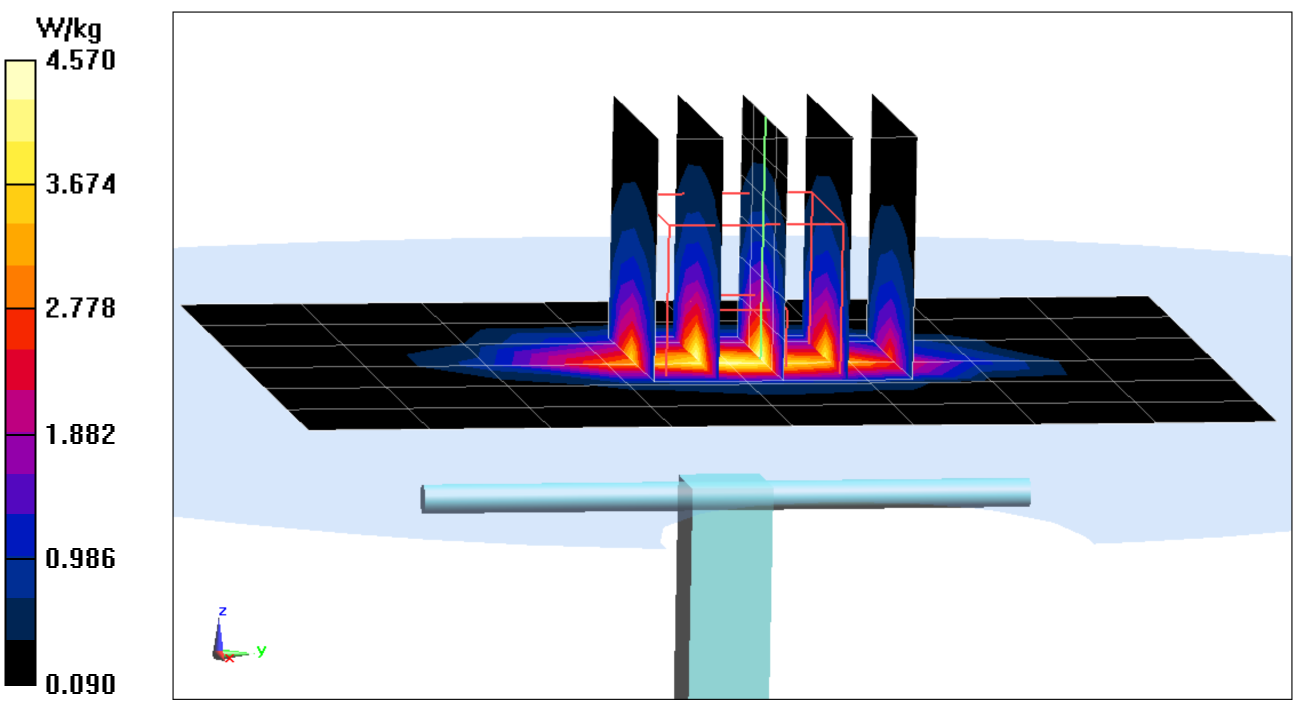
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.481 S/m; ε_r = 52.68; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-14-2017; Ambient Temp: 20.4°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3209; ConvF(5.13, 5.13, 5.13); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.38 W/kg
SAR(1 g) = 3.67 W/kg
Deviation(1 g) = -0.81%



PCTEST ENGINEERING LABORATORY, INC.

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

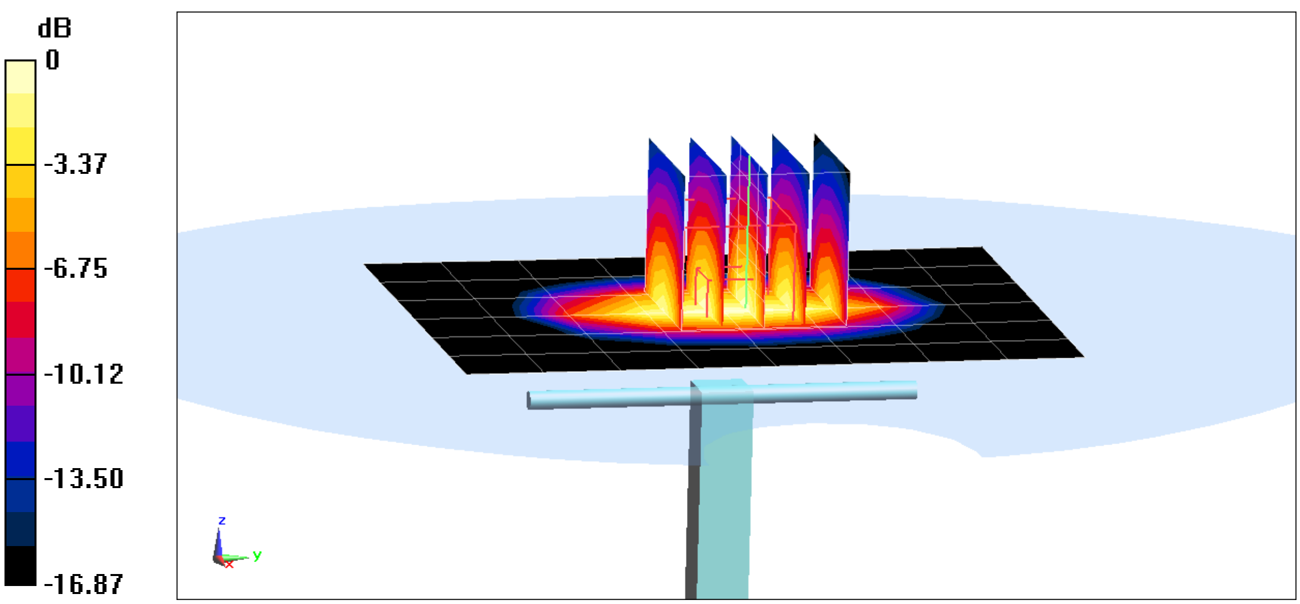
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.462 S/m; ε_r = 53.879; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-25-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3288; ConvF(5.09, 5.09, 5.09); Calibrated: 1/13/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 6.23 W/kg
SAR(1 g) = 3.62 W/kg
Deviation(1 g) = -2.16%



0 dB = 4.46 W/kg = 6.49 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

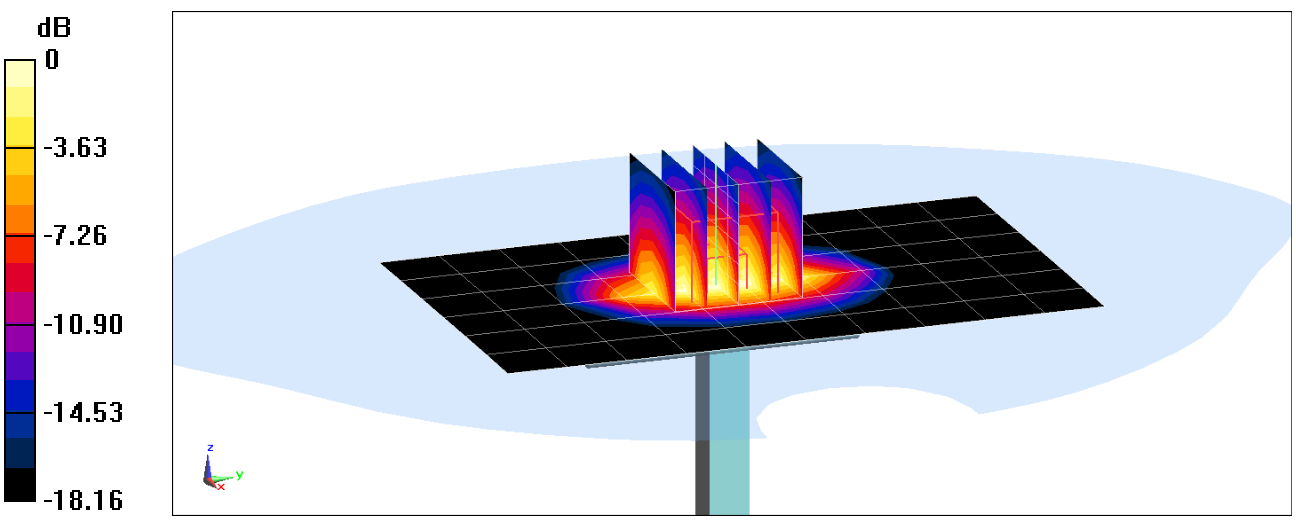
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.559 S/m; ε_r = 52.395; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-10-2017; Ambient Temp: 21.8°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): 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) = 4.12 W/kg
Deviation(1 g) = 5.37%



0 dB = 6.46 W/kg = 8.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d180

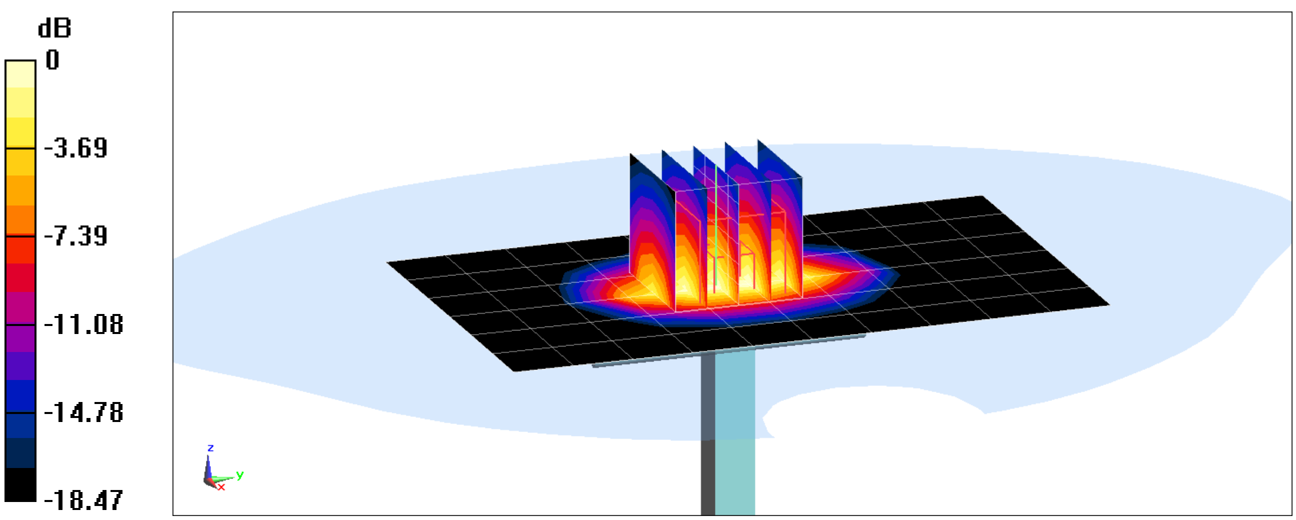
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.571 S/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-12-2017; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.81, 7.81, 7.81); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.57 W/kg
SAR(1 g) = 4.06 W/kg; SAR(10 g) = 2.08 W/kg
Deviation(1 g) = 2.78%; Deviation(10 g) = -0.48%



0 dB = 6.30 W/kg = 7.99 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

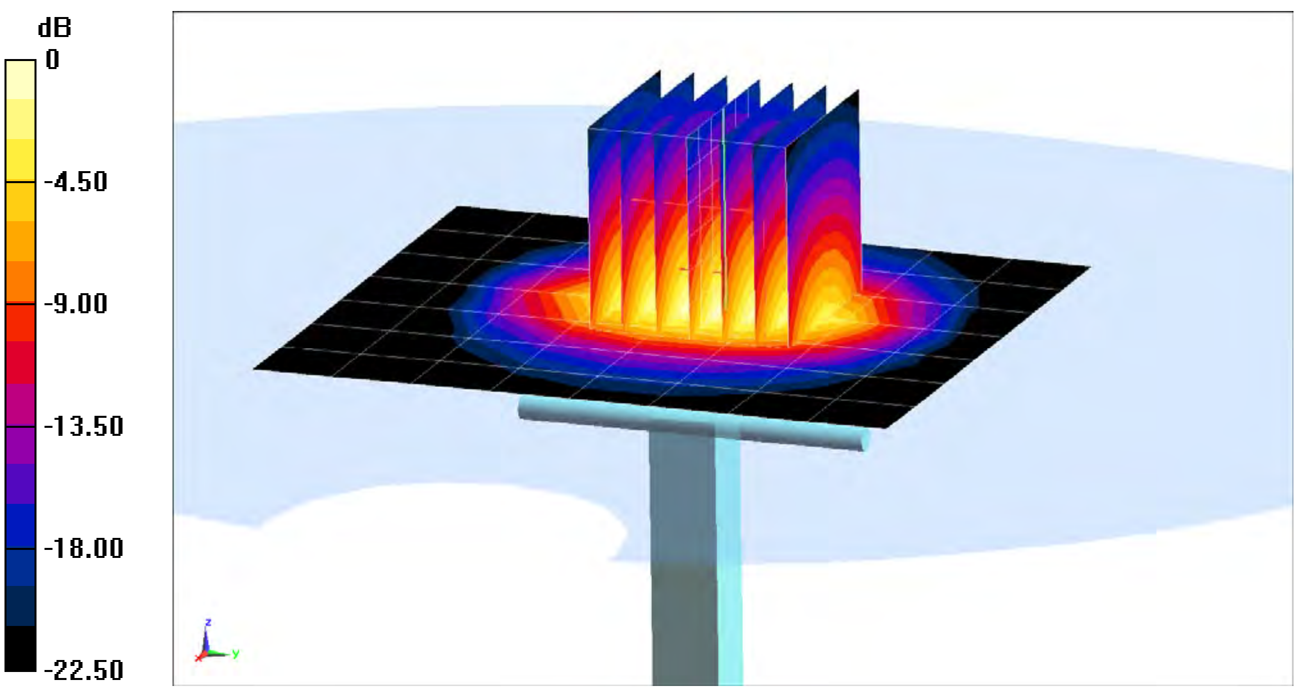
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.026 S/m; ε_r = 51.152; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-12-2017; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.42, 4.42, 4.42); Calibrated: 03/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 03/08/2017
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.6 W/kg
SAR(1 g) = 5.07 W/kg
Deviation(1 g) = 1.20%



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

PCTEST ENGINEERING LABORATORY, INC.

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

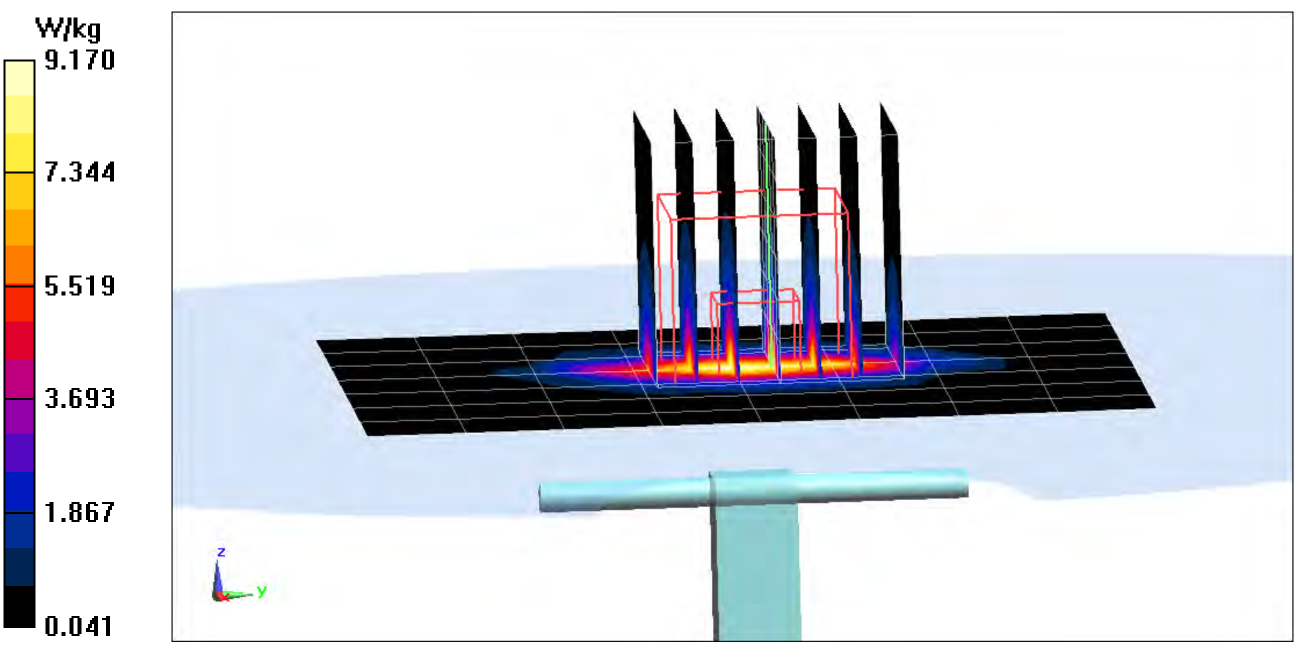
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.037 S/m; ε_r = 51.813; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 5.35 W/kg; SAR(10 g) = 2.41 W/kg
Deviation(1 g) = 5.31%; Deviation(10 g) = 1.26%



PCTEST ENGINEERING LABORATORY, INC.

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

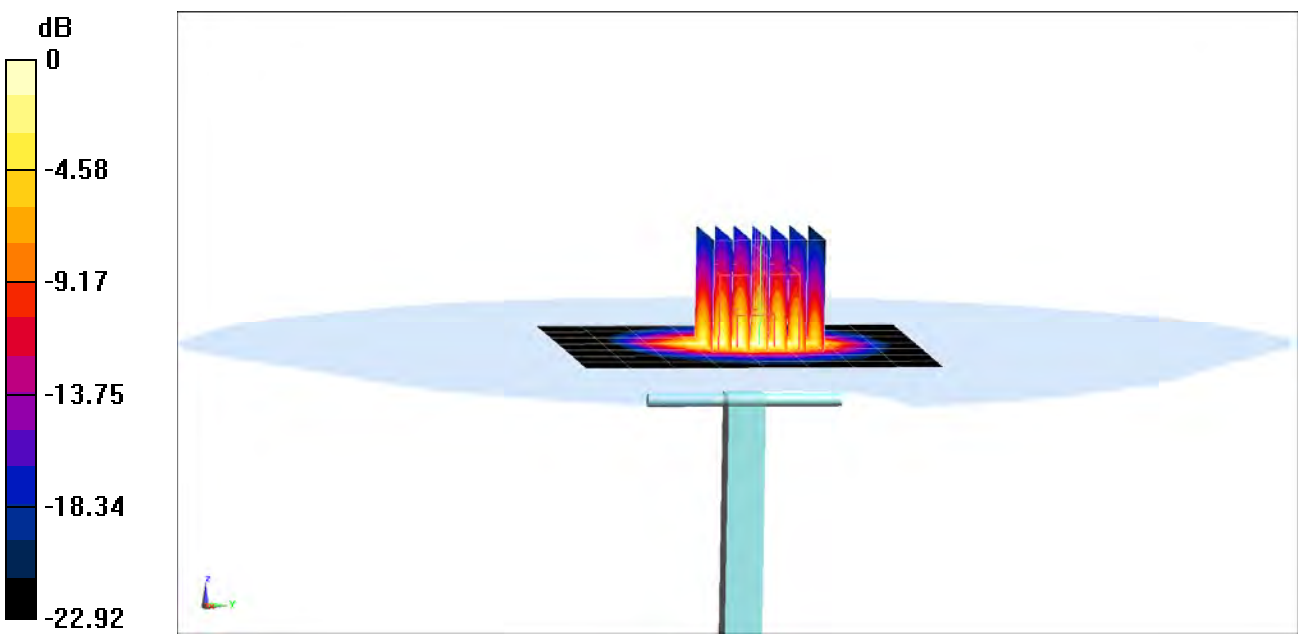
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.027 S/m; ε_r = 52.046; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-20-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7406; ConvF(7.6, 7.6, 7.6); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.16 W/kg
Deviation(1 g) = 2.99%



0 dB = 8.67 W/kg = 9.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

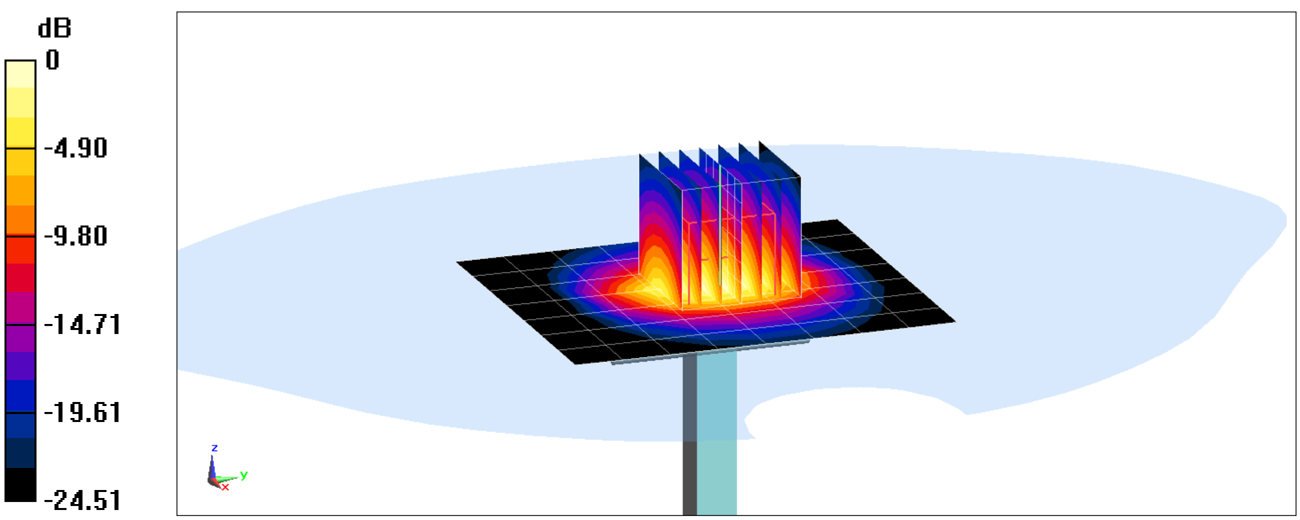
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; $\sigma = 2.244$ S/m; $\varepsilon_r = 51.216$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2017; Ambient Temp: 22.1°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.7 W/kg
SAR(1 g) = 5.62 W/kg; SAR(10 g) = 2.44 W/kg
Deviation(1 g) = 3.50%; Deviation(10 g) = 0.00%



0 dB = 9.89 W/kg = 9.95 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

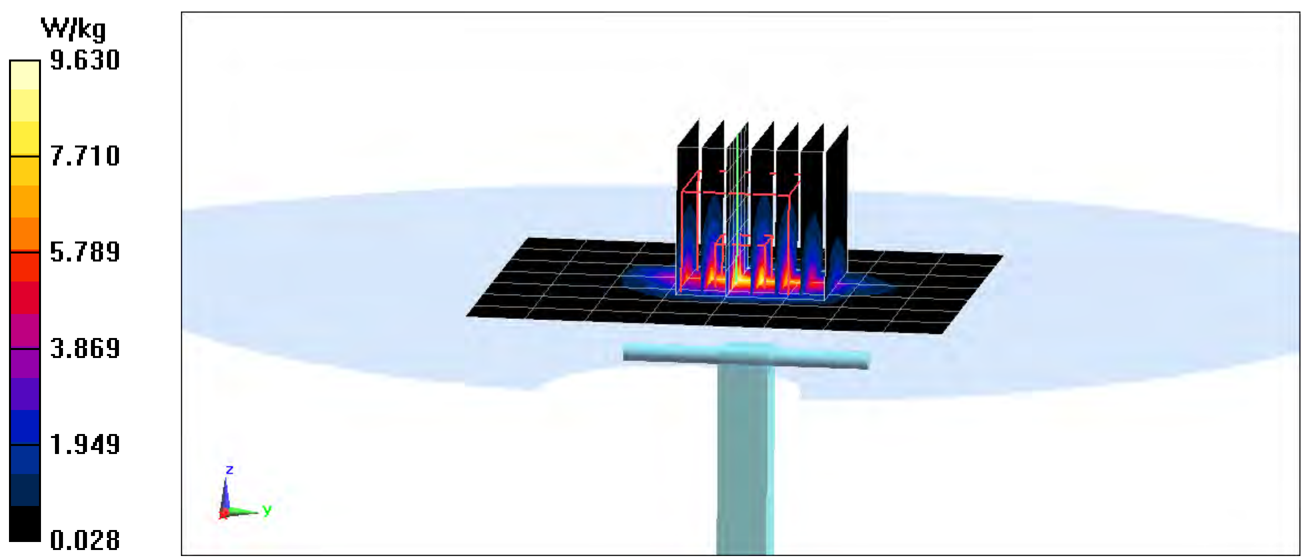
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.231 S/m; ε_r = 51.272; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-23-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.3 W/kg
SAR(10 g) = 2.39 W/kg
Deviation(10 g) = -4.02%



PCTEST ENGINEERING LABORATORY, INC.

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

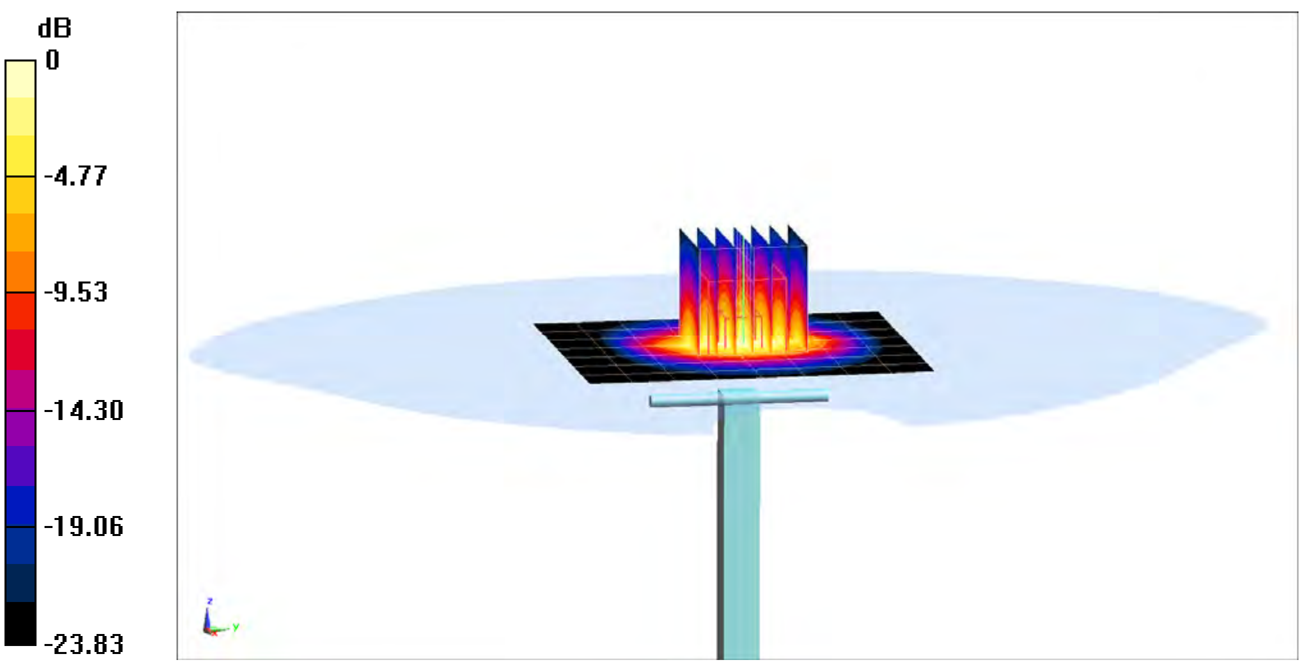
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; $\sigma = 2.208$ S/m; $\varepsilon_r = 51.342$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-28-2017; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.31, 7.31, 7.31); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.6 W/kg
SAR(1 g) = 5.50 W/kg
Deviation(1 g) = 1.29%



0 dB = 9.80 W/kg = 9.91 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

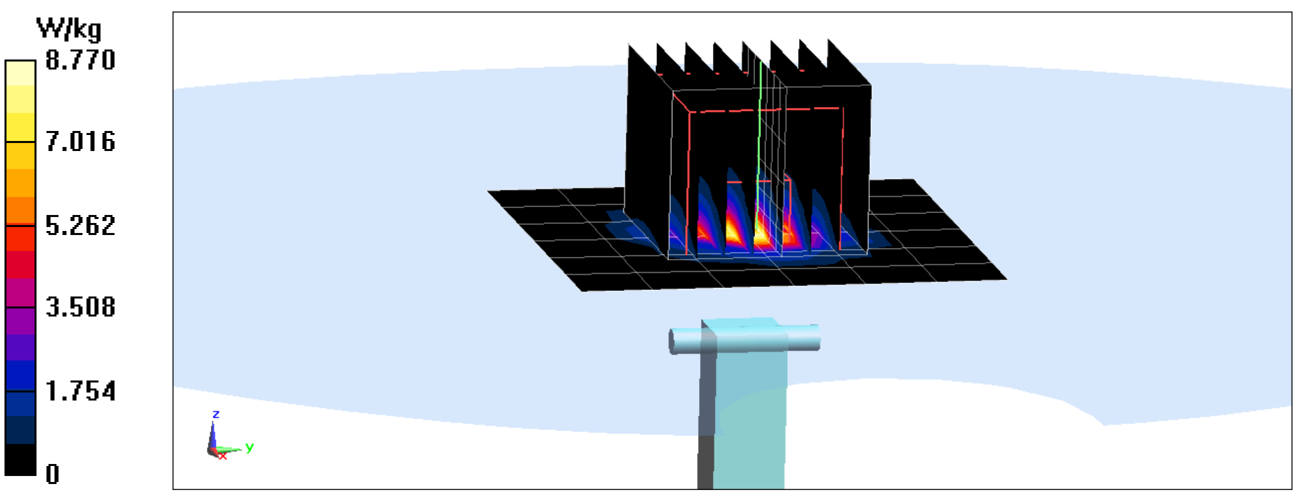
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.481 S/m; ε_r = 47.664; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(4.19, 4.19, 4.19); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=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) = 3.69 W/kg; SAR(10 g) = 1.03 W/kg
Deviation(1 g) = -4.03%; Deviation(10 g) = -4.19%



PCTEST ENGINEERING LABORATORY, INC.

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

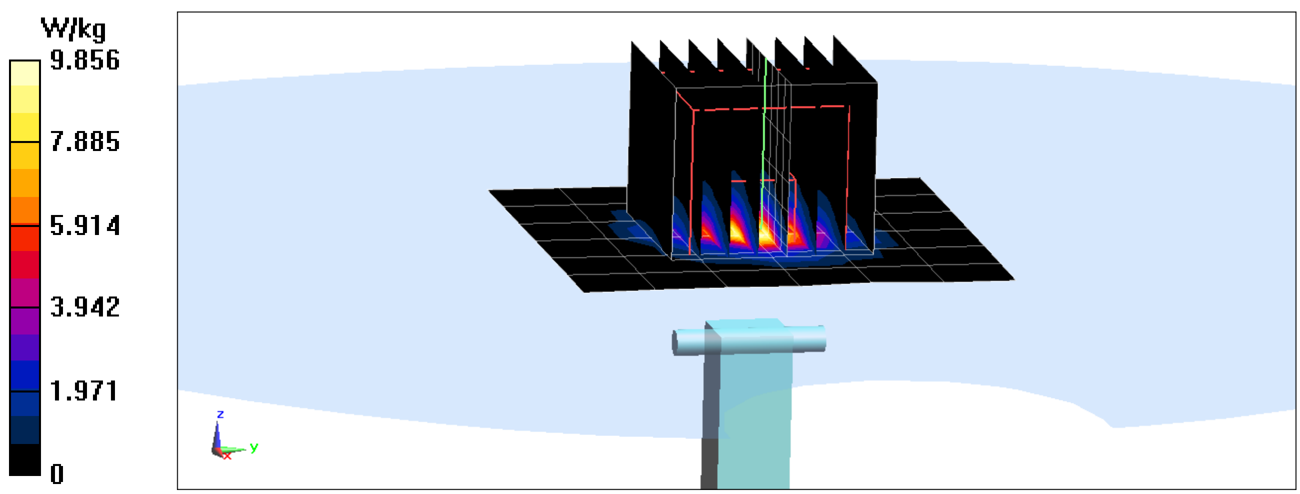
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.945 S/m; ε_r = 47.043; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.82, 3.82, 3.82); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.8 W/kg
SAR(1 g) = 4.00 W/kg SAR(10 g) = 1.11 W/kg
Deviation(1 g) = 1.91%; Deviation(10 g) = 0.45%



PCTEST ENGINEERING LABORATORY, INC.

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

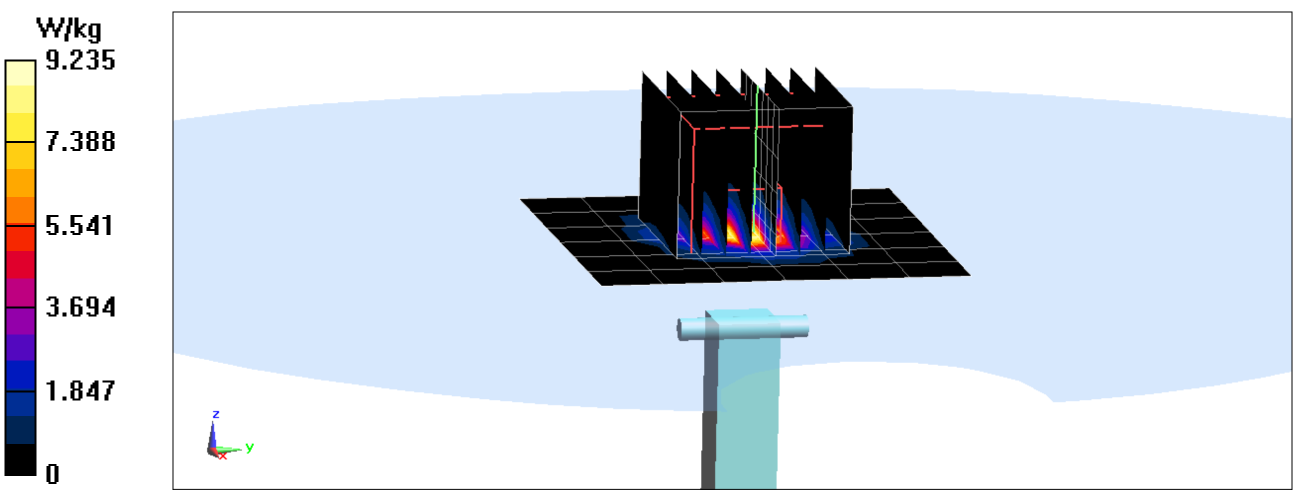
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.169 S/m; ε_r = 46.846; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-11-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3589; ConvF(3.83, 3.83, 3.83); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 3.67 W/kg
Deviation(1 g) = -4.80%



APPENDIX C: PROBE CALIBRATION

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

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

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

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D750V3-1161_Jul16

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1161
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 13, 2016

√PM
8/9/16

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 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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.17 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	**5.39 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	55.1 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.43 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.53 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω - 0.9 jΩ
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω - 4.0 jΩ
Return Loss	- 28.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 19, 2015

DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

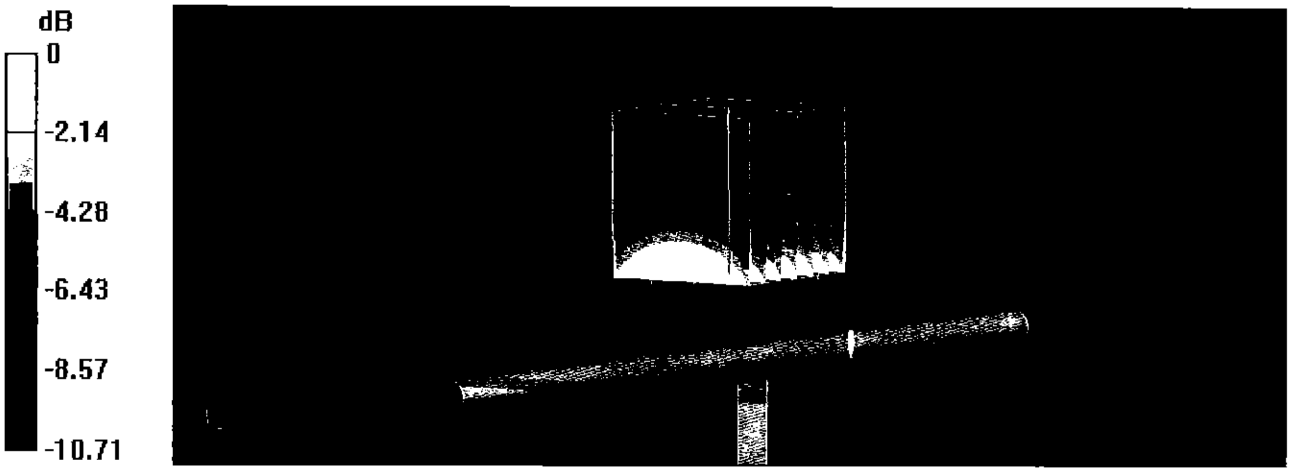
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); 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)

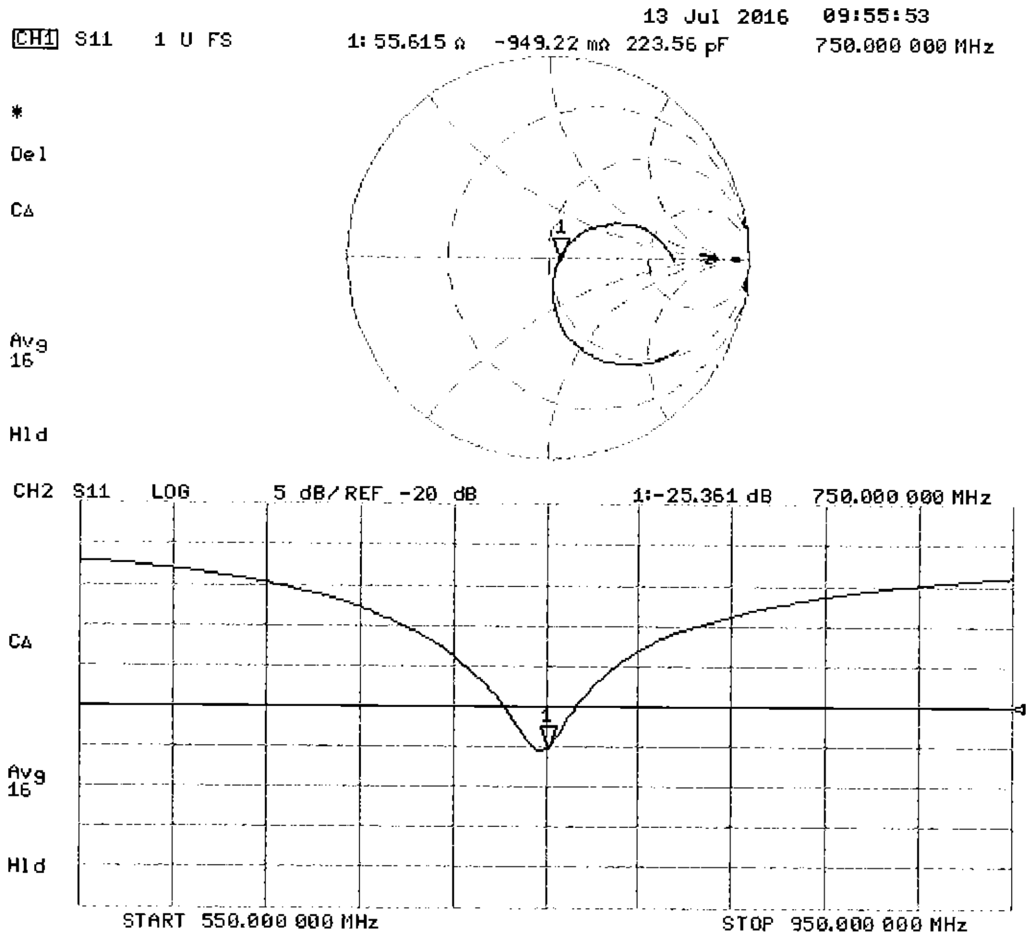
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.07 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 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 750 MHz; Type: D750V3; Serial: D750V3 - SN:1161

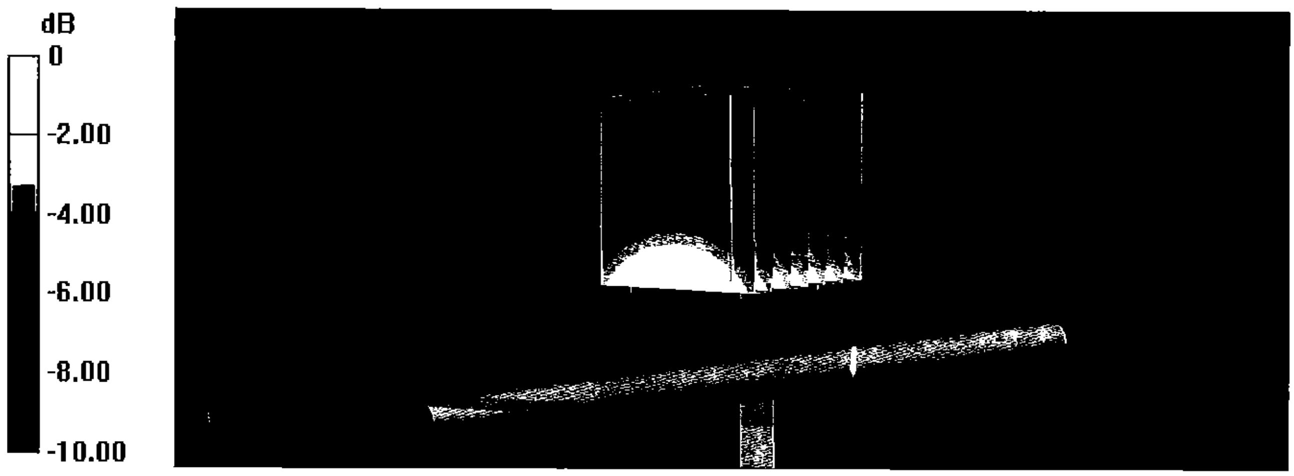
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 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)

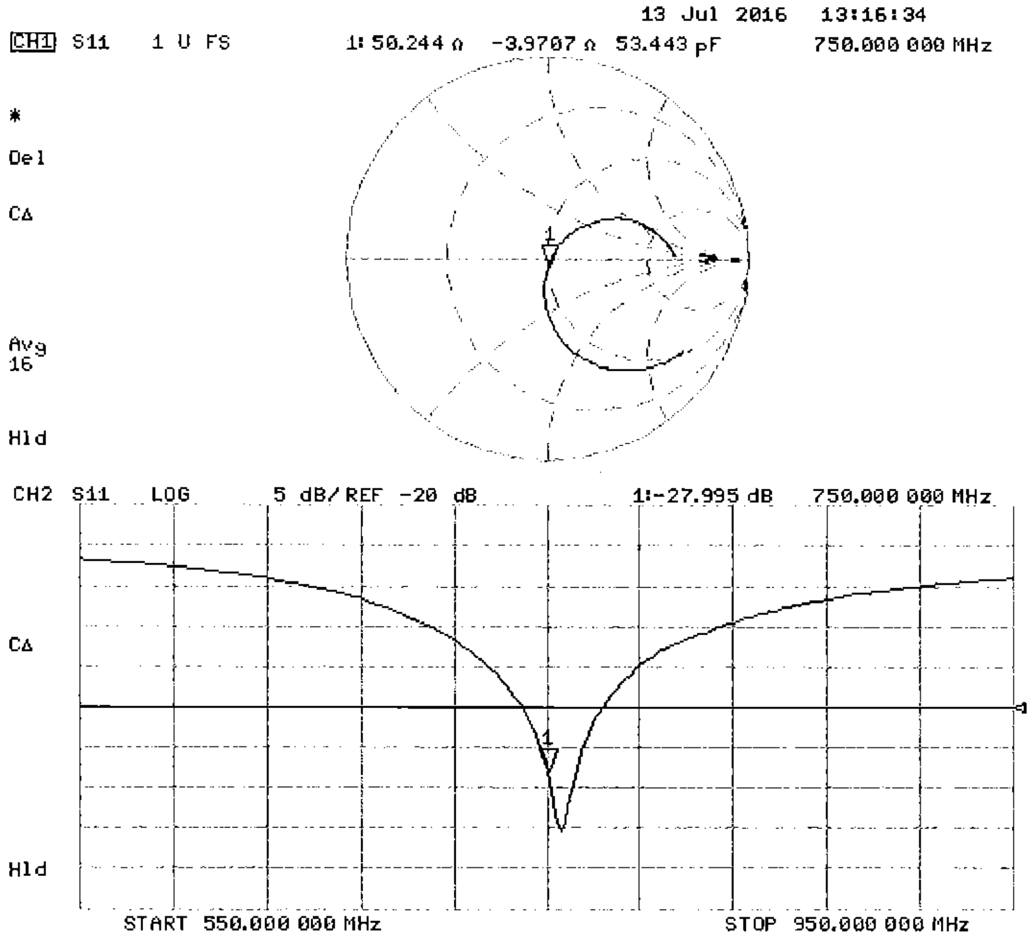
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.33 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.22 W/kg
SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object	D750V3 – SN: 1161
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 12, 2017
Description:	SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/14/2017	Annual	6/14/2018	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	11/15/2016	Annual	11/15/2017	3334
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

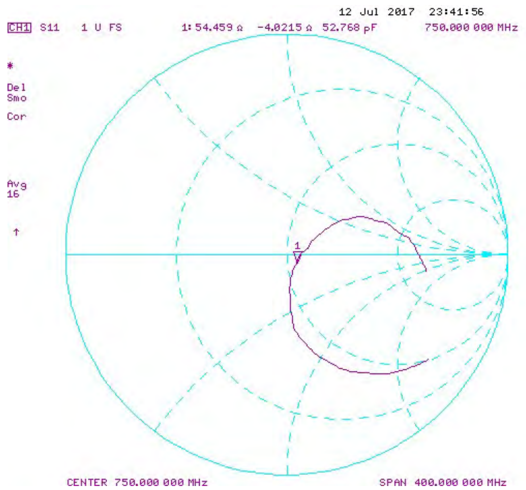
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

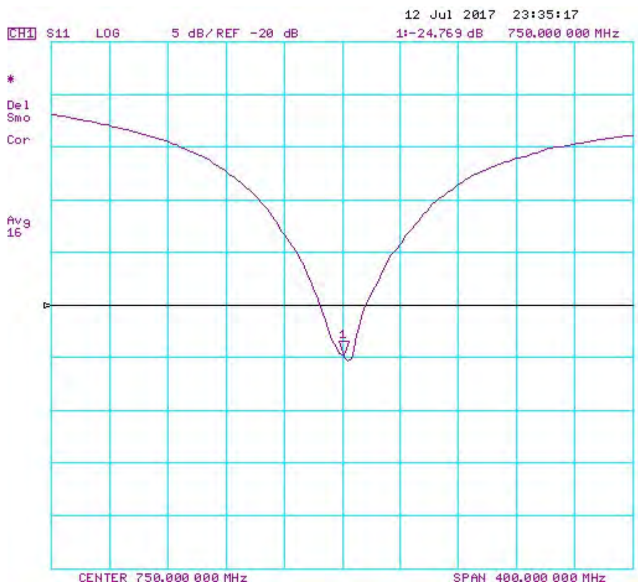
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/12/2017	1.033	1.63	1.65	0.98%	1.08	1.09	1.11%	55.6	54.5	1.1	-0.9	-4.0	3.1	-25.4	-24.8	2.40%	PASS

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/12/2017	1.033	1.69	1.75	3.80%	1.11	1.17	5.79%	50.2	48.0	2.2	-4.0	-6.9	2.9	-28.0	-23.9	14.60%	PASS

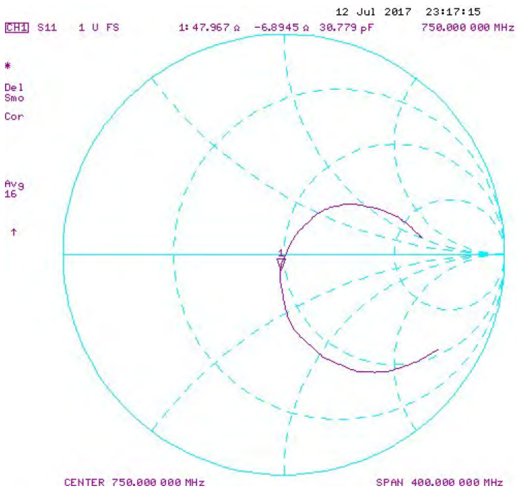
Impedance & Return-Loss Measurement Plot for Head TSL

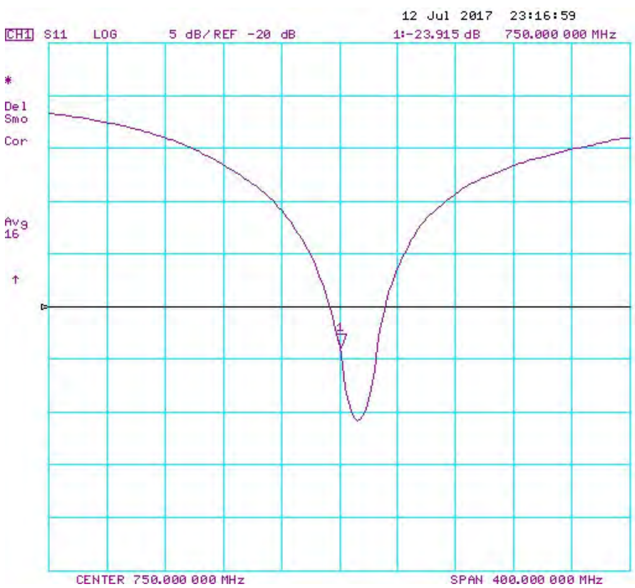




Object:	Date Issued:	Page 3 of 4
D750V3 – SN: 1161	07/12/2017	

Impedance & Return-Loss Measurement Plot for Body TSL





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

S **Schweizerischer Kalibrierdienst**
C **Service suisse d'étalonnage**
S **Servizio svizzero di taratura**
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: **D850V2-1009_Aug17**

CALIBRATION CERTIFICATE

Object D850V2 - SN:1009

8/27/17
PM

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

Calibration date: August 16, 2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 17, 2017

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	850 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	0.92 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 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	2.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**10.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.66 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.54 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	0.99 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	1.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.53 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.88 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.48 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	52.5 Ω - 2.5 jΩ
Return Loss	- 29.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.5 Ω - 7.3 jΩ
Return Loss	- 22.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.438 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 04, 2012

DASY5 Validation Report for Head TSL

Date: 16.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 850 MHz; Type: D850V2; Serial: D850V2 - SN:1009

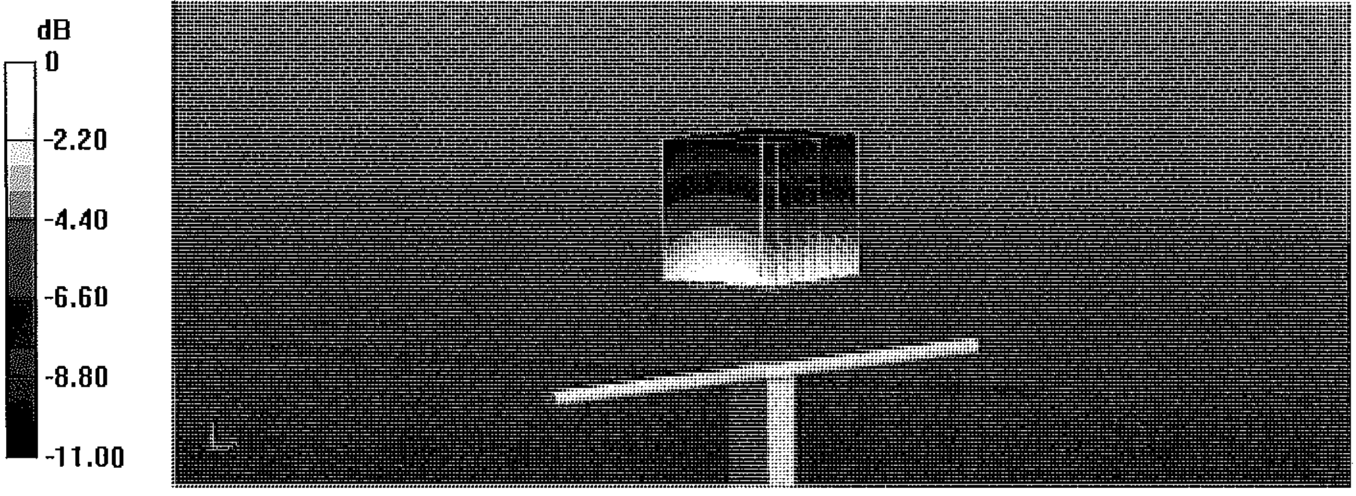
Communication System: UID 0 - CW; Frequency: 850 MHz
Medium parameters used: f = 850 MHz; σ = 0.94 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.93, 9.93, 9.93); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

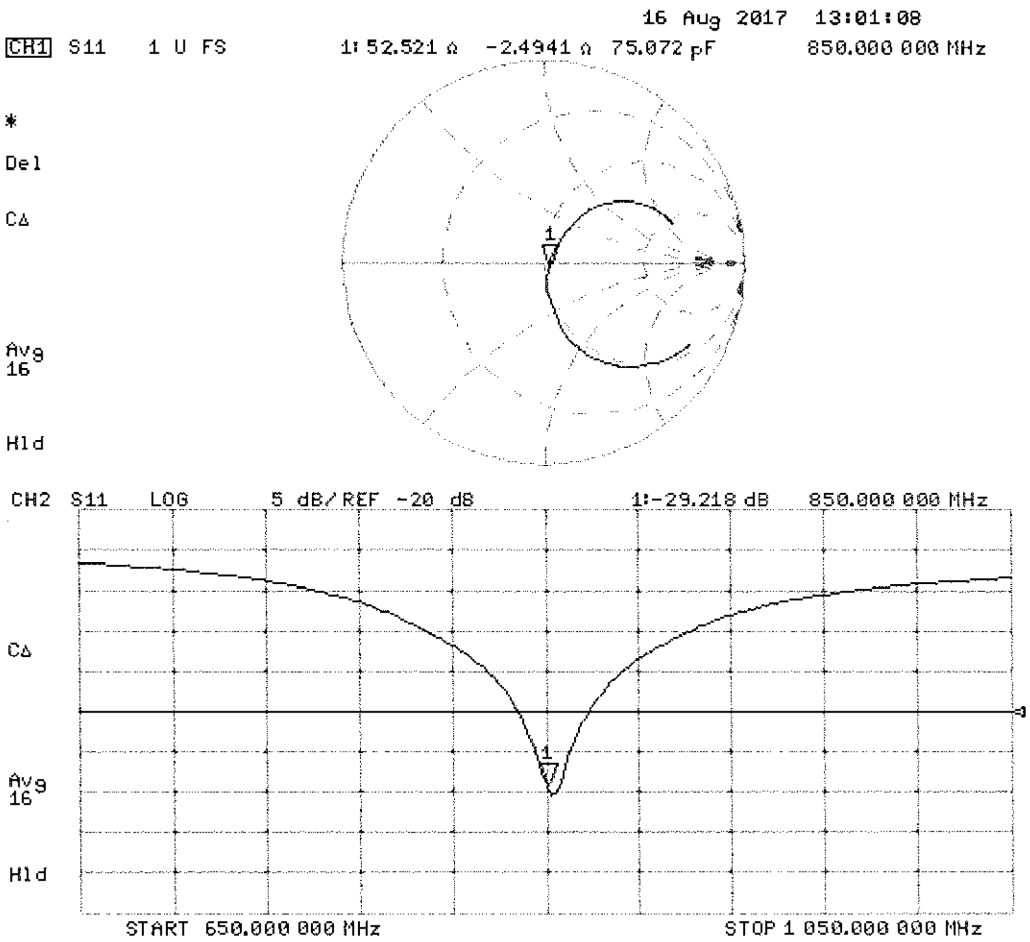
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.35 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.86 W/kg
SAR(1 g) = 2.56 W/kg; SAR(10 g) = 1.66 W/kg
Maximum value of SAR (measured) = 3.43 W/kg



0 dB = 3.43 W/kg = 5.35 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 850 MHz; Type: D850V2; Serial: D850V2 - SN:1009

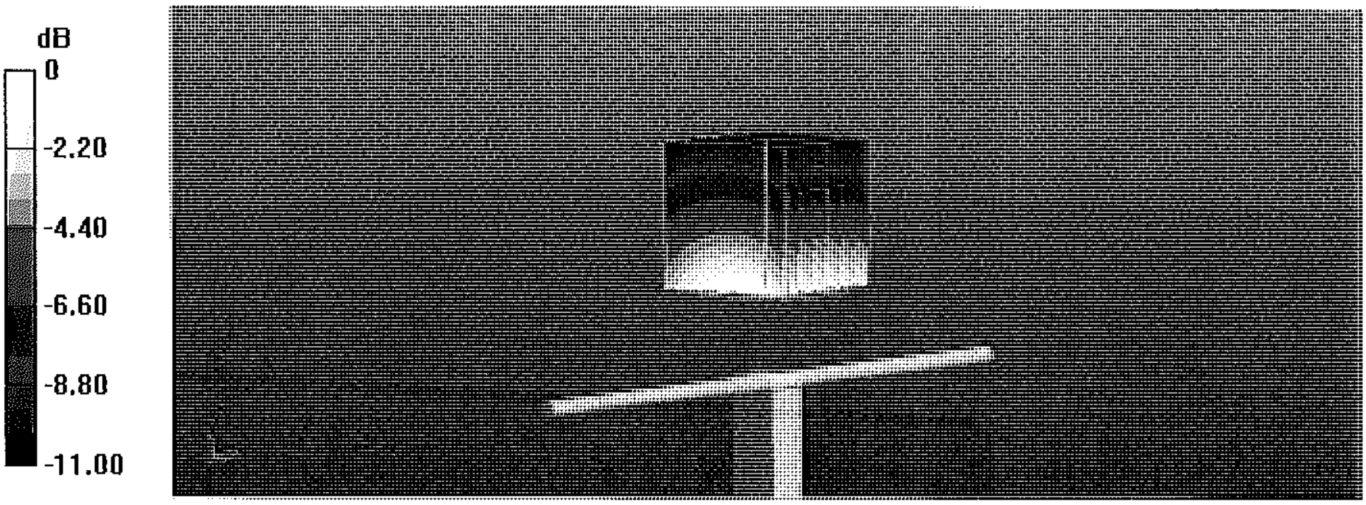
Communication System: UID 0 - CW; Frequency: 850 MHz
Medium parameters used: f = 850 MHz; σ = 1.02 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.11, 10.11, 10.11); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

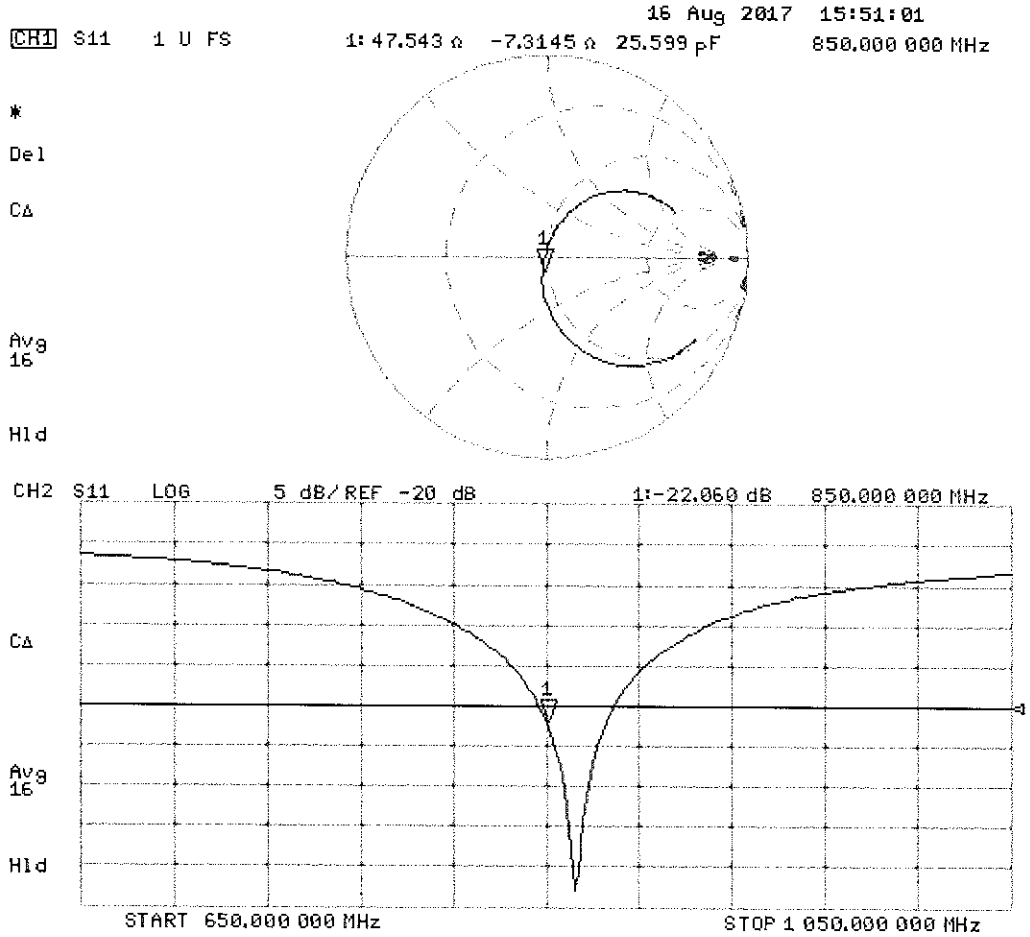
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.51 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.80 W/kg
SAR(1 g) = 2.53 W/kg; SAR(10 g) = 1.65 W/kg
Maximum value of SAR (measured) = 3.35 W/kg



0 dB = 3.35 W/kg = 5.25 dBW/kg

Impedance Measurement Plot for Body TSL



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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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: D835V2-4d180_May17

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d180

BN ✓
05-23-2017

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

Calibration date: May 11, 2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 11, 2017

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	V52.10.0
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	40.8 ± 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	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.26 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.07 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	55.2 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.61 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.32 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.9 Ω - 5.0 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.7 Ω - 8.6 jΩ
Return Loss	- 20.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.393 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 24, 2014

DASY5 Validation Report for Head TSL

Date: 11.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

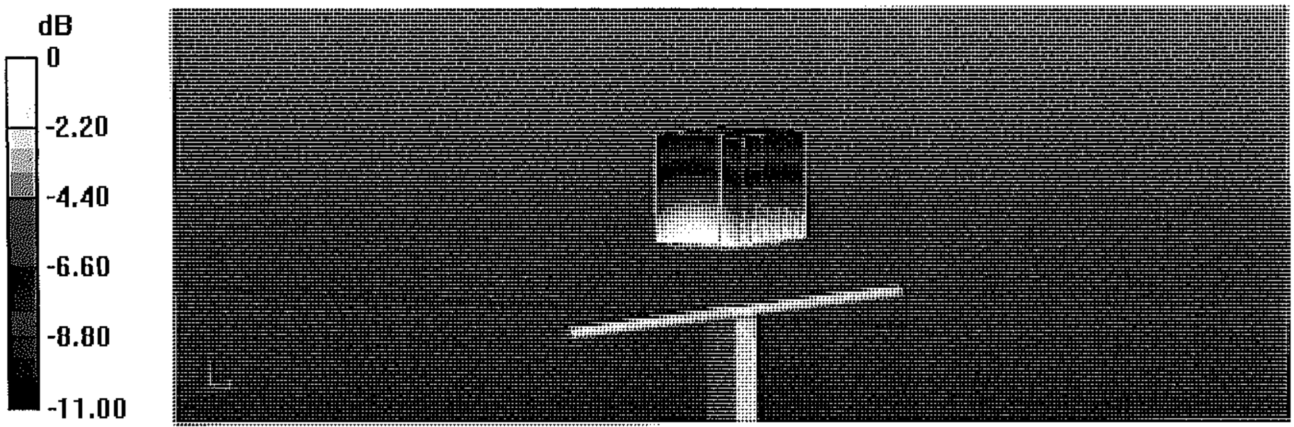
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.94$ S/m; $\varepsilon_r = 40.8$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

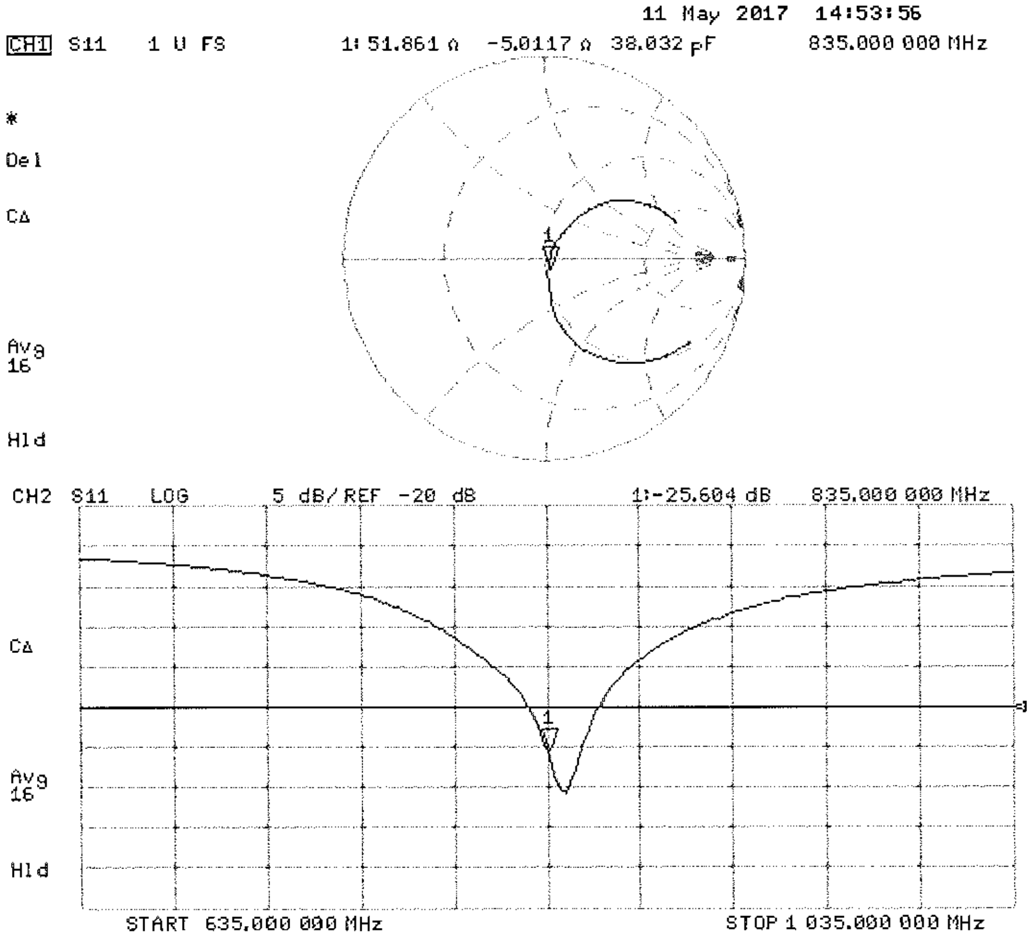
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.02 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

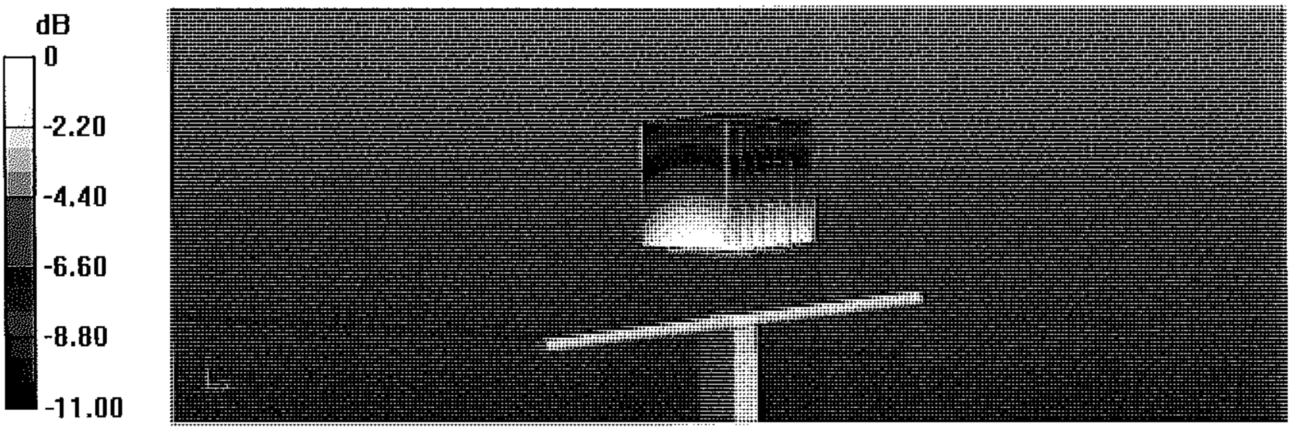
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.99$ S/m; $\varepsilon_r = 55.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

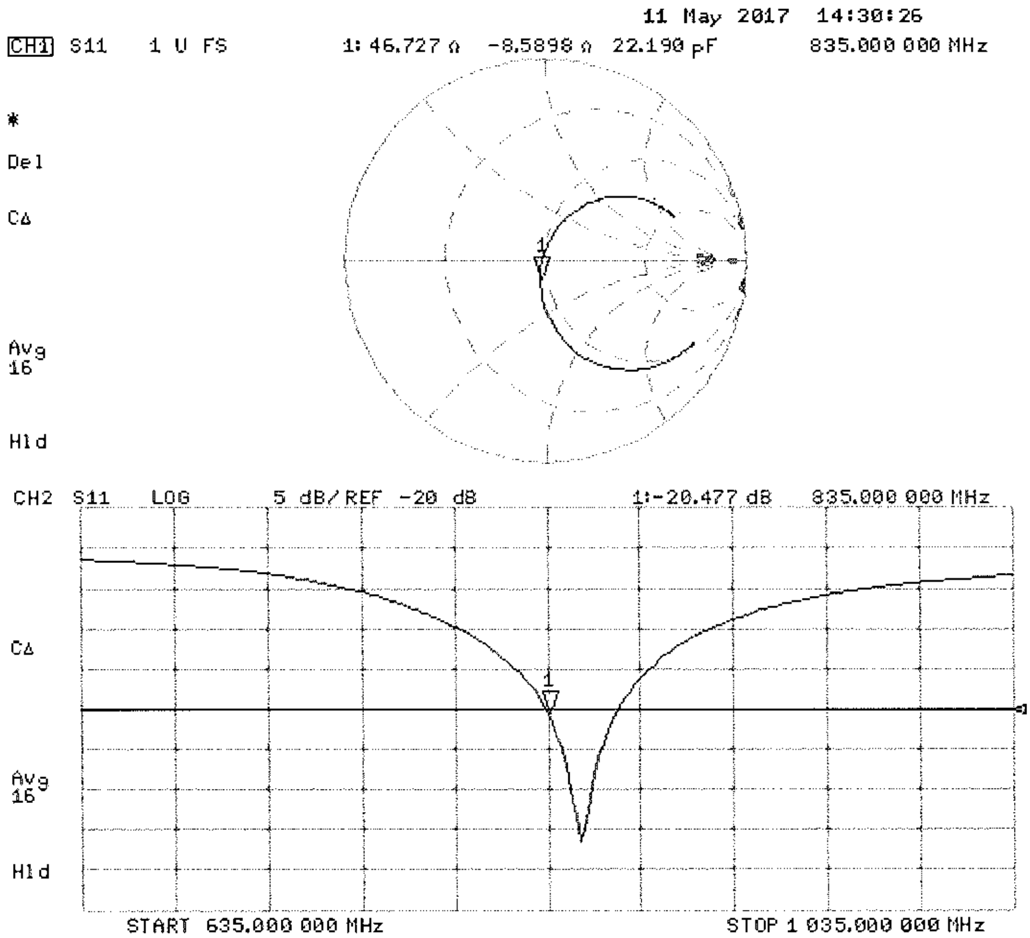
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.10 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.19 W/kg



0 dB = 3.19 W/kg = 5.04 dBW/kg

Impedance Measurement Plot for Body TSL



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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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: D1750V2-1150_Jul16

CALIBRATION CERTIFICATE

Object	D1750V2 - SN:1150
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 14, 2016

√PN 8/9/16

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

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	38.8 ± 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	9.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 Ω + 0.4 jΩ
Return Loss	- 40.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.4 Ω - 0.5 jΩ
Return Loss	- 28.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.218 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 10, 2015

DASY5 Validation Report for Head TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

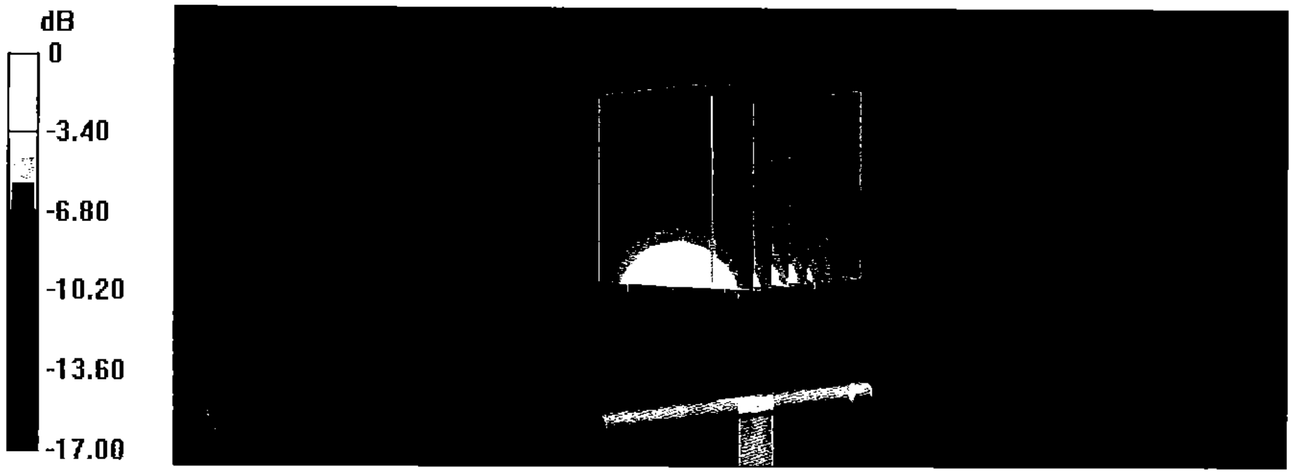
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); 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)

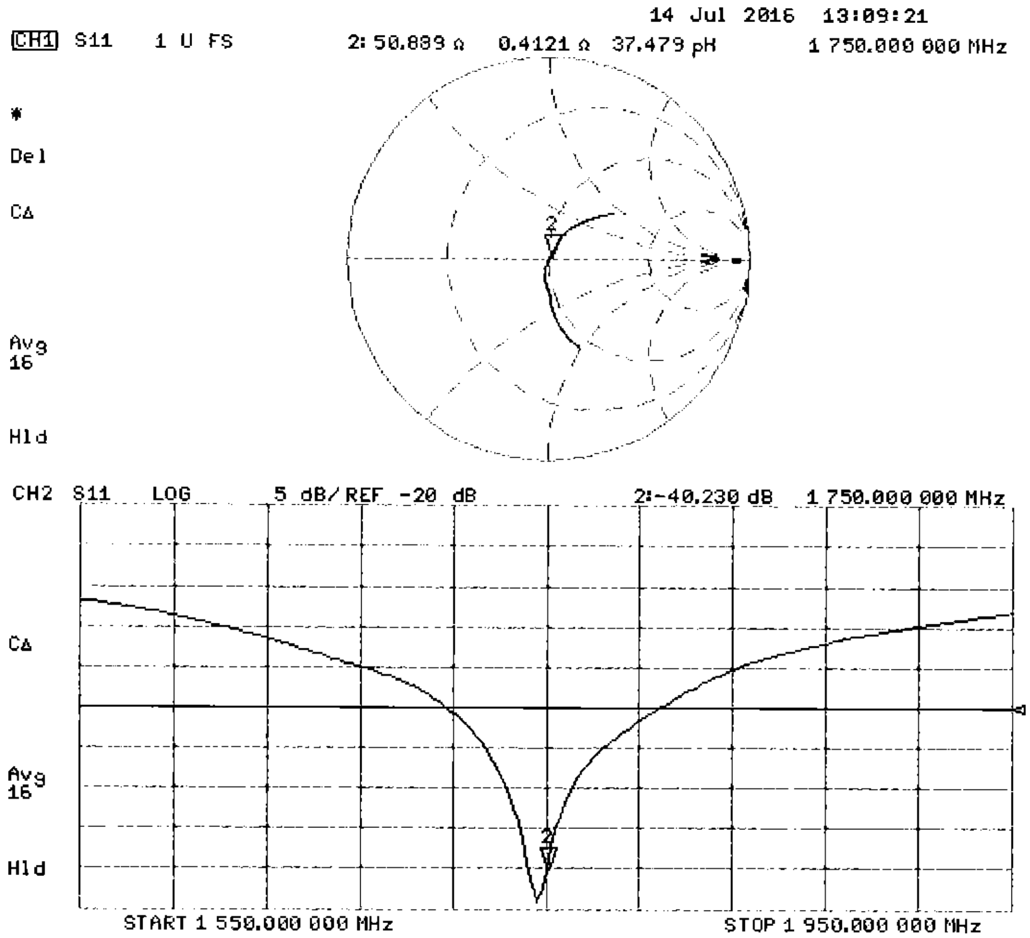
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.4 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.8 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

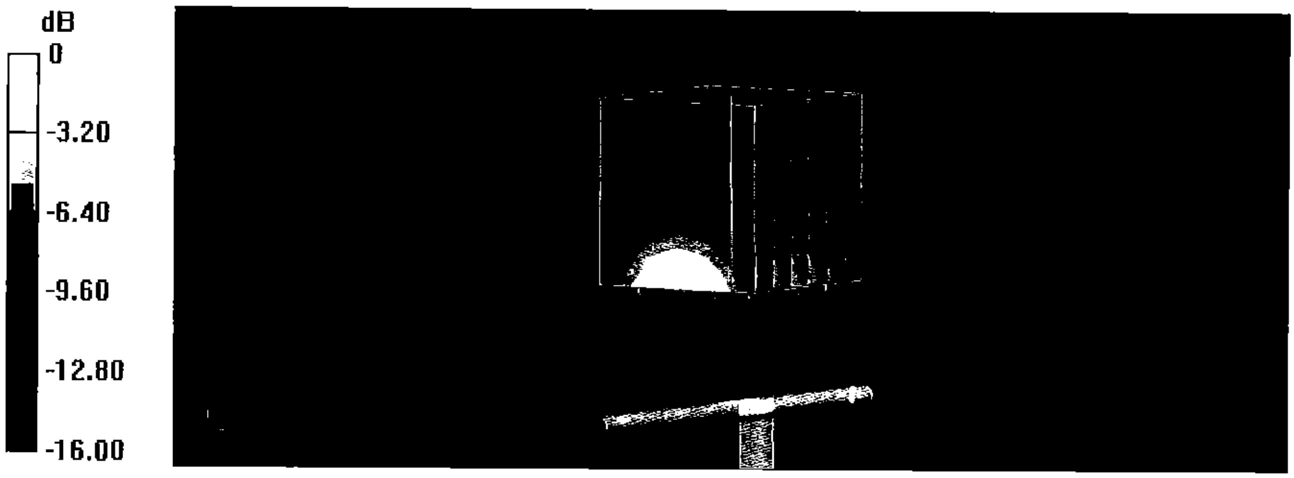
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.48 S/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 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)

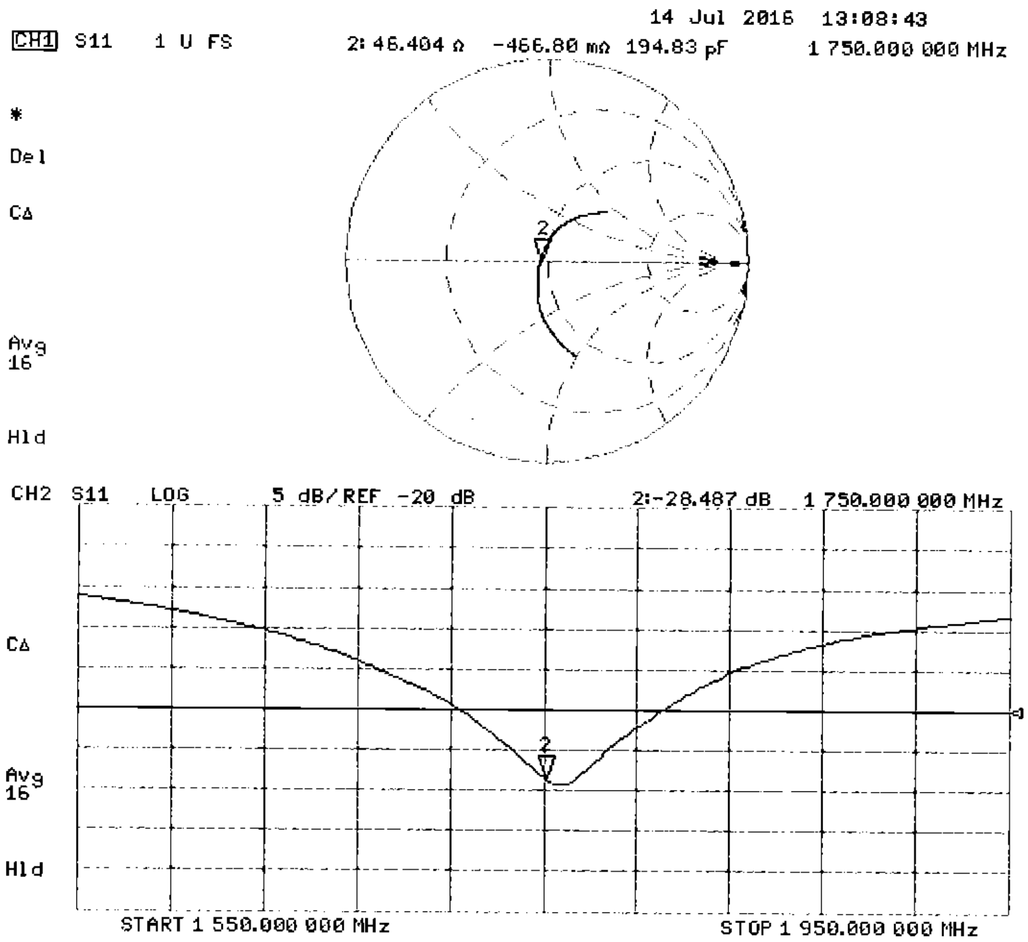
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.4 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.09 W/kg; SAR(10 g) = 4.85 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

Impedance Measurement Plot for Body TSL



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

Certification of Calibration

Object	D1750V2 – SN: 1150
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 07, 2017
Description:	SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

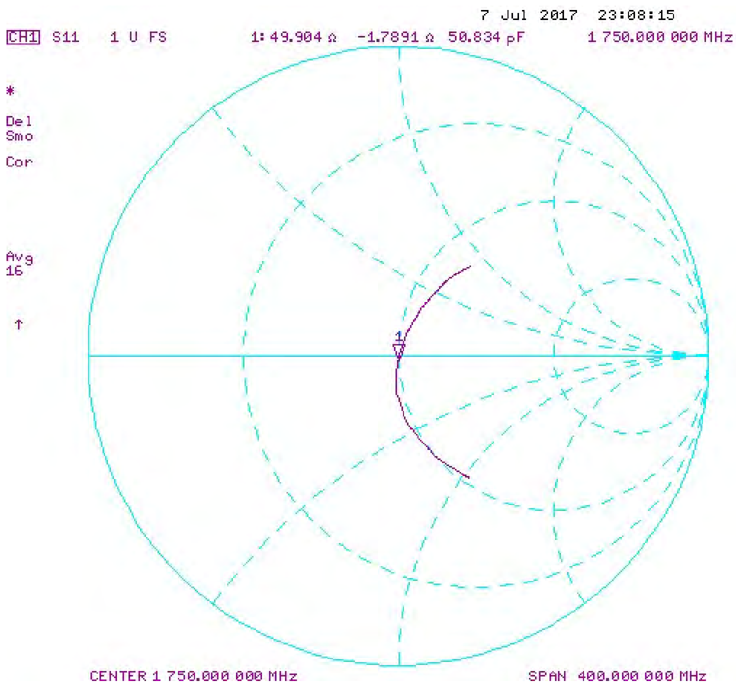
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

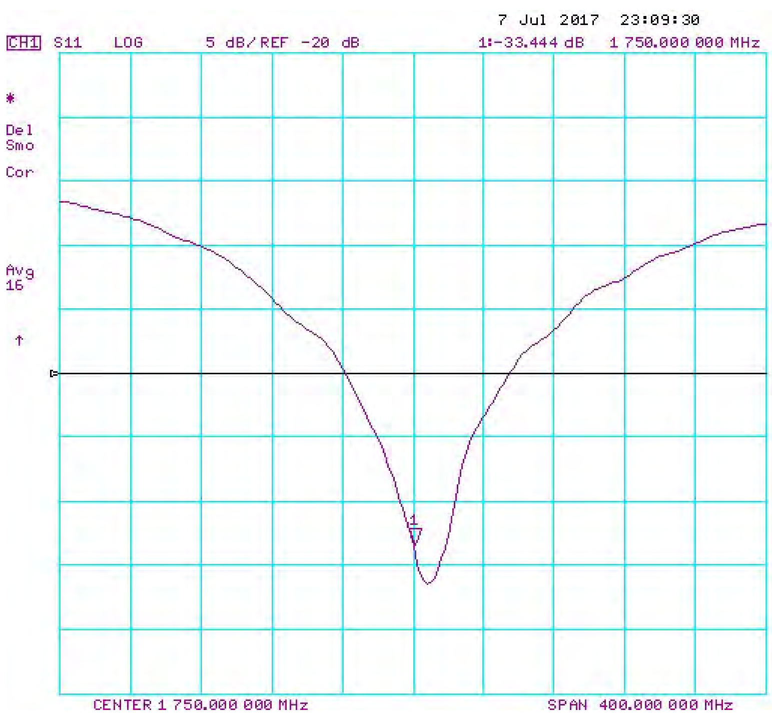
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.61	3.57	-1.11%	1.92	1.88	-2.08%	50.9	49.9	1	0.4	-1.8	2.1	-40.2	-33.4	16.90%	PASS

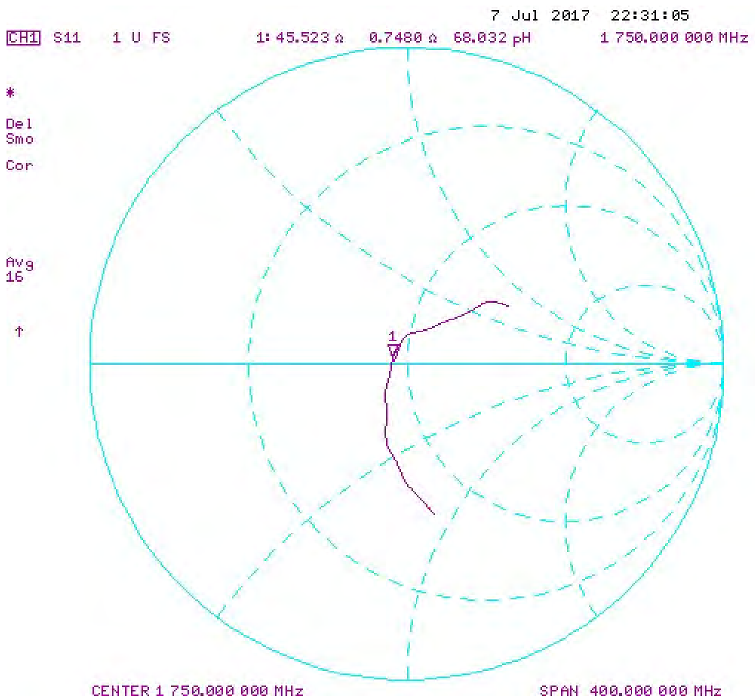
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.65	3.68	0.82%	1.95	1.97	1.03%	46.4	45.5	0.9	-0.5	0.7	1.2	-28.5	-23.6	17.20%	PASS

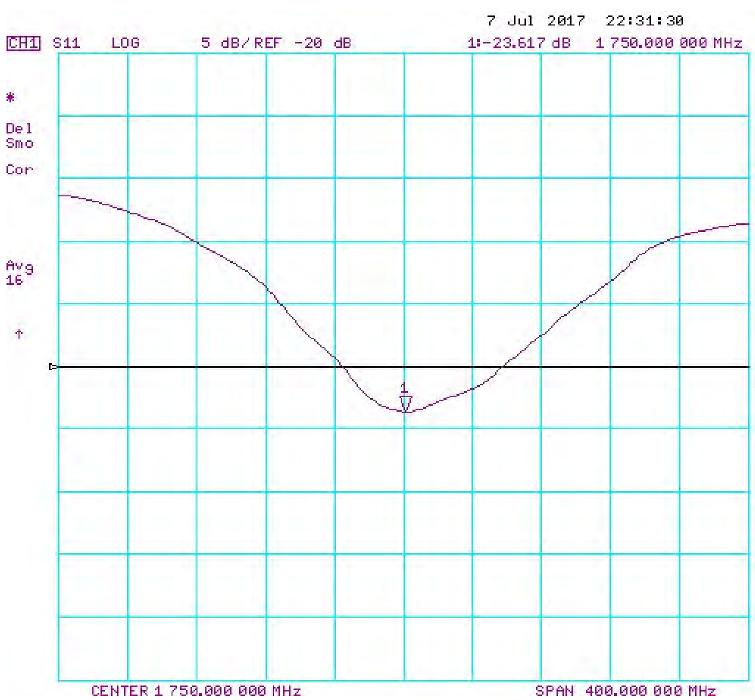
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





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

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

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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D1750V2-1092_May17**

CALIBRATION CERTIFICATE

Object D1750V2 - SN:1092

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

BN ✓
05-23-2017

Calibration date: May 09, 2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: May 11, 2017

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	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.83 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.3 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	53.7 ± 6 %	1.47 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	9.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.93 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 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	48.9 Ω - 0.5 jΩ
Return Loss	- 38.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.2 Ω - 0.8 jΩ
Return Loss	- 25.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.217 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 07, 2012

DASY5 Validation Report for Head TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

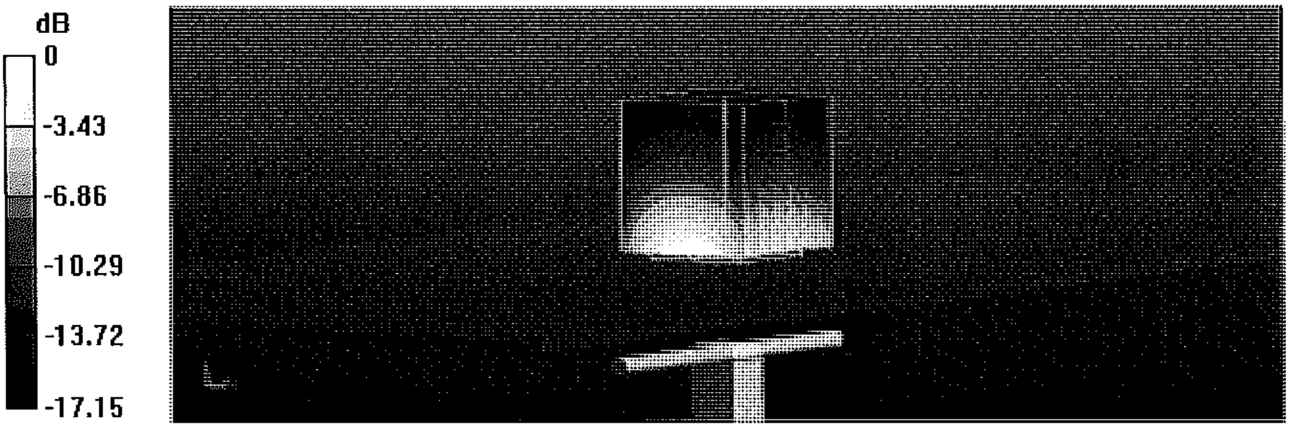
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.0(1442); SEMCAD X 14.6.10(7413)

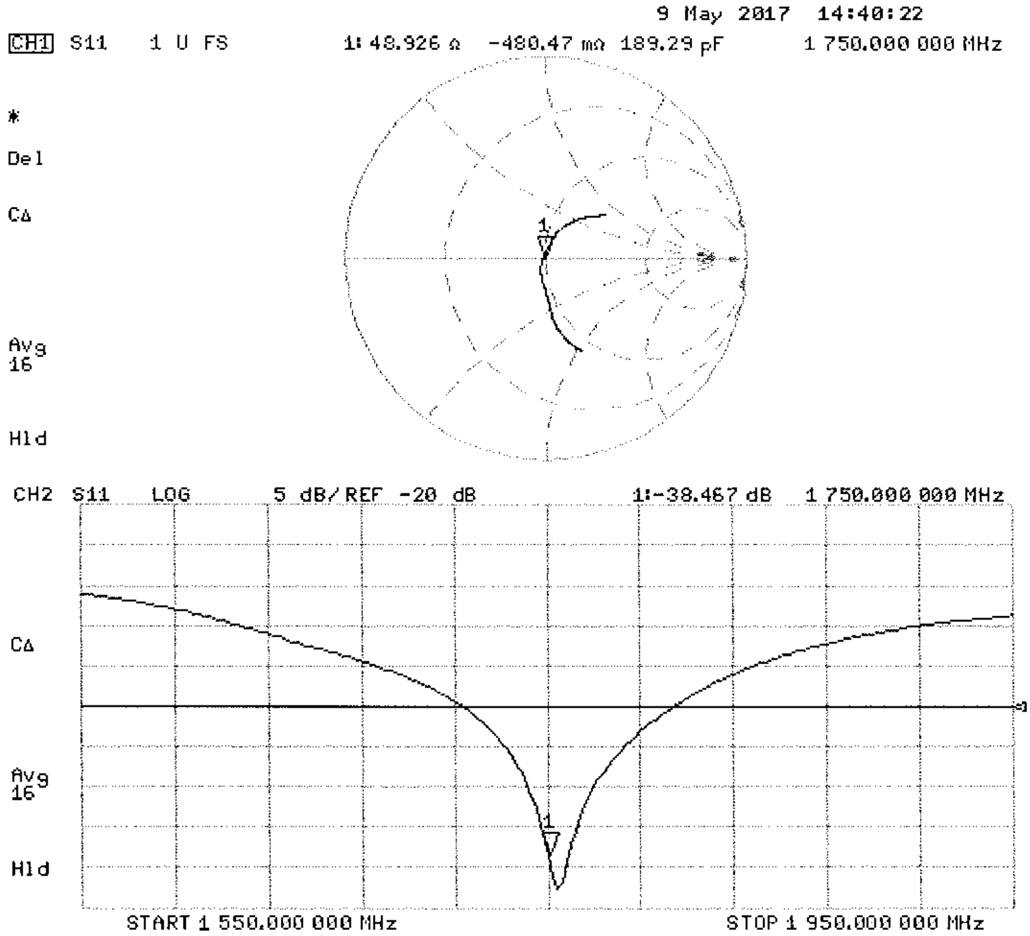
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.6 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.11 W/kg; SAR(10 g) = 4.83 W/kg
Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

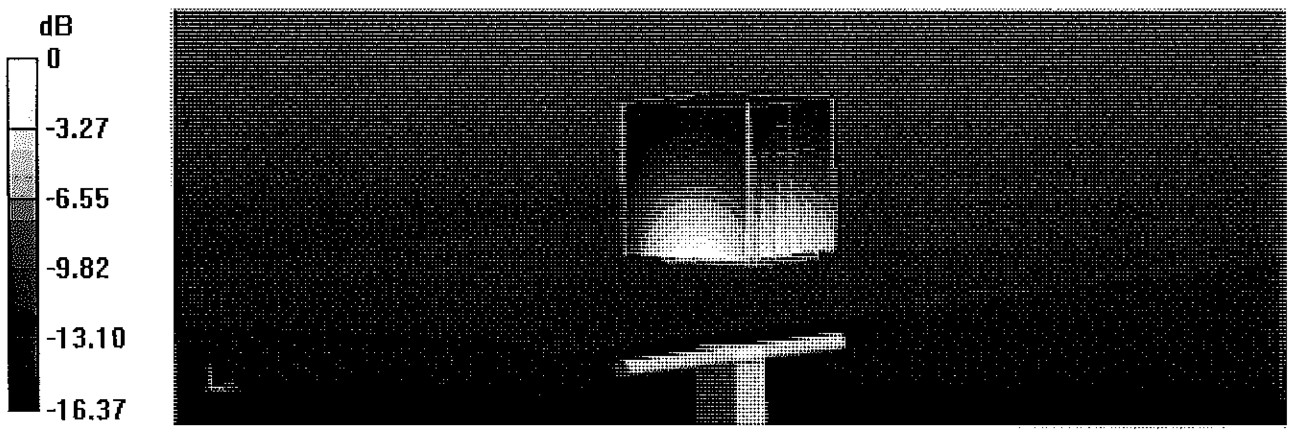
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.47 S/m; ε_r = 53.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1442); SEMCAD X 14.6.10(7413)

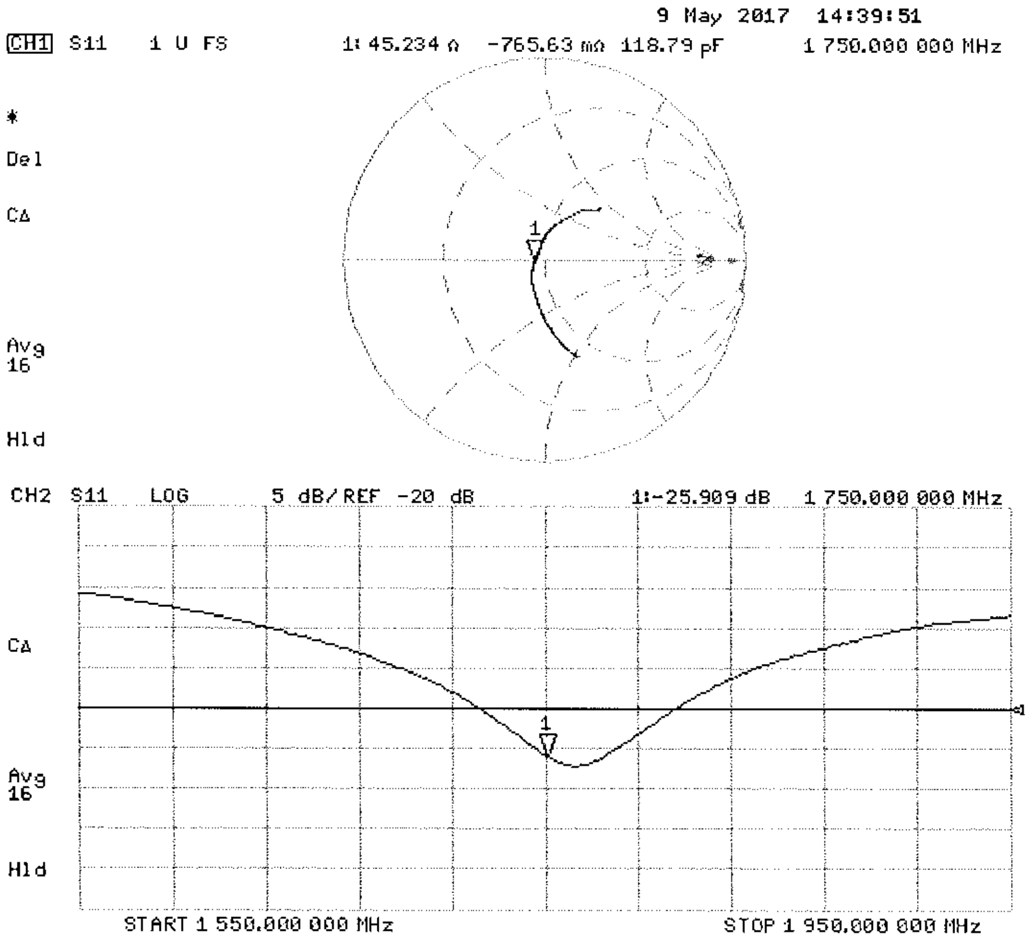
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.81 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9.15 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
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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: **D1900V2-5d026_May17**

CALIBRATION CERTIFICATE

Object: D1900V2 - SN:5d026

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

BNV
05-23-2017

Calibration date: May 10, 2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	Leif Klysner
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 12, 2017

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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**

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	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.3 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.75 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.7 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	54.2 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.0 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.34 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.5 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	52.7 Ω + 8.4 jΩ
Return Loss	- 21.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω + 8.8 jΩ
Return Loss	- 20.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

DASY5 Validation Report for Head TSL

Date: 10.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

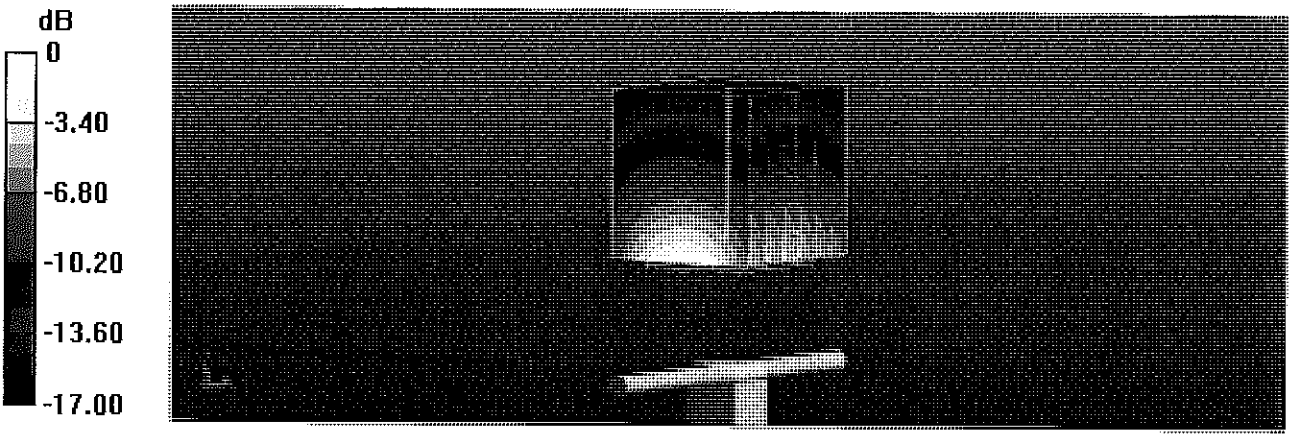
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 S/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

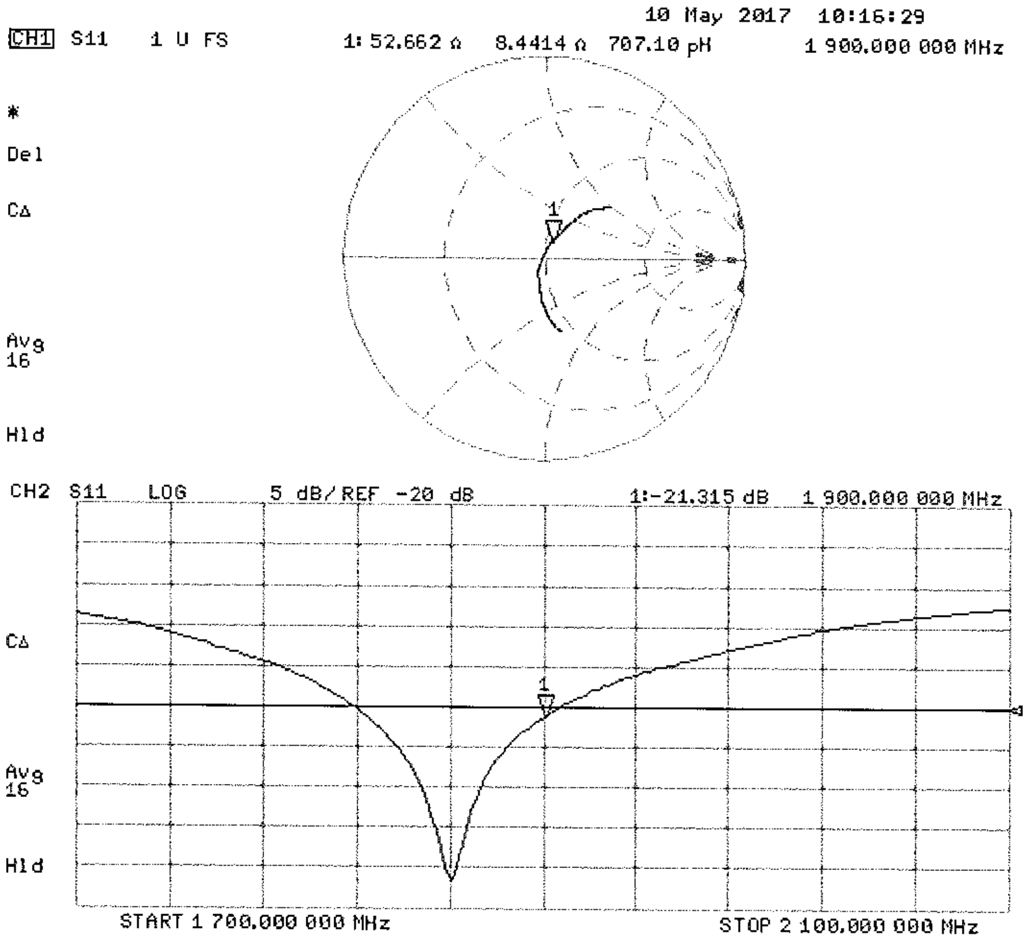
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.4 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 9.75 W/kg; SAR(10 g) = 5.14 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 Head TSL



DASY5 Validation Report for Body TSL

Date: 10.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

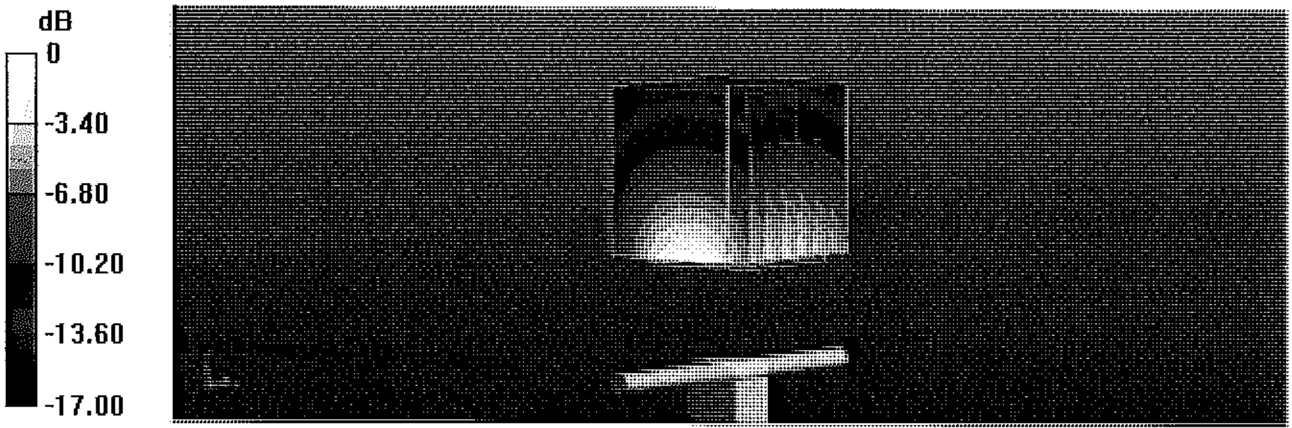
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.51 S/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

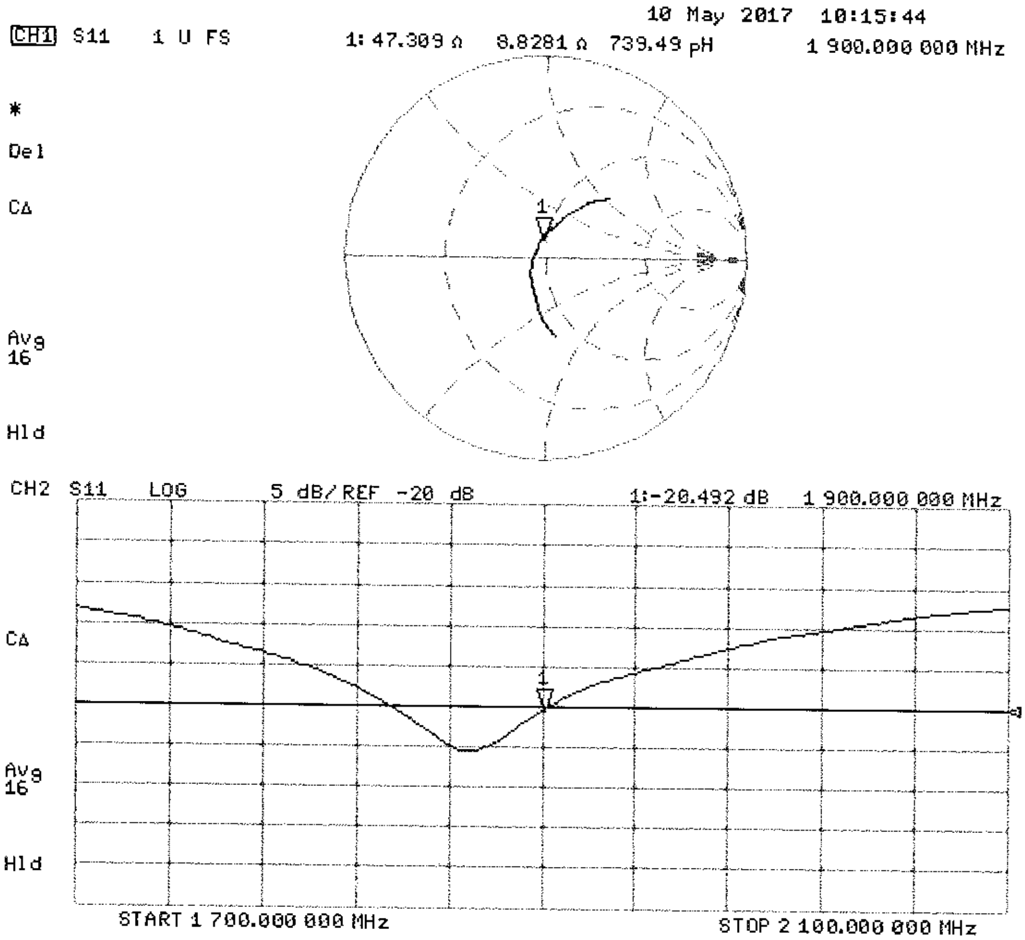
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.9 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.34 W/kg
Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg

Impedance Measurement Plot for Body TSL



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S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D2450V2-981_Jul16

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:981
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 25, 2016

VPM
8/9/16

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

Issued: July 27, 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	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.0 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.8 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	**24.7 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	2.03 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	**50.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.04 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**23.8 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	53.2 Ω + 3.4 jΩ
Return Loss	- 26.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω + 4.5 jΩ
Return Loss	- 27.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 30, 2014

DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

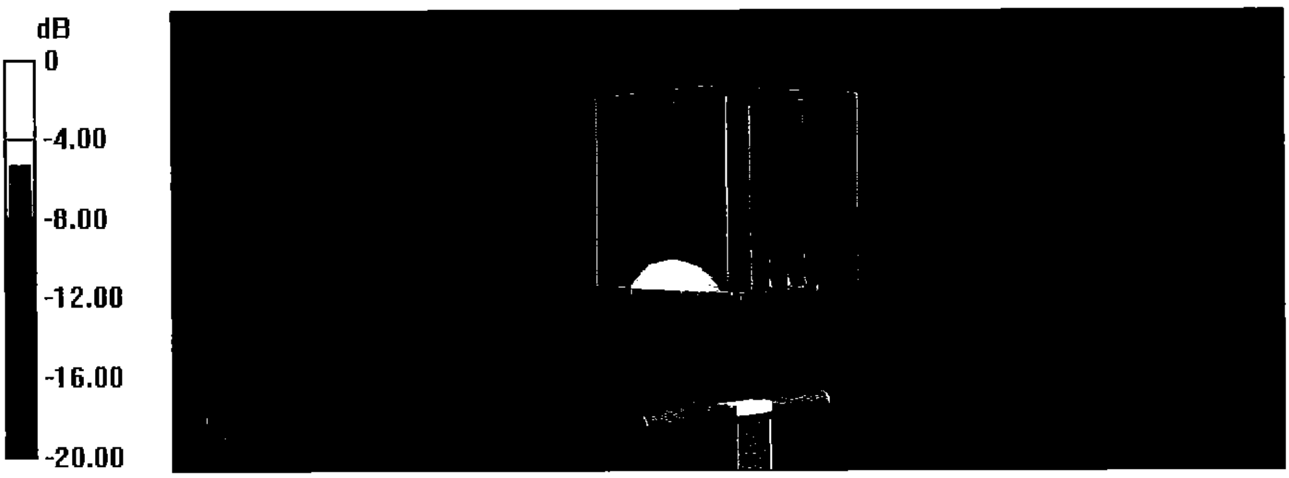
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

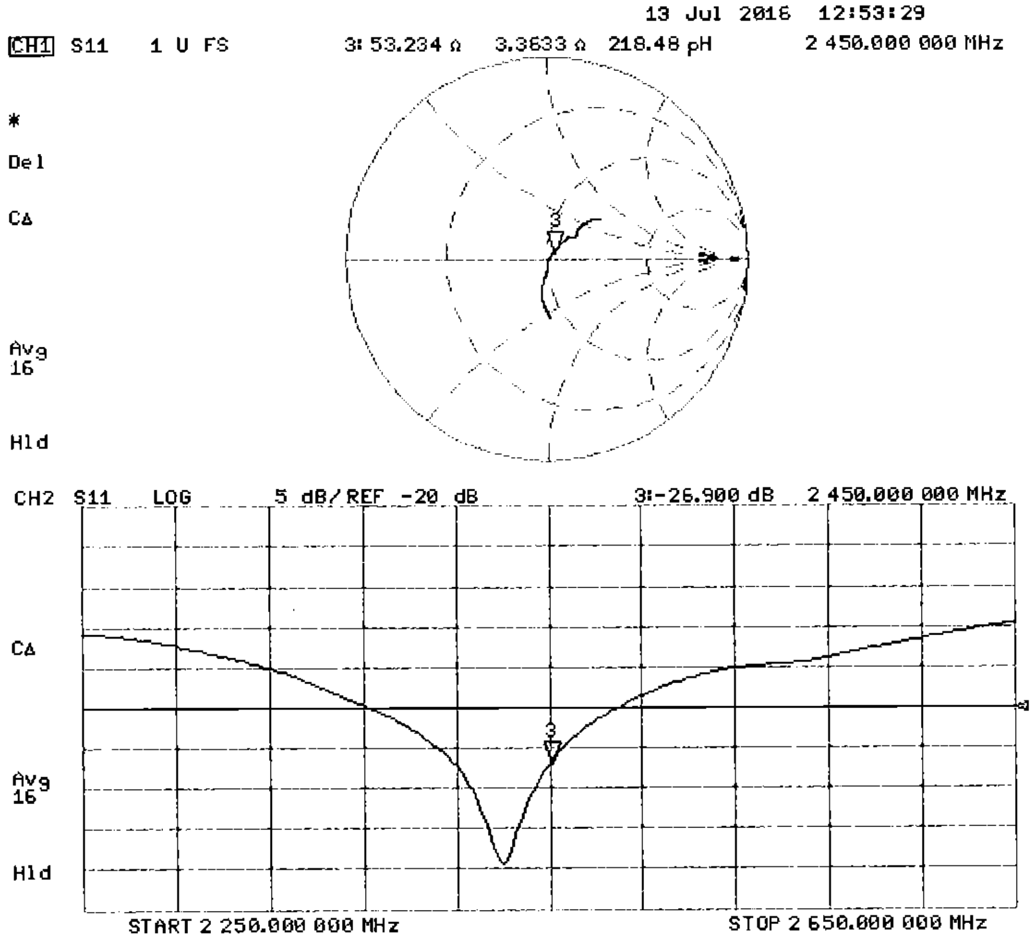
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 115.8 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR (measured) = 22.5 W/kg



0 dB = 22.5 W/kg = 13.52 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 25.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.03 S/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

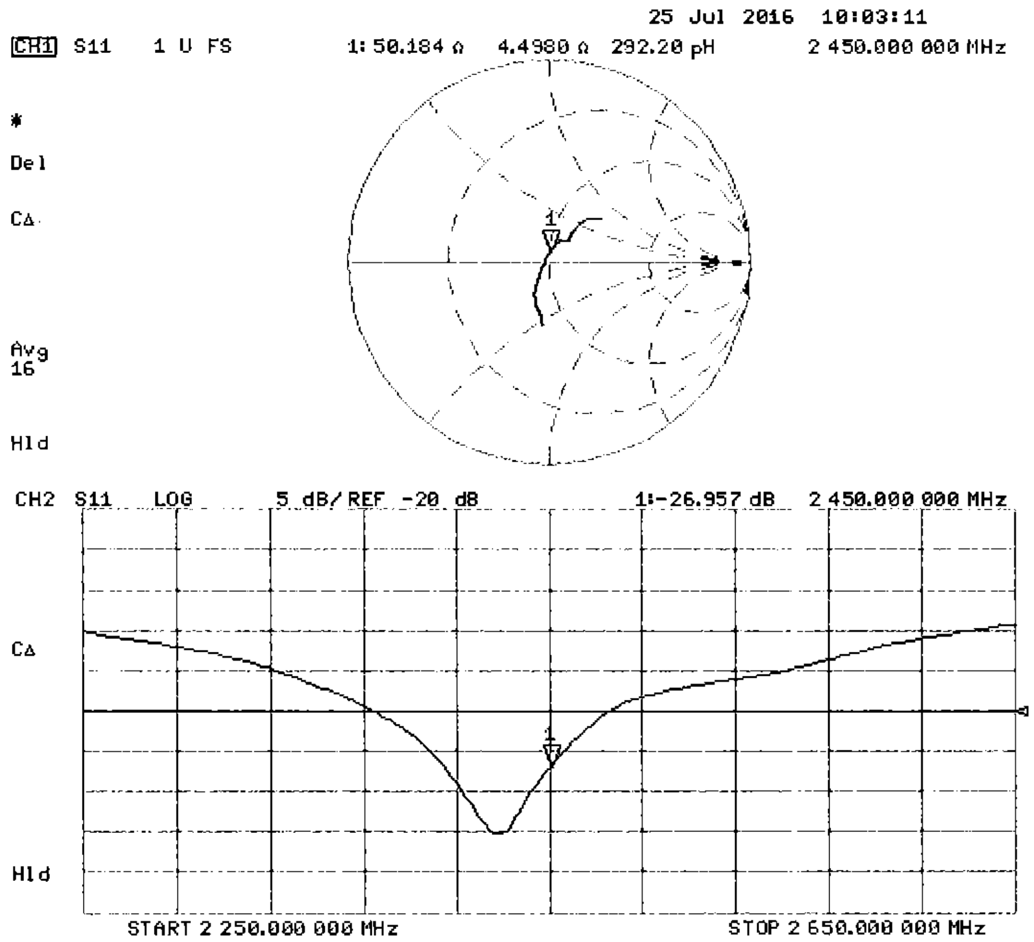
- Probe: EX3DV4 - SN7349; ConvF(7.79, 7.79, 7.79); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

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 = 107.1 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 26.0 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 6.04 W/kg
Maximum value of SAR (measured) = 21.4 W/kg

0 dB = 21.4 W/kg = 13.30 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object	D2450V2 – SN: 981
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 24, 2017
Description:	SAR Validation Dipole at 2450 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

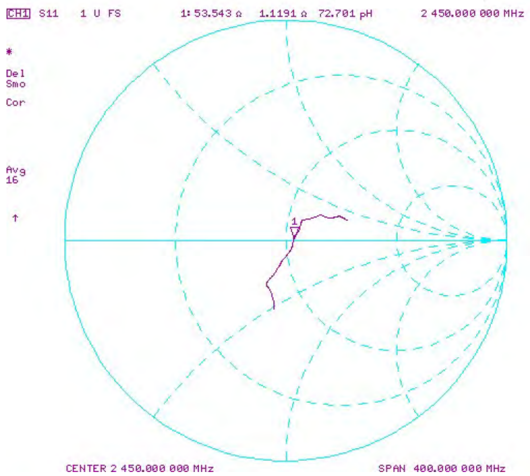
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

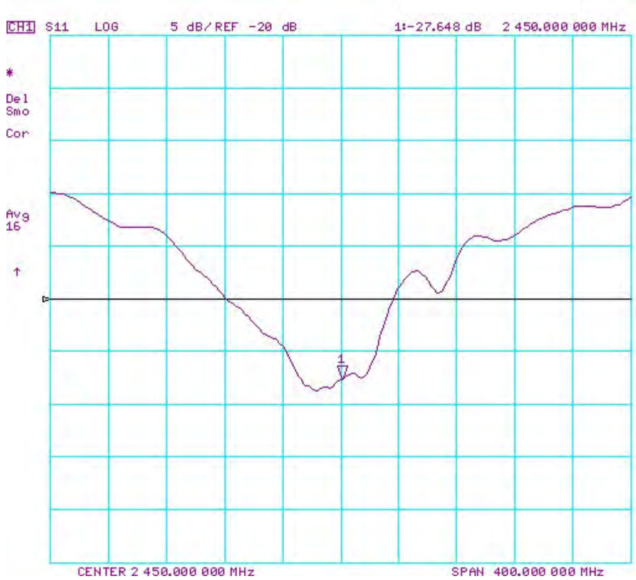
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/25/2016	7/24/2017	1.162	5.28	5.57	5.49%	2.47	2.56	3.64%	53.2	53.5	0.3	3.4	1.1	2.3	-26.9	-27.6	-2.60%	PASS

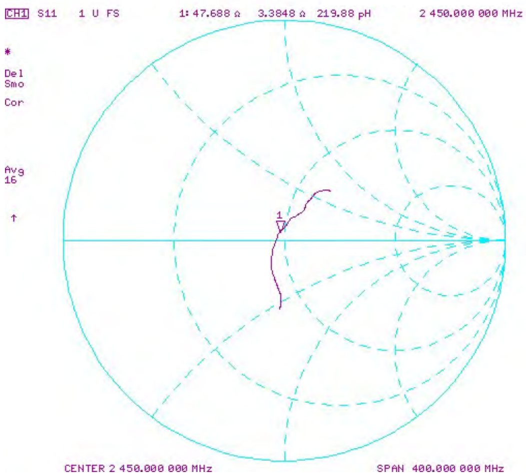
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/25/2016	7/24/2017	1.162	5.08	5.34	5.12%	2.38	2.39	0.42%	50.2	47.7	2.5	4.5	3.4	1.1	-27.0	-27.6	-2.20%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL



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S Schweizerischer Kalibrierdienst
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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: D2600V2-1126_Jul17

CALIBRATION CERTIFICATE

Object	D2600V2 - SN:1126
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 10, 2017

BN✓ 8/3/2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: July 11, 2017

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.2 ± 6 %	2.04 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	14.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**56.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.6 ± 6 %	2.22 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	13.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**54.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.4 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.8 Ω - 7.7 jΩ
Return Loss	- 21.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.8 Ω - 5.8 jΩ
Return Loss	- 21.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.154 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 22, 2015

DASY5 Validation Report for Head TSL

Date: 10.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

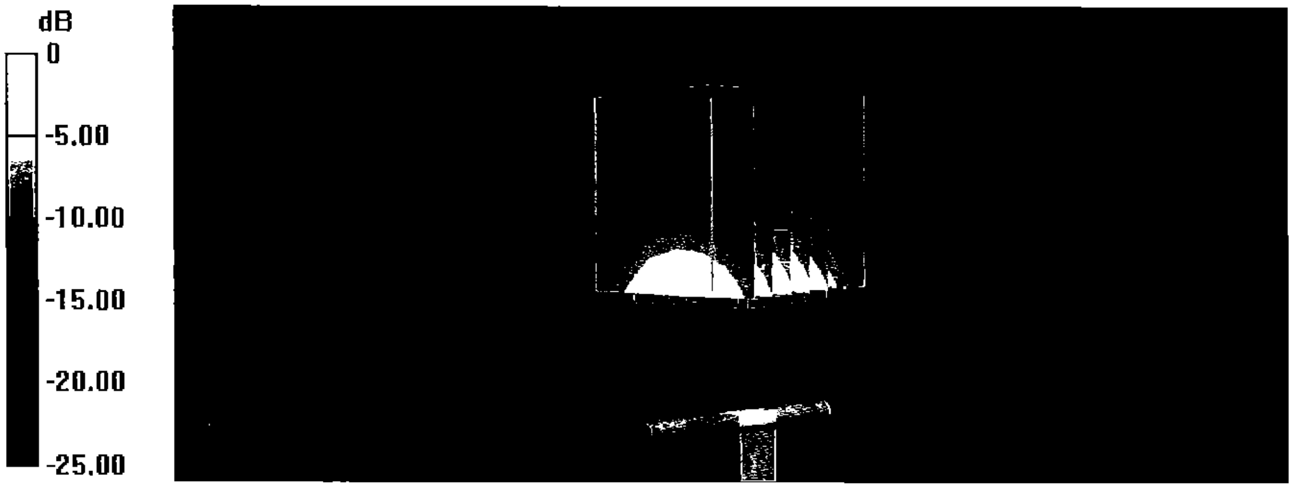
Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.04 S/m; ε_r = 37.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

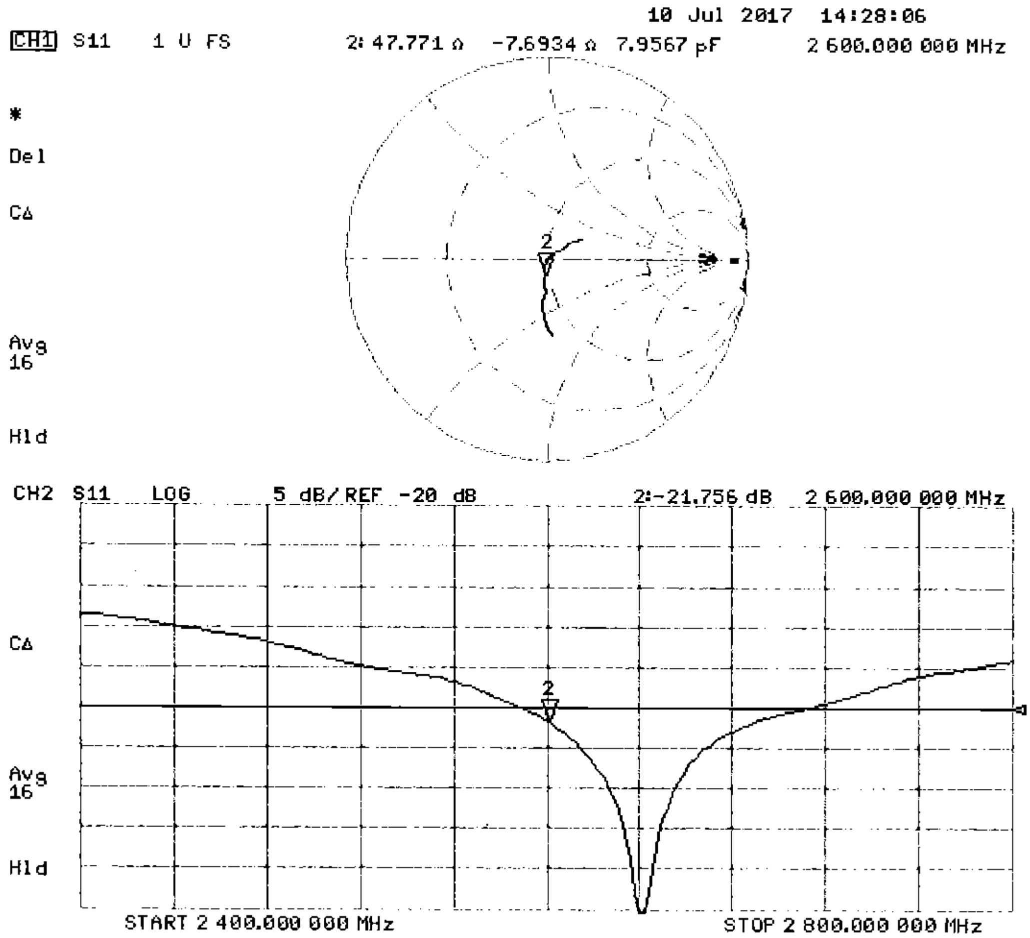
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 113.2 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 31.3 W/kg
SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.4 W/kg
Maximum value of SAR (measured) = 24.0 W/kg



0 dB = 24.0 W/kg = 13.80 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 10.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

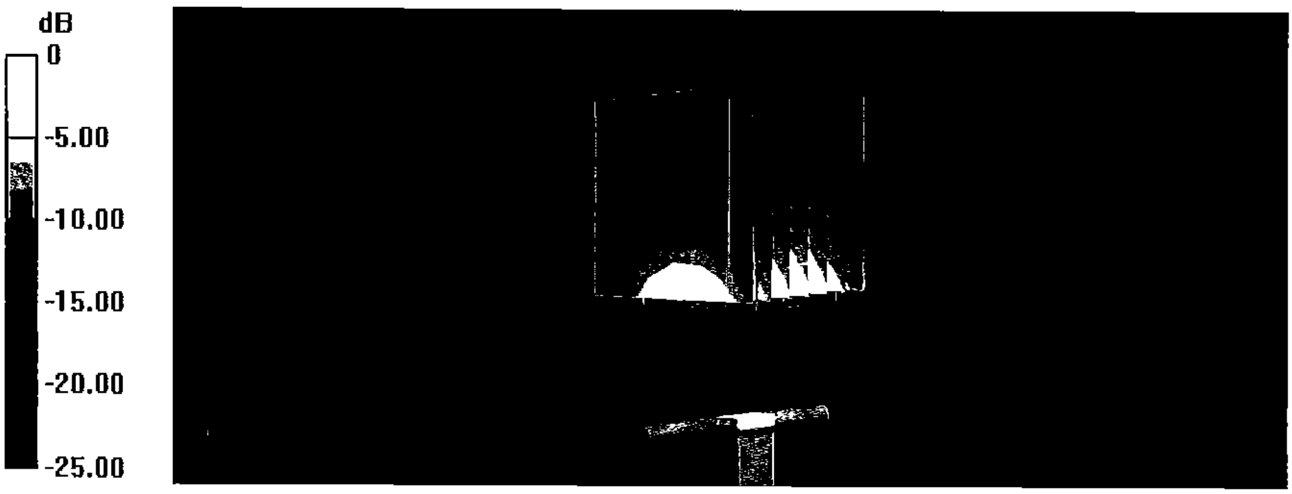
Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; $\sigma = 2.22$ S/m; $\varepsilon_r = 51.6$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

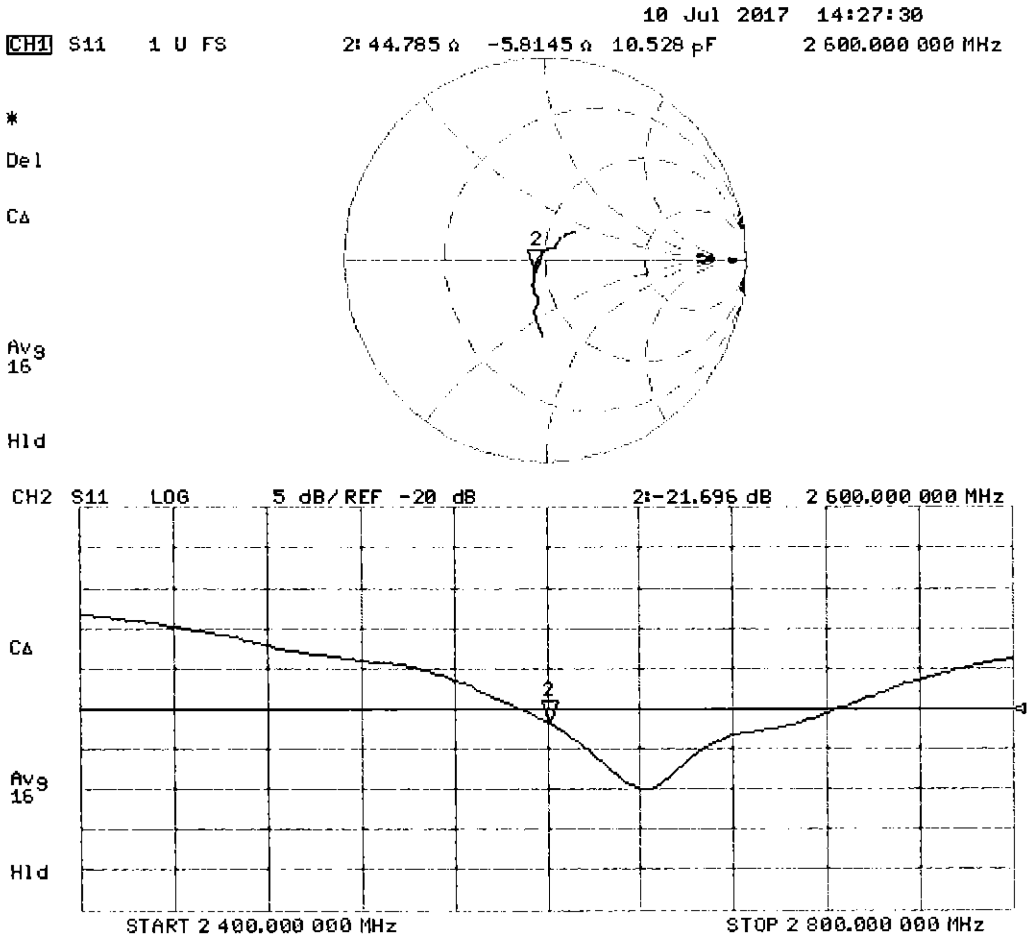
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.8 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.16 W/kg
Maximum value of SAR (measured) = 22.2 W/kg



0 dB = 22.2 W/kg = 13.46 dBW/kg

Impedance Measurement Plot for Body TSL



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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: D5GHzV2-1191_Sep16

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN:1191
Calibration procedure(s)	QA CAL-22.v2 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	September 21, 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: 3503	30-Jun-16 (No. EX3-3503_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:	Leif Klysner	Laboratory Technician	Leif Klysner
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 22, 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 62209-2, "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
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.5 ± 6 %	4.59 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**78.9 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.6 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.0 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**83.6 W / kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.8 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.8 ± 6 %	5.08 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.4 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.74 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**77.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.6 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	6.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**79.2 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**22.2 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	6.21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**76.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.2 W/kg ± 19.5 % (k=2)**

((

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	55.7 Ω - 4.3 jΩ
Return Loss	- 23.4 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	58.3 Ω - 3.2 jΩ
Return Loss	- 21.8 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	58.1 Ω + 4.8 jΩ
Return Loss	- 21.2 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	56.1 Ω - 3.7 jΩ
Return Loss	- 23.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.9 Ω - 1.7 jΩ
Return Loss	- 21.7 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	59.5 Ω + 6.9 jΩ
Return Loss	- 19.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.204 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 28, 2003

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DASY5 Validation Report for Head TSL

Date: 21.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: f = 5250 MHz; σ = 4.59 S/m; ε_r = 34.5; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 4.93 S/m; ε_r = 34; ρ = 1000 kg/m^3 , Medium parameters used: f = 5750 MHz; σ = 5.08 S/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

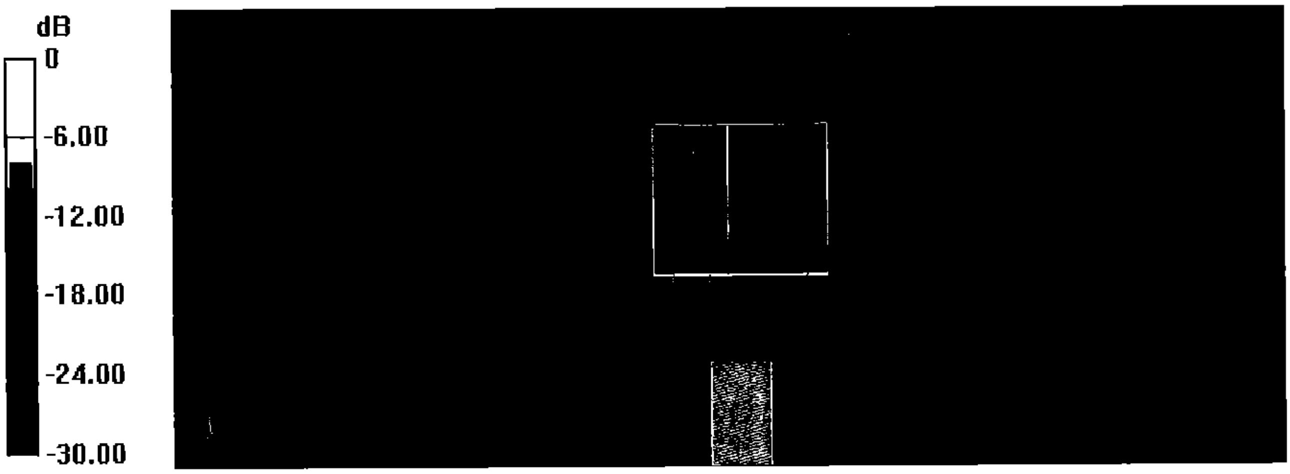
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.42, 5.42, 5.42); Calibrated: 30.06.2016, ConvF(4.89, 4.89, 4.89); Calibrated: 30.06.2016, ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016;
- 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=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.49 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 28.6 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 18.2 W/kg

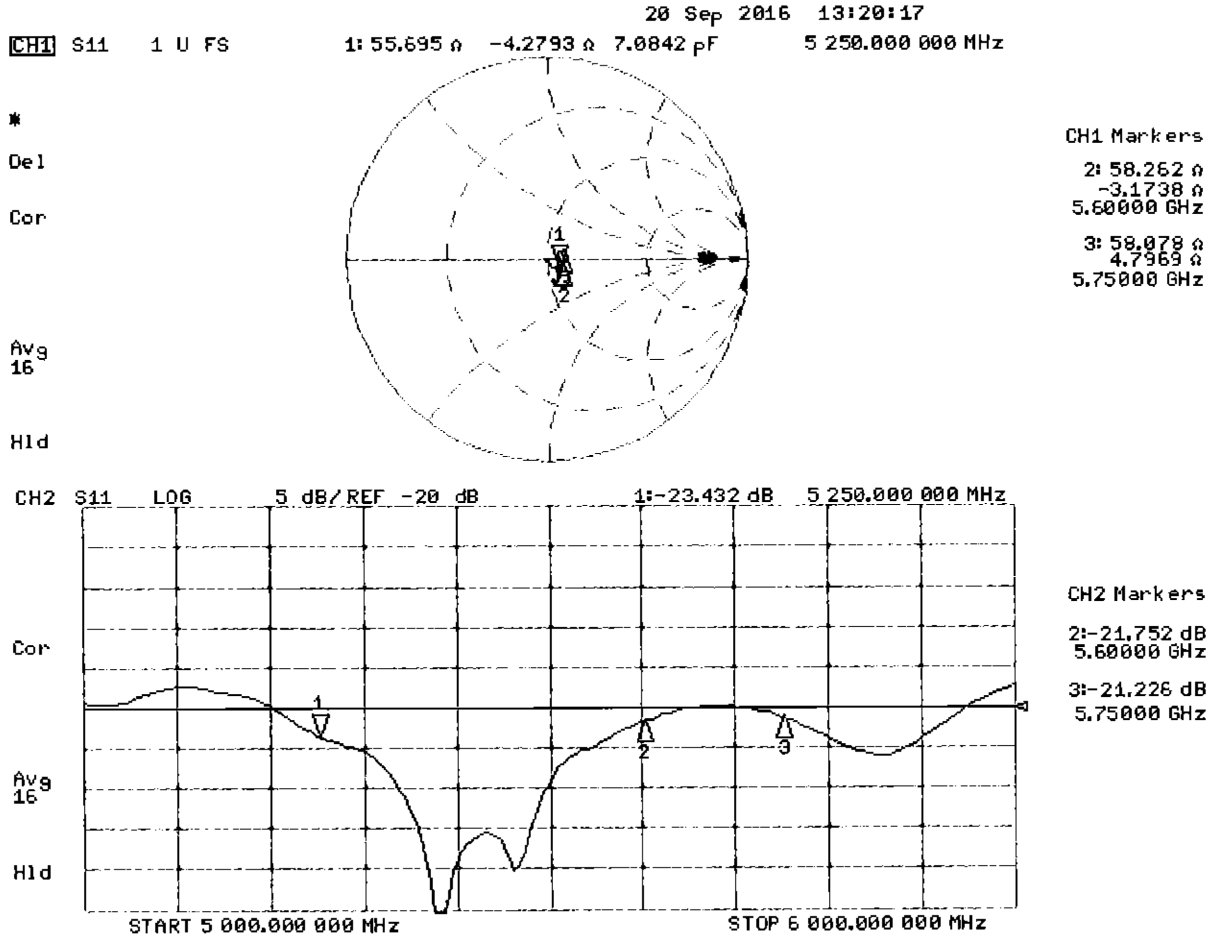
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.34 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg
Maximum value of SAR (measured) = 20.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.15 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 20.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: f = 5250 MHz; σ = 5.52 S/m; ε_r = 47.4; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 6 S/m; ε_r = 46.8; ρ = 1000 kg/m^3 , Medium parameters used: f = 5750 MHz; σ = 6.21 S/m; ε_r = 46.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

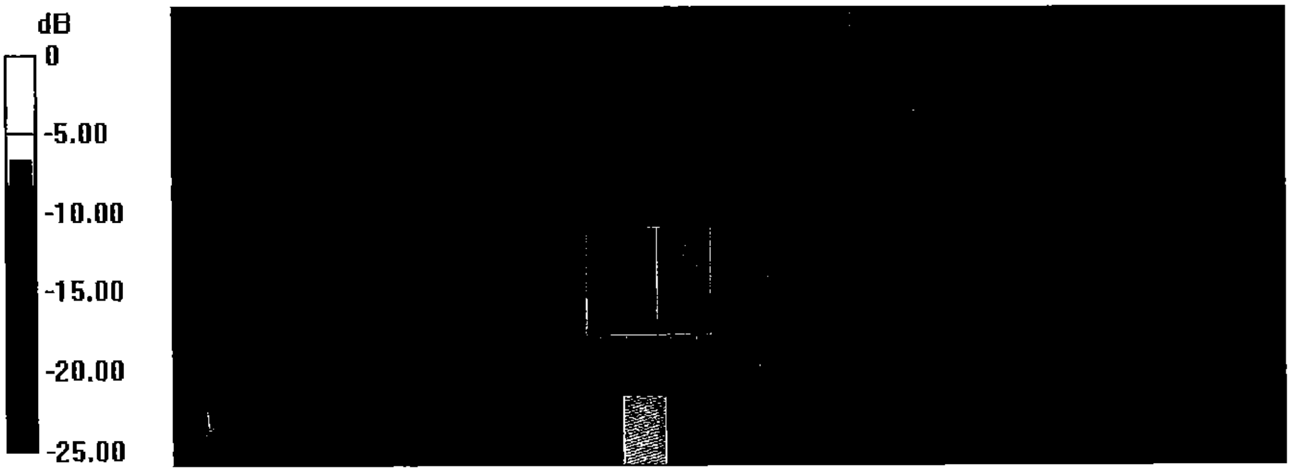
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016, ConvF(4.35, 4.35, 4.35); Calibrated: 30.06.2016, ConvF(4.3, 4.3, 4.3); Calibrated: 30.06.2016;
- 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=100mW, dist=10mm, f=5250MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.49 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 29.1 W/kg
SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 17.7 W/kg

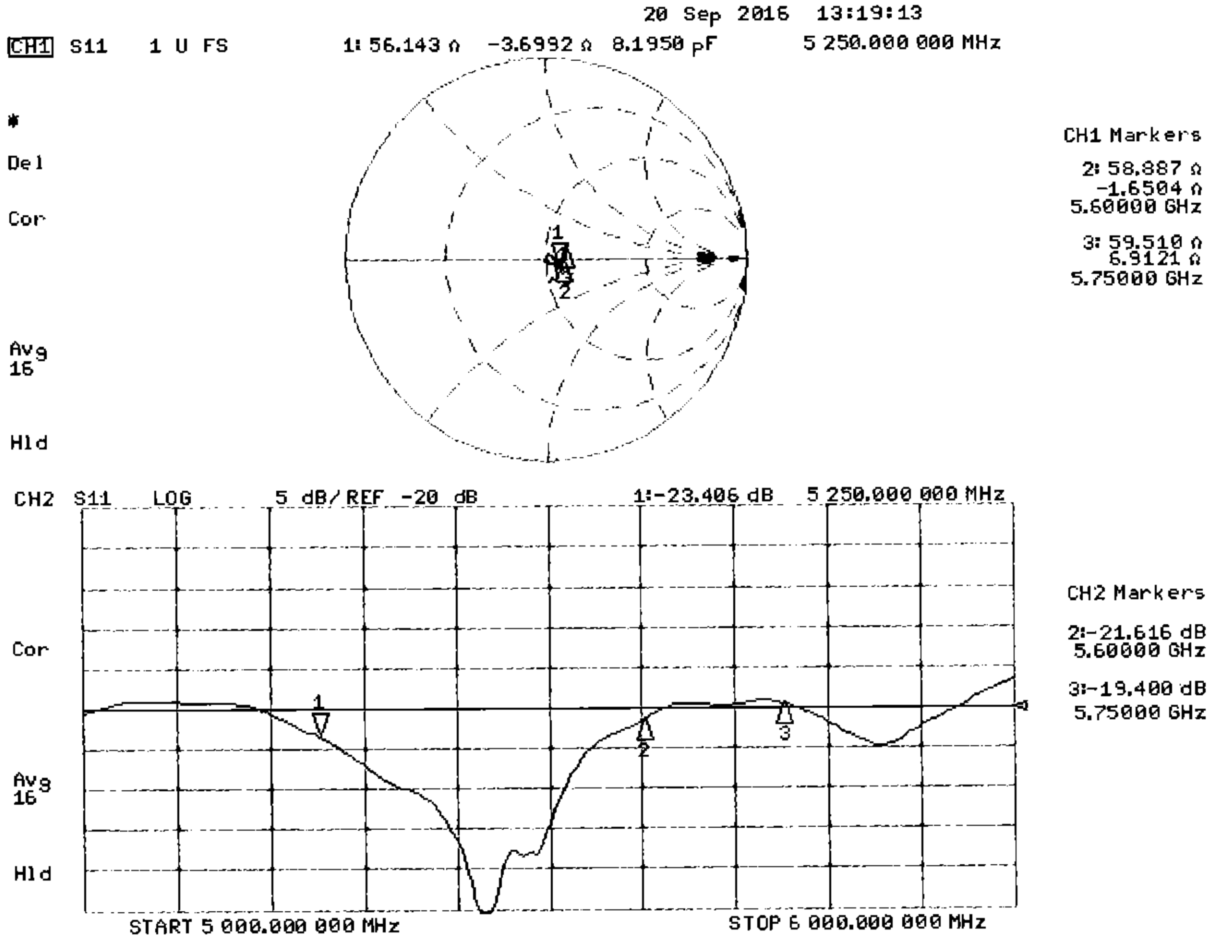
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.85 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 32.5 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.24 W/kg
Maximum value of SAR (measured) = 18.8 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.21 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 32.7 W/kg
SAR(1 g) = 7.65 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 17.7 W/kg = 12.48 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
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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: D750V3-1034_May17

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1034
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 11, 2017

BN✓
05-23-2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 11, 2017

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	V52.10.0
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	41.0 ± 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	2.10 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	**5.39 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	55.3 ± 6 %	0.96 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	**8.71 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.76 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω + 0.9 jΩ
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.4 Ω - 2.5 jΩ
Return Loss	- 32.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 06, 2011

DASY5 Validation Report for Head TSL

Date: 11.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

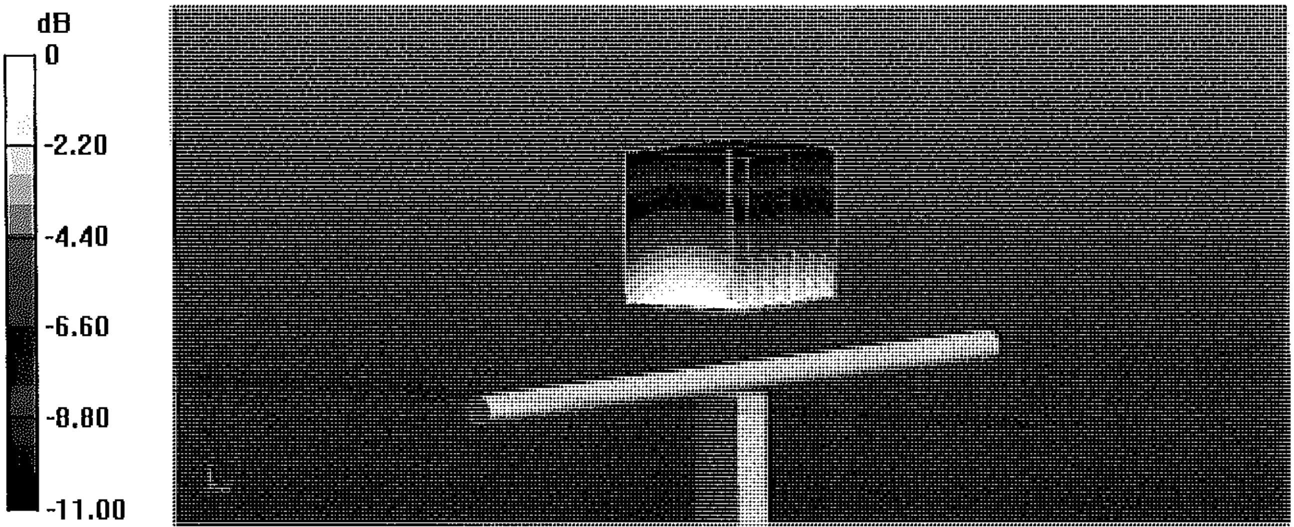
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.17, 10.17, 10.17); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

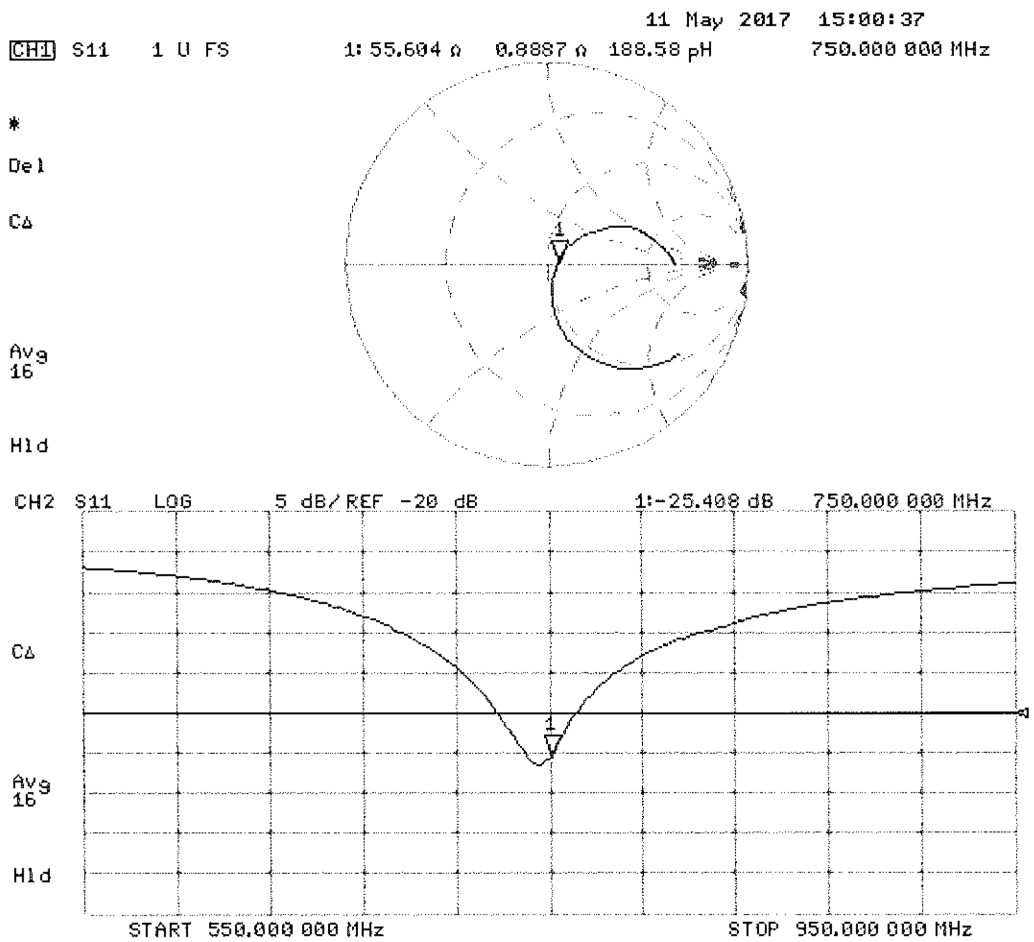
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.89 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

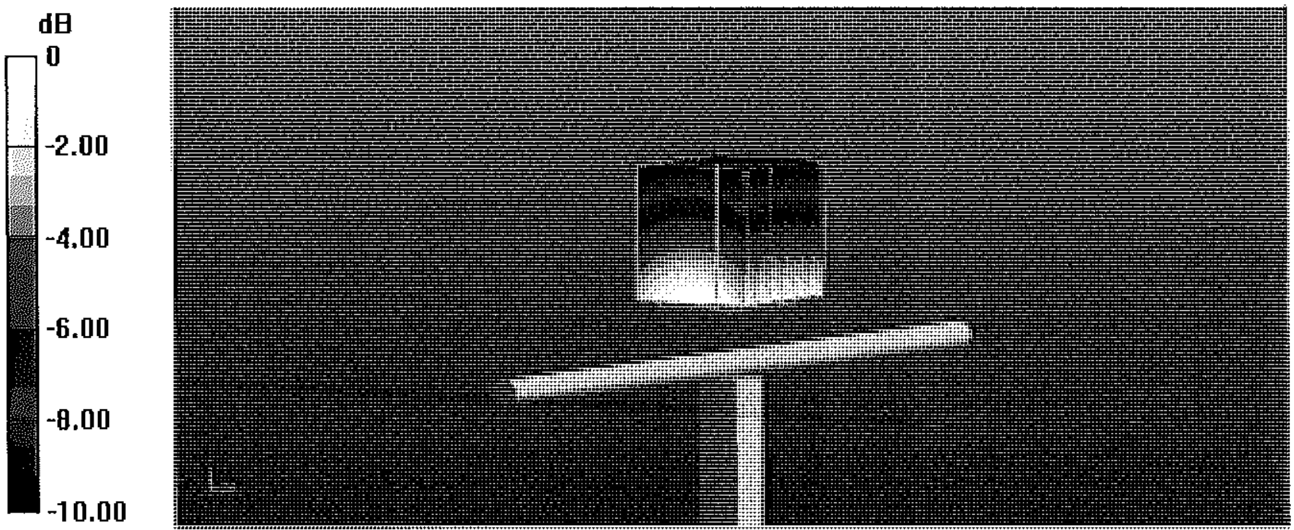
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1444); SEMCAD X 14.6.10(7416)

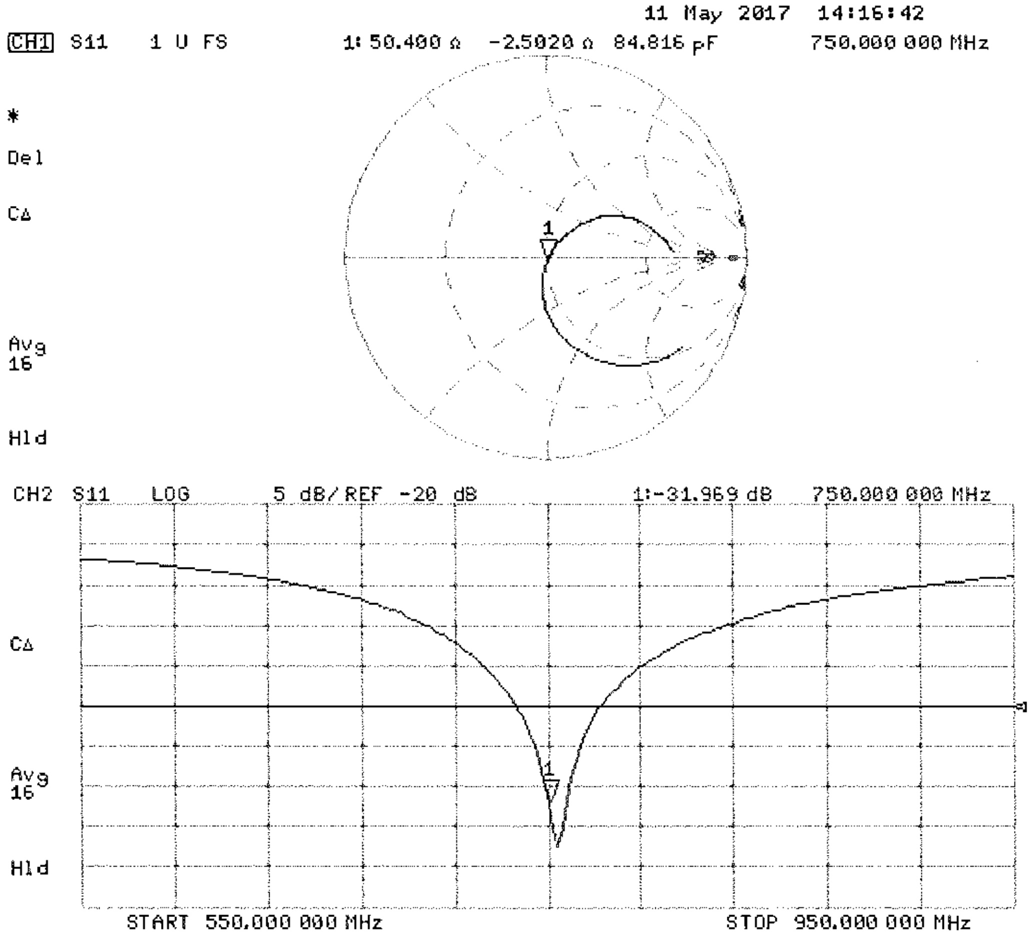
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.84 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.17 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d132_Jan17

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d132
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	January 11, 2017

BN ✓
01/26/2017

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	04-Jan-17 (No. DAE4-601_Jan17)	Jan-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: January 12, 2017

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	41.4 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.52 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.16 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	54.0 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.50 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.80 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.64 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.46 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 - 2.6 jΩ
Return Loss	- 29.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω - 6.1 jΩ
Return Loss	- 23.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 11.01.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

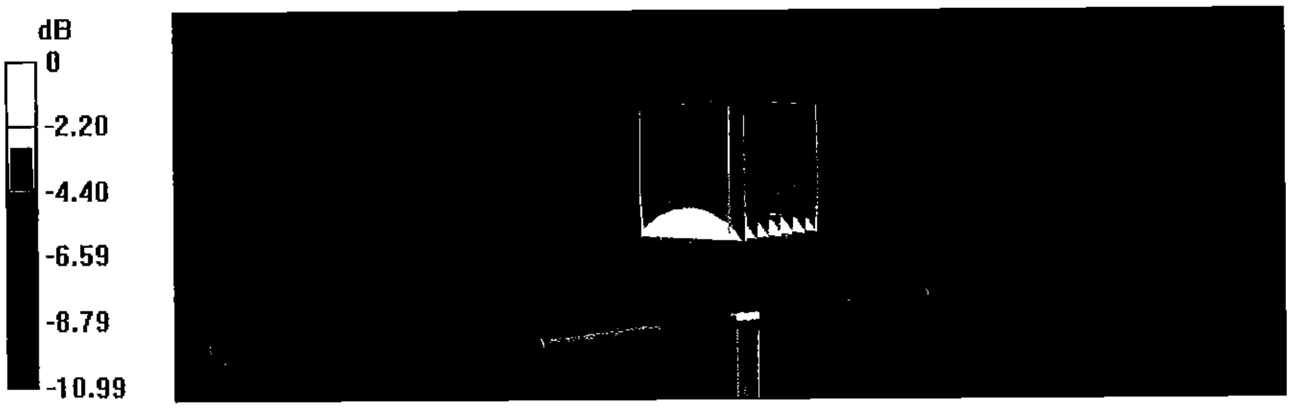
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.92$ S/m; $\varepsilon_r = 41.4$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

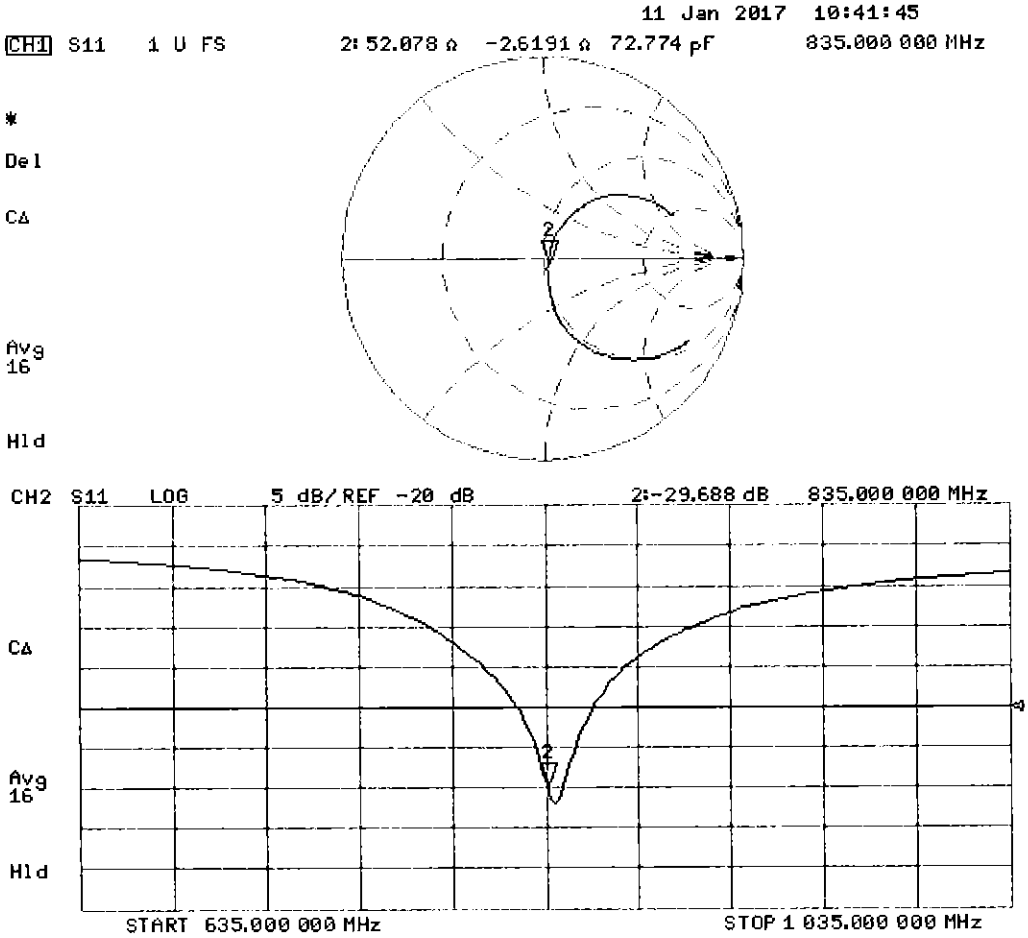
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.53 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.69 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.56 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 Head TSL



DASY5 Validation Report for Body TSL

Date: 10.01.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

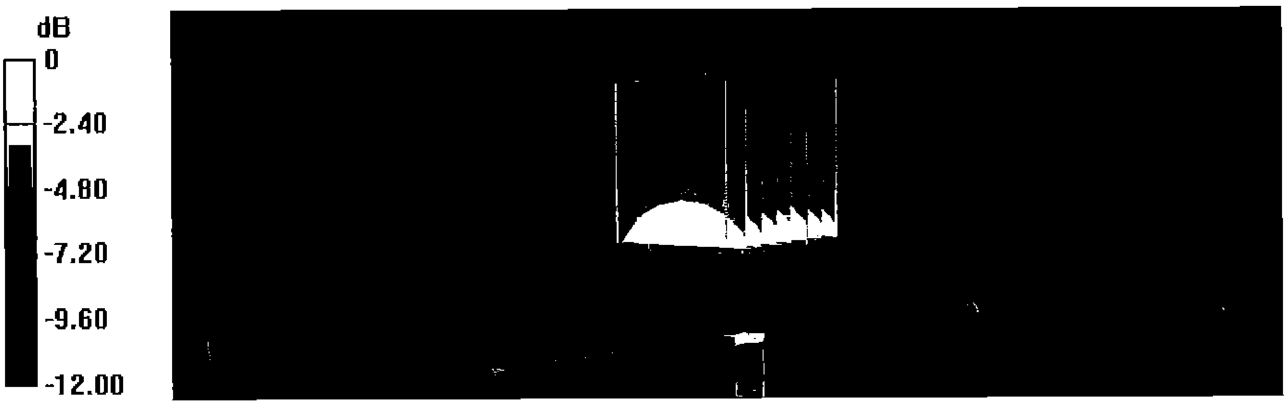
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

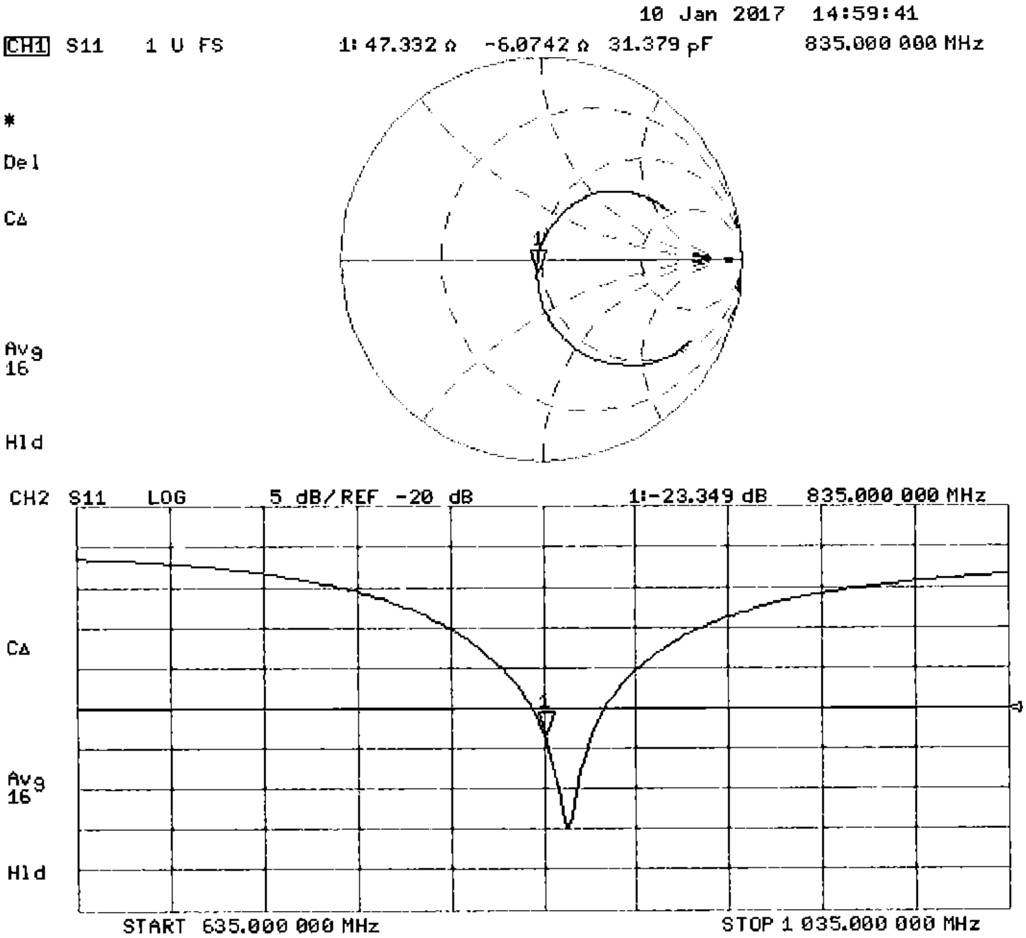
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.28 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.5 W/kg; SAR(10 g) = 1.64 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

Impedance Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: 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

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

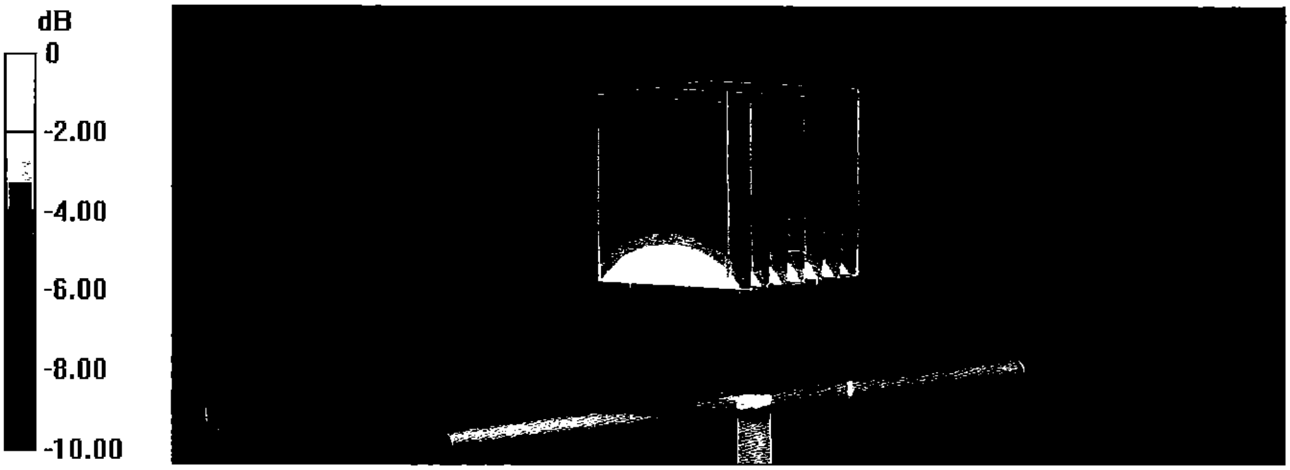
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

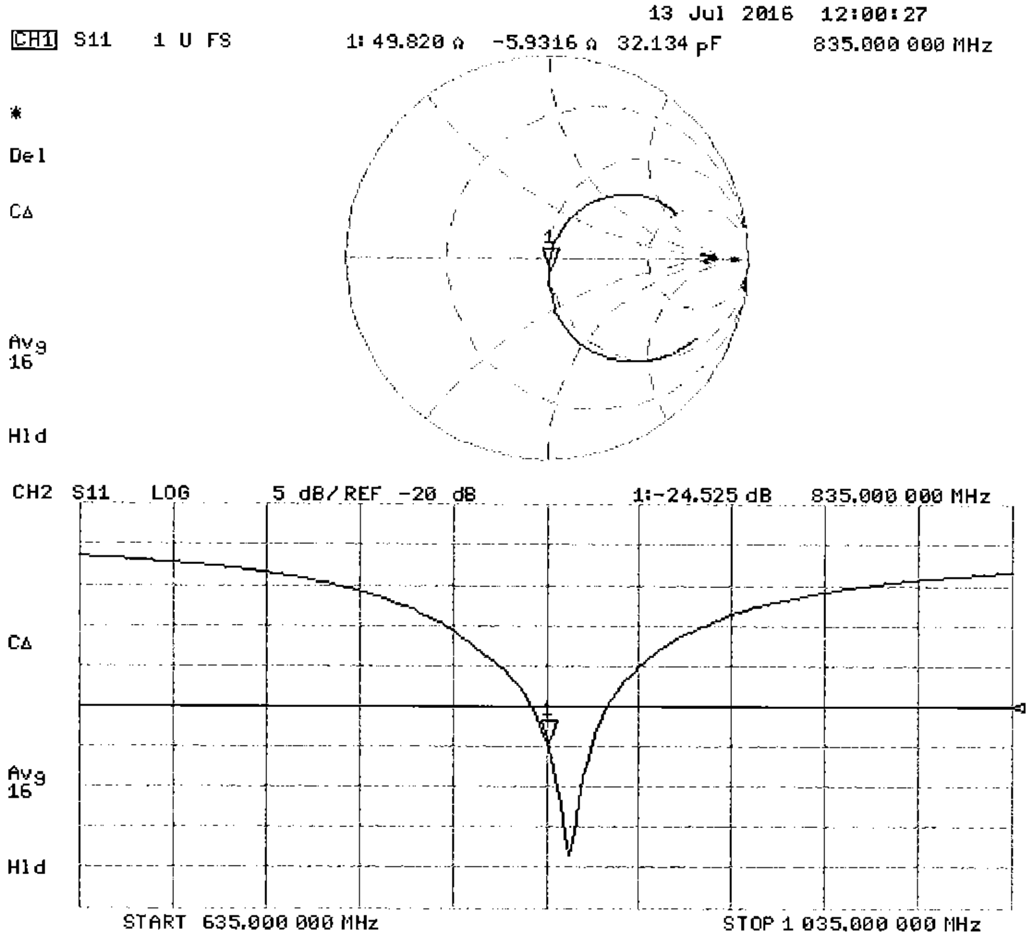
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

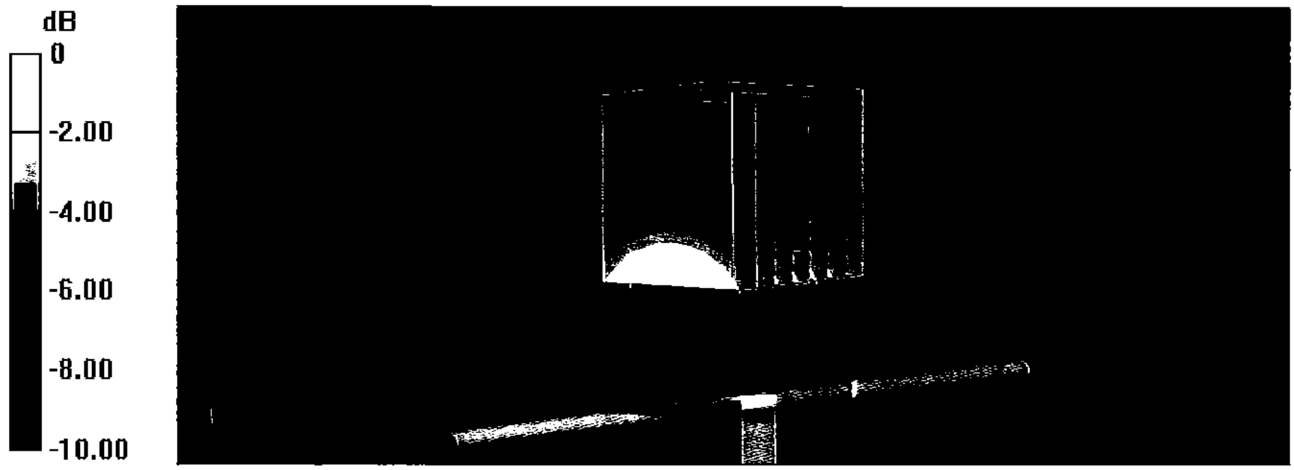
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

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)

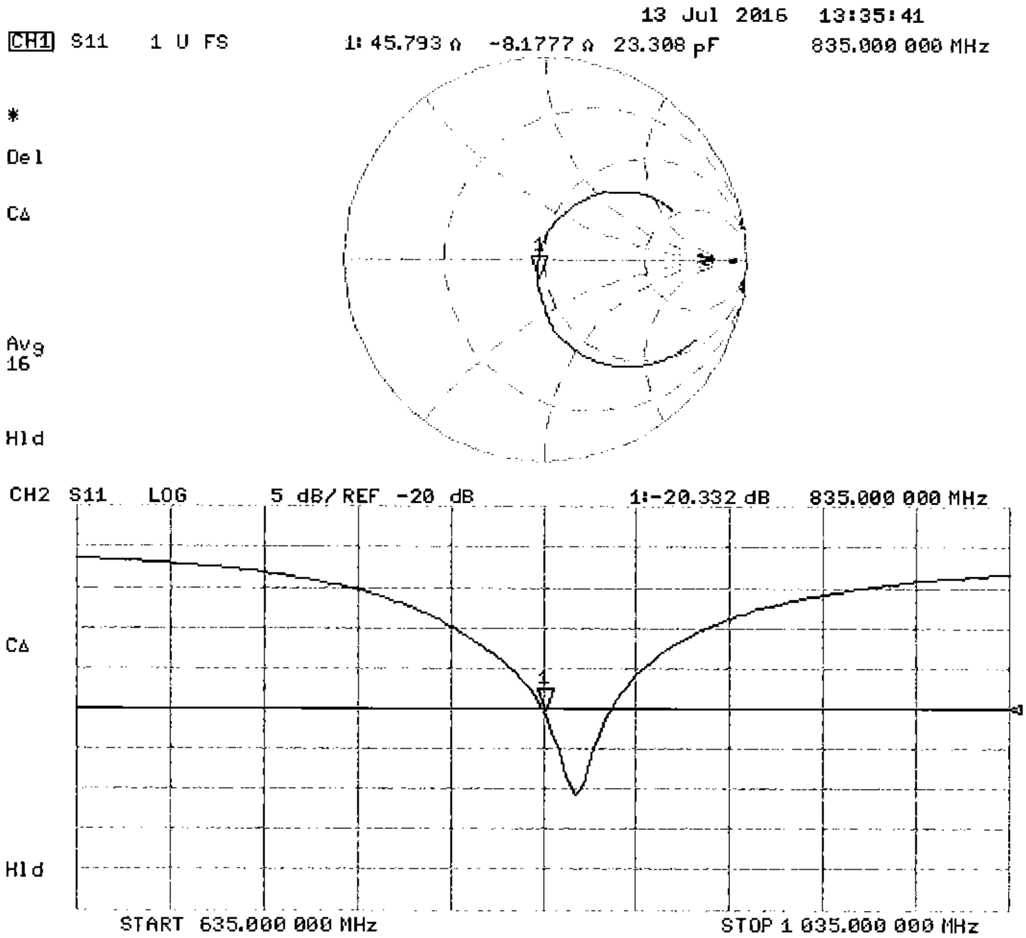
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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



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

Certification of Calibration

Object	D835V2 – SN: 4d047
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 13, 2017
Description:	SAR Validation Dipole at 835 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

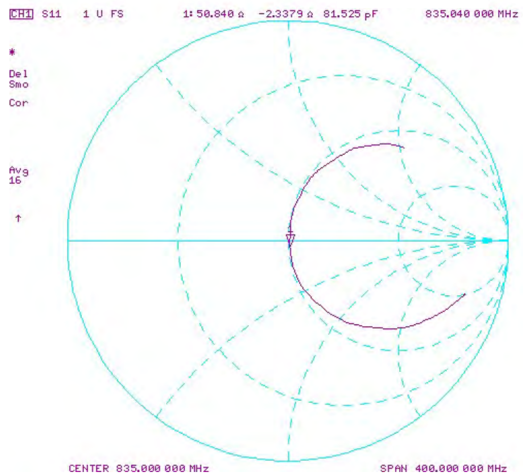
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

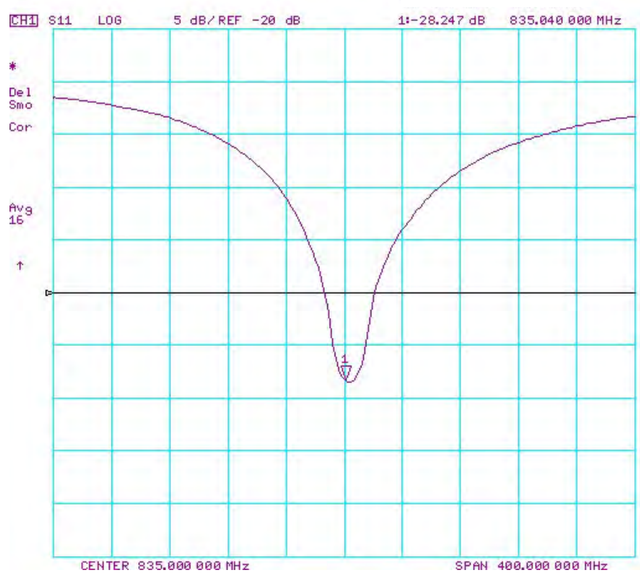
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/13/2017	0	1.83	1.95	6.79%	1.19	1.28	7.56%	49.8	50.8	1	-5.9	-2.3	3.6	-24.5	-28.2	-15.10%	PASS

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/13/2017	0	1.91	1.99	3.97%	1.25	1.31	4.97%	45.8	46.3	0.5	-8.2	-6.7	1.5	-20.3	-22.5	-10.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL