PCTEST ENGINEERING LABORATORY, INC.

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

SAR EVALUATION REPORT

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
07/24/17 - 08/10/17
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M1707180221-01-R1.ZNF

FCC ID: **ZNFV30A**

APPLICANT: **LG ELECTRONICS MOBILECOMM U.S.A., INC.**

DUT Type: Portable Handset
Application Type: Class II Permissive Change
FCC Rule Part(s): CFR §2.1093
Model: LG-H931
Additional Model(s): LGH931, H931, LG-H933, LGH933, H933, LG-VS996, LGVS996, VS996, LG-US998, LGUS998, US998

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.12	0.63	0.63	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.16	0.53	0.65	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.15	0.69	0.69	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.21	0.90	0.90	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.16	0.57	0.67	N/A
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	0.16	0.67	0.80	N/A
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.17	0.62	0.72	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.14	0.59	0.59	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	0.13	0.55	0.55	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.13	0.52	0.52	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.21	0.74	0.74	N/A
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	0.18	0.54	0.73	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 30	2307.5 - 2312.5 MHz	< 0.1	1.16	1.16	N/A
PCE	LTE Band 7	2502.5 - 2567.5 MHz	< 0.1	1.01	1.01	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.53	0.53	N/A
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.89	0.23	0.23	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	0.40	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.31	0.57	N/A	1.48
NII	U-NII-2C	5500 - 5720 MHz	0.38	0.69	N/A	1.81
NII	U-NII-3	5745 - 5825 MHz	0.63	0.73	0.73	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	< 0.1	< 0.1	< 0.1	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.42	1.59	1.59	3.02

This revised Test Report (S/N: 1M1707180221-01-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Randy Ortanez
President

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

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 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 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 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

1.2 Power Reduction for SAR

This device uses an independent fixed level power reduction mechanism for WLAN operations during voice or VoIP held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

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1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

1.3.1 Maximum Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**34.2**	**34.2**	**30.0**	**28.0**	**27.0**	**27.0**	**27.0**	**26.0**	**25.0**
	Nominal	**33.7**	**33.7**	**29.5**	**27.5**	**26.5**	**26.5**	**26.5**	**25.5**	**24.5**
GSM/GPRS/EDGE 1900	Maximum	**31.7**	**31.7**	**27.5**	**26.5**	**25.5**	**26.0**	**26.0**	**25.5**	**24.5**
	Nominal	**31.2**	**31.2**	**27.0**	**26.0**	**25.0**	**25.5**	**25.5**	**25.0**	**24.0**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**25.5**	**25.5**	**25.5**	**25.5**
	Nominal	**25.0**	**25.0**	**25.0**	**25.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.7**	**24.7**	**24.7**	**24.7**
	Nominal	**24.2**	**24.2**	**24.2**	**24.2**
UMTS Band 2 (1900 MHz)	Maximum	**24.7**	**24.7**	**24.7**	**24.7**
	Nominal	**24.2**	**24.2**	**24.2**	**24.2**

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	**25.5**
	Nominal	**25.0**
PCS CDMA/EVDO	Maximum	**24.7**
	Nominal	**24.2**

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**25.5**
	Nominal	**25.0**
LTE Band 17	Maximum	**25.5**
	Nominal	**25.0**
LTE Band 13	Maximum	**25.5**
	Nominal	**25.0**
LTE Band 5 (Cell)	Maximum	**25.5**
	Nominal	**25.0**
LTE Band 66 (AWS)	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 4 (AWS)	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 25 (PCS)	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 2 (PCS)	Maximum	**24.7**
	Nominal	**24.2**
LTE Band 30	Maximum	**25.2**
	Nominal	**24.7**
LTE Band 7	Maximum	**23.7**
	Nominal	**23.2**
LTE Band 41	Maximum	**22.7**
	Nominal	**22.2**

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Mode / Band		Modulated Average - Single Tx Chain (dBm)						Modulated Average - MIMO (dBm)		
		Antenna 1			Antenna 2			MIMO		
		Ch 1-2	Ch 3-9	Ch 10-11	Ch 1-2	Ch 3-9	Ch 10-11	Ch 1-2	Ch 3-9	Ch 10-11
IEEE 802.11b (2.4 GHz)	Maximum	19.0			18.5			21.7		
	Nominal	18.0			17.5			20.7		
IEEE 802.11g (2.4 GHz)	Maximum	17.5	18.0	16.0	17.5	18.0	16.0	20.5	21.0	19.0
	Nominal	16.5	17.0	15.0	16.5	17.0	15.0	19.5	20.0	18.0
IEEE 802.11n (2.4 GHz)	Maximum	16.5	17.0	15.0	16.5	17.0	15.0	19.5	20.0	18.0
	Nominal	15.5	16.0	14.0	15.5	16.0	14.0	18.5	19.0	17.0
IEEE 802.11ac (2.4 GHz)	Maximum	16.5	17.0	15.0	16.5	17.0	15.0	19.5	20.0	18.0
	Nominal	15.5	16.0	14.0	15.5	16.0	14.0	18.5	19.0	17.0

Mode / Band		Modulated Average (dBm)
Bluetooth 1 Mbps	Maximum	12.5
	Nominal	11.5
Bluetooth 2 Mbps	Maximum	12.0
	Nominal	11.0
Bluetooth 3 Mbps	Maximum	12.0
	Nominal	11.0
Bluetooth LE	Maximum	2.5
	Nominal	1.5

Mode / Band		Modulated Average (dBm)		
		20 MHz Bandwidth		
		Antenna 1	Antenna 2	MIMO
IEEE 802.11a (5 GHz)	Maximum	17.0	16.5	19.7
	Nominal	16.0	15.5	18.7
IEEE 802.11n (5 GHz)	Maximum	17.0	16.5	19.7
	Nominal	16.0	15.5	18.7
IEEE 802.11ac (5 GHz)	Maximum	17.0	16.5	19.7
	Nominal	16.0	15.5	18.7

Mode / Band		Modulated Average (dBm)								Modulated Average - MIMO (dBm)			
		40 MHz Bandwidth											
		Antenna 1				Antenna 2				MIMO			
		Ch 38	Ch 46, 54	Ch 62, 102	Ch 110 - 159	Ch 38	Ch 46, 54	Ch 62, 102	Ch 110 - 159	Ch 38	Ch 46, 54	Ch 62, 102	Ch 110 - 159
IEEE 802.11n (5 GHz)	Maximum	14.0	16.0	14.0	16.0	13.5	15.5	13.5	15.5	16.7	18.7	16.7	18.7
	Nominal	13.0	15.0	13.0	15.0	12.5	14.5	12.5	14.5	15.7	17.7	15.7	17.7
IEEE 802.11ac (5 GHz)	Maximum	14.0	16.0	14.0	16.0	13.5	15.5	13.5	15.5	16.7	18.7	16.7	18.7
	Nominal	13.0	15.0	13.0	15.0	12.5	14.5	12.5	14.5	15.7	17.7	15.7	17.7

Mode / Band		Modulated Average (dBm)						Modulated Average - MIMO (dBm)		
		80 MHz Bandwidth								
		Antenna 1			Antenna 2			MIMO		
		Ch 42	Ch 58	Ch 106 - 155	Ch 42	Ch 58	Ch 106 - 155	Ch 42	Ch 58	Ch 106 - 155
IEEE 802.11ac (5 GHz)	Maximum	13.0	11.0	13.0	12.5	10.5	12.5	15.7	13.7	15.7
	Nominal	12.0	10.0	12.0	11.5	9.5	11.5	14.7	12.7	14.7

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1.3.2 Reduced Power

Mode / Band		Modulated Average (dBm)						Modulated Average - MIMO (dBm)		
		Antenna 1			Antenna 2			MIMO		
		Ch 1-2	Ch 3-9	Ch 10-11	Ch 1-2	Ch 3-9	Ch 10-11	Ch 1-2	Ch 3-9	Ch 10-11
IEEE 802.11b (2.4 GHz)	Maximum	**17.0**			**17.0**			**20.0**		
	Nominal	**16.0**			**16.0**			**19.0**		
IEEE 802.11g (2.4 GHz)	Maximum	**17.0**	**17.0**	**16.0**	**17.0**	**17.0**	**16.0**	**20.0**	**20.0**	**19.0**
	Nominal	**16.0**	**16.0**	**15.0**	**16.0**	**16.0**	**15.0**	**19.0**	**19.0**	**18.0**
IEEE 802.11n (2.4 GHz)	Maximum	**16.5**	**17.0**	**15.0**	**16.5**	**17.0**	**15.0**	**19.5**	**20.0**	**18.0**
	Nominal	**15.5**	**16.0**	**14.0**	**15.5**	**16.0**	**14.0**	**18.5**	**19.0**	**17.0**
IEEE 802.11ac (2.4 GHz)	Maximum	**16.5**	**17.0**	**15.0**	**16.5**	**17.0**	**15.0**	**19.5**	**20.0**	**18.0**
	Nominal	**15.5**	**16.0**	**14.0**	**15.5**	**16.0**	**14.0**	**18.5**	**19.0**	**17.0**

1.4 DUT Antenna Locations

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

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Yes	Yes	No	Yes	No	Yes
Cell. EVDO	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 66 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 30	Yes	Yes	No	Yes	Yes	Yes
LTE Band 7	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-2A and 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.

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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.

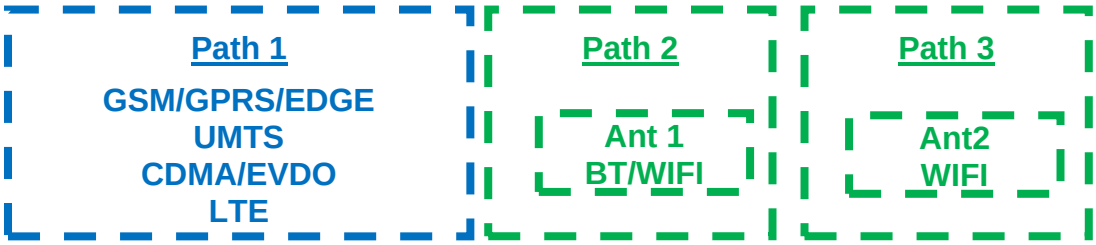

Figure 1-1
Simultaneous Transmission Paths

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 Bluetooth	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
4	1x CDMA voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
5	1x CDMA voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	1x CDMA voice + 2.4 GHz WI-FI Ant 1+ 5 GHz WI-FI Ant 2	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
8	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
9	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^Bluetooth Tethering is considered.
10	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
11	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
12	GSM voice + 2.4 GHz WI-FI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	N/A	Yes	
13	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
14	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
15	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered.
16	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
17	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
18	UMTS + 2.4 GHz WI-FI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	Yes	Yes	
19	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
20	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^Bluetooth Tethering is considered.
22	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
23	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
24	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
25	CDMA/EVDO data + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
26	CDMA/EVDO data + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
27	CDMA/EVDO data + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	*-Pre-installed VOIP applications are considered. ^Bluetooth Tethering is considered.
28	CDMA/EVDO data + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
29	CDMA/EVDO data + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
30	CDMA/EVDO data + 2.4 GHz WI-FI Ant 1 + 5 GHz WI-FI Ant 2	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
31	GPRS/EDGE + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
32	GPRS/EDGE + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
33	GPRS/EDGE + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	*-Pre-installed VOIP applications are considered. ^Bluetooth Tethering is considered.
34	GPRS/EDGE + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
35	GPRS/EDGE + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
36	GPRS/EDGE + 2.4 GHz WI-FI Ant 1 + 5 GHz WI-FI Ant 2	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.

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1. All licensed modes share the same antenna path and cannot transmit simultaneously.
2. 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.
3. Per the manufacturer, WIFI Direct is 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.
4. 5 GHz Wireless Router is only supported for the U-NII-1 and U-NII-3 by S/W, therefore U-NII2A and U-NII2C were not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN. 802.11a/g/n/ac modes support CDD and 802.11n/ac modes additionally support SDM. 802.11b mode supports TDD operations only.
6. This device supports VOLTE and VOWIFI.
7. Bluetooth tethering is supported.

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-2A & U-NII-2C WIFI, only 2.4 GHz, U-NII-1, 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) 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-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for Bluetooth, 2.4 GHz, U-NII-1, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

(B) Licensed Transmitter(s)

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

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

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest

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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.

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.

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

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

This device supports 64QAM on the uplink 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 64QAM is $\leq \frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is $\leq$ 1.45 W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

This device supports both LTE B12 and LTE B17. Since the supported frequency span for LTE B17 falls completely within the supported frequency span for LTE B12, both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B12.

This device supports both LTE 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).

This device supports downlink 4x4 MIMO operations for LTE Bands 2, 4, and 66 only. Per May 2017 TCB Workshop Notes, SAR for downlink 4x4 MIMO was not required since the maximum average output power with 4x4 downlink MIMO active was not > 0.25 dB higher than the maximum output power with downlink 4x4 MIMO inactive.

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

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1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Phablet Serial Number
GSM/GPRS/EDGE 850	15318	15318	15318	-
GSM/GPRS/EDGE 1900	15300	15300	15300	-
UMTS 850	15318	15318	15318	-
UMTS 1750	15318	15300	15300	-
UMTS 1900	15300	15318	15318	-
Cell. CDMA/EVDO	15300	15318	15318	-
PCS CDMA/EVDO	15300	15300	15300	-
LTE Band 12	15284	15268	15268	-
LTE Band 13	15284	15268	15268	-
LTE Band 5 (Cell)	15276	15284	15284	-
LTE Band 66 (AWS)	15284	15276	15276	-
LTE Band 25 (PCS)	15268	15268	15268	-
LTE Band 30	15284	15276	15276	-
LTE Band 7	15284	15276	15276	-
LTE Band 41	15292	15276	15276	-
2.4 GHz WLAN	15516	15516	15516	-
5 GHz WLAN	15516	15508	15508	15508
Bluetooth	15508	15516	15516	-

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2 LTE INFORMATION

LTE Information					
FCC ID	**ZNFV30A**				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 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 30 (2307.5 - 2312.5 MHz)				
	LTE Band 7 (2502.5 - 2567.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 17: 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 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 30: 5 MHz, 10 MHz				
	LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 17: 5 MHz	706.5 (23755)		710 (23790)	713.5 (23825)	
LTE Band 17: 10 MHz	709 (23780)		710 (23790)	711 (23800)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 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 30: 5 MHz	2307.5 (27685)		2310 (27710)	2312.5 (27735)	
LTE Band 30: 10 MHz	N/A		2310 (27710)	N/A	
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 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: 16, UL: 5				
Modulations Supported in UL	QPSK, 16QAM, 64 QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full features on 3GGP Release 13. It supports downlink carrier aggregation, downlink MIMO, and LAA features as shown in Section 9, Appendix H, and Appendix I. 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 13 features are not supported: Relay, HetNet, Enhanced eICIC, MDH, eMBMS, Cross-carrier scheduling, Enhanced SC-FDMA				

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3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

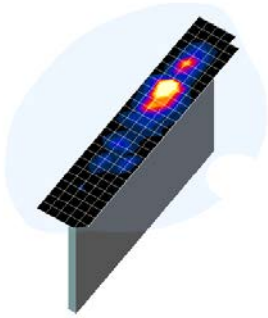

Figure 4-1
Sample SAR Area Scan

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

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5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

Figure 5-2 shows the front, back and side views of the SAM Twin Phantom. The 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].

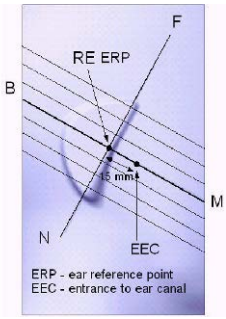

Figure 5-1
Close-Up Side view of ERP

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.

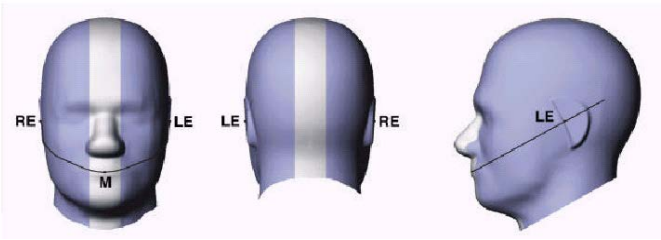

Figure 5-2
Front, back and side view of SAM Twin Phantom

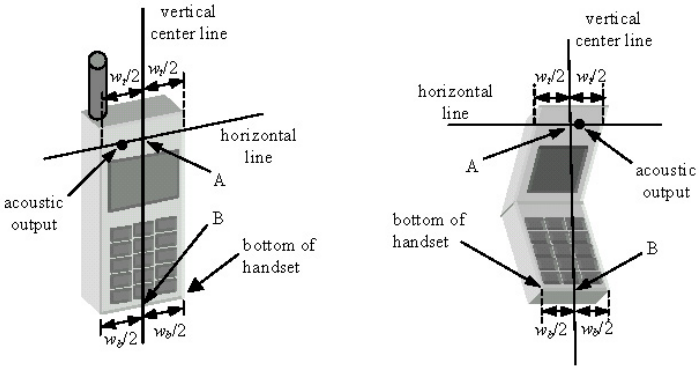

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity 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).

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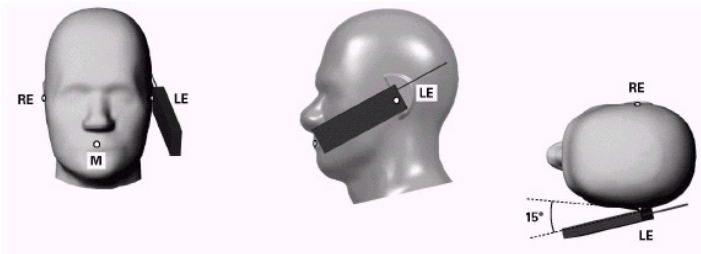

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

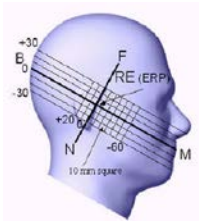

Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

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

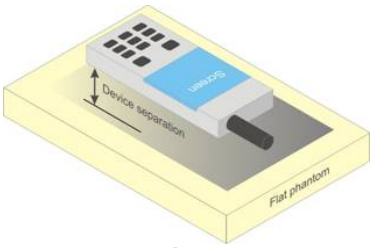

Figure 6-4
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not

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

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L 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.

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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.

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7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

7.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 7-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *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.

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8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

8.4 SAR Measurement Conditions for 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.

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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
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
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.

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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.

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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.

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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.

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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:

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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.

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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.

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9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Band	Channel	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	1013	824.7	25.36	25.40	25.23	25.32	25.38	25.07	25.06
	384	836.52	25.39	25.40	25.26	25.34	25.48	25.10	25.13
	777	848.31	25.35	25.34	25.30	25.43	25.34	25.08	25.07
PCS	25	1851.25	24.50	24.45	24.57	24.43	24.48	24.25	24.29
	600	1880	24.52	24.48	24.55	24.48	24.33	24.20	24.22
	1175	1908.75	24.57	24.43	24.56	24.52	24.38	24.21	24.22

Note: RC1 is only applicable for IS-95 compatibility.

Figure 9-1
Power Measurement Setup

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9.2 GSM Conducted Powers

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	34.00	**33.99**	29.60	27.58	26.52	26.63	26.51	25.50	24.49
	190	34.11	**34.12**	29.84	27.65	26.80	26.80	26.64	25.77	24.74
	251	34.04	**34.10**	30.00	28.00	27.00	27.00	26.80	25.85	25.00
GSM 1900	512	31.63	31.63	27.21	26.39	**25.37**	25.92	25.77	25.44	24.50
	661	31.68	31.61	27.34	26.41	**25.42**	25.94	25.53	25.32	24.36
	810	31.70	31.70	27.20	26.23	**25.26**	25.75	25.47	25.15	24.27

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	24.97	**24.96**	23.58	23.32	23.51	17.60	20.49	21.24	21.48
	190	25.08	**25.09**	23.82	23.39	23.79	17.77	20.62	21.51	21.73
	251	25.01	**25.07**	23.98	23.74	23.99	17.97	20.78	21.59	21.99
GSM 1900	512	22.60	22.60	21.19	22.13	**22.36**	16.89	19.75	21.18	21.49
	661	22.65	22.58	21.32	22.15	**22.41**	16.91	19.51	21.06	21.35
	810	22.67	22.67	21.18	21.97	**22.25**	16.72	19.45	20.89	21.26
GSM 850	**Frame Avg.Targets:**	24.67	**24.67**	23.48	23.24	23.49	17.47	20.48	21.24	21.49
GSM 1900		22.17	22.17	20.98	21.74	**21.99**	16.47	19.48	20.74	20.99

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: 12 (Max 4 Tx uplink slots)
EDGE Multislot class: 12 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A

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Figure 9-2
Power Measurement Setup

9.3 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	25.36	25.40	25.38	24.47	24.56	24.37	24.57	24.55	24.59	-
99		12.2 kbps AMR	25.39	25.46	25.42	24.36	24.47	24.23	24.52	24.54	24.54	-
6	HSDPA	Subtest 1	25.24	25.46	25.37	24.39	24.39	24.43	24.52	24.67	24.64	0
6		Subtest 2	25.39	25.40	25.35	24.43	24.45	24.26	24.60	24.56	24.43	0
6		Subtest 3	24.82	24.82	24.64	23.87	23.89	23.90	24.03	24.11	24.03	0.5
6		Subtest 4	24.69	24.76	24.76	23.81	23.88	23.86	23.99	24.10	24.04	0.5
6	HSUPA	Subtest 1	25.34	25.31	25.42	24.42	24.43	24.37	24.49	24.61	24.56	0
6		Subtest 2	23.25	23.42	23.31	22.39	22.46	22.35	22.47	22.57	22.49	2
6		Subtest 3	24.43	24.19	24.41	23.40	23.45	23.33	23.53	23.49	23.44	1
6		Subtest 4	23.40	23.39	23.38	22.41	22.42	22.36	22.49	22.41	22.45	2
6		Subtest 5	25.35	25.24	25.40	24.30	24.40	24.27	24.44	24.42	24.46	0
8	DC-HSDPA	Subtest 1	25.23	25.39	25.31	24.35	24.33	24.46	24.51	24.68	24.69	0
8		Subtest 2	25.35	25.38	25.35	24.49	24.43	24.27	24.61	24.49	24.47	0
8		Subtest 3	24.80	24.92	24.59	23.93	23.84	23.81	24.06	24.10	24.06	0.5
8		Subtest 4	24.65	24.78	24.80	23.76	23.87	23.92	23.92	24.10	24.06	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

Figure 9-3
Power Measurement Setup

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9.4 LTE Conducted Powers

9.4.1 LTE Band 12

Table 9-1
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	25.36	0	0
	1	25	**25.50**		0
	1	49	25.30		0
	25	0	**24.30**	0-1	1
	25	12	24.00		1
	25	25	24.11		1
	50	0	23.96		1
16QAM	1	0	24.38	0-1	1
	1	25	24.32		1
	1	49	24.38		1
	25	0	23.00	0-2	2
	25	12	23.15		2
	25	25	23.09		2
	50	0	23.09		2
64QAM	1	0	23.36	0-2	2
	1	25	23.29		2
	1	49	23.33		2
	25	0	22.04	0-3	3
	25	12	22.01		3
	25	25	21.97		3
	50	0	22.04		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 9-2
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	24.87	24.89	25.04	0	0
	1	12	24.91	24.81	25.05		0
	1	24	24.88	24.78	24.59		0
	12	0	24.01	23.93	24.06	0-1	1
	12	6	23.95	23.90	24.06		1
	12	13	24.05	23.96	24.06		1
	25	0	24.06	23.94	24.05		1
16QAM	1	0	24.47	24.17	24.32	0-1	1
	1	12	24.25	24.17	24.27		1
	1	24	24.40	24.23	23.98		1
	12	0	23.18	23.04	23.14	0-2	2
	12	6	23.24	22.98	23.15		2
	12	13	23.28	22.89	23.17		2
	25	0	23.20	22.99	23.13		2
64QAM	1	0	23.31	23.29	23.26	0-2	2
	1	12	23.31	23.17	23.18		2
	1	24	23.47	23.23	22.89		2
	12	0	22.22	21.89	22.06	0-3	3
	12	6	22.11	22.05	22.20		3
	12	13	22.26	21.93	22.07		3
	25	0	22.27	21.88	22.20		3

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

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.97	24.72	24.98	0	0
	1	7	25.00	24.87	25.05		0
	1	14	24.93	24.80	24.60		0
	8	0	23.94	23.95	23.96	0-1	1
	8	4	23.95	23.90	23.98		1
	8	7	23.99	23.92	23.98		1
	15	0	23.96	23.87	24.02		1
16QAM	1	0	24.32	23.99	24.20	0-1	1
	1	7	24.34	24.26	24.36		1
	1	14	24.29	24.07	23.94		1
	8	0	23.00	22.99	23.06	0-2	2
	8	4	22.96	22.97	23.00		2
	8	7	23.05	23.02	23.02		2
	15	0	23.08	22.95	23.04		2
64QAM	1	0	23.47	23.12	23.26	0-2	2
	1	7	23.40	23.22	23.42		2
	1	14	23.30	23.16	23.01		2
	8	0	22.01	21.87	21.90	0-3	3
	8	4	21.93	22.01	22.01		3
	8	7	21.95	21.99	22.07		3
	15	0	21.98	21.84	22.11		3

Table 9-4
LTE Band 12 Conducted Powers -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.87	24.81	24.81	0	0
	1	2	24.89	24.82	24.89		0
	1	5	24.80	24.81	24.44		0
	3	0	25.03	24.82	24.77		0
	3	2	24.95	24.88	24.59		0
	3	3	24.89	24.77	24.63		0
	6	0	23.85	23.89	23.98	0-1	1
16QAM	1	0	24.24	24.06	24.14	0-1	1
	1	2	24.18	24.12	24.20		1
	1	5	24.14	24.03	23.90		1
	3	0	23.90	23.99	24.01		1
	3	2	23.89	24.09	23.96		1
	3	3	23.94	23.96	23.78		1
	6	0	22.83	22.76	23.15	0-2	2
64QAM	1	0	23.13	22.94	23.27	0-2	2
	1	2	23.28	23.06	23.12		2
	1	5	23.13	23.02	22.91		2
	3	0	22.99	23.06	22.86		2
	3	2	22.98	22.97	22.86		2
	3	3	22.86	22.93	22.81		2
	6	0	21.79	21.69	22.12	0-3	3

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9.4.2 LTE Band 13

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

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.30	0	0
	1	25	**25.47**		0
	1	49	25.06		0
	25	0	24.27	0-1	1
	25	12	**24.28**		1
	25	25	23.95		1
	50	0	24.24		1
16QAM	1	0	23.87	0-1	1
	1	25	24.40		1
	1	49	23.72		1
	25	0	23.40	0-2	2
	25	12	23.25		2
	25	25	23.22		2
	50	0	23.43		2
64QAM	1	0	23.31	0-2	2
	1	25	23.50		2
	1	49	23.23		2
	25	0	22.07	0-3	3
	25	12	22.09		3
	25	25	22.25		3
	50	0	22.15		3

Table 9-6
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.36	0	0
	1	12	25.15		0
	1	24	24.97		0
	12	0	24.46	0-1	1
	12	6	24.33		1
	12	13	24.21		1
	25	0	24.22		1
16QAM	1	0	24.50	0-1	1
	1	12	24.42		1
	1	24	24.25		1
	12	0	23.39	0-2	2
	12	6	23.42		2
	12	13	23.40		2
	25	0	23.33		2
64QAM	1	0	23.09	0-2	2
	1	12	23.05		2
	1	24	23.23		2
	12	0	22.25	0-3	3
	12	6	22.09		3
	12	13	22.10		3
	25	0	22.05		3

Note: LTE Band 13 at 10MHz and 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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9.4.3 LTE Band 5 (Cell)

Table 9-7
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.49	0	0
	1	25	**25.50**		0
	1	49	25.35		0
	25	0	24.38	0-1	1
	25	12	**24.46**		1
	25	25	24.44		1
	50	0	24.45		1
16QAM	1	0	24.43	0-1	1
	1	25	24.48		1
	1	49	24.30		1
	25	0	23.42	0-2	2
	25	12	23.50		2
	25	25	23.50		2
	50	0	23.48		2
64QAM	1	0	23.50	0-2	2
	1	25	23.36		2
	1	49	23.29		2
	25	0	22.36	0-3	3
	25	12	22.44		3
	25	25	22.42		3
	50	0	22.37		3

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

Table 9-8
LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.46	25.45	25.33	0	0
	1	12	25.38	25.36	25.06		0
	1	24	25.40	25.42	24.94		0
	12	0	24.47	24.35	24.42	0-1	1
	12	6	24.42	24.44	24.38		1
	12	13	24.39	24.43	24.37		1
	25	0	24.34	24.48	24.41		1
16QAM	1	0	24.32	24.21	24.30	0-1	1
	1	12	24.35	24.46	24.42		1
	1	24	24.45	24.49	24.43		1
	12	0	23.45	23.43	23.31	0-2	2
	12	6	23.46	23.42	23.40		2
	12	13	23.41	23.48	23.50		2
	25	0	23.45	23.42	23.40		2
64QAM	1	0	23.35	23.18	23.31	0-2	2
	1	12	23.36	23.44	23.43		2
	1	24	23.42	23.30	23.46		2
	12	0	22.50	22.27	22.32	0-3	3
	12	6	22.50	22.31	22.45		3
	12	13	22.44	22.36	22.50		3
	25	0	22.44	22.50	22.43		3

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

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.42	25.26	25.33	0	0
	1	7	25.32	25.42	25.26		0
	1	14	25.27	25.27	25.06		0
	8	0	24.28	24.39	24.50	0-1	1
	8	4	24.39	24.39	24.38		1
	8	7	24.37	24.37	24.36		1
	15	0	24.41	24.50	24.25		1
16QAM	1	0	24.41	24.50	24.46	0-1	1
	1	7	24.42	24.40	24.43		1
	1	14	24.31	24.42	24.42		1
	8	0	23.36	23.47	23.44	0-2	2
	8	4	23.31	23.33	23.43		2
	8	7	23.36	23.50	23.35		2
	15	0	23.32	23.36	23.37		2
64QAM	1	0	23.30	23.41	23.32	0-2	2
	1	7	23.50	23.30	23.45		2
	1	14	23.25	23.37	23.39		2
	8	0	22.26	22.35	22.46	0-3	3
	8	4	22.41	22.26	22.45		3
	8	7	22.44	22.50	22.40		3
	15	0	22.26	22.34	22.38		3

Table 9-10
LTE Band 5 (Cell) Conducted Powers -1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.17	25.33	25.16	0	0
	1	2	25.31	25.36	25.14		0
	1	5	25.24	25.24	24.91		0
	3	0	25.28	25.28	25.09		0
	3	2	25.41	25.39	25.11		0
	3	3	25.21	25.32	25.00		0
	6	0	24.34	24.34	24.29	0-1	1
16QAM	1	0	24.48	24.43	24.46	0-1	1
	1	2	24.26	24.48	24.45		1
	1	5	24.44	24.25	24.50		1
	3	0	24.43	24.40	24.32		1
	3	2	24.48	24.47	24.24		1
	3	3	24.50	24.41	24.22		1
	6	0	23.27	23.48	23.23	0-2	2
64QAM	1	0	23.43	23.39	23.45	0-2	2
	1	2	23.37	23.44	23.46		2
	1	5	23.37	23.38	23.50		2
	3	0	23.39	23.47	23.20		2
	3	2	23.49	23.39	23.33		2
	3	3	23.49	23.40	23.10		2
	6	0	22.23	22.37	22.26	0-3	3

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9.4.4 LTE Band 66 (AWS)

Table 9-11
LTE Band 66 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.43	24.66	**24.67**	0	0
	1	50	24.32	24.56	24.52		0
	1	99	24.04	24.40	24.16		0
	50	0	23.52	23.57	**23.62**	0-1	1
	50	25	23.20	23.51	23.61		1
	50	50	23.23	23.43	23.50		1
	100	0	23.23	23.42	23.55		1
16QAM	1	0	23.06	23.58	23.67	0-1	1
	1	50	23.00	23.43	23.60		1
	1	99	23.26	23.68	23.65		1
	50	0	22.57	22.61	22.65	0-2	2
	50	25	22.18	22.58	22.67		2
	50	50	22.27	22.57	22.60		2
	100	0	22.15	22.55	22.63		2
64QAM	1	0	22.15	22.49	22.68	0-2	2
	1	50	21.98	22.44	22.62		2
	1	99	22.27	22.65	22.70		2
	50	0	21.67	21.67	21.59	0-3	3
	50	25	21.08	21.66	21.56		3
	50	50	21.30	21.50	21.57		3
	100	0	21.23	21.53	21.68		3

Table 9-12
LTE Band 66 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.82	24.41	24.59	0	0
	1	36	24.33	24.20	24.29		0
	1	74	24.10	24.61	24.59		0
	36	0	23.48	23.36	23.65	0-1	1
	36	18	23.63	23.46	23.50		1
	36	37	23.18	23.65	23.70		1
	75	0	22.78	23.68	23.66		1
16QAM	1	0	23.20	23.25	23.47	0-1	1
	1	36	22.88	23.01	23.36		1
	1	74	23.44	23.41	23.58		1
	36	0	22.31	22.41	22.54	0-2	2
	36	18	22.59	22.42	22.63		2
	36	37	22.14	22.68	22.60		2
	75	0	21.87	22.69	22.65		2
64QAM	1	0	22.11	22.26	22.48	0-2	2
	1	36	21.83	21.94	22.39		2
	1	74	22.48	22.52	22.55		2
	36	0	21.30	21.40	21.47	0-3	3
	36	18	21.48	21.50	21.58		3
	36	37	21.12	21.63	21.51		3
	75	0	20.82	21.59	21.70		3

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Table 9-13
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	23.90	24.18	24.19	0	0
	1	25	24.10	24.26	24.63		0
	1	49	23.88	24.60	24.69		0
	25	0	23.20	23.24	23.61	0-1	1
	25	12	23.32	23.41	23.58		1
	25	25	23.61	23.55	23.40		1
	50	0	23.35	23.41	23.49		1
16QAM	1	0	23.12	22.94	23.57	0-1	1
	1	25	23.37	23.17	23.29		1
	1	49	23.08	23.35	23.60		1
	25	0	22.13	22.47	22.59	0-2	2
	25	12	22.39	22.50	22.54		2
	25	25	22.66	22.47	22.50		2
	50	0	22.49	22.42	22.41		2
64QAM	1	0	22.18	22.01	22.49	0-2	2
	1	25	22.41	22.12	22.36		2
	1	49	22.07	22.46	22.61		2
	25	0	21.09	21.35	21.57	0-3	3
	25	12	21.27	21.41	21.62		3
	25	25	21.64	21.54	21.45		3
	50	0	21.43	21.39	21.40		3

Table 9-14
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	24.49	24.12	24.70	0	0
	1	12	24.63	24.11	24.68		0
	1	24	24.45	24.19	24.56		0
	12	0	23.30	23.33	23.61	0-1	1
	12	6	23.29	23.23	23.61		1
	12	13	23.34	23.40	23.49		1
	25	0	23.35	23.34	23.64		1
16QAM	1	0	23.25	23.68	23.68	0-1	1
	1	12	23.31	23.62	23.70		1
	1	24	23.37	23.64	23.40		1
	12	0	22.30	22.47	22.59	0-2	2
	12	6	22.41	22.44	22.53		2
	12	13	22.34	22.43	22.59		2
	25	0	22.31	22.31	22.57		2
64QAM	1	0	22.29	22.67	22.70	0-2	2
	1	12	22.29	22.70	22.63		2
	1	24	22.47	22.52	22.25		2
	12	0	21.28	21.39	21.52	0-3	3
	12	6	21.50	21.54	21.46		3
	12	13	21.48	21.34	21.70		3
	25	0	21.24	21.42	21.47		3

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Table 9-15
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	24.29	24.28	0	0
	1	7	24.20	24.35	24.28		0
	1	14	24.14	24.15	24.30		0
	8	0	23.41	23.32	23.20	0-1	1
	8	4	23.21	23.35	23.28		1
	8	7	23.22	23.19	23.23		1
	15	0	23.16	23.26	23.36		1
16QAM	1	0	23.53	23.41	23.45	0-1	1
	1	7	23.56	23.53	23.19		1
	1	14	23.49	23.39	23.47		1
	8	0	22.35	22.23	22.32	0-2	2
	8	4	22.31	22.13	22.31		2
	8	7	22.33	22.21	22.20		2
	15	0	22.28	22.17	22.18		2
64QAM	1	0	22.46	22.43	22.47	0-2	2
	1	7	22.60	22.59	22.26		2
	1	14	22.32	22.46	22.27		2
	8	0	21.40	21.36	21.31	0-3	3
	8	4	21.39	21.14	21.46		3
	8	7	21.23	21.16	21.18		3
	15	0	21.10	21.32	21.34		3

Table 9-16
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)	Low-Mid Channel 132322 (1745.0 MHz)	Mid-High 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.21	24.16	24.27	0	0
	1	2	24.23	24.21	24.29		0
	1	5	24.36	24.22	24.34		0
	3	0	24.23	24.12	24.27		0
	3	2	24.22	24.10	24.23		0
	3	3	24.10	24.20	24.21		0
	6	0	23.25	23.11	23.23	0-1	1
16QAM	1	0	23.48	23.45	23.34	0-1	1
	1	2	23.48	23.52	23.49		1
	1	5	23.28	23.39	23.34		1
	3	0	23.25	23.09	23.35		1
	3	2	23.26	23.21	23.42		1
	3	3	23.32	23.16	23.31		1
	6	0	22.13	22.27	22.11	0-2	2
64QAM	1	0	22.12	22.28	22.40	0-2	2
	1	2	22.23	22.33	22.35		2
	1	5	22.44	22.36	22.35		2
	3	0	22.22	22.32	22.42		2
	3	2	22.50	22.37	22.38		2
	3	3	22.14	22.27	22.25		2
	6	0	21.25	21.14	21.09	0-3	3

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9.4.5 LTE Band 25 (PCS)

Table 9-17
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	24.69	24.68	24.65	0	0
	1	50	24.34	24.29	**24.70**		0
	1	99	24.21	23.93	24.24		0
	50	0	23.32	23.53	23.49	0-1	1
	50	25	23.10	23.20	**23.70**		1
	50	50	23.32	23.18	23.60		1
	100	0	23.27	23.29	23.67		1
16QAM	1	0	23.58	23.61	23.51	0-1	1
	1	50	23.35	23.44	23.68		1
	1	99	23.49	23.60	23.63		1
	50	0	22.41	22.51	22.65	0-2	2
	50	25	22.15	22.28	22.58		2
	50	50	22.23	22.12	22.60		2
	100	0	22.33	22.30	22.55		2
64QAM	1	0	22.53	22.54	22.52	0-2	2
	1	50	22.39	22.42	22.69		2
	1	99	22.52	22.69	22.55		2
	50	0	21.30	21.54	21.61	0-3	3
	50	25	21.19	21.32	21.50		3
	50	50	21.32	21.07	21.65		3
	100	0	21.30	21.27	21.53		3

Table 9-18
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	24.48	24.47	24.67	0	0
	1	36	24.18	23.92	24.64		0
	1	74	24.30	24.15	24.29		0
	36	0	23.34	23.51	23.69	0-1	1
	36	18	23.24	23.19	23.69		1
	36	37	22.95	23.14	23.55		1
	75	0	23.22	23.22	23.65		1
16QAM	1	0	23.52	23.67	23.51	0-1	1
	1	36	23.52	23.29	23.60		1
	1	74	23.65	23.40	23.56		1
	36	0	22.45	22.41	22.70	0-2	2
	36	18	22.39	22.23	22.57		2
	36	37	22.25	22.11	22.49		2
	75	0	22.35	22.26	22.42		2
64QAM	1	0	22.43	22.59	22.46	0-2	2
	1	36	22.40	22.39	22.60		2
	1	74	22.64	22.44	22.60		2
	36	0	21.41	21.36	21.56	0-3	3
	36	18	21.45	21.21	21.60		3
	36	37	21.33	20.99	21.49		3
	75	0	21.38	21.30	21.31		3

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REV 18.3 M
01/30/2017

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Table 9-19
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	24.50	24.35	24.53	0	0
	1	25	24.32	24.03	24.67		0
	1	49	24.36	24.18	24.15		0
	25	0	23.45	23.31	23.58	0-1	1
	25	12	23.45	23.17	23.50		1
	25	25	23.44	23.10	23.58		1
	50	0	23.43	23.11	23.40		1
16QAM	1	0	23.62	23.61	23.50	0-1	1
	1	25	23.61	23.32	23.54		1
	1	49	23.47	23.54	23.64		1
	25	0	22.40	22.37	22.68	0-2	2
	25	12	22.40	22.37	22.60		2
	25	25	22.42	22.18	22.56		2
	50	0	22.35	22.25	22.64		2
64QAM	1	0	22.57	22.64	22.61	0-2	2
	1	25	22.59	22.37	22.43		2
	1	49	22.57	22.59	22.59		2
	25	0	21.29	21.36	21.63	0-3	3
	25	12	21.36	21.31	21.68		3
	25	25	21.28	21.22	21.68		3
	50	0	21.41	21.29	21.61		3

Table 9-20
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	24.41	24.20	24.64	0	0
	1	12	24.29	24.02	24.64		0
	1	24	24.21	24.05	24.30		0
	12	0	23.39	23.28	23.69	0-1	1
	12	6	23.40	23.23	23.68		1
	12	13	23.30	23.16	23.49		1
	25	0	23.35	23.11	23.68		1
16QAM	1	0	23.61	23.48	23.55	0-1	1
	1	12	23.68	23.53	23.55		1
	1	24	23.67	23.39	23.48		1
	12	0	22.50	22.45	22.67	0-2	2
	12	6	22.45	22.22	22.69		2
	12	13	22.46	22.20	22.56		2
	25	0	22.41	22.14	22.66		2
64QAM	1	0	22.53	22.51	22.51	0-2	2
	1	12	22.61	22.60	22.51		2
	1	24	22.70	22.47	22.49		2
	12	0	21.47	21.32	21.60	0-3	3
	12	6	21.53	21.23	21.67		3
	12	13	21.52	21.22	21.70		3
	25	0	21.61	21.13	21.62		3

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Table 9-21
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	24.30	24.13	24.70	0	0
	1	7	24.40	24.02	24.40		0
	1	14	24.29	23.94	24.08		0
	8	0	23.37	23.16	23.57	0-1	1
	8	4	23.40	23.24	23.45		1
	8	7	23.35	23.13	23.30		1
	15	0	23.32	23.21	23.41		1
16QAM	1	0	23.58	23.48	23.56	0-1	1
	1	7	23.64	23.50	23.65		1
	1	14	23.69	23.30	23.49		1
	8	0	22.36	22.28	22.50	0-2	2
	8	4	22.31	22.32	22.52		2
	8	7	22.39	22.15	22.39		2
	15	0	22.42	22.19	22.49		2
64QAM	1	0	22.48	22.26	22.45	0-2	2
	1	7	22.63	22.48	22.60		2
	1	14	22.61	22.33	22.48		2
	8	0	21.18	21.11	21.52	0-3	3
	8	4	21.40	21.31	21.48		3
	8	7	21.38	21.36	21.27		3
	15	0	21.33	21.18	21.48		3

Table 9-22
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	24.26	24.10	24.17	0	0
	1	2	24.24	24.27	24.19		0
	1	5	24.24	24.11	24.11		0
	3	0	24.30	24.23	24.10		0
	3	2	24.37	24.24	24.14		0
	3	3	24.25	24.20	24.13		0
	6	0	23.32	23.17	23.27	0-1	1
16QAM	1	0	23.69	23.42	23.51	0-1	1
	1	2	23.55	23.56	23.54		1
	1	5	23.65	23.44	23.43		1
	3	0	23.24	23.30	23.28		1
	3	2	23.39	23.44	23.41		1
	3	3	23.35	23.25	23.36		1
	6	0	22.28	22.07	22.49	0-2	2
64QAM	1	0	22.56	22.42	22.46	0-2	2
	1	2	22.65	22.54	22.57		2
	1	5	22.66	22.49	22.30		2
	3	0	22.24	22.22	22.18		2
	3	2	22.43	22.27	22.38		2
	3	3	22.24	22.15	22.34		2
	6	0	21.39	21.14	21.40	0-3	3

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9.4.6 LTE Band 30

Table 9-23
LTE Band 30 Conducted Powers - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.17	0	0
	1	25	**25.20**		0
	1	49	24.98		0
	25	0	23.77	0-1	1
	25	12	23.74		1
	25	25	**23.84**		1
	50	0	23.79		1
16QAM	1	0	24.09	0-1	1
	1	25	24.20		1
	1	49	24.16		1
	25	0	22.81	0-2	2
	25	12	22.82		2
	25	25	22.83		2
	50	0	22.82		2
64QAM	1	0	22.90	0-2	2
	1	25	22.74		2
	1	49	22.89		2
	25	0	21.66	0-3	3
	25	12	21.65		3
	25	25	21.78		3
	50	0	21.81		3

Table 9-24
LTE Band 30 Conducted Powers - 5 MHz Bandwidth

LTE Band 30 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.65	0	0
	1	12	24.71		0
	1	24	24.65		0
	12	0	23.76	0-1	1
	12	6	23.78		1
	12	13	23.77		1
	25	0	23.81		1
16QAM	1	0	24.05	0-1	1
	1	12	23.99		1
	1	24	24.05		1
	12	0	22.91	0-2	2
	12	6	22.96		2
	12	13	22.91		2
	25	0	22.81		2
64QAM	1	0	22.99	0-2	2
	1	12	22.86		2
	1	24	22.60		2
	12	0	21.66	0-3	3
	12	6	21.78		3
	12	13	21.70		3
	25	0	21.80		3

Note: LTE Band 30 at 10MHz and 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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9.4.7 LTE Band 7

Table 9-25
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	23.37	**23.60**	23.51	0	0
	1	50	23.17	23.22	23.44		0
	1	99	23.29	23.03	23.13		0
	50	0	**22.26**	22.25	22.14	0-1	1
	50	25	22.23	22.16	22.01		1
	50	50	22.13	22.13	21.98		1
	100	0	22.19	22.15	22.03		1
16QAM	1	0	22.48	22.43	22.54	0-1	1
	1	50	22.38	22.32	22.40		1
	1	99	22.51	22.29	22.33		1
	50	0	21.35	21.35	21.18	0-2	2
	50	25	21.24	21.27	21.13		2
	50	50	21.21	21.13	20.99		2
	100	0	21.32	21.19	21.04		2
64QAM	1	0	21.48	21.41	21.52	0-2	2
	1	50	21.27	21.25	21.28		2
	1	99	21.35	21.33	21.37		2
	50	0	20.41	20.18	20.18	0-3	3
	50	25	20.35	20.18	20.05		3
	50	50	20.16	20.22	20.22		3
	100	0	20.32	20.15	20.00		3

Table 9-26
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	23.34	23.19	23.19	0	0
	1	36	23.37	23.05	23.01		0
	1	74	23.14	22.96	22.97		0
	36	0	22.26	22.07	22.10	0-1	1
	36	18	22.21	22.13	22.07		1
	36	37	22.23	22.08	21.96		1
	75	0	22.25	22.16	22.00		1
16QAM	1	0	22.52	22.43	22.42	0-1	1
	1	36	22.49	22.36	22.23		1
	1	74	22.32	22.35	22.26		1
	36	0	21.32	21.11	21.14	0-2	2
	36	18	21.30	21.17	21.00		2
	36	37	21.21	21.12	20.99		2
	75	0	21.33	21.19	21.06		2
64QAM	1	0	21.43	21.34	21.36	0-2	2
	1	36	21.41	21.44	21.24		2
	1	74	21.37	21.34	21.33		2
	36	0	20.37	20.12	20.08	0-3	3
	36	18	20.35	20.16	19.98		3
	36	37	20.19	20.14	20.01		3
	75	0	20.29	20.15	20.09		3

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Table 9-27
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	23.18	23.17	23.14	0	0
	1	25	23.13	23.16	23.07		0
	1	49	23.15	23.11	22.92		0
	25	0	22.22	22.13	22.01	0-1	1
	25	12	22.31	22.18	21.99		1
	25	25	22.24	22.13	22.08		1
	50	0	22.31	22.16	22.03		1
16QAM	1	0	22.45	22.45	22.50	0-1	1
	1	25	22.34	22.41	22.38		1
	1	49	22.42	22.39	22.47		1
	25	0	21.31	21.16	21.12	0-2	2
	25	12	21.28	21.19	21.07		2
	25	25	21.28	21.18	21.15		2
	50	0	21.24	21.22	21.05		2
64QAM	1	0	21.45	21.41	21.37	0-2	2
	1	25	21.38	21.54	21.31		2
	1	49	21.39	21.35	21.47		2
	25	0	20.38	20.15	20.07	0-3	3
	25	12	20.26	20.17	20.03		3
	25	25	20.21	20.26	19.97		3
	50	0	20.36	20.39	20.03		3

Table 9-28
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	23.28	23.14	23.20	0	0
	1	12	23.27	23.23	23.14		0
	1	24	23.26	23.11	23.17		0
	12	0	22.25	22.15	22.22	0-1	1
	12	6	22.28	22.17	22.28		1
	12	13	22.26	22.08	22.28		1
	25	0	22.25	22.07	22.20		1
16QAM	1	0	22.50	22.40	22.32	0-1	1
	1	12	22.44	22.32	22.28		1
	1	24	22.34	22.37	22.30		1
	12	0	21.26	21.23	21.12	0-2	2
	12	6	21.34	21.29	21.21		2
	12	13	21.29	21.13	21.07		2
	25	0	21.29	21.13	20.98		2
64QAM	1	0	21.51	21.35	21.44	0-2	2
	1	12	21.52	21.48	21.28		2
	1	24	21.31	21.42	21.11		2
	12	0	20.33	20.24	20.12	0-3	3
	12	6	20.21	20.11	20.20		3
	12	13	20.29	20.18	20.20		3
	25	0	20.18	20.27	19.95		3

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9.4.8 LTE Band 41

Table 9-29
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	22.51	22.59	**22.70**	22.47	22.21	0	0
	1	50	22.41	22.46	22.47	22.41	22.49		0
	1	99	22.47	22.41	22.51	22.03	22.07		0
	50	0	**21.45**	21.40	21.41	21.23	21.38	0-1	1
	50	25	21.44	21.36	21.38	21.29	21.23		1
	50	50	21.39	21.31	21.36	21.23	21.31		1
	100	0	21.42	21.33	21.43	21.35	21.36		1
16QAM	1	0	21.39	21.64	21.54	21.25	21.65	0-1	1
	1	50	21.23	21.44	21.38	21.14	21.52		1
	1	99	21.21	21.42	21.33	21.15	21.53		1
	50	0	20.50	20.50	20.44	20.25	20.44	0-2	2
	50	25	20.41	20.44	20.34	20.30	20.32		2
	50	50	20.37	20.40	20.33	20.24	20.34		2
	100	0	20.44	20.36	20.39	20.32	20.36		2
64QAM	1	0	20.65	20.64	20.60	20.64	20.59	0-2	2
	1	50	20.52	20.56	20.56	20.69	20.55		2
	1	99	20.61	20.62	20.69	20.57	20.43		2
	50	0	19.41	19.51	19.57	19.43	19.58	0-3	3
	50	25	19.56	19.48	19.59	19.55	19.47		3
	50	50	19.60	19.50	19.68	19.66	19.64		3
	100	0	19.51	19.46	19.70	19.65	19.66		3

Table 9-30
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	22.51	22.45	22.55	22.46	22.33	0	0
	1	36	22.36	22.30	22.42	22.36	22.22		0
	1	74	22.31	22.31	22.36	22.29	22.15		0
	36	0	21.47	21.44	21.41	21.41	21.28	0-1	1
	36	18	21.38	21.38	21.38	21.40	21.21		1
	36	37	21.40	21.38	21.35	21.35	21.27		1
	75	0	21.41	21.36	21.35	21.37	21.22		1
16QAM	1	0	21.42	21.49	21.60	21.38	21.34	0-1	1
	1	36	21.26	21.34	21.47	21.35	21.20		1
	1	74	21.23	21.28	21.42	21.26	21.20		1
	36	0	20.44	20.39	20.38	20.39	20.30	0-2	2
	36	18	20.37	20.36	20.38	20.40	20.24		2
	36	37	20.33	20.33	20.34	20.31	20.19		2
	75	0	20.42	20.36	20.40	20.37	20.22		2
64QAM	1	0	20.57	20.59	20.70	20.64	20.59	0-2	2
	1	36	20.45	20.64	20.54	20.61	20.44		2
	1	74	20.64	20.59	20.67	20.60	20.55		2
	36	0	19.61	19.55	19.70	19.61	19.58	0-3	3
	36	18	19.67	19.55	19.52	19.54	19.57		3
	36	37	19.68	19.53	19.60	19.47	19.59		3
	75	0	19.59	19.54	19.51	19.62	19.59		3

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Table 9-31
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	22.44	22.37	22.49	22.47	22.69	0	0
	1	25	22.30	22.32	22.44	22.36	22.22		0
	1	49	22.34	22.31	22.38	22.35	22.66		0
	25	0	21.40	21.40	21.36	21.43	21.38	0-1	1
	25	12	21.46	21.42	21.37	21.40	21.28		1
	25	25	21.38	21.36	21.37	21.38	21.39		1
	50	0	21.42	21.37	21.40	21.41	21.39		1
16QAM	1	0	21.41	21.44	21.59	21.39	21.63	0-1	1
	1	25	21.31	21.39	21.49	21.32	21.21		1
	1	49	21.30	21.33	21.49	21.24	21.67		1
	25	0	20.44	20.38	20.41	20.43	20.39	0-2	2
	25	12	20.43	20.35	20.35	20.40	20.24		2
	25	25	20.37	20.37	20.36	20.35	20.35		2
	50	0	20.41	20.37	20.40	20.39	20.40		2
64QAM	1	0	20.69	20.57	20.64	20.54	20.66	0-2	2
	1	25	20.55	20.62	20.70	20.50	20.54		2
	1	49	20.56	20.68	20.55	20.63	20.63		2
	25	0	19.56	19.49	19.60	19.62	19.68	0-3	3
	25	12	19.59	19.68	19.59	19.50	19.57		3
	25	25	19.58	19.52	19.61	19.54	19.51		3
	50	0	19.61	19.54	19.42	19.62	19.42		3

Table 9-32
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	22.36	22.36	22.21	22.42	22.21	0	0
	1	12	22.31	22.31	22.19	22.46	22.21		0
	1	24	22.29	22.29	22.18	22.36	22.20		0
	12	0	21.40	21.34	21.38	21.44	21.23	0-1	1
	12	6	21.44	21.45	21.41	21.41	21.25		1
	12	13	21.42	21.36	21.35	21.37	21.21		1
	25	0	21.37	21.39	21.39	21.41	21.19		1
16QAM	1	0	21.30	21.29	21.45	21.36	21.18	0-1	1
	1	12	21.29	21.25	21.53	21.35	21.13		1
	1	24	21.22	21.28	21.50	21.30	21.12		1
	12	0	20.39	20.39	20.45	20.41	20.18	0-2	2
	12	6	20.44	20.39	20.46	20.39	20.20		2
	12	13	20.39	20.31	20.38	20.35	20.16		2
	25	0	20.37	20.35	20.35	20.37	20.22		2
64QAM	1	0	20.54	20.44	20.50	20.55	20.64	0-2	2
	1	12	20.51	20.63	20.57	20.64	20.66		2
	1	24	20.67	20.60	20.64	20.63	20.48		2
	12	0	19.57	19.66	19.65	19.64	19.67	0-3	3
	12	6	19.67	19.49	19.60	19.63	19.52		3
	12	13	19.48	19.61	19.53	19.60	19.56		3
	25	0	19.64	19.62	19.64	19.65	19.56		3

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REV 18.3 M
01/30/2017

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9.4.9 LTE Carrier Aggregation Conducted Powers

Table 9-33
LTE Band 12 PCC Two Component Carrier Aggregation 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_12B	LTE B12	5	23155	713.5	QPSK	1	12	5155	743.5	LTE B12	5	5107	738.7	24.98	25.05
CA_2A-12A (1)	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	25.44	25.50
CA_12A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B30	10	9820	2355	25.33	25.50
CA_12A-66A (2)	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B66	20	66786	2145	25.38	25.50
CA_4A-12A (2)	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B4	20	2175	2132.5	25.40	25.50
CA_7A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B7	20	3100	2655	25.40	25.50

Table 9-34
LTE Band 12 PCC Three Component Carrier Aggregation 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	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	25.46	25.50
CA_2A-12B	LTE B12	5	23155	713.5	QPSK	1	12	5155	743.5	LTE B2	20	900	1960	LTE B12	5	5107	738.7	25.03	25.05
CA_4A-12B	LTE B12	5	23155	713.5	QPSK	1	12	5155	743.5	LTE B4	20	2175	2132.5	LTE B12	5	5107	738.7	25.02	25.05
CA_2A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	25.31	25.50
CA_4A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	25.46	25.50
CA_2A-12A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	25.48	25.50
CA_2A-12A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	25.50	25.50
CA_4A-12A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	25.38	25.50
CA_4A-7A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	25.39	25.50
CA_12A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.46	25.50
CA_2A-7A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B7	20	3100	2655	25.44	25.50
CA_12A-30A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	25.45	25.50

Table 9-35
LTE Band 12 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_12A-30A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B30	10	9820	2355	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.43	25.50
CA_2A-2A-12A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B30	10	9820	2355	25.40	25.50
CA_2A-12A-30A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	LTE B66	20	66786	2145	25.41	25.50
CA_2A-12A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.47	25.50
CA_2A-4A-7A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	25.44	25.50
CA_2A-4A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	25.48	25.50
CA_2A_4A-12A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	25.41	25.50
CA_12A-4A-4A-30A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	LTE B30	10	9820	2355	25.40	25.50
CA_2A-2A-12A-66A	LTE B12	10	23095	707.5	QPSK	1	25	5095	737.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B66	20	66786	2145	25.43	25.50

Table 9-36
LTE Band 17 PCC Two Component Carrier Aggregation 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-17A	LTE B17	10	23790	710	QPSK	1	25	5790	740	LTE B2	10	900	1960	25.34	25.50
CA_4A-17A	LTE B17	10	23790	710	QPSK	1	25	5790	740	LTE B4	10	2175	2132.5	25.46	25.50

Table 9-37
LTE Band 13 PCC Two Component Carrier Aggregation 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_4A-13A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B4	20	2175	2132.5	25.48	25.47
CA_13A-66A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B66	20	66786	2145	25.41	25.47
CA_2A-13A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	25.45	25.47

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Table 9-38
LTE Band 13 PCC Three Component Carrier Aggregation 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-13A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B2	5	900	1960	LTE B2	5	625	1932.5	25.50	25.47
CA_2A-13A-66A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B66	20	66786	2145	25.45	25.47
CA_2A-4A-13A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	25.46	25.47
CA_4A-4A-13A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	25.40	25.47
CA_13A-66A-66A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.49	25.47
CA_13A-66B	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B66	15	66786	2145	LTE B66	5	66885	2154.9	25.42	25.47
CA_13A-66C	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	25.33	25.47

Table 9-39
LTE Band 5 PCC Two Component Carrier Aggregation 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	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	25.40	25.50
CA_5B	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B5	5	2450	874	25.50	25.50
CA_5A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B66	20	66786	2145	25.45	25.50
CA_4A-5A (1)	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B4	20	2175	2132.5	25.46	25.50
CA_5A-30A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B30	10	9820	2355	25.44	25.50

Table 9-40
LTE Band 5 PCC Three Component Carrier Aggregation 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-5A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	25.46	25.50
CA_2A-5A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	25.40	25.50
CA_2A-4A-5A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	25.44	25.50
CA_4A-4A-5A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	25.50	25.50
CA_5A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.33	25.50
CA_5A-66B	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B66	15	66786	2145	LTE B66	5	66885	2154.9	25.38	25.50
CA_5A-66C	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	25.50	25.50
CA_5A-30A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	25.46	25.50
CA_2A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	25.49	25.50
CA_4A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	25.49	25.50

Table 9-41
LTE Band 5 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	24.54	LTE Rel. 8 Tx.Power
CA_2A-2A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B30	10	9820	2355	25.48	25.50
CA_2A-5A-30A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	LTE B66	20	66786	2145	25.47	25.50
CA_2A-4A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	25.46	25.50
CA_2A-2A-5A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B66	20	66786	2145	25.49	25.50
CA_5A-30A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B30	10	9820	2355	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.48	25.50
CA_2A-5A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	LTE B2	20	900	1960	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.50	25.50

Table 9-42
LTE Band 66 PCC Two Component Carrier Aggregation 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 (2)	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	24.60	24.70
CA_5A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B5	10	2525	881.5	24.66	24.70
CA_13A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B13	10	5230	751	24.70	24.70
CA_66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	5	66461	2112.5	24.60	24.70
CA_66B	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	15	67018	2168.2	24.60	24.70
CA_66C	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	20	66994	2165.8	24.60	24.70
CA_30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B30	10	9820	2355	24.65	24.70
CA_29A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B29	10	9715	722.5	24.59	24.70
CA_12A-66A (2)	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B12	10	5095	737.5	24.68	24.70

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Table 9-43
LTE Band 66 PCC Three Component Carrier Aggregation 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-12A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B12	10	5095	737.5	24.62	24.70
CA_5A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.64	24.70
CA_2A-5A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B5	10	2525	881.5	24.61	24.70
CA_2A-13A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B13	10	5230	751	24.62	24.70
CA_2A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B66	5	66461	2112.5	24.63	24.70
CA_2A-66B	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B66	15	67018	2168.2	24.50	24.70
CA_2A-66C	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B66	20	66994	2165.8	24.59	24.70
CA_2A-2A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	24.60	24.70
CA_5A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B5	10	2525	881.5	LTE B66	5	66461	2112.5	24.63	24.70
CA_5A-66B	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B5	10	2525	881.5	LTE B66	15	67018	2168.2	24.60	24.70
CA_5A-66C	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B5	10	2525	881.5	LTE B66	20	66994	2165.8	24.60	24.70
CA_13A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B13	10	5230	751	LTE B66	5	66461	2112.5	24.60	24.70
CA_13A-66B	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B13	10	5230	751	LTE B66	15	67018	2168.2	24.60	24.70
CA_13A-66C	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B13	10	5230	751	LTE B66	20	66994	2165.8	24.59	24.70
CA_66A-66C	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	20	66578	2124.2	LTE B66	5	66461	2112.5	24.65	24.70
CA_66B-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	15	67018	2168.2	LTE B66	5	66461	2112.5	24.59	24.70
CA_12A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B12	10	5095	737.5	LTE B66	5	66461	2112.5	24.61	24.70
CA_12A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.66	24.70
CA_30A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B30	10	5230	2355	LTE B66	5	66461	2112.5	24.66	24.70
CA_2A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	24.63	24.70
CA_66A-66B	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	15	66554	2121.8	LTE B66	5	66461	2112.5	24.51	24.70
CA_29A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.50	24.70
CA_66C-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	20	66994	2165.8	LTE B66	5	66461	2112.5	24.57	24.70

Table 9-44
LTE Band 66 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	24.54	LTE Rel. 8 Tx.Power
CA_5A-30A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	5	66461	2112.5	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.66	24.70
CA_2A-5A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	5	66461	2112.5	LTE B2	20	900	1960	LTE B5	10	2525	881.5	24.67	24.70
CA_2A-2A-12A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B12	10	5095	737.5	24.70	24.70
CA_12A-30A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	5	66461	2112.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.68	24.70
CA_2A-12A-66A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B66	5	66461	2112.5	LTE B2	20	900	1960	LTE B12	10	5095	737.5	24.69	24.70
CA_2A-5A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.70	24.70
CA_2A-12A-30A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.68	24.70
CA_2A-2A-5A-66A	LTE B66	5	132647	1777.5	QPSK	1	0	67111	2177.5	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B5	10	2525	881.5	24.67	24.70

Table 9-45
LTE Band 4 PCC Two Component Carrier Aggregation 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_4A-4A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	24.38	24.70
CA_2A-4A (2)	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	24.44	24.70
CA_4A-5A (1)	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B5	10	2525	881.5	24.43	24.70
CA_4A-13A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B13	10	5230	751	24.46	24.70
CA_4A-29A (2)	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B29	10	9715	722.5	24.36	24.70
CA_4A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B30	10	9820	2355	24.66	24.70
CA_4A-7A (1)	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B7	20	3100	2655	24.70	24.70
CA_4A-12A (2)	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B12	10	5095	737.5	24.68	24.70
CA_4A-17A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B17	10	5790	740	24.60	24.70

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Table 9-46
LTE Band 4 PCC Three Component Carrier Aggregation 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-4A-5A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B5	10	2525	881.5	24.65	24.70
CA_2A-4A-13A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B13	10	5230	751	24.55	24.70
CA_4A-4A-5A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B5	10	2525	881.5	24.70	24.70
CA_4A-4A-13A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B13	10	5230	751	24.54	24.70
CA_4A-4A-7A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B7	20	3100	2655	24.70	24.70
CA_2A-4A-7A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B7	20	3100	2655	24.59	24.70
CA_2A-4A-29A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B29	10	9715	722.5	24.61	24.70
CA_4A-4A-29A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B29	10	9715	722.5	24.67	24.70
CA_4A-12B	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	24.52	24.70
CA_2A-4A-12A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B12	10	5095	737.5	24.58	24.70
CA_4A-4A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B30	10	9820	2355	24.61	24.70
CA_4A-4A-12A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B12	10	5095	737.5	24.54	24.70
CA_2A-4A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	24.61	24.70
CA_4A-29A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.61	24.70
CA_4A-5A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.46	24.70
CA_4A-12A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.65	24.70
CA_4A-7A-7A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B7	5	3100	2655	LTE B7	5	2775	2622.5	24.55	24.70
CA_4A-7A-12A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	24.51	24.70

Table 9-47
LTE Band 4 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	24.54	LTE Rel. 8 Tx.Power
CA_4A-4A-12A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B4	5	1975	2112.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.65	24.70
CA_2A-4A-12A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.63	24.70
CA_2A-4A-4A-12A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B4	5	1975	2112.5	LTE B12	10	5095	737.5	24.61	24.70
CA_2A-4A-7A-7A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B7	5	3100	2655	LTE B7	5	2775	2622.5	24.69	24.70
CA_2A-4A-5A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.63	24.70
CA_2A-4A-7A-12A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	24.67	24.70
CA_2A-4A-29A-30A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.61	24.70

Table 9-48
LTE Band 2 PCC Two Component Carrier Aggregation 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	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	24.20	24.70
CA_2A-4A (2)	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	24.11	24.70
CA_2A-5A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B5	10	2525	881.5	24.20	24.70
CA_2A-13A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B13	10	5230	751	24.16	24.70
CA_2A-66A (2)	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B66	20	66786	2145	24.13	24.70
CA_2A-12A (1)	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	10	5095	737.5	24.17	24.70
CA_2A-29A (2)	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B29	10	9715	722.5	24.16	24.70
CA_2A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B30	10	9820	2355	24.19	24.70
CA_2A-7A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B7	20	3100	2655	24.19	24.70
CA_2A-17A	LTE B2	10	19150	1905	QPSK	1	25	1150	1985	LTE B17	10	5790	740	24.11	24.67

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Table 9-49
LTE Band 2 PCC Three Component Carrier Aggregation 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-5A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B5	10	2525	881.5	24.56	24.70
CA_2A-2A-13A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B13	10	5230	751	24.61	24.70
CA_2A-4A-5A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	24.54	24.70
CA_2A-4A-13A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	24.60	24.70
CA_2A-5A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	24.62	24.70
CA_2A-13A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B13	10	5230	751	LTE B66	20	66786	2145	24.59	24.70
CA_2A-66A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	24.58	24.70
CA_2A-66B	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B66	15	66786	2145	LTE B66	5	66879	2154.3	24.70	24.70
CA_2A-66C	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	24.69	24.70
CA_2A-2A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B66	20	66786	2145	24.56	24.70
CA_2A-2A-12A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B12	10	5095	737.5	24.57	24.70
CA_2A-4A-12A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	24.58	24.70
CA_2A-12B	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	24.68	24.70
CA_2A-12A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	24.65	24.70
CA_2A-2A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B30	10	9820	2355	24.69	24.70
CA_2A-4A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	24.67	24.70
CA_2A-5A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.69	24.70
CA_2A-12A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.70	24.70
CA_2A-29A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.69	24.70
CA_2A-30A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B30	10	9820	2355	LTE B66	20	66786	2145	24.65	24.70
CA_2A-4A-29A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	24.67	24.70
CA_2A-4A-7A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	24.64	24.70
CA_2A-7A-7A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B7	5	3100	2655	LTE B7	5	2775	2622.5	24.64	24.70
CA_2A-7A-12A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	24.66	24.70

Table 9-50
LTE Band 2 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	LTE Tx.Power with DL CA Enabled (dBm)	LTE Rel. 8 Tx.Power
CA_2A-2A-4A-4A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	24.57	24.70
CA_2A-2A-5A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.56	24.70
CA_2A-2A-12A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.54	24.70
CA_2A-5A-30A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	24.56	24.70
CA_2A-12A-30A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	24.57	24.70
CA_2A-2A-5A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	24.55	24.70
CA_2A-4A-12A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	24.59	24.70
CA_2A-4A-4A-12A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	LTE B12	10	5095	737.5	24.58	24.70
CA_2A-4A-29A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	24.58	24.70
CA_2A-4A-7A-12A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	24.56	24.70
CA_2A-4A-5A-30A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	24.55	24.70
CA_2A-4A-7A-7A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B4	20	2175	2132.5	LTE B7	5	3100	2655	LTE B7	5	2775	2622.5	24.57	24.70
CA_2A-2A-12A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B2	5	625	1932.5	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	24.60	24.70
CA_2A-12A-66A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B12	10	5095	737.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	24.57	24.70
CA_2A-5A-66A-66A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	LTE B5	10	4108	881.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	24.60	24.70

Table 9-51
LTE Band 30 PCC Two Component Carrier Aggregation 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-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	25.06	25.20
CA_4A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	20	2175	2132.5	25.11	25.20
CA_29A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B29	10	9715	722.5	25.03	25.20
CA_5A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B5	10	2525	881.5	25.04	25.20
CA_12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B12	10	5095	737.5	25.20	25.20
CA_30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B66	20	66786	2145	25.16	25.20

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Table 9-52
LTE Band 30 PCC Three Component Carrier Aggregation 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_4A-4A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	5	2175	2132.5	LTE B4	5	2375	2152.5	25.13	25.20
CA_5A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	25.06	25.20
CA_2A-2A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	5	900	1960	LTE B2	5	625	1932.5	25.20	25.20
CA_2A-29A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B29	10	9715	722.5	25.13	25.20
CA_2A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B66	20	66786	2145	25.10	25.20
CA_2A-4A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	25.09	25.20
CA_2A-5A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	25.06	25.20
CA_2A-12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B12	10	5095	737.5	25.08	25.20
CA_30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.11	25.20
CA_4A-29A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	25.20	25.20
CA_12A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	25.12	25.20
CA_4A-5A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	25.16	25.20
CA_4A-12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	25.10	25.20
CA_29A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	25.16	25.20

Table 9-53
LTE Band 30 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	24.54	LTE Rel. 8 Tx.Power
CA_2A-4A-12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	25.16	25.20
CA_5A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B5	10	2525	881.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.19	25.20
CA_4A-4A-12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	LTE B12	10	5095	737.5	25.16	25.20
CA_12A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B12	10	5095	737.5	LTE B66	5	66786	2145	LTE B66	5	67311	2197.5	25.18	25.20
CA_2A-2A-5A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B5	10	2525	881.5	25.20	25.20
CA_2A-2A-12A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	5	900	1960	LTE B2	5	625	1932.5	LTE B12	10	5095	737.5	25.17	25.20
CA_2A-12A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	5	900	1960	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	25.20	25.20
CA_2A-4A-5A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	25.17	25.20
CA_2A-4A-29A-30A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	25.18	25.20
CA_2A-5A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	5	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	25.16	25.20

Table 9-54
LTE Band 7 PCC Two Component Carrier Aggregation 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_4A-7A (1)	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B4	20	2175	2132.5	23.68	23.60
CA_2A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	23.52	23.60
CA_7A-7A (1)	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B7	5	2775	2622.5	23.60	23.60
CA_7B	LTE B7	15	20825	2507.5	QPSK	1	36	2825	2627.5	LTE B7	5	2918	2636.8	23.45	23.37
CA_7C (1)	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B7	20	2902	2635.2	23.61	23.60
CA_7A-12A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B12	10	5095	737.5	23.66	23.60

Table 9-55
LTE Band 7 PCC Three Component Carrier Aggregation 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_4A-4A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B4	5	2175	2132.5	LTE B4	5	1975	2112.5	23.61	23.60
CA_2A-7A-12A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	LTE B12	10	5095	737.5	23.60	23.60
CA_2A-7A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	LTE B7	5	2775	2622.5	23.55	23.60
CA_2A-4A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.69	23.60
CA_4A-7A-12A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	23.64	23.60
CA_4A-7A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B4	20	2175	2132.5	LTE B7	5	2775	2622.5	23.48	23.60

Table 9-56
LTE Band 7 PCC Four Component Carrier Aggregation Conducted Powers

	PCC									SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW	PCC (UL) Ch	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Off.	PCC (DL) Channel	PCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	SCC Band	SCC BW	SCC (DL) Ch	SCC (DL) Frequency	24.54	LTE Rel. 8 Tx.Power
CA_2A-4A-7A-12A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	23.58	23.60
CA_2A-4A-7A-7A	LTE B7	20	21100	2535	QPSK	1	0	3100	2655	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B7	5	2775	2622.5	23.60	23.60

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Table 9-57
Three Component Carrier 2x2 MIMO 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]	DL Antenna Configuration	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	DL Antenna Configuration	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	DL Antenna Configuration	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-4A-4A	LTE B2	20	19100	1900	QPSK	1	50	1100	1980	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B4	5	2375	2152.5	2x2 MIMO	24.61	24.70
CA_2A-4A-4A	LTE B4	5	20375	1752.5	QPSK	1	0	2375	2152.5	2x2 MIMO	LTE B4	5	1975	2112.5	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	24.59	24.70

Notes:

1. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. For 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.
4. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
5. Per FCC guidance, LTE Band 66 standalone powers were used to select measurement configurations for LTE Band 4, LTE Band 25 standalone powers were used to select measurement configurations for LTE Band 2, and LTE Band 12 standalone powers were used to select measurement configurations for LTE Band 17.
6. 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.

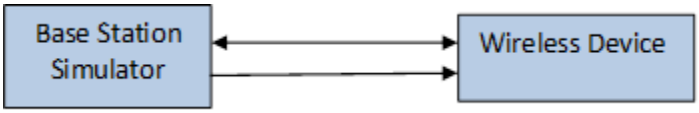

Figure 9-4
Power Measurement Setup

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9.5 WLAN Conducted Powers

Table 9-58
2.4 GHz WLAN Ant 1 Maximum Average RF Power

2.4GHz Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11b	802.11g
		Average	Average
2412	1	18.65	N/A
2422	3	N/A	17.75
2437	6	**18.85**	17.86
2452	9	N/A	17.75
2462	11	18.83	N/A

Table 9-59
2.4 GHz WLAN Ant 2 Maximum Average RF Power

2.4GHz Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11b	802.11g
		Average	Average
2412	1	**18.49**	N/A
2422	3	N/A	17.36
2437	6	**18.49**	17.23
2452	9	N/A	17.33
2462	11	18.37	N/A

Table 9-60
2.4 GHz WLAN Ant 1 Reduced Average RF Power

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	16.98	16.89	N/A	N/A
2422	3	N/A	16.89	16.63	16.81
2437	6	16.90	16.91	16.71	16.70
2452	9	N/A	16.95	16.64	16.74
2462	11	**16.98**	N/A	N/A	N/A

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Table 9-61
2.4 GHz WLAN Ant 2 Reduced Average RF Power

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	16.22	16.27	N/A	N/A
2422	3	N/A	16.27	16.15	16.04
2437	6	**16.28**	16.15	16.01	15.90
2452	9	N/A	16.07	16.14	15.83
2462	11	15.34	N/A	N/A	N/A

Table 9-62
2.4 GHz WLAN MIMO 802.11n Reduced Average RF Power

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2422	3	16.63	16.15	19.41
2437	6	16.71	16.01	19.38
2452	9	16.64	16.14	**19.41**

Table 9-63
5 GHz WLAN Ant 1 Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	**16.76**	16.54	16.55
5200	40	16.72	16.51	16.51
5220	44	16.68	16.50	16.54
5240	48	16.61	16.40	16.38
5260	52	16.57	16.39	16.38
5280	56	16.52	16.50	16.58
5300	60	16.54	16.35	16.39
5320	64	**16.66**	16.45	16.42
5500	100	16.66	16.50	16.49
5580	116	**16.81**	16.61	16.60
5660	132	16.68	16.47	16.49
5720	144	16.73	16.51	16.55
5745	149	16.76	16.57	16.51
5785	157	16.75	16.56	16.58
5825	165	**16.80**	16.60	16.60

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Table 9-64
5 GHz WLAN Ant 2 Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	16.40	16.18	16.18
5200	40	16.46	16.23	16.19
5220	44	16.48	16.31	16.24
5240	48	**16.49**	16.26	16.29
5260	52	16.48	16.31	16.27
5280	56	16.48	16.24	16.25
5300	60	16.45	16.24	16.25
5320	64	**16.49**	16.30	16.27
5500	100	16.38	16.20	16.17
5580	116	**16.49**	16.28	16.23
5660	132	16.44	16.31	16.25
5720	144	16.47	16.23	16.24
5745	149	16.45	16.30	16.28
5785	157	**16.47**	16.30	16.28
5825	165	16.34	16.39	16.41

Table 9-65
5 GHz WLAN MIMO 802.11n Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5180	36	16.54	16.18	19.37
5200	40	16.51	16.23	19.38
5220	44	16.50	16.31	**19.42**
5240	48	16.40	16.26	19.34
5260	52	16.39	16.31	19.36
5280	56	16.50	16.24	19.38
5300	60	16.35	16.24	19.31
5320	64	16.45	16.30	**19.39**
5500	100	16.50	16.20	19.36
5580	116	16.61	16.28	**19.46**
5660	132	16.47	16.31	19.40
5720	144	16.51	16.23	19.38
5745	149	16.57	16.30	19.45
5785	157	16.56	16.30	19.44
5825	165	16.89	16.39	**19.66**

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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.

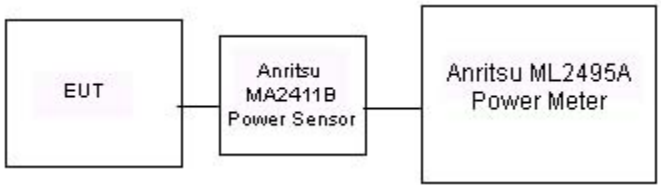

Figure 9-5
Power Measurement Setup for Bandwidths < 50 MHz

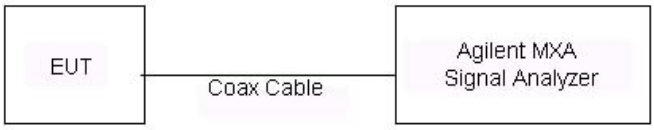

Figure 9-6
Power Measurement Setup for Bandwidths > 50 MHz

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9.6 Bluetooth Conducted Powers

Table 9-66
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.41	10.986
2441	1.0	39	**11.59**	14.426
2480	1.0	78	10.68	11.686
2402	2.0	0	9.68	9.283
2441	2.0	39	10.91	12.320
2480	2.0	78	9.98	9.950
2402	3.0	0	9.73	9.388
2441	3.0	39	10.95	12.440
2480	3.0	78	10.03	10.059

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

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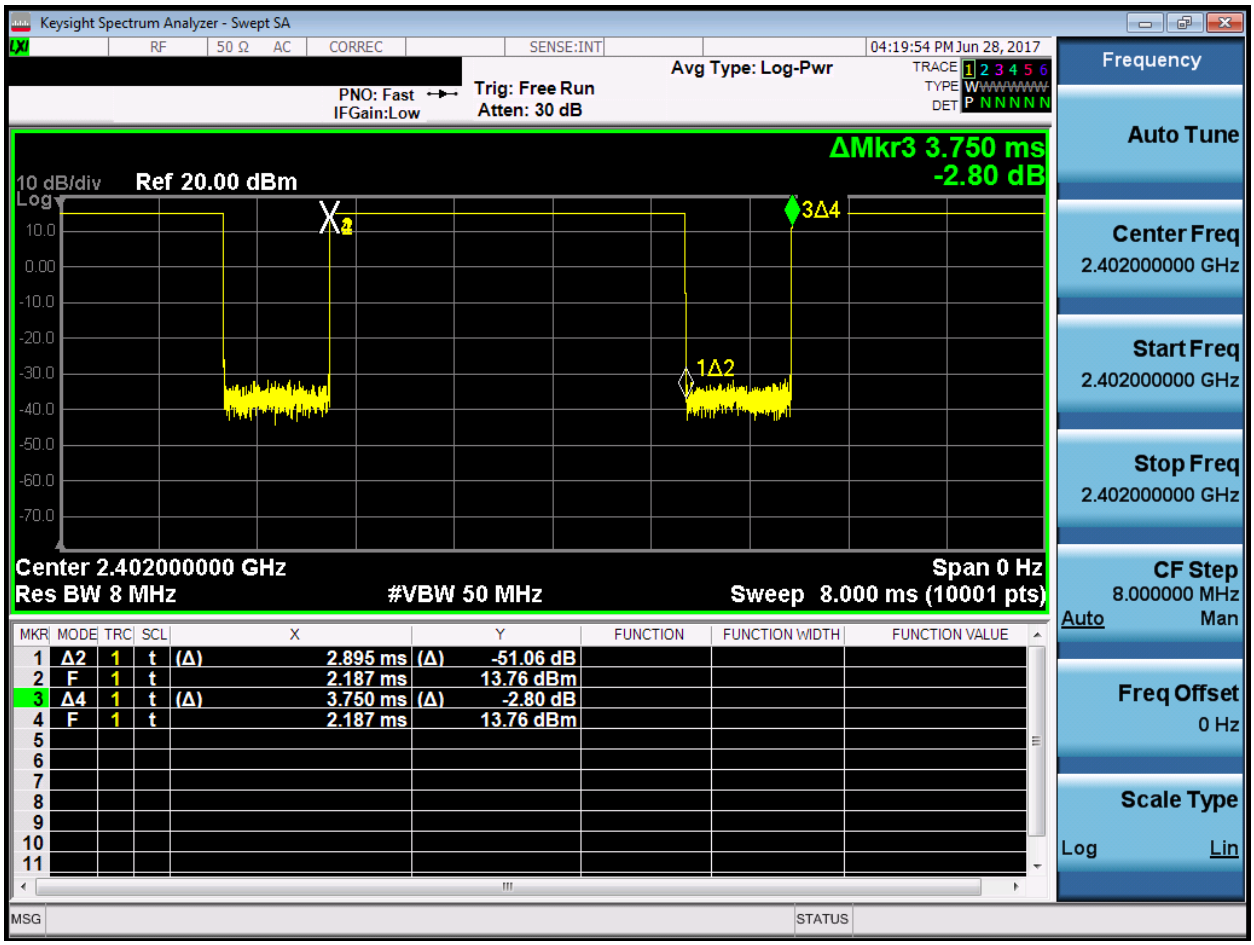

Figure 9-7
Bluetooth Transmission Plot

Equation 2
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.895ms}{3.750ms} * 100\% = 77.2\%$$

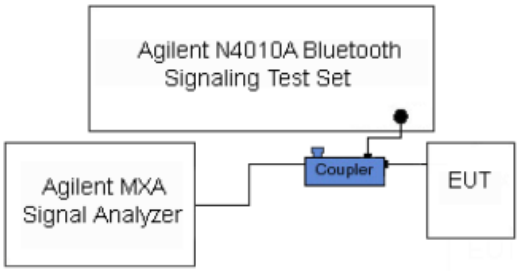

Figure 9-8
Power Measurement Setup

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
7/24/2017	750H	20.5	700	0.880	44.097	0.889	42.201	-1.01%	4.49%
			710	0.883	44.057	0.890	42.149	-0.79%	4.53%
			720	0.887	44.028	0.891	42.097	-0.45%	4.59%
			725	0.888	44.013	0.891	42.071	-0.34%	4.62%
			740	0.893	43.978	0.893	41.994	0.00%	4.72%
			755	0.898	43.942	0.894	41.916	0.45%	4.83%
			770	0.903	43.886	0.895	41.838	0.89%	4.90%
			785	0.908	43.833	0.896	41.760	1.34%	4.96%
8/2/2017	835H	20.2	820	0.870	40.062	0.899	41.578	-3.23%	-3.65%
			835	0.885	39.863	0.900	41.500	-1.67%	-3.94%
			850	0.900	39.656	0.916	41.500	-1.75%	-4.44%
8/7/2017	835H	21.0	820	0.893	42.634	0.899	41.578	-0.67%	2.54%
			835	0.908	42.461	0.900	41.500	0.89%	2.32%
			850	0.921	42.281	0.916	41.500	0.55%	1.88%
7/26/2017	1750H	20.0	1710	1.369	39.841	1.348	40.142	1.56%	-0.75%
			1750	1.407	39.653	1.371	40.079	2.63%	-1.06%
			1790	1.450	39.457	1.394	40.016	4.02%	-1.40%
7/24/2017	1900H	22.7	1850	1.395	40.279	1.400	40.000	-0.36%	0.70%
			1880	1.435	40.128	1.400	40.000	2.50%	0.32%
			1910	1.464	40.013	1.400	40.000	4.57%	0.03%
8/2/2017	1900H	22.4	1850	1.392	39.479	1.400	40.000	-0.57%	-1.30%
			1880	1.419	39.319	1.400	40.000	1.36%	-1.70%
			1910	1.454	39.221	1.400	40.000	3.86%	-1.95%
8/9/2017	1900H	21.5	1850	1.378	39.824	1.400	40.000	-1.57%	-0.44%
			1880	1.418	39.726	1.400	40.000	1.29%	-0.69%
			1910	1.447	39.557	1.400	40.000	3.36%	-1.11%
7/26/2017	2300-2600H	22.7	2300	1.717	38.995	1.670	39.500	2.81%	-1.28%
			2310	1.727	38.965	1.679	39.480	2.86%	-1.30%
			2320	1.738	38.930	1.687	39.460	3.02%	-1.34%
			2400	1.825	38.609	1.756	39.289	3.93%	-1.73%
			2450	1.877	38.446	1.800	39.200	4.28%	-1.92%
			2500	1.938	38.233	1.855	39.136	4.47%	-2.31%
			2550	1.992	38.072	1.909	39.073	4.35%	-2.56%
			2600	2.046	37.849	1.964	39.009	4.18%	-2.97%
			2650	2.109	37.672	2.018	38.945	4.51%	-3.27%
			2700	2.159	37.463	2.073	38.882	4.15%	-3.65%
7/31/2017	2400-2600H	21.6	2400	1.812	39.268	1.756	39.289	3.19%	-0.05%
			2450	1.865	39.092	1.800	39.200	3.61%	-0.28%
			2500	1.927	38.894	1.855	39.136	3.88%	-0.62%
			2550	1.988	38.732	1.909	39.073	4.14%	-0.87%
			2600	2.039	38.527	1.964	39.009	3.82%	-1.24%
8/10/2017	2400H	20.5	2400	1.832	38.219	1.756	39.289	4.33%	-2.72%
			2450	1.887	38.017	1.800	39.200	4.83%	-3.02%
			2500	1.945	37.821	1.855	39.136	4.85%	-3.36%
07/31/2017	5200H-5800H	21.5	5240	4.552	35.877	4.696	35.940	-3.07%	-0.18%
			5260	4.600	35.828	4.717	35.917	-2.48%	-0.25%
			5320	4.616	35.755	4.778	35.849	-3.39%	-0.26%
			5580	4.889	35.428	5.045	35.551	-3.09%	-0.35%
			5600	4.913	35.421	5.065	35.529	-3.00%	-0.30%
			5745	5.078	35.166	5.214	35.363	-2.61%	-0.56%
			5765	5.087	35.252	5.234	35.340	-2.81%	-0.25%
			5785	5.099	35.208	5.255	35.317	-2.97%	-0.31%
			5825	5.144	35.095	5.296	35.271	-2.87%	-0.50%

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Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
7/24/2017	750B	23.5	700	0.912	55.492	0.959	55.726	-4.90%	-0.42%
			710	0.921	55.402	0.960	55.687	-4.06%	-0.51%
			720	0.930	55.303	0.961	55.648	-3.23%	-0.62%
			725	0.935	55.256	0.961	55.629	-2.71%	-0.67%
			740	0.949	55.110	0.963	55.570	-1.45%	-0.83%
			755	0.963	54.956	0.964	55.512	-0.10%	-1.00%
			770	0.976	54.792	0.965	55.453	1.14%	-1.19%
			785	0.991	54.628	0.966	55.395	2.59%	-1.38%
7/31/2017	835B	21.5	820	0.989	54.642	0.969	55.258	2.06%	-1.11%
			835	1.005	54.424	0.970	55.200	3.61%	-1.41%
			850	1.020	54.264	0.988	55.154	3.24%	-1.61%
8/4/2017	835B	21.2	820	0.956	53.042	0.969	55.258	-1.34%	-4.01%
			835	0.974	52.870	0.970	55.200	0.41%	-4.22%
			850	0.986	52.727	0.988	55.154	-0.20%	-4.40%
8/6/2017	835B	20.2	820	0.961	52.799	0.969	55.258	-0.83%	-4.45%
			835	0.977	52.650	0.970	55.200	0.72%	-4.62%
			850	0.992	52.501	0.988	55.154	0.40%	-4.81%
7/27/2017	1750B	21.5	1710	1.463	51.569	1.463	53.537	0.00%	-3.68%
			1750	1.505	51.397	1.488	53.432	1.14%	-3.81%
			1790	1.550	51.246	1.514	53.326	2.38%	-3.90%
8/7/2017	1750B	21.0	1710	1.467	52.131	1.463	53.537	0.27%	-2.63%
			1750	1.506	51.942	1.488	53.432	1.21%	-2.79%
			1790	1.552	51.794	1.514	53.326	2.51%	-2.87%
7/29/2017	1900B	21.8	1850	1.503	52.410	1.520	53.300	-1.12%	-1.67%
			1880	1.539	52.276	1.520	53.300	1.25%	-1.92%
			1910	1.571	52.170	1.520	53.300	3.36%	-2.12%
7/31/2017	1900B	21.9	1850	1.520	53.355	1.520	53.300	0.00%	0.10%
			1880	1.556	53.270	1.520	53.300	2.37%	-0.06%
			1910	1.590	53.182	1.520	53.300	4.61%	-0.22%
8/3/2017	1900B	23.9	1850	1.452	53.382	1.520	53.300	-4.47%	0.15%
			1880	1.489	53.292	1.520	53.300	-2.04%	-0.02%
			1910	1.528	53.127	1.520	53.300	0.53%	-0.32%
8/8/2017	2300B	22.8	2300	1.811	51.850	1.809	52.900	0.11%	-1.98%
			2310	1.823	51.809	1.816	52.887	0.39%	-2.04%
			2320	1.836	51.765	1.826	52.873	0.55%	-2.10%
8/7/2017	2400-2600B	22.9	2400	1.945	51.453	1.902	52.767	2.26%	-2.49%
			2450	2.005	51.277	1.950	52.700	2.82%	-2.70%
			2500	2.079	51.054	2.021	52.636	2.87%	-3.01%
			2550	2.147	50.921	2.092	52.573	2.63%	-3.14%
			2600	2.213	50.656	2.163	52.509	2.31%	-3.53%
			2650	2.292	50.507	2.234	52.445	2.60%	-3.70%
			2700	2.357	50.291	2.305	52.382	2.26%	-3.99%
8/10/2017	2400-2600B	22.6	2400	1.938	51.058	1.902	52.767	1.89%	-3.24%
			2450	2.004	50.863	1.950	52.700	2.77%	-3.49%
			2500	2.071	50.693	2.021	52.636	2.47%	-3.69%
			2550	2.136	50.519	2.092	52.573	2.10%	-3.91%
			2600	2.207	50.329	2.163	52.509	2.03%	-4.15%
			2650	2.274	50.166	2.234	52.445	1.79%	-4.35%
			2700	2.341	49.941	2.305	52.382	1.56%	-4.66%
7/31/2017	2600B	22.5	2500	2.108	52.548	2.021	52.636	4.30%	-0.17%
			2550	2.177	52.390	2.092	52.573	4.06%	-0.35%
			2600	2.242	52.155	2.163	52.509	3.65%	-0.67%
			2650	2.325	51.987	2.234	52.445	4.07%	-0.87%
			2700	2.383	51.794	2.305	52.382	3.38%	-1.12%
07/31/2017	5200B-5800B	21.9	5180	5.332	47.906	5.276	49.041	1.06%	-2.31%
			5220	5.375	47.819	5.323	48.987	0.98%	-2.38%
			5240	5.411	47.779	5.346	48.960	1.22%	-2.41%
			5260	5.446	47.792	5.369	48.933	1.43%	-2.33%
			5320	5.517	47.659	5.439	48.851	1.43%	-2.44%
			5580	5.860	47.196	5.743	48.499	2.04%	-2.69%
			5600	5.894	47.157	5.766	48.471	2.22%	-2.71%
			5660	5.977	47.086	5.837	48.390	2.40%	-2.69%
			5745	6.097	46.970	5.936	48.275	2.71%	-2.70%
			5765	6.130	46.941	5.959	48.248	2.87%	-2.71%
			5785	6.150	46.927	5.982	48.220	2.81%	-2.68%
			5825	6.206	46.803	6.029	48.166	2.94%	-2.83%
8/7/2017	5200B-5800B	21.9	5240	5.367	47.776	5.346	48.960	0.39%	-2.42%
			5260	5.390	47.746	5.369	48.933	0.39%	-2.43%
			5320	5.465	47.659	5.439	48.851	0.48%	-2.44%
			5500	5.692	47.367	5.650	48.607	0.74%	-2.55%
			5580	5.803	47.255	5.743	48.499	1.04%	-2.57%
			5600	5.846	47.191	5.766	48.471	1.39%	-2.64%
			5660	5.912	47.129	5.837	48.390	1.28%	-2.61%
			5700	5.974	47.052	5.883	48.336	1.55%	-2.66%
			5745	6.024	47.002	5.936	48.275	1.48%	-2.64%
			5765	6.036	46.953	5.959	48.248	1.29%	-2.68%

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

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10.2 Test System Verification

Prior to SAR assessment, the system is verified to ±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)	$Deviation_{1g}$ (%)
J	750	HEAD	07/24/2017	20.7	20.5	0.200	1054	3209	1.650	8.370	8.250	-1.43%
K	835	HEAD	08/02/2017	22.1	20.2	0.200	4d119	7406	1.960	9.460	9.800	3.59%
K	835	HEAD	08/07/2017	22.4	21.5	0.200	4d132	7406	1.920	9.520	9.600	0.84%
H	1750	HEAD	07/26/2017	22.3	20.0	0.100	1092	3318	3.700	36.400	37.000	1.65%
H	1900	HEAD	07/24/2017	22.6	22.7	0.100	5d026	3318	4.180	39.300	41.800	6.36%
J	1900	HEAD	08/02/2017	21.9	21.1	0.100	5d026	3209	3.880	39.300	38.800	-1.27%
H	1900	HEAD	08/09/2017	22.2	21.5	0.100	5d148	3318	4.090	40.200	40.900	1.74%
I	2300	HEAD	07/26/2017	21.7	21.7	0.100	1038	3213	5.070	47.500	50.700	6.74%
I	2450	HEAD	07/26/2017	21.7	21.7	0.100	945	3213	5.460	51.300	54.600	6.43%
I	2450	HEAD	07/31/2017	22.1	21.6	0.100	797	3213	5.500	52.100	55.000	5.57%
H	2450	HEAD	08/10/2017	21.1	20.5	0.100	945	3318	5.130	51.300	51.300	0.00%
I	2600	HEAD	07/26/2017	21.7	21.7	0.100	1071	3213	5.870	56.300	58.700	4.26%
H	5250	HEAD	07/31/2017	21.1	20.0	0.050	1237	3914	3.870	79.200	77.400	-2.27%
H	5600	HEAD	07/31/2017	21.1	20.0	0.050	1237	3914	4.050	83.300	81.000	-2.76%
H	5750	HEAD	07/31/2017	21.1	20.0	0.050	1237	3914	4.000	81.500	80.000	-1.84%
K	750	BODY	07/24/2017	21.7	22.0	0.200	1054	7406	1.750	8.610	8.750	1.63%
E	835	BODY	07/31/2017	22.7	21.5	0.200	4d180	3319	1.980	9.610	9.900	3.02%
I	835	BODY	08/04/2017	22.4	21.0	0.200	4d132	3213	1.940	9.800	9.700	-1.02%
I	835	BODY	08/06/2017	21.9	20.2	0.200	4d180	3213	1.980	9.610	9.900	3.02%
K	1750	BODY	07/27/2017	22.4	21.5	0.100	1092	7406	3.880	37.000	38.800	4.86%
J	1750	BODY	08/07/2017	19.5	21.0	0.100	1092	3209	3.750	37.000	37.500	1.35%
J	1900	BODY	07/29/2017	21.5	21.0	0.100	5d026	3209	3.970	40.300	39.700	-1.49%
J	1900	BODY	07/31/2017	21.3	21.6	0.100	5d026	3209	4.040	40.300	40.400	0.25%
J	1900	BODY	08/03/2017	22.3	22.0	0.100	5d026	3209	4.080	40.300	40.800	1.24%
G	2300	BODY	08/08/2017	22.4	21.5	0.100	1038	3287	4.990	47.500	49.900	5.05%
G	2600	BODY	07/31/2017	22.2	21.9	0.100	1071	3287	5.830	54.200	58.300	7.56%
G	2450	BODY	08/10/2017	22.2	21.4	0.100	797	3287	5.180	50.700	51.800	2.17%
G	2600	BODY	08/10/2017	22.2	21.4	0.100	1071	3287	5.670	54.200	56.700	4.61%
G	2450	BODY	08/07/2017	22.3	21.5	0.100	945	3287	5.080	50.200	50.800	1.20%
G	2600	BODY	08/07/2017	22.3	21.5	0.100	1004	3287	5.630	55.300	56.300	1.81%
D	5250	BODY	07/31/2017	22.1	21.2	0.050	1123	3589	3.510	75.900	70.200	-7.51%
D	5600	BODY	07/31/2017	22.1	21.2	0.050	1123	3589	3.950	78.900	79.000	0.13%
D	5750	BODY	07/31/2017	22.1	21.2	0.050	1123	3589	3.710	76.300	74.200	-2.75%

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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)	$Deviation_{10g}$ (%)
D	5250	BODY	08/07/2017	21.8	21.0	0.050	1123	3589	1.040	21.300	20.800	-2.35%
D	5600	BODY	08/07/2017	21.8	21.0	0.050	1123	3589	1.090	22.100	21.800	-1.36%
D	5750	BODY	08/07/2017	21.8	21.0	0.050	1123	3589	1.030	21.300	20.600	-3.29%

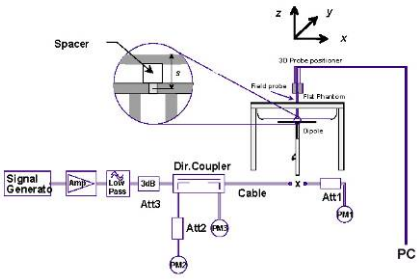

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	34.2	34.11	0.07	Right	Cheek	15318	1	1:8.3	0.086	1.021	0.088	
836.60	190	GSM 850	GSM	34.2	34.11	-0.01	Right	Tilt	15318	1	1:8.3	0.062	1.021	0.063	
836.60	190	GSM 850	GSM	34.2	34.11	-0.04	Left	Cheek	15318	1	1:8.3	0.120	1.021	0.123	A1
836.60	190	GSM 850	GSM	34.2	34.11	0.04	Left	Tilt	15318	1	1:8.3	0.057	1.021	0.058	
836.60	190	GSM 850	GPRS	34.2	34.12	0.03	Right	Cheek	15318	1	1:8.3	0.068	1.019	0.069	
836.60	190	GSM 850	GPRS	34.2	34.12	-0.03	Right	Tilt	15318	1	1:8.3	0.059	1.019	0.060	
836.60	190	GSM 850	GPRS	34.2	34.12	-0.19	Left	Cheek	15318	1	1:8.3	0.110	1.019	0.112	
836.60	190	GSM 850	GPRS	34.2	34.12	0.16	Left	Tilt	15318	1	1:8.3	0.050	1.019	0.051	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-2
GSM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	31.7	31.68	0.03	Right	Cheek	15300	1	1:8.3	0.068	1.005	0.068	
1880.00	661	GSM 1900	GSM	31.7	31.68	0.19	Right	Tilt	15300	1	1:8.3	0.025	1.005	0.025	
1880.00	661	GSM 1900	GSM	31.7	31.68	0.02	Left	Cheek	15300	1	1:8.3	0.091	1.005	0.091	
1880.00	661	GSM 1900	GSM	31.7	31.68	0.17	Left	Tilt	15300	1	1:8.3	0.034	1.005	0.034	
1880.00	661	GSM 1900	GPRS	25.5	25.42	0.00	Right	Cheek	15300	4	1:2.076	0.110	1.019	0.112	
1880.00	661	GSM 1900	GPRS	25.5	25.42	0.02	Right	Tilt	15300	4	1:2.076	0.048	1.019	0.049	
1880.00	661	GSM 1900	GPRS	25.5	25.42	0.00	Left	Cheek	15300	4	1:2.076	0.159	1.019	0.162	A2
1880.00	661	GSM 1900	GPRS	25.5	25.42	-0.15	Left	Tilt	15300	4	1:2.076	0.071	1.019	0.072	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.5	25.40	0.04	Right	Cheek	15318	1:1	0.081	1.023	0.083	
836.60	4183	UMTS 850	RMC	25.5	25.40	0.05	Right	Tilt	15318	1:1	0.064	1.023	0.065	
836.60	4183	UMTS 850	RMC	25.5	25.40	0.04	Left	Cheek	15318	1:1	0.143	1.023	0.146	A3
836.60	4183	UMTS 850	RMC	25.5	25.40	0.05	Left	Tilt	15318	1:1	0.064	1.023	0.065	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-4
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.12	Right	Cheek	15318	1:1	0.173	1.033	0.179	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.09	Right	Tilt	15318	1:1	0.124	1.033	0.128	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.01	Left	Cheek	15318	1:1	0.205	1.033	**0.212**	A4
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.04	Left	Tilt	15318	1:1	0.127	1.033	0.131	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.09	Right	Cheek	15300	1:1	0.112	1.035	0.116	
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.09	Right	Tilt	15300	1:1	0.043	1.035	0.045	
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.08	Left	Cheek	15300	1:1	0.157	1.035	0.162	A5
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.06	Left	Tilt	15300	1:1	0.068	1.035	0.070	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-6
Cell. CDMA 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)	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.40	-0.06	Right	Cheek	15300	1:1	0.100	1.023	0.102	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.40	0.13	Right	Tilt	15300	1:1	0.072	1.023	0.074	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.40	-0.01	Left	Cheek	15300	1:1	0.134	1.023	0.137	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.40	-0.02	Left	Tilt	15300	1:1	0.074	1.023	0.076	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.13	0.02	Right	Cheek	15300	1:1	0.094	1.089	0.102	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.13	-0.12	Right	Tilt	15300	1:1	0.070	1.089	0.076	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.13	0.07	Left	Cheek	15300	1:1	0.142	1.089	0.155	A6
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.13	-0.20	Left	Tilt	15300	1:1	0.072	1.089	0.078	
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
PCS CDMA 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	600	PCS CDMA	RC3 / SO55	24.7	24.48	0.09	Right	Cheek	15300	1:1	0.120	1.052	0.126	
1880.00	600	PCS CDMA	RC3 / SO55	24.7	24.48	0.00	Right	Tilt	15300	1:1	0.046	1.052	0.048	
1880.00	600	PCS CDMA	RC3 / SO55	24.7	24.48	-0.14	Left	Cheek	15300	1:1	0.154	1.052	0.162	A7
1880.00	600	PCS CDMA	RC3 / SO55	24.7	24.48	0.17	Left	Tilt	15300	1:1	0.071	1.052	0.075	
1880.00	600	PCS CDMA	EVDO Rev. A	24.7	24.22	-0.02	Right	Cheek	15300	1:1	0.122	1.117	0.136	
1880.00	600	PCS CDMA	EVDO Rev. A	24.7	24.22	0.09	Right	Tilt	15300	1:1	0.041	1.117	0.046	
1880.00	600	PCS CDMA	EVDO Rev. A	24.7	24.22	0.02	Left	Cheek	15300	1:1	0.153	1.117	0.171	
1880.00	600	PCS CDMA	EVDO Rev. A	24.7	24.22	0.05	Left	Tilt	15300	1:1	0.066	1.117	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							

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Table 11-8
LTE Band 12 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	0.01	0	Right	Cheek	QPSK	1	25	15284	1:1	0.101	1.000	0.101	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	0.04	1	Right	Cheek	QPSK	25	0	15284	1:1	0.080	1.047	0.084	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	0.07	0	Right	Tilt	QPSK	1	25	15284	1:1	0.059	1.000	0.059	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.03	1	Right	Tilt	QPSK	25	0	15284	1:1	0.050	1.047	0.052	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.08	0	Left	Cheek	QPSK	1	25	15284	1:1	0.141	1.000	0.141	A8
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	0.02	1	Left	Cheek	QPSK	25	0	15284	1:1	0.107	1.047	0.112	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	0.00	0	Left	Tilt	QPSK	1	25	15284	1:1	0.070	1.000	0.070	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	0.06	1	Left	Tilt	QPSK	25	0	15284	1:1	0.053	1.047	0.055	
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 13 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.03	0	Right	Cheek	QPSK	1	25	15284	1:1	0.088	1.007	0.089	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.00	1	Right	Cheek	QPSK	25	12	15284	1:1	0.065	1.052	0.068	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.02	0	Right	Tilt	QPSK	1	25	15284	1:1	0.062	1.007	0.062	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.10	1	Right	Tilt	QPSK	25	12	15284	1:1	0.048	1.052	0.050	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	0.07	0	Left	Cheek	QPSK	1	25	15284	1:1	0.127	1.007	0.128	A9
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	-0.03	1	Left	Cheek	QPSK	25	12	15284	1:1	0.096	1.052	0.101	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	0.07	0	Left	Tilt	QPSK	1	25	15284	1:1	0.062	1.007	0.062	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.03	1	Left	Tilt	QPSK	25	12	15284	1:1	0.045	1.052	0.047	
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 5 (Cell) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.04	0	Right	Cheek	QPSK	1	25	15276	1:1	0.077	1.000	0.077	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.14	1	Right	Cheek	QPSK	25	12	15276	1:1	0.055	1.009	0.055	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.10	0	Right	Tilt	QPSK	1	25	15276	1:1	0.067	1.000	0.067	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.07	1	Right	Tilt	QPSK	25	12	15276	1:1	0.050	1.009	0.050	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.12	0	Left	Cheek	QPSK	1	25	15276	1:1	0.131	1.000	0.131	A10
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.10	1	Left	Cheek	QPSK	25	12	15276	1:1	0.098	1.009	0.099	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.11	0	Left	Tilt	QPSK	1	25	15276	1:1	0.059	1.000	0.059	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.02	1	Left	Tilt	QPSK	25	12	15276	1:1	0.048	1.009	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													

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Table 11-11
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.15	0	Right	Cheek	QPSK	1	0	15284	1:1	0.179	1.007	0.180	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.03	1	Right	Cheek	QPSK	50	0	15284	1:1	0.152	1.019	0.155	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.12	0	Right	Tilt	QPSK	1	0	15284	1:1	0.134	1.007	0.135	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.01	1	Right	Tilt	QPSK	50	0	15284	1:1	0.129	1.019	0.131	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.00	0	Left	Cheek	QPSK	1	0	15284	1:1	0.209	1.007	**0.210**	A11
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.01	1	Left	Cheek	QPSK	50	0	15284	1:1	0.183	1.019	0.186	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.02	0	Left	Tilt	QPSK	1	0	15284	1:1	0.132	1.007	0.133	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.05	1	Left	Tilt	QPSK	50	0	15284	1:1	0.125	1.019	0.127	
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 25 (PCS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	-0.03	0	Right	Cheek	QPSK	1	50	15268	1:1	0.126	1.000	0.126	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	-0.01	1	Right	Cheek	QPSK	50	25	15268	1:1	0.118	1.000	0.118	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	0.20	0	Right	Tilt	QPSK	1	50	15268	1:1	0.053	1.000	0.053	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	0.15	1	Right	Tilt	QPSK	50	25	15268	1:1	0.048	1.000	0.048	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	0.04	0	Left	Cheek	QPSK	1	50	15268	1:1	0.178	1.000	0.178	A12
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	0.06	1	Left	Cheek	QPSK	50	25	15268	1:1	0.151	1.000	0.151	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	0.06	0	Left	Tilt	QPSK	1	50	15268	1:1	0.095	1.000	0.095	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	0.05	1	Left	Tilt	QPSK	50	25	15268	1:1	0.081	1.000	0.081	
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 30 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.10	0	Right	Cheek	QPSK	1	25	15284	1:1	0.039	1.000	0.039	A13
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.18	1	Right	Cheek	QPSK	25	25	15284	1:1	0.031	1.086	0.034	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.21	0	Right	Tilt	QPSK	1	25	15284	1:1	0.019	1.000	0.019	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.19	1	Right	Tilt	QPSK	25	25	15284	1:1	0.014	1.086	0.015	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.18	0	Left	Cheek	QPSK	1	25	15284	1:1	0.028	1.000	0.028	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.17	1	Left	Cheek	QPSK	25	25	15284	1:1	0.026	1.086	0.028	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.12	0	Left	Tilt	QPSK	1	25	15284	1:1	0.019	1.000	0.019	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.12	1	Left	Tilt	QPSK	25	25	15284	1:1	0.016	1.086	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									**Head 1.6 W/kg (mW/g) averaged over 1 gram**										

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Table 11-14
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)	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.19	0	Right	Cheek	QPSK	1	0	15284	1:1	0.064	1.023	0.065	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.19	1	Right	Cheek	QPSK	50	0	15284	1:1	0.051	1.107	0.056	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.15	0	Right	Tilt	QPSK	1	0	15284	1:1	0.038	1.023	0.039	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.12	1	Right	Tilt	QPSK	50	0	15284	1:1	0.034	1.107	0.038	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.14	0	Left	Cheek	QPSK	1	0	15284	1:1	0.074	1.023	0.076	A14
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.16	1	Left	Cheek	QPSK	50	0	15284	1:1	0.061	1.107	0.068	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.18	0	Left	Tilt	QPSK	1	0	15284	1:1	0.020	1.023	0.020	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.19	1	Left	Tilt	QPSK	50	0	15284	1:1	0.020	1.107	0.022	
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 41 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.16	0	Right	Cheek	QPSK	1	0	15292	1:1.58	0.029	1.000	0.029	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.20	1	Right	Cheek	QPSK	50	0	15292	1:1.58	0.026	1.059	0.028	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.16	0	Right	Tilt	QPSK	1	0	15292	1:1.58	0.028	1.000	0.028	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.17	1	Right	Tilt	QPSK	50	0	15292	1:1.58	0.028	1.059	0.030	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	-0.09	0	Left	Cheek	QPSK	1	0	15292	1:1.58	0.034	1.000	0.034	A15
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.16	1	Left	Cheek	QPSK	50	0	15292	1:1.58	0.018	1.059	0.019	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.15	0	Left	Tilt	QPSK	1	0	15292	1:1.58	0.012	1.000	0.012	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.16	1	Left	Tilt	QPSK	50	0	15292	1:1.58	0.010	1.059	0.011	
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
DTS Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	17.0	16.98	-0.14	Right	Cheek	1	15516	1	99.0	1.079	0.878	1.005	1.010	0.891	
2462	11	802.11b	DSSS	22	17.0	16.98	-0.19	Right	Cheek	1	15516	1	99.0	1.102	0.846	1.005	1.010	0.859	
2462	11	802.11b	DSSS	22	17.0	16.98	0.13	Right	Tilt	1	15516	1	99.0	0.338	0.284	1.005	1.010	0.288	
2462	11	802.11b	DSSS	22	17.0	16.98	-0.11	Left	Cheek	1	15516	1	99.0	0.152	-	1.005	1.010	-	
2462	11	802.11b	DSSS	22	17.0	16.98	0.15	Left	Tilt	1	15516	1	99.0	0.110	-	1.005	1.010	-	
2412	1	802.11b	DSSS	22	17.0	16.22	0.16	Right	Cheek	2	15516	1	99.0	0.731	0.627	1.197	1.010	0.758	
2437	6	802.11b	DSSS	22	17.0	16.28	0.15	Right	Cheek	2	15516	1	99.0	0.794	0.679	1.180	1.010	0.809	
2437	6	802.11b	DSSS	22	17.0	16.28	0.13	Right	Tilt	2	15516	1	99.0	0.654	0.532	1.180	1.010	0.634	
2437	6	802.11b	DSSS	22	17.0	16.28	-0.12	Left	Cheek	2	15516	1	99.0	0.487	-	1.180	1.010	-	
2437	6	802.11b	DSSS	22	17.0	16.28	0.04	Left	Tilt	2	15516	1	99.0	0.522	-	1.180	1.010	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-17
DTS MIMO Head SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (Ant 1)	Conducted Power [dBm] (Ant 1)	Maximum Allowed Power [dBm] (Ant 2)	Conducted Power [dBm] (Ant 2)	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)	
2422	3	802.11n	OFDM	20	17.0	16.63	17.0	16.15	0.10	Right	Cheek	MIMO	15516	13	94.3	1.106	0.897	1.216	1.060	1.156	A16
2452	9	802.11n	OFDM	20	17.0	16.64	17.0	16.14	0.21	Right	Cheek	MIMO	15516	13	94.3	1.081	0.869	1.219	1.060	1.123	
2422	3	802.11n	OFDM	20	17.0	16.63	17.0	16.15	0.11	Right	Tilt	MIMO	15516	13	94.3	0.725	0.633	1.216	1.060	0.816	
2452	9	802.11n	OFDM	20	17.0	16.64	17.0	16.14	-0.03	Right	Tilt	MIMO	15516	13	94.3	0.918	0.618	1.219	1.060	0.799	
2452	9	802.11n	OFDM	20	17.0	16.64	17.0	16.14	-0.10	Left	Cheek	MIMO	15516	13	94.3	0.363	-	1.219	1.060	-	
2452	9	802.11n	OFDM	20	17.0	16.64	17.0	16.14	0.21	Left	Tilt	MIMO	15516	13	94.3	0.402	-	1.219	1.060	-	
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
NII Head SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	17.0	16.66	-0.20	Right	Cheek	1	15516	6	94.3	0.456	-	1.081	1.060	-	
5320	64	802.11a	OFDM	20	17.0	16.66	0.19	Right	Tilt	1	15516	6	94.3	0.542	0.267	1.081	1.060	0.306	
5320	64	802.11a	OFDM	20	17.0	16.66	0.13	Left	Cheek	1	15516	6	94.3	0.134	-	1.081	1.060	-	
5320	64	802.11a	OFDM	20	17.0	16.66	0.18	Left	Tilt	1	15516	6	94.3	0.141	-	1.081	1.060	-	
5320	64	802.11a	OFDM	20	16.5	16.49	0.13	Right	Cheek	2	15516	6	94.3	0.592	-	1.002	1.060	-	
5320	64	802.11a	OFDM	20	16.5	16.49	0.17	Right	Tilt	2	15516	6	94.3	0.610	0.295	1.002	1.060	0.313	
5320	64	802.11a	OFDM	20	16.5	16.49	0.19	Left	Cheek	2	15516	6	94.3	0.142	-	1.002	1.060	-	
5320	64	802.11a	OFDM	20	16.5	16.49	0.15	Left	Tilt	2	15516	6	94.3	0.156	-	1.002	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.12	Right	Cheek	1	15516	6	94.3	0.711	-	1.045	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.19	Right	Tilt	1	15516	6	94.3	0.873	0.346	1.045	1.060	0.383	
5580	116	802.11a	OFDM	20	17.0	16.81	0.10	Left	Cheek	1	15516	6	94.3	0.213	-	1.045	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.10	Left	Tilt	1	15516	6	94.3	0.221	-	1.045	1.060	-	
5580	116	802.11a	OFDM	20	16.5	16.49	0.17	Right	Cheek	2	15516	6	94.3	0.459	0.209	1.002	1.060	0.222	
5580	116	802.11a	OFDM	20	16.5	16.49	0.14	Right	Tilt	2	15516	6	94.3	0.450	-	1.002	1.060	-	
5580	116	802.11a	OFDM	20	16.5	16.49	0.19	Left	Cheek	2	15516	6	94.3	0.178	-	1.002	1.060	-	
5580	116	802.11a	OFDM	20	16.5	16.49	0.15	Left	Tilt	2	15516	6	94.3	0.173	-	1.002	1.060	-	
5825	165	802.11a	OFDM	20	17.0	16.80	0.17	Right	Cheek	1	15516	6	94.3	1.410	0.565	1.047	1.060	**0.627**	A17
5825	165	802.11a	OFDM	20	17.0	16.80	0.17	Right	Tilt	1	15516	6	94.3	1.286	0.455	1.047	1.060	0.505	
5825	165	802.11a	OFDM	20	17.0	16.80	0.17	Left	Cheek	1	15516	6	94.3	0.314	-	1.047	1.060	-	
5825	165	802.11a	OFDM	20	17.0	16.80	0.16	Left	Tilt	1	15516	6	94.3	0.330	-	1.047	1.060	-	
5785	157	802.11a	OFDM	20	16.5	16.47	0.16	Right	Cheek	2	15516	6	94.3	0.382	-	1.007	1.060	-	
5785	157	802.11a	OFDM	20	16.5	16.47	0.17	Right	Tilt	2	15516	6	94.3	0.423	0.185	1.007	1.060	0.197	
5785	157	802.11a	OFDM	20	16.5	16.47	0.18	Left	Cheek	2	15516	6	94.3	0.168	-	1.007	1.060	-	
5785	157	802.11a	OFDM	20	16.5	16.47	0.13	Left	Tilt	2	15516	6	94.3	0.149	-	1.007	1.060	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 11-19
Bluetooth Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Data Rate (Mbps)	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor (Duty Cycle)	Scaling Factor (Power)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	12.5	11.59	0.05	Right	Cheek	1	15508	77.2%	0.059	1.295	1.233	0.094	A18
2441	39	Bluetooth	FHSS	12.5	11.59	-0.20	Right	Tilt	1	15508	77.2%	0.013	1.295	1.233	0.021	
2441	39	Bluetooth	FHSS	12.5	11.59	0.05	Left	Cheek	1	15508	77.2%	0.009	1.295	1.233	0.014	
2441	39	Bluetooth	FHSS	12.5	11.59	-0.14	Left	Tilt	1	15508	77.2%	0.004	1.295	1.233	0.006	
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 11-20
GSM/UMTS/CDMA Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	34.2	34.11	0.03	10 mm	15318	1	1:8.3	back	0.512	1.021	0.523	
836.60	190	GSM 850	GPRS	34.2	34.12	0.18	10 mm	15318	1	1:8.3	back	0.620	1.019	0.632	A19
1880.00	661	GSM 1900	GSM	31.7	31.68	-0.02	10 mm	15300	1	1:8.3	back	0.320	1.005	0.322	
1880.00	661	GSM 1900	GPRS	25.5	25.42	-0.01	10 mm	15300	4	1:2.076	back	0.517	1.019	0.527	A20
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.03	10 mm	15318	N/A	1:1	back	0.671	1.023	0.686	A22
1712.40	1312	UMTS 1750	RMC	24.7	24.47	-0.02	10 mm	15300	N/A	1:1	back	0.766	1.054	0.807	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	-0.01	10 mm	15300	N/A	1:1	back	0.811	1.033	0.838	
1752.60	1513	UMTS 1750	RMC	24.7	24.37	0.02	10 mm	15300	N/A	1:1	back	0.735	1.079	0.793	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.00	10 mm	15300	N/A	1:1	back	0.869	1.033	0.898	A23
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.01	10 mm	15318	N/A	1:1	back	0.551	1.035	0.570	A24
836.52	384	Cell. CDMA	TDSO / SO32	25.5	25.48	0.04	10 mm	15318	N/A	1:1	back	0.668	1.005	0.671	A26
1880.00	600	PCS CDMA	TDSO / SO32	24.7	24.33	0.02	10 mm	15300	N/A	1:1	back	0.570	1.089	0.621	A28
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Note: Blue entry represents variability measurement.

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Table 11-21
LTE Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.03	0	15268	QPSK	1	25	10 mm	back	1:1	0.593	1.000	0.593	A30
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.02	1	15268	QPSK	25	0	10 mm	back	1:1	0.452	1.047	0.473	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	0.02	0	15268	QPSK	1	25	10 mm	back	1:1	0.549	1.007	0.553	A31
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	-0.02	1	15268	QPSK	25	12	10 mm	back	1:1	0.427	1.052	0.449	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.03	0	15284	QPSK	1	25	10 mm	back	1:1	0.520	1.000	0.520	A32
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.03	1	15284	QPSK	25	12	10 mm	back	1:1	0.403	1.009	0.407	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.04	0	15276	QPSK	1	0	10 mm	back	1:1	0.737	1.007	0.742	A33
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.05	1	15276	QPSK	50	0	10 mm	back	1:1	0.675	1.019	0.688	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	-0.07	0	15268	QPSK	1	50	10 mm	back	1:1	0.543	1.000	0.543	A34
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	-0.05	1	15268	QPSK	50	25	10 mm	back	1:1	0.475	1.000	0.475	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	-0.01	0	15276	QPSK	1	25	10 mm	back	1:1	1.160	1.000	**1.160**	A36
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.10	1	15276	QPSK	25	25	10 mm	back	1:1	1.030	1.086	1.119	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.79	0.01	1	15276	QPSK	50	0	10 mm	back	1:1	1.040	1.099	1.143	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.04	0	15276	QPSK	1	25	10 mm	back	1:1	1.160	1.000	**1.160**	
2510.00	20850	Low	LTE Band 7	20	23.7	23.37	-0.02	0	15276	QPSK	1	0	10 mm	back	1:1	0.918	1.079	0.991	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	-0.06	0	15276	QPSK	1	0	10 mm	back	1:1	0.953	1.023	0.975	
2560.00	21350	High	LTE Band 7	20	23.7	23.51	0.00	0	15276	QPSK	1	0	10 mm	back	1:1	0.858	1.045	0.897	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.02	1	15276	QPSK	50	0	10 mm	back	1:1	0.901	1.107	0.997	
2535.00	21100	Mid	LTE Band 7	20	22.7	22.25	0.03	1	15276	QPSK	50	0	10 mm	back	1:1	0.896	1.109	0.994	
2560.00	21350	High	LTE Band 7	20	22.7	22.14	0.01	1	15276	QPSK	50	0	10 mm	back	1:1	0.822	1.138	0.935	
2510.00	20850	Low	LTE Band 7	20	22.7	22.19	0.01	1	15276	QPSK	100	0	10 mm	back	1:1	0.887	1.125	0.998	
2510.00	20850	Low	LTE Band 7	20	23.7	23.37	-0.14	0	15276	QPSK	1	0	10 mm	back	1:1	0.934	1.079	1.008	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	-0.15	0	15276	QPSK	1	0	10 mm	back	1:1	0.968	1.023	0.990	A37
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	-0.07	0	15276	QPSK	1	0	10 mm	back	1:1.58	0.534	1.000	0.534	A38
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.02	1	15276	QPSK	50	0	10 mm	back	1:1.58	0.328	1.059	0.347	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: Blue entry represents variability measurement.

Table 11-22
DTS Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	19.0	18.85	0.07	10 mm	1	15516	1	back	99.0	0.277	0.218	1.035	1.010	**0.228**	A39
2437	6	802.11b	DSSS	22	18.5	18.49	0.12	10 mm	2	15516	1	back	99.0	0.185	0.159	1.002	1.010	0.161	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-23
NII Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	17.0	16.66	0.05	10 mm	1	15508	6	back	94.3	1.146	0.501	1.081	1.060	0.574	
5320	64	802.11a	OFDM	20	16.5	16.49	0.08	10 mm	2	15508	6	back	94.3	0.619	0.273	1.002	1.060	0.290	
5580	116	802.11a	OFDM	20	17.0	16.81	-0.02	10 mm	1	15508	6	back	94.3	1.442	0.620	1.045	1.060	0.687	
5580	116	802.11a	OFDM	20	16.5	16.49	0.04	10 mm	2	15508	6	back	94.3	0.673	0.292	1.002	1.060	0.310	
5825	165	802.11a	OFDM	20	17.0	16.80	-0.06	10 mm	1	15508	6	back	94.3	1.458	0.655	1.047	1.060	**0.727**	
5785	157	802.11a	OFDM	20	16.5	16.47	0.08	10 mm	2	15508	6	back	94.3	0.485	0.217	1.007	1.060	0.232	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Table 11-24
NII MIMO Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (Ant 1)	Conducted Power [dBm] (Ant 1)	Maximum Allowed Power [dBm] (Ant 2)	Conducted Power [dBm] (Ant 2)	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5320	64	802.11n	OFDM	20	17.0	16.45	16.5	16.30	0.16	10 mm	MIMO	15508	13	back	94.5	1.434	0.656	1.135	1.058	0.788	
5580	116	802.11n	OFDM	20	17.0	16.61	16.5	16.28	0.08	10 mm	MIMO	15508	13	back	94.5	1.696	0.730	1.094	1.058	0.845	
5660	132	802.11n	OFDM	20	17.0	16.47	16.5	16.31	0.06	10 mm	MIMO	15508	13	back	94.5	1.583	0.755	1.130	1.058	0.903	
5825	165	802.11n	OFDM	20	17.0	16.89	16.5	16.39	-0.20	10 mm	MIMO	15508	13	back	94.5	1.558	0.758	1.026	1.058	0.823	A40
5745	149	802.11n	OFDM	20	17.0	16.57	16.5	16.30	0.07	10 mm	MIMO	15508	13	back	94.5	1.725	0.728	1.104	1.058	0.850	
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
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 (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	12.5	11.59	0.03	10 mm	15516	1	back	77.2	0.008	1.233	1.295	**0.013**	A41
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

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11.3 Standalone Hotspot SAR Data

Table 11-26
GPRS/UMTS/CDMA Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	34.2	34.12	0.18	10 mm	15318	1	1:8.3	back	0.620	1.019	0.632	A19
836.60	190	GSM 850	GPRS	34.2	34.12	-0.08	10 mm	15318	1	1:8.3	front	0.574	1.019	0.585	
836.60	190	GSM 850	GPRS	34.2	34.12	-0.02	10 mm	15318	1	1:8.3	bottom	0.273	1.019	0.278	
836.60	190	GSM 850	GPRS	34.2	34.12	0.01	10 mm	15318	1	1:8.3	right	0.091	1.019	0.093	
836.60	190	GSM 850	GPRS	34.2	34.12	0.02	10 mm	15318	1	1:8.3	left	0.185	1.019	0.189	
1880.00	661	GSM 1900	GPRS	25.5	25.42	-0.01	10 mm	15300	4	1:2.076	back	0.517	1.019	0.527	
1880.00	661	GSM 1900	GPRS	25.5	25.42	0.11	10 mm	15300	4	1:2.076	front	0.539	1.019	0.549	
1880.00	661	GSM 1900	GPRS	25.5	25.42	-0.14	10 mm	15300	4	1:2.076	bottom	0.633	1.019	0.645	A21
1880.00	661	GSM 1900	GPRS	25.5	25.42	-0.06	10 mm	15300	4	1:2.076	left	0.220	1.019	0.224	
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.03	10 mm	15318	N/A	1:1	back	0.671	1.023	0.686	A22
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.04	10 mm	15318	N/A	1:1	front	0.581	1.023	0.594	
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.04	10 mm	15318	N/A	1:1	bottom	0.333	1.023	0.341	
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.05	10 mm	15318	N/A	1:1	right	0.112	1.023	0.115	
836.60	4183	UMTS 850	RMC	25.5	25.40	-0.01	10 mm	15318	N/A	1:1	left	0.248	1.023	0.254	
1712.40	1312	UMTS 1750	RMC	24.7	24.47	-0.02	10 mm	15300	N/A	1:1	back	0.766	1.054	0.807	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	-0.01	10 mm	15300	N/A	1:1	back	0.811	1.033	0.838	
1752.60	1513	UMTS 1750	RMC	24.7	24.37	0.02	10 mm	15300	N/A	1:1	back	0.735	1.079	0.793	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.01	10 mm	15300	N/A	1:1	front	0.773	1.033	0.799	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.00	10 mm	15300	N/A	1:1	bottom	0.706	1.033	0.729	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.05	10 mm	15300	N/A	1:1	left	0.385	1.033	0.398	
1732.40	1412	UMTS 1750	RMC	24.7	24.56	0.00	10 mm	15300	N/A	1:1	back	0.869	1.033	0.898	A23
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.01	10 mm	15318	N/A	1:1	back	0.551	1.035	0.570	
1880.00	9400	UMTS 1900	RMC	24.7	24.55	0.01	10 mm	15318	N/A	1:1	front	0.464	1.035	0.480	
1880.00	9400	UMTS 1900	RMC	24.7	24.55	-0.02	10 mm	15318	N/A	1:1	bottom	0.645	1.035	0.668	A25
1880.00	9400	UMTS 1900	RMC	24.7	24.55	-0.02	10 mm	15318	N/A	1:1	left	0.293	1.035	0.303	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.10	0.01	10 mm	15318	N/A	1:1	back	0.726	1.096	0.796	A27
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.10	-0.01	10 mm	15318	N/A	1:1	front	0.657	1.096	0.720	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.10	-0.02	10 mm	15318	N/A	1:1	bottom	0.318	1.096	0.349	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.10	0.04	10 mm	15318	N/A	1:1	right	0.101	1.096	0.111	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.10	0.00	10 mm	15318	N/A	1:1	left	0.256	1.096	0.281	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.7	24.20	-0.01	10 mm	15300	N/A	1:1	back	0.458	1.122	0.514	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.7	24.20	0.00	10 mm	15300	N/A	1:1	front	0.474	1.122	0.532	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.7	24.20	-0.06	10 mm	15300	N/A	1:1	bottom	0.642	1.122	0.720	A29
1880.00	600	PCS CDMA	EVDO Rev. 0	24.7	24.20	-0.01	10 mm	15300	N/A	1:1	left	0.225	1.122	0.252	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Note: Blue entry represents variability measurement.

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Table 11-27
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.03	0	15268	QPSK	1	25	10 mm	back	1:1	0.593	1.000	0.593	A30
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.02	1	15268	QPSK	25	0	10 mm	back	1:1	0.452	1.047	0.473	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.05	0	15268	QPSK	1	25	10 mm	front	1:1	0.533	1.000	0.533	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.05	1	15268	QPSK	25	0	10 mm	front	1:1	0.407	1.047	0.426	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.13	0	15268	QPSK	1	25	10 mm	bottom	1:1	0.306	1.000	0.306	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.15	1	15268	QPSK	25	0	10 mm	bottom	1:1	0.228	1.047	0.239	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	-0.01	0	15268	QPSK	1	25	10 mm	right	1:1	0.164	1.000	0.164	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	-0.03	1	15268	QPSK	25	0	10 mm	right	1:1	0.122	1.047	0.128	
707.50	23095	Mid	LTE Band 12	10	25.5	25.50	0.15	0	15268	QPSK	1	25	10 mm	left	1:1	0.173	1.000	0.173	
707.50	23095	Mid	LTE Band 12	10	24.5	24.30	0.11	1	15268	QPSK	25	0	10 mm	left	1:1	0.147	1.047	0.154	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-28
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	0.02	0	15268	QPSK	1	25	10 mm	back	1:1	0.549	1.007	0.553	A31
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	-0.02	1	15268	QPSK	25	12	10 mm	back	1:1	0.427	1.052	0.449	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.01	0	15268	QPSK	1	25	10 mm	front	1:1	0.516	1.007	0.520	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.04	1	15268	QPSK	25	12	10 mm	front	1:1	0.401	1.052	0.422	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.10	0	15268	QPSK	1	25	10 mm	bottom	1:1	0.286	1.007	0.288	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	-0.01	1	15268	QPSK	25	12	10 mm	bottom	1:1	0.222	1.052	0.234	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.13	0	15268	QPSK	1	25	10 mm	right	1:1	0.103	1.007	0.104	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.00	1	15268	QPSK	25	12	10 mm	right	1:1	0.083	1.052	0.087	
782.00	23230	Mid	LTE Band 13	10	25.5	25.47	-0.08	0	15268	QPSK	1	25	10 mm	left	1:1	0.203	1.007	0.204	
782.00	23230	Mid	LTE Band 13	10	24.5	24.28	0.18	1	15268	QPSK	25	12	10 mm	left	1:1	0.158	1.052	0.166	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-29
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.03	0	15284	QPSK	1	25	10 mm	back	1:1	0.520	1.000	0.520	A32
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.03	1	15284	QPSK	25	12	10 mm	back	1:1	0.403	1.009	0.407	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.01	0	15284	QPSK	1	25	10 mm	front	1:1	0.484	1.000	0.484	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.02	1	15284	QPSK	25	12	10 mm	front	1:1	0.371	1.009	0.374	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.00	0	15284	QPSK	1	25	10 mm	bottom	1:1	0.270	1.000	0.270	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	-0.01	1	15284	QPSK	25	12	10 mm	bottom	1:1	0.205	1.009	0.207	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.01	0	15284	QPSK	1	25	10 mm	right	1:1	0.091	1.000	0.091	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	-0.02	1	15284	QPSK	25	12	10 mm	right	1:1	0.072	1.009	0.073	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.02	0	15284	QPSK	1	25	10 mm	left	1:1	0.191	1.000	0.191	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.46	0.00	1	15284	QPSK	25	12	10 mm	left	1:1	0.143	1.009	0.144	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-30
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.04	0	15276	QPSK	1	0	10 mm	back	1:1	0.737	1.007	0.742	A33
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.05	1	15276	QPSK	50	0	10 mm	back	1:1	0.675	1.019	0.688	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.04	0	15276	QPSK	1	0	10 mm	front	1:1	0.709	1.007	0.714	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.01	1	15276	QPSK	50	0	10 mm	front	1:1	0.475	1.019	0.484	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.04	0	15276	QPSK	1	0	10 mm	bottom	1:1	0.421	1.007	0.424	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.05	1	15276	QPSK	50	0	10 mm	bottom	1:1	0.423	1.019	0.431	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.7	24.67	0.09	0	15276	QPSK	1	0	10 mm	left	1:1	0.206	1.007	0.207	
1770.00	132572	High	LTE Band 66 (AWS)	20	23.7	23.62	0.05	1	15276	QPSK	50	0	10 mm	left	1:1	0.201	1.019	0.205	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	-0.07	0	15268	QPSK	1	50	10 mm	back	1:1	0.543	1.000	0.543	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	-0.05	1	15268	QPSK	50	25	10 mm	back	1:1	0.475	1.000	0.475	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	-0.02	0	15268	QPSK	1	50	10 mm	front	1:1	0.476	1.000	0.476	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	0.01	1	15268	QPSK	50	25	10 mm	front	1:1	0.423	1.000	0.423	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	-0.06	0	15268	QPSK	1	50	10 mm	bottom	1:1	0.729	1.000	0.729	A35
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	-0.04	1	15268	QPSK	50	25	10 mm	bottom	1:1	0.644	1.000	0.644	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.70	0.03	0	15268	QPSK	1	50	10 mm	left	1:1	0.258	1.000	0.258	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.70	-0.06	1	15268	QPSK	50	25	10 mm	left	1:1	0.229	1.000	0.229	
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 30 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	-0.01	0	15276	QPSK	1	25	10 mm	back	1:1	1.160	1.000	**1.160**	A36
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.10	1	15276	QPSK	25	25	10 mm	back	1:1	1.030	1.086	1.119	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.79	0.01	1	15276	QPSK	50	0	10 mm	back	1:1	1.040	1.099	1.143	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.05	0	15276	QPSK	1	25	10 mm	front	1:1	0.047	1.000	0.047	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.01	1	15276	QPSK	25	25	10 mm	front	1:1	0.036	1.086	0.039	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.00	0	15276	QPSK	1	25	10 mm	bottom	1:1	0.277	1.000	0.277	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	-0.02	1	15276	QPSK	25	25	10 mm	bottom	1:1	0.240	1.086	0.261	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	-0.09	0	15276	QPSK	1	25	10 mm	right	1:1	0.062	1.000	0.062	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.02	1	15276	QPSK	25	25	10 mm	right	1:1	0.056	1.086	0.061	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.14	0	15276	QPSK	1	25	10 mm	left	1:1	0.015	1.000	0.015	
2310.00	27710	Mid	LTE Band 30	10	24.2	23.84	0.17	1	15276	QPSK	25	25	10 mm	left	1:1	0.013	1.086	0.014	
2310.00	27710	Mid	LTE Band 30	10	25.2	25.20	0.04	0	15276	QPSK	1	25	10 mm	back	1:1	1.160	1.000	**1.160**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: Blue entry represents variability measurement.

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Table 11-33
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)	
2510.00	20850	Low	LTE Band 7	20	23.7	23.37	-0.02	0	15276	QPSK	1	0	10 mm	back	1:1	0.918	1.079	0.991	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	-0.06	0	15276	QPSK	1	0	10 mm	back	1:1	0.953	1.023	0.975	
2560.00	21350	High	LTE Band 7	20	23.7	23.51	0.00	0	15276	QPSK	1	0	10 mm	back	1:1	0.858	1.045	0.897	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	0.02	1	15276	QPSK	50	0	10 mm	back	1:1	0.901	1.107	0.997	
2535.00	21100	Mid	LTE Band 7	20	22.7	22.25	0.03	1	15276	QPSK	50	0	10 mm	back	1:1	0.896	1.109	0.994	
2560.00	21350	High	LTE Band 7	20	22.7	22.14	0.01	1	15276	QPSK	50	0	10 mm	back	1:1	0.822	1.138	0.935	
2510.00	20850	Low	LTE Band 7	20	22.7	22.19	0.01	1	15276	QPSK	100	0	10 mm	back	1:1	0.887	1.125	0.998	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.07	0	15276	QPSK	1	0	10 mm	front	1:1	0.407	1.023	0.416	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	-0.01	1	15276	QPSK	50	0	10 mm	front	1:1	0.381	1.107	0.422	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	0.04	0	15276	QPSK	1	0	10 mm	bottom	1:1	0.513	1.023	0.525	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	-0.04	1	15276	QPSK	50	0	10 mm	bottom	1:1	0.483	1.107	0.535	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	-0.15	0	15276	QPSK	1	0	10 mm	left	1:1	0.125	1.023	0.128	
2510.00	20850	Low	LTE Band 7	20	22.7	22.26	-0.01	1	15276	QPSK	50	0	10 mm	left	1:1	0.116	1.107	0.128	
2510.00	20850	Low	LTE Band 7	20	23.7	23.37	-0.14	0	15276	QPSK	1	0	10 mm	back	1:1	0.934	1.079	1.008	
2535.00	21100	Mid	LTE Band 7	20	23.7	23.60	-0.15	0	15276	QPSK	1	0	10 mm	back	1:1	0.968	1.023	0.990	A37
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: Blue entry represents variability measurement.

Table 11-34
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	-0.07	0	15276	QPSK	1	0	10 mm	back	1:1.58	0.534	1.000	0.534	A38
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.02	1	15276	QPSK	50	0	10 mm	back	1:1.58	0.328	1.059	0.347	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.04	0	15276	QPSK	1	0	10 mm	front	1:1.58	0.255	1.000	0.255	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.03	1	15276	QPSK	50	0	10 mm	front	1:1.58	0.154	1.059	0.163	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.00	0	15276	QPSK	1	0	10 mm	bottom	1:1.58	0.270	1.000	0.270	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	0.00	1	15276	QPSK	50	0	10 mm	bottom	1:1.58	0.162	1.059	0.172	
2593.00	40620	Mid	LTE Band 41	20	22.7	22.70	0.02	0	15276	QPSK	1	0	10 mm	left	1:1.58	0.082	1.000	0.082	
2506.00	39750	Low	LTE Band 41	20	21.7	21.45	-0.01	1	15276	QPSK	50	0	10 mm	left	1:1.58	0.051	1.059	0.054	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-35
WLAN SISO Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	19.0	18.85	0.07	10 mm	1	15516	1	back	99.0	0.277	0.218	1.035	1.010	**0.228**	A39
2437	6	802.11b	DSSS	22	19.0	18.85	0.21	10 mm	1	15516	1	front	99.0	0.197	-	1.035	1.010	-	
2437	6	802.11b	DSSS	22	19.0	18.85	0.02	10 mm	1	15516	1	top	99.0	0.090	-	1.035	1.010	-	
2437	6	802.11b	DSSS	22	19.0	18.85	0.13	10 mm	1	15516	1	left	99.0	0.260	-	1.035	1.010	-	
2437	6	802.11b	DSSS	22	18.5	18.49	0.12	10 mm	2	15516	1	back	99.0	0.185	-	1.002	1.010	-	
2437	6	802.11b	DSSS	22	18.5	18.49	0.12	10 mm	2	15516	1	front	99.0	0.172	-	1.002	1.010	-	
2437	6	802.11b	DSSS	22	18.5	18.49	0.09	10 mm	2	15516	1	top	99.0	0.222	0.178	1.002	1.010	0.180	
2437	6	802.11b	DSSS	22	18.5	18.49	-0.14	10 mm	2	15516	1	left	99.0	0.013	-	1.002	1.010	-	
5180	36	802.11a	OFDM	20	17.0	16.76	-0.07	10 mm	1	15508	6	back	94.3	0.773	0.353	1.057	1.060	0.396	
5180	36	802.11a	OFDM	20	17.0	16.76	-0.17	10 mm	1	15508	6	front	94.3	0.045	-	1.057	1.060	-	
5180	36	802.11a	OFDM	20	17.0	16.76	0.12	10 mm	1	15508	6	top	94.3	0.194	-	1.057	1.060	-	
5180	36	802.11a	OFDM	20	17.0	16.76	0.17	10 mm	1	15508	6	left	94.3	0.376	-	1.057	1.060	-	
5240	48	802.11a	OFDM	20	16.5	16.49	0.19	10 mm	2	15508	6	back	94.3	0.528	0.238	1.002	1.060	0.253	
5240	48	802.11a	OFDM	20	16.5	16.49	0.00	10 mm	2	15508	6	front	94.3	0.055	-	1.002	1.060	-	
5240	48	802.11a	OFDM	20	16.5	16.49	0.10	10 mm	2	15508	6	top	94.3	0.239	-	1.002	1.060	-	
5240	48	802.11a	OFDM	20	16.5	16.49	0.00	10 mm	2	15508	6	left	94.3	0.143	-	1.002	1.060	-	
5825	165	802.11a	OFDM	20	17.0	16.80	-0.06	10 mm	1	15508	6	back	94.3	1.458	0.655	1.047	1.060	**0.727**	
5825	165	802.11a	OFDM	20	17.0	16.80	0.15	10 mm	1	15508	6	front	94.3	0.244	-	1.047	1.060	-	
5825	165	802.11a	OFDM	20	17.0	16.80	0.20	10 mm	1	15508	6	top	94.3	0.281	-	1.047	1.060	-	
5825	165	802.11a	OFDM	20	17.0	16.80	-0.02	10 mm	1	15508	6	left	94.3	1.005	0.437	1.047	1.060	0.485	
5785	157	802.11a	OFDM	20	16.5	16.47	0.08	10 mm	2	15508	6	back	94.3	0.485	0.217	1.007	1.060	0.232	
5785	157	802.11a	OFDM	20	16.5	16.47	0.00	10 mm	2	15508	6	front	94.3	0.060	-	1.007	1.060	-	
5785	157	802.11a	OFDM	20	16.5	16.47	0.14	10 mm	2	15508	6	top	94.3	0.212	-	1.007	1.060	-	
5785	157	802.11a	OFDM	20	16.5	16.47	0.00	10 mm	2	15508	6	left	94.3	0.148	-	1.007	1.060	-	

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 11-36
WLAN MIMO Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm] (Ant 1)	Conducted Power [dBm] (Ant 1)	Maximum Allowed Power [dBm] (Ant 2)	Conducted Power [dBm] (Ant 2)	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)	
5220	44	802.11n	OFDM	20	17.0	16.50	16.5	16.31	0.14	10 mm	MIMO	15508	13	back	94.5	1.322	0.585	1.122	1.058	0.694	
5220	44	802.11n	OFDM	20	17.0	16.50	16.5	16.31	0.11	10 mm	MIMO	15508	13	front	94.5	0.156	-	1.122	1.058	-	
5220	44	802.11n	OFDM	20	17.0	16.50	16.5	16.31	0.00	10 mm	MIMO	15508	13	top	94.5	0.390	-	1.122	1.058	-	
5220	44	802.11n	OFDM	20	17.0	16.50	16.5	16.31	0.19	10 mm	MIMO	15508	13	left	94.5	0.559	0.260	1.122	1.058	0.309	
5825	165	802.11n	OFDM	20	17.0	16.89	16.5	16.39	-0.20	10 mm	MIMO	15508	13	back	94.5	1.558	0.758	1.026	1.058	0.823	A40
5745	149	802.11n	OFDM	20	17.0	16.57	16.5	16.30	0.07	10 mm	MIMO	15508	13	back	94.5	1.725	0.728	1.104	1.058	0.850	
5825	165	802.11n	OFDM	20	17.0	16.89	16.5	16.39	0.20	10 mm	MIMO	15508	13	front	94.5	0.286	0.122	1.026	1.058	0.132	
5825	165	802.11n	OFDM	20	17.0	16.89	16.5	16.39	0.00	10 mm	MIMO	15508	13	top	94.5	0.443	-	1.026	1.058	-	
5825	165	802.11n	OFDM	20	17.0	16.89	16.5	16.39	0.14	10 mm	MIMO	15508	13	left	94.5	1.204	0.498	1.026	1.058	0.541	

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

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Table 11-37
Bluetooth Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Device Serial Number	Data Rate (Mbps)	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441.00	39	Bluetooth	FHSS	12.5	11.59	0.03	15516	1	10 mm	back	77.2	0.008	1.233	1.295	0.013	
2441.00	39	Bluetooth	FHSS	12.5	11.59	0.07	15516	1	10 mm	front	77.2	0.005	1.233	1.295	0.008	
2441.00	39	Bluetooth	FHSS	12.5	11.59	-0.14	15516	1	10 mm	top	77.2	0.003	1.233	1.295	0.005	
2441.00	39	Bluetooth	FHSS	12.5	11.59	0.19	15516	1	10 mm	left	77.2	0.010	1.233	1.295	**0.016**	A42
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							**Body 1.6 W/kg (mW/g) averaged over 1 gram**									

11.4 Standalone Phablet SAR Data

Table 11-38
WLAN Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	17.0	16.66	0.04	0 mm	1	15508	6	back	94.3	27.720	1.290	1.081	1.060	1.478	
5320	64	802.11a	OFDM	20	17.0	16.66	0.14	0 mm	1	15508	6	front	94.3	1.561	-	1.081	1.060	-	
5320	64	802.11a	OFDM	20	17.0	16.66	-0.01	0 mm	1	15508	6	top	94.3	2.318	-	1.081	1.060	-	
5320	64	802.11a	OFDM	20	17.0	16.66	0.13	0 mm	1	15508	6	left	94.3	5.605	0.679	1.081	1.060	0.778	
5320	64	802.11a	OFDM	20	16.5	16.49	-0.05	0 mm	2	15508	6	back	94.3	8.569	1.140	1.002	1.060	1.211	
5320	64	802.11a	OFDM	20	16.5	16.49	0.00	0 mm	2	15508	6	front	94.3	1.476	-	1.002	1.060	-	
5320	64	802.11a	OFDM	20	16.5	16.49	0.18	0 mm	2	15508	6	top	94.3	5.443	0.482	1.002	1.060	0.512	
5320	64	802.11a	OFDM	20	16.5	16.49	0.19	0 mm	2	15508	6	left	94.3	0.729	-	1.002	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.05	0 mm	1	15508	6	back	94.3	18.434	1.450	1.045	1.060	1.606	
5500	100	802.11a	OFDM	20	17.0	16.66	0.00	0 mm	1	15508	6	back	94.3	30.013	1.330	1.081	1.060	1.524	
5660	132	802.11a	OFDM	20	17.0	16.68	-0.03	0 mm	1	15508	6	back	94.3	29.217	1.590	1.076	1.060	1.813	A43
5720	144	802.11a	OFDM	20	17.0	16.73	-0.03	0 mm	1	15508	6	back	94.3	17.236	1.530	1.064	1.060	1.726	
5580	116	802.11a	OFDM	20	17.0	16.81	0.00	0 mm	1	15508	6	front	94.3	2.628	-	1.045	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.11	0 mm	1	15508	6	top	94.3	3.372	-	1.045	1.060	-	
5580	116	802.11a	OFDM	20	17.0	16.81	0.16	0 mm	1	15508	6	left	94.3	8.460	0.961	1.045	1.060	1.064	
5580	116	802.11a	OFDM	20	16.5	16.49	0.07	0 mm	2	15508	6	back	94.3	5.052	0.947	1.002	1.060	1.006	
5580	116	802.11a	OFDM	20	16.5	16.49	0.00	0 mm	2	15508	6	front	94.3	1.487	-	1.002	1.060	-	
5580	116	802.11a	OFDM	20	16.5	16.49	0.19	0 mm	2	15508	6	top	94.3	4.110	0.362	1.002	1.060	0.384	
5580	116	802.11a	OFDM	20	16.5	16.49	0.20	0 mm	2	15508	6	left	94.3	0.779	-	1.002	1.060	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								**Phablet 4.0 W/kg (mW/g) averaged over 10 grams**											

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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 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
4. GPRS was additionally evaluated for head and body-worn exposure conditions to address possible VoIP scenarios.

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

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

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.6.4.
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. 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.
5. Per KDB Publication 941225 D05Av01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

WLAN Notes:

1. For held-to-ear and hotspot operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.7.5 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

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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.

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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

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

When standalone SAR is not required for phablet exposure conditions per KDB 648474 D04v01r03. Therefore, no further analysis was required to determine that possible simultaneous scenarios would not exceed the SAR limit.

12.3 Head SAR Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM/GPRS 850	0.123	0.891	1.014
	GSM/GPRS 1900	0.162	0.891	1.053
	UMTS 850	0.146	0.891	1.037
	UMTS 1750	0.212	0.891	**1.103**
	UMTS 1900	0.162	0.891	1.053
	Cell. CDMA/EVDO	0.155	0.891	1.046
	PCS CDMA/EVDO	0.171	0.891	1.062
	LTE Band 12	0.141	0.891	1.032
	LTE Band 13	0.128	0.891	1.019
	LTE Band 5 (Cell)	0.131	0.891	1.022
	LTE Band 66 (AWS)	0.210	0.891	1.101
	LTE Band 25 (PCS)	0.178	0.891	1.069
	LTE Band 30	0.039	0.891	0.930
	LTE Band 7	0.076	0.891	0.967
	LTE Band 41	0.034	0.891	0.925

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM/GPRS 850	0.123	0.809	0.932
	GSM/GPRS 1900	0.162	0.809	0.971
	UMTS 850	0.146	0.809	0.955
	UMTS 1750	0.212	0.809	**1.021**
	UMTS 1900	0.162	0.809	0.971
	Cell. CDMA/EVDO	0.155	0.809	0.964
	PCS CDMA/EVDO	0.171	0.809	0.980
	LTE Band 12	0.141	0.809	0.950
	LTE Band 13	0.128	0.809	0.937
	LTE Band 5 (Cell)	0.131	0.809	0.940
	LTE Band 66 (AWS)	0.210	0.809	1.019
	LTE Band 25 (PCS)	0.178	0.809	0.987
	LTE Band 30	0.039	0.809	0.848
	LTE Band 7	0.076	0.809	0.885
	LTE Band 41	0.034	0.809	0.843

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM/GPRS 850	0.123	1.156	1.279
	GSM/GPRS 1900	0.162	1.156	1.318
	UMTS 850	0.146	1.156	1.302
	UMTS 1750	0.212	1.156	**1.368**
	UMTS 1900	0.162	1.156	1.318
	Cell. CDMA/EVDO	0.155	1.156	1.311
	PCS CDMA/EVDO	0.171	1.156	1.327
	LTE Band 12	0.141	1.156	1.297
	LTE Band 13	0.128	1.156	1.284
	LTE Band 5 (Cell)	0.131	1.156	1.287
	LTE Band 66 (AWS)	0.210	1.156	1.366
	LTE Band 25 (PCS)	0.178	1.156	1.334
	LTE Band 30	0.039	1.156	1.195
	LTE Band 7	0.076	1.156	1.232
	LTE Band 41	0.034	1.156	1.190

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM/GPRS 850	0.123	0.627	0.313	0.750	0.436	1.063
	GSM/GPRS 1900	0.162	0.627	0.313	0.789	0.475	1.102
	UMTS 850	0.146	0.627	0.313	0.773	0.459	1.086
	UMTS 1750	0.212	0.627	0.313	0.839	0.525	**1.152**
	UMTS 1900	0.162	0.627	0.313	0.789	0.475	1.102
	Cell. CDMA/EVDO	0.155	0.627	0.313	0.782	0.468	1.095
	PCS CDMA/EVDO	0.171	0.627	0.313	0.798	0.484	1.111
	LTE Band 12	0.141	0.627	0.313	0.768	0.454	1.081
	LTE Band 13	0.128	0.627	0.313	0.755	0.441	1.068
	LTE Band 5 (Cell)	0.131	0.627	0.313	0.758	0.444	1.071
	LTE Band 66 (AWS)	0.210	0.627	0.313	0.837	0.523	1.150
	LTE Band 25 (PCS)	0.178	0.627	0.313	0.805	0.491	1.118
	LTE Band 30	0.039	0.627	0.313	0.666	0.352	0.979
	LTE Band 7	0.076	0.627	0.313	0.703	0.389	1.016
	LTE Band 41	0.034	0.627	0.313	0.661	0.347	0.974

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM/GPRS 850	0.123	0.891	0.313	1.014	0.436	1.327
	GSM/GPRS 1900	0.162	0.891	0.313	1.053	0.475	1.366
	UMTS 850	0.146	0.891	0.313	1.037	0.459	1.350
	UMTS 1750	0.212	0.891	0.313	1.103	0.525	**1.416**
	UMTS 1900	0.162	0.891	0.313	1.053	0.475	1.366
	Cell. CDMA/EVDO	0.155	0.891	0.313	1.046	0.468	1.359
	PCS CDMA/EVDO	0.171	0.891	0.313	1.062	0.484	1.375
	LTE Band 12	0.141	0.891	0.313	1.032	0.454	1.345
	LTE Band 13	0.128	0.891	0.313	1.019	0.441	1.332
	LTE Band 5 (Cell)	0.131	0.891	0.313	1.022	0.444	1.335
	LTE Band 66 (AWS)	0.210	0.891	0.313	1.101	0.523	1.414
	LTE Band 25 (PCS)	0.178	0.891	0.313	1.069	0.491	1.382
	LTE Band 30	0.039	0.891	0.313	0.930	0.352	1.243
	LTE Band 7	0.076	0.891	0.313	0.967	0.389	1.280
	LTE Band 41	0.034	0.891	0.313	0.925	0.347	1.238

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Table 12-6
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM/GPRS 850	0.123	0.094	0.217
	GSM/GPRS 1900	0.162	0.094	0.256
	UMTS 850	0.146	0.094	0.240
	UMTS 1750	0.212	0.094	**0.306**
	UMTS 1900	0.162	0.094	0.256
	Cell. CDMA/EVDO	0.155	0.094	0.249
	PCS CDMA/EVDO	0.171	0.094	0.265
	LTE Band 12	0.141	0.094	0.235
	LTE Band 13	0.128	0.094	0.222
	LTE Band 5 (Cell)	0.131	0.094	0.225
	LTE Band 66 (AWS)	0.210	0.094	0.304
	LTE Band 25 (PCS)	0.178	0.094	0.272
	LTE Band 30	0.039	0.094	0.133
	LTE Band 7	0.076	0.094	0.170
	LTE Band 41	0.034	0.094	0.128

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12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn 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
Body-Worn	GSM/GPRS 850	0.632	0.228	0.161	0.860	0.793	1.021
	GSM/GPRS 1900	0.527	0.228	0.161	0.755	0.688	0.916
	UMTS 850	0.686	0.228	0.161	0.914	0.847	1.075
	UMTS 1750	0.898	0.228	0.161	1.126	1.059	1.287
	UMTS 1900	0.570	0.228	0.161	0.798	0.731	0.959
	Cell. CDMA	0.671	0.228	0.161	0.899	0.832	1.060
	PCS CDMA	0.621	0.228	0.161	0.849	0.782	1.010
	LTE Band 12	0.593	0.228	0.161	0.821	0.754	0.982
	LTE Band 13	0.553	0.228	0.161	0.781	0.714	0.942
	LTE Band 5 (Cell)	0.520	0.228	0.161	0.748	0.681	0.909
	LTE Band 66 (AWS)	0.742	0.228	0.161	0.970	0.903	1.131
	LTE Band 25 (PCS)	0.543	0.228	0.161	0.771	0.704	0.932
	LTE Band 30	1.160	0.228	0.161	1.388	1.321	**1.549**
	LTE Band 7	1.008	0.228	0.161	1.236	1.169	1.397
	LTE Band 41	0.534	0.228	0.161	0.762	0.695	0.923

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Table 12-8
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn 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)		SPLSR
		1	2	3	1+2	1+3	1+2
Body-Worn	GSM/GPRS 850	0.632	0.727	0.310	1.359	0.942	N/A
	GSM/GPRS 1900	0.527	0.727	0.310	1.254	0.837	N/A
	UMTS 850	0.686	0.727	0.310	1.413	0.996	N/A
	UMTS 1750	0.898	0.727	0.310	See Note 1	1.208	0.02
	UMTS 1900	0.570	0.727	0.310	1.297	0.880	N/A
	Cell. CDMA	0.671	0.727	0.310	1.398	0.981	N/A
	PCS CDMA	0.621	0.727	0.310	1.348	0.931	N/A
	LTE Band 12	0.593	0.727	0.310	1.320	0.903	N/A
	LTE Band 13	0.553	0.727	0.310	1.280	0.863	N/A
	LTE Band 5 (Cell)	0.520	0.727	0.310	1.247	0.830	N/A
	LTE Band 66 (AWS)	0.742	0.727	0.310	1.469	1.052	N/A
	LTE Band 25 (PCS)	0.543	0.727	0.310	1.270	0.853	N/A
	LTE Band 30	1.160	0.727	0.310	See Note 1	**1.470**	0.02
	LTE Band 7	1.008	0.727	0.310	See Note 1	1.318	0.02
	LTE Band 41	0.534	0.727	0.310	1.261	0.844	N/A

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body-Worn	GSM/GPRS 850	0.632	0.903	1.535	N/A
	GSM/GPRS 1900	0.527	0.903	1.430	N/A
	UMTS 850	0.686	0.903	**1.589**	N/A
	UMTS 1750	0.898	0.903	See Note 1	0.02
	UMTS 1900	0.570	0.903	1.473	N/A
	Cell. CDMA	0.671	0.903	1.574	N/A
	PCS CDMA	0.621	0.903	1.524	N/A
	LTE Band 12	0.593	0.903	1.496	N/A
	LTE Band 13	0.553	0.903	1.456	N/A
	LTE Band 5 (Cell)	0.520	0.903	1.423	N/A
	LTE Band 66 (AWS)	0.742	0.903	See Note 1	0.02
	LTE Band 25 (PCS)	0.543	0.903	1.446	N/A
	LTE Band 30	1.160	0.903	See Note 1	0.02
	LTE Band 7	1.008	0.903	See Note 1	0.02
	LTE Band 41	0.534	0.903	1.437	N/A

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Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz Ant 1 & 5 GHz Ant 2 WLAN (Body-Worn at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM/GPRS 850	0.632	0.228	0.310	0.860	0.942	1.170
	GSM/GPRS 1900	0.527	0.228	0.310	0.755	0.837	1.065
	UMTS 850	0.686	0.228	0.310	0.914	0.996	1.224
	UMTS 1750	0.898	0.228	0.310	1.126	1.208	1.436
	UMTS 1900	0.570	0.228	0.310	0.798	0.880	1.108
	Cell. CDMA	0.671	0.228	0.310	0.899	0.981	1.209
	PCS CDMA	0.621	0.228	0.310	0.849	0.931	1.159
	LTE Band 12	0.593	0.228	0.310	0.821	0.903	1.131
	LTE Band 13	0.553	0.228	0.310	0.781	0.863	1.091
	LTE Band 5 (Cell)	0.520	0.228	0.310	0.748	0.830	1.058
	LTE Band 66 (AWS)	0.742	0.228	0.310	0.970	1.052	1.280
	LTE Band 25 (PCS)	0.543	0.228	0.310	0.771	0.853	1.081
	LTE Band 30	1.160	0.228	0.310	1.388	1.470	See table below
	LTE Band 7	1.008	0.228	0.310	1.236	1.318	**1.546**
	LTE Band 41	0.534	0.228	0.310	0.762	0.844	1.072

Antenna Pair		SPLS Ratio
Ant "a"	Ant "b"	$(a+b)^{1.5}/D_{a-b}$
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.01
2.4 GHz WLAN Ant 1	LTE Band 30	0.01
5 GHz WLAN Ant 2	LTE Band 30	0.01

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Table 12-10
Simultaneous Transmission Scenario with Bluetooth (Body-Worn 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
Body-Worn	GSM/GPRS 850	0.632	0.013	0.645
	GSM/GPRS 1900	0.527	0.013	0.540
	UMTS 850	0.686	0.013	0.699
	UMTS 1750	0.898	0.013	0.911
	UMTS 1900	0.570	0.013	0.583
	Cell. CDMA	0.671	0.013	0.684
	PCS CDMA	0.621	0.013	0.634
	LTE Band 12	0.593	0.013	0.606
	LTE Band 13	0.553	0.013	0.566
	LTE Band 5 (Cell)	0.520	0.013	0.533
	LTE Band 66 (AWS)	0.742	0.013	0.755
	LTE Band 25 (PCS)	0.543	0.013	0.556
	LTE Band 30	1.160	0.013	**1.173**
	LTE Band 7	1.008	0.013	1.021
	LTE Band 41	0.534	0.013	0.547

Notes:
1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.

12.5 Hotspot SAR 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 ("-")

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

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Table 12-11
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	GPRS 850	0.632	0.228	0.180	0.860	0.812	1.040
	GPRS 1900	0.645	0.228	0.180	0.873	0.825	1.053
	UMTS 850	0.686	0.228	0.180	0.914	0.866	1.094
	UMTS 1750	0.898	0.228	0.180	1.126	1.078	1.306
	UMTS 1900	0.668	0.228	0.180	0.896	0.848	1.076
	Cell. EVDO	0.796	0.228	0.180	1.024	0.976	1.204
	PCS EVDO	0.720	0.228	0.180	0.948	0.900	1.128
	LTE Band 12	0.593	0.228	0.180	0.821	0.773	1.001
	LTE Band 13	0.553	0.228	0.180	0.781	0.733	0.961
	LTE Band 5 (Cell)	0.520	0.228	0.180	0.748	0.700	0.928
	LTE Band 66 (AWS)	0.742	0.228	0.180	0.970	0.922	1.150
	LTE Band 25 (PCS)	0.729	0.228	0.180	0.957	0.909	1.137
	LTE Band 30	1.160	0.228	0.180	1.388	1.340	**1.568**
	LTE Band 7	1.008	0.228	0.180	1.236	1.188	1.416
	LTE Band 41	0.534	0.228	0.180	0.762	0.714	0.942

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Hotspot SAR	GPRS 850	0.632	0.727	0.253	1.359	0.885
	GPRS 1900	0.645	0.727	0.253	1.372	0.898
	UMTS 850	0.686	0.727	0.253	1.413	0.939
	UMTS 1750	0.898	0.727	0.253	See Table Below	1.151
	UMTS 1900	0.668	0.727	0.253	1.395	0.921
	Cell. EVDO	0.796	0.727	0.253	**1.523**	1.049
	PCS EVDO	0.720	0.727	0.253	1.447	0.973
	LTE Band 12	0.593	0.727	0.253	1.320	0.846
	LTE Band 13	0.553	0.727	0.253	1.280	0.806
	LTE Band 5 (Cell)	0.520	0.727	0.253	1.247	0.773
	LTE Band 66 (AWS)	0.742	0.727	0.253	1.469	0.995
	LTE Band 25 (PCS)	0.729	0.727	0.253	1.456	0.982
	LTE Band 30	1.160	0.727	0.253	See Table Below	1.413
	LTE Band 7	1.008	0.727	0.253	See Table Below	1.261
	LTE Band 41	0.534	0.727	0.253	1.261	0.787

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.898	0.727	See Note 1	0.02
	Front	0.799	0.727*	**1.526**	N/A
	Top	-	0.727*	0.727	N/A
	Bottom	0.729	-	0.729	N/A
	Right	-	-	-	N/A
	Left	0.398	0.485	0.883	N/A

Simult Tx	Configuration	LTE Band 30 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	1.160	0.727	See Note 1	0.02
	Front	0.047	0.727*	**0.774**	N/A
	Top	-	0.727*	0.727	N/A
	Bottom	0.277	-	0.277	N/A
	Right	0.062	-	0.062	N/A
	Left	0.015	0.485	0.500	N/A

Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	1.008	0.727	See Note 1	0.02
	Front	0.422	0.727*	**1.149**	N/A
	Top	-	0.727*	0.727	N/A
	Bottom	0.535	-	0.535	N/A
	Right	-	-	-	N/A
	Left	0.128	0.485	0.613	N/A

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Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.632	0.850	1.482
	GPRS 1900	0.645	0.850	1.495
	UMTS 850	0.686	0.850	1.536
	UMTS 1750	0.898	0.850	See Table Below
	UMTS 1900	0.668	0.850	1.518
	Cell. EVDO	0.796	0.850	See Table Below
	PCS EVDO	0.720	0.850	1.570
	LTE Band 12	0.593	0.850	1.443
	LTE Band 13	0.553	0.850	1.403
	LTE Band 5 (Cell)	0.520	0.850	1.370
	LTE Band 66 (AWS)	0.742	0.850	**1.592**
	LTE Band 25 (PCS)	0.729	0.850	1.579
	LTE Band 30	1.160	0.850	See Table Below
	LTE Band 7	1.008	0.850	See Table Below
	LTE Band 41	0.534	0.850	1.384

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.898	0.850	See Note 1	0.02
	Front	0.799	0.132	0.931	N/A
	Top	-	0.850*	0.850	N/A
	Bottom	0.729	-	0.729	N/A
	Right	-	-	-	N/A
	Left	0.398	0.541	**0.939**	N/A

Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.796	0.850	See Note 1	0.01
	Front	0.720	0.132	**0.852**	N/A
	Top	-	0.850*	0.850	N/A
	Bottom	0.349	-	0.349	N/A
	Right	0.111	-	0.111	N/A
	Left	0.281	0.541	0.822	N/A

Simult Tx	Configuration	LTE Band 30 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	1.160	0.850	See Note 1	0.02
	Front	0.047	0.132	0.179	N/A
	Top	-	0.850*	**0.850**	N/A
	Bottom	0.277	-	0.277	N/A
	Right	0.062	-	0.062	N/A
	Left	0.015	0.541	0.556	N/A

Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	1.008	0.850	See Note 1	0.02
	Front	0.422	0.132	0.554	N/A
	Top	-	0.850*	**0.850**	N/A
	Bottom	0.535	-	0.535	N/A
	Right	-	-	-	N/A
	Left	0.128	0.541	0.669	N/A

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.632	0.228	0.253	0.860	0.885	1.113
	GPRS 1900	0.645	0.228	0.253	0.873	0.898	1.126
	UMTS 850	0.686	0.228	0.253	0.914	0.939	1.167
	UMTS 1750	0.898	0.228	0.253	1.126	1.151	1.379
	UMTS 1900	0.668	0.228	0.253	0.896	0.921	1.149
	Cell. EVDO	0.796	0.228	0.253	1.024	1.049	1.277
	PCS EVDO	0.720	0.228	0.253	0.948	0.973	1.201
	LTE Band 12	0.593	0.228	0.253	0.821	0.846	1.074
	LTE Band 13	0.553	0.228	0.253	0.781	0.806	1.034
	LTE Band 5 (Cell)	0.520	0.228	0.253	0.748	0.773	1.001
	LTE Band 66 (AWS)	0.742	0.228	0.253	0.970	0.995	1.223
	LTE Band 25 (PCS)	0.729	0.228	0.253	0.957	0.982	1.210
	LTE Band 30	1.160	0.228	0.253	1.388	1.413	See table below
	LTE Band 7	1.008	0.228	0.253	1.236	1.261	**1.489**
	LTE Band 41	0.534	0.228	0.253	0.762	0.787	1.015

Simult Tx	Configuration	LTE Band 30 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			SPLSR		
		1	2	3	1+2	1+3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	1.160	0.228	0.253	1.388	**1.413**	See Note 1	0.01	0.01	0.01
	Front	0.047	0.228*	0.253*	0.275	0.300	0.528	N/A	N/A	N/A
	Top	-	0.228*	0.253*	0.228	0.253	0.481	N/A	N/A	N/A
	Bottom	0.277	-	-	0.277	0.277	0.277	N/A	N/A	N/A
	Right	0.062	-	-	0.062	0.062	0.062	N/A	N/A	N/A
	Left	0.015	0.228*	0.253*	0.243	0.268	0.496	N/A	N/A	N/A

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.632	0.016	0.648
	GPRS 1900	0.645	0.016	0.661
	UMTS 850	0.686	0.016	0.702
	UMTS 1750	0.898	0.016	0.914
	UMTS 1900	0.668	0.016	0.684
	Cell. EVDO	0.796	0.016	0.812
	PCS EVDO	0.720	0.016	0.736
	LTE Band 12	0.593	0.016	0.609
	LTE Band 13	0.553	0.016	0.569
	LTE Band 5 (Cell)	0.520	0.016	0.536
	LTE Band 66 (AWS)	0.742	0.016	0.758
	LTE Band 25 (PCS)	0.729	0.016	0.745
	LTE Band 30	1.160	0.016	**1.176**
	LTE Band 7	1.008	0.016	1.024
	LTE Band 41	0.534	0.016	0.550

Notes:

1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.

12.6 Phablet Simultaneous Transmission Analysis

Table 12-15
Simultaneous Transmission Scenario with 5 GHz WLAN (Phablet at 0.0 cm)

Exposure Condition	5GHz WLAN Ant 1 SAR (W/kg)	5GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
	1	2	1+2
Phablet SAR	1.813	1.211	**3.024**

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12.7 SPLSR Evaluation and Analysis

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

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

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

12.7.1 Body-Worn Back Side SPLSR Evaluation and Analysis

Table 12-16
Peak SAR Locations for Body-Worn Back Side

Mode/Band	x (mm)	y (mm)
2.4 GHz WLAN Ant 1	17.80	36.00
5 GHz WLAN Ant 1	16.00	54.00
5 GHz WLAN Ant 2	5.00	61.00
5 GHz WLAN MIMO	17.00	55.00
LTE Band 30	-27.80	-67.20
LTE Band 7	8.00	-73.40
LTE Band 66	-16.50	-63.50
UMTS 1750	-18.50	-55.50

Table 12-17
Body-Worn Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN MIMO	LTE Band 30	0.903	1.16	2.063	130.15	0.02	1
5 GHz WLAN MIMO	LTE Band 7	0.903	1.008	1.911	128.72	0.02	2
5 GHz WLAN MIMO	LTE Band 66	0.903	0.742	1.645	123.14	0.02	3
5 GHz WLAN MIMO	UMTS 1750	0.903	0.898	1.801	116.06	0.02	4
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.228	0.31	0.538	28.09	0.01	5
2.4 GHz WLAN Ant 1	LTE Band 30	0.228	1.16	1.388	112.83	0.01	
5 GHz WLAN Ant 2	LTE Band 30	0.31	1.16	1.470	132.33	0.01	
5 GHz WLAN Ant 1	LTE Band 30	0.727	1.16	1.887	128.87	0.02	6
5 GHz WLAN Ant 1	LTE Band 7	0.727	1.008	1.735	127.65	0.02	7
5 GHz WLAN Ant 1	UMTS 1750	0.727	0.898	1.625	114.81	0.02	8

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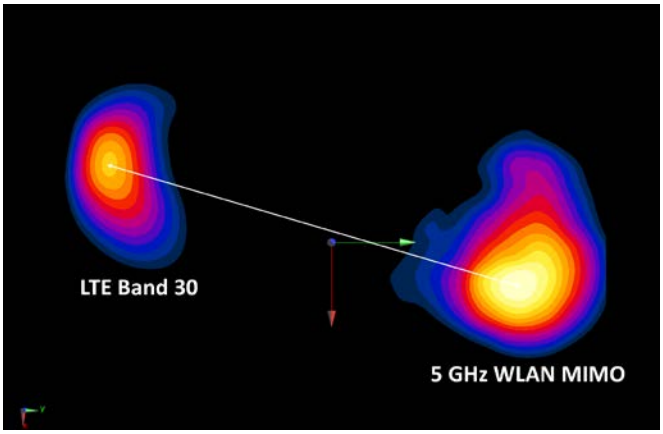
Table 12-18
Body-Worn Back Side SAR to Peak Location Separation Ratio Plots



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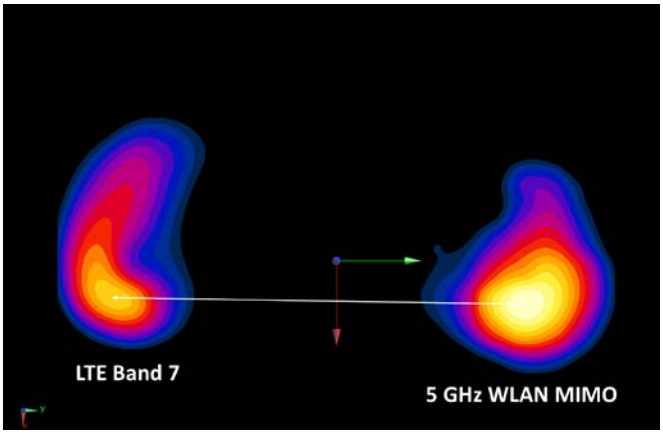

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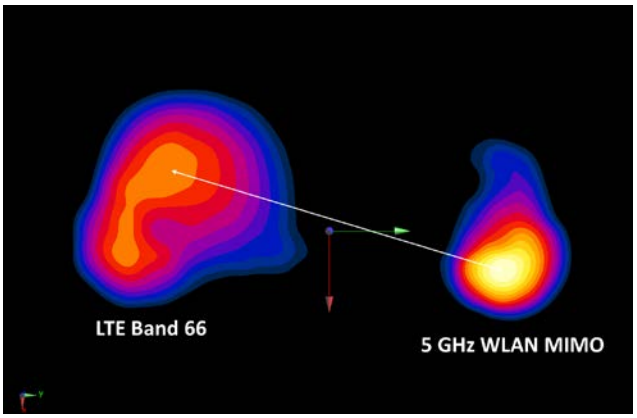

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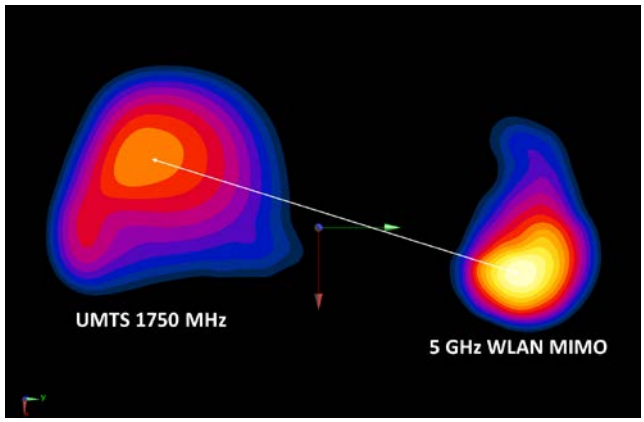

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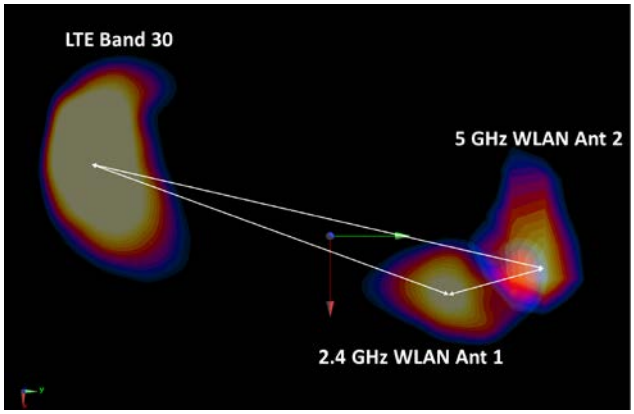

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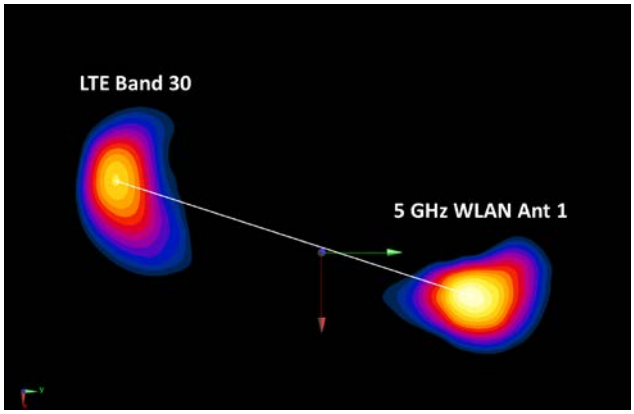

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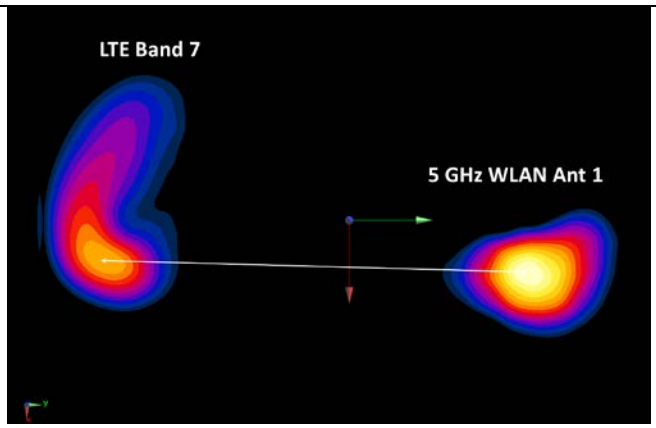	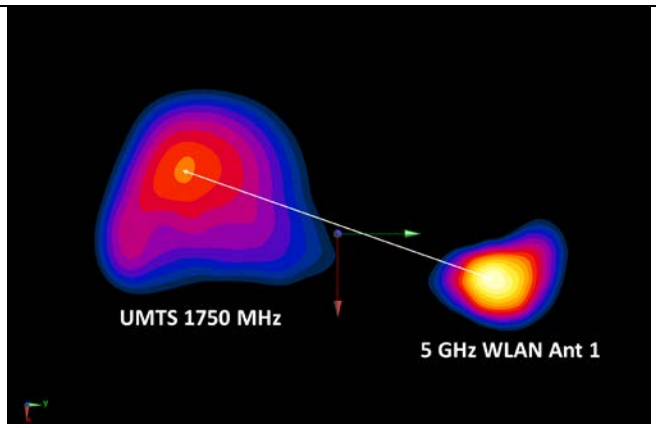
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12.7.2 Hotspot Back Side SPLSR Evaluation and Analysis

Table 12-19
Peak SAR Locations for Hotspot Back Side

Mode/Band	x (mm)	y (mm)
2.4 GHz WLAN Ant 1	17.80	36.00
5 GHz WLAN Ant 1	16.00	54.00
5 GHz WLAN Ant 2	5.00	61.00
5 GHz WLAN MIMO	14.00	63.00
LTE Band 30	-27.80	-67.20
UMTS 1750	-18.50	-55.50
Cell. CDMA	-32.00	-73.50
LTE Band 7	8.00	-73.40

Table 12-20
Hotspot Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN Ant 1	UMTS 1750	0.727	0.898	1.625	114.81	0.02	1
5 GHz WLAN Ant 1	LTE Band 30	0.727	1.16	1.887	128.87	0.02	2
5 GHz WLAN Ant 1	LTE Band 7	0.727	1.008	1.735	127.65	0.02	3
5 GHz WLAN MIMO	UMTS 1750	0.85	0.898	1.748	122.88	0.02	4
5 GHz WLAN MIMO	Cell. CDMA	0.85	0.796	1.646	144.04	0.01	5
5 GHz WLAN MIMO	LTE Band 30	0.85	1.16	2.010	136.75	0.02	6
5 GHz WLAN MIMO	LTE Band 7	0.85	1.008	1.858	136.53	0.02	7
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.228	0.253	0.481	28.09	0.01	8
2.4 GHz WLAN Ant 1	LTE Band 30	0.228	1.16	1.388	112.83	0.01	
5 GHz WLAN Ant 2	LTE Band 30	0.253	1.16	1.413	132.33	0.01	

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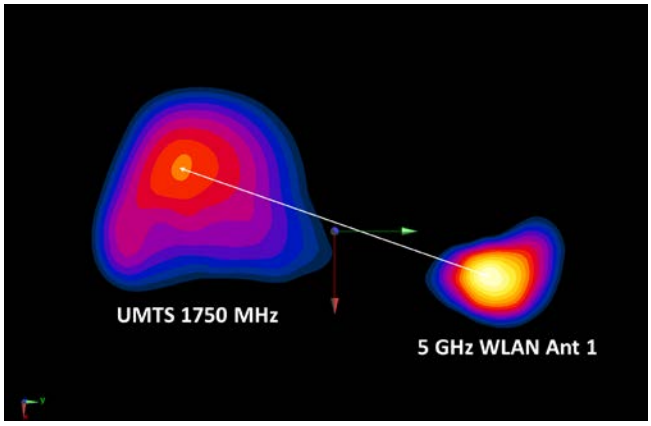
Table 12-21
Hotspot Back Side SAR to Peak Location Separation Ratio Plots



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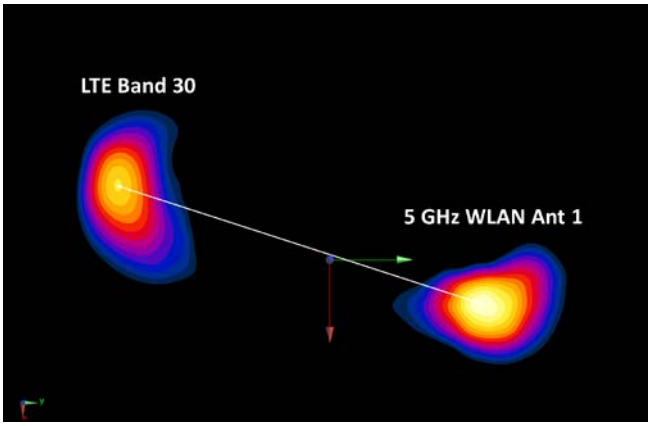

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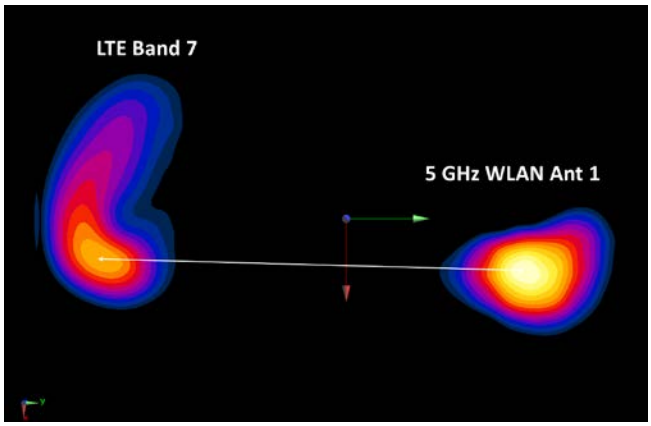

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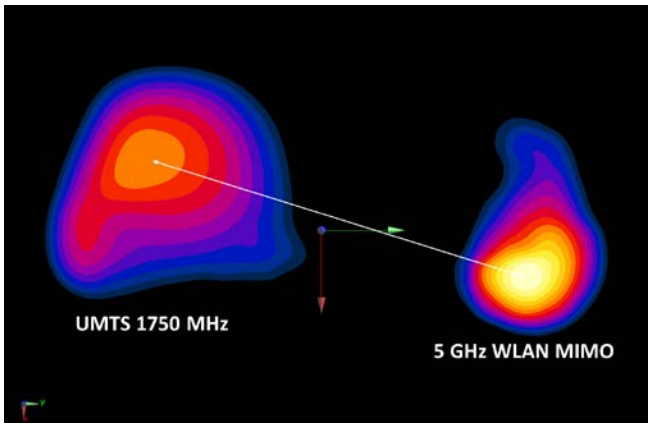

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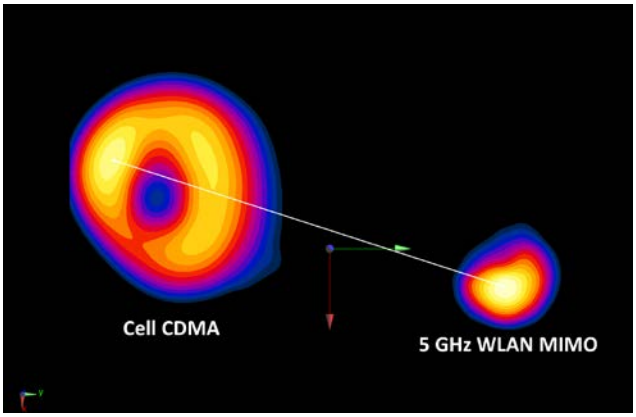

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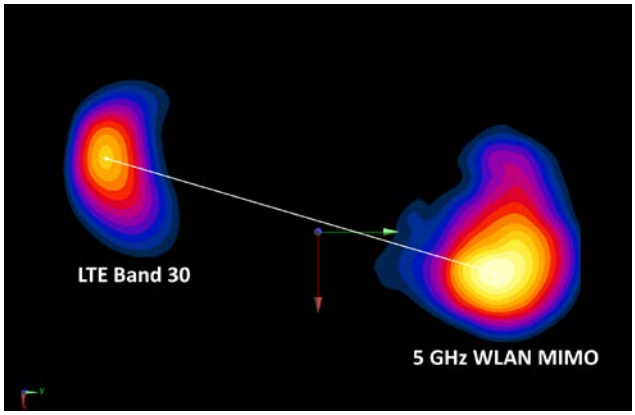

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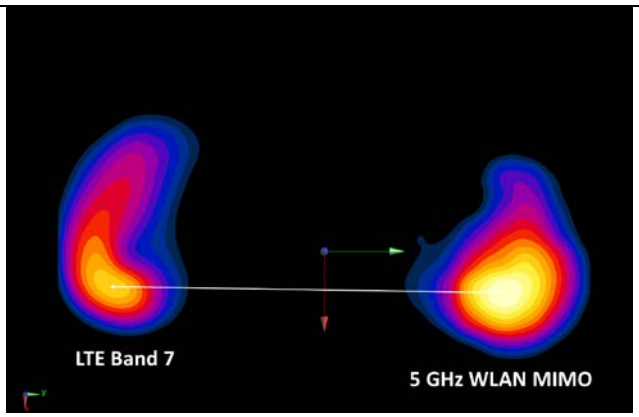	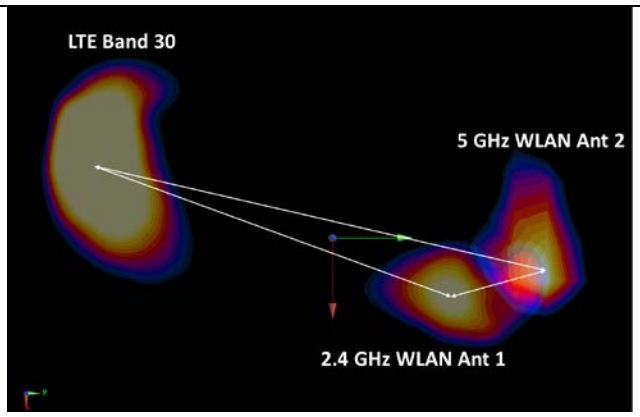
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12.8 Simultaneous Transmission Conclusion

The above numerical summed SAR results and SPLSR analysis are 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.

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

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

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

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

Table 13-1
Body SAR Measurement Variability Results

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	1732.40	1412	UMTS 1750	RMC	back	10 mm	0.811	0.869	1.07	N/A	N/A	N/A	N/A
2300	2310.00	27710	LTE Band 30, 10 MHz Bandwidth	QPSK, 1 RB, 25 RB Offset	back	10 mm	1.160	1.160	1.00	N/A	N/A	N/A	N/A
2450	2510.00	20850	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	10 mm	0.918	0.934	1.02	N/A	N/A	N/A	N/A
2600	2535.00	21100	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	10 mm	0.953	0.968	1.02	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						

13.2 Measurement Uncertainty

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

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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(+D2:D134250kHz-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
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	10/5/2016	Annual	10/5/2017	GB42230325
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
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
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	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
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
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
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Agilent	E4438C	ESG Vector Signal Generator	3/23/2017	Biennial	3/23/2019	MY42082659
Agilent	E4438C	ESG Vector Signal Generator	3/24/2017	Annual	3/24/2018	MY45091346
Agilent	E4432B	ESG-D Series Signal Generator	3/24/2017	Annual	3/24/2018	US40053896
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	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
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
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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	8/18/2016	Annual	8/18/2017	1207470
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	MT8820C	Radio Communication Analyzer	5/23/2017	Annual	5/23/2018	6201240328
Anritsu	MT8820C	Radio Communication Analyzer	12/8/2016	Annual	12/8/2017	6201300731
Rohde & Schwarz	CMW500	Radio Communication Tester	6/6/2017	Annual	6/6/2018	108843
Rohde & Schwarz	CMW500	Radio Communication tester	7/14/2017	Annual	7/14/2018	140144
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
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394

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Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
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
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
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
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
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	D1900V2	1900 MHz SAR Dipole	2/9/2017	Annual	2/9/2018	5d148
SPEAG	D2300V2	2300 MHz SAR Dipole	3/7/2017	Annual	3/7/2018	1038
SPEAG	D2450V2	2450 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	797
SPEAG	D2450V2	2450 MHz SAR Dipole	2/13/2017	Annual	2/13/2018	882
SPEAG	D2450V2	2450 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	945
SPEAG	D2600V2	2600 MHz SAR Dipole	4/13/2017	Annual	4/13/2018	1004
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/2/2016	Annual	8/2/2017	1237
SPEAG	D5GHzV2	5 GHz SAR Dipole	3/9/2017	Annual	3/9/2018	1123
SPEAG	D750V3	750 MHz Dipole	3/7/2017	Annual	3/7/2018	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/11/2017	Annual	4/11/2018	4d119
SPEAG	D835V2	835 MHz SAR Dipole	1/11/2017	Annual	1/11/2018	4d132
SPEAG	D835V2	850 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	4d180
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2017	Annual	4/11/2018	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3318
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
SPEAG	EX3DV4	SAR Probe	4/18/2017	Annual	4/18/2018	7406
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209

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. All equipment was only used within its calibration period.

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15 MEASUREMENT UNCERTAINTIES

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

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16 CONCLUSION

16.1 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

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PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

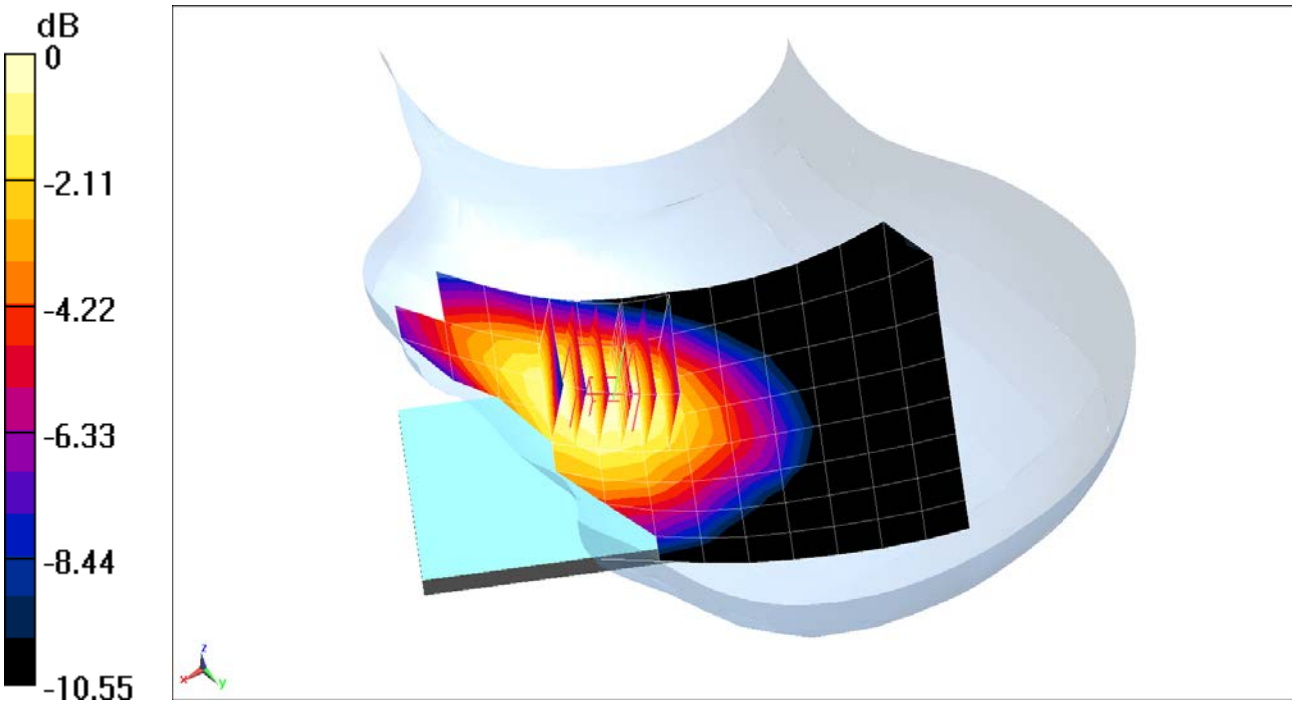
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.887 S/m; ε_r = 39.841; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-02-2017; Ambient Temp: 22.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: GSM 850, 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 = 11.84 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.151 W/kg
SAR(1 g) = 0.120 W/kg



0 dB = 0.140 W/kg = -8.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

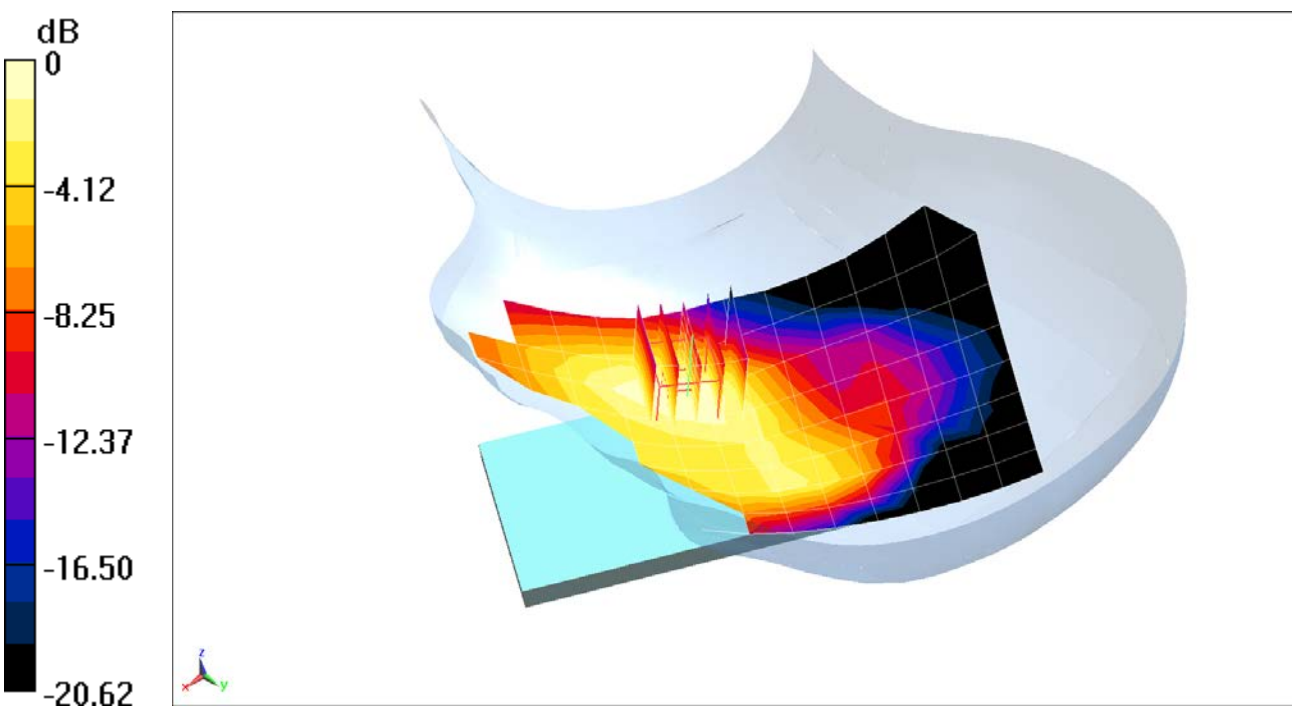
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.076
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.418 S/m; ε_r = 39.726; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3318; ConvF(5.31, 5.31, 5.31); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 1900, Left Head, Cheek, Mid.ch, 4 Tx slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.25 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.241 W/kg
SAR(1 g) = 0.159 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

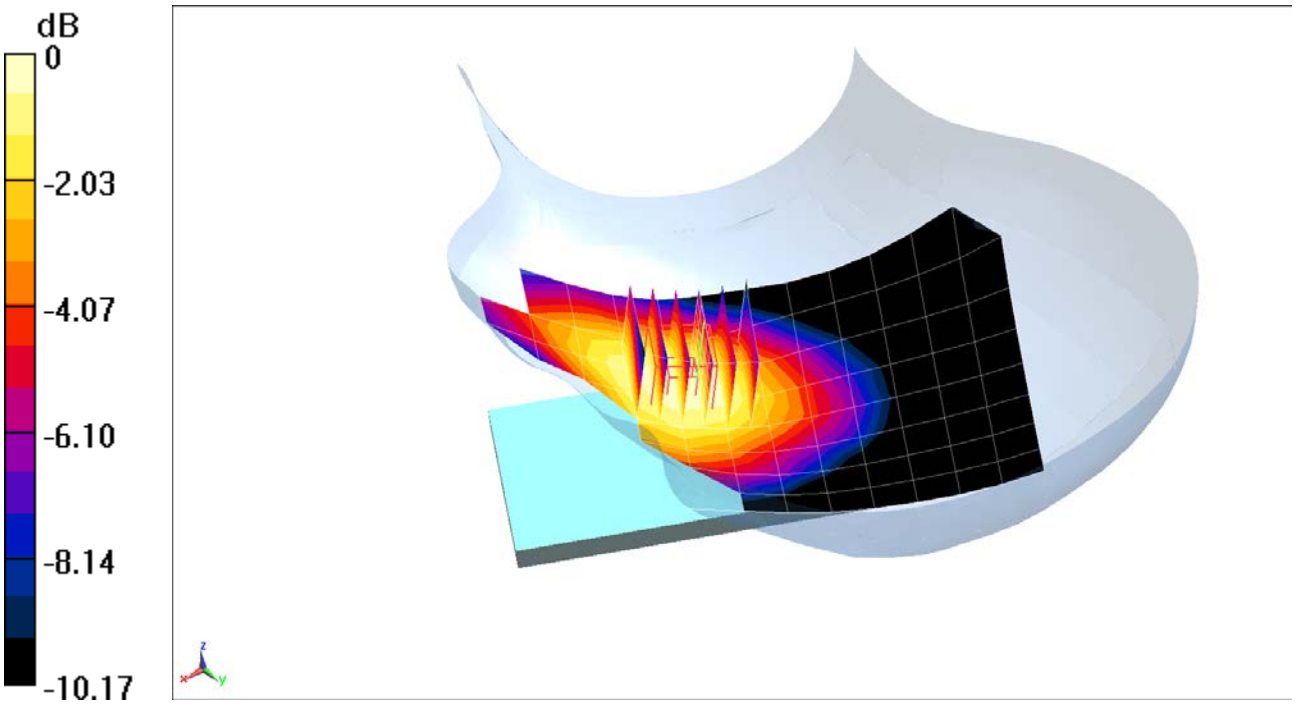
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.887 S/m; ε_r = 39.841; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-02-2017; Ambient Temp: 22.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 850, 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 = 12.92 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.177 W/kg
SAR(1 g) = 0.143 W/kg



0 dB = 0.165 W/kg = -7.83 dBW/kg

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

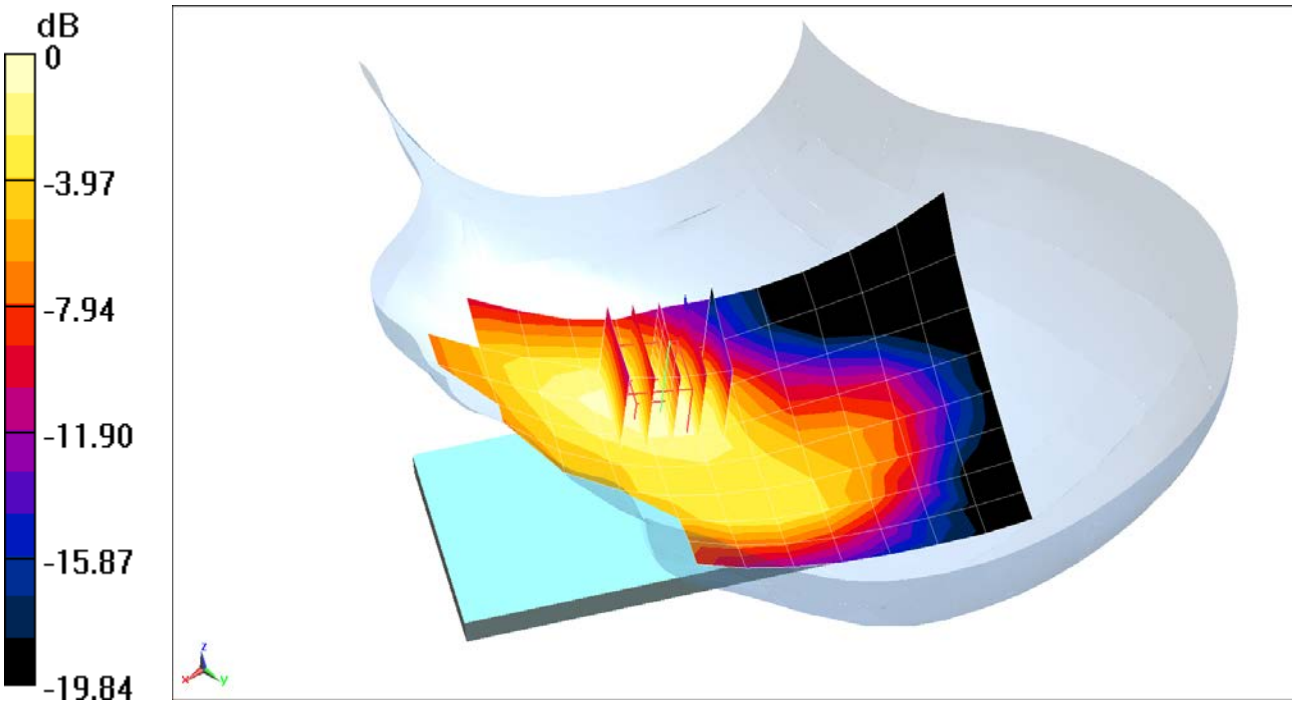
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.39 S/m; ε_r = 39.736; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-26-2017; Ambient Temp: 22.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.74 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.205 W/kg



0 dB = 0.233 W/kg = -6.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

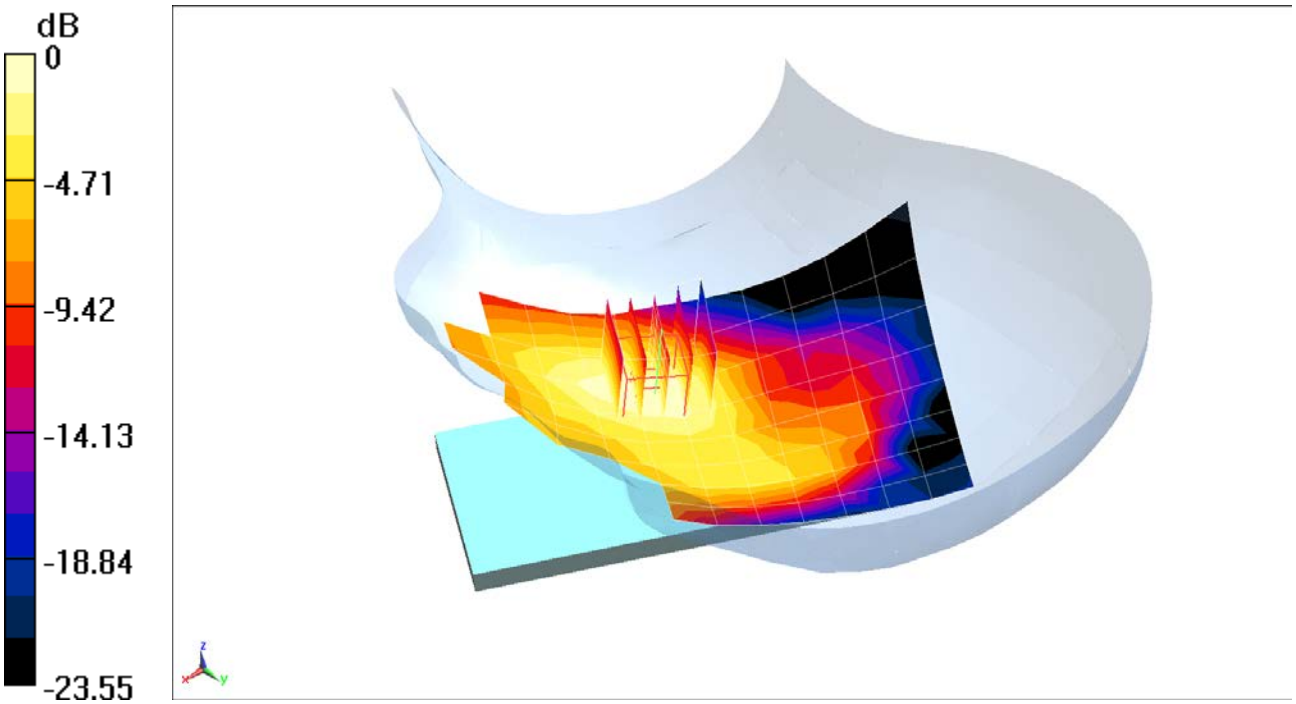
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.419 S/m; ε_r = 39.319; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-02-2017; Ambient Temp: 21.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); 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 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 = 11.08 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.157 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

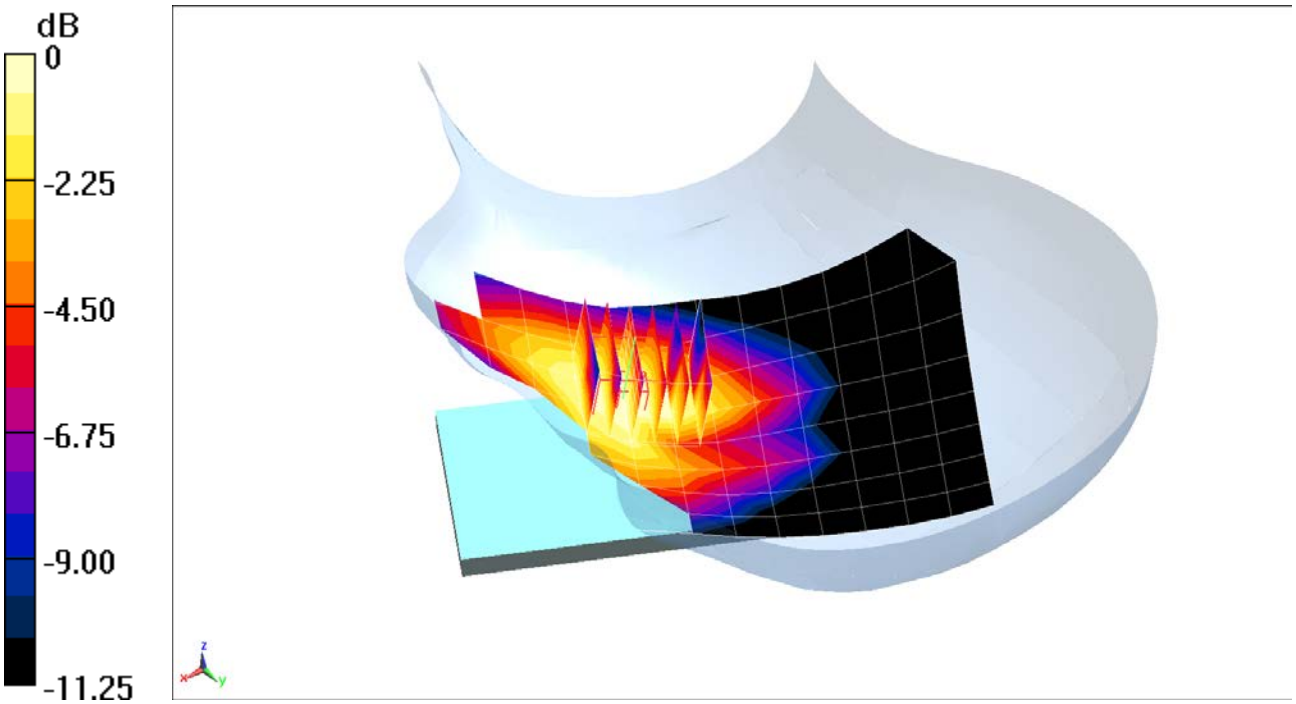
Communication System: UID 0, Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.909 S/m; ε_r = 42.443; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-07-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. EVDO Rev. A, Rule Part 22H, 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 = 12.45 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.180 W/kg
SAR(1 g) = 0.142 W/kg



0 dB = 0.158 W/kg = -8.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

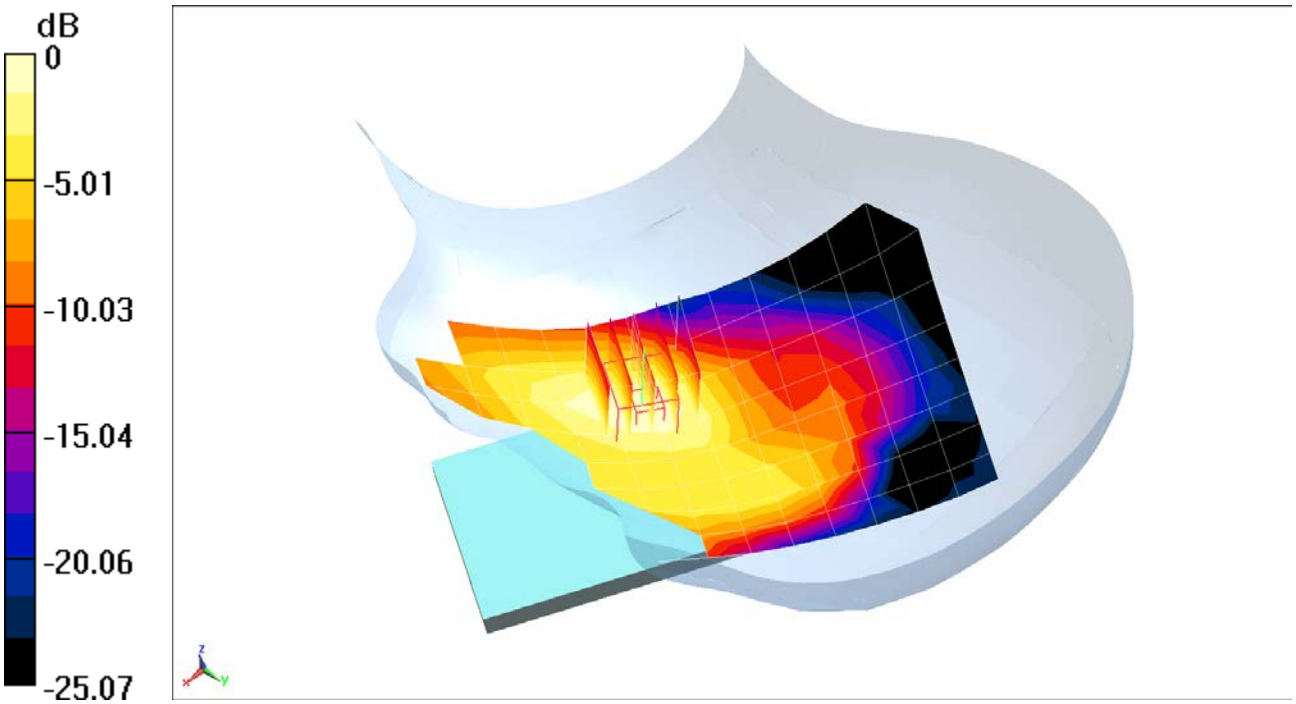
Communication System: UID 0, PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.419 S/m; ε_r = 39.319; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-02-2017; Ambient Temp: 21.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); 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: PCS CDMA, 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 = 10.79 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.240 W/kg
SAR(1 g) = 0.154 W/kg



0 dB = 0.177 W/kg = -7.52 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

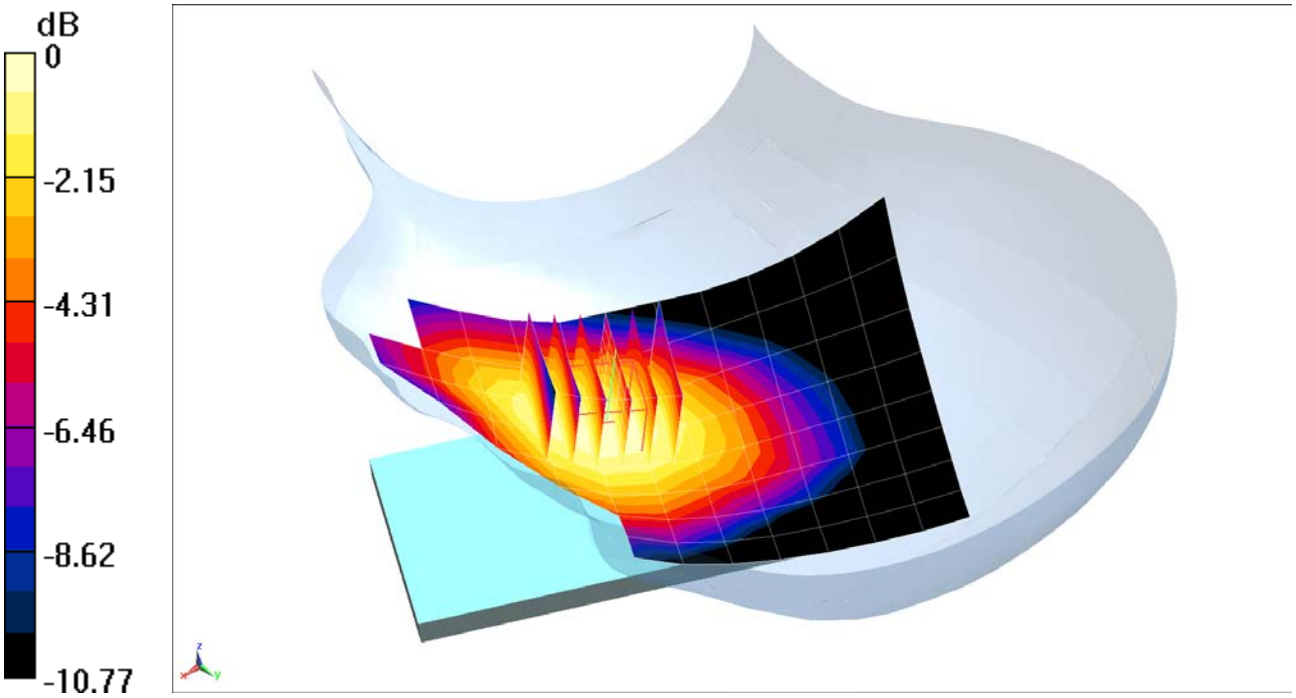
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.882 S/m; ε_r = 44.067; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-24-2017; Ambient Temp: 20.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3209; ConvF(6.76, 6.76, 6.76); 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 12, Left Head, Cheek, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 25 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 = 13.64 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.173 W/kg
SAR(1 g) = 0.141 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

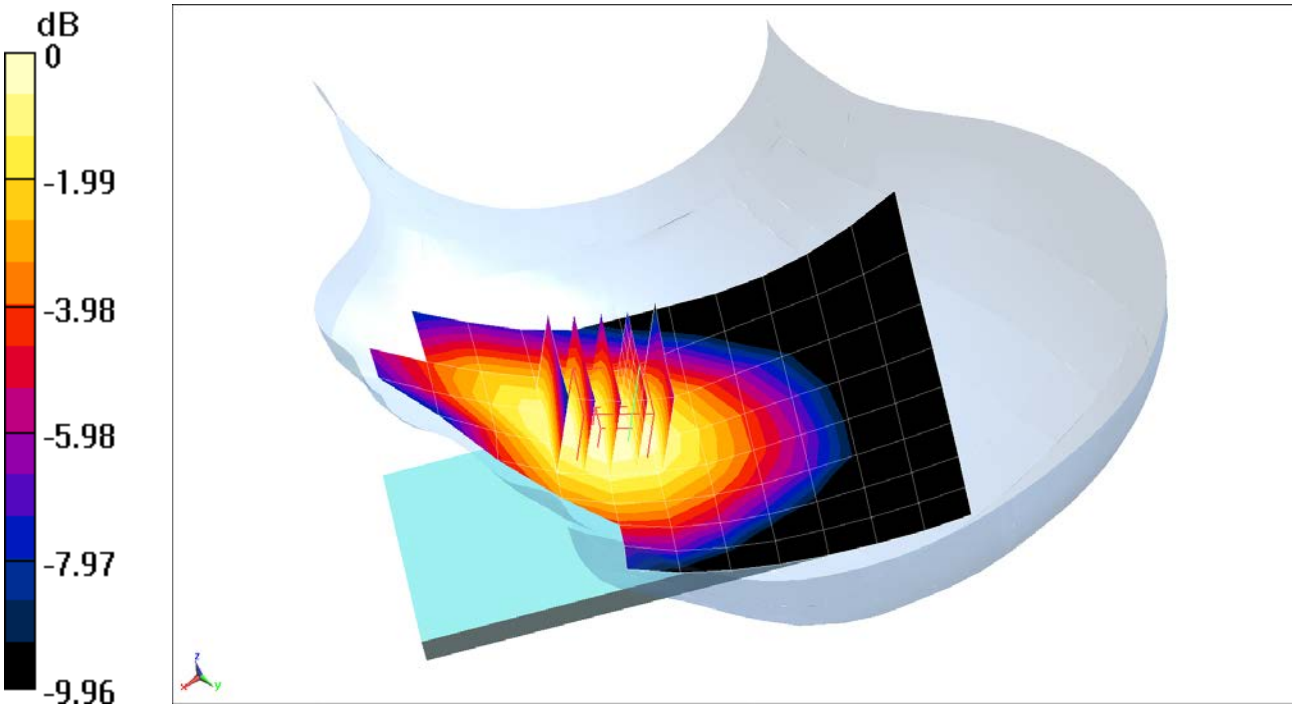
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.907 S/m; ε_r = 43.844; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-24-2017; Ambient Temp: 20.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3209; ConvF(6.76, 6.76, 6.76); 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 13, Left Head, Cheek, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 25 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.904 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.154 W/kg
SAR(1 g) = 0.127 W/kg



0 dB = 0.135 W/kg = -8.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15276

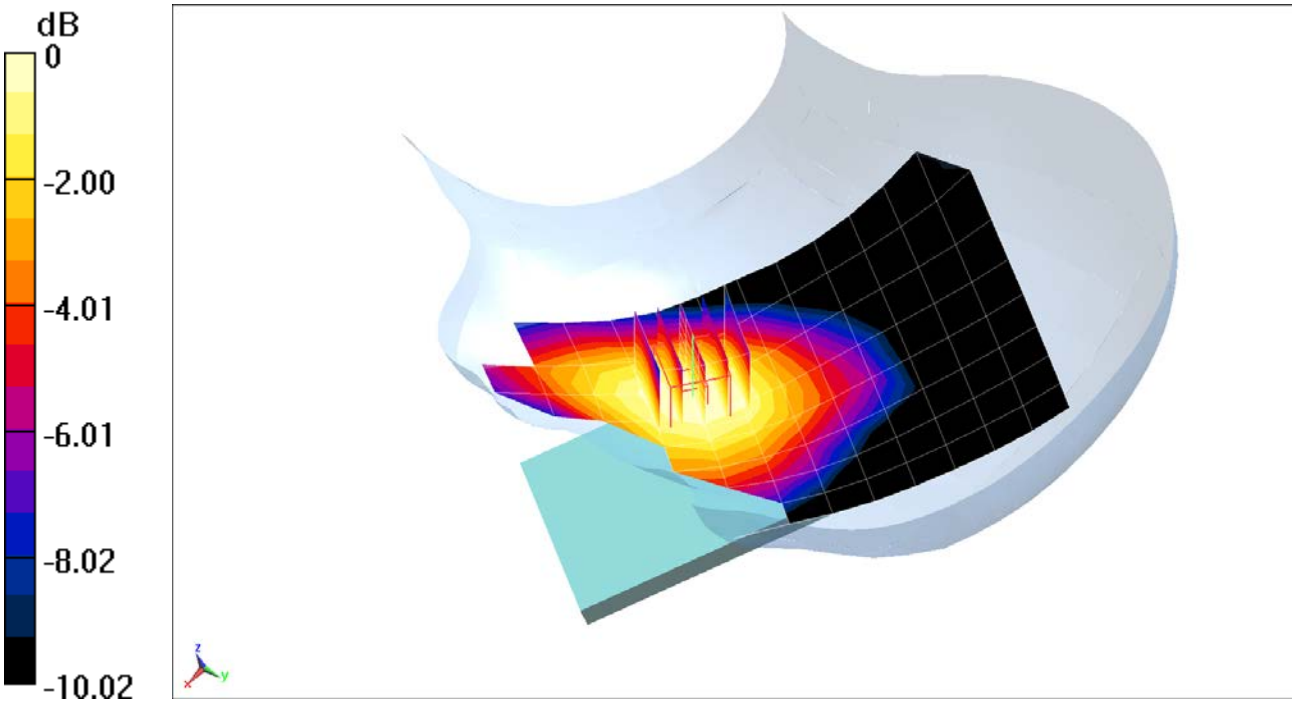
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.886 S/m; ε_r = 39.842; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 08-02-2017; Ambient Temp: 22.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.71 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.163 W/kg
SAR(1 g) = 0.131 W/kg



0 dB = 0.151 W/kg = -8.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

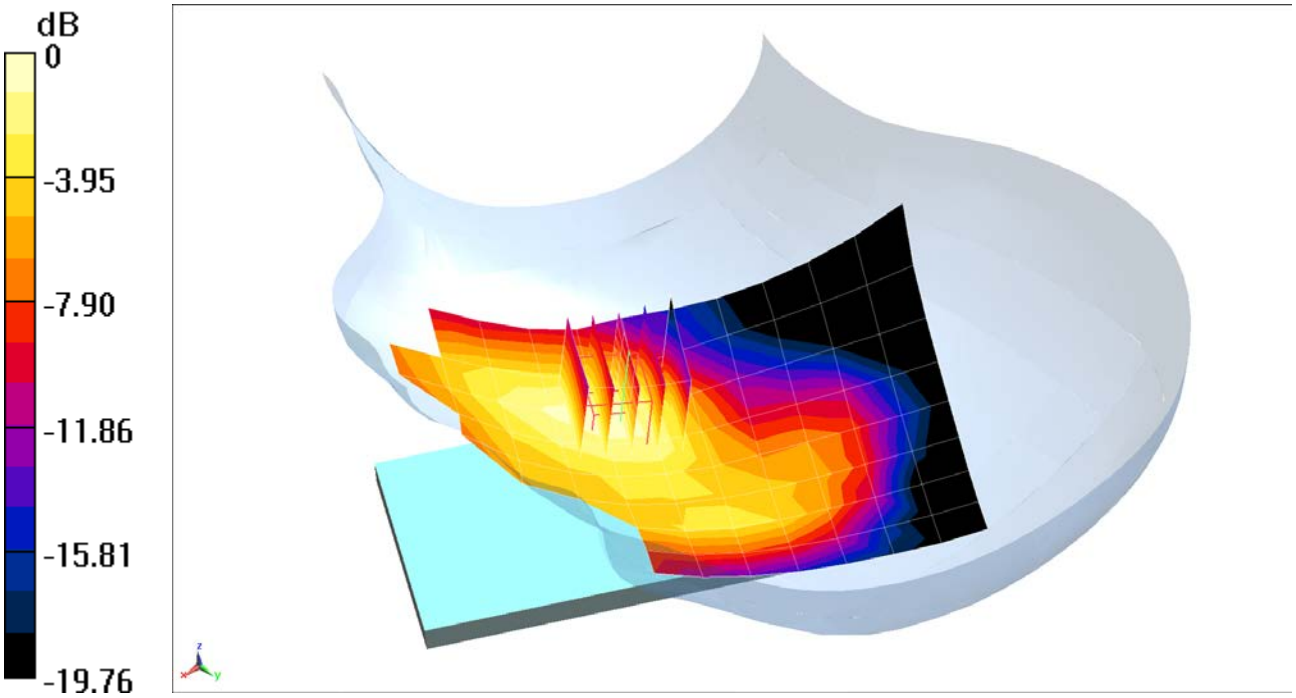
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1770 MHz; σ = 1.429 S/m; ε_r = 39.555; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-26-2017; Ambient Temp: 22.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 66 (AWS), Left Head, Cheek, High.ch, QPSK
20 MHz Bandwidth, 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 = 13.36 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.318 W/kg
SAR(1 g) = 0.209 W/kg



0 dB = 0.241 W/kg = -6.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15268

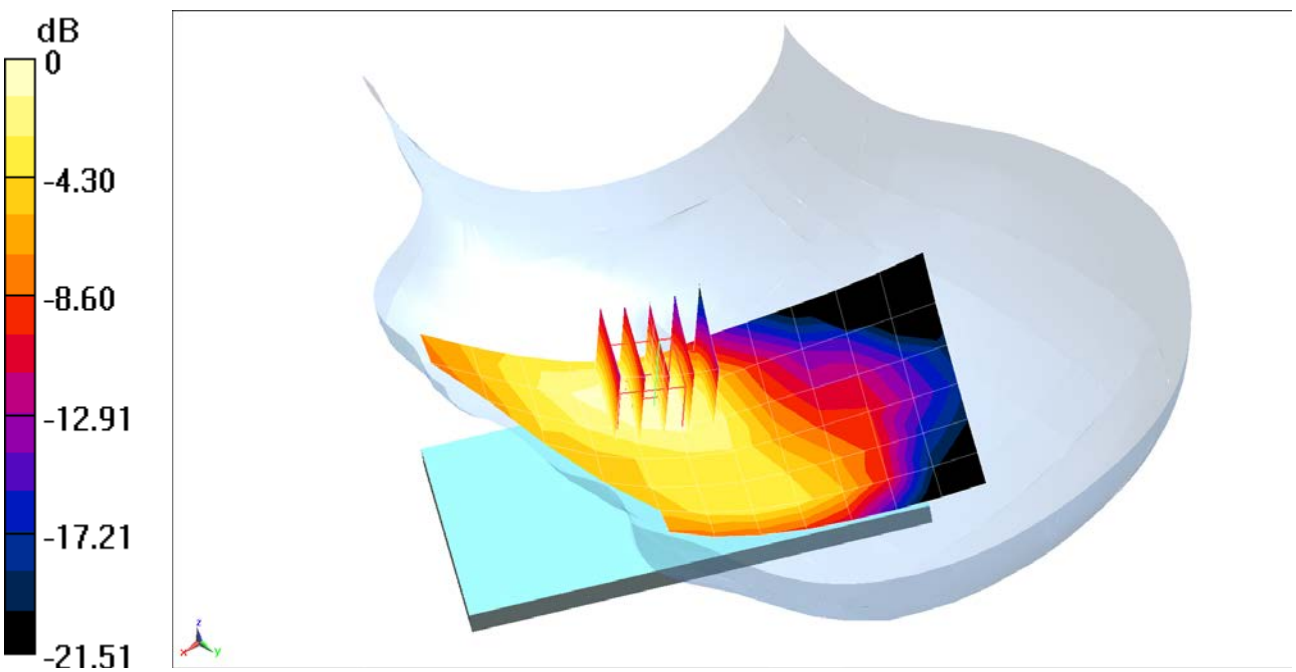
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.459 S/m; ε_r = 40.032; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-24-2017; Ambient Temp: 22.6°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3318; ConvF(5.31, 5.31, 5.31); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 25 (PCS), Left Head, Cheek, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.30 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.276 W/kg
SAR(1 g) = 0.178 W/kg



0 dB = 0.206 W/kg = -6.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

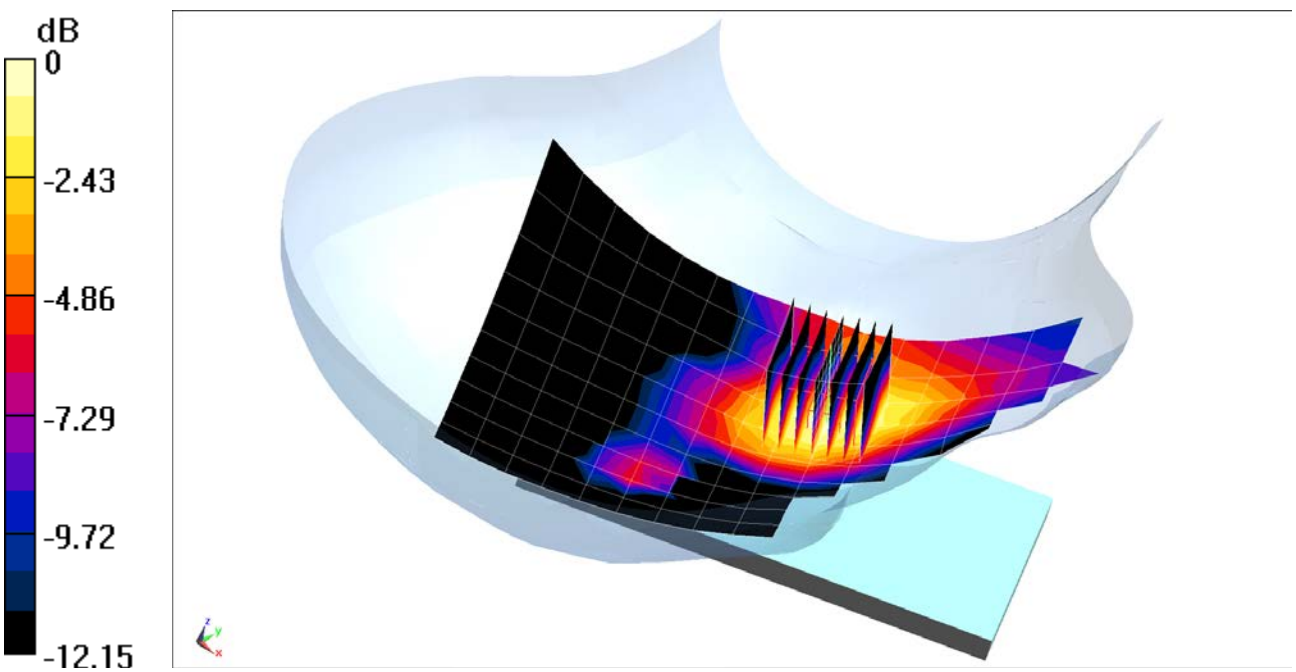
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2310 MHz; σ = 1.727 S/m; ε_r = 38.965; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3213; ConvF(4.95, 4.95, 4.95); 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 30, Right Head, Cheek, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 25 RB Offset

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.486 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0690 W/kg
SAR(1 g) = 0.039 W/kg



0 dB = 0.0478 W/kg = -13.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

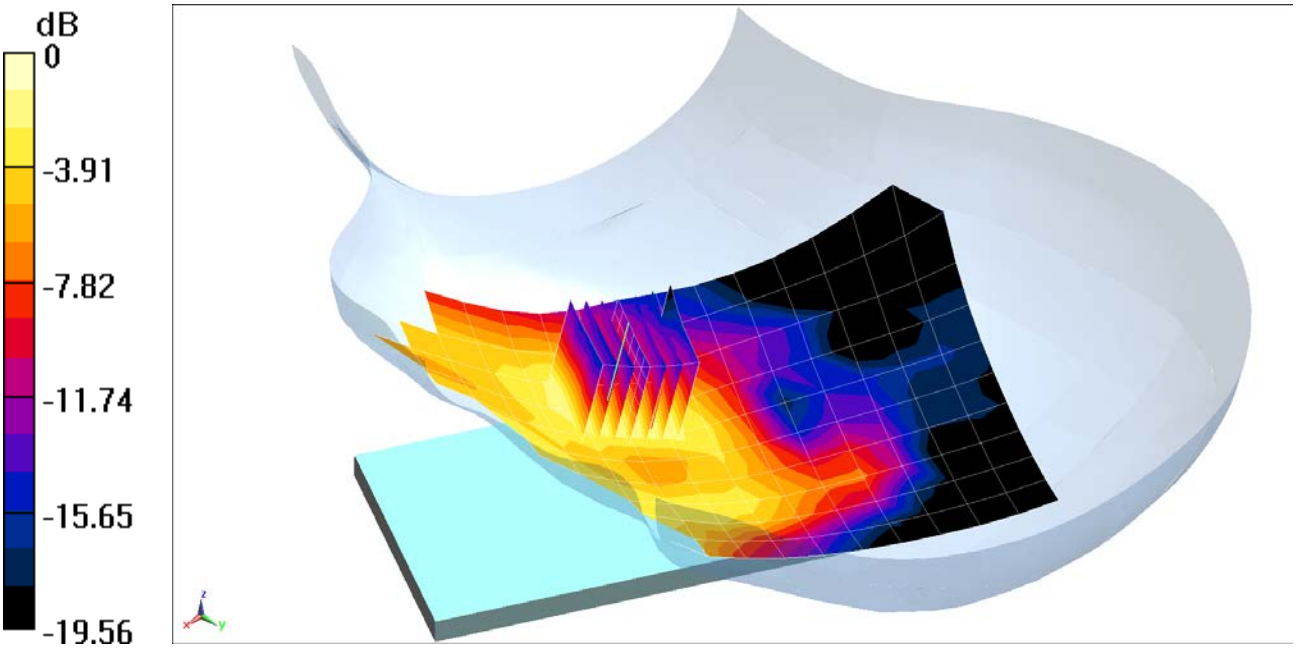
Communication System: UID 0, LTE Band 7; Frequency: 2535 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used (interpolated):
f = 2535 MHz; σ = 1.97 S/m; ε_r = 38.781; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3213; ConvF(4.70, 4.70, 4.70); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Left Head, Cheek, Mid.ch,
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 = 6.955 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.132 W/kg
SAR(1 g) = 0.074 W/kg



0 dB = 0.0899 W/kg = -10.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15292

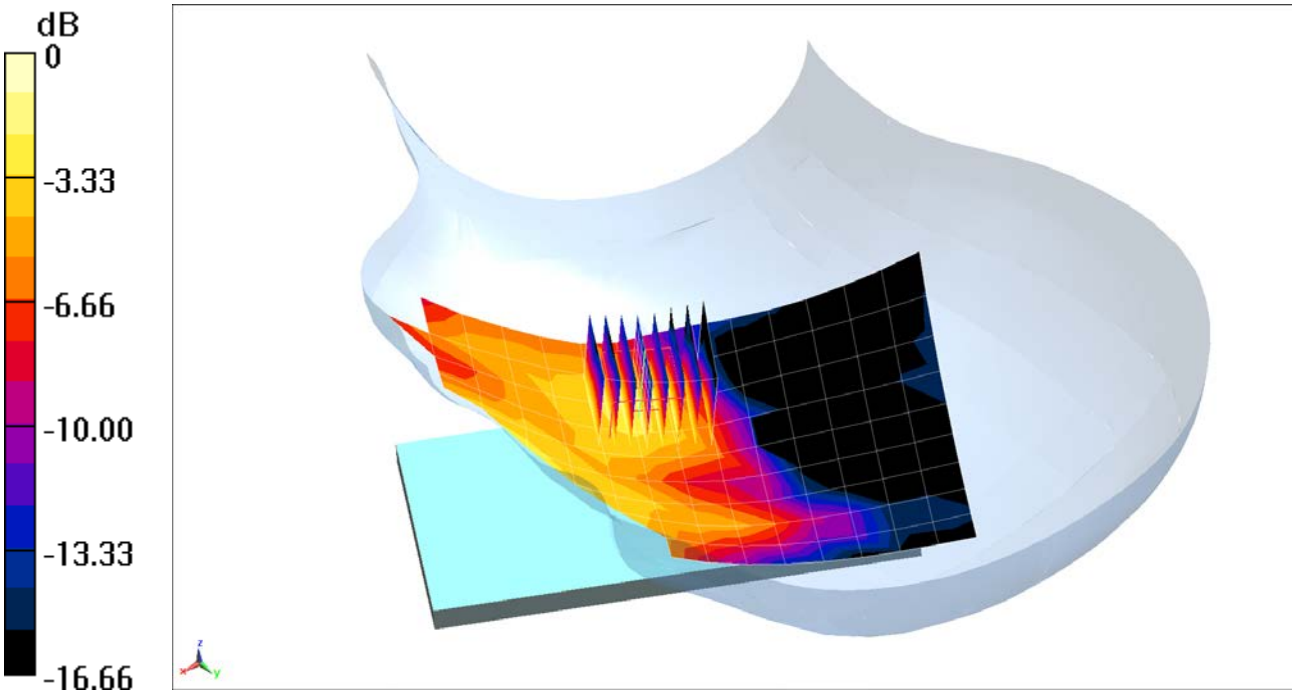
Communication System: UID 0, LTE Band 41; Frequency: 2593 MHz; Duty Cycle: 1:1.58
Medium: 2450 Head Medium parameters used (interpolated):
f = 2593 MHz; σ = 2.038 S/m; ε_r = 37.88; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3213; ConvF(4.70, 4.70, 4.70); 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 41, 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 (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.775 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.0610 W/kg
SAR(1 g) = 0.034 W/kg



0 dB = 0.0415 W/kg = -13.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15516

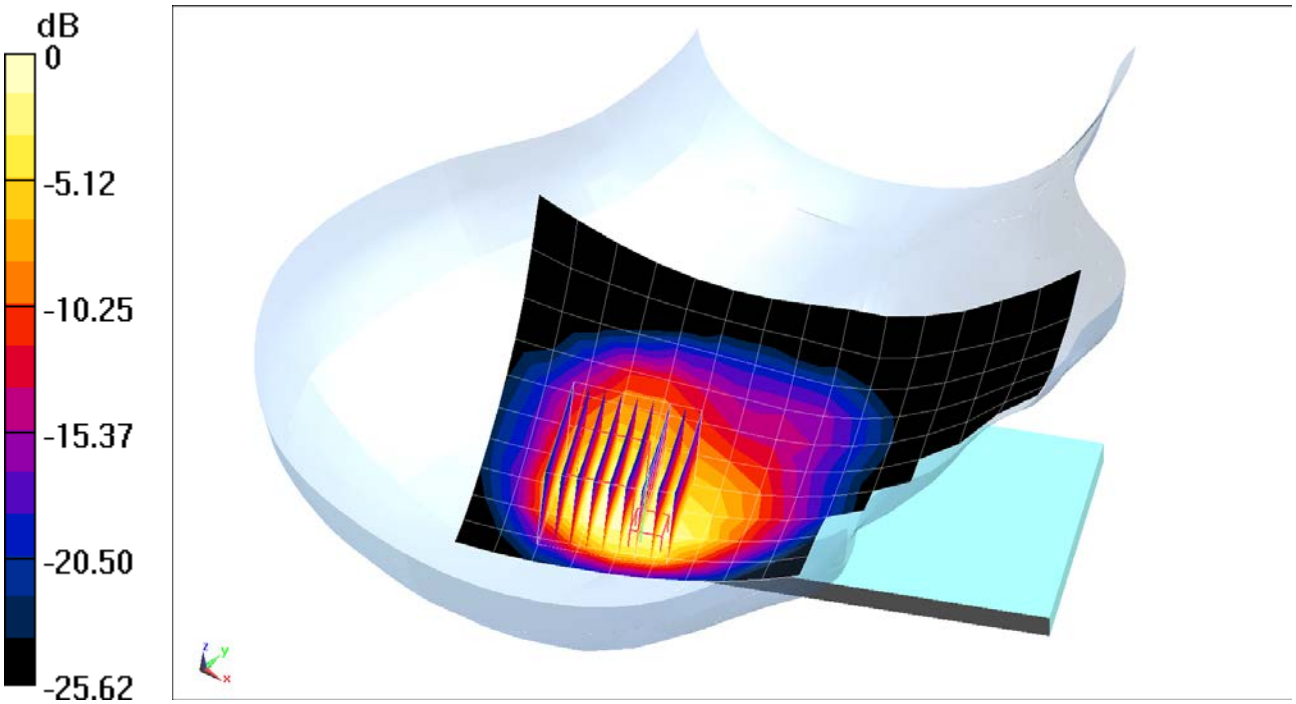
Communication System: UID 0, IEEE 802.11n; Frequency: 2422 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2422 MHz; σ = 1.856 S/m; ε_r = 38.13; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 08-10-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3318; ConvF(4.74, 4.74, 4.74); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11n, MIMO, 20 MHz Bandwidth, Right Head, Cheek, Ch 3, 13 Mbps

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.54 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 2.35 W/kg
SAR(1 g) = 0.897 W/kg



0 dB = 1.25 W/kg = 0.97 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15516

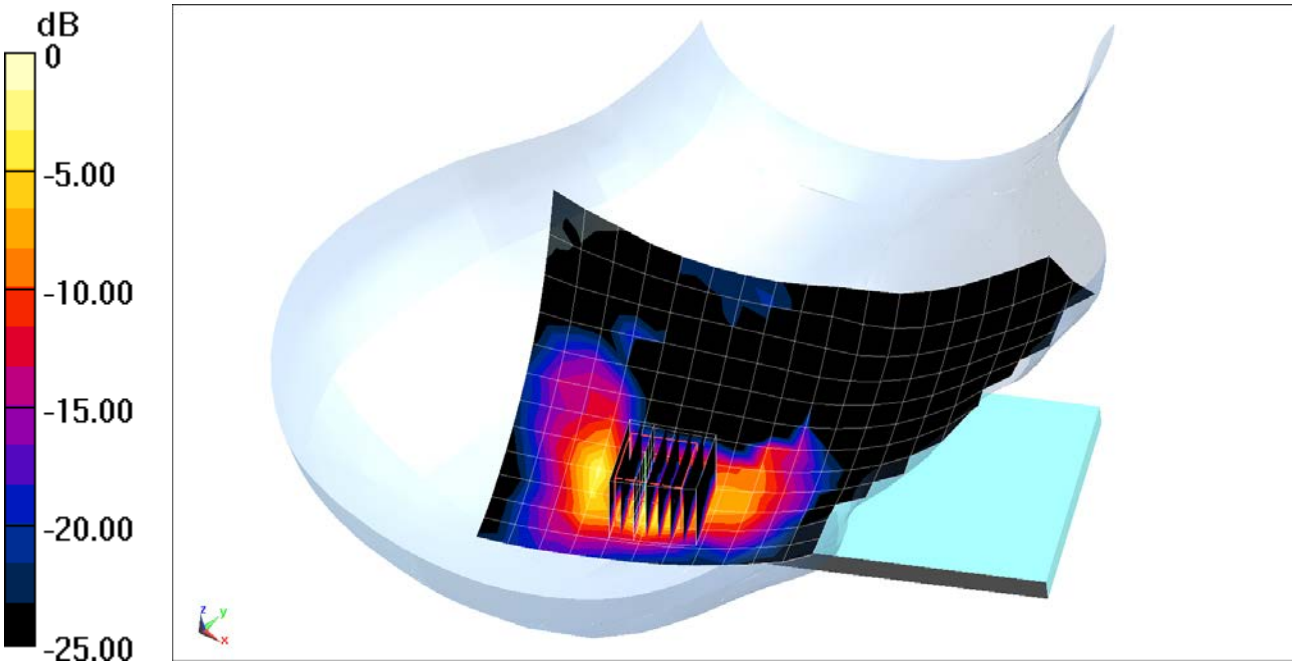
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5825 MHz; σ = 5.144 S/m; ε_r = 35.095; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-31-2017; Ambient Temp: 21.1°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 802.11a, U-NII-3, Antenna 1, 20 MHz Bandwidth,
Right Head, Cheek, Ch 165, 6 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 = 2.695 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 2.66 W/kg
SAR(1 g) = 0.565 W/kg



0 dB = 1.70 W/kg = 2.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15508

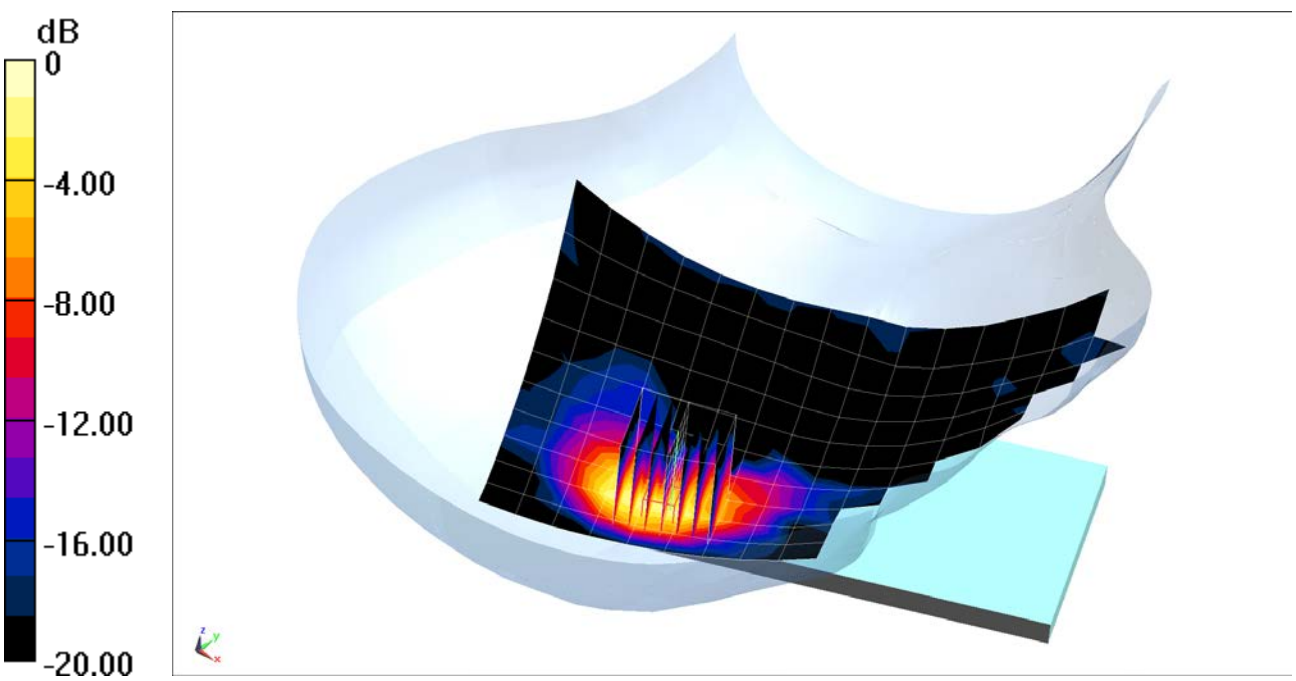
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.295
Medium: 2450 Head Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.855 S/m; ε_r = 39.124; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3213; ConvF(4.70, 4.70, 4.70); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.140 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.161 W/kg
SAR(1 g) = 0.059 W/kg



0 dB = 0.0849 W/kg = -10.71 dBW/kg

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

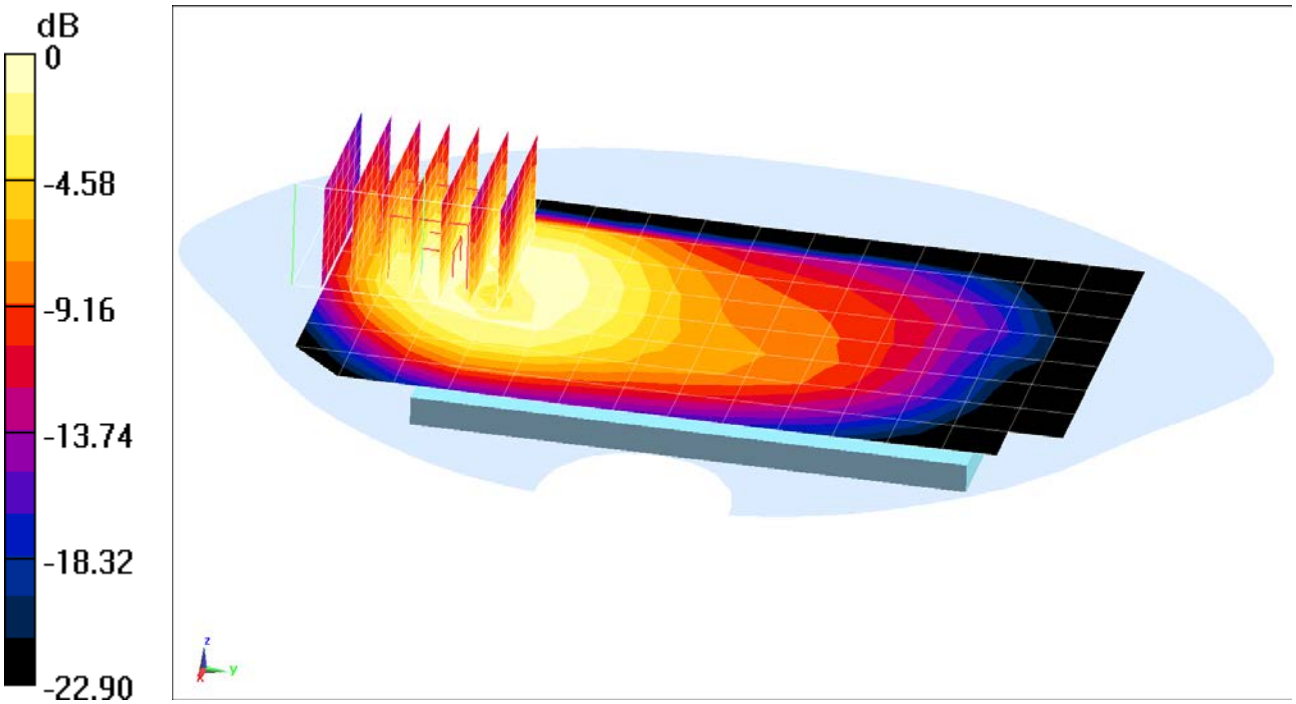
Communication System: UID 0, _GSM GPRS; 1 Tx slot; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.979 S/m; ε_r = 52.634; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-06-2017; Ambient Temp: 21.9°C; Tissue Temp: 20.2°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, 1 Tx Slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.45 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.620 W/kg



0 dB = 0.706 W/kg = -1.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

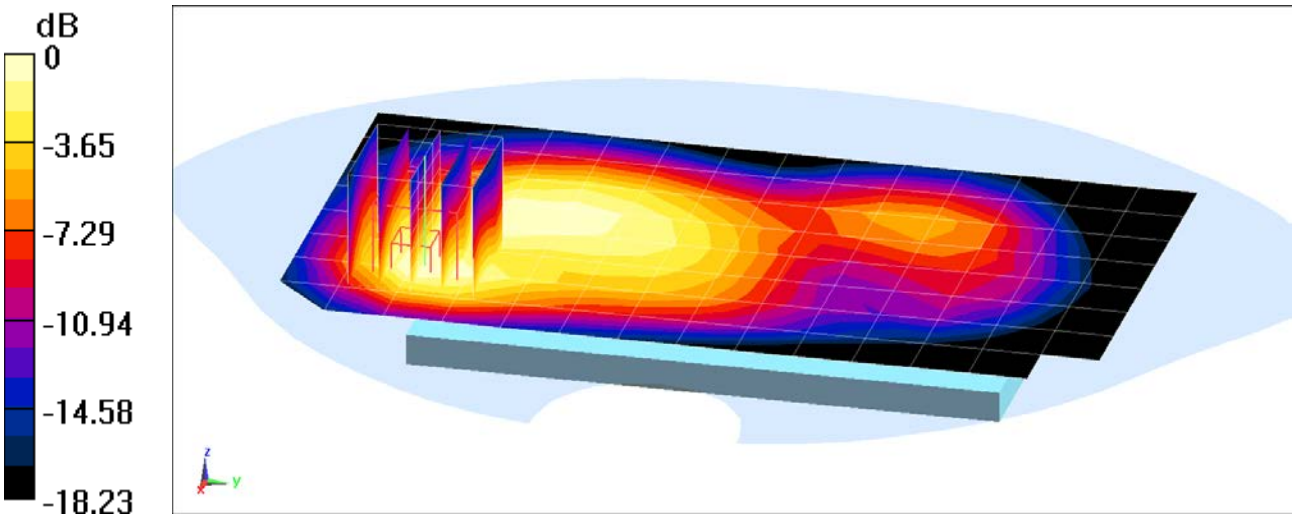
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.076
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 53.27; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.3°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: GPRS 1900, Body SAR, Back side, Mid.ch, 4 Tx Slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.23 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.904 W/kg
SAR(1 g) = 0.517 W/kg



0 dB = 0.620 W/kg = -2.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

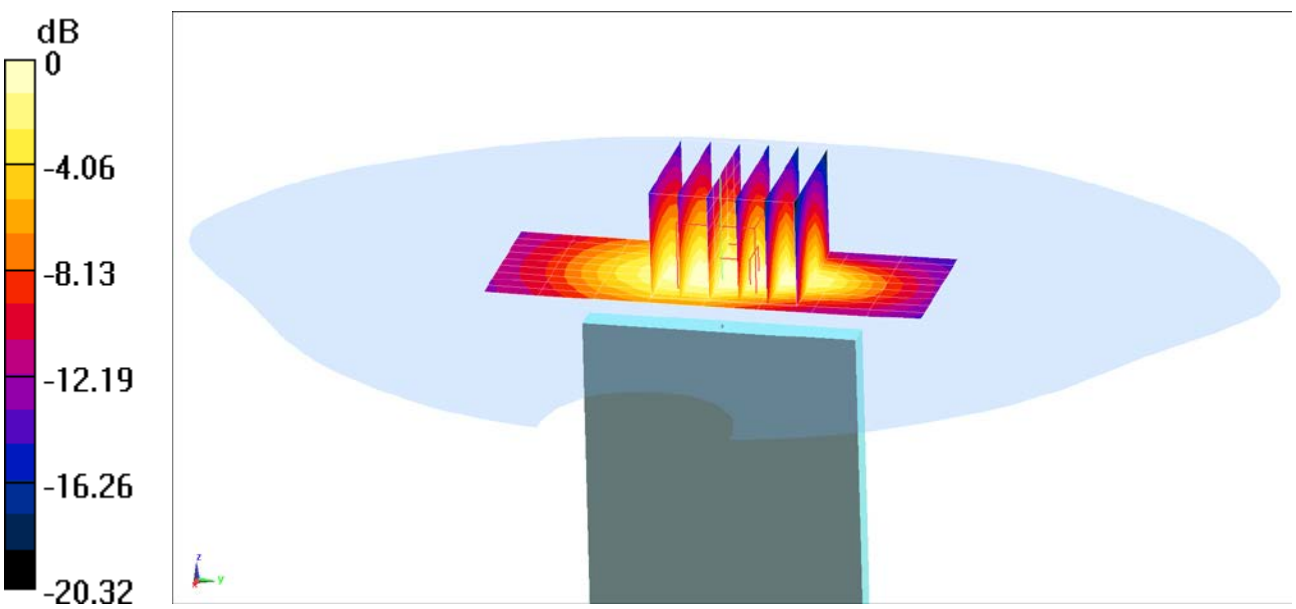
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.076
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 53.27; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.3°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: GPRS 1900, Body SAR, Bottom Edge, Mid.ch, 4 Tx Slots

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.75 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.633 W/kg



0 dB = 0.724 W/kg = -1.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

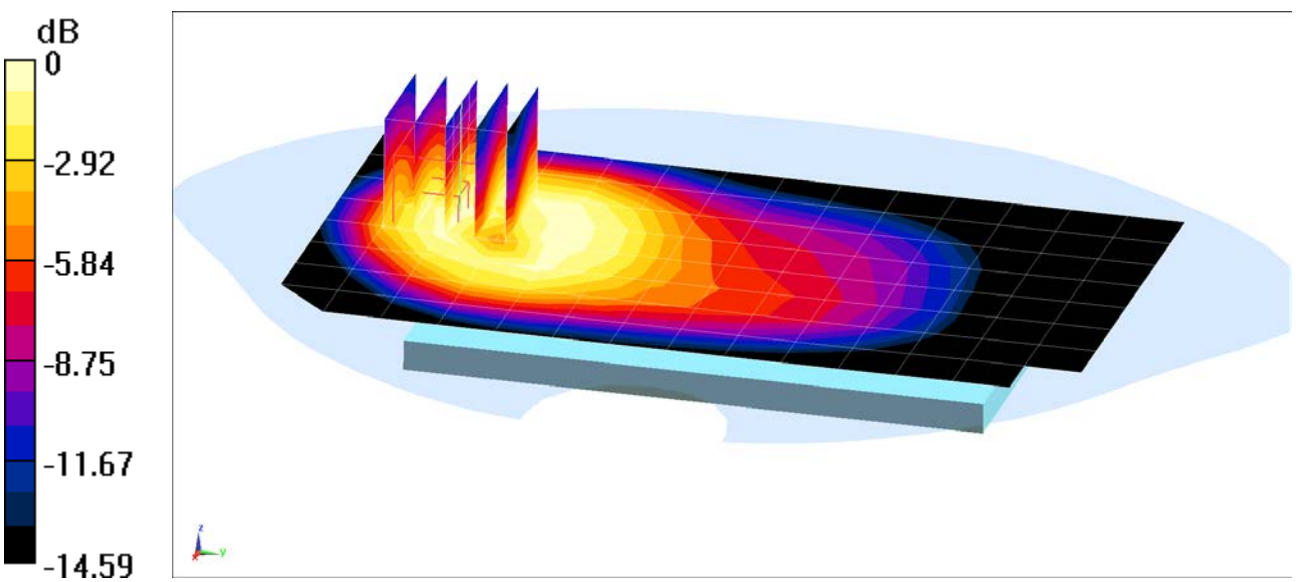
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.007 S/m; ε_r = 54.407; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(6.29, 6.29, 6.29); 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 850, Body SAR, Back side, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.96 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.671 W/kg



0 dB = 0.787 W/kg = -1.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

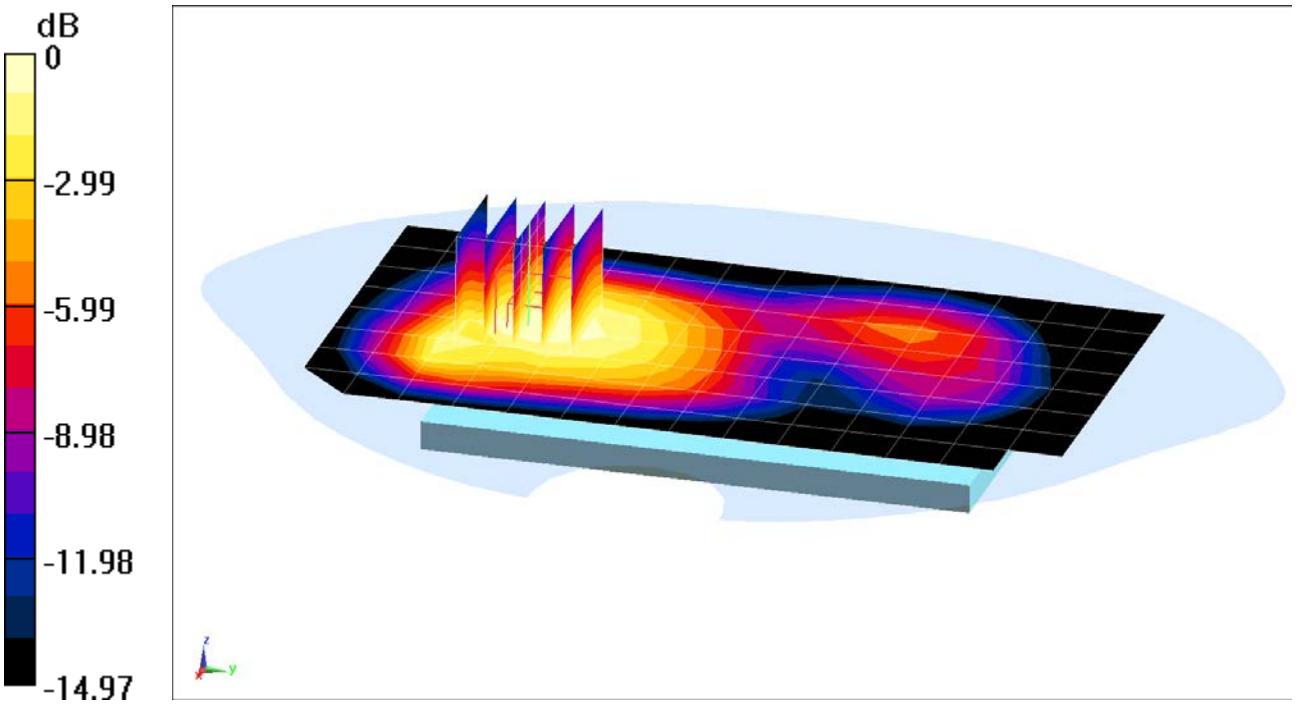
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.489 S/m; ε_r = 52.025; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 19.5°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, 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 = 25.45 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.869 W/kg



0 dB = 1.01 W/kg = 0.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

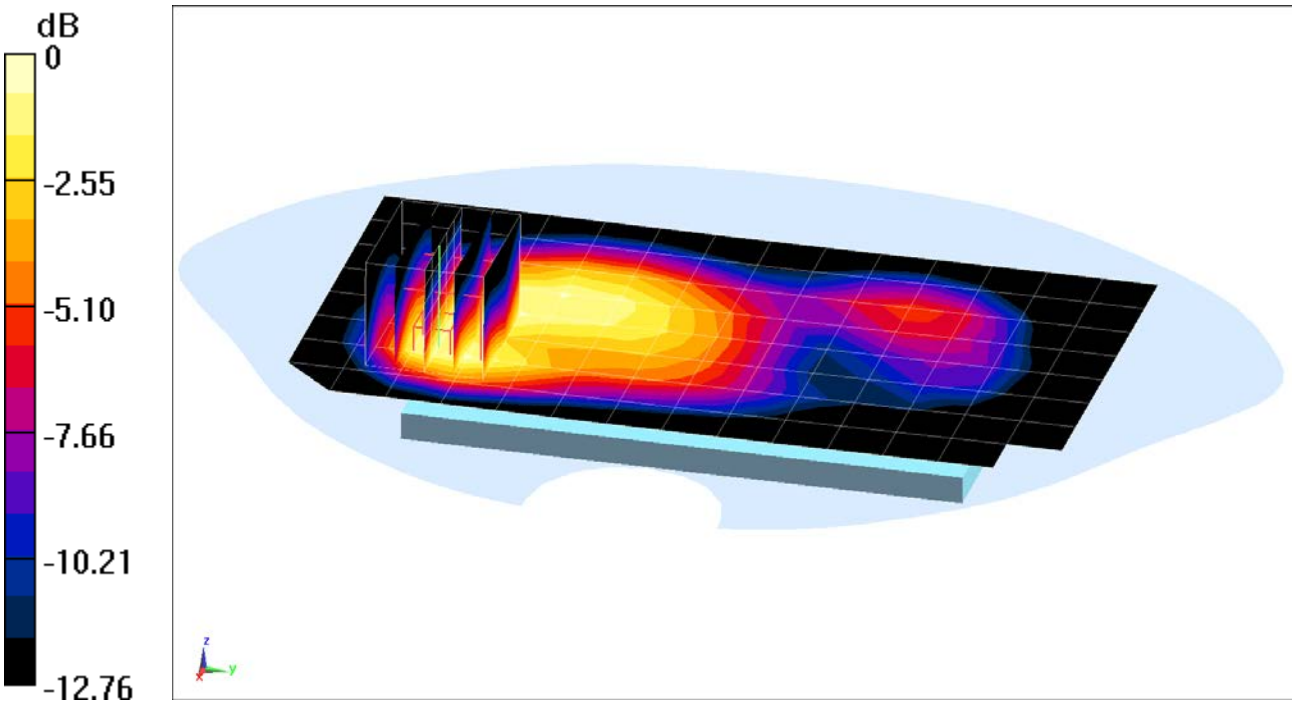
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.539 S/m; ε_r = 52.276; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-29-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: UMTS 1900, Body SAR, Back side, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.52 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.970 W/kg
SAR(1 g) = 0.551 W/kg



0 dB = 0.696 W/kg = -1.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

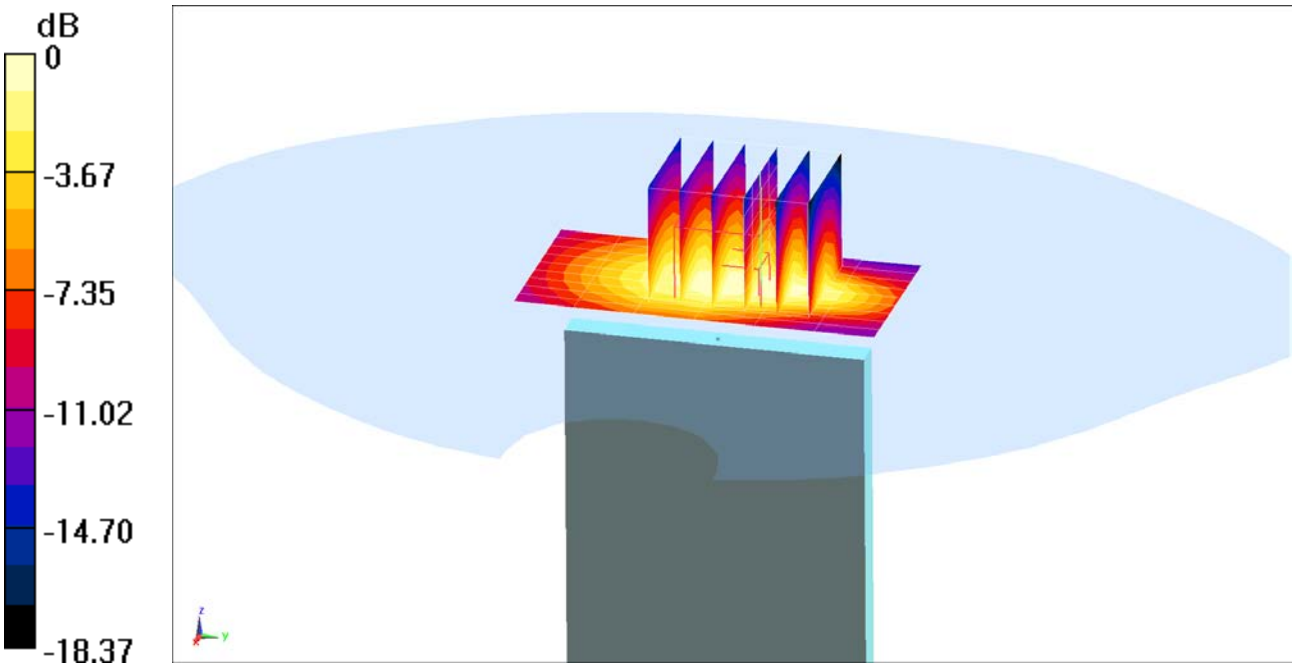
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.539 S/m; ε_r = 52.276; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space 1.0 cm

Test Date: 07-29-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: UMTS 1900, Body SAR, Bottom Edge, Mid.ch

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.86 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.645 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

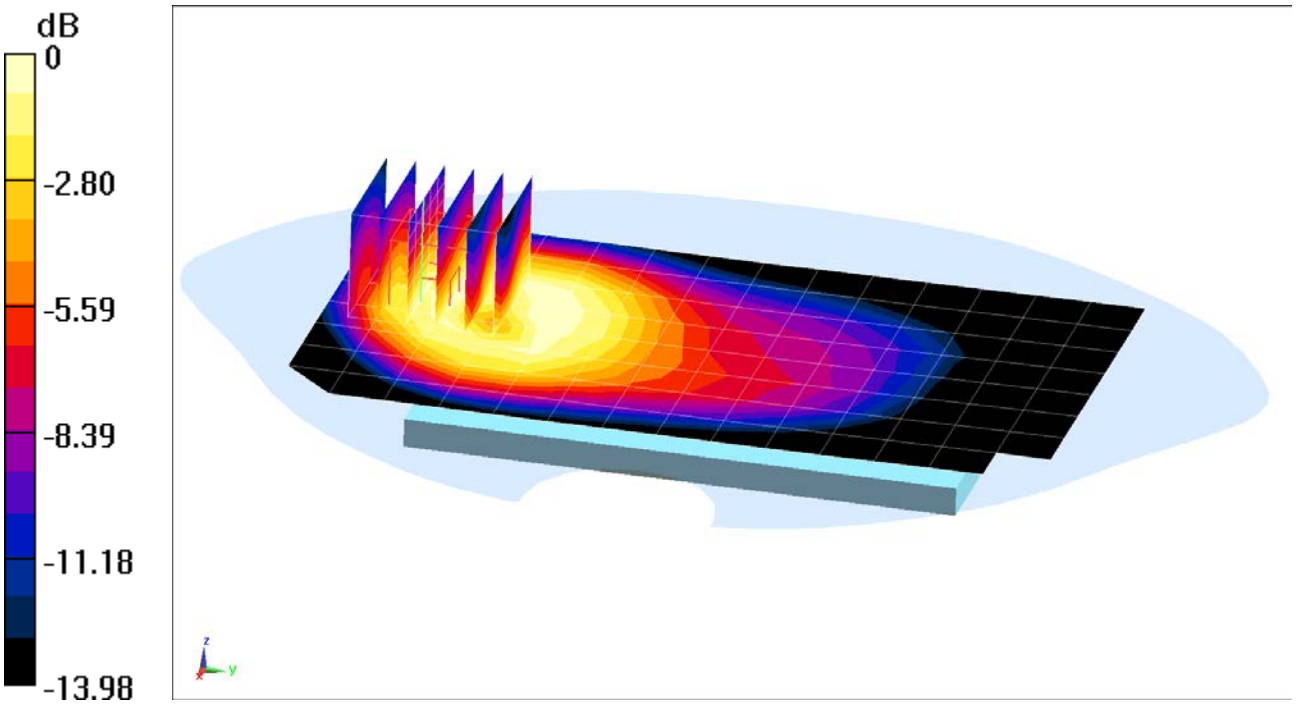
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.975 S/m; ε_r = 52.856; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-04-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.0°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, 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 = 26.66 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.668 W/kg



0 dB = 0.768 W/kg = -1.15 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15318

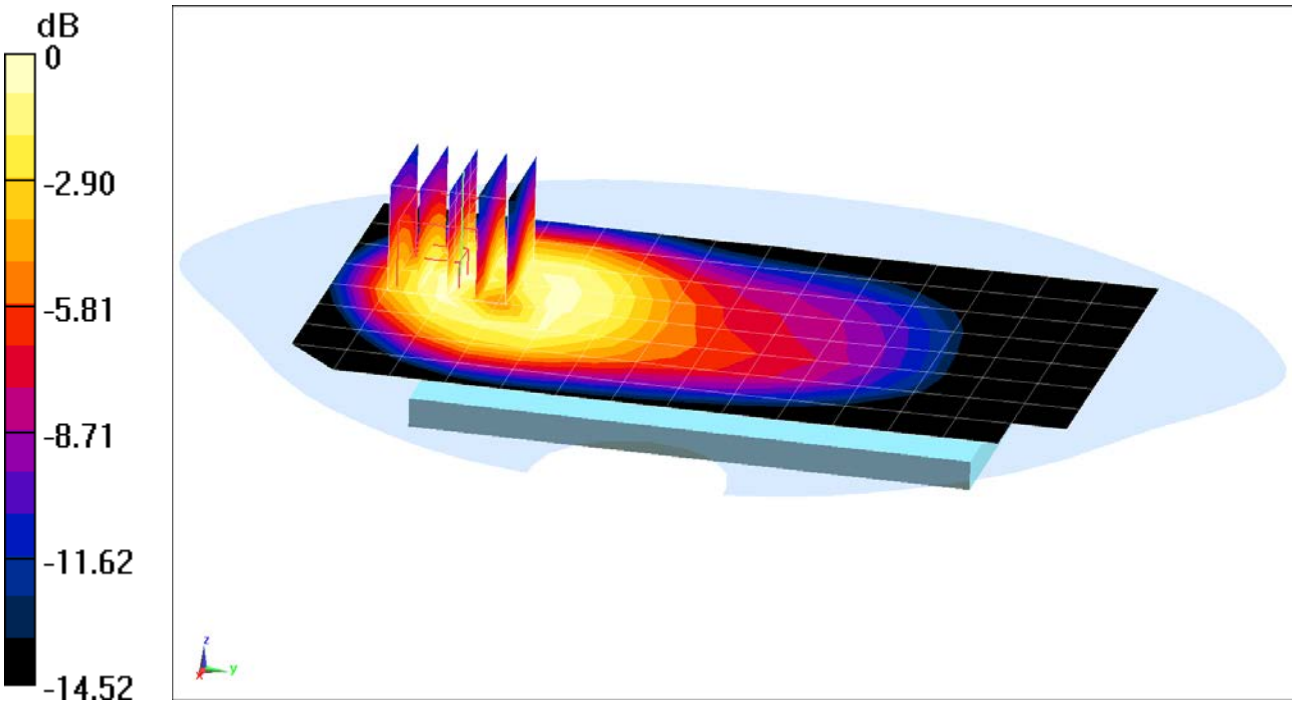
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.975 S/m; ε_r = 52.856; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-04-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.0°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 Rev. 0, 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 = 28.37 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.726 W/kg



0 dB = 0.855 W/kg = -0.68 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

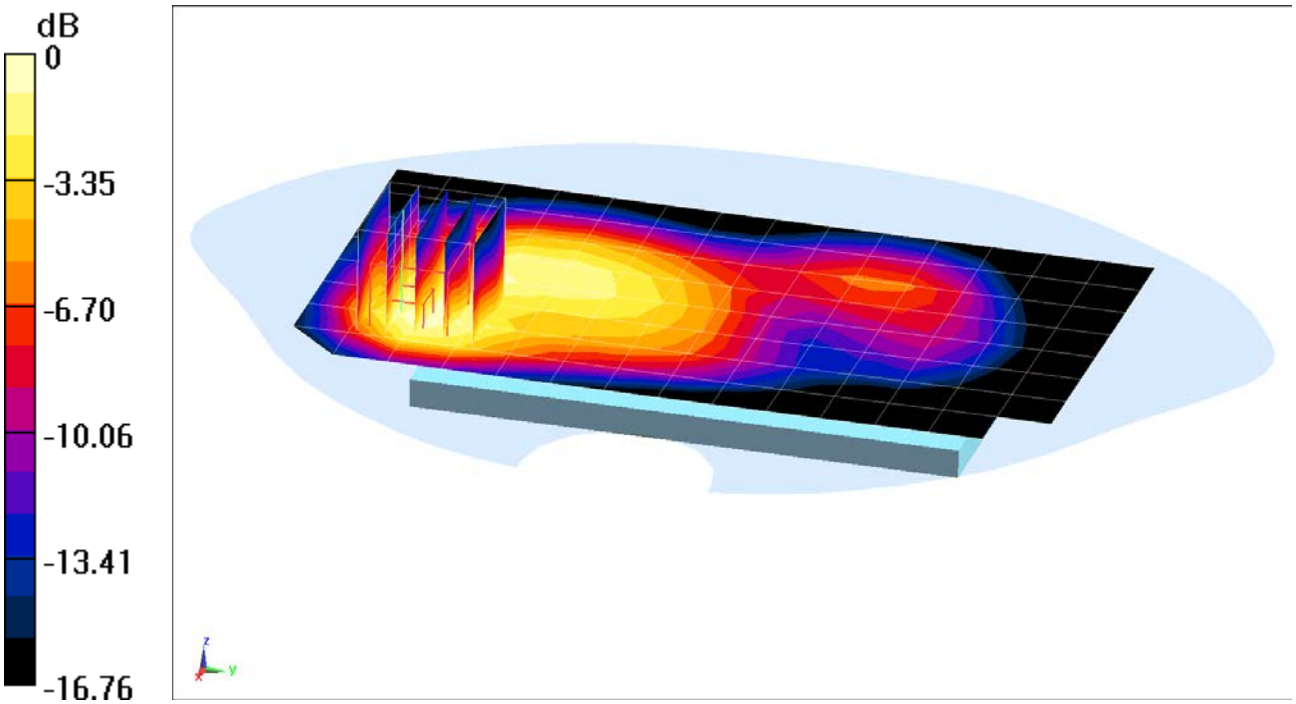
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 53.27; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.3°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: 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 = 18.27 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.570 W/kg



0 dB = 0.706 W/kg = -1.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15300

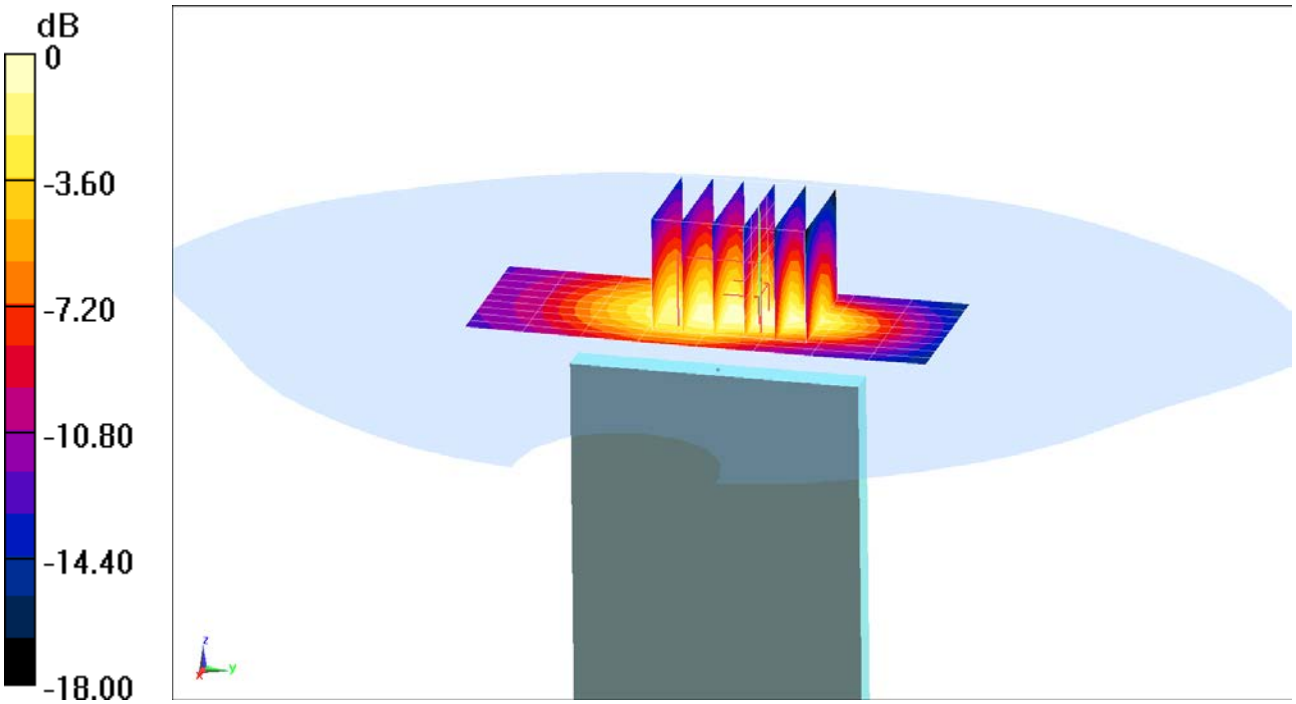
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.489 S/m; ε_r = 53.292; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-03-2017; Ambient Temp: 22.3°C; Tissue Temp:22.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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: PCS EVDO Rev. 0, Body SAR, Bottom Edge, Mid.ch

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.34 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.642 W/kg



0 dB = 0.783 W/kg = -1.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15268

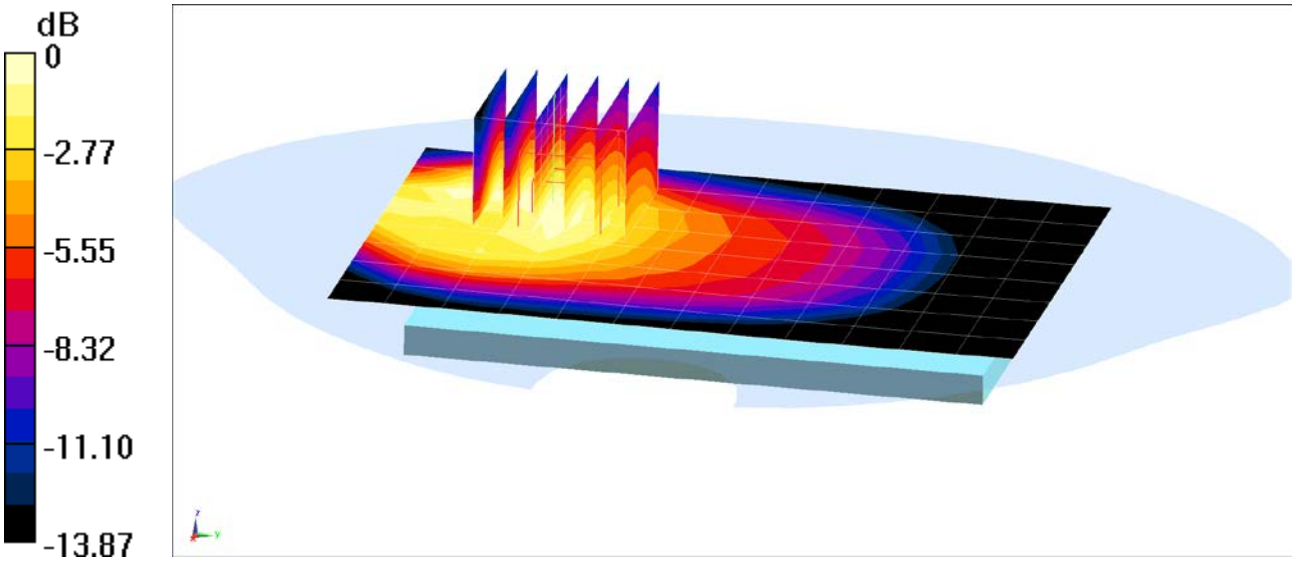
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.919 S/m; ε_r = 55.425; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space 1.0 cm

Test Date: 07-24-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(9.90, 9.90, 9.90); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 25 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 = 26.16 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.910 W/kg
SAR(1 g) = 0.593 W/kg



0 dB = 0.787 W/kg = -1.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15268

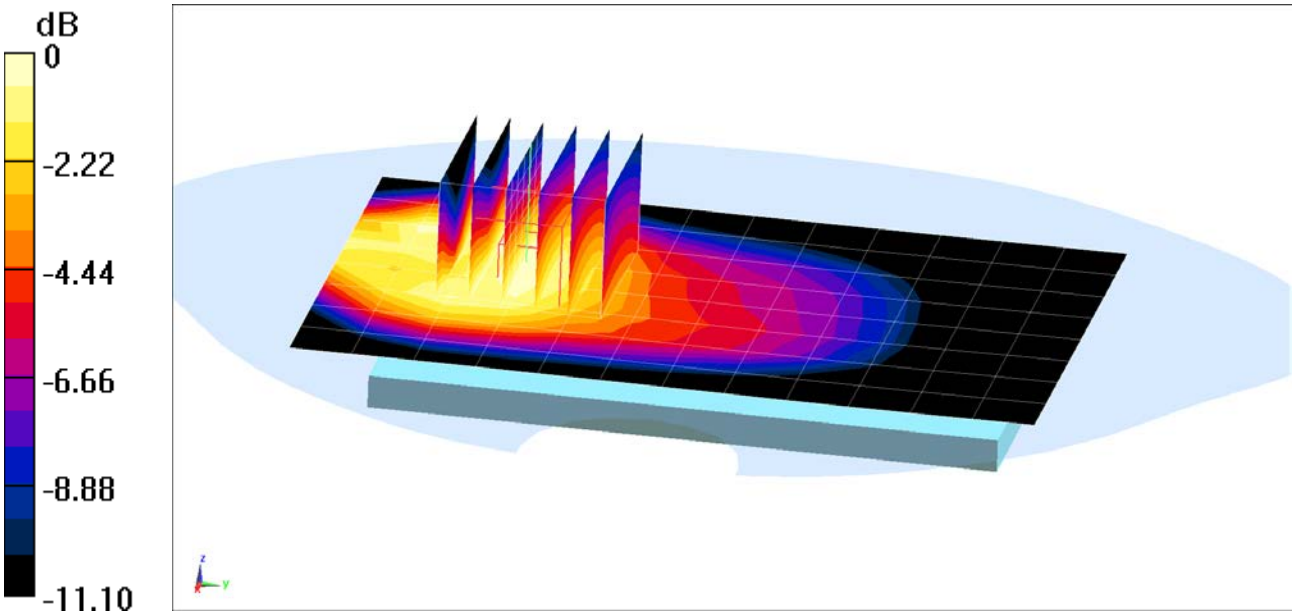
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.988 S/m; ε_r = 54.661; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-24-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(9.90, 9.90, 9.90); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.26 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.823 W/kg
SAR(1 g) = 0.549 W/kg



0 dB = 0.711 W/kg = -1.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15284

Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.006 S/m; ε_r = 54.408; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

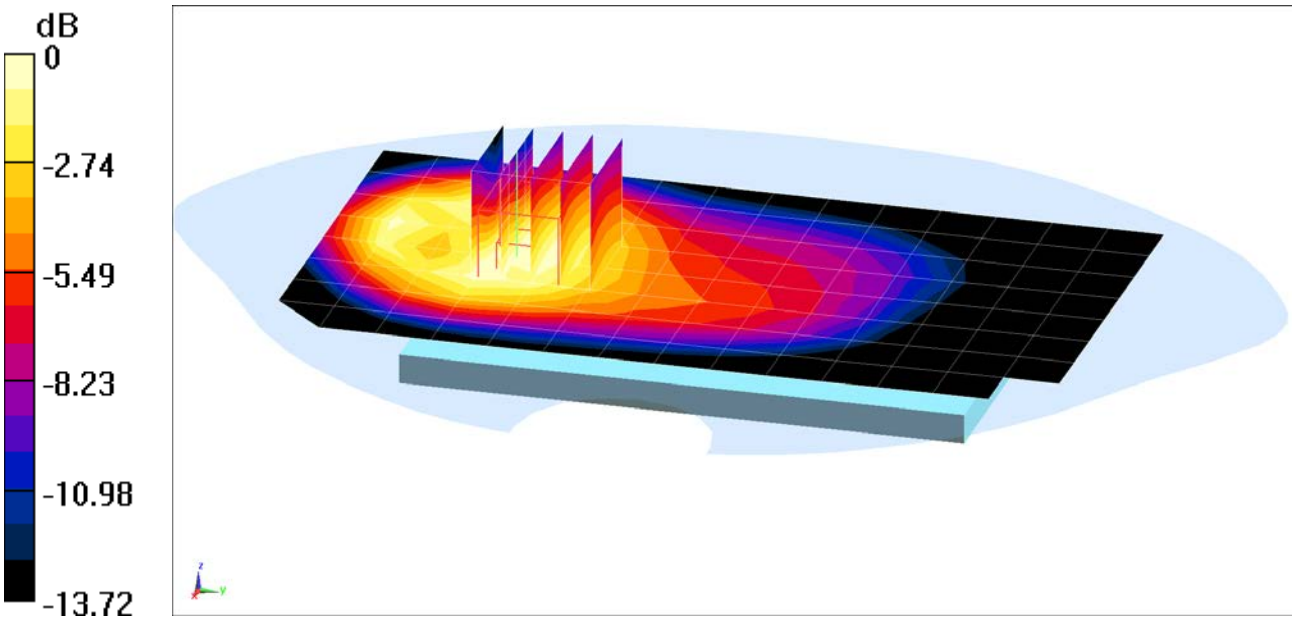
Test Date: 07-31-2017; Ambient Temp: 22.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(6.29, 6.29, 6.29); 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 5 (Cell.), Body SAR, Back side, Mid.ch, QPSK,

10 MHz Bandwidth, 1 RB, 25 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7): Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.53 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.745 W/kg
SAR(1 g) = 0.520 W/kg



0 dB = 0.594 W/kg = -2.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15276

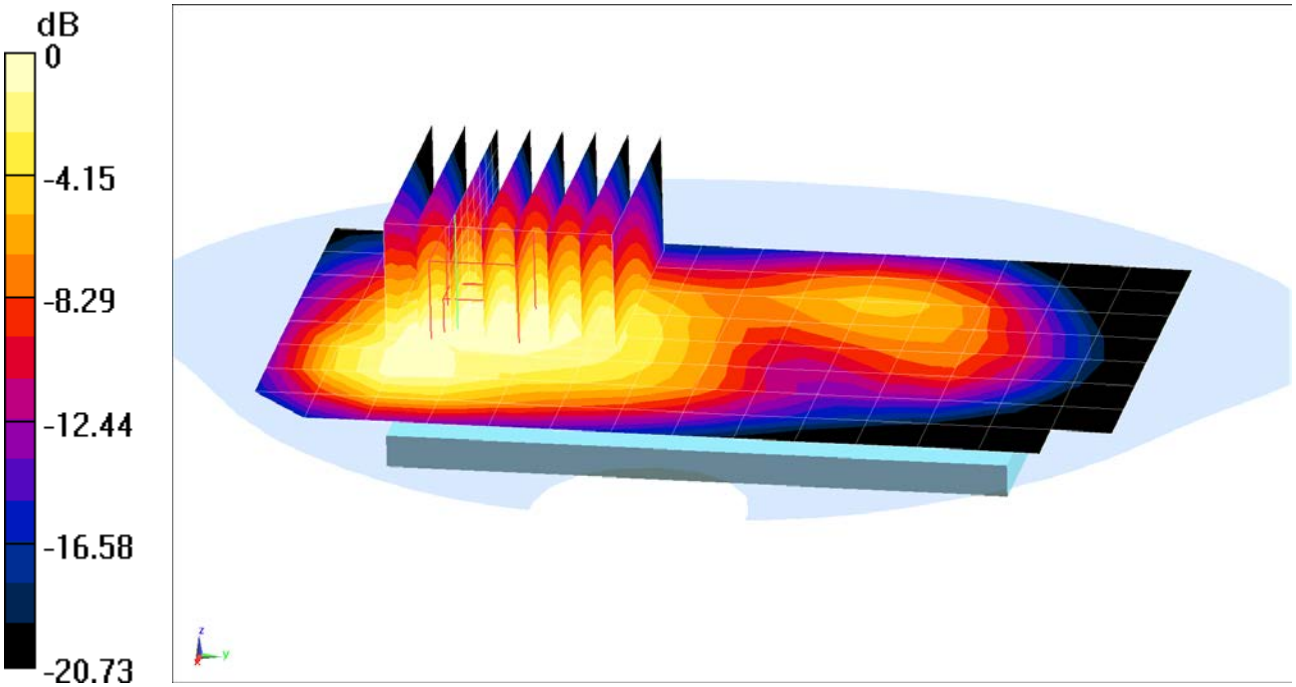
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1770 MHz; σ = 1.528 S/m; ε_r = 51.322; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-27-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(8.08, 8.08, 8.08); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (9x8x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.89 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.737 W/kg



0 dB = 0.994 W/kg = -0.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15268

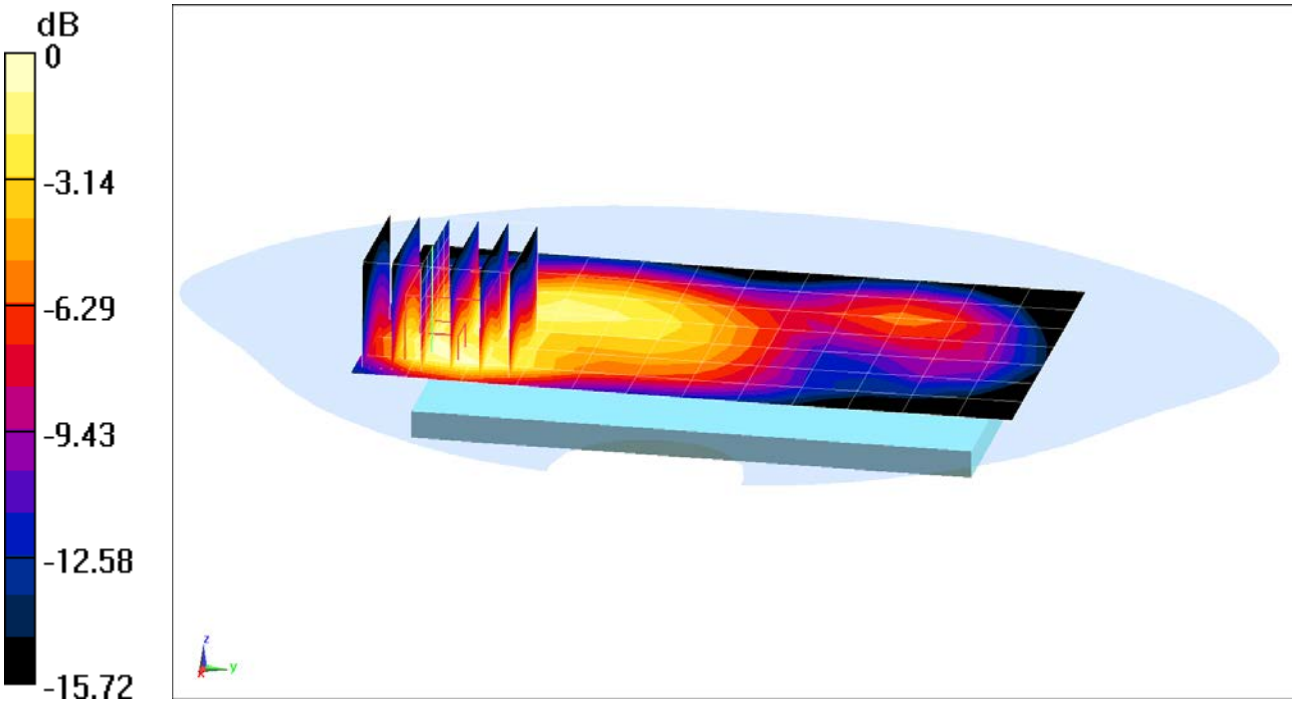
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.566 S/m; ε_r = 52.188; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-29-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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 25 (PCS), Body SAR, Back side, High.ch, QPSK 20 MHz Bandwidth, 1 RB, 50 RB Offset

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.70 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.972 W/kg
SAR(1 g) = 0.543 W/kg



0 dB = 0.670 W/kg = -1.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15268

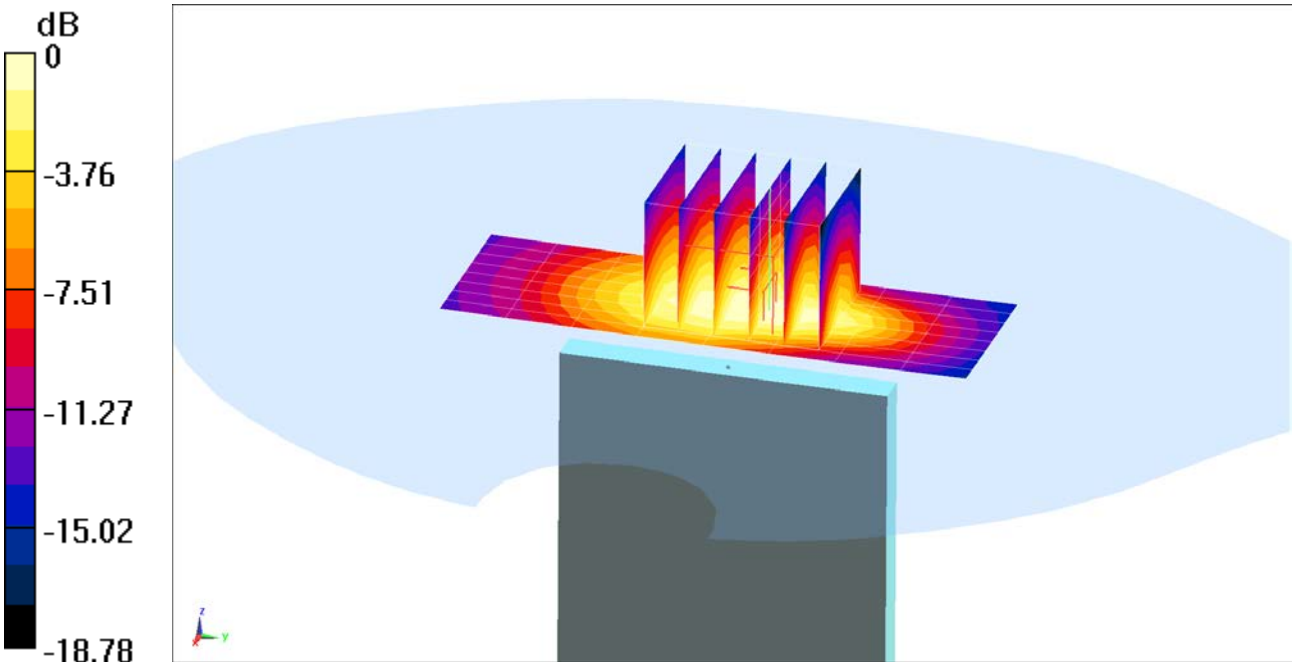
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.566 S/m; ε_r = 52.188; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-29-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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 25 (PCS), Body SAR, Bottom Edge, High.ch, QPSK
20 MHz Bandwidth, 1 RB, 50 RB Offset

Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.08 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.729 W/kg



0 dB = 0.881 W/kg = -0.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15276

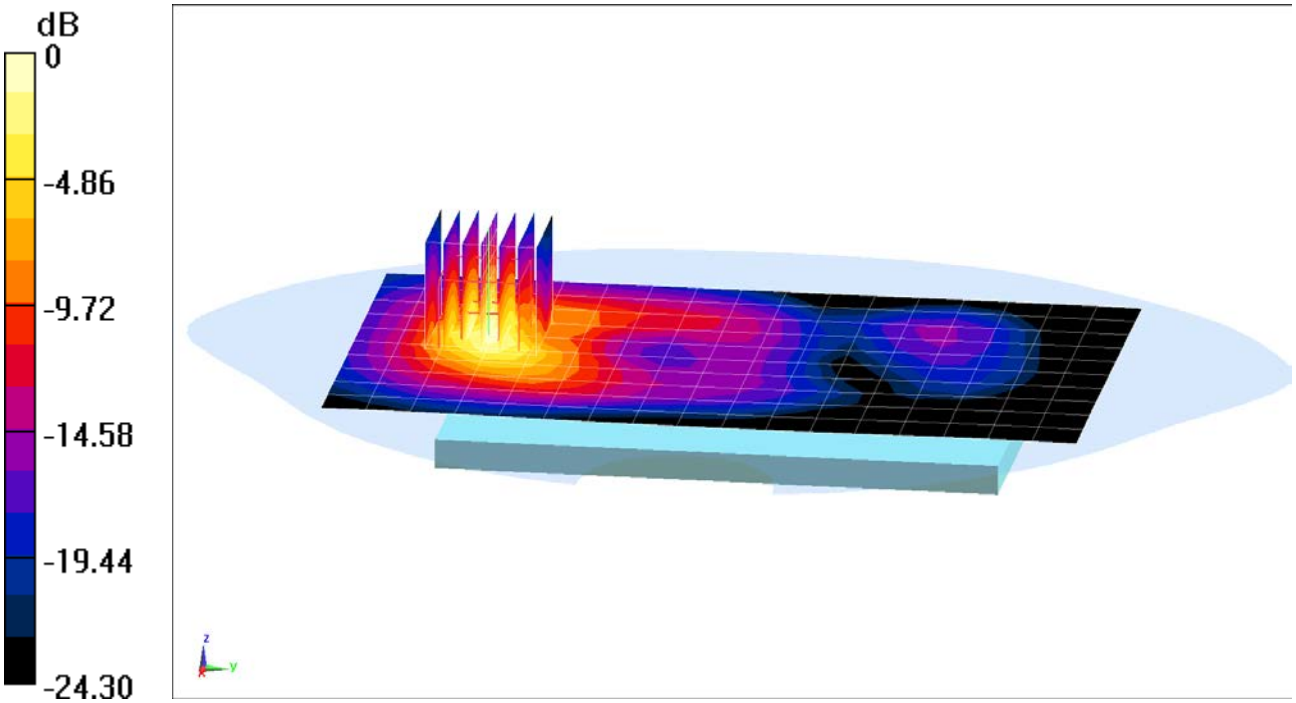
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2310 MHz; σ = 1.823 S/m; ε_r = 51.809; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-08-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.55, 4.55, 4.55); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 30, Body SAR, Back side, Mid.ch, QPSK
10 MHz Bandwidth, 1 RB, 25 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 = 27.80 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.45 W/kg
SAR(1 g) = 1.16 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15276

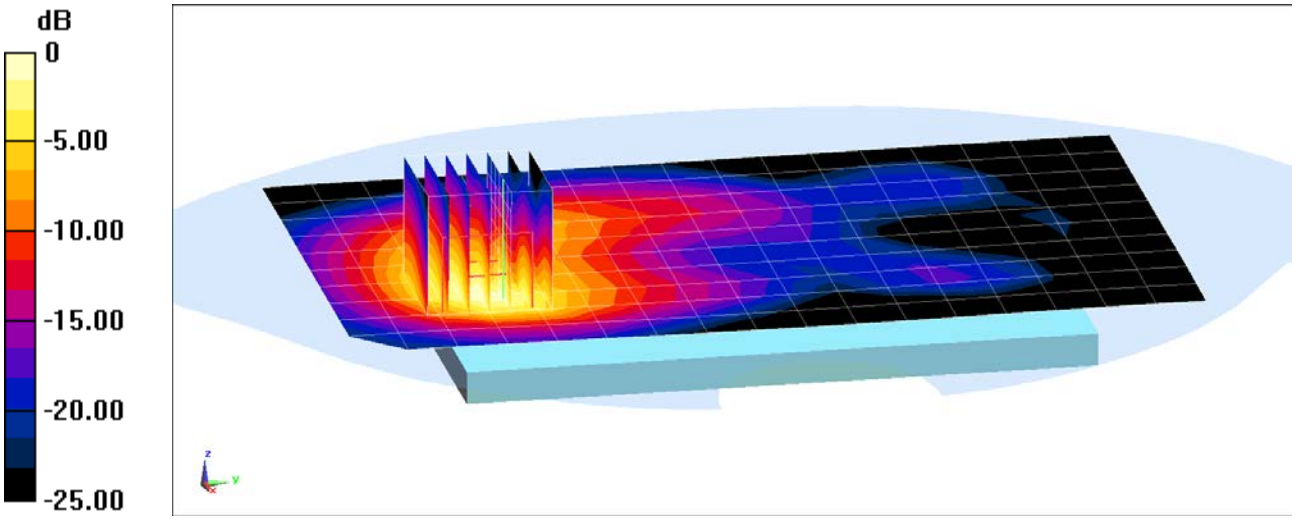
Communication System: UID 0, LTE Band 7; Frequency: 2535 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2535 MHz; σ = 2.117 S/m; ε_r = 50.571; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-10-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3287; ConvF(4.12, 4.12, 4.12); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 7, Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 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 = 22.98 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.968 W/kg



0 dB = 1.28 W/kg = 1.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15276

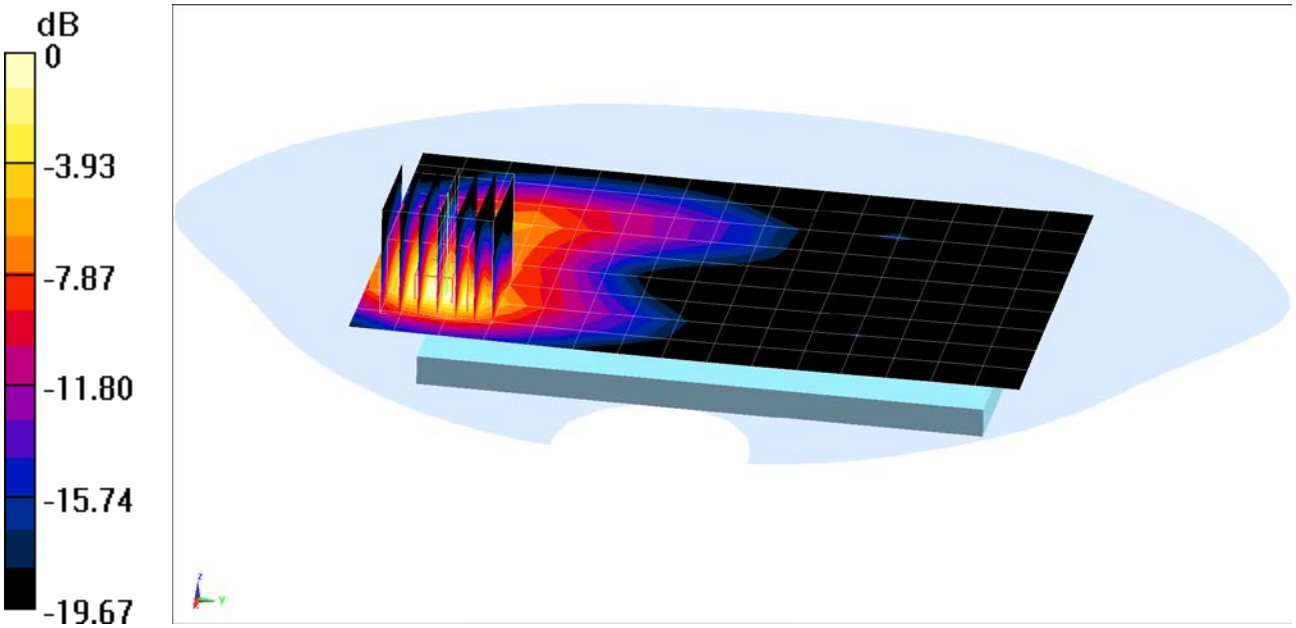
Communication System: UID 0, LTE Band 41; Frequency: 2593 MHz; Duty Cycle: 1:1.58
Medium: 2600 Body Medium parameters used (interpolated):
f = 2593 MHz; σ = 2.233 S/m; ε_r = 52.188; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3287; ConvF(4.12, 4.12, 4.12); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, Body SAR, Back side, Mid.ch, QPSK
20 MHz Bandwidth, 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 = 16.91 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.534 W/kg



0 dB = 0.728 W/kg = -1.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15516

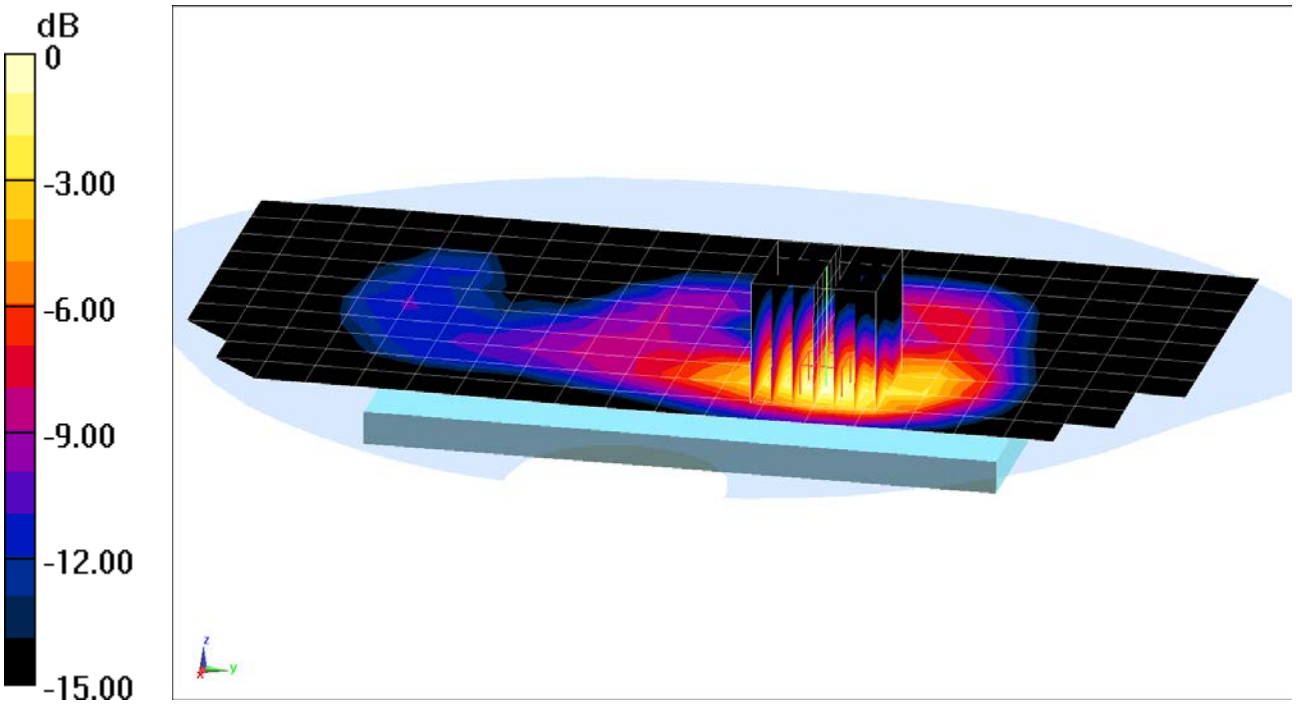
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.989 S/m; ε_r = 51.323; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (11x21x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.27 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.456 W/kg
SAR(1 g) = 0.218 W/kg



0 dB = 0.282 W/kg = -5.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15508

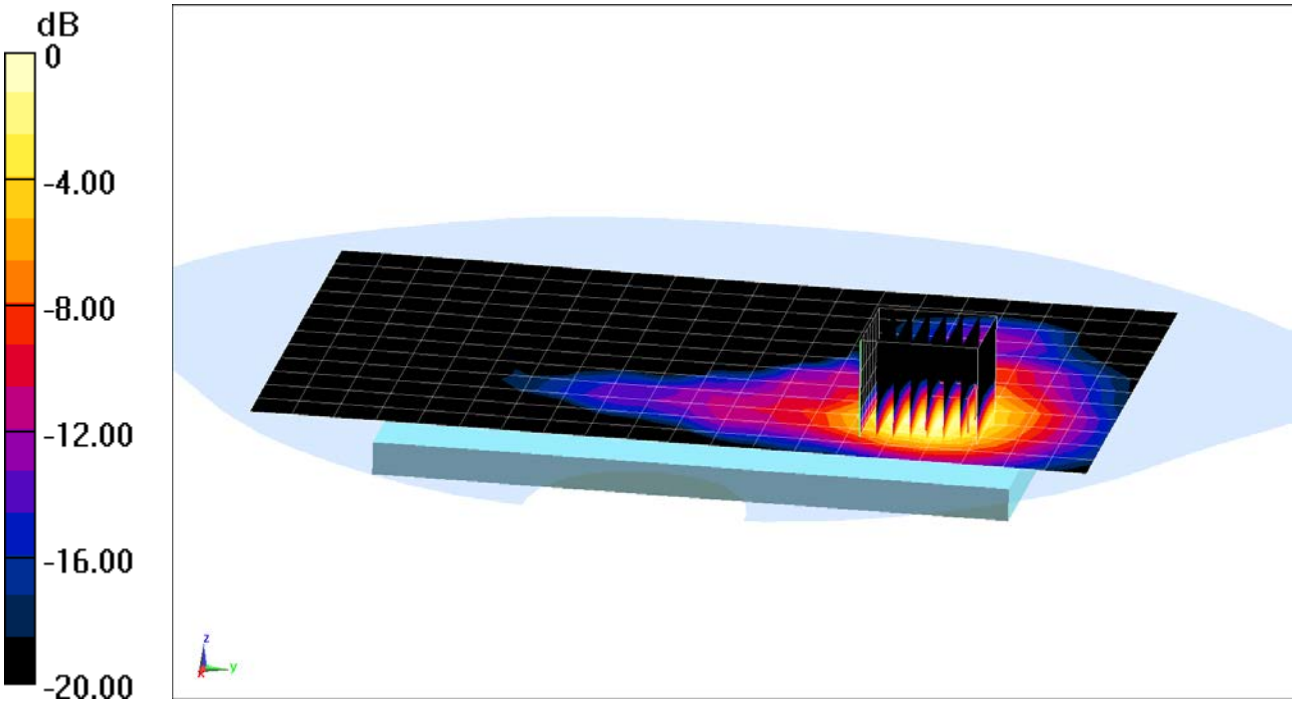
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5825 MHz; σ = 6.206 S/m; ε_r = 46.803; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.2°C

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

Mode: IEEE 802.11n, MIMO, UNII-3, 20 MHz Bandwidth, Body SAR, Ch 165, 13 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 11.50 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 3.09 W/kg
SAR(1 g) = 0.758 W/kg



0 dB = 1.82 W/kg = 2.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15516

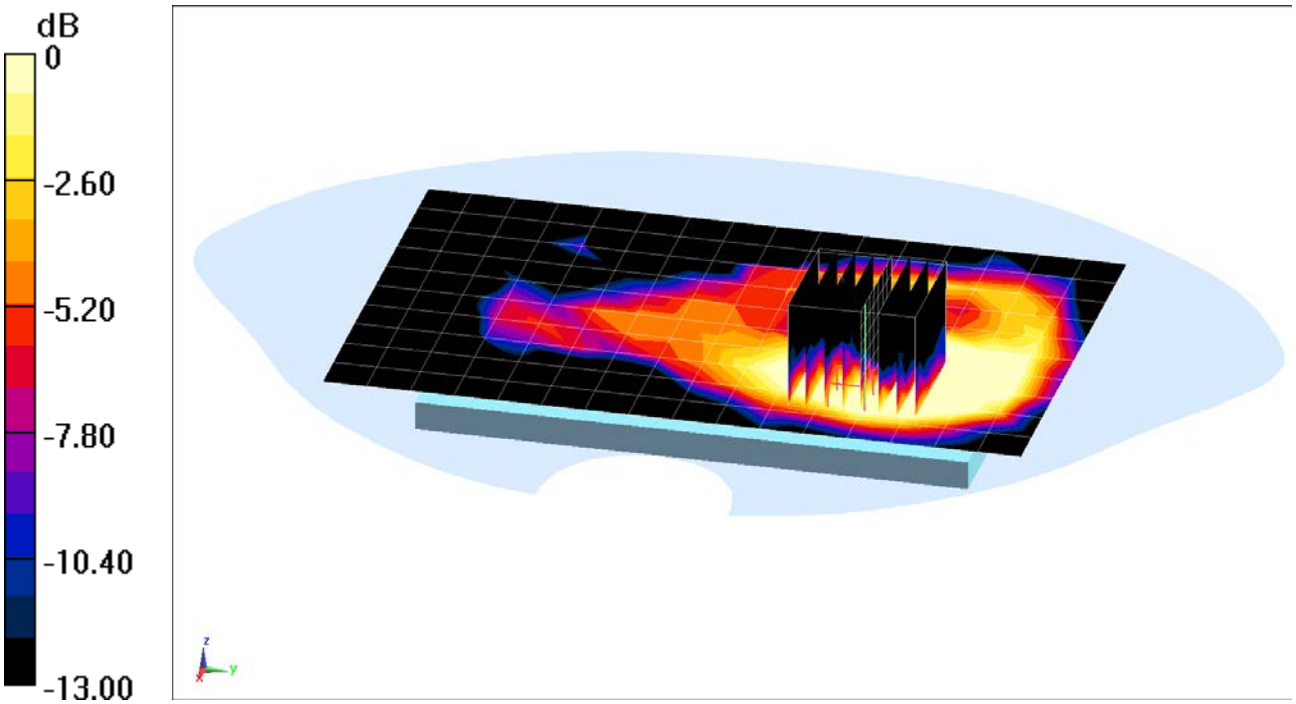
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.295
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.994 S/m; ε_r = 51.309; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
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 (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.369 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0240 W/kg
SAR(1 g) = 0.00833 W/kg



0 dB = 0.0116 W/kg = -19.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15516

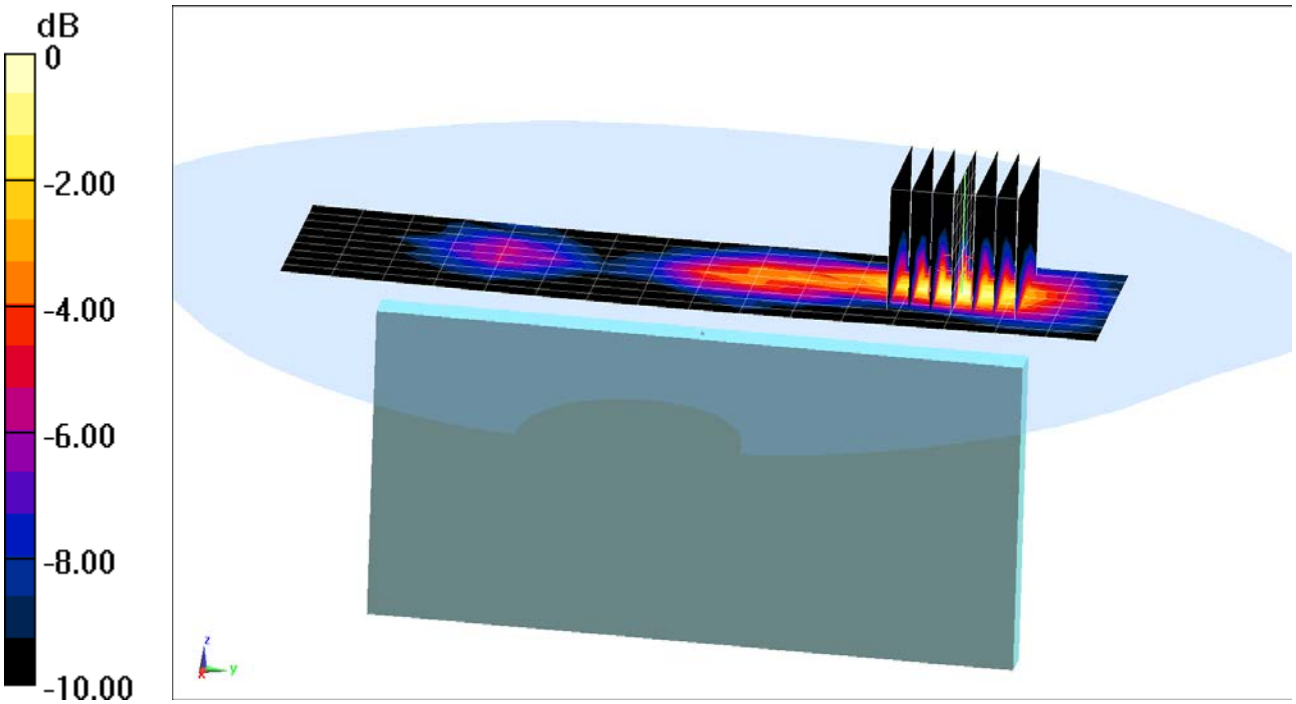
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.295
Medium: 2450 Body Medium parameters used (interpolated):
f = 2441 MHz; σ = 1.994 S/m; ε_r = 51.309; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (10x17x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.440 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0200 W/kg
SAR(1 g) = 0.00953 W/kg



0 dB = 0.0134 W/kg = -18.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFV30A; Type: Portable Handset; Serial: 15508

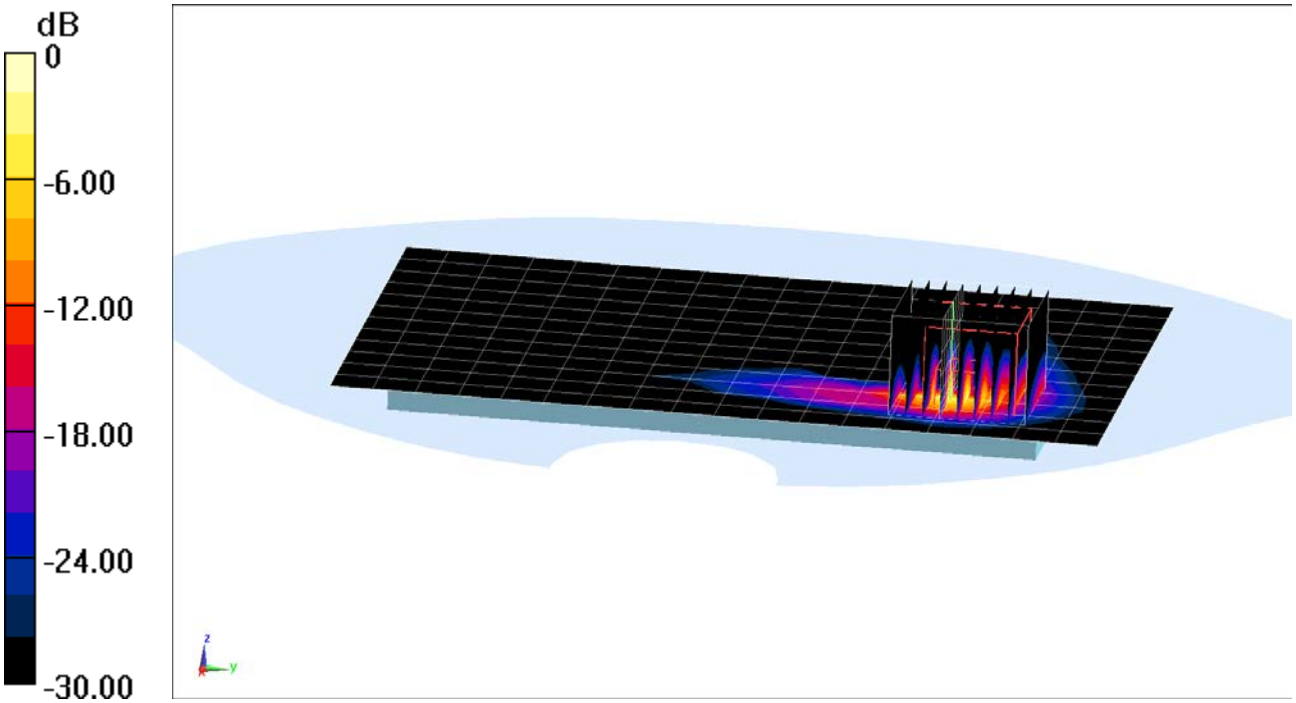
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5660 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5660 MHz; σ = 5.912 S/m; ε_r = 47.129; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 08-07-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.0°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)

Mode: IEEE 802.11a, UNII-2C, Antenna 1, 20 MHz Bandwidth, Phablet SAR Ch 132, 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 = 44.53 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 89.1 W/kg
SAR(10 g) = 1.59 W/kg



0 dB = 36.8 W/kg = 15.66 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

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PCTEST ENGINEERING LABORATORY, INC.

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

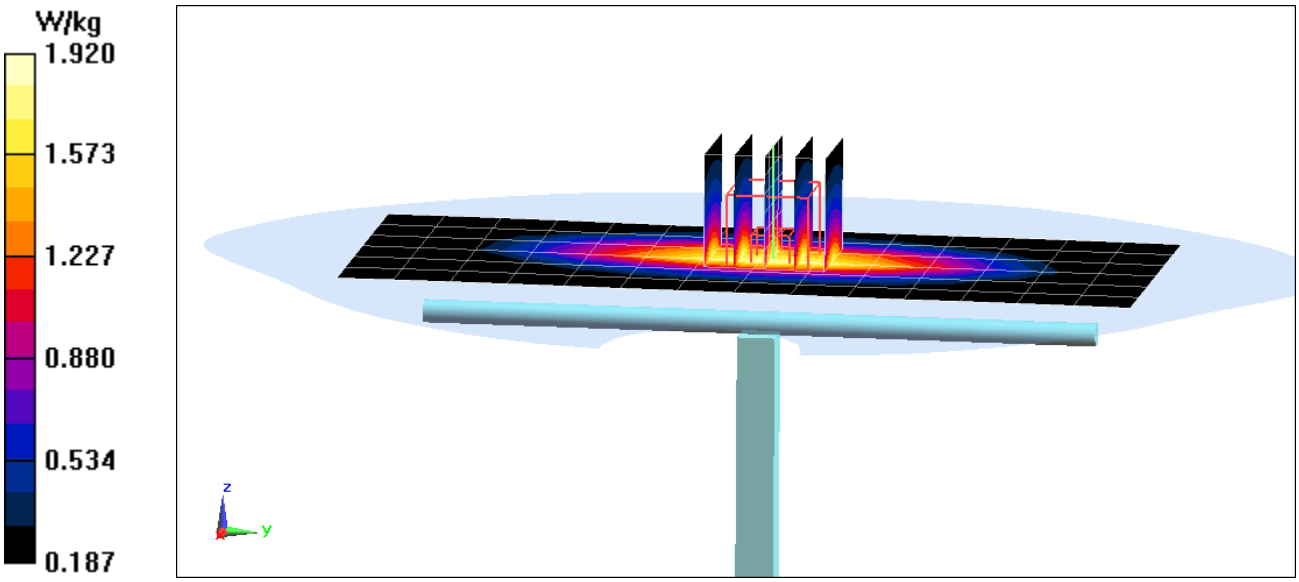
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.896 S/m; ε_r = 43.954; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-24-2017; Ambient Temp: 20.7°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3209; ConvF(6.76, 6.76, 6.76); 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)

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) = 2.42 W/kg
SAR(1 g) = 1.65 W/kg
Deviation(1 g) = -1.43%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

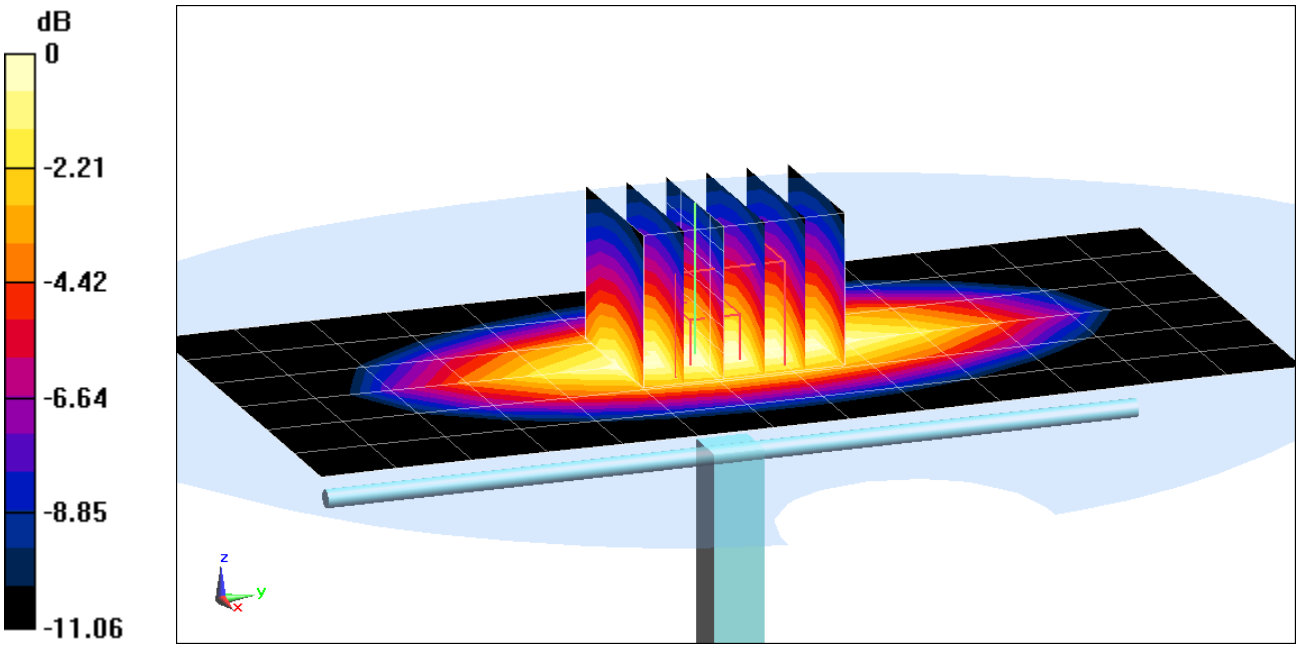
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.885 S/m; ε_r = 39.863; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-02-2017; Ambient Temp: 22.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 1.96 W/kg
Deviation(1 g) = 3.59%



0 dB = 2.68 W/kg = 4.28 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

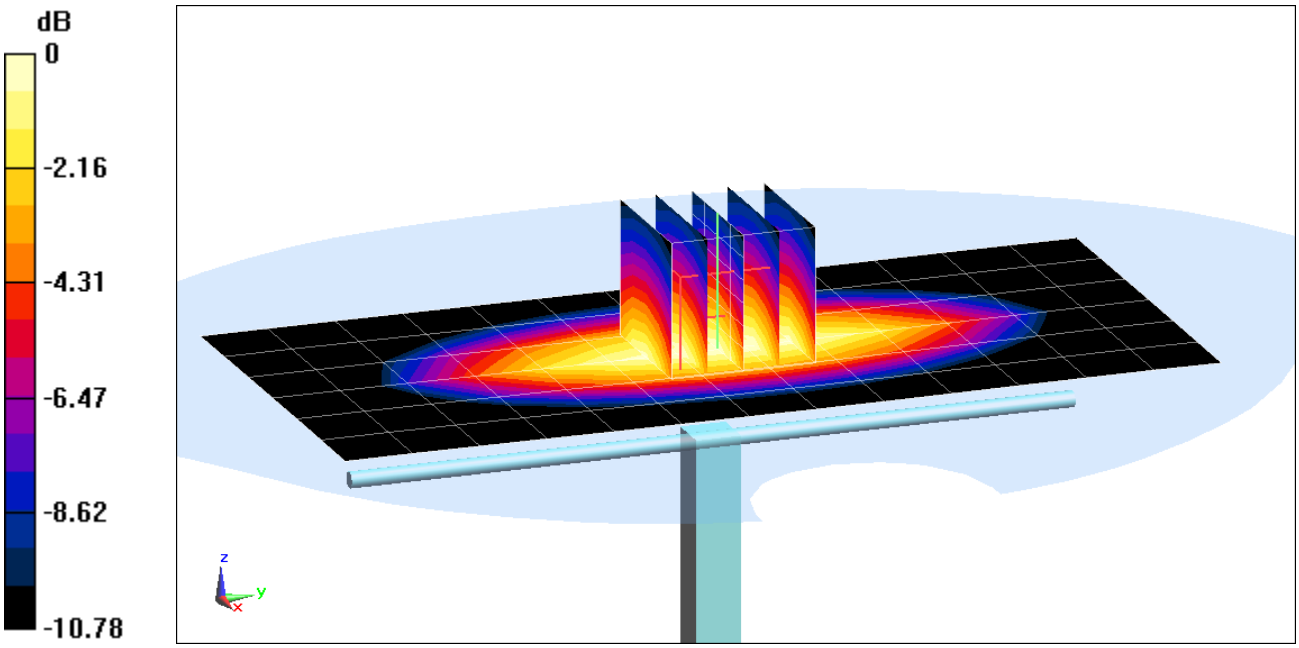
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.908 S/m; ε_r = 42.461; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-07-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(9.97, 9.97, 9.97); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.88 W/kg
SAR(1 g) = 1.92 W/kg
Deviation(1 g) = 0.84%



0 dB = 2.55 W/kg = 4.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

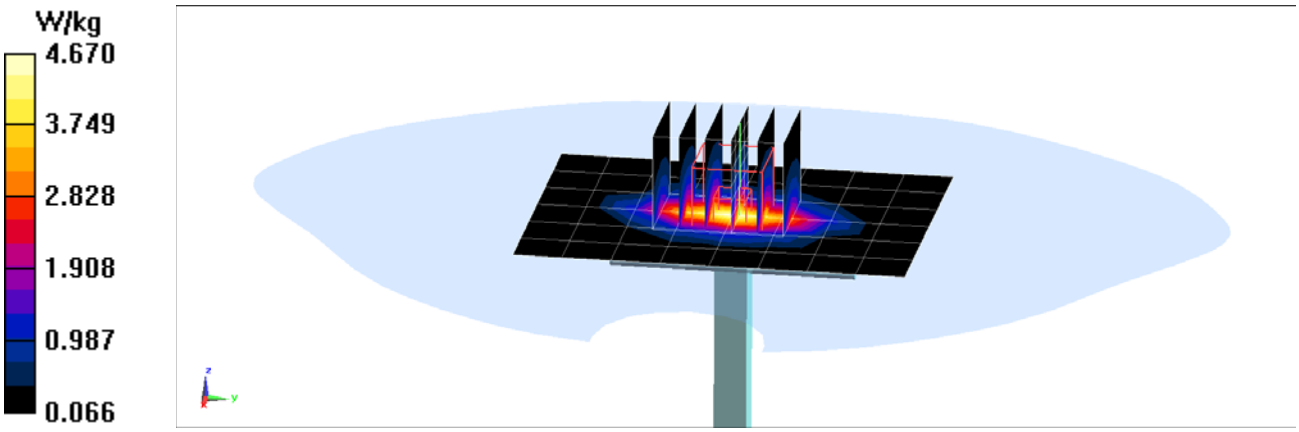
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.407 S/m; ε_r = 39.653; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-26-2017; Ambient Temp: 22.3°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3318; ConvF(5.49, 5.49, 5.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
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 (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.72 W/kg
SAR(1 g) = 3.7 W/kg
Deviation(1 g) = 1.65%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

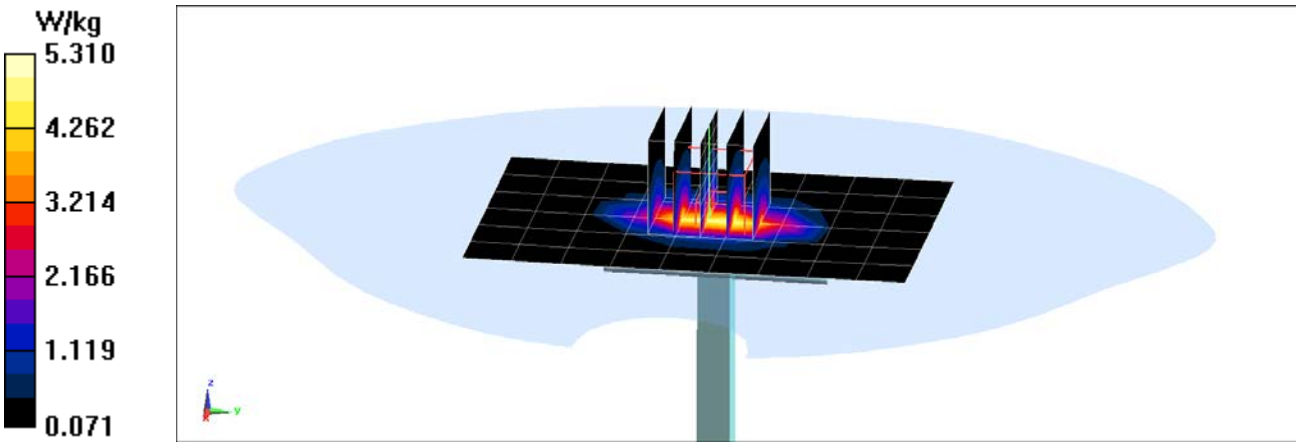
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.454 S/m; ε_r = 40.051; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-24-2017; Ambient Temp: 22.6°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3318; ConvF(5.31, 5.31, 5.31); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 7.84 W/kg
SAR(1 g) = 4.18 W/kg
Deviation(1 g) = 6.36%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

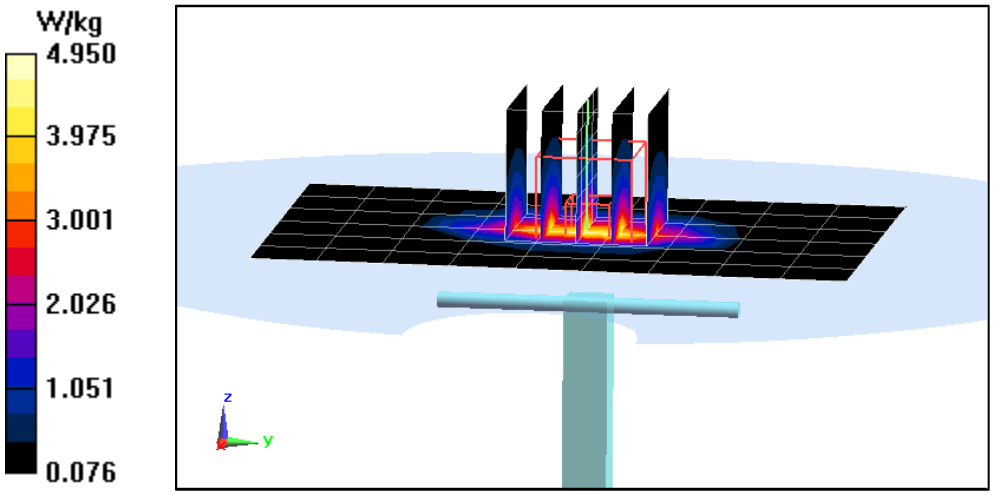
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.442 S/m; ε_r = 39.254; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-02-2017; Ambient Temp: 21.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); 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)

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) = 7.14 W/kg
SAR(1 g) = 3.88 W/kg
Deviation(1 g) = -1.27%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

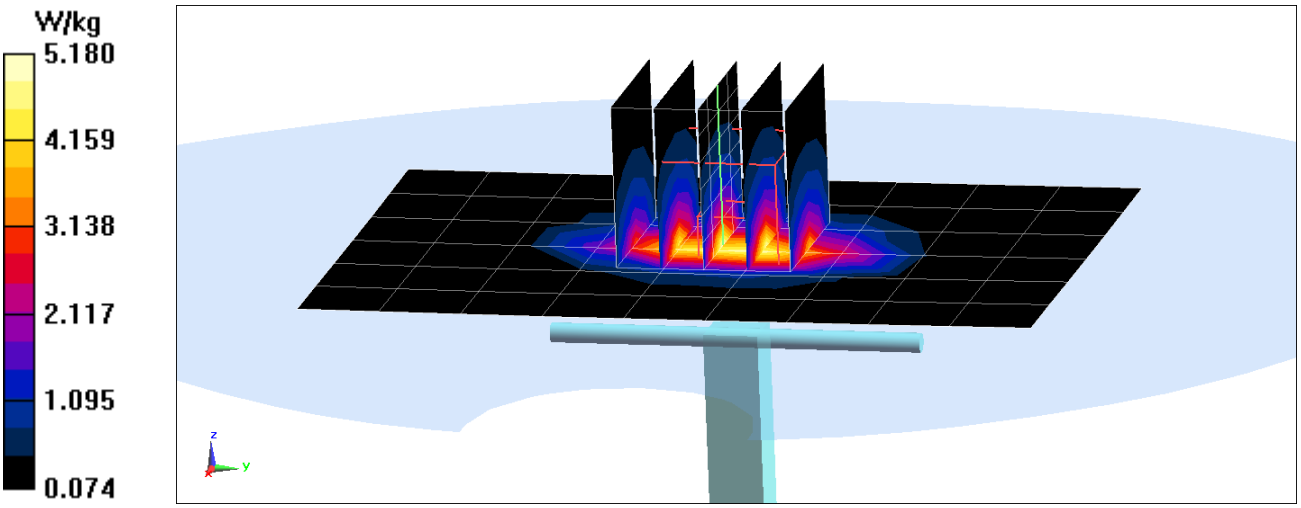
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.437 S/m; ε_r = 39.613; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-09-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3318; ConvF(5.31, 5.31, 5.31); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 7.57 W/kg
SAR(1 g) = 4.09 W/kg
Deviation(1 g) = 1.74%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1038

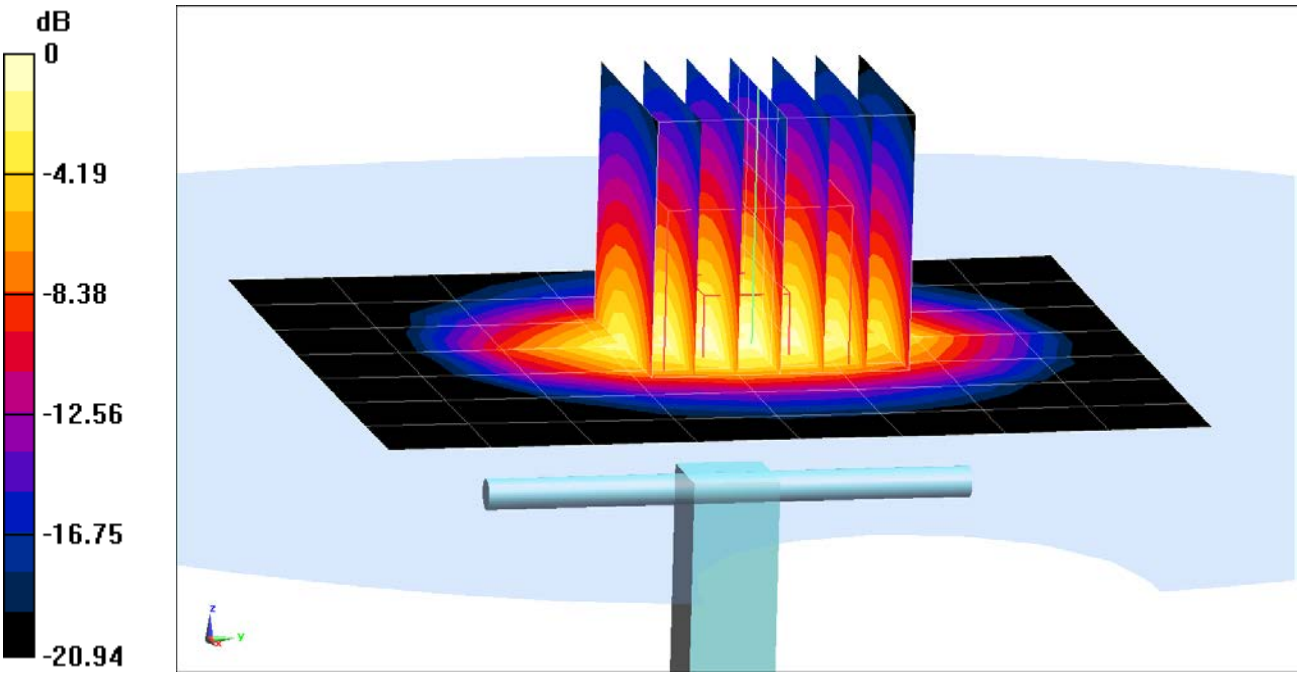
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2300 MHz; σ = 1.717 S/m; ε_r = 38.995; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3213; ConvF(4.95, 4.95, 4.95); 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)

2300 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.1 W/kg
SAR(1 g) = 5.07 W/kg
Deviation(1 g) = 6.74%



0 dB = 6.61 W/kg = 8.20 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 945

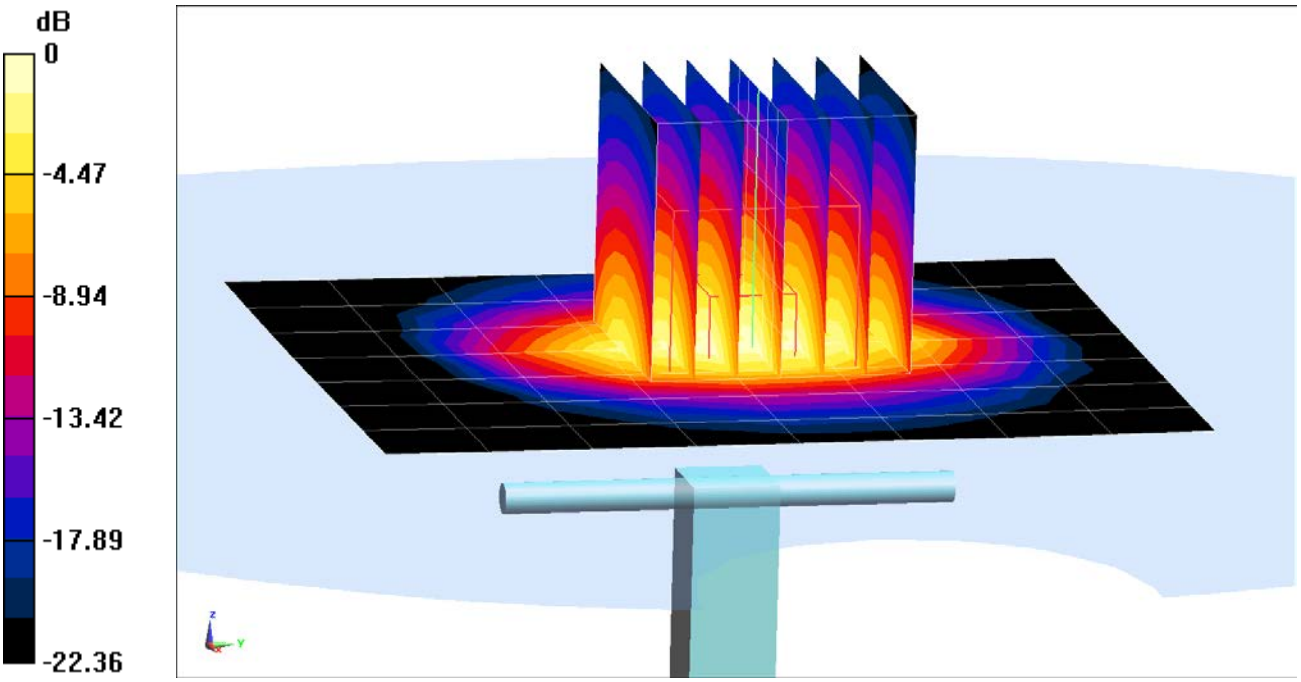
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.877 S/m; ε_r = 38.446; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.46 W/kg
Deviation(1 g) = 6.43%



0 dB = 7.22 W/kg = 8.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

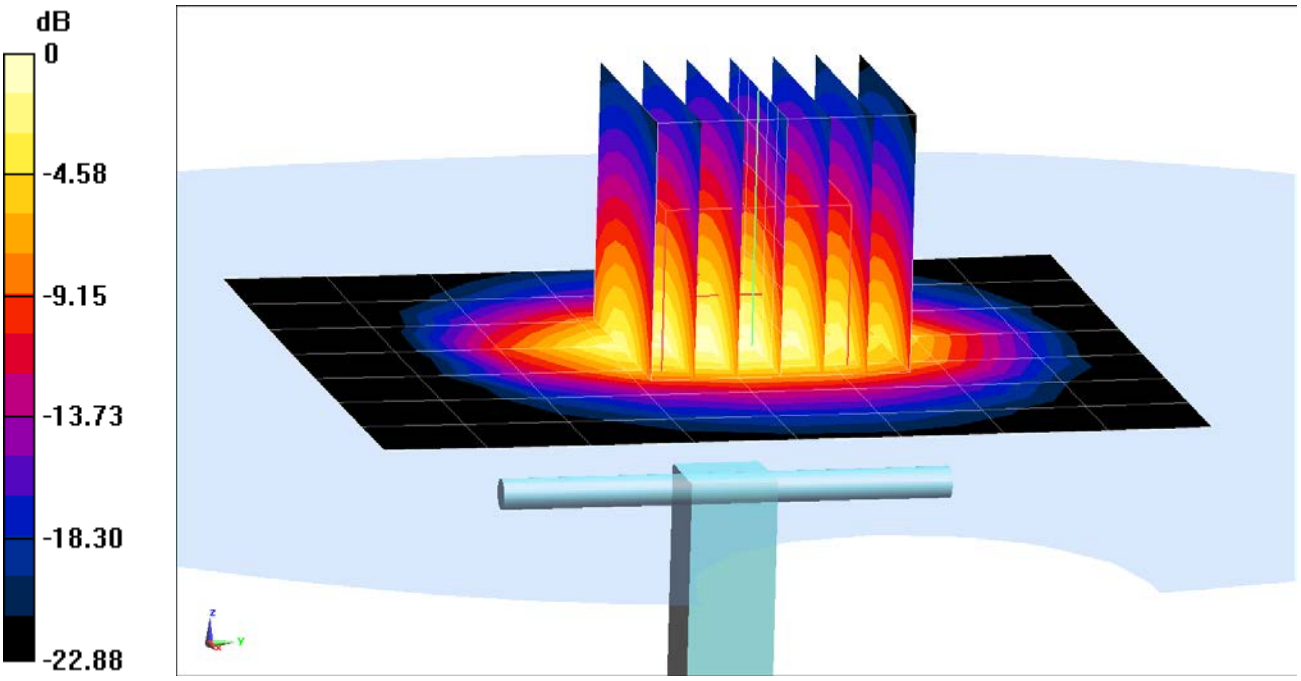
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.865 S/m; ε_r = 39.092; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.5 W/kg
SAR(1 g) = 5.5 W/kg
Deviation(1 g) = 5.57%



0 dB = 7.20 W/kg = 8.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 945

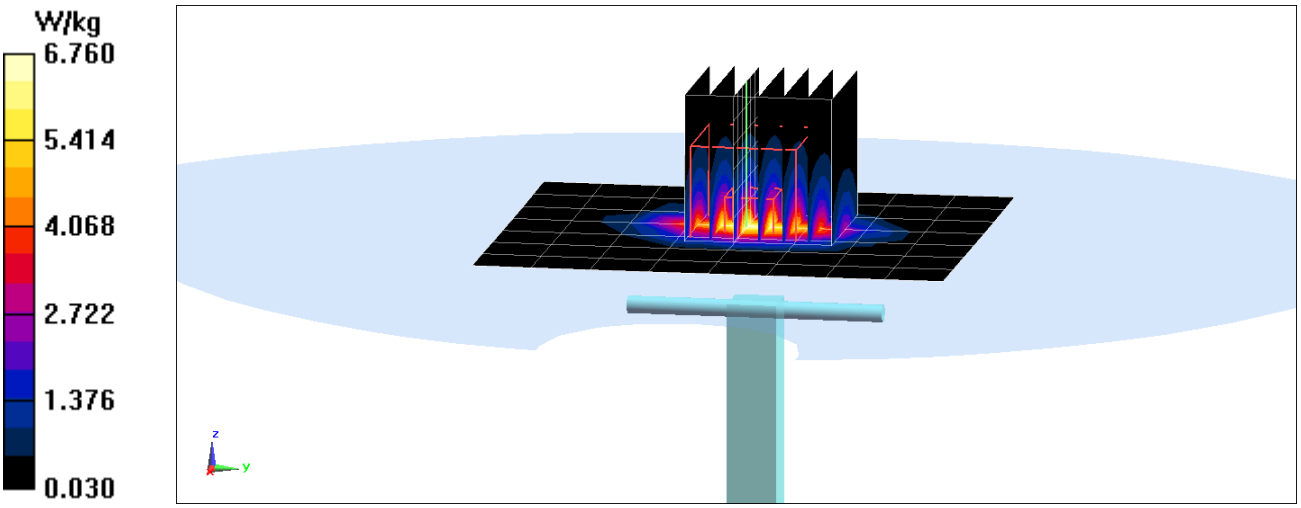
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.887 S/m; ε_r = 38.017; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-10-2017; Ambient Temp: 21.1°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3318; ConvF(4.74, 4.74, 4.74); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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) = 5.13 W/kg
Deviation(1 g) = 0.00%



PCTEST ENGINEERING LABORATORY, INC.

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

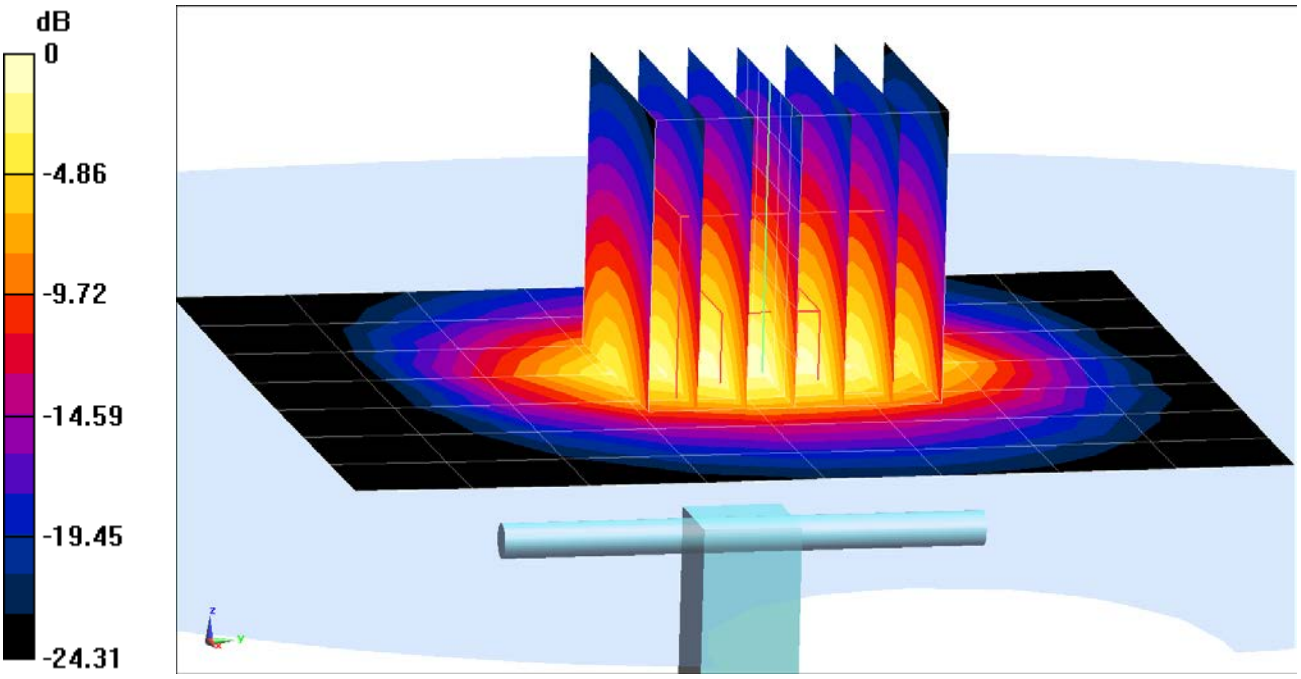
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2600 MHz; σ = 2.046 S/m; ε_r = 37.849; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3213; ConvF(4.52, 4.52, 4.52); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.9 W/kg
SAR(1 g) = 5.87 W/kg
Deviation(1 g) = 4.26%



0 dB = 7.74 W/kg = 8.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

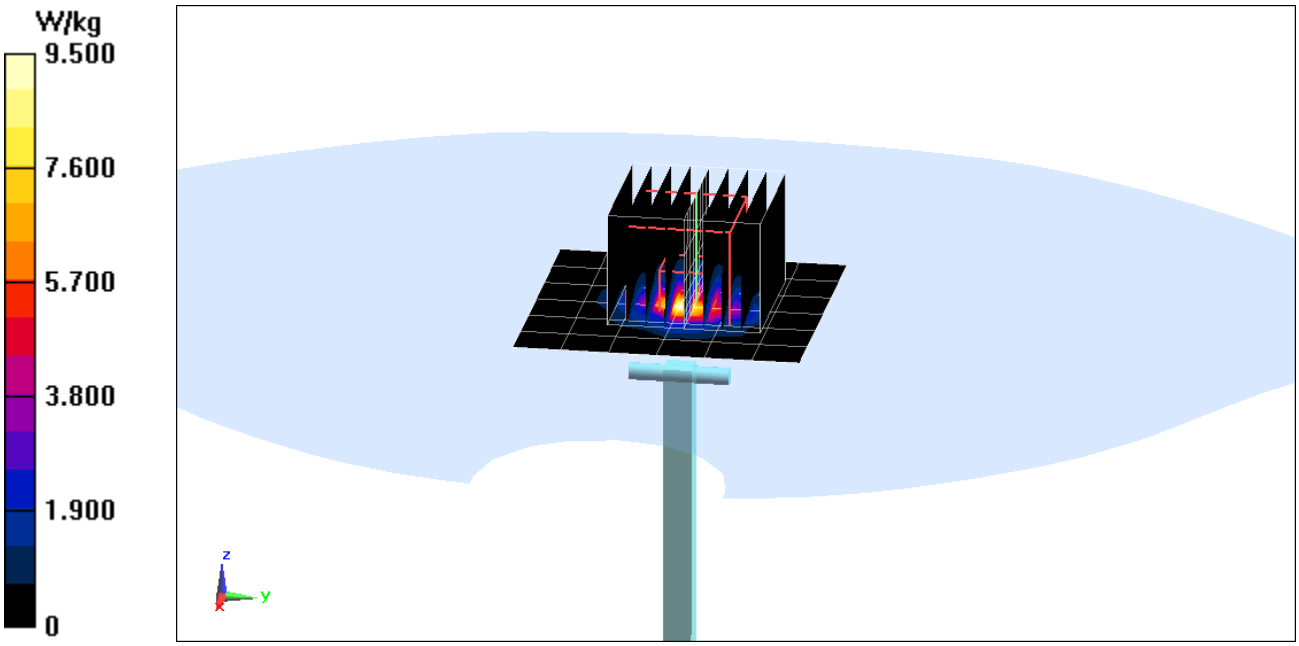
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5250 MHz; σ = 4.576 S/m; ε_r = 35.853; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.1°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 (9x9x7)/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) = 3.87 W/kg
Deviation(1 g) = -2.27%



PCTEST ENGINEERING LABORATORY, INC.

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

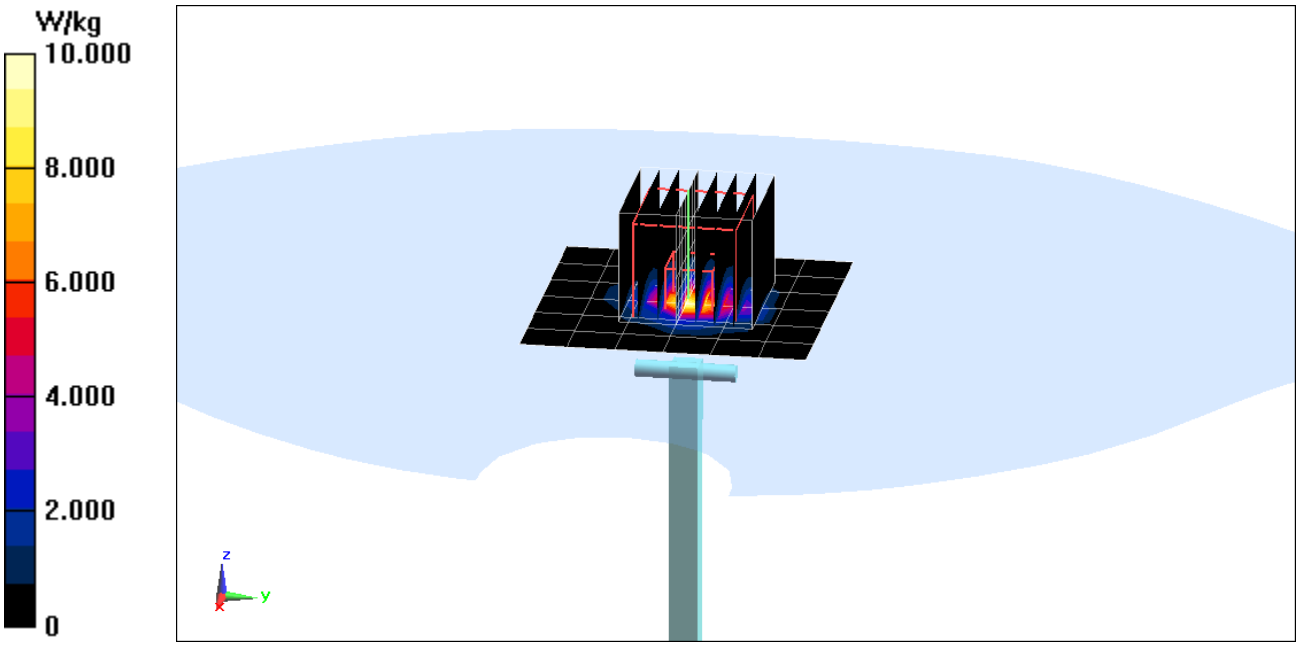
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used:
f = 5600 MHz; σ = 4.913 S/m; ε_r = 35.421; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.1°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) = 18.1 W/kg
SAR(1 g) = 4.05 W/kg
Deviation(1 g) = -2.76%



PCTEST ENGINEERING LABORATORY, INC.

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

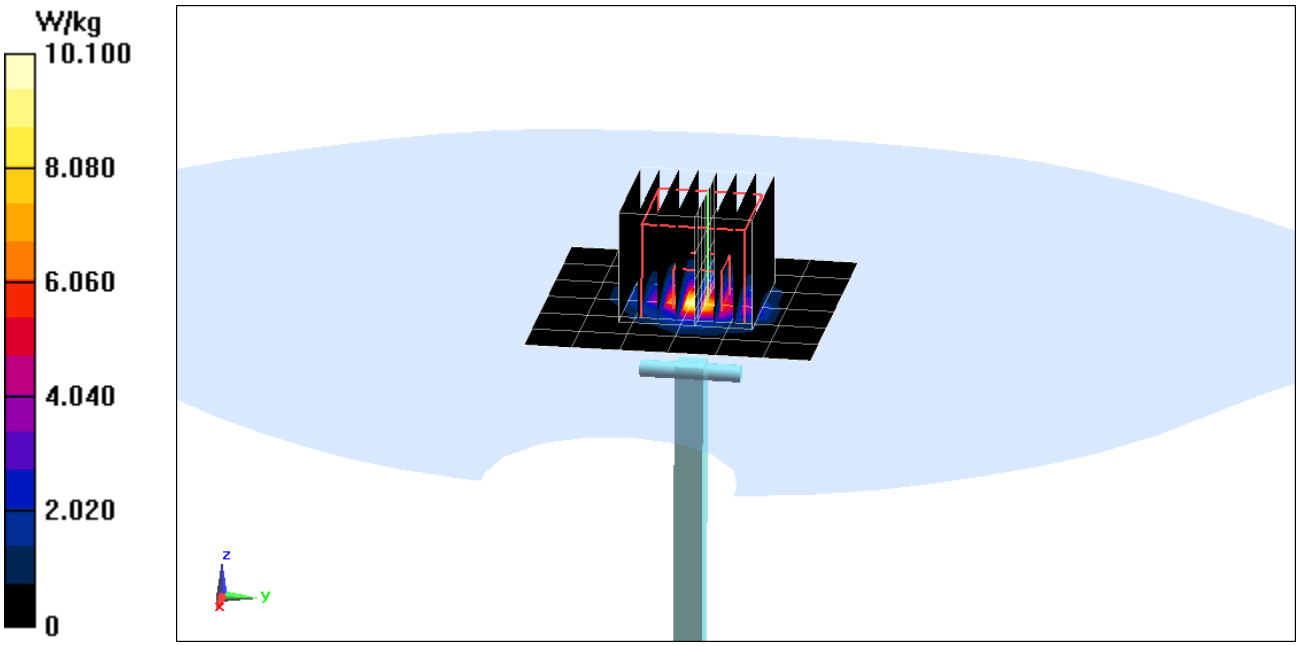
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
f = 5750 MHz; σ = 5.08 S/m; ε_r = 35.188; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.1°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) = 18.3 W/kg
SAR(1 g) = 4 W/kg
Deviation(1 g) = -1.84%



PCTEST ENGINEERING LABORATORY, INC.

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

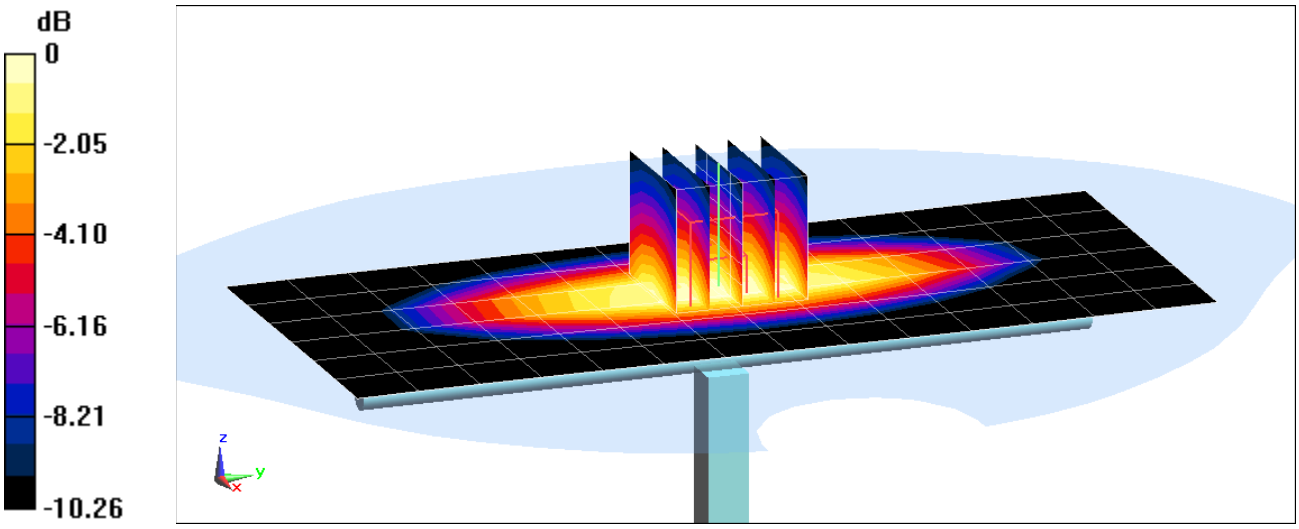
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.958 S/m; ε_r = 55.007; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-24-2017; Ambient Temp: 21.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(9.9, 9.9, 9.9); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=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) = 1.75 W/kg
Deviation(1 g) = 1.63%



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

PCTEST ENGINEERING LABORATORY, INC.

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

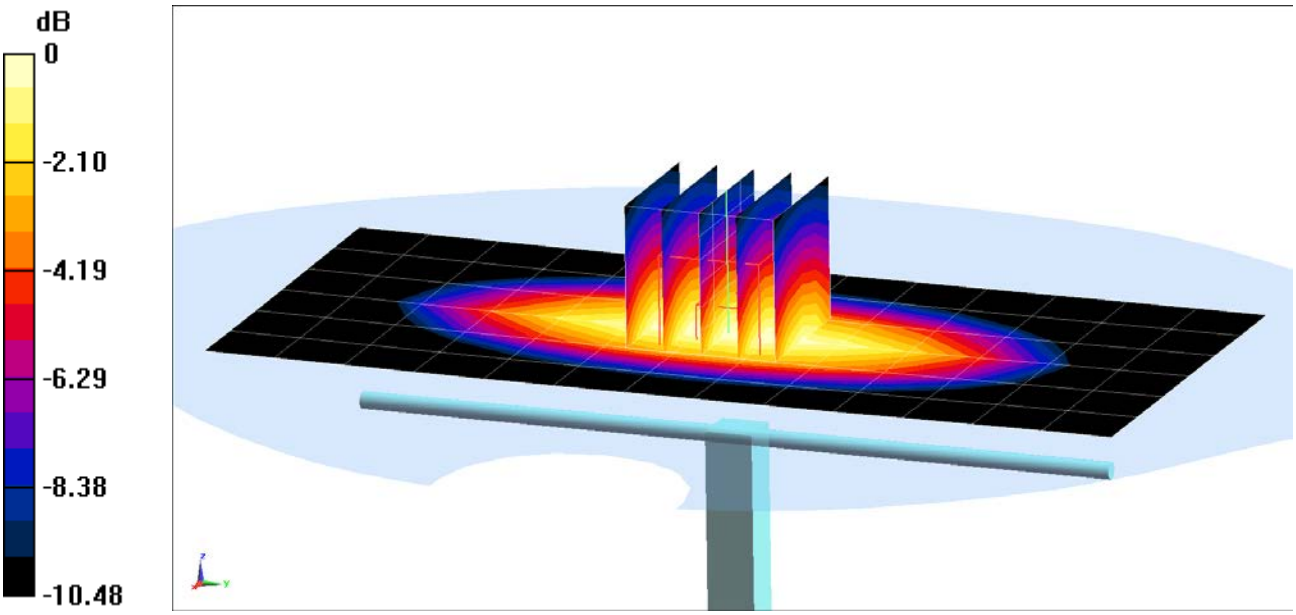
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.005 S/m; ε_r = 54.424; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-31-2017; Ambient Temp: 22.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3319; ConvF(6.29, 6.29, 6.29); 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)

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) = 3.02%



0 dB = 2.31 W/kg = 3.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

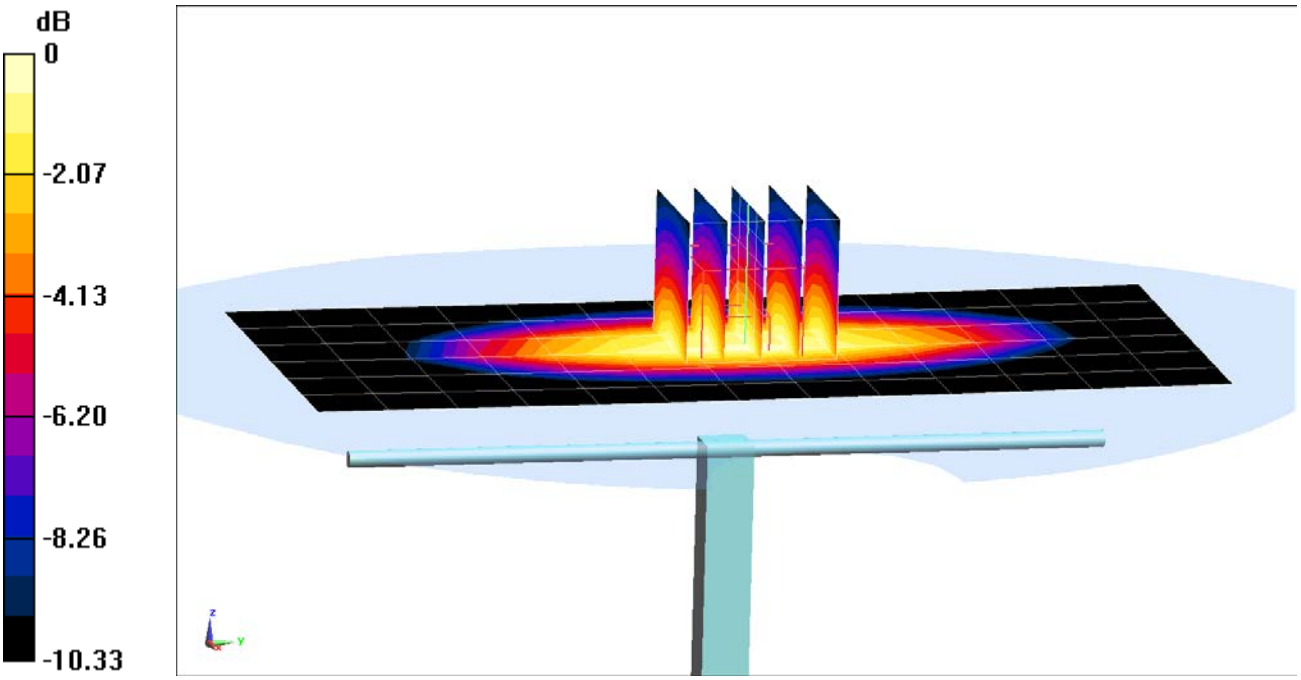
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.974 S/m; ε_r = 52.87; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-04-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.0°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) = 2.84 W/kg
SAR(1 g) = 1.94 W/kg
Deviation(1 g) = -1.02%



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

PCTEST ENGINEERING LABORATORY, INC.

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

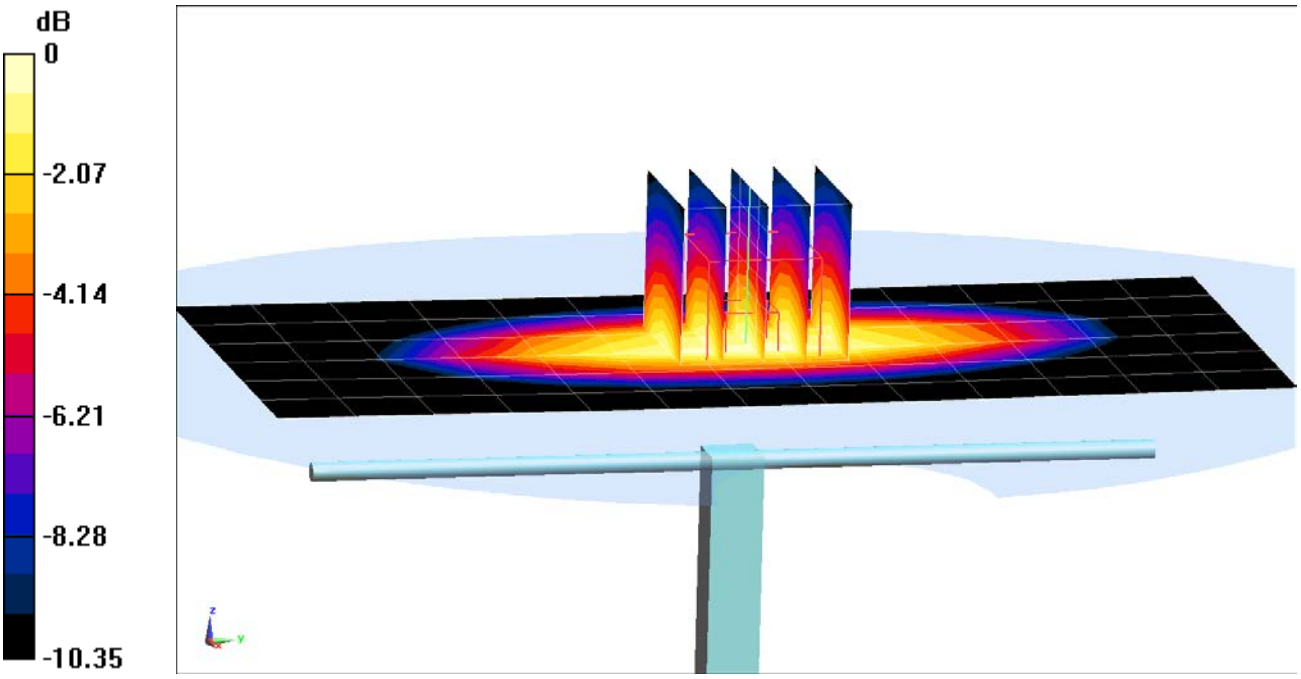
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.977 S/m; ε_r = 52.65; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08-06-2017; Ambient Temp: 21.9°C; Tissue Temp: 20.2°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) = 2.86 W/kg
SAR(1 g) = 1.98 W/kg
Deviation(1 g) = 3.02%



0 dB = 2.31 W/kg = 3.64 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

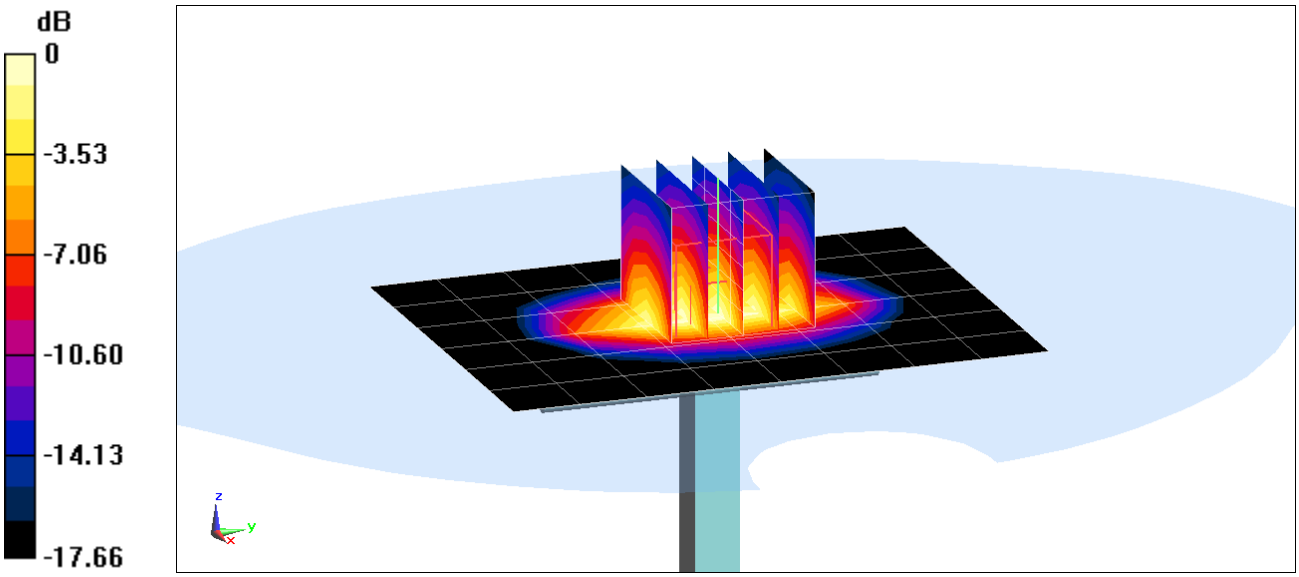
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.505 S/m; ε_r = 51.397; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-27-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(8.08, 8.08, 8.08); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: SAM Left; Type: QD000P40CD; Serial: TP:7535
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) = 7.06 W/kg
SAR(1 g) = 3.88 W/kg
Deviation(1 g) = 4.86%



0 dB = 5.93 W/kg = 7.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

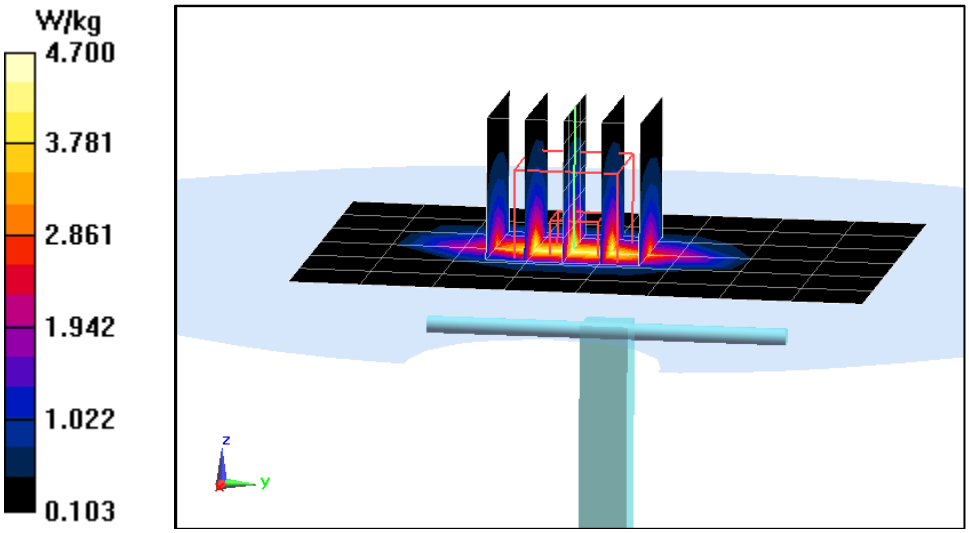
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.506 S/m; ε_r = 51.942; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 19.5°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) = 6.58 W/kg
SAR(1 g) = 3.75 W/kg
Deviation(1 g) = 1.35%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

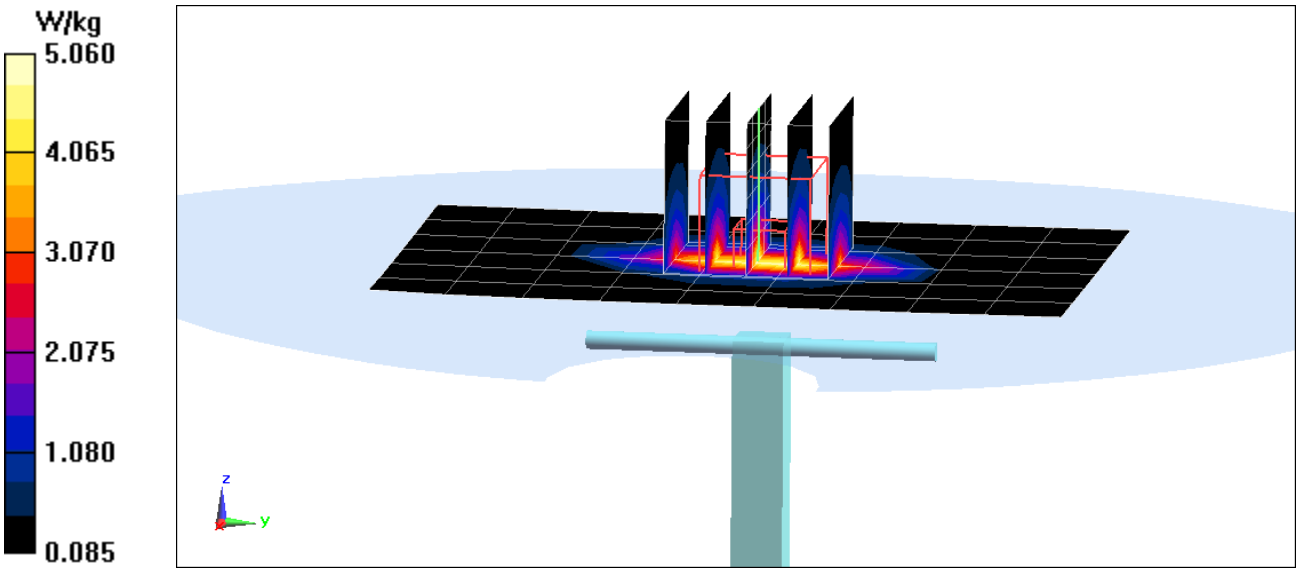
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.56 S/m; ε_r = 52.205; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-29-2017; Ambient Temp: 21.5°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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)

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) = 7.11 W/kg
SAR(1 g) = 3.97 W/kg
Deviation(1 g) = -1.49%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

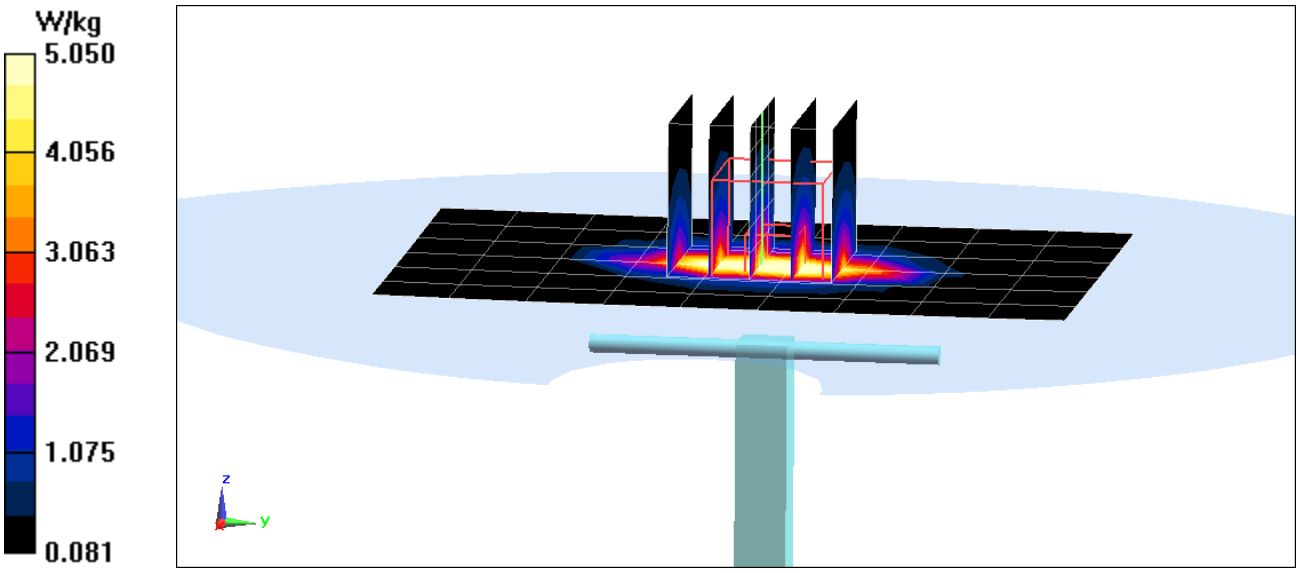
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.579 S/m; ε_r = 53.211; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 21.3°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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)

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) = 7.18 W/kg
SAR(1 g) = 4.04 W/kg
Deviation(1 g) = 0.25%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

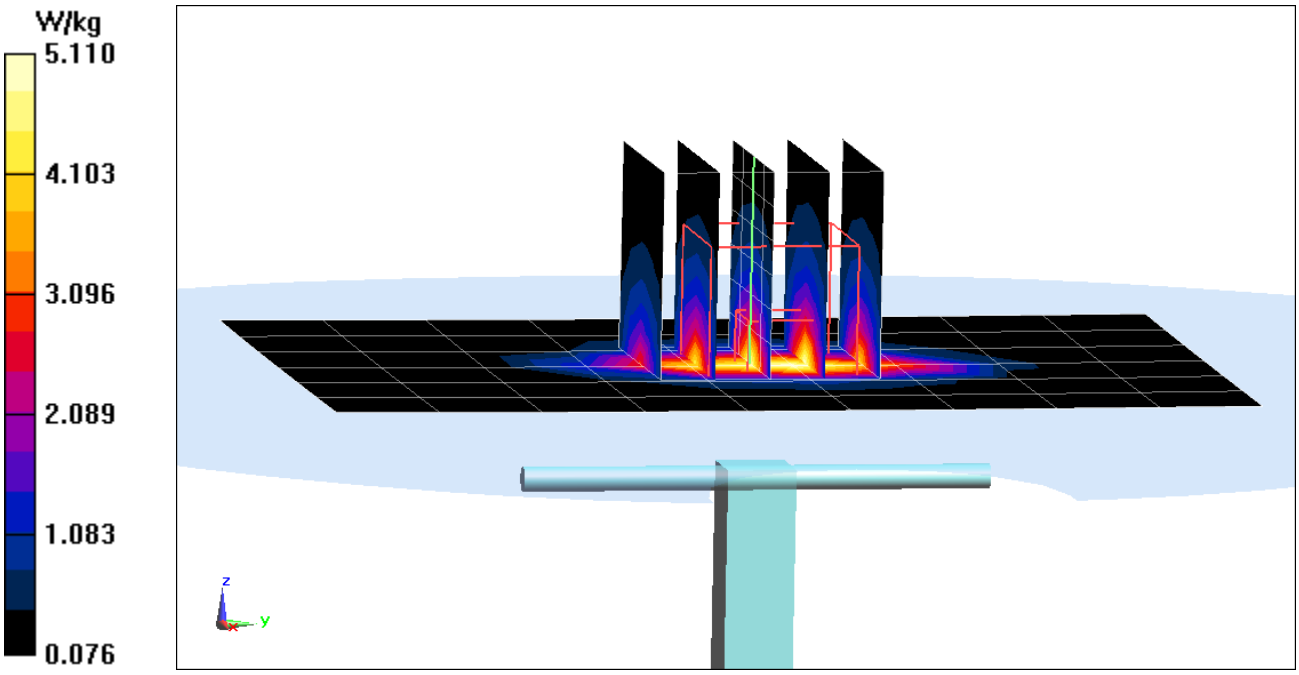
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.515 S/m; ε_r = 53.182; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-03-2017; Ambient Temp: 22.3°C; Tissue Temp:22.0°C

Probe: ES3DV3 - SN3209; ConvF(4.93, 4.93, 4.93); 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)

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) = 7.28 W/kg
SAR(1 g) = 4.08 W/kg
Deviation(1 g) = 1.24%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1038

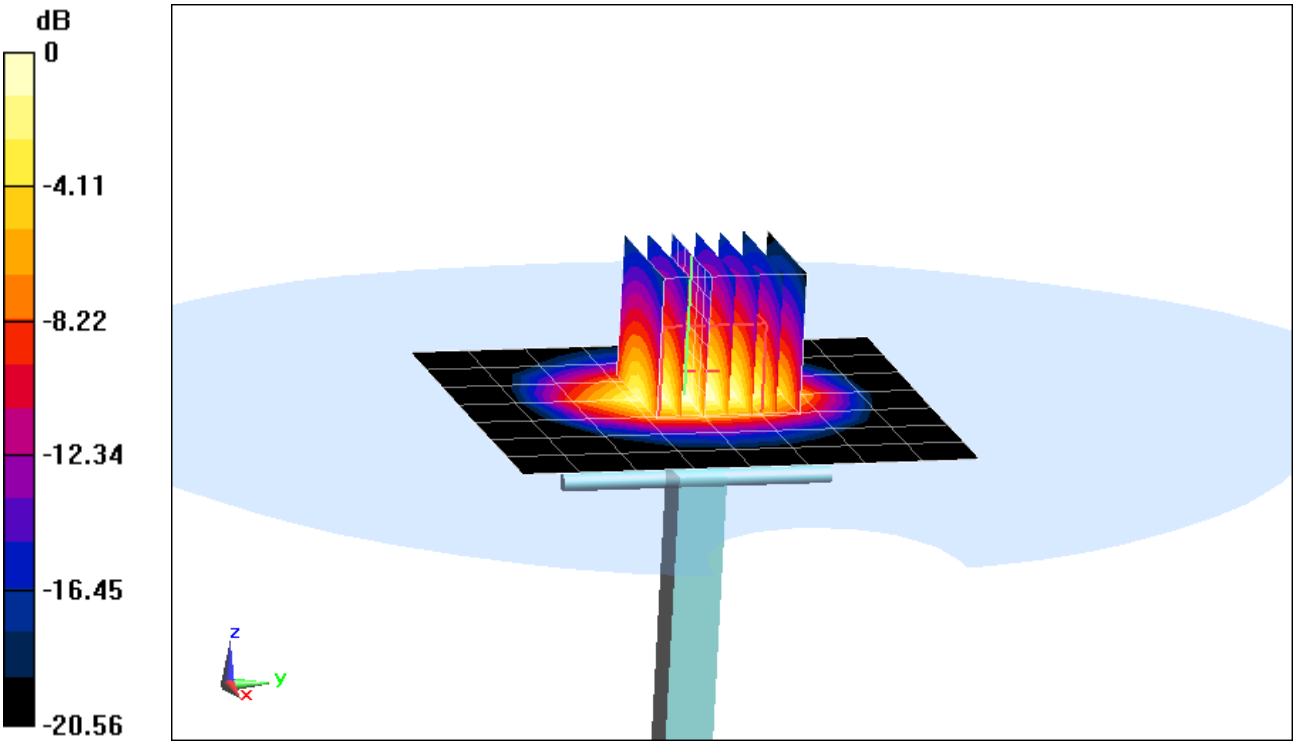
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2300 MHz; σ = 1.811 S/m; ε_r = 51.85; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-08-2017; Ambient Temp: 22.4°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.55, 4.55, 4.55); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2300 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 9.60 W/kg
SAR(1 g) = 4.99 W/kg
Deviation(1 g) = 5.05%



0 dB = 6.42 W/kg = 8.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

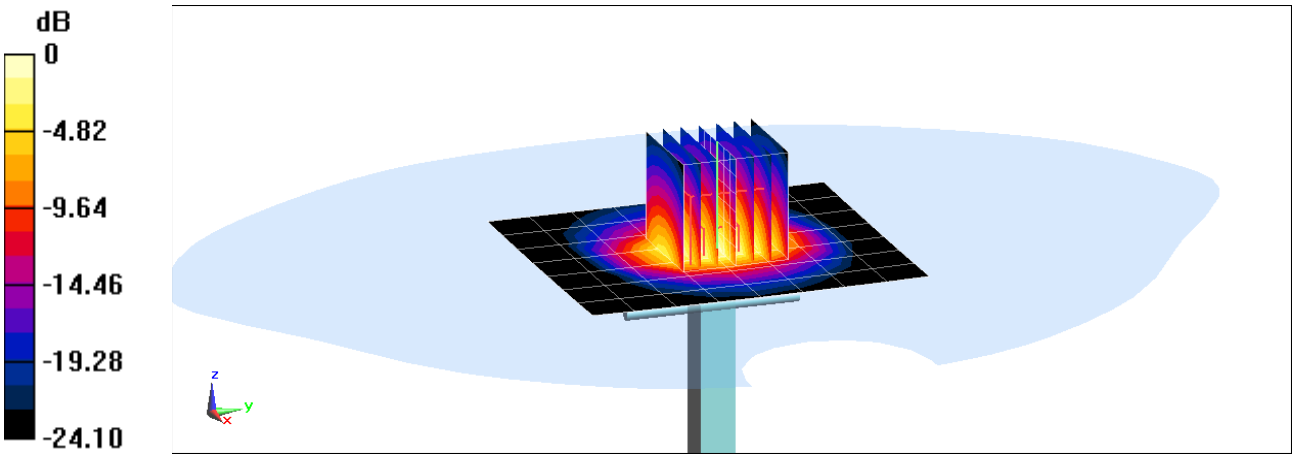
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; σ = 2.242 S/m; ε_r = 52.155; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3287; ConvF(4.12, 4.12, 4.12); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
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) = 13.0 W/kg
SAR(1 g) = 5.83 W/kg
Deviation(1 g) = 7.56%



0 dB = 7.76 W/kg = 8.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 945

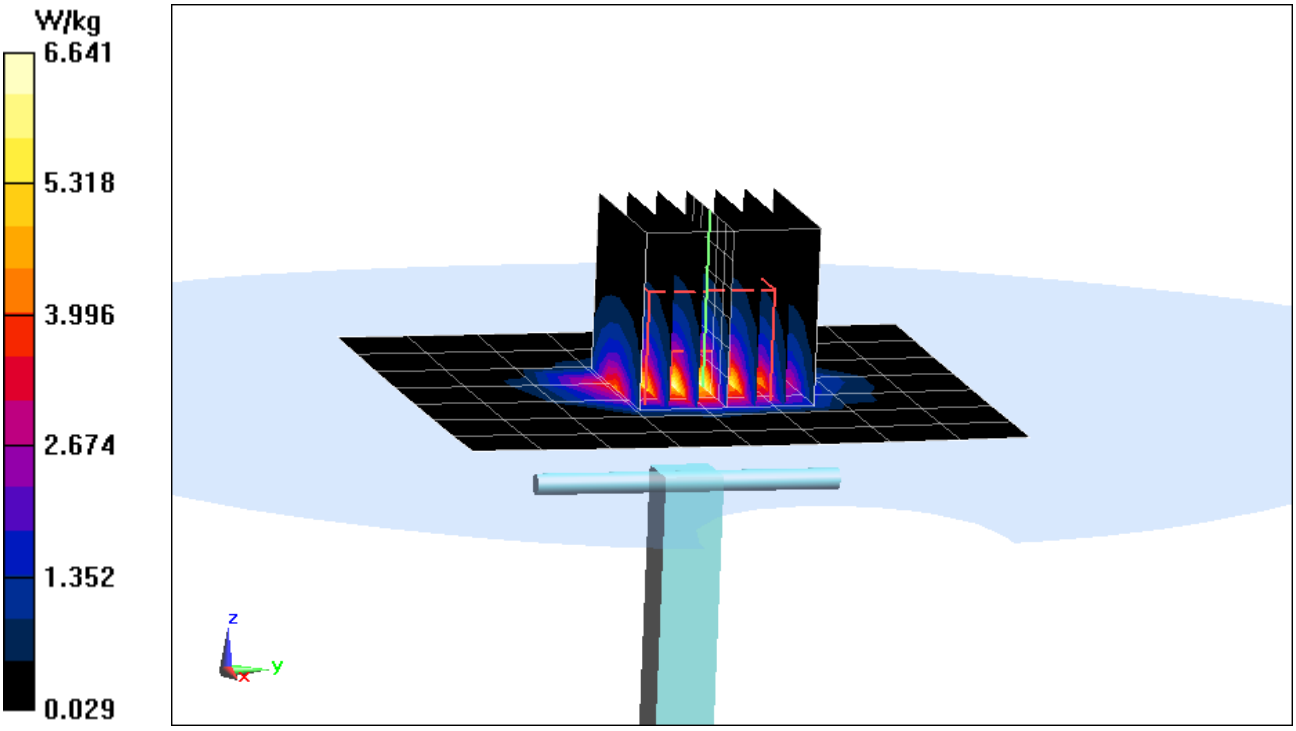
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.005 S/m; ε_r = 51.277; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
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) = 5.08 W/kg
Deviation(1 g) = 1.20%



PCTEST ENGINEERING LABORATORY, INC.

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

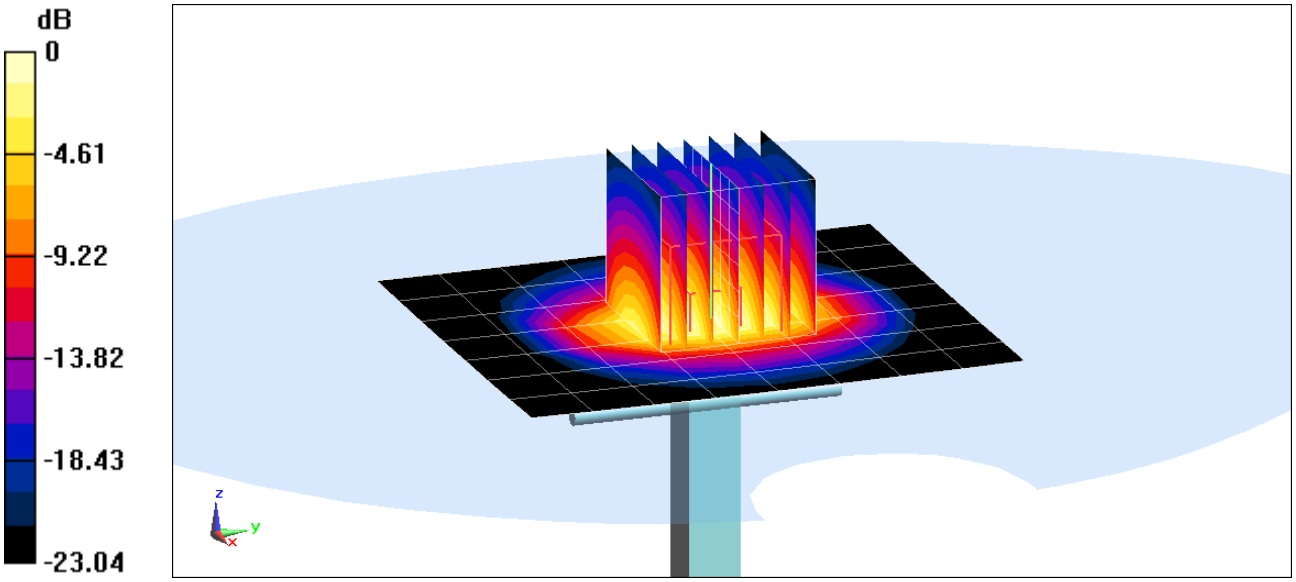
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.004 S/m; ε_r = 50.863; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-10-2017; Ambient Temp: 22.2°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3287; ConvF(4.35, 4.35, 4.35); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
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) = 11.1 W/kg
SAR(1 g) = 5.18 W/kg
Deviation(1 g) = 2.17%



0 dB = 6.88 W/kg = 8.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

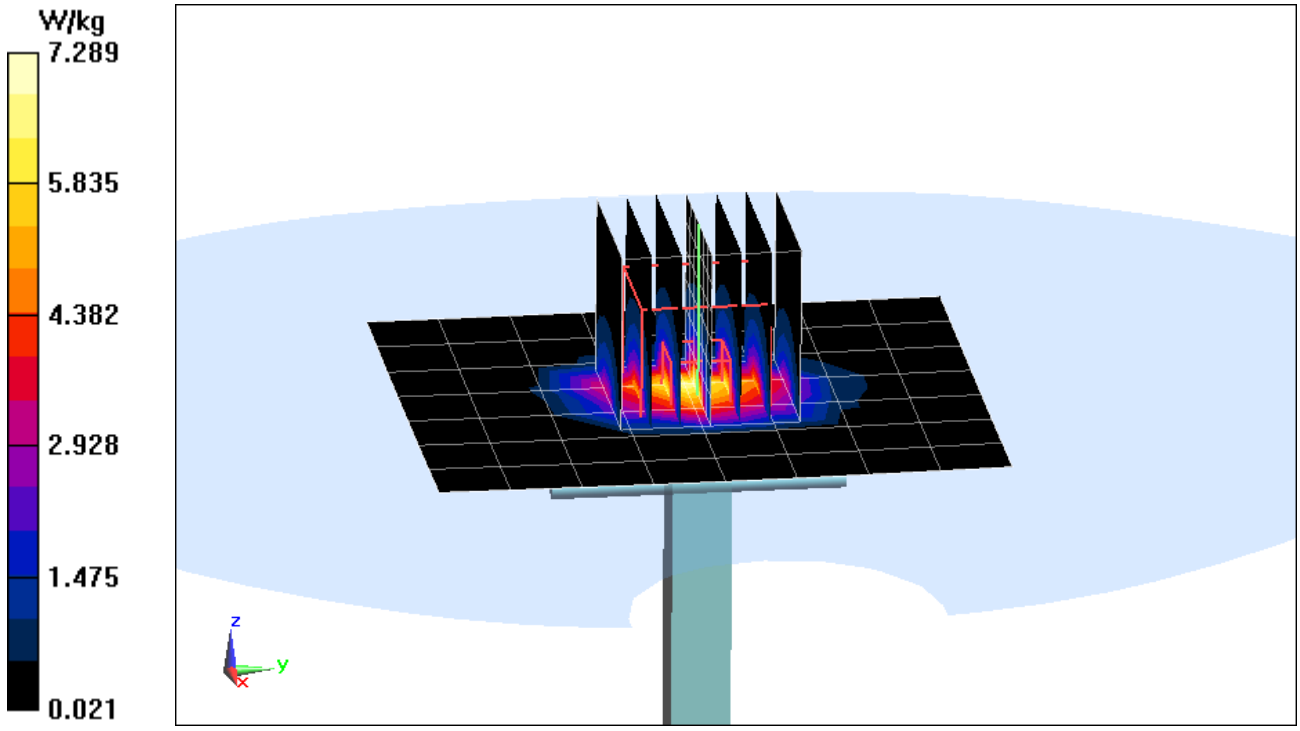
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2600 Body Medium parameters used:
f = 2600 MHz; σ = 2.213 S/m; ε_r = 50.656; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3287; ConvF(4.12, 4.12, 4.12); Calibrated: 9/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 9/14/2016
Phantom: SAM Left; Type: QD000P40CA; Serial: TP:82355
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 12.8 W/kg
SAR(1 g) = 5.63 W/kg
Deviation(1 g) = 1.81%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

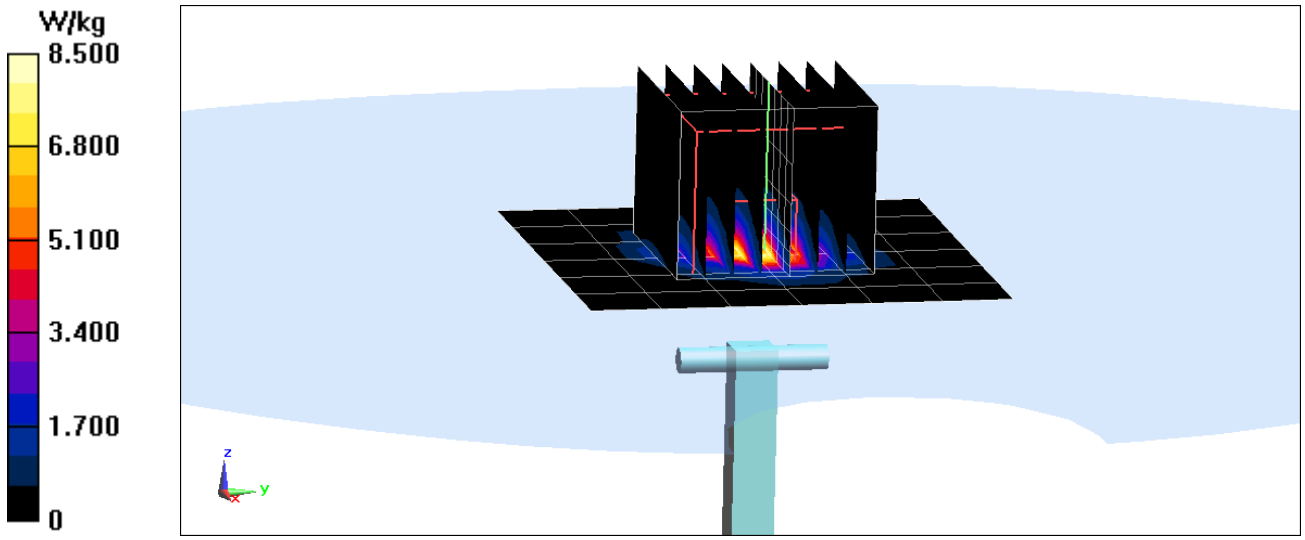
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.428 S/m; ε_r = 47.785; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(4.19, 4.19, 4.19); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.2 W/kg
SAR(1 g) = 3.51 W/kg
Deviation(1 g) = -7.51%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

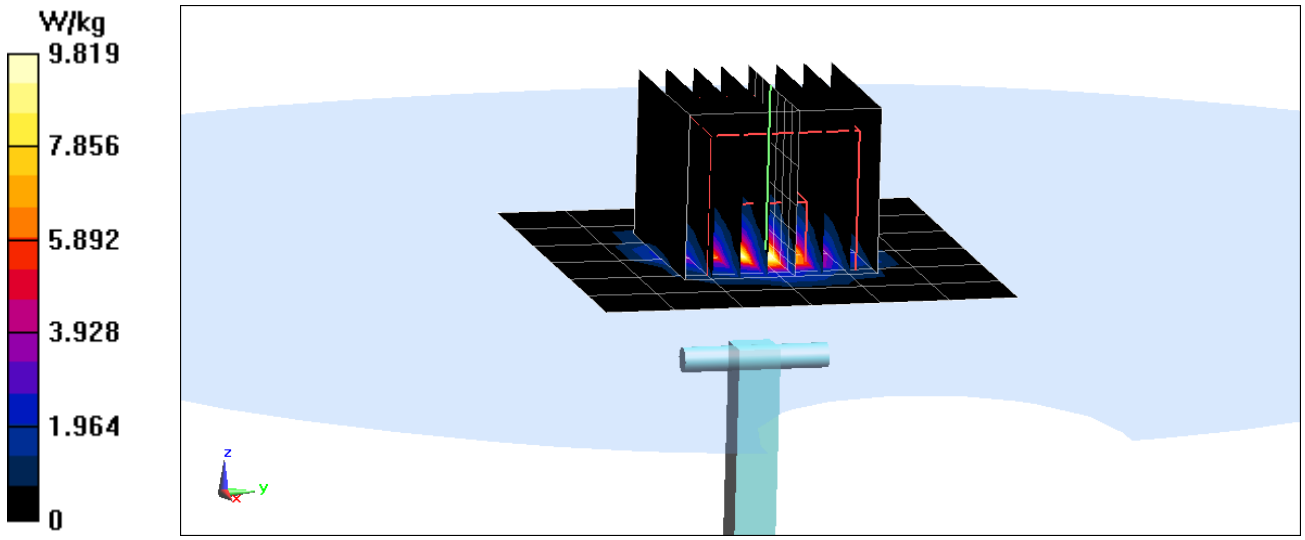
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.894 S/m; ε_r = 47.157; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3589; ConvF(3.82, 3.82, 3.82); Calibrated: 1/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/16/2017
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.6 W/kg
SAR(1 g) = 3.95 W/kg
Deviation(1 g) = 0.13%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

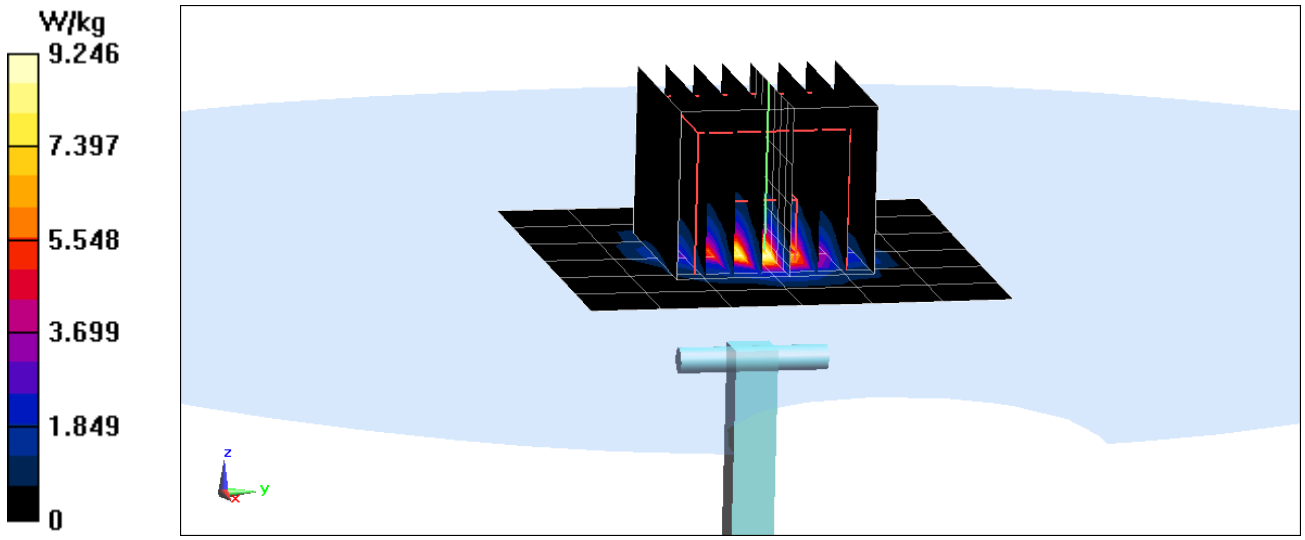
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.105 S/m; ε_r = 46.963; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-31-2017; Ambient Temp: 22.1°C; Tissue Temp: 21.2°C

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

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 3.71 W/kg
Deviation(1 g) = -2.75%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

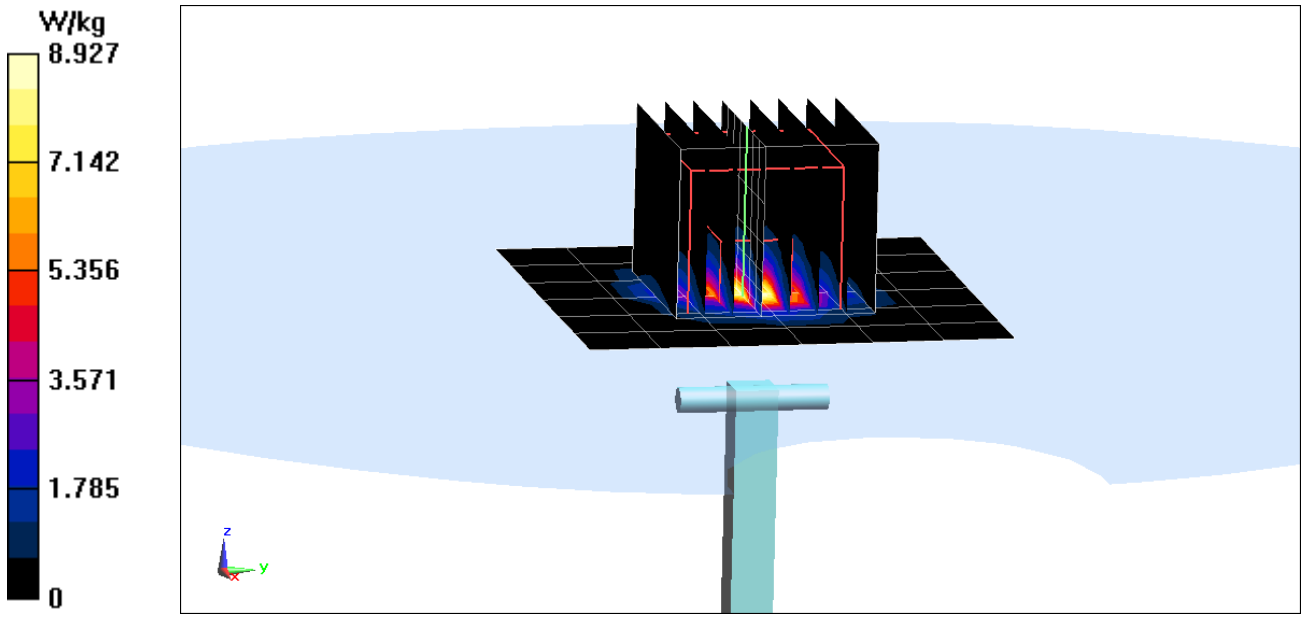
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5250 MHz; σ = 5.378 S/m; ε_r = 47.761; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.0°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) = 16.1 W/kg
SAR(1 g) = 3.73 W/kg; SAR(10 g) = 1.04 W/kg
Deviation(1 g) = -1.71%; Deviation(10 g) = -2.35%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

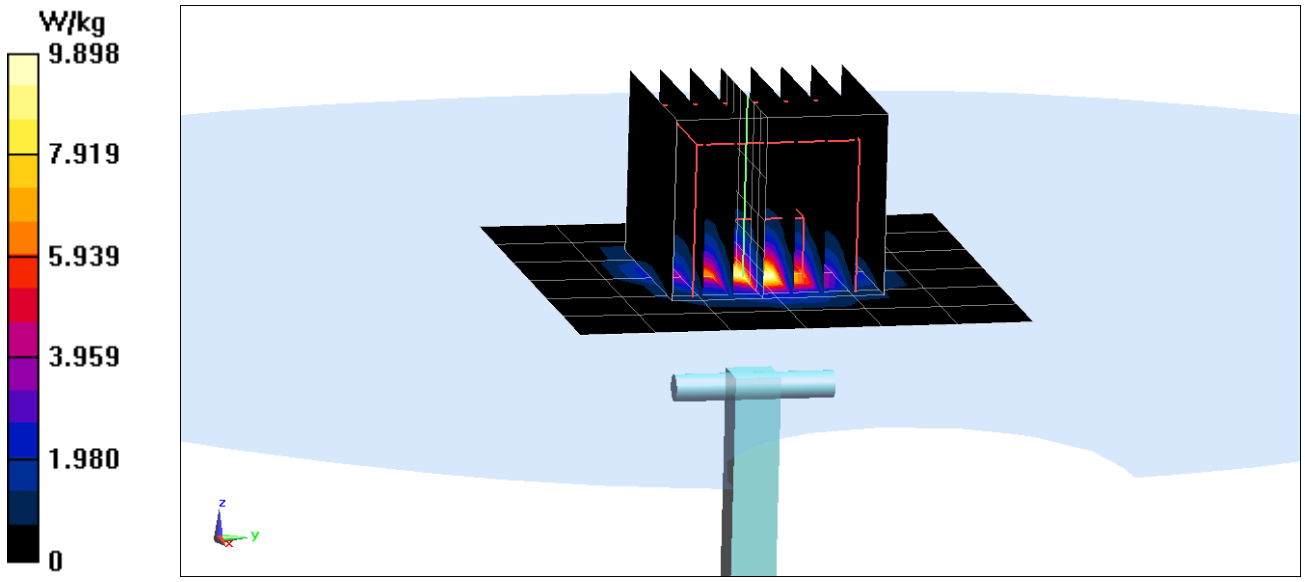
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.846 S/m; ε_r = 47.191; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.0°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) = 18.5 W/kg
SAR(1 g) = 3.95 W/kg; SAR(10 g) = 1.09 W/kg
Deviation(1 g) =0.13%; Deviation(10 g) = -1.36%



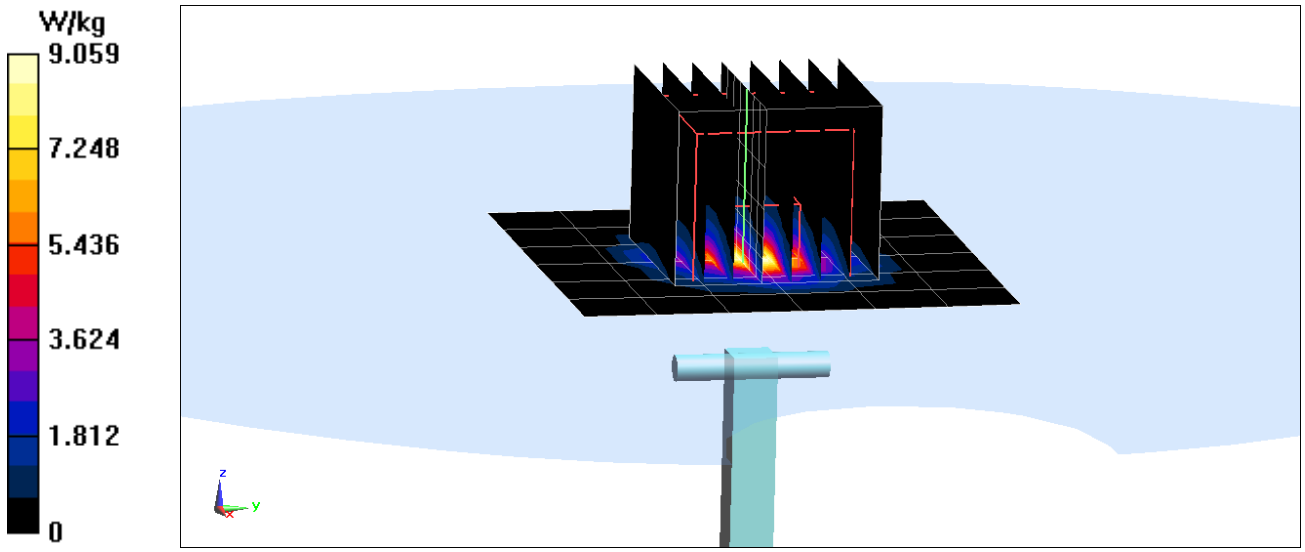
PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body Medium parameters used (interpolated):
f = 5750 MHz; σ = 6.027 S/m; ε_r = 46.99; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08-07-2017; Ambient Temp: 21.8°C; Tissue Temp: 21.0°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) = 16.9 W/kg
SAR(1 g) = 3.68 W/kg; SAR(10 g) = 1.03 W/kg
Deviation(1 g) = -3.54%; Deviation(10 g) = -3.29%