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

SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics, Co. Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do 443-742, Korea

Date of Testing:
01/15/15 - 01/29/15
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1501190090.A3L

FCC ID: **A3LSMG920V**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-G920V

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	0.24	0.42	0.42
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.33	0.57	0.72
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.19	0.34	0.80
PCE	UMTS 850	826.40 - 846.60 MHz	0.19	0.39	0.39
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.26	0.56
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.23	0.48	0.91
PCE	LTE Band 13	779.5 - 784.5 MHz	0.15	0.41	0.41
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.22	0.42	0.42
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.24	0.50	0.90
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.17	0.53	0.76
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.70	< 0.1	< 0.1
NII	U-NII-1	5180 - 5240 MHz	N/A		
NII	U-NII-2A	5260 - 5320 MHz	0.15	< 0.1	
NII	U-NII-2C < 5.65 GHz	5500 - 5580 MHz	0.27	0.11	
NII	U-NII-2C > 5.65 GHz + U-NII-3	5660 - 5825 MHz	0.55	0.12	0.12
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r03:			1.09	0.74	1.13

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

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

Randy Ortanez
President

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

TABLE OF CONTENTS

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
U-NII-1	Data	5180 - 5240 MHz
U-NII-2A	Data	5260 - 5320 MHz
U-NII-2C < 5.65 GHz	Data	5500 - 5580 MHz
U-NII-2C > 5.65 GHz + U-NII-3	Data	5660 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz
MST	Data	1 - 8.3 kHz

1.2 Power Reduction for SAR

The device utilizes power reduction under portable hotspot for SAR compliance. There is power reduction for UMTS Band 2, CDMA/EVDO 1900, and LTE Band 4/Band 2. There is no power reduction for GSM/GPRS/EDGE 850/1900, UMTS Band 5, CDMA/EVDO 850, LTE Bands 13/5, and WLAN modes. All hotspot SAR evaluations for this device were performed with the maximum allowed output power in hotspot mode. Additional evaluations at reduced output power conditions were considered for simultaneous transmission purposes. The reduced powers were confirmed via conducted power measurements at the RF port (See Section 9). A detailed description of the hotspot power reduction is included in the operational description.

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05.

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**33.0**	**33.0**	**32.5**	**31.0**	**30.5**	**28.0**	**26.5**	**24.0**	**23.5**
	Nominal	**32.5**	**32.5**	**32.0**	**30.5**	**30.0**	**27.5**	**26.0**	**23.5**	**23.0**
GSM/GPRS/EDGE 1900	Maximum	**30.5**	**30.5**	**29.0**	**27.5**	**26.5**	**26.5**	**25.5**	**23.5**	**22.5**
	Nominal	**30.0**	**30.0**	**28.5**	**27.0**	**26.0**	**26.0**	**25.0**	**23.0**	**22.0**

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*
UMTS Band 5 (850 MHz)	Maximum	**24.5**	**23.0**	**22.5**
	Nominal	**24.0**	**22.5**	**22.0**
UMTS Band 2 (1900 MHz) - Hotspot Mode Inactive	Maximum	**24.5**	**23.0**	**22.5**
	Nominal	**24.0**	**22.5**	**22.0**
UMTS Band 2 (1900 MHz) - Hotspot Mode Active	Maximum	**22.5**	**20.5**	**20.5**
	Nominal	**22.0**	**20.0**	**20.0**

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	**25.0**
	Nominal	**24.5**
PCS CDMA/EVDO - Hotspot Mode Inactive	Maximum	**25.0**
	Nominal	**24.5**
PCS CDMA/EVDO - Hotspot Mode Active	Maximum	**23.0**
	Nominal	**22.5**

Mode / Band		Modulated Average (dBm)
LTE Band 13	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 5 (Cell)	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 4 (AWS) - Hotspot Mode Inactive	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 4 (AWS) - Hotspot Mode Active	Maximum	**22.5**
	Nominal	**22.0**
LTE Band 2 (PCS) - Hotspot Mode Inactive	Maximum	**24.5**
	Nominal	**24.0**
LTE Band 2 (PCS) - Hotspot Mode Active	Maximum	**22.5**
	Nominal	**22.0**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz) - SISO	Maximum	**17.5**
	Nominal	**17.0**
IEEE 802.11g (2.4 GHz) - SISO	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11n (2.4 GHz) - SISO	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (2.4 GHz) - MIMO	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11a (5 GHz) - SISO	Maximum	**14.5**
	Nominal	**14.0**
IEEE 802.11n/ac (5 GHz) 20 MHz BW - SISO	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n/ac (5 GHz) 40 MHz BW - SISO	Maximum	**12.5**
	Nominal	**12.0**
IEEE 802.11ac (5 GHz) 80 MHz BW - SISO	Maximum	**11.5**
	Nominal	**11.0**
IEEE 802.11n/ac (5 GHz) 20 MHz BW - MIMO	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11n/ac (5 GHz) 40 MHz BW - MIMO	Maximum	**15.5**
	Nominal	**15.0**
IEEE 802.11ac (5 GHz) 80 MHz BW - MIMO	Maximum	**14.5**
	Nominal	**14.0**
Bluetooth	Maximum	**10.5**
	Nominal	**10.0**
Bluetooth LE	Maximum	**7.0**
	Nominal	**6.5**

1.4 DUT Antenna Locations

- A diagram showing the location of the device antennas can be found in Appendix F. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC filing.
- The overall dimensions of this device are > 9 x 5 cm. The overall diagonal dimension of the device is <160 mm and the diagonal display is <150 mm.

Table 1-1
Sides for SAR Testing

Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
Cell. EVDO	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	Yes	Yes
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	Yes	No
5.8 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5.8 GHz WLAN Ant 2	Yes	Yes	Yes	No	Yes	No

Note: Particular DUT edges were not required to be evaluated for Wireless Router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v01 guidance, page 2. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled, U-NII-1, U-NII-2A & U-NII-2C WLAN operations are disabled. Therefore U-NII-1, U-NII-2A & U-NII-2C WLAN operations are not considered in this section.

1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D05v01, 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 D01v05 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	1x CDMA voice + 2.4 GHz WI-FI	Yes	Yes	N/A	
2	1x CDMA voice + 5 GHz WI-FI	Yes	Yes	N/A	
3	1x CDMA voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
4	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	
5	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	
6	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
7	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	
8	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	
9	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	
10	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	
11	LTE + 5 GHz WI-FI	Yes	Yes	Yes	
12	LTE + 2.4 GHz Bluetooth	N/A	Yes	N/A	
13	CDMA/EVDO data + 2.4 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
14	CDMA/EVDO data + 5 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
15	CDMA/EVDO data + 2.4 GHz Bluetooth	N/A	Yes*	N/A	*-Pre-installed VOIP applications are considered.
16	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	
17	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	
18	1x CDMA voice + CDMA/EVDO data	N/A	N/A	N/A	Not supported by HW
19	CDMA/EVDO data + LTE	N/A	N/A	N/A	Not supported by HW
20	1x CDMA voice + LTE	N/A	N/A	N/A	Not supported by HW
21	1x CDMA voice + LTE + 2.4 GHz WI-FI	N/A	N/A	N/A	Not supported by HW
22	1x CDMA voice + LTE + 5 GHz WI-FI	N/A	N/A	N/A	Not supported by HW

1. 2.4 GHz WLAN, 5 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
4. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
5. 5 GHz Wireless Router is only supported for the U-NII-3 Band by S/W, therefore U-NII1, U-NII-2A, & U-NII-2C Bands were not evaluated for wireless router conditions.
6. This device supports 2x2 MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.
7. This device supports VoLTE.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A & U-NII-2C WIFI, only 2.4 GHz and UNII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02.

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 248227 D01 DR02-41929.

Since this device supports the band gap channels, the channels in the U-NII-2C band above 5.65 GHz were grouped with the channels in the U-NII-3 as a single aggregate band. The channels in U-NII-2C below 5.65 GHz were considered separately for SAR evaluation.

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 447498 D01v05, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; [(11/15)* √2.480] = 1.2< 3.0. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

GSM/GPRS DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS 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 D01v03.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02.

This device supports inter-band LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r01, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

1.8 Guidance Applied

- IEEE 1528-2003
- FCC KDB Publication 941225 D01v03, D05v02r03, D05Av01r01, D06v01r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01 DR02-41929 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r02 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r03, D02v01r01 (SAR Measurements up to 6 GHz)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.9 Device Serial Numbers

Several samples were used with identical hardware 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
Cell. CDMA/EVDO	08FCB	08FC8	08FC8
PCS CDMA/EVDO - Hotspot Mode Inactive	08FCF	08FCF	N/A
PCS CDMA/EVDO - Hotspot Mode Active	08FD5	N/A	08FD5
GSM/GPRS/EDGE 850	08C6B	08C68	08C68
UMTS 850	08C6B	08C6B	08C6B
GSM/GPRS/EDGE 1900	08C6B	08C68	08C68
UMTS 1900 - Hotspot Mode Inactive	08C6B	08C6B	N/A
UMTS 1900 - Hotspot Mode Active	N/A	N/A	08FDB
LTE Band 13	08FC4	08FDA	08FDA
LTE Band 5 (Cell)	08FC4	08FC4	08FC4
LTE Band 4 (AWS) - Hotspot Mode Inactive	08FA6	08FA6	N/A
LTE Band 4 (AWS) - Hotspot Mode Active	N/A	N/A	08FD5
LTE Band 2 (PCS) - Hotspot Mode Inactive	08D9A	08D9A	N/A
LTE Band 2 (PCS) - Hotspot Mode Active	N/A	N/A	08DB6
2.4 GHz WLAN	08FA2	08FA2	08FA2
5 GHz WLAN	08FA2	08FA2	08FA2

2 LTE INFORMATION

LTE Information			
FCC ID	**A3LSMG920V**		
Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	LTE Band 13 (779.5 - 784.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
Channel Bandwidths	LTE Band 13: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 13: 5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
LTE Band 13: 10 MHz	782 (23230)	782 (23230)	782 (23230)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)	1732.5 (20175)	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	1732.5 (20175)	1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	1732.5 (20175)	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)	1732.5 (20175)	1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)	1732.5 (20175)	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)	1732.5 (20175)	1745 (20300)
LTE Band 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)
UE Category	6		
Modulations Supported in UL	QPSK, 16QAM		
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES		
A-MPR (Additional MPR) disabled for SAR Testing?	YES		

	LTE B13 (PCC) + LTE B4 (SCC)	LTE B13 (PCC) + LTE B2 (SCC)	LTE B4 (PCC) + LTE B13 (SCC)	LTE B4 (PCC) + LTE B4 (SCC)	LTE B4 (PCC) + LTE B2 (SCC)	LTE B2 (PCC) + LTE B13 (SCC)	LTE B2 (PCC) + LTE B4 (SCC)	LTE B2 (PCC) + LTE B2 (SCC)
LTE Carrier Aggregation Possible Combinations	10MHz (B13) + 5MHz (B4)	10MHz (B13) + 5MHz (B2)	5MHz (B4) + 10MHz (B13)	5MHz (B4) + 5MHz (B4)	5MHz (B4) + 5MHz (B2)	5MHz (B2) + 10MHz (B13)	5MHz (B2) + 5MHz (B4)	5MHz (B2) + 5MHz (B2)
	10MHz (B13) + 10MHz (B4)	10MHz (B13) + 10MHz (B2)	10MHz (B4) + 10MHz (B13)	5MHz (B4) + 10MHz (B4)	5MHz (B4) + 10MHz (B2)	10MHz (B2) + 10MHz (B13)	5MHz (B2) + 10MHz (B4)	5MHz (B2) + 10MHz (B2)
	10MHz (B13) + 15MHz (B4)	10MHz (B13) + 15MHz (B2)	15MHz (B4) + 10MHz (B13)	5MHz (B4) + 15MHz (B4)	5MHz (B4) + 15MHz (B2)	15MHz (B2) + 10MHz (B13)	5MHz (B2) + 15MHz (B4)	5MHz (B2) + 15MHz (B2)
	10MHz (B13) + 20MHz (B4)	10MHz (B13) + 20MHz (B2)	20MHz (B4) + 10MHz (B13)	5MHz (B4) + 20MHz (B4)	5MHz (B4) + 20MHz (B2)	20MHz (B2) + 10MHz (B13)	5MHz (B2) + 20MHz (B4)	5MHz (B2) + 20MHz (B2)
				10MHz (B4) + 5MHz (B4)	10MHz (B4) + 5MHz (B2)		10MHz (B2) + 5MHz (B4)	10MHz (B2) + 5MHz (B2)
				10MHz (B4) + 10MHz (B4)	10MHz (B4) + 10MHz (B2)		10MHz (B2) + 10MHz (B4)	10MHz (B2) + 10MHz (B2)
				10MHz (B4) + 15MHz (B4)	10MHz (B4) + 15MHz (B2)		10MHz (B2) + 15MHz (B4)	10MHz (B2) + 15MHz (B2)
				10MHz (B4) + 20MHz (B4)	10MHz (B4) + 20MHz (B2)		10MHz (B2) + 20MHz (B4)	10MHz (B2) + 20MHz (B2)
				15MHz (B4) + 5MHz (B4)	15MHz (B4) + 5MHz (B2)		15MHz (B2) + 5MHz (B4)	15MHz (B2) + 5MHz (B2)
				15MHz (B4) + 10MHz (B4)	15MHz (B4) + 10MHz (B2)		15MHz (B2) + 10MHz (B4)	15MHz (B2) + 10MHz (B2)
				15MHz (B4) + 15MHz (B4)	15MHz (B4) + 15MHz (B2)		15MHz (B2) + 15MHz (B4)	15MHz (B2) + 15MHz (B2)
				15MHz (B4) + 20MHz (B4)	15MHz (B4) + 20MHz (B2)		15MHz (B2) + 20MHz (B4)	15MHz (B2) + 20MHz (B2)
				20MHz (B4) + 5MHz (B4)	20MHz (B4) + 5MHz (B2)		20MHz (B2) + 5MHz (B4)	20MHz (B2) + 5MHz (B2)
				20MHz (B4) + 10MHz (B4)	20MHz (B4) + 10MHz (B2)		20MHz (B2) + 10MHz (B4)	20MHz (B2) + 10MHz (B2)
				20MHz (B4) + 15MHz (B4)	20MHz (B4) + 15MHz (B2)		20MHz (B2) + 15MHz (B4)	20MHz (B2) + 15MHz (B2)
				20MHz (B4) + 20MHz (B4)	20MHz (B4) + 20MHz (B2)		20MHz (B2) + 20MHz (B4)	20MHz (B2) + 20MHz (B2)
LTE Carrier Aggregation Additional Information	This device does not support full CA features on 3GPP Release 10. It supports a maximum of 2 carriers in the downlink only. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WIFI Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.							

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01 and IEEE 1528-2013:

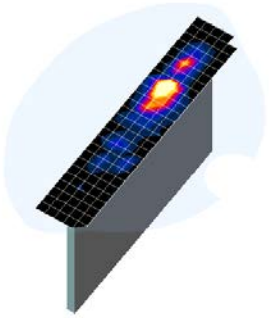


Figure 4-1
Sample SAR Area Scan

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 D01v01 (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 D01v01 (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 D01v01*

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

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

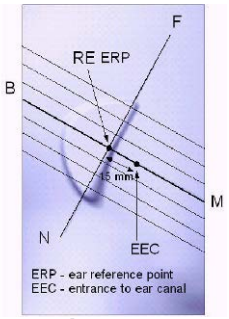


Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 5-3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

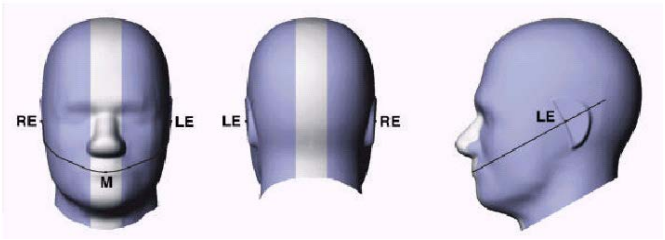


Figure 5-2
Front, back and side view of SAM Twin Phantom

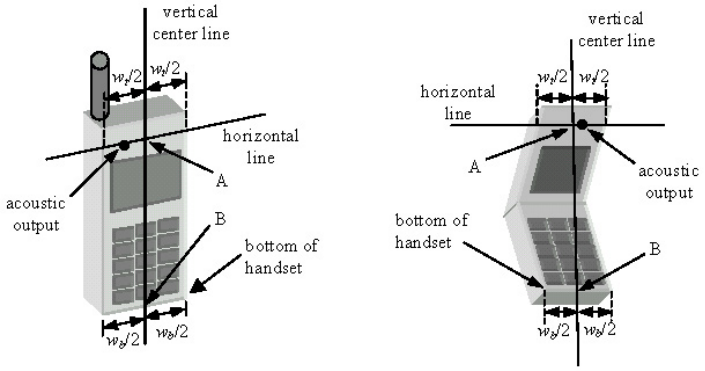


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

6.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

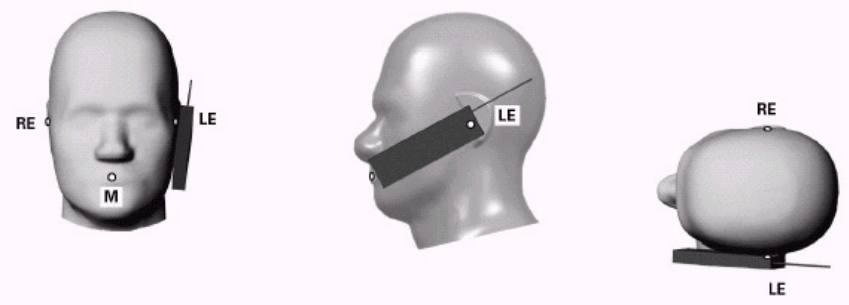


Figure 6-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

6.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

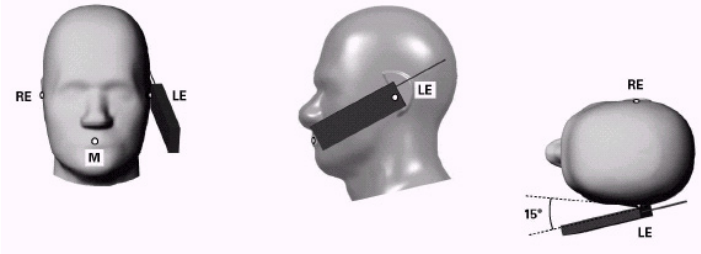


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

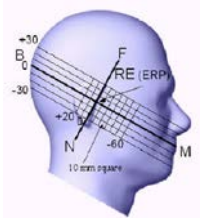


Figure 6-3
Side view w/ relevant markings

6.4 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 D04v01, 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 D01v05 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

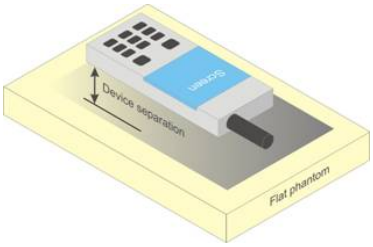


Figure 6-4
Sample Body-Worn Diagram

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

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

6.5 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 44798 D01v05 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v05, 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.

6.6 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 D06 v01 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 D01v05 publication 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.

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05, 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 D01v01r02.

8.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03, 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 $\leq$ 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 $\leq$ 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 D01v03 “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 D01v03 "3G SAR Measurement Procedures.

8.4.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "SAR Measurement Procedures for 3G Devices" v02, October 2007. Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the "All Up" condition.

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

Table 8-1
Parameters for Max. Power for RC1

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

Table 8-2
Parameters for Max. Power for RC3

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

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

. All measured SAR in 1x mode higher than 1.5 W/kg must be repeated for 1x Advanced.

8.4.2 Head SAR Measurements

SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. SAR for RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1 using the exposure configuration that results in the highest SAR for that channel in RC3.

Head SAR was additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.4.4 for EVDO Rev. A configuration parameters.

8.4.3 Body 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 Handsets with EVDO

For handsets with Ev-Do capabilities, when the maximum average output of each channel in Rev. 0 is less than ¼ dB higher than that measured in RC3 (1x RTT), body SAR for EV-DO is not required. Otherwise, SAR for Rev. 0 is measured on the maximum output channel at 153.6 kbps using the body exposure configuration that results in the highest SAR for that channel in RC3. SAR for Rev. A is not required when the maximum average output of each channel is less than that measured in Rev. 0 or less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel for Rev. A using

a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations. A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots would be configured in the downlink for both Rev. 0 and Rev. A.

8.4.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 per KDB Publication 941225 D01 procedures for “1x Ev-Do data Devices”. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels 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.

SAR is not required for 1x RTT for Ev-Do devices that also support 1x RTT voice and/or data operations, when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, CDMA “Body-SAR Measurement” procedures for “CDMA 2000 1x Handsets” were applied.

8.5 SAR Measurement Conditions for UMTS

8.5.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.5.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.5.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s". The 3G SAR test reduction procedure is applied to other spreading codes and multiple $DPDCH_n$ configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or $DPDCH_n$, for the highest reported SAR configuration in 12.2 kbps RMC.

8.5.4 SAR Measurements for Handsets 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 for Handsets 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.

8.6 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.6.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.6.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

8.6.3 A-MPR

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

8.6.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r01:

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 Carrier Aggregation

LTE Carrier Aggregation (CA) measurements were made in accordance to 3GPP TS 36.521-1 V10.4.0 (2012-12). 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 the Secondary component carrier (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC. Additional output powers were measured using two carriers in the downlink for the release 8 configurations with the highest output power among all channels, RB configurations and bandwidths for each uplink band. Per FCC Guidance, no SAR measurements were required.

8.7 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n/ac transmitters. 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 D01v DR02-41929 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.

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. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz are grouped with the 5.8 GHz channels in U-NII-3 band or §15.247 5.8 GHz band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are disabled, 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.

8.7.5 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is › 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

8.7.6 OFDM Transmission Mode and SAR Test Channel Selection

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

8.7.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output power is the initial test channel. Otherwise, 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)

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 applicable. When the highest reported SAR for the initial test configuration, adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power, is ≤ 1.2 W/kg, no additional SAR testing for the subsequent test configurations is required.

8.7.9 MIMO SAR considerations

Per KDB 248227 D01 DR02-41929, the simultaneous SAR provisions in KDB Publication 447498 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.

9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Table 9-1
Maximum Average RF Output Powers

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	22H	824.7	24.25	24.23	24.25	24.22	24.21	24.19
	384	22H	836.52	24.99	24.92	24.87	24.92	24.88	24.87
	777	22H	848.31	24.94	24.91	24.89	24.89	24.80	24.72
PCS	25	24E	1851.25	24.86	24.95	24.83	24.89	24.98	24.93
	600	24E	1880	24.55	24.44	24.51	24.47	24.51	24.42
	1175	24E	1908.75	24.75	24.73	24.69	24.71	24.85	24.82

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

Table 9-2
Hotspot Reduced Average RF Output Powers – Representing Hotspot Mode Active

Band	Channel	Rule Part	Frequency	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	24E	1851.25	22.90	22.94	22.99	22.93
	600	24E	1880	22.47	22.48	22.48	22.41
	1175	24E	1908.75	22.71	22.78	22.69	22.68

Per KDB Publication 941225 D01v03:

1. Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. Ev-Do and TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.
3. Hotspot SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. If the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, then Rev. A SAR is not required. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for that RF channel in Rev. 0. SAR is not required for 1x RTT for Ev-Do hotspot devices when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Head SAR was additionally evaluated with EVDO Rev. A to determine compliance for held-to-ear VoIP operations.

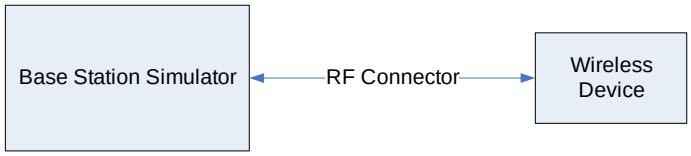


Figure 9-1
Power Measurement Setup

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	31.82	32.04	31.46	29.67	**28.97**	27.89	25.33	23.19	22.69
	190	32.86	33.00	32.41	30.52	**30.10**	27.83	26.21	24.00	23.50
	251	32.52	32.61	32.00	30.59	**29.49**	27.51	26.07	23.88	23.44
GSM 1900	512	29.97	29.93	28.50	27.21	**25.74**	25.57	24.40	22.43	21.08
	661	29.76	29.74	28.32	26.72	**25.09**	25.37	24.31	22.38	21.04
	810	30.05	30.04	28.42	26.85	**25.34**	25.71	24.79	22.65	21.43
		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	22.79	23.01	25.44	25.41	**25.96**	18.86	19.31	18.93	19.68
	190	23.83	23.97	26.39	26.26	**27.09**	18.80	20.19	19.74	20.49
	251	23.49	23.58	25.98	26.33	**26.48**	18.48	20.05	19.62	20.43
GSM 1900	512	20.94	20.90	22.89	22.95	**22.73**	16.54	18.38	18.17	18.07
	661	20.73	20.71	22.70	22.46	**22.08**	16.34	18.29	18.12	18.03
	810	21.02	21.01	22.80	22.59	**22.33**	16.68	18.77	18.39	18.42
GSM 850	**Frame Avg.Targets:**	23.47	23.47	25.98	26.24	**26.99**	18.47	19.98	19.24	19.99
GSM 1900		20.97	20.97	22.48	22.74	**22.99**	16.97	18.98	18.74	18.99

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. 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. GPRS (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.
4. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

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

Figure 9-2
Power Measurement Setup

9.3 UMTS Conducted Powers

Table 9-3
Maximum Average RF Output Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.59	23.93	23.93	23.98	23.58	23.72	-
99		12.2 kbps AMR	23.57	23.81	23.84	23.96	23.41	23.65	-
6	HSDPA	Subtest 1	21.93	22.66	22.77	22.76	22.27	22.61	0
6		Subtest 2	21.99	22.71	22.78	22.82	22.21	22.45	0
6		Subtest 3	21.51	22.47	22.41	22.29	21.67	21.71	0.5
6		Subtest 4	21.59	22.38	22.41	22.30	21.67	21.91	0.5
6	HSUPA	Subtest 1	21.92	22.39	22.49	22.32	21.53	22.30	0
6		Subtest 2	21.10	21.52	21.82	20.66	20.50	20.42	2
6		Subtest 3	21.11	21.25	21.33	20.52	20.44	20.48	1
6		Subtest 4	21.15	21.45	21.81	20.55	20.57	20.43	2
6		Subtest 5	21.51	22.08	22.43	22.38	21.79	22.19	0

Table 9-4
Hotspot Reduced Average RF Output Powers – Representing Hotspot Mode Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	21.59	21.37	21.49	-
99		12.2 kbps AMR	21.41	21.26	21.34	-
6	HSDPA	Subtest 1	20.47	20.27	20.32	0
6		Subtest 2	20.44	20.26	20.30	0
6		Subtest 3	19.95	19.73	19.71	0.5
6		Subtest 4	19.94	19.74	19.74	0.5
6	HSUPA	Subtest 1	20.45	20.26	20.31	0
6		Subtest 2	19.33	19.22	19.23	2
6		Subtest 3	19.13	19.06	19.11	1
6		Subtest 4	19.62	19.52	19.45	2
6		Subtest 5	20.27	20.16	20.22	0

UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

This device does not support DC-HSDPA.

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 1 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.

Figure 9-3
Power Measurement Setup

9.4 LTE Conducted Powers

9.4.1 LTE Band 13

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	10	QPSK	1	0	24.40	0	0
	782.0	23230	10	QPSK	1	25	**24.50**	0	0
	782.0	23230	10	QPSK	1	49	24.29	0	0
	782.0	23230	10	QPSK	25	0	23.39	0-1	1
	782.0	23230	10	QPSK	25	12	**23.49**	0-1	1
	782.0	23230	10	QPSK	25	25	23.41	0-1	1
	782.0	23230	10	QPSK	50	0	23.45	0-1	1
	782.0	23230	10	16QAM	1	0	23.42	0-1	1
	782.0	23230	10	16QAM	1	25	23.50	0-1	1
	782.0	23230	10	16QAM	1	49	23.32	0-1	1
	782.0	23230	10	16QAM	25	0	22.38	0-2	2
	782.0	23230	10	16QAM	25	12	22.49	0-2	2
	782.0	23230	10	16QAM	25	25	22.40	0-2	2
	782.0	23230	10	16QAM	50	0	22.41	0-2	2

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	5	QPSK	1	0	24.47	0	0
	782.0	23230	5	QPSK	1	12	24.35	0	0
	782.0	23230	5	QPSK	1	24	24.44	0	0
	782.0	23230	5	QPSK	12	0	23.26	0-1	1
	782.0	23230	5	QPSK	12	6	23.41	0-1	1
	782.0	23230	5	QPSK	12	13	23.28	0-1	1
	782.0	23230	5	QPSK	25	0	23.33	0-1	1
	782.0	23230	5	16-QAM	1	0	23.49	0-1	1
	782.0	23230	5	16-QAM	1	12	23.50	0-1	1
	782.0	23230	5	16-QAM	1	24	23.46	0-1	1
	782.0	23230	5	16-QAM	12	0	22.34	0-2	2
	782.0	23230	5	16-QAM	12	6	22.39	0-2	2
	782.0	23230	5	16-QAM	12	13	22.36	0-2	2
	782.0	23230	5	16-QAM	25	0	22.29	0-2	2

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

9.4.2 LTE Band 5 (Cell)

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	836.5	20525	10	QPSK	1	0	24.31	0	0
	836.5	20525	10	QPSK	1	25	**24.47**	0	0
	836.5	20525	10	QPSK	1	49	24.08	0	0
	836.5	20525	10	QPSK	25	0	23.15	0-1	1
	836.5	20525	10	QPSK	25	12	**23.27**	0-1	1
	836.5	20525	10	QPSK	25	25	23.10	0-1	1
	836.5	20525	10	QPSK	50	0	23.20	0-1	1
	836.5	20525	10	16QAM	1	0	23.33	0-1	1
	836.5	20525	10	16QAM	1	25	23.43	0-1	1
	836.5	20525	10	16QAM	1	49	23.32	0-1	1
	836.5	20525	10	16QAM	25	0	22.12	0-2	2
	836.5	20525	10	16QAM	25	12	22.23	0-2	2
	836.5	20525	10	16QAM	25	25	22.13	0-2	2
	836.5	20525	10	16QAM	50	0	22.20	0-2	2

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

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	826.5	20425	5	QPSK	1	0	24.46	0	0
	826.5	20425	5	QPSK	1	12	24.35	0	0
	826.5	20425	5	QPSK	1	24	24.36	0	0
	826.5	20425	5	QPSK	12	0	23.28	0-1	1
	826.5	20425	5	QPSK	12	6	23.31	0-1	1
	826.5	20425	5	QPSK	12	13	23.28	0-1	1
	826.5	20425	5	QPSK	25	0	23.26	0-1	1
	826.5	20425	5	16-QAM	1	0	23.30	0-1	1
	826.5	20425	5	16-QAM	1	12	23.41	0-1	1
	826.5	20425	5	16-QAM	1	24	23.33	0-1	1
	826.5	20425	5	16-QAM	12	0	22.40	0-2	2
	826.5	20425	5	16-QAM	12	6	22.32	0-2	2
	826.5	20425	5	16-QAM	12	13	22.33	0-2	2
	826.5	20425	5	16-QAM	25	0	22.31	0-2	2
Mid	836.5	20525	5	QPSK	1	0	24.43	0	0
	836.5	20525	5	QPSK	1	12	24.47	0	0
	836.5	20525	5	QPSK	1	24	24.41	0	0
	836.5	20525	5	QPSK	12	0	23.29	0-1	1
	836.5	20525	5	QPSK	12	6	23.34	0-1	1
	836.5	20525	5	QPSK	12	13	23.21	0-1	1
	836.5	20525	5	QPSK	25	0	23.32	0-1	1
	836.5	20525	5	16-QAM	1	0	23.30	0-1	1
	836.5	20525	5	16-QAM	1	12	23.22	0-1	1
	836.5	20525	5	16-QAM	1	24	23.36	0-1	1
	836.5	20525	5	16-QAM	12	0	22.19	0-2	2
	836.5	20525	5	16-QAM	12	6	22.23	0-2	2
	836.5	20525	5	16-QAM	12	13	22.17	0-2	2
	836.5	20525	5	16-QAM	25	0	22.20	0-2	2
High	846.5	20625	5	QPSK	1	0	24.24	0	0
	846.5	20625	5	QPSK	1	12	24.39	0	0
	846.5	20625	5	QPSK	1	24	24.13	0	0
	846.5	20625	5	QPSK	12	0	23.16	0-1	1
	846.5	20625	5	QPSK	12	6	23.06	0-1	1
	846.5	20625	5	QPSK	12	13	23.03	0-1	1
	846.5	20625	5	QPSK	25	0	23.04	0-1	1
	846.5	20625	5	16-QAM	1	0	23.38	0-1	1
	846.5	20625	5	16-QAM	1	12	23.31	0-1	1
	846.5	20625	5	16-QAM	1	24	23.29	0-1	1
	846.5	20625	5	16-QAM	12	0	22.13	0-2	2
	846.5	20625	5	16-QAM	12	6	22.02	0-2	2
	846.5	20625	5	16-QAM	12	13	22.05	0-2	2
	846.5	20625	5	16-QAM	25	0	22.01	0-2	2

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	825.5	20415	3	QPSK	1	0	24.45	0	0
	825.5	20415	3	QPSK	1	7	24.39	0	0
	825.5	20415	3	QPSK	1	14	24.37	0	0
	825.5	20415	3	QPSK	8	0	23.36	0-1	1
	825.5	20415	3	QPSK	8	4	23.41	0-1	1
	825.5	20415	3	QPSK	8	7	23.37	0-1	1
	825.5	20415	3	QPSK	15	0	23.38	0-1	1
	825.5	20415	3	16-QAM	1	0	23.40	0-1	1
	825.5	20415	3	16-QAM	1	7	23.48	0-1	1
	825.5	20415	3	16-QAM	1	14	23.41	0-1	1
	825.5	20415	3	16-QAM	8	0	22.27	0-2	2
	825.5	20415	3	16-QAM	8	4	22.29	0-2	2
	825.5	20415	3	16-QAM	8	7	22.17	0-2	2
	825.5	20415	3	16-QAM	15	0	22.15	0-2	2
Mid	836.5	20525	3	QPSK	1	0	24.39	0	0
	836.5	20525	3	QPSK	1	7	24.36	0	0
	836.5	20525	3	QPSK	1	14	24.27	0	0
	836.5	20525	3	QPSK	8	0	23.21	0-1	1
	836.5	20525	3	QPSK	8	4	23.32	0-1	1
	836.5	20525	3	QPSK	8	7	23.24	0-1	1
	836.5	20525	3	QPSK	15	0	23.21	0-1	1
	836.5	20525	3	16-QAM	1	0	23.35	0-1	1
	836.5	20525	3	16-QAM	1	7	23.42	0-1	1
	836.5	20525	3	16-QAM	1	14	23.36	0-1	1
	836.5	20525	3	16-QAM	8	0	22.24	0-2	2
	836.5	20525	3	16-QAM	8	4	22.31	0-2	2
	836.5	20525	3	16-QAM	8	7	22.23	0-2	2
	836.5	20525	3	16-QAM	15	0	22.26	0-2	2
High	847.5	20635	3	QPSK	1	0	24.25	0	0
	847.5	20635	3	QPSK	1	7	24.24	0	0
	847.5	20635	3	QPSK	1	14	24.15	0	0
	847.5	20635	3	QPSK	8	0	23.07	0-1	1
	847.5	20635	3	QPSK	8	4	23.04	0-1	1
	847.5	20635	3	QPSK	8	7	23.00	0-1	1
	847.5	20635	3	QPSK	15	0	23.05	0-1	1
	847.5	20635	3	16-QAM	1	0	23.31	0-1	1
	847.5	20635	3	16-QAM	1	7	23.18	0-1	1
	847.5	20635	3	16-QAM	1	14	23.12	0-1	1
	847.5	20635	3	16-QAM	8	0	22.01	0-2	2
	847.5	20635	3	16-QAM	8	4	22.16	0-2	2
	847.5	20635	3	16-QAM	8	7	22.07	0-2	2
	847.5	20635	3	16-QAM	15	0	22.00	0-2	2

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	824.7	20407	1.4	QPSK	1	0	24.36	0	0
	824.7	20407	1.4	QPSK	1	2	24.40	0	0
	824.7	20407	1.4	QPSK	1	5	24.41	0	0
	824.7	20407	1.4	QPSK	3	0	24.38	0	0
	824.7	20407	1.4	QPSK	3	2	24.35	0	0
	824.7	20407	1.4	QPSK	3	3	24.32	0	0
	824.7	20407	1.4	QPSK	6	0	23.27	0-1	1
	824.7	20407	1.4	16-QAM	1	0	23.46	0-1	1
	824.7	20407	1.4	16-QAM	1	2	23.38	0-1	1
	824.7	20407	1.4	16-QAM	1	5	23.35	0-1	1
	824.7	20407	1.4	16-QAM	3	0	23.30	0-1	1
	824.7	20407	1.4	16-QAM	3	2	23.27	0-1	1
	824.7	20407	1.4	16-QAM	3	3	23.19	0-1	1
	824.7	20407	1.4	16-QAM	6	0	22.21	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	24.28	0	0
	836.5	20525	1.4	QPSK	1	2	24.48	0	0
	836.5	20525	1.4	QPSK	1	5	24.32	0	0
	836.5	20525	1.4	QPSK	3	0	24.47	0	0
	836.5	20525	1.4	QPSK	3	2	24.49	0	0
	836.5	20525	1.4	QPSK	3	3	24.45	0	0
	836.5	20525	1.4	QPSK	6	0	23.42	0-1	1
	836.5	20525	1.4	16-QAM	1	0	23.25	0-1	1
	836.5	20525	1.4	16-QAM	1	2	23.30	0-1	1
	836.5	20525	1.4	16-QAM	1	5	23.33	0-1	1
	836.5	20525	1.4	16-QAM	3	0	23.27	0-1	1
	836.5	20525	1.4	16-QAM	3	2	23.20	0-1	1
	836.5	20525	1.4	16-QAM	3	3	23.24	0-1	1
	836.5	20525	1.4	16-QAM	6	0	22.47	0-2	2
High	848.3	20643	1.4	QPSK	1	0	24.38	0	0
	848.3	20643	1.4	QPSK	1	2	24.30	0	0
	848.3	20643	1.4	QPSK	1	5	24.29	0	0
	848.3	20643	1.4	QPSK	3	0	24.32	0	0
	848.3	20643	1.4	QPSK	3	2	24.22	0	0
	848.3	20643	1.4	QPSK	3	3	24.25	0	0
	848.3	20643	1.4	QPSK	6	0	23.21	0-1	1
	848.3	20643	1.4	16-QAM	1	0	23.22	0-1	1
	848.3	20643	1.4	16-QAM	1	2	23.31	0-1	1
	848.3	20643	1.4	16-QAM	1	5	23.24	0-1	1
	848.3	20643	1.4	16-QAM	3	0	23.15	0-1	1
	848.3	20643	1.4	16-QAM	3	2	23.09	0-1	1
	848.3	20643	1.4	16-QAM	3	3	23.11	0-1	1
	848.3	20643	1.4	16-QAM	6	0	22.17	0-2	2

9.4.3 LTE Band 4 (AWS) – Maximum Output Power

Table 9-11
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	**24.36**	0	0
	1732.5	20175	20	QPSK	1	50	23.57	0	0
	1732.5	20175	20	QPSK	1	99	23.83	0	0
	1732.5	20175	20	QPSK	50	0	**22.91**	0-1	1
	1732.5	20175	20	QPSK	50	25	22.58	0-1	1
	1732.5	20175	20	QPSK	50	50	22.65	0-1	1
	1732.5	20175	20	QPSK	100	0	22.62	0-1	1
	1732.5	20175	20	16QAM	1	0	23.50	0-1	1
	1732.5	20175	20	16QAM	1	50	22.92	0-1	1
	1732.5	20175	20	16QAM	1	99	23.23	0-1	1
	1732.5	20175	20	16QAM	50	0	21.96	0-2	2
	1732.5	20175	20	16QAM	50	25	21.65	0-2	2
	1732.5	20175	20	16QAM	50	50	21.72	0-2	2
	1732.5	20175	20	16QAM	100	0	21.64	0-2	2

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-12
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	24.13	0	0
	1717.5	20025	15	QPSK	1	36	23.91	0	0
	1717.5	20025	15	QPSK	1	74	23.90	0	0
	1717.5	20025	15	QPSK	36	0	23.02	0-1	1
	1717.5	20025	15	QPSK	36	18	22.96	0-1	1
	1717.5	20025	15	QPSK	36	37	22.97	0-1	1
	1717.5	20025	15	QPSK	75	0	22.96	0-1	1
	1717.5	20025	15	16QAM	1	0	23.45	0-1	1
	1717.5	20025	15	16QAM	1	36	23.35	0-1	1
	1717.5	20025	15	16QAM	1	74	23.21	0-1	1
	1717.5	20025	15	16QAM	36	0	22.16	0-2	2
	1717.5	20025	15	16QAM	36	18	22.07	0-2	2
	1717.5	20025	15	16QAM	36	37	22.03	0-2	2
	1717.5	20025	15	16QAM	75	0	21.99	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	23.70	0	0
	1732.5	20175	15	QPSK	1	36	23.52	0	0
	1732.5	20175	15	QPSK	1	74	23.65	0	0
	1732.5	20175	15	QPSK	36	0	22.54	0-1	1
	1732.5	20175	15	QPSK	36	18	22.50	0-1	1
	1732.5	20175	15	QPSK	36	37	22.57	0-1	1
	1732.5	20175	15	QPSK	75	0	22.51	0-1	1
	1732.5	20175	15	16QAM	1	0	22.82	0-1	1
	1732.5	20175	15	16QAM	1	36	22.84	0-1	1
	1732.5	20175	15	16QAM	1	74	22.90	0-1	1
	1732.5	20175	15	16QAM	36	0	21.63	0-2	2
	1732.5	20175	15	16QAM	36	18	21.59	0-2	2
	1732.5	20175	15	16QAM	36	37	21.58	0-2	2
	1732.5	20175	15	16QAM	75	0	21.53	0-2	2
High	1747.5	20325	15	QPSK	1	0	23.78	0	0
	1747.5	20325	15	QPSK	1	36	23.89	0	0
	1747.5	20325	15	QPSK	1	74	24.14	0	0
	1747.5	20325	15	QPSK	36	0	22.85	0-1	1
	1747.5	20325	15	QPSK	36	18	22.96	0-1	1
	1747.5	20325	15	QPSK	36	37	23.11	0-1	1
	1747.5	20325	15	QPSK	75	0	22.92	0-1	1
	1747.5	20325	15	16QAM	1	0	23.26	0-1	1
	1747.5	20325	15	16QAM	1	36	23.44	0-1	1
	1747.5	20325	15	16QAM	1	74	23.09	0-1	1
	1747.5	20325	15	16QAM	36	0	21.84	0-2	2
	1747.5	20325	15	16QAM	36	18	21.92	0-2	2
	1747.5	20325	15	16QAM	36	37	22.10	0-2	2
	1747.5	20325	15	16QAM	75	0	21.93	0-2	2

Table 9-13
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	24.31	0	0
	1715	20000	10	QPSK	1	25	24.14	0	0
	1715	20000	10	QPSK	1	49	24.05	0	0
	1715	20000	10	QPSK	25	0	23.01	0-1	1
	1715	20000	10	QPSK	25	12	22.71	0-1	1
	1715	20000	10	QPSK	25	25	22.70	0-1	1
	1715	20000	10	QPSK	50	0	22.77	0-1	1
	1715	20000	10	16QAM	1	0	23.28	0-1	1
	1715	20000	10	16QAM	1	25	23.12	0-1	1
	1715	20000	10	16QAM	1	49	22.78	0-1	1
	1715	20000	10	16QAM	25	0	21.98	0-2	2
	1715	20000	10	16QAM	25	12	21.84	0-2	2
	1715	20000	10	16QAM	25	25	21.82	0-2	2
	1715	20000	10	16QAM	50	0	21.79	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	23.86	0	0
	1732.5	20175	10	QPSK	1	25	23.77	0	0
	1732.5	20175	10	QPSK	1	49	23.78	0	0
	1732.5	20175	10	QPSK	25	0	22.60	0-1	1
	1732.5	20175	10	QPSK	25	12	22.58	0-1	1
	1732.5	20175	10	QPSK	25	25	22.51	0-1	1
	1732.5	20175	10	QPSK	50	0	22.52	0-1	1
	1732.5	20175	10	16QAM	1	0	23.17	0-1	1
	1732.5	20175	10	16QAM	1	25	23.19	0-1	1
	1732.5	20175	10	16QAM	1	49	23.08	0-1	1
	1732.5	20175	10	16QAM	25	0	21.57	0-2	2
	1732.5	20175	10	16QAM	25	12	21.58	0-2	2
	1732.5	20175	10	16QAM	25	25	21.56	0-2	2
	1732.5	20175	10	16QAM	50	0	21.51	0-2	2
High	1750	20350	10	QPSK	1	0	24.14	0	0
	1750	20350	10	QPSK	1	25	24.09	0	0
	1750	20350	10	QPSK	1	49	24.22	0	0
	1750	20350	10	QPSK	25	0	23.17	0-1	1
	1750	20350	10	QPSK	25	12	23.15	0-1	1
	1750	20350	10	QPSK	25	25	23.14	0-1	1
	1750	20350	10	QPSK	50	0	23.16	0-1	1
	1750	20350	10	16QAM	1	0	23.33	0-1	1
	1750	20350	10	16QAM	1	25	23.23	0-1	1
	1750	20350	10	16QAM	1	49	23.15	0-1	1
	1750	20350	10	16QAM	25	0	22.32	0-2	2
	1750	20350	10	16QAM	25	12	22.19	0-2	2
	1750	20350	10	16QAM	25	25	22.15	0-2	2
	1750	20350	10	16QAM	50	0	22.09	0-2	2

Table 9-14
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	24.08	0	0
	1712.5	19975	5	QPSK	1	12	24.10	0	0
	1712.5	19975	5	QPSK	1	24	23.94	0	0
	1712.5	19975	5	QPSK	12	0	22.89	0-1	1
	1712.5	19975	5	QPSK	12	6	22.90	0-1	1
	1712.5	19975	5	QPSK	12	13	22.73	0-1	1
	1712.5	19975	5	QPSK	25	0	22.86	0-1	1
	1712.5	19975	5	16-QAM	1	0	23.20	0-1	1
	1712.5	19975	5	16-QAM	1	12	23.14	0-1	1
	1712.5	19975	5	16-QAM	1	24	23.34	0-1	1
	1712.5	19975	5	16-QAM	12	0	21.95	0-2	2
	1712.5	19975	5	16-QAM	12	6	21.92	0-2	2
	1712.5	19975	5	16-QAM	12	13	21.81	0-2	2
	1712.5	19975	5	16-QAM	25	0	21.78	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	23.75	0	0
	1732.5	20175	5	QPSK	1	12	23.67	0	0
	1732.5	20175	5	QPSK	1	24	23.88	0	0
	1732.5	20175	5	QPSK	12	0	22.55	0-1	1
	1732.5	20175	5	QPSK	12	6	22.59	0-1	1
	1732.5	20175	5	QPSK	12	13	22.56	0-1	1
	1732.5	20175	5	QPSK	25	0	22.52	0-1	1
	1732.5	20175	5	16-QAM	1	0	23.09	0-1	1
	1732.5	20175	5	16-QAM	1	12	23.12	0-1	1
	1732.5	20175	5	16-QAM	1	24	23.01	0-1	1
	1732.5	20175	5	16-QAM	12	0	21.60	0-2	2
	1732.5	20175	5	16-QAM	12	6	21.57	0-2	2
	1732.5	20175	5	16-QAM	12	13	21.59	0-2	2
	1732.5	20175	5	16-QAM	25	0	21.52	0-2	2
High	1752.5	20375	5	QPSK	1	0	24.18	0	0
	1752.5	20375	5	QPSK	1	12	24.11	0	0
	1752.5	20375	5	QPSK	1	24	24.21	0	0
	1752.5	20375	5	QPSK	12	0	23.25	0-1	1
	1752.5	20375	5	QPSK	12	6	23.19	0-1	1
	1752.5	20375	5	QPSK	12	13	23.17	0-1	1
	1752.5	20375	5	QPSK	25	0	23.20	0-1	1
	1752.5	20375	5	16-QAM	1	0	23.16	0-1	1
	1752.5	20375	5	16-QAM	1	12	23.42	0-1	1
	1752.5	20375	5	16-QAM	1	24	23.30	0-1	1
	1752.5	20375	5	16-QAM	12	0	22.48	0-2	2
	1752.5	20375	5	16-QAM	12	6	22.41	0-2	2
	1752.5	20375	5	16-QAM	12	13	22.40	0-2	2
	1752.5	20375	5	16-QAM	25	0	22.36	0-2	2

Table 9-15
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	24.02	0	0
	1711.5	19965	3	QPSK	1	7	23.95	0	0
	1711.5	19965	3	QPSK	1	14	24.05	0	0
	1711.5	19965	3	QPSK	8	0	22.99	0-1	1
	1711.5	19965	3	QPSK	8	4	22.87	0-1	1
	1711.5	19965	3	QPSK	8	7	22.79	0-1	1
	1711.5	19965	3	QPSK	15	0	22.86	0-1	1
	1711.5	19965	3	16-QAM	1	0	23.31	0-1	1
	1711.5	19965	3	16-QAM	1	7	23.14	0-1	1
	1711.5	19965	3	16-QAM	1	14	23.18	0-1	1
	1711.5	19965	3	16-QAM	8	0	22.15	0-2	2
	1711.5	19965	3	16-QAM	8	4	22.10	0-2	2
	1711.5	19965	3	16-QAM	8	7	22.08	0-2	2
	1711.5	19965	3	16-QAM	15	0	21.92	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	23.66	0	0
	1732.5	20175	3	QPSK	1	7	23.80	0	0
	1732.5	20175	3	QPSK	1	14	24.15	0	0
	1732.5	20175	3	QPSK	8	0	22.58	0-1	1
	1732.5	20175	3	QPSK	8	4	22.50	0-1	1
	1732.5	20175	3	QPSK	8	7	22.57	0-1	1
	1732.5	20175	3	QPSK	15	0	22.52	0-1	1
	1732.5	20175	3	16-QAM	1	0	22.84	0-1	1
	1732.5	20175	3	16-QAM	1	7	23.05	0-1	1
	1732.5	20175	3	16-QAM	1	14	23.00	0-1	1
	1732.5	20175	3	16-QAM	8	0	21.66	0-2	2
	1732.5	20175	3	16-QAM	8	4	21.73	0-2	2
	1732.5	20175	3	16-QAM	8	7	21.64	0-2	2
	1732.5	20175	3	16-QAM	15	0	21.52	0-2	2
High	1753.5	20385	3	QPSK	1	0	24.28	0	0
	1753.5	20385	3	QPSK	1	7	24.07	0	0
	1753.5	20385	3	QPSK	1	14	24.10	0	0
	1753.5	20385	3	QPSK	8	0	23.32	0-1	1
	1753.5	20385	3	QPSK	8	4	23.41	0-1	1
	1753.5	20385	3	QPSK	8	7	23.42	0-1	1
	1753.5	20385	3	QPSK	15	0	23.38	0-1	1
	1753.5	20385	3	16-QAM	1	0	23.17	0-1	1
	1753.5	20385	3	16-QAM	1	7	23.05	0-1	1
	1753.5	20385	3	16-QAM	1	14	23.19	0-1	1
	1753.5	20385	3	16-QAM	8	0	22.32	0-2	2
	1753.5	20385	3	16-QAM	8	4	22.35	0-2	2
	1753.5	20385	3	16-QAM	8	7	22.40	0-2	2
	1753.5	20385	3	16-QAM	15	0	22.26	0-2	2

Table 9-16
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	24.13	0	0
	1710.7	19957	1.4	QPSK	1	2	24.05	0	0
	1710.7	19957	1.4	QPSK	1	5	23.99	0	0
	1710.7	19957	1.4	QPSK	3	0	23.86	0	0
	1710.7	19957	1.4	QPSK	3	2	23.77	0	0
	1710.7	19957	1.4	QPSK	3	3	23.90	0	0
	1710.7	19957	1.4	QPSK	6	0	22.90	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	23.13	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	23.04	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.90	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	22.97	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	22.74	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	22.60	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	22.00	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	23.64	0	0
	1732.5	20175	1.4	QPSK	1	2	23.59	0	0
	1732.5	20175	1.4	QPSK	1	5	23.60	0	0
	1732.5	20175	1.4	QPSK	3	0	23.51	0	0
	1732.5	20175	1.4	QPSK	3	2	23.50	0	0
	1732.5	20175	1.4	QPSK	3	3	23.61	0	0
	1732.5	20175	1.4	QPSK	6	0	22.50	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	23.05	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	22.92	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	22.87	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	22.61	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	22.63	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	22.72	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	21.53	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	23.97	0	0
	1754.3	20393	1.4	QPSK	1	2	23.88	0	0
	1754.3	20393	1.4	QPSK	1	5	24.07	0	0
	1754.3	20393	1.4	QPSK	3	0	24.11	0	0
	1754.3	20393	1.4	QPSK	3	2	23.77	0	0
	1754.3	20393	1.4	QPSK	3	3	23.70	0	0
	1754.3	20393	1.4	QPSK	6	0	23.06	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.98	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	23.02	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.99	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	23.00	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	22.85	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.76	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	21.78	0-2	2

9.4.4 LTE Band 4 (AWS) – Reduced Power - Representing Hotspot Mode Active

Table 9-17
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	21.75	0	0
	1732.5	20175	20	QPSK	1	50	21.82	0	0
	1732.5	20175	20	QPSK	1	99	**22.16**	0	0
	1732.5	20175	20	QPSK	50	0	20.89	0-1	1
	1732.5	20175	20	QPSK	50	25	20.86	0-1	1
	1732.5	20175	20	QPSK	50	50	**20.98**	0-1	1
	1732.5	20175	20	QPSK	100	0	20.96	0-1	1
	1732.5	20175	20	16QAM	1	0	21.06	0-1	1
	1732.5	20175	20	16QAM	1	50	20.99	0-1	1
	1732.5	20175	20	16QAM	1	99	21.26	0-1	1
	1732.5	20175	20	16QAM	50	0	19.80	0-2	2
	1732.5	20175	20	16QAM	50	25	19.82	0-2	2
	1732.5	20175	20	16QAM	50	50	19.95	0-2	2
	1732.5	20175	20	16QAM	100	0	19.87	0-2	2

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-18
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	21.58	0	0
	1717.5	20025	15	QPSK	1	36	22.01	0	0
	1717.5	20025	15	QPSK	1	74	22.01	0	0
	1717.5	20025	15	QPSK	36	0	20.76	0-1	1
	1717.5	20025	15	QPSK	36	18	21.02	0-1	1
	1717.5	20025	15	QPSK	36	37	21.17	0-1	1
	1717.5	20025	15	QPSK	75	0	21.24	0-1	1
	1717.5	20025	15	16QAM	1	0	21.05	0-1	1
	1717.5	20025	15	16QAM	1	36	21.16	0-1	1
	1717.5	20025	15	16QAM	1	74	21.06	0-1	1
	1717.5	20025	15	16QAM	36	0	19.58	0-2	2
	1717.5	20025	15	16QAM	36	18	20.08	0-2	2
	1717.5	20025	15	16QAM	36	37	19.66	0-2	2
	1717.5	20025	15	16QAM	75	0	19.84	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	21.76	0	0
	1732.5	20175	15	QPSK	1	36	21.88	0	0
	1732.5	20175	15	QPSK	1	74	22.15	0	0
	1732.5	20175	15	QPSK	36	0	20.76	0-1	1
	1732.5	20175	15	QPSK	36	18	21.03	0-1	1
	1732.5	20175	15	QPSK	36	37	21.11	0-1	1
	1732.5	20175	15	QPSK	75	0	21.08	0-1	1
	1732.5	20175	15	16QAM	1	0	21.12	0-1	1
	1732.5	20175	15	16QAM	1	36	20.97	0-1	1
	1732.5	20175	15	16QAM	1	74	21.10	0-1	1
	1732.5	20175	15	16QAM	36	0	19.64	0-2	2
	1732.5	20175	15	16QAM	36	18	19.92	0-2	2
	1732.5	20175	15	16QAM	36	37	19.80	0-2	2
	1732.5	20175	15	16QAM	75	0	19.82	0-2	2
High	1747.5	20325	15	QPSK	1	0	21.69	0	0
	1747.5	20325	15	QPSK	1	36	21.95	0	0
	1747.5	20325	15	QPSK	1	74	22.10	0	0
	1747.5	20325	15	QPSK	36	0	20.59	0-1	1
	1747.5	20325	15	QPSK	36	18	21.17	0-1	1
	1747.5	20325	15	QPSK	36	37	20.95	0-1	1
	1747.5	20325	15	QPSK	75	0	21.14	0-1	1
	1747.5	20325	15	16QAM	1	0	21.07	0-1	1
	1747.5	20325	15	16QAM	1	36	21.17	0-1	1
	1747.5	20325	15	16QAM	1	74	20.91	0-1	1
	1747.5	20325	15	16QAM	36	0	19.79	0-2	2
	1747.5	20325	15	16QAM	36	18	19.72	0-2	2
	1747.5	20325	15	16QAM	36	37	19.80	0-2	2
	1747.5	20325	15	16QAM	75	0	19.90	0-2	2

Table 9-19
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	22.00	0	0
	1715	20000	10	QPSK	1	25	21.59	0	0
	1715	20000	10	QPSK	1	49	22.15	0	0
	1715	20000	10	QPSK	25	0	20.66	0-1	1
	1715	20000	10	QPSK	25	12	21.26	0-1	1
	1715	20000	10	QPSK	25	25	21.00	0-1	1
	1715	20000	10	QPSK	50	0	20.77	0-1	1
	1715	20000	10	16QAM	1	0	21.03	0-1	1
	1715	20000	10	16QAM	1	25	21.14	0-1	1
	1715	20000	10	16QAM	1	49	21.38	0-1	1
	1715	20000	10	16QAM	25	0	19.83	0-2	2
	1715	20000	10	16QAM	25	12	20.18	0-2	2
	1715	20000	10	16QAM	25	25	19.53	0-2	2
	1715	20000	10	16QAM	50	0	20.12	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	21.80	0	0
	1732.5	20175	10	QPSK	1	25	21.68	0	0
	1732.5	20175	10	QPSK	1	49	22.08	0	0
	1732.5	20175	10	QPSK	25	0	20.64	0-1	1
	1732.5	20175	10	QPSK	25	12	21.18	0-1	1
	1732.5	20175	10	QPSK	25	25	20.93	0-1	1
	1732.5	20175	10	QPSK	50	0	20.92	0-1	1
	1732.5	20175	10	16QAM	1	0	20.92	0-1	1
	1732.5	20175	10	16QAM	1	25	20.95	0-1	1
	1732.5	20175	10	16QAM	1	49	21.25	0-1	1
	1732.5	20175	10	16QAM	25	0	19.74	0-2	2
	1732.5	20175	10	16QAM	25	12	20.01	0-2	2
	1732.5	20175	10	16QAM	25	25	19.60	0-2	2
	1732.5	20175	10	16QAM	50	0	19.92	0-2	2
High	1750	20350	10	QPSK	1	0	21.99	0	0
	1750	20350	10	QPSK	1	25	21.71	0	0
	1750	20350	10	QPSK	1	49	22.01	0	0
	1750	20350	10	QPSK	25	0	20.59	0-1	1
	1750	20350	10	QPSK	25	12	21.17	0-1	1
	1750	20350	10	QPSK	25	25	20.76	0-1	1
	1750	20350	10	QPSK	50	0	21.00	0-1	1
	1750	20350	10	16QAM	1	0	20.99	0-1	1
	1750	20350	10	16QAM	1	25	20.78	0-1	1
	1750	20350	10	16QAM	1	49	21.40	0-1	1
	1750	20350	10	16QAM	25	0	19.60	0-2	2
	1750	20350	10	16QAM	25	12	20.17	0-2	2
	1750	20350	10	16QAM	25	25	19.76	0-2	2
	1750	20350	10	16QAM	50	0	20.00	0-2	2

Table 9-20
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	21.72	0	0
	1712.5	19975	5	QPSK	1	12	21.94	0	0
	1712.5	19975	5	QPSK	1	24	21.92	0	0
	1712.5	19975	5	QPSK	12	0	20.51	0-1	1
	1712.5	19975	5	QPSK	12	6	21.05	0-1	1
	1712.5	19975	5	QPSK	12	13	20.91	0-1	1
	1712.5	19975	5	QPSK	25	0	21.05	0-1	1
	1712.5	19975	5	16-QAM	1	0	21.05	0-1	1
	1712.5	19975	5	16-QAM	1	12	20.70	0-1	1
	1712.5	19975	5	16-QAM	1	24	21.03	0-1	1
	1712.5	19975	5	16-QAM	12	0	19.85	0-2	2
	1712.5	19975	5	16-QAM	12	6	20.14	0-2	2
	1712.5	19975	5	16-QAM	12	13	19.87	0-2	2
	1712.5	19975	5	16-QAM	25	0	19.88	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	21.63	0	0
	1732.5	20175	5	QPSK	1	12	21.77	0	0
	1732.5	20175	5	QPSK	1	24	22.10	0	0
	1732.5	20175	5	QPSK	12	0	20.69	0-1	1
	1732.5	20175	5	QPSK	12	6	21.06	0-1	1
	1732.5	20175	5	QPSK	12	13	21.08	0-1	1
	1732.5	20175	5	QPSK	25	0	21.05	0-1	1
	1732.5	20175	5	16-QAM	1	0	21.05	0-1	1
	1732.5	20175	5	16-QAM	1	12	20.77	0-1	1
	1732.5	20175	5	16-QAM	1	24	21.11	0-1	1
	1732.5	20175	5	16-QAM	12	0	19.93	0-2	2
	1732.5	20175	5	16-QAM	12	6	19.99	0-2	2
	1732.5	20175	5	16-QAM	12	13	19.71	0-2	2
	1732.5	20175	5	16-QAM	25	0	19.96	0-2	2
High	1752.5	20375	5	QPSK	1	0	21.82	0	0
	1752.5	20375	5	QPSK	1	12	21.61	0	0
	1752.5	20375	5	QPSK	1	24	22.12	0	0
	1752.5	20375	5	QPSK	12	0	20.54	0-1	1
	1752.5	20375	5	QPSK	12	6	20.97	0-1	1
	1752.5	20375	5	QPSK	12	13	21.23	0-1	1
	1752.5	20375	5	QPSK	25	0	20.95	0-1	1
	1752.5	20375	5	16-QAM	1	0	21.15	0-1	1
	1752.5	20375	5	16-QAM	1	12	20.81	0-1	1
	1752.5	20375	5	16-QAM	1	24	21.26	0-1	1
	1752.5	20375	5	16-QAM	12	0	19.80	0-2	2
	1752.5	20375	5	16-QAM	12	6	19.98	0-2	2
	1752.5	20375	5	16-QAM	12	13	19.88	0-2	2
	1752.5	20375	5	16-QAM	25	0	19.86	0-2	2

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

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	21.76	0	0
	1711.5	19965	3	QPSK	1	7	21.70	0	0
	1711.5	19965	3	QPSK	1	14	21.87	0	0
	1711.5	19965	3	QPSK	8	0	20.65	0-1	1
	1711.5	19965	3	QPSK	8	4	20.94	0-1	1
	1711.5	19965	3	QPSK	8	7	20.96	0-1	1
	1711.5	19965	3	QPSK	15	0	20.73	0-1	1
	1711.5	19965	3	16-QAM	1	0	21.15	0-1	1
	1711.5	19965	3	16-QAM	1	7	20.75	0-1	1
	1711.5	19965	3	16-QAM	1	14	21.19	0-1	1
	1711.5	19965	3	16-QAM	8	0	19.66	0-2	2
	1711.5	19965	3	16-QAM	8	4	19.97	0-2	2
	1711.5	19965	3	16-QAM	8	7	19.81	0-2	2
	1711.5	19965	3	16-QAM	15	0	19.95	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	21.63	0	0
	1732.5	20175	3	QPSK	1	7	21.83	0	0
	1732.5	20175	3	QPSK	1	14	21.96	0	0
	1732.5	20175	3	QPSK	8	0	20.50	0-1	1
	1732.5	20175	3	QPSK	8	4	21.10	0-1	1
	1732.5	20175	3	QPSK	8	7	21.10	0-1	1
	1732.5	20175	3	QPSK	15	0	20.88	0-1	1
	1732.5	20175	3	16-QAM	1	0	21.24	0-1	1
	1732.5	20175	3	16-QAM	1	7	20.74	0-1	1
	1732.5	20175	3	16-QAM	1	14	21.04	0-1	1
	1732.5	20175	3	16-QAM	8	0	19.54	0-2	2
	1732.5	20175	3	16-QAM	8	4	19.95	0-2	2
	1732.5	20175	3	16-QAM	8	7	19.51	0-2	2
	1732.5	20175	3	16-QAM	15	0	20.08	0-2	2
High	1753.5	20385	3	QPSK	1	0	21.73	0	0
	1753.5	20385	3	QPSK	1	7	21.83	0	0
	1753.5	20385	3	QPSK	1	14	21.96	0	0
	1753.5	20385	3	QPSK	8	0	20.54	0-1	1
	1753.5	20385	3	QPSK	8	4	21.06	0-1	1
	1753.5	20385	3	QPSK	8	7	21.22	0-1	1
	1753.5	20385	3	QPSK	15	0	21.00	0-1	1
	1753.5	20385	3	16-QAM	1	0	21.41	0-1	1
	1753.5	20385	3	16-QAM	1	7	20.59	0-1	1
	1753.5	20385	3	16-QAM	1	14	20.90	0-1	1
	1753.5	20385	3	16-QAM	8	0	19.53	0-2	2
	1753.5	20385	3	16-QAM	8	4	19.95	0-2	2
	1753.5	20385	3	16-QAM	8	7	19.71	0-2	2
	1753.5	20385	3	16-QAM	15	0	20.07	0-2	2

Table 9-22
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	21.57	0	0
	1710.7	19957	1.4	QPSK	1	2	22.06	0	0
	1710.7	19957	1.4	QPSK	1	5	22.04	0	0
	1710.7	19957	1.4	QPSK	3	0	21.57	0	0
	1710.7	19957	1.4	QPSK	3	2	21.97	0	0
	1710.7	19957	1.4	QPSK	3	3	22.08	0	0
	1710.7	19957	1.4	QPSK	6	0	21.21	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	21.30	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	20.99	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	21.21	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	20.61	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	20.85	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	20.55	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	20.26	0-2	2
Mid	1732.5	20175	1.4	QPSK	1	0	21.62	0	0
	1732.5	20175	1.4	QPSK	1	2	21.87	0	0
	1732.5	20175	1.4	QPSK	1	5	21.91	0	0
	1732.5	20175	1.4	QPSK	3	0	21.69	0	0
	1732.5	20175	1.4	QPSK	3	2	21.94	0	0
	1732.5	20175	1.4	QPSK	3	3	22.08	0	0
	1732.5	20175	1.4	QPSK	6	0	21.05	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	21.14	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	20.91	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	21.12	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	20.88	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	21.02	0-1	1
	1732.5	20175	1.4	16-QAM	3	3	21.40	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	20.20	0-2	2
High	1754.3	20393	1.4	QPSK	1	0	21.90	0	0
	1754.3	20393	1.4	QPSK	1	2	22.02	0	0
	1754.3	20393	1.4	QPSK	1	5	22.08	0	0
	1754.3	20393	1.4	QPSK	3	0	21.90	0	0
	1754.3	20393	1.4	QPSK	3	2	22.03	0	0
	1754.3	20393	1.4	QPSK	3	3	22.09	0	0
	1754.3	20393	1.4	QPSK	6	0	20.90	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	21.17	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	21.04	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	21.09	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	20.93	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	20.85	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	20.82	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	20.35	0-2	2

9.4.5 LTE Band 2 (PCS) – Maximum Output Power

Table 9-23
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	23.51	0	0
	1860	18700	20	QPSK	1	50	**23.92**	0	0
	1860	18700	20	QPSK	1	99	23.55	0	0
	1860	18700	20	QPSK	50	0	22.69	0-1	1
	1860	18700	20	QPSK	50	25	**22.85**	0-1	1
	1860	18700	20	QPSK	50	50	22.78	0-1	1
	1860	18700	20	QPSK	100	0	22.71	0-1	1
	1860	18700	20	16QAM	1	0	22.91	0-1	1
	1860	18700	20	16QAM	1	50	23.28	0-1	1
	1860	18700	20	16QAM	1	99	23.07	0-1	1
	1860	18700	20	16QAM	50	0	21.70	0-2	2
	1860	18700	20	16QAM	50	25	21.87	0-2	2
	1860	18700	20	16QAM	50	50	21.83	0-2	2
	1860	18700	20	16QAM	100	0	21.71	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	23.50	0	0
	1880.0	18900	20	QPSK	1	50	23.73	0	0
	1880.0	18900	20	QPSK	1	99	23.52	0	0
	1880.0	18900	20	QPSK	50	0	22.83	0-1	1
	1880.0	18900	20	QPSK	50	25	22.68	0-1	1
	1880.0	18900	20	QPSK	50	50	22.76	0-1	1
	1880.0	18900	20	QPSK	100	0	22.70	0-1	1
	1880.0	18900	20	16QAM	1	0	23.03	0-1	1
	1880.0	18900	20	16QAM	1	50	23.17	0-1	1
	1880.0	18900	20	16QAM	1	99	22.89	0-1	1
	1880.0	18900	20	16QAM	50	0	21.61	0-2	2
	1880.0	18900	20	16QAM	50	25	21.83	0-2	2
	1880.0	18900	20	16QAM	50	50	21.74	0-2	2
	1880.0	18900	20	16QAM	100	0	21.84	0-2	2
High	1900	19100	20	QPSK	1	0	23.41	0	0
	1900	19100	20	QPSK	1	50	23.26	0	0
	1900	19100	20	QPSK	1	99	23.49	0	0
	1900	19100	20	QPSK	50	0	22.15	0-1	1
	1900	19100	20	QPSK	50	25	22.23	0-1	1
	1900	19100	20	QPSK	50	50	22.22	0-1	1
	1900	19100	20	QPSK	100	0	22.20	0-1	1
	1900	19100	20	16QAM	1	0	22.46	0-1	1
	1900	19100	20	16QAM	1	50	22.26	0-1	1
	1900	19100	20	16QAM	1	99	22.35	0-1	1
	1900	19100	20	16QAM	50	0	21.04	0-2	2
	1900	19100	20	16QAM	50	25	21.08	0-2	2
	1900	19100	20	16QAM	50	50	21.05	0-2	2
	1900	19100	20	16QAM	100	0	21.17	0-2	2

Table 9-24
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	18675	15	QPSK	1	0	23.51	0	0
	1857.5	18675	15	QPSK	1	36	23.69	0	0
	1857.5	18675	15	QPSK	1	74	23.81	0	0
	1857.5	18675	15	QPSK	36	0	22.62	0-1	1
	1857.5	18675	15	QPSK	36	18	22.73	0-1	1
	1857.5	18675	15	QPSK	36	37	22.83	0-1	1
	1857.5	18675	15	QPSK	75	0	22.74	0-1	1
	1857.5	18675	15	16QAM	1	0	22.53	0-1	1
	1857.5	18675	15	16QAM	1	36	22.82	0-1	1
	1857.5	18675	15	16QAM	1	74	22.95	0-1	1
	1857.5	18675	15	16QAM	36	0	21.55	0-2	2
	1857.5	18675	15	16QAM	36	18	21.63	0-2	2
	1857.5	18675	15	16QAM	36	37	21.71	0-2	2
	1857.5	18675	15	16QAM	75	0	21.69	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	23.56	0	0
	1880.0	18900	15	QPSK	1	36	23.70	0	0
	1880.0	18900	15	QPSK	1	74	23.60	0	0
	1880.0	18900	15	QPSK	36	0	22.78	0-1	1
	1880.0	18900	15	QPSK	36	18	22.85	0-1	1
	1880.0	18900	15	QPSK	36	37	22.92	0-1	1
	1880.0	18900	15	QPSK	75	0	22.80	0-1	1
	1880.0	18900	15	16QAM	1	0	22.94	0-1	1
	1880.0	18900	15	16QAM	1	36	23.10	0-1	1
	1880.0	18900	15	16QAM	1	74	23.03	0-1	1
	1880.0	18900	15	16QAM	36	0	21.80	0-2	2
	1880.0	18900	15	16QAM	36	18	21.85	0-2	2
	1880.0	18900	15	16QAM	36	37	21.94	0-2	2
	1880.0	18900	15	16QAM	75	0	21.74	0-2	2
High	1902.5	19125	15	QPSK	1	0	23.18	0	0
	1902.5	19125	15	QPSK	1	36	23.38	0	0
	1902.5	19125	15	QPSK	1	74	23.37	0	0
	1902.5	19125	15	QPSK	36	0	22.18	0-1	1
	1902.5	19125	15	QPSK	36	18	22.14	0-1	1
	1902.5	19125	15	QPSK	36	37	22.10	0-1	1
	1902.5	19125	15	QPSK	75	0	22.30	0-1	1
	1902.5	19125	15	16QAM	1	0	22.14	0-1	1
	1902.5	19125	15	16QAM	1	36	22.29	0-1	1
	1902.5	19125	15	16QAM	1	74	22.07	0-1	1
	1902.5	19125	15	16QAM	36	0	21.09	0-2	2
	1902.5	19125	15	16QAM	36	18	21.36	0-2	2
	1902.5	19125	15	16QAM	36	37	21.36	0-2	2
	1902.5	19125	15	16QAM	75	0	21.42	0-2	2

Table 9-25
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	23.59	0	0
	1855	18650	10	QPSK	1	25	23.79	0	0
	1855	18650	10	QPSK	1	49	23.64	0	0
	1855	18650	10	QPSK	25	0	22.70	0-1	1
	1855	18650	10	QPSK	25	12	22.79	0-1	1
	1855	18650	10	QPSK	25	25	22.91	0-1	1
	1855	18650	10	QPSK	50	0	22.94	0-1	1
	1855	18650	10	16QAM	1	0	22.56	0-1	1
	1855	18650	10	16QAM	1	25	22.93	0-1	1
	1855	18650	10	16QAM	1	49	23.17	0-1	1
	1855	18650	10	16QAM	25	0	21.52	0-2	2
	1855	18650	10	16QAM	25	12	21.54	0-2	2
	1855	18650	10	16QAM	25	25	21.72	0-2	2
	1855	18650	10	16QAM	50	0	21.86	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	23.81	0	0
	1880.0	18900	10	QPSK	1	25	23.85	0	0
	1880.0	18900	10	QPSK	1	49	23.51	0	0
	1880.0	18900	10	QPSK	25	0	23.06	0-1	1
	1880.0	18900	10	QPSK	25	12	22.79	0-1	1
	1880.0	18900	10	QPSK	25	25	23.12	0-1	1
	1880.0	18900	10	QPSK	50	0	22.51	0-1	1
	1880.0	18900	10	16QAM	1	0	23.01	0-1	1
	1880.0	18900	10	16QAM	1	25	23.30	0-1	1
	1880.0	18900	10	16QAM	1	49	22.79	0-1	1
	1880.0	18900	10	16QAM	25	0	21.52	0-2	2
	1880.0	18900	10	16QAM	25	12	21.61	0-2	2
	1880.0	18900	10	16QAM	25	25	21.72	0-2	2
	1880.0	18900	10	16QAM	50	0	21.83	0-2	2
High	1905	19150	10	QPSK	1	0	23.32	0	0
	1905	19150	10	QPSK	1	25	23.35	0	0
	1905	19150	10	QPSK	1	49	23.37	0	0
	1905	19150	10	QPSK	25	0	22.19	0-1	1
	1905	19150	10	QPSK	25	12	22.22	0-1	1
	1905	19150	10	QPSK	25	25	21.97	0-1	1
	1905	19150	10	QPSK	50	0	22.43	0-1	1
	1905	19150	10	16QAM	1	0	22.02	0-1	1
	1905	19150	10	16QAM	1	25	22.19	0-1	1
	1905	19150	10	16QAM	1	49	22.08	0-1	1
	1905	19150	10	16QAM	25	0	21.20	0-2	2
	1905	19150	10	16QAM	25	12	21.33	0-2	2
	1905	19150	10	16QAM	25	25	21.20	0-2	2
	1905	19150	10	16QAM	50	0	21.26	0-2	2

Table 9-26
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	23.52	0	0
	1852.5	18625	5	QPSK	1	12	23.65	0	0
	1852.5	18625	5	QPSK	1	24	23.81	0	0
	1852.5	18625	5	QPSK	12	0	22.77	0-1	1
	1852.5	18625	5	QPSK	12	6	22.94	0-1	1
	1852.5	18625	5	QPSK	12	13	22.87	0-1	1
	1852.5	18625	5	QPSK	25	0	23.01	0-1	1
	1852.5	18625	5	16-QAM	1	0	22.65	0-1	1
	1852.5	18625	5	16-QAM	1	12	22.80	0-1	1
	1852.5	18625	5	16-QAM	1	24	23.18	0-1	1
	1852.5	18625	5	16-QAM	12	0	21.53	0-2	2
	1852.5	18625	5	16-QAM	12	6	21.67	0-2	2
	1852.5	18625	5	16-QAM	12	13	21.64	0-2	2
	1852.5	18625	5	16-QAM	25	0	21.67	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	23.78	0	0
	1880.0	18900	5	QPSK	1	12	23.86	0	0
	1880.0	18900	5	QPSK	1	24	23.57	0	0
	1880.0	18900	5	QPSK	12	0	23.02	0-1	1
	1880.0	18900	5	QPSK	12	6	22.78	0-1	1
	1880.0	18900	5	QPSK	12	13	23.00	0-1	1
	1880.0	18900	5	QPSK	25	0	22.67	0-1	1
	1880.0	18900	5	16-QAM	1	0	23.10	0-1	1
	1880.0	18900	5	16-QAM	1	12	23.17	0-1	1
	1880.0	18900	5	16-QAM	1	24	22.76	0-1	1
	1880.0	18900	5	16-QAM	12	0	21.51	0-2	2
	1880.0	18900	5	16-QAM	12	6	21.67	0-2	2
	1880.0	18900	5	16-QAM	12	13	21.89	0-2	2
	1880.0	18900	5	16-QAM	25	0	22.01	0-2	2
High	1907.5	19175	5	QPSK	1	0	23.25	0	0
	1907.5	19175	5	QPSK	1	12	23.26	0	0
	1907.5	19175	5	QPSK	1	24	23.39	0	0
	1907.5	19175	5	QPSK	12	0	22.38	0-1	1
	1907.5	19175	5	QPSK	12	6	22.33	0-1	1
	1907.5	19175	5	QPSK	12	13	22.11	0-1	1
	1907.5	19175	5	QPSK	25	0	22.42	0-1	1
	1907.5	19175	5	16-QAM	1	0	22.01	0-1	1
	1907.5	19175	5	16-QAM	1	12	22.12	0-1	1
	1907.5	19175	5	16-QAM	1	24	22.14	0-1	1
	1907.5	19175	5	16-QAM	12	0	21.25	0-2	2
	1907.5	19175	5	16-QAM	12	6	21.34	0-2	2
	1907.5	19175	5	16-QAM	12	13	21.15	0-2	2
	1907.5	19175	5	16-QAM	25	0	21.22	0-2	2

Table 9-27
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	23.66	0	0
	1851.5	18615	3	QPSK	1	7	23.57	0	0
	1851.5	18615	3	QPSK	1	14	23.91	0	0
	1851.5	18615	3	QPSK	8	0	22.66	0-1	1
	1851.5	18615	3	QPSK	8	4	23.08	0-1	1
	1851.5	18615	3	QPSK	8	7	23.03	0-1	1
	1851.5	18615	3	QPSK	15	0	23.05	0-1	1
	1851.5	18615	3	16-QAM	1	0	22.64	0-1	1
	1851.5	18615	3	16-QAM	1	7	22.61	0-1	1
	1851.5	18615	3	16-QAM	1	14	23.34	0-1	1
	1851.5	18615	3	16-QAM	8	0	21.71	0-2	2
	1851.5	18615	3	16-QAM	8	4	21.73	0-2	2
	1851.5	18615	3	16-QAM	8	7	21.51	0-2	2
	1851.5	18615	3	16-QAM	15	0	21.66	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	23.83	0	0
	1880.0	18900	3	QPSK	1	7	23.90	0	0
	1880.0	18900	3	QPSK	1	14	23.70	0	0
	1880.0	18900	3	QPSK	8	0	22.83	0-1	1
	1880.0	18900	3	QPSK	8	4	22.71	0-1	1
	1880.0	18900	3	QPSK	8	7	23.17	0-1	1
	1880.0	18900	3	QPSK	15	0	22.63	0-1	1
	1880.0	18900	3	16-QAM	1	0	22.99	0-1	1
	1880.0	18900	3	16-QAM	1	7	23.16	0-1	1
	1880.0	18900	3	16-QAM	1	14	22.66	0-1	1
	1880.0	18900	3	16-QAM	8	0	21.51	0-2	2
	1880.0	18900	3	16-QAM	8	4	21.51	0-2	2
	1880.0	18900	3	16-QAM	8	7	22.02	0-2	2
	1880.0	18900	3	16-QAM	15	0	21.90	0-2	2
High	1908.5	19185	3	QPSK	1	0	23.20	0	0
	1908.5	19185	3	QPSK	1	7	23.33	0	0
	1908.5	19185	3	QPSK	1	14	23.49	0	0
	1908.5	19185	3	QPSK	8	0	22.31	0-1	1
	1908.5	19185	3	QPSK	8	4	22.26	0-1	1
	1908.5	19185	3	QPSK	8	7	22.09	0-1	1
	1908.5	19185	3	QPSK	15	0	22.35	0-1	1
	1908.5	19185	3	16-QAM	1	0	22.02	0-1	1
	1908.5	19185	3	16-QAM	1	7	22.18	0-1	1
	1908.5	19185	3	16-QAM	1	14	22.07	0-1	1
	1908.5	19185	3	16-QAM	8	0	21.18	0-2	2
	1908.5	19185	3	16-QAM	8	4	21.28	0-2	2
	1908.5	19185	3	16-QAM	8	7	21.22	0-2	2
	1908.5	19185	3	16-QAM	15	0	21.29	0-2	2

Table 9-28
LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	23.52	0	0
	1850.7	18607	1.4	QPSK	1	2	23.53	0	0
	1850.7	18607	1.4	QPSK	1	5	23.88	0	0
	1850.7	18607	1.4	QPSK	3	0	23.64	0	0
	1850.7	18607	1.4	QPSK	3	2	23.80	0	0
	1850.7	18607	1.4	QPSK	3	3	23.79	0	0
	1850.7	18607	1.4	QPSK	6	0	23.01	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	22.66	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	22.73	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	23.35	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	22.84	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	22.88	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	22.60	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	21.81	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	23.89	0	0
	1880.0	18900	1.4	QPSK	1	2	23.90	0	0
	1880.0	18900	1.4	QPSK	1	5	23.88	0	0
	1880.0	18900	1.4	QPSK	3	0	23.65	0	0
	1880.0	18900	1.4	QPSK	3	2	23.69	0	0
	1880.0	18900	1.4	QPSK	3	3	23.80	0	0
	1880.0	18900	1.4	QPSK	6	0	22.60	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	23.02	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	23.13	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	22.71	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	22.86	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	22.87	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	22.83	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	21.93	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	23.37	0	0
	1909.3	19193	1.4	QPSK	1	2	23.52	0	0
	1909.3	19193	1.4	QPSK	1	5	23.29	0	0
	1909.3	19193	1.4	QPSK	3	0	23.43	0	0
	1909.3	19193	1.4	QPSK	3	2	23.14	0	0
	1909.3	19193	1.4	QPSK	3	3	23.25	0	0
	1909.3	19193	1.4	QPSK	6	0	22.54	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	22.06	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	22.04	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	22.01	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	22.21	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	22.42	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	22.18	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	21.13	0-2	2

9.4.6 LTE Band 2 (PCS) – Reduced Power - Representing Hotspot Mode Active

Table 9-29
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	**22.45**	0	0
	1860	18700	20	QPSK	1	50	22.36	0	0
	1860	18700	20	QPSK	1	99	22.08	0	0
	1860	18700	20	QPSK	50	0	**21.38**	0-1	1
	1860	18700	20	QPSK	50	25	21.30	0-1	1
	1860	18700	20	QPSK	50	50	21.15	0-1	1
	1860	18700	20	QPSK	100	0	21.30	0-1	1
	1860	18700	20	16QAM	1	0	21.44	0-1	1
	1860	18700	20	16QAM	1	50	21.45	0-1	1
	1860	18700	20	16QAM	1	99	21.35	0-1	1
	1860	18700	20	16QAM	50	0	20.47	0-2	2
	1860	18700	20	16QAM	50	25	20.43	0-2	2
	1860	18700	20	16QAM	50	50	20.49	0-2	2
	1860	18700	20	16QAM	100	0	20.36	0-2	2
Mid	1880.0	18900	20	QPSK	1	0	22.40	0	0
	1880.0	18900	20	QPSK	1	50	22.37	0	0
	1880.0	18900	20	QPSK	1	99	22.14	0	0
	1880.0	18900	20	QPSK	50	0	21.12	0-1	1
	1880.0	18900	20	QPSK	50	25	21.19	0-1	1
	1880.0	18900	20	QPSK	50	50	21.28	0-1	1
	1880.0	18900	20	QPSK	100	0	21.21	0-1	1
	1880.0	18900	20	16QAM	1	0	21.40	0-1	1
	1880.0	18900	20	16QAM	1	50	21.37	0-1	1
	1880.0	18900	20	16QAM	1	99	21.33	0-1	1
	1880.0	18900	20	16QAM	50	0	20.42	0-2	2
	1880.0	18900	20	16QAM	50	25	20.46	0-2	2
	1880.0	18900	20	16QAM	50	50	20.44	0-2	2
	1880.0	18900	20	16QAM	100	0	20.43	0-2	2
High	1900	19100	20	QPSK	1	0	22.29	0	0
	1900	19100	20	QPSK	1	50	22.32	0	0
	1900	19100	20	QPSK	1	99	22.34	0	0
	1900	19100	20	QPSK	50	0	21.28	0-1	1
	1900	19100	20	QPSK	50	25	21.29	0-1	1
	1900	19100	20	QPSK	50	50	21.33	0-1	1
	1900	19100	20	QPSK	100	0	21.33	0-1	1
	1900	19100	20	16QAM	1	0	21.45	0-1	1
	1900	19100	20	16QAM	1	50	21.24	0-1	1
	1900	19100	20	16QAM	1	99	21.43	0-1	1
	1900	19100	20	16QAM	50	0	20.25	0-2	2
	1900	19100	20	16QAM	50	25	20.26	0-2	2
	1900	19100	20	16QAM	50	50	20.21	0-2	2
	1900	19100	20	16QAM	100	0	20.25	0-2	2

Table 9-30
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1857.5	18675	15	QPSK	1	0	22.39	0	0
	1857.5	18675	15	QPSK	1	36	22.40	0	0
	1857.5	18675	15	QPSK	1	74	22.02	0	0
	1857.5	18675	15	QPSK	36	0	21.42	0-1	1
	1857.5	18675	15	QPSK	36	18	21.30	0-1	1
	1857.5	18675	15	QPSK	36	37	21.23	0-1	1
	1857.5	18675	15	QPSK	75	0	21.11	0-1	1
	1857.5	18675	15	16QAM	1	0	21.25	0-1	1
	1857.5	18675	15	16QAM	1	36	21.33	0-1	1
	1857.5	18675	15	16QAM	1	74	21.29	0-1	1
	1857.5	18675	15	16QAM	36	0	20.29	0-2	2
	1857.5	18675	15	16QAM	36	18	20.26	0-2	2
	1857.5	18675	15	16QAM	36	37	20.38	0-2	2
	1857.5	18675	15	16QAM	75	0	20.21	0-2	2
Mid	1880.0	18900	15	QPSK	1	0	22.26	0	0
	1880.0	18900	15	QPSK	1	36	22.23	0	0
	1880.0	18900	15	QPSK	1	74	22.15	0	0
	1880.0	18900	15	QPSK	36	0	21.21	0-1	1
	1880.0	18900	15	QPSK	36	18	21.26	0-1	1
	1880.0	18900	15	QPSK	36	37	21.25	0-1	1
	1880.0	18900	15	QPSK	75	0	21.12	0-1	1
	1880.0	18900	15	16QAM	1	0	21.34	0-1	1
	1880.0	18900	15	16QAM	1	36	21.45	0-1	1
	1880.0	18900	15	16QAM	1	74	21.16	0-1	1
	1880.0	18900	15	16QAM	36	0	20.22	0-2	2
	1880.0	18900	15	16QAM	36	18	20.44	0-2	2
	1880.0	18900	15	16QAM	36	37	20.37	0-2	2
	1880.0	18900	15	16QAM	75	0	20.40	0-2	2
High	1902.5	19125	15	QPSK	1	0	22.17	0	0
	1902.5	19125	15	QPSK	1	36	22.14	0	0
	1902.5	19125	15	QPSK	1	74	22.33	0	0
	1902.5	19125	15	QPSK	36	0	21.35	0-1	1
	1902.5	19125	15	QPSK	36	18	21.09	0-1	1
	1902.5	19125	15	QPSK	36	37	21.23	0-1	1
	1902.5	19125	15	QPSK	75	0	21.32	0-1	1
	1902.5	19125	15	16QAM	1	0	21.25	0-1	1
	1902.5	19125	15	16QAM	1	36	21.13	0-1	1
	1902.5	19125	15	16QAM	1	74	21.45	0-1	1
	1902.5	19125	15	16QAM	36	0	20.34	0-2	2
	1902.5	19125	15	16QAM	36	18	20.19	0-2	2
	1902.5	19125	15	16QAM	36	37	20.18	0-2	2
	1902.5	19125	15	16QAM	75	0	20.08	0-2	2

Table 9-31
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	22.41	0	0
	1855	18650	10	QPSK	1	25	22.22	0	0
	1855	18650	10	QPSK	1	49	21.96	0	0
	1855	18650	10	QPSK	25	0	21.38	0-1	1
	1855	18650	10	QPSK	25	12	21.13	0-1	1
	1855	18650	10	QPSK	25	25	21.24	0-1	1
	1855	18650	10	QPSK	50	0	21.19	0-1	1
	1855	18650	10	16QAM	1	0	21.34	0-1	1
	1855	18650	10	16QAM	1	25	21.13	0-1	1
	1855	18650	10	16QAM	1	49	21.39	0-1	1
	1855	18650	10	16QAM	25	0	20.14	0-2	2
	1855	18650	10	16QAM	25	12	20.36	0-2	2
	1855	18650	10	16QAM	25	25	20.16	0-2	2
	1855	18650	10	16QAM	50	0	20.28	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	22.25	0	0
	1880.0	18900	10	QPSK	1	25	22.14	0	0
	1880.0	18900	10	QPSK	1	49	22.02	0	0
	1880.0	18900	10	QPSK	25	0	21.10	0-1	1
	1880.0	18900	10	QPSK	25	12	21.11	0-1	1
	1880.0	18900	10	QPSK	25	25	21.16	0-1	1
	1880.0	18900	10	QPSK	50	0	21.21	0-1	1
	1880.0	18900	10	16QAM	1	0	21.36	0-1	1
	1880.0	18900	10	16QAM	1	25	21.32	0-1	1
	1880.0	18900	10	16QAM	1	49	21.22	0-1	1
	1880.0	18900	10	16QAM	25	0	20.04	0-2	2
	1880.0	18900	10	16QAM	25	12	20.48	0-2	2
	1880.0	18900	10	16QAM	25	25	20.23	0-2	2
	1880.0	18900	10	16QAM	50	0	20.40	0-2	2
High	1905	19150	10	QPSK	1	0	22.11	0	0
	1905	19150	10	QPSK	1	25	22.24	0	0
	1905	19150	10	QPSK	1	49	22.29	0	0
	1905	19150	10	QPSK	25	0	21.27	0-1	1
	1905	19150	10	QPSK	25	12	20.95	0-1	1
	1905	19150	10	QPSK	25	25	21.26	0-1	1
	1905	19150	10	QPSK	50	0	21.35	0-1	1
	1905	19150	10	16QAM	1	0	21.28	0-1	1
	1905	19150	10	16QAM	1	25	21.13	0-1	1
	1905	19150	10	16QAM	1	49	21.29	0-1	1
	1905	19150	10	16QAM	25	0	20.33	0-2	2
	1905	19150	10	16QAM	25	12	20.03	0-2	2
	1905	19150	10	16QAM	25	25	20.03	0-2	2
	1905	19150	10	16QAM	50	0	20.00	0-2	2

Table 9-32
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	22.39	0	0
	1852.5	18625	5	QPSK	1	12	22.07	0	0
	1852.5	18625	5	QPSK	1	24	21.78	0	0
	1852.5	18625	5	QPSK	12	0	21.44	0-1	1
	1852.5	18625	5	QPSK	12	6	20.95	0-1	1
	1852.5	18625	5	QPSK	12	13	21.30	0-1	1
	1852.5	18625	5	QPSK	25	0	21.19	0-1	1
	1852.5	18625	5	16-QAM	1	0	21.17	0-1	1
	1852.5	18625	5	16-QAM	1	12	20.96	0-1	1
	1852.5	18625	5	16-QAM	1	24	21.45	0-1	1
	1852.5	18625	5	16-QAM	12	0	20.07	0-2	2
	1852.5	18625	5	16-QAM	12	6	20.26	0-2	2
	1852.5	18625	5	16-QAM	12	13	20.32	0-2	2
	1852.5	18625	5	16-QAM	25	0	20.24	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	22.34	0	0
	1880.0	18900	5	QPSK	1	12	22.23	0	0
	1880.0	18900	5	QPSK	1	24	22.11	0	0
	1880.0	18900	5	QPSK	12	0	20.97	0-1	1
	1880.0	18900	5	QPSK	12	6	20.92	0-1	1
	1880.0	18900	5	QPSK	12	13	21.05	0-1	1
	1880.0	18900	5	QPSK	25	0	21.08	0-1	1
	1880.0	18900	5	16-QAM	1	0	21.43	0-1	1
	1880.0	18900	5	16-QAM	1	12	21.14	0-1	1
	1880.0	18900	5	16-QAM	1	24	21.27	0-1	1
	1880.0	18900	5	16-QAM	12	0	19.90	0-2	2
	1880.0	18900	5	16-QAM	12	6	20.49	0-2	2
	1880.0	18900	5	16-QAM	12	13	20.23	0-2	2
	1880.0	18900	5	16-QAM	25	0	20.35	0-2	2
High	1907.5	19175	5	QPSK	1	0	22.19	0	0
	1907.5	19175	5	QPSK	1	12	22.10	0	0
	1907.5	19175	5	QPSK	1	24	22.13	0	0
	1907.5	19175	5	QPSK	12	0	21.19	0-1	1
	1907.5	19175	5	QPSK	12	6	21.04	0-1	1
	1907.5	19175	5	QPSK	12	13	21.07	0-1	1
	1907.5	19175	5	QPSK	25	0	21.16	0-1	1
	1907.5	19175	5	16-QAM	1	0	21.34	0-1	1
	1907.5	19175	5	16-QAM	1	12	21.10	0-1	1
	1907.5	19175	5	16-QAM	1	24	21.24	0-1	1
	1907.5	19175	5	16-QAM	12	0	20.23	0-2	2
	1907.5	19175	5	16-QAM	12	6	19.96	0-2	2
	1907.5	19175	5	16-QAM	12	13	19.84	0-2	2
	1907.5	19175	5	16-QAM	25	0	19.86	0-2	2

Table 9-33
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	22.43	0	0
	1851.5	18615	3	QPSK	1	7	21.87	0	0
	1851.5	18615	3	QPSK	1	14	21.61	0	0
	1851.5	18615	3	QPSK	8	0	21.50	0-1	1
	1851.5	18615	3	QPSK	8	4	20.93	0-1	1
	1851.5	18615	3	QPSK	8	7	21.35	0-1	1
	1851.5	18615	3	QPSK	15	0	21.01	0-1	1
	1851.5	18615	3	16-QAM	1	0	21.20	0-1	1
	1851.5	18615	3	16-QAM	1	7	20.95	0-1	1
	1851.5	18615	3	16-QAM	1	14	21.25	0-1	1
	1851.5	18615	3	16-QAM	8	0	19.98	0-2	2
	1851.5	18615	3	16-QAM	8	4	20.12	0-2	2
	1851.5	18615	3	16-QAM	8	7	20.36	0-2	2
	1851.5	18615	3	16-QAM	15	0	20.31	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	22.20	0	0
	1880.0	18900	3	QPSK	1	7	22.10	0	0
	1880.0	18900	3	QPSK	1	14	21.91	0	0
	1880.0	18900	3	QPSK	8	0	20.83	0-1	1
	1880.0	18900	3	QPSK	8	4	20.80	0-1	1
	1880.0	18900	3	QPSK	8	7	20.93	0-1	1
	1880.0	18900	3	QPSK	15	0	21.01	0-1	1
	1880.0	18900	3	16-QAM	1	0	21.50	0-1	1
	1880.0	18900	3	16-QAM	1	7	21.15	0-1	1
	1880.0	18900	3	16-QAM	1	14	21.34	0-1	1
	1880.0	18900	3	16-QAM	8	0	19.76	0-2	2
	1880.0	18900	3	16-QAM	8	4	20.34	0-2	2
	1880.0	18900	3	16-QAM	8	7	20.20	0-2	2
	1880.0	18900	3	16-QAM	15	0	20.27	0-2	2
High	1908.5	19185	3	QPSK	1	0	22.07	0	0
	1908.5	19185	3	QPSK	1	7	21.93	0	0
	1908.5	19185	3	QPSK	1	14	22.00	0	0
	1908.5	19185	3	QPSK	8	0	21.22	0-1	1
	1908.5	19185	3	QPSK	8	4	21.08	0-1	1
	1908.5	19185	3	QPSK	8	7	21.15	0-1	1
	1908.5	19185	3	QPSK	15	0	21.15	0-1	1
	1908.5	19185	3	16-QAM	1	0	21.21	0-1	1
	1908.5	19185	3	16-QAM	1	7	21.15	0-1	1
	1908.5	19185	3	16-QAM	1	14	21.11	0-1	1
	1908.5	19185	3	16-QAM	8	0	20.13	0-2	2
	1908.5	19185	3	16-QAM	8	4	19.84	0-2	2
	1908.5	19185	3	16-QAM	8	7	19.70	0-2	2
	1908.5	19185	3	16-QAM	15	0	19.96	0-2	2

Table 9-34
LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	22.28	0	0
	1850.7	18607	1.4	QPSK	1	2	21.78	0	0
	1850.7	18607	1.4	QPSK	1	5	21.68	0	0
	1850.7	18607	1.4	QPSK	3	0	22.40	0	0
	1850.7	18607	1.4	QPSK	3	2	21.94	0	0
	1850.7	18607	1.4	QPSK	3	3	22.33	0	0
	1850.7	18607	1.4	QPSK	6	0	21.00	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	21.02	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	21.01	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	21.06	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	21.03	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	20.97	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	21.34	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	20.11	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	22.06	0	0
	1880.0	18900	1.4	QPSK	1	2	21.99	0	0
	1880.0	18900	1.4	QPSK	1	5	21.88	0	0
	1880.0	18900	1.4	QPSK	3	0	21.69	0	0
	1880.0	18900	1.4	QPSK	3	2	21.61	0	0
	1880.0	18900	1.4	QPSK	3	3	21.93	0	0
	1880.0	18900	1.4	QPSK	6	0	20.84	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	21.49	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	21.22	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	21.31	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	20.61	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	21.30	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	21.26	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	20.35	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	22.04	0	0
	1909.3	19193	1.4	QPSK	1	2	21.95	0	0
	1909.3	19193	1.4	QPSK	1	5	22.06	0	0
	1909.3	19193	1.4	QPSK	3	0	22.13	0	0
	1909.3	19193	1.4	QPSK	3	2	22.15	0	0
	1909.3	19193	1.4	QPSK	3	3	22.16	0	0
	1909.3	19193	1.4	QPSK	6	0	21.19	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	21.27	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	21.11	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	20.96	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	21.08	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	20.91	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	20.65	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	19.92	0-2	2

9.5 LTE Carrier Aggregation Conducted Powers

Table 9-35
Maximum LTE Carrier Aggregation Conducted Powers
– Band 13 (PCC) 10MHz BW + Band 4 (SCC) 20 MHz BW

Band 13 (PCC) 10 MHz BW + Band 4 (SCC) 20 MHz BW				
782 MHz / ch.23230 + 2132.5 MHz / ch. 2175	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	25	24.48	24.50

Table 9-36
Maximum LTE Carrier Aggregation Conducted Powers
– Band 13 (PCC) 10 MHz BW+ Band 2 (SCC) 20 MHz BW

Band 13 (PCC) 10 MHz BW + Band 2 (SCC) 20 MHz BW				
782 MHz / ch.23230 + 1960.0 MHz / ch. 900	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	25	24.32	24.50

Table 9-37
Maximum LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 13 (SCC) 10 MHz BW

Band 4 (PCC) 20 MHz BW + Band 13 (SCC) 10 MHz BW				
1732.5 MHz / ch.20175 + 751 MHz / ch. 5230	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	23.96	24.36

Table 9-38
Reduced LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 13 (SCC) 10 MHz BW

Band 4 (PCC) 20 MHz BW + Band 13 (SCC) 10 MHz BW				
1732.5 MHz / ch.20175 + 751 MHz / ch. 5230	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	99	22.28	22.16

Table 9-39
Maximum LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 4 (SCC) 20 MHz BW

Band 4 (PCC) 20 MHz BW + Band 4 (SCC) 20 MHz BW				
1720 MHz / ch.20050 + 2145 MHz / ch. 2300	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	24.16	24.36

Table 9-40
Reduced LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 4 (SCC) 20 MHz BW

Band 4 (PCC) 20 MHz BW + Band 4 (SCC) 20 MHz BW				
1720 MHz / ch.20050 + 2145 MHz / ch. 2300	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	99	22.08	22.16

Table 9-41
Maximum LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 2 (SCC) 20 MHz BW

Band 4 (PCC) 20 MHz BW + Band 2 (SCC) 20 MHz BW				
1732.5 MHz / ch.20175 + 1960.0 MHz / ch. 900	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	24.06	24.36

Table 9-42
Reduced LTE Carrier Aggregation Conducted Powers
– Band 4 (PCC) 20MHz BW + Band 2 (SCC) 20 MHz BW

Band 4 (PCC) 20 MHz BW + Band 2 (SCC) 20 MHz BW				
1732.5 MHz / ch.20175 + 1960.0 MHz / ch. 900	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	99	22.30	22.16

Table 9-43
Maximum LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 13 (SCC) 10 MHz BW

Band 2 (PCC) 20 MHz BW + Band 13 (SCC) 10 MHz BW				
1860 MHz / ch.18700 + 751 MHz / ch. 5230	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	50	23.83	23.92

Table 9-44
Reduced LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 13 (SCC) 10 MHz BW

Band 2 (PCC) 20 MHz BW + Band 13 (SCC) 10 MHz BW				
1860 MHz / ch.18700 + 751 MHz / ch. 5230	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	22.47	22.45

Table 9-45
Maximum LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 4 (SCC) 20 MHz BW

Band 2 (PCC) 20 MHz BW + Band 4 (SCC) 20 MHz BW				
1860 MHz / ch.18700 + 2132.5 MHz / ch. 2175	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	50	23.95	23.92

Table 9-46
Reduced LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 4 (SCC) 20 MHz BW

Band 2 (PCC) 20 MHz BW + Band 4 (SCC) 20 MHz BW				
1860 MHz / ch.18700 + 2132.5 MHz / ch. 2175	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	22.50	22.45

Table 9-47
Maximum LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 2 (SCC) 20 MHz BW

Band 2 (PCC) 20 MHz BW + Band 2 (SCC) 20 MHz BW				
1860 MHz / ch.18700 +1980 MHz / ch. 1100	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	50	23.84	23.92

Table 9-48
Reduced LTE Carrier Aggregation Conducted Powers
– Band 2 (PCC) 20MHz BW + Band 2 (SCC) 20 MHz BW

Band 2 (PCC) 20 MHz BW + Band 2 (SCC) 20 MHz BW				
1860 MHz / ch.18700 +1980 MHz / ch. 1100	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	Rel. 8 Tx.Power (dBm)
	1	0	22.47	22.45

Notes:

1. The device does not support all Rel. 10 Carrier Aggregation features due to modem chipset limitation.
2. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest output power (across all bandwidths, channels and RB Configurations) for each band
3. This device supports inter-band CA with 2 carriers (B13+B4, B13+B2, B4+B13, B4+B2, B2+B13, B2+B4) with a maximum of 10 MHz of spectrum for LTE Band 13 and a maximum of 20 MHz of spectrum for LTE Band 4/2. This device supports intra-band CA with 2 carriers (B4+B4, B2+B2).
4. All control and acknowledge data is sent on uplink channels that operate identical to release 8 specifications.

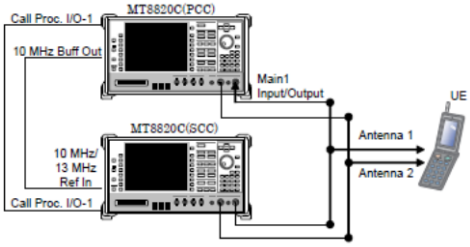


Figure 9-4
Power Measurement Setup

9.6 WLAN Conducted Powers

Table 9-49
2.4 GHz Average RF Power – Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]
		IEEE Transmission Mode
		802.11b
2412	1	16.66
2437	6	16.93
2462	11	**17.49**

Table 9-50
2.4 GHz Average RF Power – Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]
		IEEE Transmission Mode
		802.11b
2412	1	**17.30**
2437	6	16.94
2462	11	17.10

Table 9-51
5 GHz (20 MHz Bandwidth) Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]
		IEEE Transmission Mode
		802.11a
5180	36	14.49
5200	40	14.46
5220	44	13.44
5240	48	13.54
5260	52	13.52
5280	56	13.55
5300	60	13.55
5320	64	**14.46**
5500	100	**14.17**
5540	108	13.42
5580	116	14.05
5660	132	13.62
5745	149	**13.72**
5825	165	13.47

Table 9-52
5 GHz (20 MHz Bandwidth) Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]
		IEEE Transmission Mode
		802.11a
5180	36	13.89
5200	40	13.80
5220	44	13.85
5240	48	13.81
5260	52	13.57
5280	56	**13.48**
5300	60	13.38
5320	64	13.45
5500	100	13.58
5540	108	13.78
5580	116	**14.12**
5660	132	13.80
5745	149	**13.81**
5825	165	13.46

Justification for test configurations for WLAN per KDB Publication 248227 D01DR02-41929:

- 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.

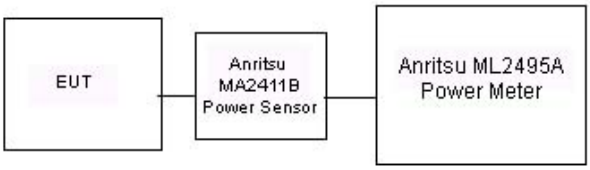


Figure 9-5
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/19/2015	750H	19.5	725	0.875	41.262	0.891	42.071	-1.80%	-1.92%
			740	0.890	40.993	0.893	41.994	-0.34%	-2.38%
			755	0.902	40.754	0.894	41.916	0.89%	-2.77%
			770	0.916	40.561	0.895	41.838	2.35%	-3.05%
			785	0.932	40.353	0.896	41.760	4.02%	-3.37%
01/16/2015	835H	23.3	820	0.883	40.963	0.899	41.578	-1.78%	-1.48%
			835	0.897	40.801	0.900	41.500	-0.33%	-1.68%
			850	0.911	40.621	0.916	41.500	-0.55%	-2.12%
01/19/2015	835H	22.0	820	0.917	43.652	0.899	41.578	2.00%	4.99%
			835	0.933	43.439	0.900	41.500	3.67%	4.67%
			850	0.944	43.224	0.916	41.500	3.06%	4.15%
01/16/2015	1750H	22.7	1710	1.299	38.638	1.348	40.142	-3.64%	-3.75%
			1750	1.340	38.482	1.371	40.079	-2.26%	-3.98%
			1790	1.382	38.312	1.394	40.016	-0.86%	-4.26%
01/16/2015	1900H	21.9	1850	1.347	39.528	1.400	40.000	-3.79%	-1.18%
			1880	1.378	39.355	1.400	40.000	-1.57%	-1.61%
			1910	1.412	39.200	1.400	40.000	0.86%	-2.00%
01/20/2015	2450H	23.0	2401	1.794	40.670	1.756	39.287	2.16%	3.52%
			2450	1.849	40.470	1.800	39.200	2.72%	3.24%
			2499	1.903	40.278	1.853	39.138	2.70%	2.91%
01/27/2015	5200H-5800H	22.8	5280	4.877	35.739	4.737	35.894	2.96%	-0.43%
			5300	4.903	35.673	4.758	35.871	3.05%	-0.55%
			5320	4.920	35.637	4.778	35.849	2.97%	-0.59%
			5500	5.129	35.206	4.963	35.643	3.34%	-1.23%
			5580	5.236	34.988	5.045	35.551	3.79%	-1.58%
			5600	5.254	34.958	5.065	35.529	3.73%	-1.61%
			5745	5.430	34.635	5.214	35.363	4.14%	-2.06%
			5800	5.496	34.471	5.270	35.300	4.29%	-2.35%
01/15/2015	750B	21.9	725	0.941	54.488	0.961	55.629	-2.08%	-2.05%
			740	0.956	54.338	0.963	55.570	-0.73%	-2.22%
			755	0.970	54.194	0.964	55.512	0.62%	-2.37%
			770	0.984	54.028	0.965	55.453	1.97%	-2.57%
			785	0.999	53.887	0.966	55.395	3.42%	-2.72%
01/15/2015	835B	22.0	820	0.989	53.432	0.969	55.258	2.06%	-3.30%
			835	1.004	53.289	0.970	55.200	3.51%	-3.46%
			850	1.018	53.128	0.988	55.154	3.04%	-3.67%
01/19/2015	835B	22.6	820	0.979	54.586	0.969	55.258	1.03%	-1.22%
			835	0.993	54.447	0.970	55.200	2.37%	-1.36%
			850	1.007	54.302	0.988	55.154	1.92%	-1.54%
01/19/2015	1750B	23.0	1710	1.418	51.678	1.463	53.537	-3.08%	-3.47%
			1750	1.461	51.563	1.488	53.432	-1.81%	-3.50%
			1790	1.498	51.358	1.514	53.326	-1.06%	-3.69%
01/19/2015	1900B	21.8	1850	1.518	51.842	1.520	53.300	-0.13%	-2.74%
			1880	1.548	51.717	1.520	53.300	1.84%	-2.97%
			1910	1.583	51.570	1.520	53.300	4.14%	-3.25%
01/29/2015	1900B	22.9	1850	1.494	52.412	1.520	53.300	-1.71%	-1.67%
			1880	1.527	52.312	1.520	53.300	0.46%	-1.85%
			1910	1.563	52.220	1.520	53.300	2.83%	-2.03%
01/19/2015	2450B	22.8	2401	1.956	51.267	1.903	52.765	2.79%	-2.84%
			2450	2.031	51.040	1.950	52.700	4.15%	-3.15%
			2499	2.092	50.858	2.019	52.638	3.62%	-3.38%
01/19/2015	5200B-5800B	22.6	5280	5.500	48.179	5.393	48.906	1.98%	-1.49%
			5300	5.542	48.230	5.416	48.879	2.33%	-1.33%
			5320	5.582	48.064	5.439	48.851	2.63%	-1.61%
			5500	5.845	47.908	5.650	48.607	3.45%	-1.44%
			5580	5.899	47.646	5.743	48.499	2.72%	-1.76%
			5600	5.977	47.642	5.766	48.471	3.66%	-1.71%
			5745	6.176	47.389	5.936	48.275	4.04%	-1.84%
			5800	6.183	47.296	6.000	48.200	3.05%	-1.88%

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 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

10.2 Test System Verification

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

Table 10-2
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
K	750	HEAD	01/19/2015	24.2	21.3	0.100	1054	3288	0.784	8.330	7.840	-5.88%
J	835	HEAD	01/16/2015	23.4	23.3	0.100	4d133	3022	0.915	9.200	9.150	-0.54%
D	835	HEAD	01/19/2015	23.1	23.0	0.100	4d133	3263	0.971	9.200	9.710	5.54%
I	1750	HEAD	01/16/2015	23.3	22.7	0.100	1008	3209	3.370	36.900	33.700	-8.67%
G	1900	HEAD	01/16/2015	24.2	22.8	0.100	5d149	3258	3.810	40.200	38.100	-5.22%
I	2450	HEAD	01/20/2015	21.9	23.0	0.100	719	3209	4.860	52.100	48.600	-6.72%
E	5300	HEAD	01/27/2015	24.3	21.8	0.100	1120	7308	7.910	83.400	79.100	-5.16%
E	5500	HEAD	01/27/2015	24.3	21.8	0.100	1120	7308	7.950	84.900	79.500	-6.36%
E	5600	HEAD	01/27/2015	24.4	21.8	0.100	1120	7308	8.150	82.200	81.500	-0.85%
E	5800	HEAD	01/27/2015	24.3	21.8	0.100	1120	7308	7.650	79.100	76.500	-3.29%
I	750	BODY	01/15/2015	23.1	21.9	0.100	1054	3209	0.891	8.640	8.910	3.12%
K	835	BODY	01/15/2015	23.3	22.0	0.100	4d133	3288	0.966	9.350	9.660	3.32%
K	835	BODY	01/19/2015	24.2	22.6	0.100	4d133	3288	0.972	9.350	9.720	3.96%
D	1750	BODY	01/19/2015	23.0	23.0	0.100	1008	3263	3.690	37.600	36.900	-1.86%
G	1900	BODY	01/19/2015	24.4	21.8	0.100	5d149	3258	3.950	40.400	39.500	-2.23%
G	1900	BODY	01/29/2015	24.0	22.9	0.100	5d141	3258	4.080	40.600	40.800	0.49%
I	2450	BODY	01/19/2015	24.0	22.8	0.100	719	3209	5.150	51.800	51.500	-0.58%
H	5300	BODY	01/19/2015	24.7	23.1	0.100	1191	3920	7.950	79.900	79.500	-0.50%
H	5500	BODY	01/19/2015	24.1	23.1	0.100	1191	3920	7.600	83.100	76.000	-8.54%
H	5600	BODY	01/19/2015	24.1	23.1	0.100	1191	3920	7.630	84.100	76.300	-9.27%
H	5800	BODY	01/19/2015	23.9	23.1	0.100	1191	3920	7.090	78.000	70.900	-9.10%

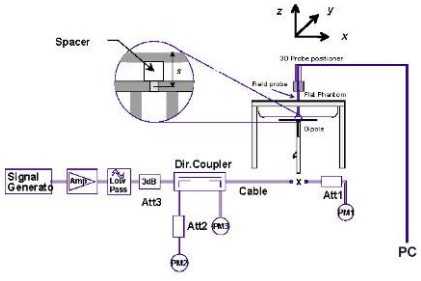


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
CDMA/EVDO 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	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.92	0.03	Right	Cheek	08FCB	1:1	0.228	1.019	0.232	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.92	0.08	Right	Tilt	08FCB	1:1	0.154	1.019	0.157	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.92	0.13	Left	Cheek	08FCB	1:1	0.194	1.019	0.198	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.92	0.06	Left	Tilt	08FCB	1:1	0.155	1.019	0.158	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.87	0.14	Right	Cheek	08FCB	1:1	0.233	1.030	0.240	A1
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.87	-0.09	Right	Tilt	08FCB	1:1	0.156	1.030	0.161	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.87	-0.03	Left	Cheek	08FCB	1:1	0.199	1.030	0.205	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.87	0.06	Left	Tilt	08FCB	1:1	0.148	1.030	0.152	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-2
CDMA/EVDO 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	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1851.25	25	PCS CDMA	RC3 / SO55	25.0	24.95	0.14	Right	Cheek	08FCF	1:1	0.212	1.012	0.215	
1851.25	25	PCS CDMA	RC3 / SO55	25.0	24.95	0.11	Right	Tilt	08FCF	1:1	0.137	1.012	0.139	
1851.25	25	PCS CDMA	RC3 / SO55	25.0	24.95	-0.08	Left	Cheek	08FCF	1:1	0.326	1.012	**0.330**	A2
1851.25	25	PCS CDMA	RC3 / SO55	25.0	24.95	0.05	Left	Tilt	08FCF	1:1	0.194	1.012	0.196	
1851.25	25	PCS CDMA	EVDO Rev. A	23.0	22.93	-0.01	Right	Cheek	08FD5	1:1	0.146	1.016	0.148	
1851.25	25	PCS CDMA	EVDO Rev. A	23.0	22.93	0.09	Right	Tilt	08FD5	1:1	0.048	1.016	0.049	
1851.25	25	PCS CDMA	EVDO Rev. A	23.0	22.93	0.10	Left	Cheek	08FD5	1:1	0.224	1.016	0.228	
1851.25	25	PCS CDMA	EVDO Rev. A	23.0	22.93	0.16	Left	Tilt	08FD5	1:1	0.055	1.016	0.056	
1851.25	25	PCS CDMA	EVDO Rev. A	25.0	24.93	0.13	Right	Cheek	08FCF	1:1	0.230	1.016	0.234	
1851.25	25	PCS CDMA	EVDO Rev. A	25.0	24.93	-0.02	Right	Tilt	08FCF	1:1	0.106	1.016	0.108	
1851.25	25	PCS CDMA	EVDO Rev. A	25.0	24.93	0.06	Left	Cheek	08FCF	1:1	0.296	1.016	0.301	
1851.25	25	PCS CDMA	EVDO Rev. A	25.0	24.93	0.18	Left	Tilt	08FCF	1:1	0.104	1.016	0.106	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-3
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.86	0.01	Right	Cheek	08C6B	1:8.3	0.188	1.033	0.194	A3
836.60	190	GSM 850	GSM	33.0	32.86	0.04	Right	Tilt	08C6B	1:8.3	0.119	1.033	0.123	
836.60	190	GSM 850	GSM	33.0	32.86	0.04	Left	Cheek	08C6B	1:8.3	0.180	1.033	0.186	
836.60	190	GSM 850	GSM	33.0	32.86	0.06	Left	Tilt	08C6B	1:8.3	0.117	1.033	0.121	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-4
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	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.5	23.93	0.04	Right	Cheek	08C6B	1:1	0.166	1.140	0.189	A4
836.60	4183	UMTS 850	RMC	24.5	23.93	0.07	Right	Tilt	08C6B	1:1	0.111	1.140	0.127	
836.60	4183	UMTS 850	RMC	24.5	23.93	0.03	Left	Cheek	08C6B	1:1	0.127	1.140	0.145	
836.60	4183	UMTS 850	RMC	24.5	23.93	0.13	Left	Tilt	08C6B	1:1	0.098	1.140	0.112	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.5	29.76	-0.04	Right	Cheek	08C6B	1:8.3	0.071	1.186	0.084	
1880.00	661	GSM 1900	GSM	30.5	29.76	-0.02	Right	Tilt	08C6B	1:8.3	0.020	1.186	0.024	
1880.00	661	GSM 1900	GSM	30.5	29.76	0.04	Left	Cheek	08C6B	1:8.3	0.075	1.186	0.089	A5
1880.00	661	GSM 1900	GSM	30.5	29.76	0.07	Left	Tilt	08C6B	1:8.3	0.019	1.186	0.023	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-6
UMTS 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	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	24.5	23.58	0.07	Right	Cheek	08C6B	1:1	0.150	1.236	0.185	
1880.00	9400	UMTS 1900	RMC	24.5	23.58	0.12	Right	Tilt	08C6B	1:1	0.039	1.236	0.048	
1880.00	9400	UMTS 1900	RMC	24.5	23.58	-0.14	Left	Cheek	08C6B	1:1	0.184	1.236	0.227	A6
1880.00	9400	UMTS 1900	RMC	24.5	23.58	0.06	Left	Tilt	08C6B	1:1	0.036	1.236	0.044	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-7
LTE Band 13 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	0.01	0	Right	Cheek	QPSK	1	25	08FC4	1:1	0.150	1.000	0.150	A7
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.05	1	Right	Cheek	QPSK	25	12	08FC4	1:1	0.120	1.002	0.120	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.02	0	Right	Tilt	QPSK	1	25	08FC4	1:1	0.093	1.000	0.093	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.03	1	Right	Tilt	QPSK	25	12	08FC4	1:1	0.071	1.002	0.071	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	0.13	0	Left	Cheek	QPSK	1	25	08FC4	1:1	0.085	1.000	0.085	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.12	1	Left	Cheek	QPSK	25	12	08FC4	1:1	0.072	1.002	0.072	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	0.02	0	Left	Tilt	QPSK	1	25	08FC4	1:1	0.064	1.000	0.064	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.13	1	Left	Tilt	QPSK	25	12	08FC4	1:1	0.052	1.002	0.052	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-8
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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.03	0	Right	Cheek	QPSK	1	25	08FC4	1:1	0.218	1.007	0.220	A8
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.05	1	Right	Cheek	QPSK	25	12	08FC4	1:1	0.175	1.054	0.184	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.10	0	Right	Tilt	QPSK	1	25	08FC4	1:1	0.139	1.007	0.140	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.05	1	Right	Tilt	QPSK	25	12	08FC4	1:1	0.111	1.054	0.117	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.01	0	Left	Cheek	QPSK	1	25	08FC4	1:1	0.158	1.007	0.159	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.00	1	Left	Cheek	QPSK	25	12	08FC4	1:1	0.136	1.054	0.143	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.05	0	Left	Tilt	QPSK	1	25	08FC4	1:1	0.131	1.007	0.132	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.04	1	Left	Tilt	QPSK	25	12	08FC4	1:1	0.111	1.054	0.117	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-9
LTE Band 4 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.36	0.05	0	Right	Cheek	QPSK	1	0	08FA6	1:1	0.160	1.033	0.165	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.91	0.00	1	Right	Cheek	QPSK	50	0	08FA6	1:1	0.134	1.146	0.154	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.36	0.03	0	Right	Tilt	QPSK	1	0	08FA6	1:1	0.100	1.033	0.103	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.91	0.01	1	Right	Tilt	QPSK	50	0	08FA6	1:1	0.078	1.146	0.089	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.36	0.05	0	Left	Cheek	QPSK	1	0	08FA6	1:1	0.231	1.033	0.239	A9
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.91	0.00	1	Left	Cheek	QPSK	50	0	08FA6	1:1	0.172	1.146	0.197	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.36	0.05	0	Left	Tilt	QPSK	1	0	08FA6	1:1	0.037	1.033	0.038	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.91	0.06	1	Left	Tilt	QPSK	50	0	08FA6	1:1	0.031	1.146	0.036	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-10
LTE Band 2 (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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	23.92	0.10	0	Right	Cheek	QPSK	1	50	08D9A	1:1	0.117	1.143	0.134	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	22.85	-0.03	1	Right	Cheek	QPSK	50	25	08D9A	1:1	0.090	1.161	0.104	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	23.92	-0.04	0	Right	Tilt	QPSK	1	50	08D9A	1:1	0.035	1.143	0.040	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	22.85	0.10	1	Right	Tilt	QPSK	50	25	08D9A	1:1	0.027	1.161	0.031	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	23.92	0.10	0	Left	Cheek	QPSK	1	50	08D9A	1:1	0.149	1.143	0.170	A10
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	22.85	0.06	1	Left	Cheek	QPSK	50	25	08D9A	1:1	0.123	1.161	0.143	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	23.92	0.02	0	Left	Tilt	QPSK	1	50	08D9A	1:1	0.046	1.143	0.053	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	22.85	0.15	1	Left	Tilt	QPSK	50	25	08D9A	1:1	0.040	1.161	0.046	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-11
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)	Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	17.5	17.49	0.01	Right	Cheek	1	08FA2	1	99.95	0.042	0.055	1.002	1.001	0.055	
2462	11	802.11b	DSSS	22	17.5	17.49		Right	Tilt	1	08FA2	1	99.95	0.016	-	1.002	1.001	-	
2462	11	802.11b	DSSS	22	17.5	17.49		Left	Cheek	1	08FA2	1	99.95	0.009	-	1.002	1.001	-	
2462	11	802.11b	DSSS	22	17.5	17.49		Left	Tilt	1	08FA2	1	99.95	0.006	-	1.002	1.001	-	
2412	1	802.11b	DSSS	22	17.5	17.30		Right	Cheek	2	08FA2	1	99.27	0.259	-	1.047	1.007	-	
2412	1	802.11b	DSSS	22	17.5	17.30		Right	Tilt	2	08FA2	1	99.27	0.134	-	1.047	1.007	-	
2412	1	802.11b	DSSS	22	17.5	17.30	-0.01	Left	Cheek	2	08FA2	1	99.27	0.840	0.666	1.047	1.007	**0.702**	A11
2412	1	802.11b	DSSS	22	17.5	17.30	0.02	Left	Tilt	2	08FA2	1	99.27	0.338	0.260	1.047	1.007	0.274	
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
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)	Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	14.5	14.46	0.07	Right	Cheek	1	08FA2	6	98.96	0.325	0.144	1.009	1.011	0.147	
5320	64	802.11a	OFDM	20	14.5	14.46		Right	Tilt	1	08FA2	6	98.96	0.268	-	1.009	1.011	-	
5320	64	802.11a	OFDM	20	14.5	14.46		Left	Cheek	1	08FA2	6	98.96	0.225	-	1.009	1.011	-	
5320	64	802.11a	OFDM	20	14.5	14.46		Left	Tilt	1	08FA2	6	98.96	0.209	-	1.009	1.011	-	
5280	56	802.11a	OFDM	20	14.5	13.48		Right	Cheek	2	08FA2	6	98.60	0.006	-	1.265	1.014	-	
5280	56	802.11a	OFDM	20	14.5	13.48		Right	Tilt	2	08FA2	6	98.60	0.005	-	1.265	1.014	-	
5280	56	802.11a	OFDM	20	14.5	13.48	0.06	Left	Cheek	2	08FA2	6	98.60	0.016	0.007	1.265	1.014	0.009	
5280	56	802.11a	OFDM	20	14.5	13.48		Left	Tilt	2	08FA2	6	98.60	0.005	-	1.265	1.014	-	
5500	100	802.11a	OFDM	20	14.5	14.17	0.03	Right	Cheek	1	08FA2	6	98.96	0.552	0.251	1.079	1.011	0.274	
5500	100	802.11a	OFDM	20	14.5	14.17		Right	Tilt	1	08FA2	6	98.96	0.416	-	1.079	1.011	-	
5500	100	802.11a	OFDM	20	14.5	14.17		Left	Cheek	1	08FA2	6	98.96	0.217	-	1.079	1.011	-	
5500	100	802.11a	OFDM	20	14.5	14.17		Left	Tilt	1	08FA2	6	98.96	0.208	-	1.079	1.011	-	
5580	116	802.11a	OFDM	20	14.5	14.12		Right	Cheek	2	08FA2	6	98.60	0.016	-	1.091	1.014	-	
5580	116	802.11a	OFDM	20	14.5	14.12		Right	Tilt	2	08FA2	6	98.60	0.015	-	1.091	1.014	-	
5580	116	802.11a	OFDM	20	14.5	14.12	0.04	Left	Cheek	2	08FA2	6	98.60	0.027	0.008	1.091	1.014	0.009	
5580	116	802.11a	OFDM	20	14.5	14.12		Left	Tilt	2	08FA2	6	98.60	0.016	-	1.091	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.72	0.01	Right	Cheek	1	08FA2	6	98.96	0.774	0.457	1.197	1.011	**0.553**	A12
5745	149	802.11a	OFDM	20	14.5	13.72	0.01	Right	Tilt	1	08FA2	6	98.96	0.679	0.365	1.197	1.011	0.442	
5745	149	802.11a	OFDM	20	14.5	13.72		Left	Cheek	1	08FA2	6	98.96	0.586	-	1.197	1.011	-	
5745	149	802.11a	OFDM	20	14.5	13.72		Left	Tilt	1	08FA2	6	98.96	0.500	-	1.197	1.011	-	
5745	149	802.11a	OFDM	20	14.5	13.81		Right	Cheek	2	08FA2	6	98.60	0.041	-	1.172	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.81		Right	Tilt	2	08FA2	6	98.60	0.037	-	1.172	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.81		Left	Cheek	2	08FA2	6	98.60	0.041	-	1.172	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.81	0.02	Left	Tilt	2	08FA2	6	98.60	0.042	0.017	1.172	1.014	0.020	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram											

11.2 Standalone Body-Worn SAR Data

Table 11-13
CDMA/GSM/UMTS 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	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.92	0.00	10 mm	08FC8	N/A	1:1	back	0.409	1.019	0.417	A13
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.47	-0.03	15 mm	08FCF	N/A	1:1	back	0.501	1.130	0.566	A15
836.60	190	GSM 850	GSM	33.0	32.86	0.01	10 mm	08C68	1	1:8.3	back	0.327	1.033	0.338	A17
836.60	4183	UMTS 850	RMC	24.5	23.93	-0.01	10 mm	08C6B	N/A	1:1	back	0.339	1.140	0.386	A19
1880.00	661	GSM 1900	GSM	30.5	29.76	0.05	10 mm	08C68	1	1:8.3	back	0.218	1.186	0.259	A20
1880.00	9400	UMTS 1900	RMC	24.5	23.58	0.02	15 mm	08C6B	N/A	1:1	back	0.384	1.236	0.475	A22
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 11-14
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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.02	0	08FDA	QPSK	1	25	10 mm	back	1:1	0.411	1.000	0.411	A24
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.03	1	08FDA	QPSK	25	12	10 mm	back	1:1	0.299	1.002	0.300	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.00	0	08FC4	QPSK	1	25	10 mm	back	1:1	0.414	1.007	0.417	A25
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	-0.03	1	08FC4	QPSK	25	12	10 mm	back	1:1	0.329	1.054	0.347	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	24.36	-0.09	0	08FA6	QPSK	1	0	15 mm	back	1:1	0.485	1.033	0.501	A26
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.91	-0.02	1	08FA6	QPSK	50	0	15 mm	back	1:1	0.377	1.146	0.432	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	23.92	-0.11	0	08D9A	QPSK	1	50	15 mm	back	1:1	0.465	1.143	0.531	A28
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	22.85	-0.07	1	08D9A	QPSK	50	25	15 mm	back	1:1	0.359	1.161	0.417	
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 11-15
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)	Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	17.5	17.49	0.05	10 mm	1	08FA2	1	back	99.95	0.018	0.016	1.002	1.001	0.016	
2412	1	802.11b	DSSS	22	17.5	17.30	0.10	10 mm	2	08FA2	1	back	99.27	0.059	0.048	1.047	1.007	**0.050**	A30
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 11-16
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)	Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	14.5	14.46	0.02	10 mm	1	08FA2	6	back	98.96	0.085	0.035	1.009	1.011	0.035	
5280	56	802.11a	OFDM	20	14.5	13.48	0.00	10 mm	2	08FA2	6	back	98.60	0.047	0.018	1.265	1.014	0.023	
5500	100	802.11a	OFDM	20	14.5	14.17	0.04	10 mm	1	08FA2	6	back	98.96	0.118	0.051	1.079	1.011	0.056	
5580	116	802.11a	OFDM	20	14.5	14.12	-0.05	10 mm	2	08FA2	6	back	98.60	0.214	0.103	1.091	1.014	0.114	A32
5745	149	802.11a	OFDM	20	14.5	13.72	0.00	10 mm	1	08FA2	6	back	98.96	0.061	0.026	1.197	1.011	0.031	
5745	149	802.11a	OFDM	20	14.5	13.81	0.07	10 mm	2	08FA2	6	back	98.60	0.232	0.100	1.172	1.014	**0.119**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

11.3 Standalone Wireless Router SAR Data

Table 11-17
EVDO/GPRS/UMTS 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	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.88	0.02	10 mm	08FC8	N/A	1:1	back	0.411	1.028	0.423	A14
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.88	-0.02	10 mm	08FC8	N/A	1:1	front	0.325	1.028	0.334	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.88	-0.03	10 mm	08FC8	N/A	1:1	bottom	0.171	1.028	0.176	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.88	0.05	10 mm	08FC8	N/A	1:1	right	0.109	1.028	0.112	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.88	0.04	10 mm	08FC8	N/A	1:1	left	0.315	1.028	0.324	
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.99	0.17	10 mm	08FD5	N/A	1:1	back	0.547	1.002	0.548	
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.99	-0.02	10 mm	08FD5	N/A	1:1	front	0.584	1.002	0.585	
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.99	0.12	10 mm	08FD5	N/A	1:1	bottom	0.718	1.002	0.719	A16
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.99	0.04	10 mm	08FD5	N/A	1:1	right	0.046	1.002	0.046	
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.99	-0.03	10 mm	08FD5	N/A	1:1	left	0.215	1.002	0.215	
836.60	190	GSM 850	GPRS	30.5	30.10	-0.16	10 mm	08C68	4	1:2.076	back	0.727	1.096	0.797	A18
836.60	190	GSM 850	GPRS	30.5	30.10	0.07	10 mm	08C68	4	1:2.076	front	0.539	1.096	0.591	
836.60	190	GSM 850	GPRS	30.5	30.10	-0.02	10 mm	08C68	4	1:2.076	bottom	0.188	1.096	0.206	
836.60	190	GSM 850	GPRS	30.5	30.10	-0.05	10 mm	08C68	4	1:2.076	right	0.651	1.096	0.713	
836.60	190	GSM 850	GPRS	30.5	30.10	0.05	10 mm	08C68	4	1:2.076	left	0.670	1.096	0.734	
836.60	4183	UMTS 850	RMC	24.5	23.93	-0.01	10 mm	08C6B	N/A	1:1	back	0.339	1.140	0.386	A19
836.60	4183	UMTS 850	RMC	24.5	23.93	0.00	10 mm	08C6B	N/A	1:1	front	0.269	1.140	0.307	
836.60	4183	UMTS 850	RMC	24.5	23.93	-0.03	10 mm	08C6B	N/A	1:1	bottom	0.142	1.140	0.162	
836.60	4183	UMTS 850	RMC	24.5	23.93	-0.02	10 mm	08C6B	N/A	1:1	right	0.329	1.140	0.375	
836.60	4183	UMTS 850	RMC	24.5	23.93	-0.02	10 mm	08C6B	N/A	1:1	left	0.196	1.140	0.223	
1850.20	512	GSM 1900	GPRS	26.5	25.74	-0.05	10 mm	08C68	4	1:2.076	back	0.293	1.191	0.349	
1850.20	512	GSM 1900	GPRS	26.5	25.74	0.01	10 mm	08C68	4	1:2.076	front	0.285	1.191	0.339	
1850.20	512	GSM 1900	GPRS	26.5	25.74	-0.02	10 mm	08C68	4	1:2.076	bottom	0.469	1.191	0.559	A21
1850.20	512	GSM 1900	GPRS	26.5	25.74	0.07	10 mm	08C68	4	1:2.076	right	0.018	1.191	0.021	
1850.20	512	GSM 1900	GPRS	26.5	25.74	-0.06	10 mm	08C68	4	1:2.076	left	0.087	1.191	0.104	
1880.00	9400	UMTS 1900	RMC	22.5	21.37	-0.03	10 mm	08FDB	N/A	1:1	back	0.551	1.297	0.715	
1880.00	9400	UMTS 1900	RMC	22.5	21.37	0.00	10 mm	08FDB	N/A	1:1	front	0.315	1.297	0.409	
1852.40	9262	UMTS 1900	RMC	22.5	21.59	0.05	10 mm	08FDB	N/A	1:1	bottom	0.618	1.233	0.762	
1880.00	9400	UMTS 1900	RMC	22.5	21.37	-0.06	10 mm	08FDB	N/A	1:1	bottom	0.645	1.297	0.837	
1907.60	9538	UMTS 1900	RMC	22.5	21.49	-0.03	10 mm	08FDB	N/A	1:1	bottom	0.721	1.262	**0.910**	A23
1880.00	9400	UMTS 1900	RMC	22.5	21.37	0.20	10 mm	08FDB	N/A	1:1	right	0.043	1.297	0.056	
1880.00	9400	UMTS 1900	RMC	22.5	21.37	-0.02	10 mm	08FDB	N/A	1:1	left	0.207	1.297	0.268	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-18
LTE 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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.02	0	08FDA	QPSK	1	25	10 mm	back	1:1	0.411	1.000	0.411	A24
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.03	1	08FDA	QPSK	25	12	10 mm	back	1:1	0.299	1.002	0.300	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	0.04	0	08FDA	QPSK	1	25	10 mm	front	1:1	0.343	1.000	0.343	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.04	1	08FDA	QPSK	25	12	10 mm	front	1:1	0.241	1.002	0.241	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.07	0	08FDA	QPSK	1	25	10 mm	bottom	1:1	0.131	1.000	0.131	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	-0.02	1	08FDA	QPSK	25	12	10 mm	bottom	1:1	0.101	1.002	0.101	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.10	0	08FDA	QPSK	1	25	10 mm	right	1:1	0.296	1.000	0.296	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.01	1	08FDA	QPSK	25	12	10 mm	right	1:1	0.229	1.002	0.229	
782.00	23230	Mid	LTE Band 13	10	24.5	24.50	-0.03	0	08FDA	QPSK	1	25	10 mm	left	1:1	0.264	1.000	0.264	
782.00	23230	Mid	LTE Band 13	10	23.5	23.49	0.04	1	08FDA	QPSK	25	12	10 mm	left	1:1	0.208	1.002	0.208	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-19
LTE 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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.00	0	08FC4	QPSK	1	25	10 mm	back	1:1	0.414	1.007	0.417	A25
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	-0.03	1	08FC4	QPSK	25	12	10 mm	back	1:1	0.329	1.054	0.347	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	-0.01	0	08FC4	QPSK	1	25	10 mm	front	1:1	0.346	1.007	0.348	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	-0.04	1	08FC4	QPSK	25	12	10 mm	front	1:1	0.276	1.054	0.291	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	-0.13	0	08FC4	QPSK	1	25	10 mm	bottom	1:1	0.164	1.007	0.165	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	-0.06	1	08FC4	QPSK	25	12	10 mm	bottom	1:1	0.133	1.054	0.140	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	0.13	0	08FC4	QPSK	1	25	10 mm	right	1:1	0.373	1.007	0.376	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.02	1	08FC4	QPSK	25	12	10 mm	right	1:1	0.294	1.054	0.310	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.47	-0.10	0	08FC4	QPSK	1	25	10 mm	left	1:1	0.276	1.007	0.278	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.27	0.07	1	08FC4	QPSK	25	12	10 mm	left	1:1	0.237	1.054	0.250	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-20
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	0.06	0	08FD5	QPSK	1	99	10 mm	back	1:1	0.796	1.081	0.860	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.98	0.03	1	08FD5	QPSK	50	50	10 mm	back	1:1	0.582	1.127	0.656	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.96	0.02	1	08FD5	QPSK	100	0	10 mm	back	1:1	0.537	1.132	0.608	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	-0.01	0	08FD5	QPSK	1	99	10 mm	front	1:1	0.632	1.081	0.683	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.98	-0.04	1	08FD5	QPSK	50	50	10 mm	front	1:1	0.459	1.127	0.517	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	0.02	0	08FD5	QPSK	1	99	10 mm	bottom	1:1	0.832	1.081	0.899	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.98	-0.07	1	08FD5	QPSK	50	50	10 mm	bottom	1:1	0.609	1.127	0.686	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.96	0.01	1	08FD5	QPSK	100	0	10 mm	bottom	1:1	0.569	1.132	0.644	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	-0.02	0	08FD5	QPSK	1	99	10 mm	right	1:1	0.082	1.081	0.089	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.98	0.06	1	08FD5	QPSK	50	50	10 mm	right	1:1	0.062	1.127	0.070	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	0.00	0	08FD5	QPSK	1	99	10 mm	left	1:1	0.261	1.081	0.282	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.5	20.98	0.01	1	08FD5	QPSK	50	50	10 mm	left	1:1	0.196	1.127	0.221	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.16	-0.01	0	08FD5	QPSK	1	99	10 mm	bottom	1:1	0.834	1.081	0.902	A27
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

Blue entry represents variability measurement.

Table 11-21
LTE Band 2 (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	Scaled SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.5	22.45	-0.07	0	08DB6	QPSK	1	0	10 mm	back	1:1	0.679	1.012	0.687	
1860.00	18700	Low	LTE Band 2 (PCS)	20	21.5	21.38	0.01	1	08DB6	QPSK	50	0	10 mm	back	1:1	0.569	1.028	0.585	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.5	22.45	0.02	0	08DB6	QPSK	1	0	10 mm	front	1:1	0.452	1.012	0.457	
1860.00	18700	Low	LTE Band 2 (PCS)	20	21.5	21.38	0.04	1	08DB6	QPSK	50	0	10 mm	front	1:1	0.386	1.028	0.397	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.5	22.45	0.01	0	08DB6	QPSK	1	0	10 mm	bottom	1:1	0.748	1.012	0.757	A29
1860.00	18700	Low	LTE Band 2 (PCS)	20	21.5	21.38	-0.04	1	08DB6	QPSK	50	0	10 mm	bottom	1:1	0.609	1.028	0.626	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.5	22.45	0.00	0	08DB6	QPSK	1	0	10 mm	right	1:1	0.142	1.012	0.144	
1860.00	18700	Low	LTE Band 2 (PCS)	20	21.5	21.38	-0.05	1	08DB6	QPSK	50	0	10 mm	right	1:1	0.111	1.028	0.114	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.5	22.45	0.05	0	08DB6	QPSK	1	0	10 mm	left	1:1	0.094	1.012	0.095	
1860.00	18700	Low	LTE Band 2 (PCS)	20	21.5	21.38	0.01	1	08DB6	QPSK	50	0	10 mm	left	1:1	0.078	1.028	0.080	
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 11-22
WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Scaled SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	17.5	17.49	0.05	10 mm	1	08FA2	1	back	99.95	0.018	0.016	1.002	1.001	0.016	
2462	11	802.11b	DSSS	22	17.5	17.49		10 mm	1	08FA2	1	front	99.95	0.005	-	1.002	1.001	-	
2462	11	802.11b	DSSS	22	17.5	17.49		10 mm	1	08FA2	1	top	99.95	0.006	-	1.002	1.001	-	
2462	11	802.11b	DSSS	22	17.5	17.49		10 mm	1	08FA2	1	left	99.95	0.003	-	1.002	1.001	-	
2412	1	802.11b	DSSS	22	17.5	17.30		10 mm	2	08FA2	1	back	99.27	0.059	-	1.047	1.007	-	
2412	1	802.11b	DSSS	22	17.5	17.30	0.00	10 mm	2	08FA2	1	front	99.27	0.078	0.070	1.047	1.007	**0.074**	A31
2412	1	802.11b	DSSS	22	17.5	17.30		10 mm	2	08FA2	1	top	99.27	0.007	-	1.047	1.007	-	
2412	1	802.11b	DSSS	22	17.5	17.30		10 mm	2	08FA2	1	right	99.27	0.015	-	1.047	1.007	-	
5745	149	802.11a	OFDM	20	14.5	13.72		10 mm	1	08FA2	6	back	98.96	0.061	-	1.197	1.011	-	
5745	149	802.11a	OFDM	20	14.5	13.72	0.11	10 mm	1	08FA2	6	front	98.96	0.203	0.080	1.197	1.011	0.097	
5745	149	802.11a	OFDM	20	14.5	13.72		10 mm	1	08FA2	6	top	98.96	0.065	-	1.197	1.011	-	
5745	149	802.11a	OFDM	20	14.5	13.72		10 mm	1	08FA2	6	left	98.96	0.023	-	1.197	1.011	-	
5745	149	802.11a	OFDM	20	14.5	13.81	0.07	10 mm	2	08FA2	6	back	98.60	0.232	0.100	1.172	1.014	**0.119**	A33
5745	149	802.11a	OFDM	20	14.5	13.81		10 mm	2	08FA2	6	front	98.60	0.006	-	1.172	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.81		10 mm	2	08FA2	6	top	98.60	0.035	-	1.172	1.014	-	
5745	149	802.11a	OFDM	20	14.5	13.81		10 mm	2	08FA2	6	right	98.60	0.024	-	1.172	1.014	-	
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 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, and FCC KDB Publication 447498 D01v05.
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 D01v05.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance. A test separation distance of 10 mm for body-worn SAR was also used for Cell CDMA, GSM 850/1900, UMTS 850, LTE Bands 13/5, and 2.4/5 GHz WLAN as it is more conservative.
7. Per FCC KDB Publication 648474 D04v01, 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 D01 v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 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 D06v01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.6 for more details).
10. This device utilizes power reduction for PCS CDMA/EVDO, UMTS 1900, LTE Band 4, and LTE Band 2 under some portable hotspot conditions for SAR compliance. Therefore, these wireless router configurations were tested at reduced output power levels.

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 D03v01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS 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 D01v05, 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.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v02.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO and TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers, per FCC KDB Publication 941225 D01v02.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01 procedures for data devices. Since the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, EVDO Rev. A SAR is not required. SAR is not required for 1x RTT for Ev-Do hotspot devices when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Per FCC KDB Publication 447498 D01v05, 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.
5. Head SAR was also evaluated using EVDO Rev. A to determine compliance for VoIP operations.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v05, 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 D05v02r01. 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).

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 D01DR02-41929 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 D01DR02-41929 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg. See Section 8.7.6 for more information.
4. Per KDB Publication 248227 D01DR02-41929, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
6. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05r02 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 447498 D01v05 IV.C.1.iii and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

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

Table 12-1
Estimated SAR

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

Note:

- Held-to-ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.
- Since the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, MIMO SAR is determined by the sum of 1g single transmission chain SAR values because the summation represents higher output power and yields more conservative result per KDB 248227 D01 DR02-41929.
- The highest Reported SAR for each exposure condition is used for SAR summation purpose.

12.3 Head SAR Simultaneous Transmission Analysis

Table 12-2
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	Cell. CDMA/EVDO	0.240	0.055	0.295
	PCS CDMA/EVDO	0.330	0.055	**0.385**
	GSM 850	0.194	0.055	0.249
	UMTS 850	0.189	0.055	0.244
	GSM 1900	0.089	0.055	0.144
	UMTS 1900	0.227	0.055	0.282
	LTE Band 13	0.150	0.055	0.205
	LTE Band 5 (Cell)	0.220	0.055	0.275
	LTE Band 4 (AWS)	0.239	0.055	0.294
	LTE Band 2 (PCS)	0.170	0.055	0.225

Table 12-3
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	Cell. CDMA/EVDO	0.240	0.702	0.942
	PCS CDMA/EVDO	0.330	0.702	**1.032**
	GSM 850	0.194	0.702	0.896
	UMTS 850	0.189	0.702	0.891
	GSM 1900	0.089	0.702	0.791
	UMTS 1900	0.227	0.702	0.929
	LTE Band 13	0.150	0.702	0.852
	LTE Band 5 (Cell)	0.220	0.702	0.922
	LTE Band 4 (AWS)	0.239	0.702	0.941
	LTE Band 2 (PCS)	0.170	0.702	0.872

Table 12-4
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 Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Cell. CDMA/EVDO	0.240	0.055	0.702	0.997
	PCS CDMA/EVDO	0.330	0.055	0.702	**1.087**
	GSM 850	0.194	0.055	0.702	0.951
	UMTS 850	0.189	0.055	0.702	0.946
	GSM 1900	0.089	0.055	0.702	0.846
	UMTS 1900	0.227	0.055	0.702	0.984
	LTE Band 13	0.150	0.055	0.702	0.907
	LTE Band 5 (Cell)	0.220	0.055	0.702	0.977
	LTE Band 4 (AWS)	0.239	0.055	0.702	0.996
	LTE Band 2 (PCS)	0.170	0.055	0.702	0.927

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	Cell. CDMA/EVDO	0.240	0.553	0.793
	PCS CDMA/EVDO	0.330	0.553	**0.883**
	GSM 850	0.194	0.553	0.747
	UMTS 850	0.189	0.553	0.742
	GSM 1900	0.089	0.553	0.642
	UMTS 1900	0.227	0.553	0.780
	LTE Band 13	0.150	0.553	0.703
	LTE Band 5 (Cell)	0.220	0.553	0.773
	LTE Band 4 (AWS)	0.239	0.553	0.792
	LTE Band 2 (PCS)	0.170	0.553	0.723

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-6
Simultaneous Transmission Scenario with 5 GHz WLAN – Ant 2 (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	Cell. CDMA/EVDO	0.240	0.020	0.260
	PCS CDMA/EVDO	0.330	0.020	**0.350**
	GSM 850	0.194	0.020	0.214
	UMTS 850	0.189	0.020	0.209
	GSM 1900	0.089	0.020	0.109
	UMTS 1900	0.227	0.020	0.247
	LTE Band 13	0.150	0.020	0.170
	LTE Band 5 (Cell)	0.220	0.020	0.240
	LTE Band 4 (AWS)	0.239	0.020	0.259
	LTE Band 2 (PCS)	0.170	0.020	0.190

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-7
Simultaneous Transmission Scenario with 5 GHz WLAN – MIMO (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+3
Head SAR	Cell. CDMA/EVDO	0.240	0.553	0.020	0.813
	PCS CDMA/EVDO	0.330	0.553	0.020	**0.903**
	GSM 850	0.194	0.553	0.020	0.767
	UMTS 850	0.189	0.553	0.020	0.762
	GSM 1900	0.089	0.553	0.020	0.662
	UMTS 1900	0.227	0.553	0.020	0.800
	LTE Band 13	0.150	0.553	0.020	0.723
	LTE Band 5 (Cell)	0.220	0.553	0.020	0.793
	LTE Band 4 (AWS)	0.239	0.553	0.020	0.812
	LTE Band 2 (PCS)	0.170	0.553	0.020	0.743

The worst case 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

12.4 Body-Worn Simultaneous Transmission Analysis

1. For SAR summation for body-worn back side at 15mm, the SAR values at 10mm for some transmission modes were used since the 10mm test distance was more conservative. "<" denotes that the 10mm SAR values were used for summation purposes.
2. Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used for SAR summation for body-worn back side at 15mm to determine simultaneous transmission SAR test exclusion.

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN - Ant 1 (Body-Worn at 1.5 cm)

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
Body-Worn	Cell. CDMA	<0.417	<0.016	<0.433
	PCS CDMA	0.566	<0.016	**<0.582**
	GSM 850	<0.338	<0.016	<0.354
	UMTS 850	<0.386	<0.016	<0.402
	GSM 1900	<0.259	<0.016	<0.275
	UMTS 1900	0.475	<0.016	<0.491
	LTE Band 13	<0.411	<0.016	<0.427
	LTE Band 5 (Cell)	<0.417	<0.016	<0.433
	LTE Band 4 (AWS)	0.501	<0.016	<0.517
	LTE Band 2 (PCS)	0.531	<0.016	<0.547

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN - Ant 2 (Body-Worn at 1.5 cm)

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
Body-Worn	Cell. CDMA	<0.417	<0.050	<0.467
	PCS CDMA	0.566	<0.050	**<0.616**
	GSM 850	<0.338	<0.050	<0.388
	UMTS 850	<0.386	<0.050	<0.436
	GSM 1900	<0.259	<0.050	<0.309
	UMTS 1900	0.475	<0.050	<0.525
	LTE Band 13	<0.411	<0.050	<0.461
	LTE Band 5 (Cell)	<0.417	<0.050	<0.467
	LTE Band 4 (AWS)	0.501	<0.050	<0.551
	LTE Band 2 (PCS)	0.531	<0.050	<0.581

Table 12-10
Simultaneous Transmission Scenario with 2.4 GHz WLAN - MIMO (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body-Worn	Cell. CDMA	<0.417	<0.016	<0.050	<0.483
	PCS CDMA	0.566	<0.016	<0.050	**<0.632**
	GSM 850	<0.338	<0.016	<0.050	<0.404
	UMTS 850	<0.386	<0.016	<0.050	<0.452
	GSM 1900	<0.259	<0.016	<0.050	<0.325
	UMTS 1900	0.475	<0.016	<0.050	<0.541
	LTE Band 13	<0.411	<0.016	<0.050	<0.477
	LTE Band 5 (Cell)	<0.417	<0.016	<0.050	<0.483
	LTE Band 4 (AWS)	0.501	<0.016	<0.050	<0.567
	LTE Band 2 (PCS)	0.531	<0.016	<0.050	<0.597

Table 12-11
Simultaneous Transmission Scenario with 5 GHz WLAN - Ant 1 (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	Cell. CDMA	<0.417	<0.056	<0.473
	PCS CDMA	0.566	<0.056	**<0.622**
	GSM 850	<0.338	<0.056	<0.394
	UMTS 850	<0.386	<0.056	<0.442
	GSM 1900	<0.259	<0.056	<0.315
	UMTS 1900	0.475	<0.056	<0.531
	LTE Band 13	<0.411	<0.056	<0.467
	LTE Band 5 (Cell)	<0.417	<0.056	<0.473
	LTE Band 4 (AWS)	0.501	<0.056	<0.557
	LTE Band 2 (PCS)	0.531	<0.056	<0.587

Table 12-12
Simultaneous Transmission Scenario with 5 GHz WLAN - Ant 2 (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	Cell. CDMA	<0.417	<0.119	<0.536
	PCS CDMA	0.566	<0.119	**<0.685**
	GSM 850	<0.338	<0.119	<0.457
	UMTS 850	<0.386	<0.119	<0.505
	GSM 1900	<0.259	<0.119	<0.378
	UMTS 1900	0.475	<0.119	<0.594
	LTE Band 13	<0.411	<0.119	<0.530
	LTE Band 5 (Cell)	<0.417	<0.119	<0.536
	LTE Band 4 (AWS)	0.501	<0.119	<0.620
	LTE Band 2 (PCS)	0.531	<0.119	<0.650

Table 12-13
Simultaneous Transmission Scenario with 5 GHz WLAN - MIMO (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body-Worn	Cell. CDMA	<0.417	<0.056	<0.119	<0.592
	PCS CDMA	0.566	<0.056	<0.119	**<0.741**
	GSM 850	<0.338	<0.056	<0.119	<0.513
	UMTS 850	<0.386	<0.056	<0.119	<0.561
	GSM 1900	<0.259	<0.056	<0.119	<0.434
	UMTS 1900	0.475	<0.056	<0.119	<0.650
	LTE Band 13	<0.411	<0.056	<0.119	<0.586
	LTE Band 5 (Cell)	<0.417	<0.056	<0.119	<0.592
	LTE Band 4 (AWS)	0.501	<0.056	<0.119	<0.676
	LTE Band 2 (PCS)	0.531	<0.056	<0.119	<0.706

Table 12-14
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	Cell. CDMA	<0.417	0.154	<0.571
	PCS CDMA	0.566	0.154	**0.720**
	GSM 850	<0.338	0.154	<0.492
	UMTS 850	<0.386	0.154	<0.540
	GSM 1900	<0.259	0.154	<0.413
	UMTS 1900	0.475	0.154	0.629
	LTE Band 13	<0.411	0.154	<0.565
	LTE Band 5 (Cell)	<0.417	0.154	<0.571
	LTE Band 4 (AWS)	0.501	0.154	0.655
	LTE Band 2 (PCS)	0.531	0.154	0.685

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-15
Simultaneous Transmission Scenario 2.4 GHz WLAN – Ant 1 (Hotspot at 1.0 cm)

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
Hotspot SAR	Cell. EVDO	0.423	0.016	0.439
	PCS EVDO	0.719	0.016	0.735
	GPRS 850	0.797	0.016	0.813
	UMTS 850	0.386	0.016	0.402
	GPRS 1900	0.559	0.016	0.575
	UMTS 1900	0.910	0.016	**0.926**
	LTE Band 13	0.411	0.016	0.427
	LTE Band 5 (Cell)	0.417	0.016	0.433
	LTE Band 4 (AWS)	0.902	0.016	0.918
	LTE Band 2 (PCS)	0.757	0.016	0.773

Table 12-16
Simultaneous Transmission Scenario 2.4 GHz WLAN – Ant 2 (Hotspot at 1.0 cm)

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
Hotspot SAR	Cell. EVDO	0.423	0.074	0.497
	PCS EVDO	0.719	0.074	0.793
	GPRS 850	0.797	0.074	0.871
	UMTS 850	0.386	0.074	0.460
	GPRS 1900	0.559	0.074	0.633
	UMTS 1900	0.910	0.074	**0.984**
	LTE Band 13	0.411	0.074	0.485
	LTE Band 5 (Cell)	0.417	0.074	0.491
	LTE Band 4 (AWS)	0.902	0.074	0.976
	LTE Band 2 (PCS)	0.757	0.074	0.831

Table 12-17
Simultaneous Transmission Scenario 2.4 GHz WLAN – MIMO (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+3
Hotspot SAR	Cell. EVDO	0.423	0.016	0.074	0.513
	PCS EVDO	0.719	0.016	0.074	0.809
	GPRS 850	0.797	0.016	0.074	0.887
	UMTS 850	0.386	0.016	0.074	0.476
	GPRS 1900	0.559	0.016	0.074	0.649
	UMTS 1900	0.910	0.016	0.074	**1.000**
	LTE Band 13	0.411	0.016	0.074	0.501
	LTE Band 5 (Cell)	0.417	0.016	0.074	0.507
	LTE Band 4 (AWS)	0.902	0.016	0.074	0.992
	LTE Band 2 (PCS)	0.757	0.016	0.074	0.847

Table 12-18
Simultaneous Transmission Scenario 5 GHz WLAN – Ant 1 (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Cell. EVDO	0.423	0.097	0.520
	PCS EVDO	0.719	0.097	0.816
	GPRS 850	0.797	0.097	0.894
	UMTS 850	0.386	0.097	0.483
	GPRS 1900	0.559	0.097	0.656
	UMTS 1900	0.910	0.097	**1.007**
	LTE Band 13	0.411	0.097	0.508
	LTE Band 5 (Cell)	0.417	0.097	0.514
	LTE Band 4 (AWS)	0.902	0.097	0.999
	LTE Band 2 (PCS)	0.757	0.097	0.854

Table 12-19
Simultaneous Transmission Scenario 5 GHz WLAN – Ant 2 (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Cell. EVDO	0.423	0.119	0.542
	PCS EVDO	0.719	0.119	0.838
	GPRS 850	0.797	0.119	0.916
	UMTS 850	0.386	0.119	0.505
	GPRS 1900	0.559	0.119	0.678
	UMTS 1900	0.910	0.119	**1.029**
	LTE Band 13	0.411	0.119	0.530
	LTE Band 5 (Cell)	0.417	0.119	0.536
	LTE Band 4 (AWS)	0.902	0.119	1.021
	LTE Band 2 (PCS)	0.757	0.119	0.876

Table 12-20
Simultaneous Transmission Scenario 5 GHz WLAN – MIMO (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+3
Hotspot SAR	Cell. EVDO	0.423	0.097	0.119	0.639
	PCS EVDO	0.719	0.097	0.119	0.935
	GPRS 850	0.797	0.097	0.119	1.013
	UMTS 850	0.386	0.097	0.119	0.602
	GPRS 1900	0.559	0.097	0.119	0.775
	UMTS 1900	0.910	0.097	0.119	**1.126**
	LTE Band 13	0.411	0.097	0.119	0.627
	LTE Band 5 (Cell)	0.417	0.097	0.119	0.633
	LTE Band 4 (AWS)	0.902	0.097	0.119	1.118
	LTE Band 2 (PCS)	0.757	0.097	0.119	0.973

12.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v05 and IEEE 1528-2013 Section 6.3.4.1.2.

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, 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

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	1732.50	20175	LTE Band 4 (AWS)	QPSK, 1 RB, 99 RB Offset	bottom	10 mm	0.832	0.834	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram							

13.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/30/2014	Annual	10/30/2015	1833460
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/15/2014	Annual	4/15/2015	MY45470194
Agilent	8753E	(30kHz-6GHz) Network Analyzer	12/30/2014	Annual	12/30/2015	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/15/2014	Annual	4/15/2015	3629U00687
SPEAG	D1765V2	1765 MHz SAR Dipole	5/7/2014	Annual	5/7/2015	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	4/9/2014	Annual	4/9/2015	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/23/2014	Annual	7/23/2015	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/11/2014	Annual	8/11/2015	719
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/26/2014	Annual	2/26/2015	1120
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/25/2014	Annual	9/25/2015	1191
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
SPEAG	D750V3	750 MHz Dipole	3/17/2014	Annual	3/17/2015	1054
SPEAG	D835V2	835 MHz SAR Dipole	7/24/2014	Annual	7/24/2015	4d133
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	4/24/2014	Annual	4/24/2015	836371/0079
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/26/2014	Annual	2/26/2015	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/17/2014	Annual	3/17/2015	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2014	Annual	4/11/2015	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/14/2014	Annual	5/14/2015	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/12/2014	Annual	8/12/2015	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2014	Annual	9/17/2015	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/18/2014	Annual	9/18/2015	1364
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	5/6/2014	Annual	5/6/2015	1070
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
Fisher Scientific	15-077-960	Digital Thermometer	12/4/2013	Biennial	12/4/2015	130764551
Agilent	E4438C	ESG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY45090700
Control Company	4052	Long Stem Thermometer	9/27/2013	Biennial	9/27/2015	130567447
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671826
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
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	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420651
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Anritsu	ML2495A	Power Meter	10/31/2013	Biennial	31-Oct	941001
Anritsu	MA2411B	Pulse Power Sensor	11/13/2014	Annual	11/13/2015	1339018
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1207364
Anritsu	MA2411B	Pulse Power Sensor	11/17/2014	Annual	11/17/2015	1126066
Anritsu	MT8820C	Radio Communication Analyzer	5/6/2014	Annual	5/6/2015	6201144419
Anritsu	MT8820C	Radio Communication Analyzer	8/28/2014	Annual	8/28/2015	6201240328
Rohde & Schwarz	CMW500	Radio Communication Tester	4/17/2014	Annual	4/17/2015	101699
Rohde & Schwarz	CMW500	Radio Communication Tester	4/17/2014	Annual	4/17/2015	102060
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/16/2014	Annual	4/16/2015	B010177
SPEAG	ES3DV3	SAR Probe	2/25/2014	Annual	2/25/2015	3258
SPEAG	ES3DV3	SAR Probe	3/19/2014	Annual	3/19/2015	3209
SPEAG	ES3DV3	SAR Probe	5/15/2014	Annual	5/15/2015	3263
SPEAG	EX3DV4	SAR Probe	7/16/2014	Annual	7/16/2015	7308
SPEAG	ES3DV2	SAR Probe	8/19/2014	Annual	8/19/2015	3022
SPEAG	ES3DV3	SAR Probe	9/24/2014	Annual	9/24/2015	3288
SPEAG	EX3DV4	SAR Probe	12/12/2014	Annual	12/12/2015	3920
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	5/22/2014	Annual	5/22/2015	US39170118
Fisher Scientific	S97611	Thermometer	4/12/2013	Biennial	4/12/2015	130219303
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
Gigatronics	8651A	Universal Power Meter	10/30/2014	Annual	10/30/2015	8650319
Anritsu	MA24106A	USB Power Sensor	5/14/2014	Annual	5/14/2015	1231538
Anritsu	MA24106A	USB Power Sensor	5/14/2014	Annual	5/14/2015	1231535
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Biennial	8/8/2015	130477877
Control Company	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	122014488
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43304447
Agilent	E5515C	Wireless Communications Test Set	6/26/2013	Biennial	6/26/2015	GB41450275

Note:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
2. Each equipment item was used solely within its respective calibration period.

15 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz:

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**IEEE 1528 Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	6.0	N	1	1.0	1.0	6.0	6.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)			RSS				12.1	11.7	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.2	23.5	

The above measurement uncertainties are according to IEEE Std. 1528-2003

Applicable for frequencies up to 6 GHz:

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**IEEE 1528 Sec.**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)			RSS				12.4	12.0	299
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.7	24.0	

The above measurement uncertainties are according to IEEE Std. 1528-2003

16 CONCLUSION

16.1 Measurement Conclusion

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

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

17 REFERENCES

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

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

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

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

[5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2003, Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Measurement Techniques.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[20] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz), Feb. 2005.

[21] Industry Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 4, March 2010.

[22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2009

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

[24] SAR Measurement procedures for IEEE 802.11a/b/g KDB Publication 248227 D01v01r02

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D02-D04

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

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

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

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

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

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FCB

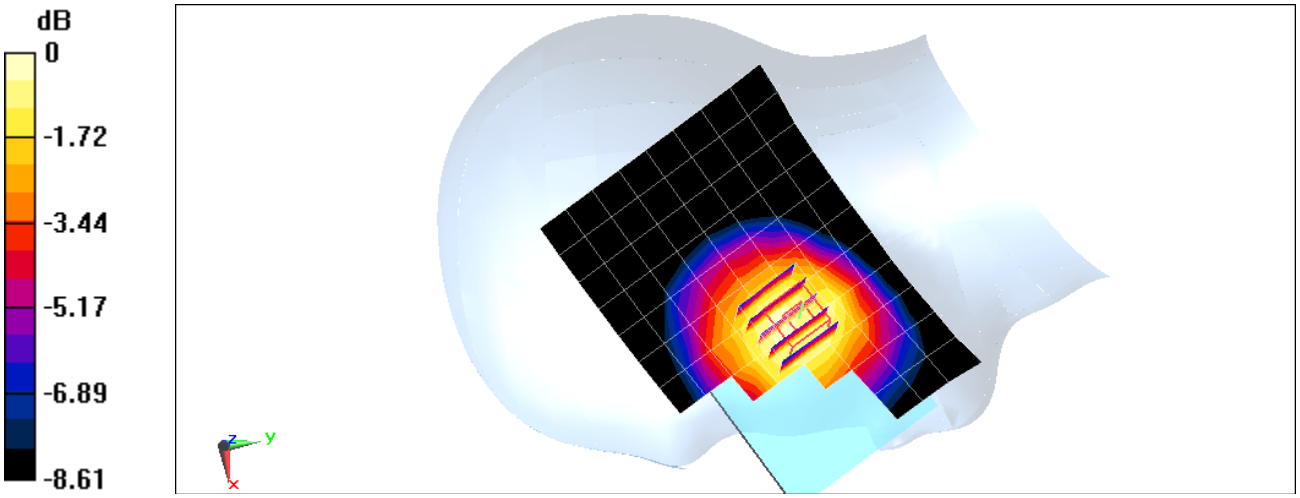
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.934 S/m; ε_r = 43.417; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-19-2015; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.23, 6.23, 6.23); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell EVDO, Right Head, Cheek, Mid.ch

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.08 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.300 W/kg
SAR(1 g) = 0.233 W/kg



0 dB = 0.257 W/kg = -5.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FCF

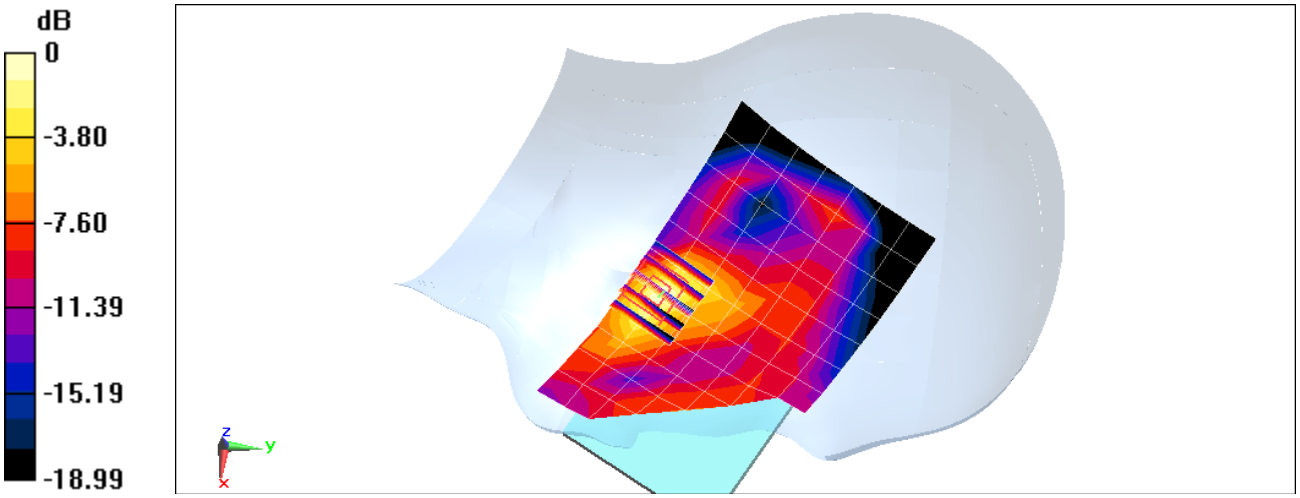
Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.348 S/m; ε_r = 39.521; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS CDMA, Left Head, Cheek, Low.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.33 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.618 W/kg
SAR(1 g) = 0.326 W/kg



0 dB = 0.438 W/kg = -3.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

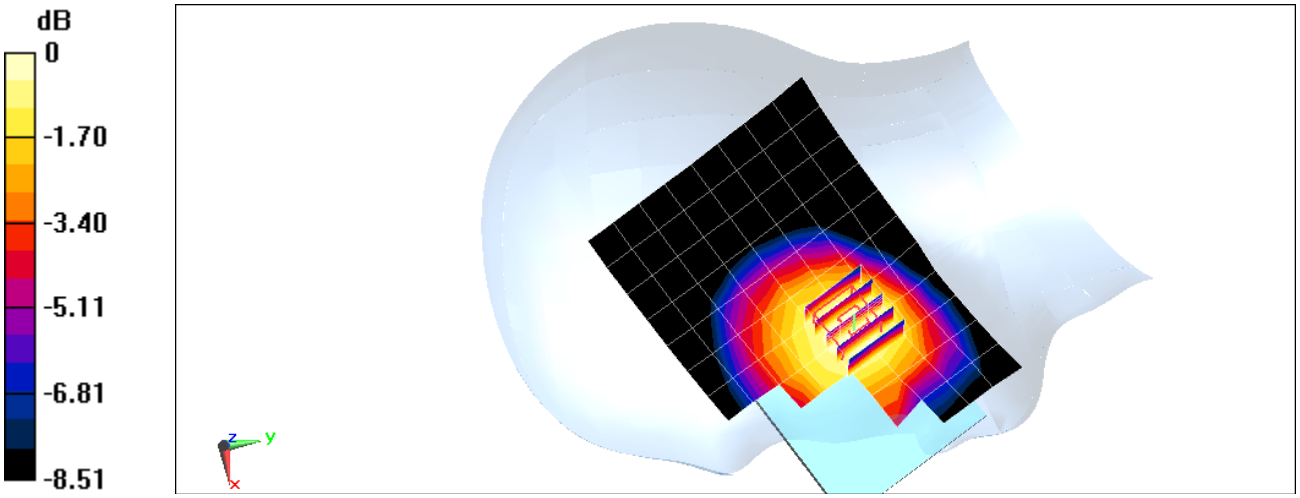
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.898 S/m; ε_r = 40.782; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-16-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.3°C

Probe: ES3DV2 - SN3022; ConvF(6.18, 6.18, 6.18); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.00 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.240 W/kg
SAR(1 g) = 0.188 W/kg



0 dB = 0.203 W/kg = -6.93 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

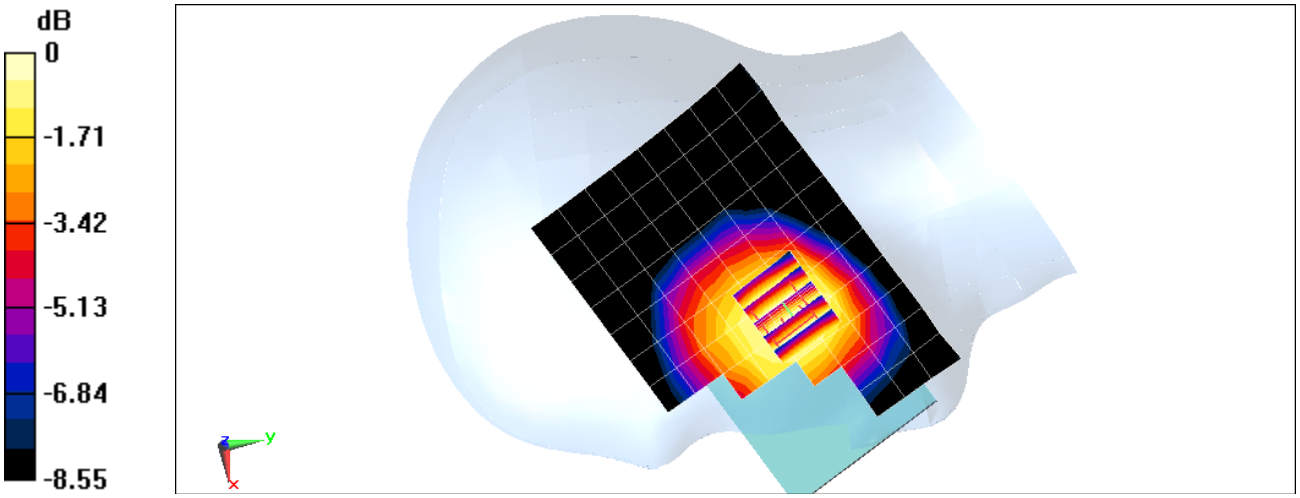
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.934 S/m; ε_r = 43.416; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-19-2015; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.23, 6.23, 6.23); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.71 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.166 W/kg



0 dB = 0.181 W/kg = -7.42 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

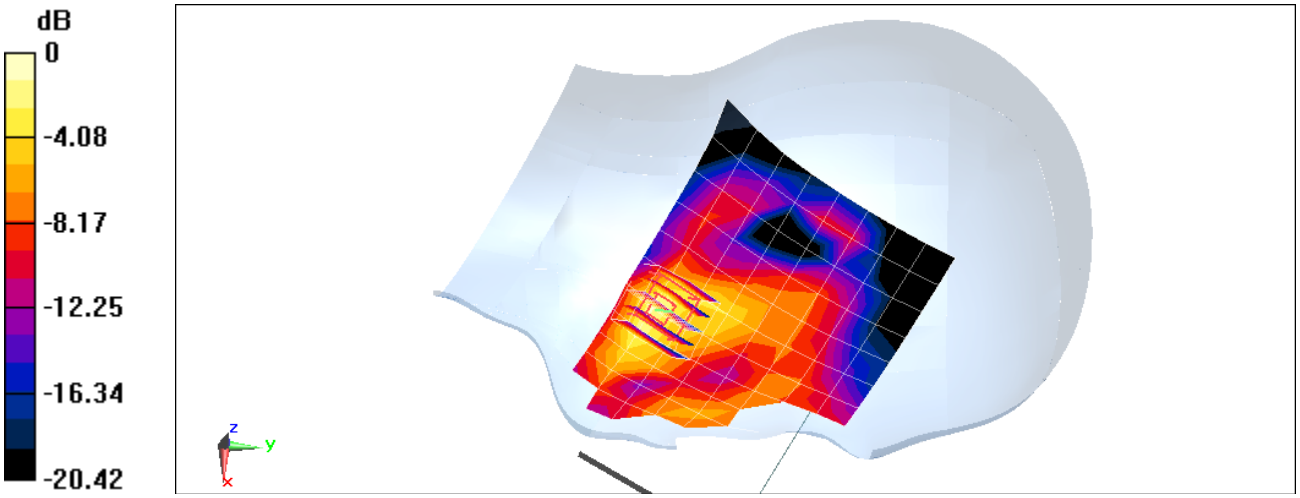
Communication System: UID 0, GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head, Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.355; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.184 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.075 W/kg



0 dB = 0.100 W/kg = -10.00 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

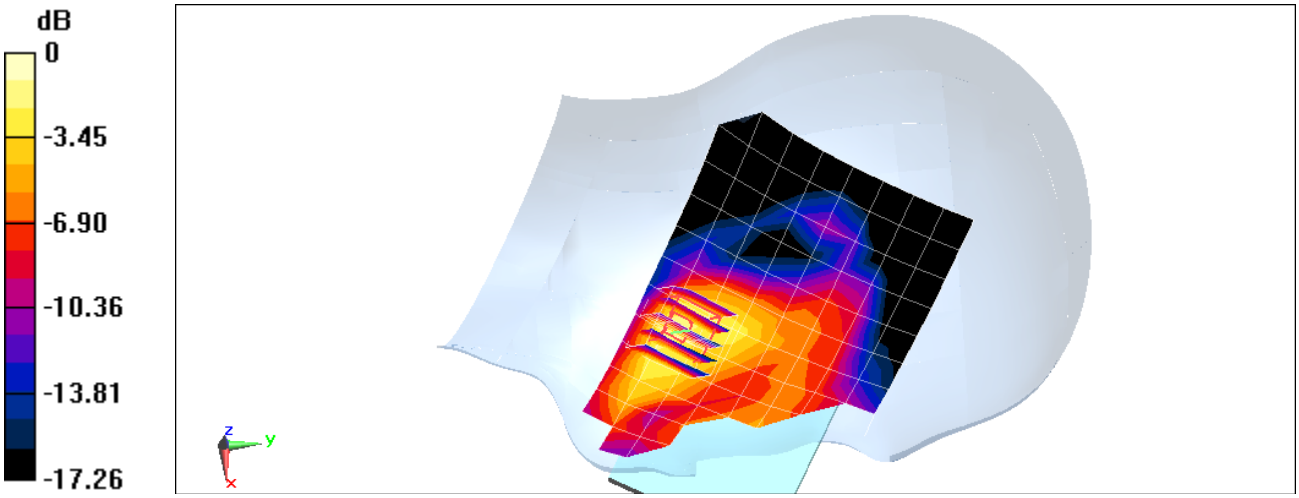
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used:
f = 1880 MHz; σ = 1.378 S/m; ε_r = 39.355; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.78 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.184 W/kg



0 dB = 0.249 W/kg = -6.04 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FC4

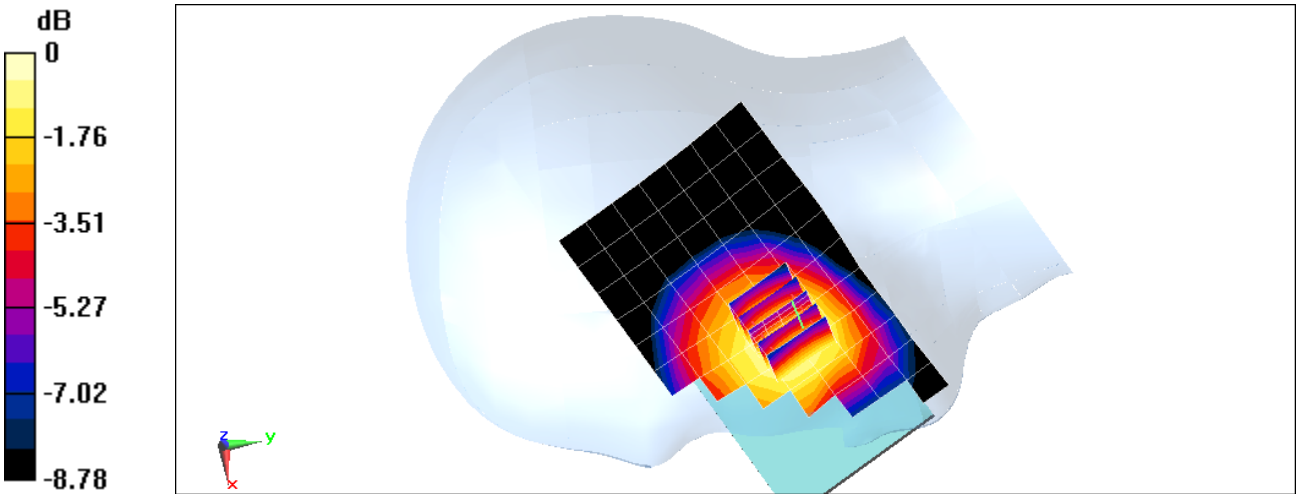
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used (interpolated):
f = 782 MHz; σ = 0.929 S/m; ε_r = 40.395; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3288; ConvF(6.81, 6.81, 6.81); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.31 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.189 W/kg
SAR(1 g) = 0.150 W/kg



0 dB = 0.163 W/kg = -7.88 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FC4

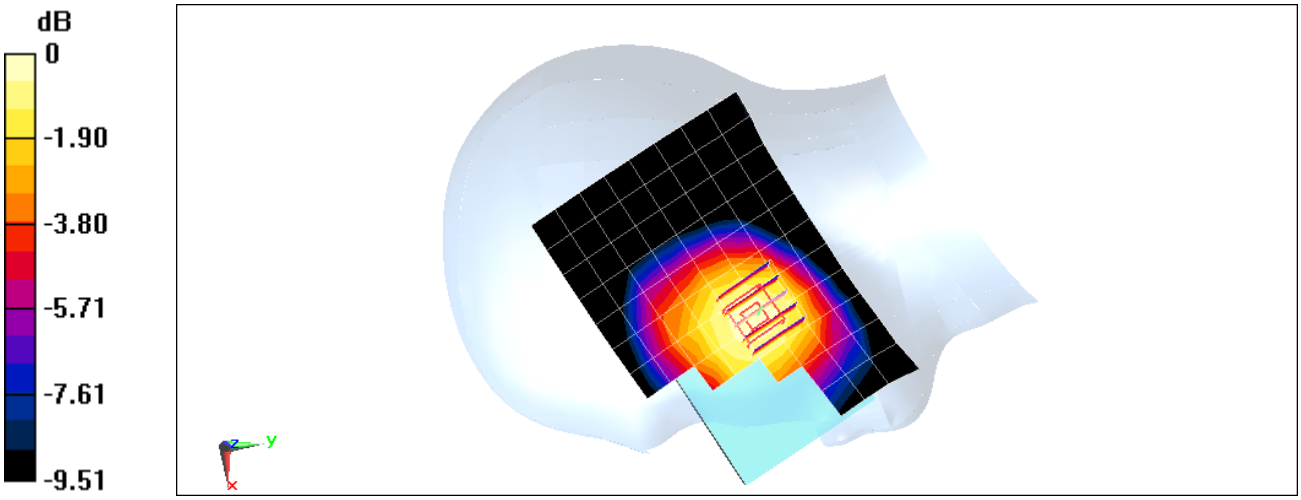
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.934 S/m; ε_r = 43.417; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-19-2015; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.23, 6.23, 6.23); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell), Right Head, Cheek, 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 = 16.51 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.269 W/kg
SAR(1 g) = 0.218 W/kg



0 dB = 0.175 W/kg = -7.57 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA6

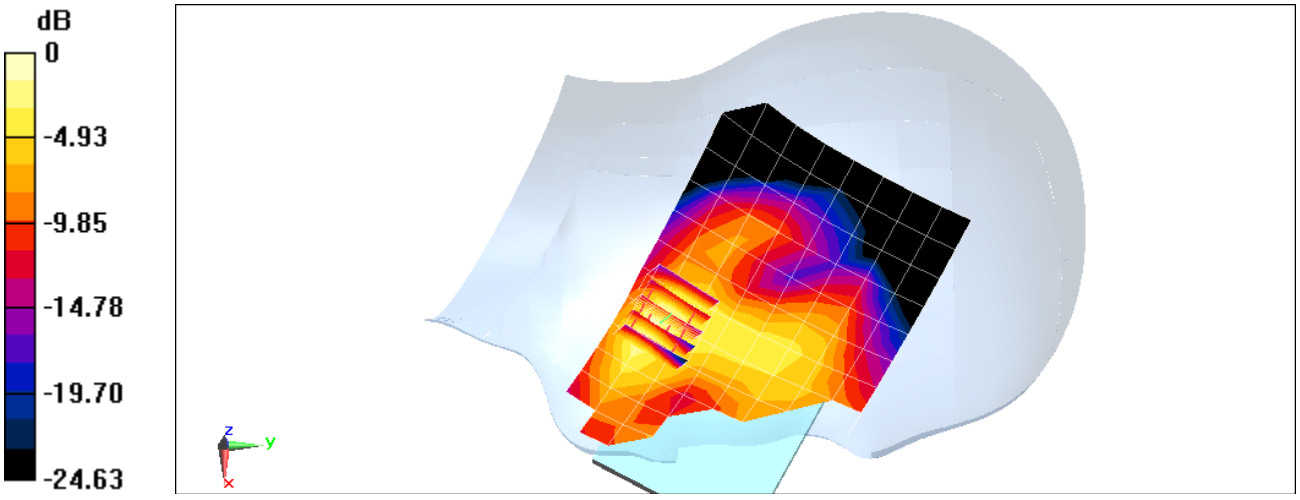
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.322 S/m; ε_r = 38.55; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3209; ConvF(5.24, 5.24, 5.24); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.51 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.231 W/kg



0 dB = 0.303 W/kg = -5.19 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08D9A

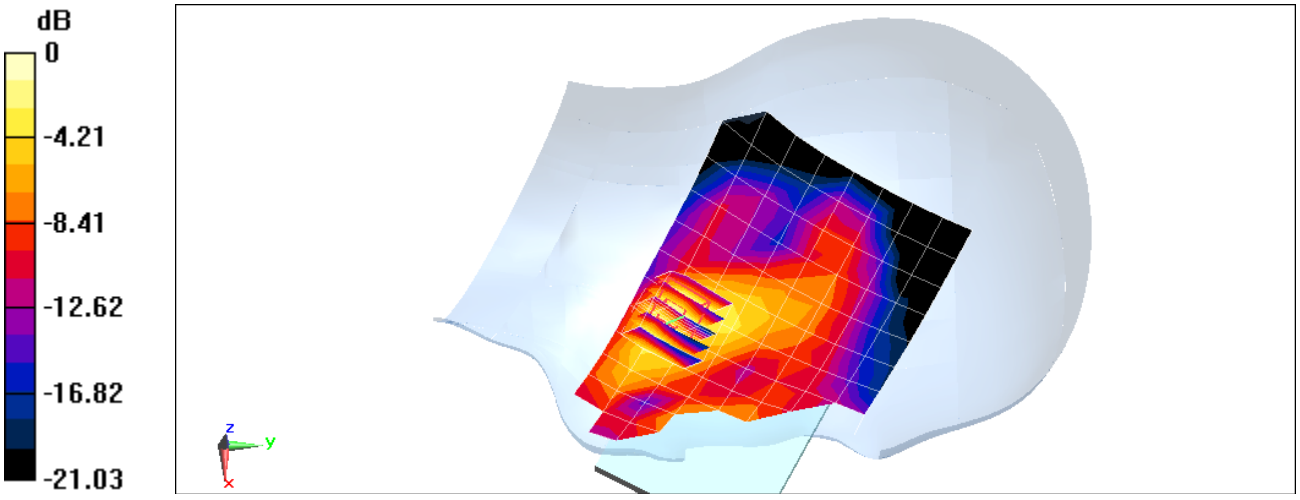
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.357 S/m; ε_r = 39.47; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 01-16-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Left Head, Cheek, Low.ch, QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.89 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.149 W/kg



0 dB = 0.197 W/kg = -7.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

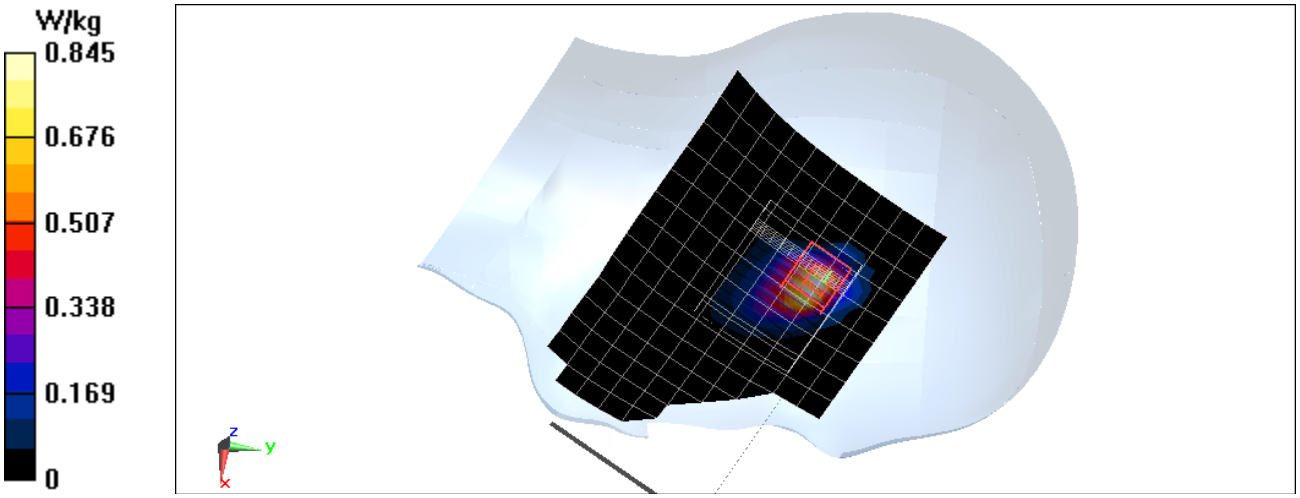
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used (interpolated):
$f = 2412$ MHz; $\sigma = 1.806$ S/m; $\varepsilon_r = 40.625$; $\rho = 1000$ kg/m^3
Phantom section: Left Section

Test Date: 01-20-2015; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(4.54, 4.54, 4.54); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Left Head, Cheek, Ch 1, 1 Mbps, Antenna 2

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (11x12x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.12 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.666 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

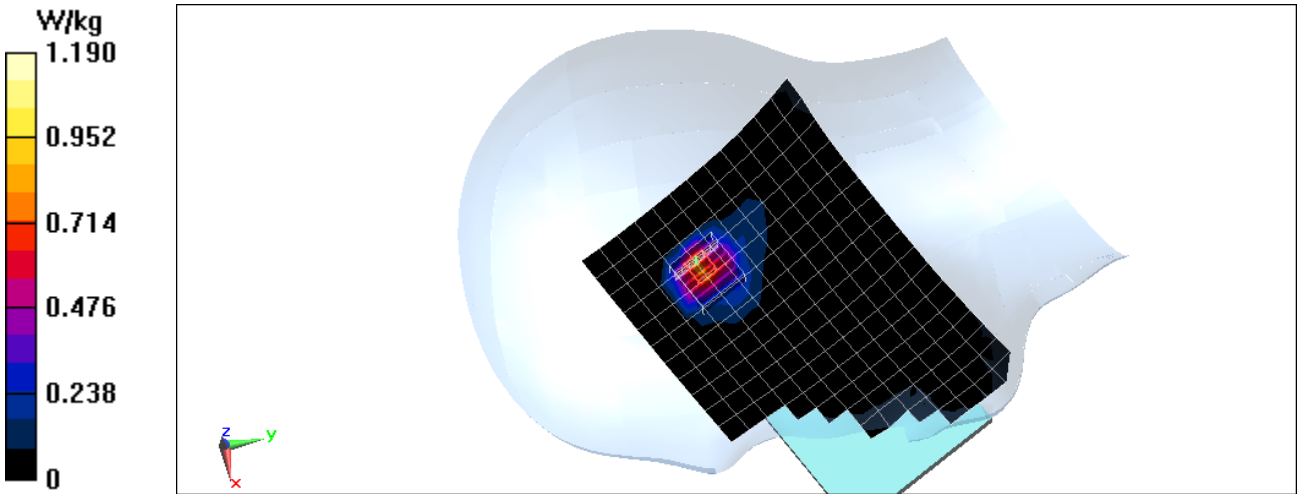
Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5745 MHz; σ = 5.43 S/m; ε_r = 34.635; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 01-27-2015; Ambient Temp: 24.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7308; ConvF(4.81, 4.81, 4.81); Calibrated: 7/16/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, 5.8 GHz, 20 MHz Bandwidth, Right Head, Cheek, Ch 149, 6 Mbps, Antenna 1

Area Scan (13x18x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 6.901 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.35 W/kg
SAR(1 g) = 0.457 W/kg



DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FC8

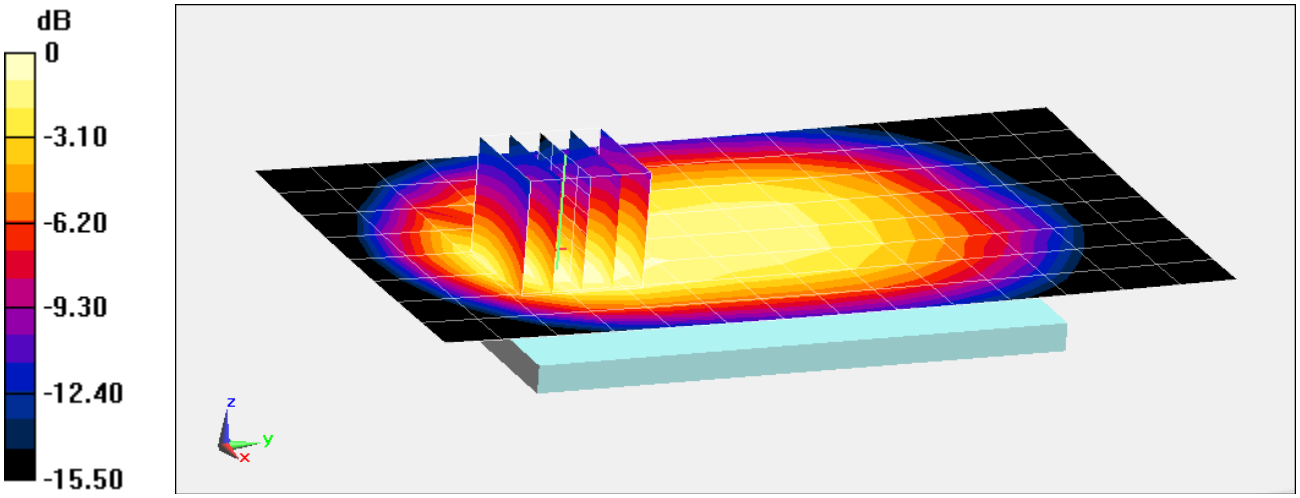
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.994 S/m; ε_r = 54.432; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. 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 = 21.31 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.720 W/kg
SAR(1 g) = 0.409 W/kg



0 dB = 0.489 W/kg = -3.11 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FC8

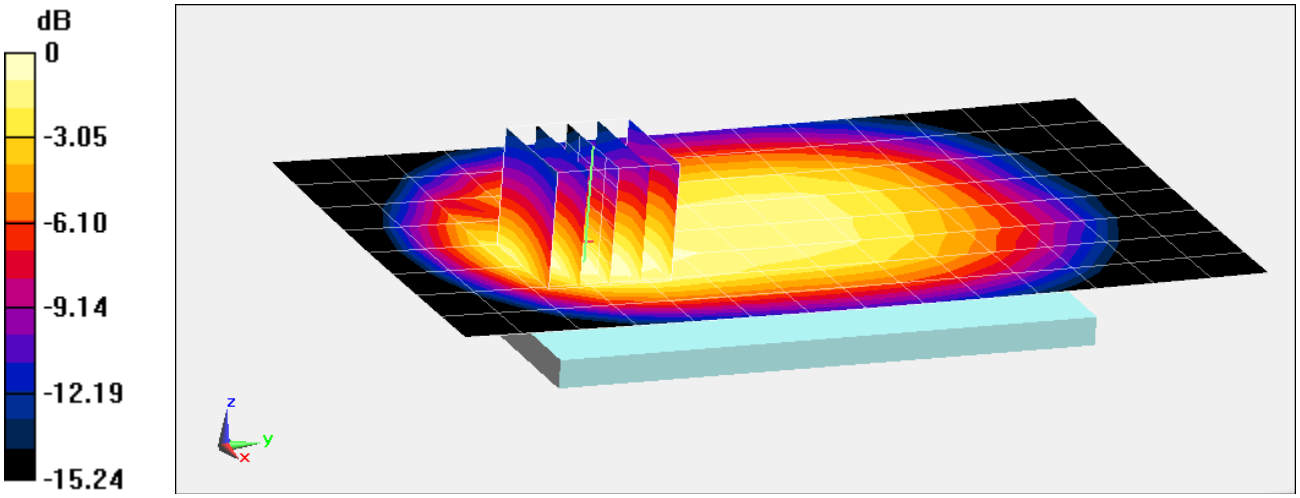
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.994 S/m; ε_r = 54.432; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO, 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 = 21.32 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.722 W/kg
SAR(1 g) = 0.411 W/kg



0 dB = 0.491 W/kg = -3.09 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FCF

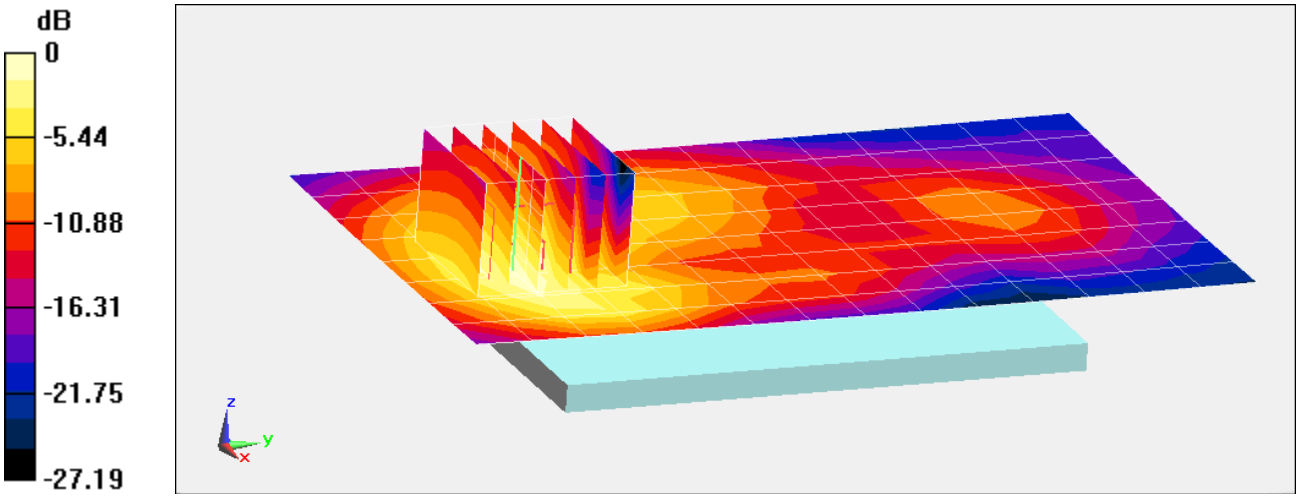
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.548 S/m; ε_r = 51.717; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS 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 = 18.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.825 W/kg
SAR(1 g) = 0.501 W/kg



0 dB = 0.583 W/kg = -2.34 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FD5

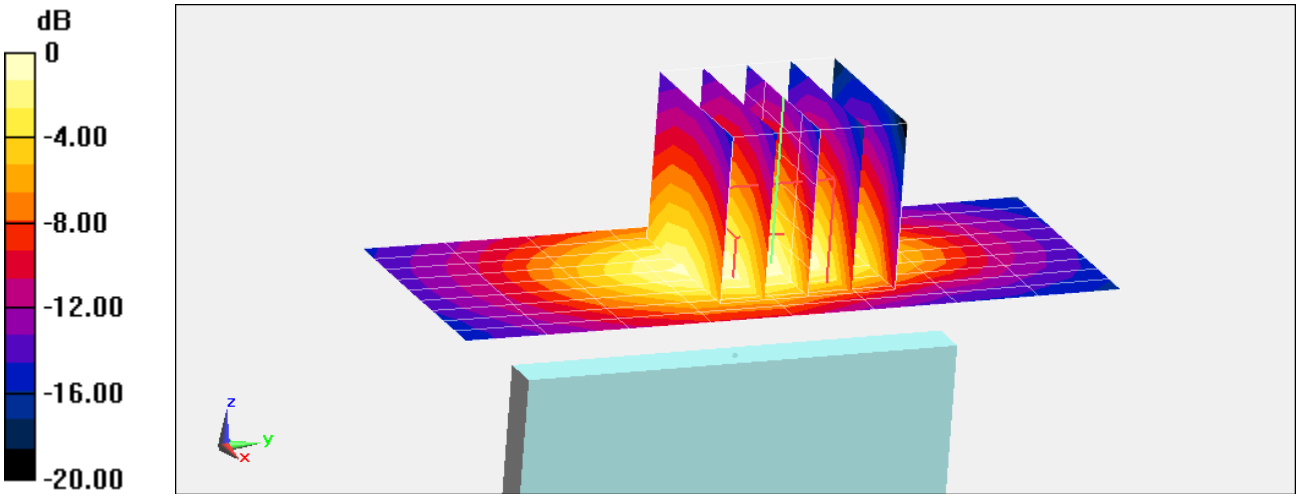
Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1851.25 MHz; σ = 1.519 S/m; ε_r = 51.837; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.38 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.718 W/kg



0 dB = 0.878 W/kg = -0.57 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C68

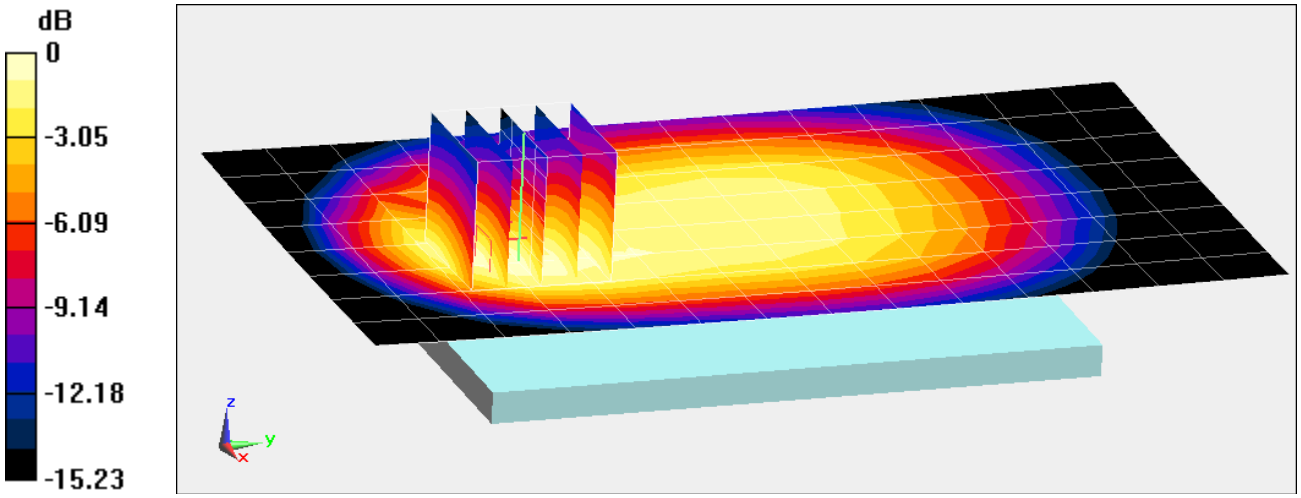
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.994 S/m; ε_r = 54.432; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.94 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.592 W/kg
SAR(1 g) = 0.327 W/kg



0 dB = 0.389 W/kg = -4.10 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C68

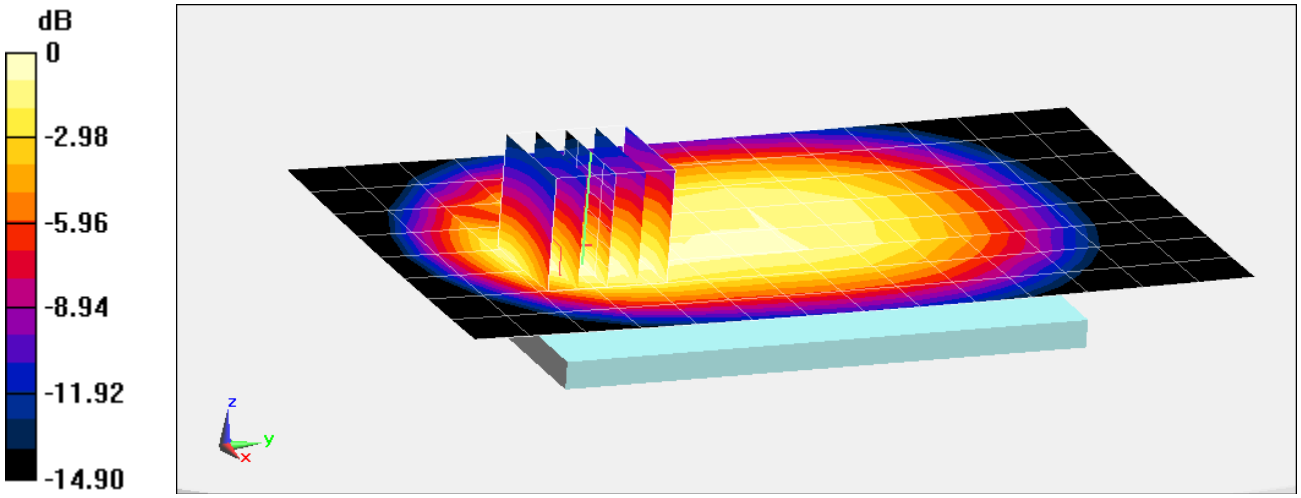
Communication System: UID 0, GSM850 GPRS; 4 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.076
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.994 S/m; ε_r = 54.432; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, 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 = 28.79 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.727 W/kg



0 dB = 0.861 W/kg = -0.65 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

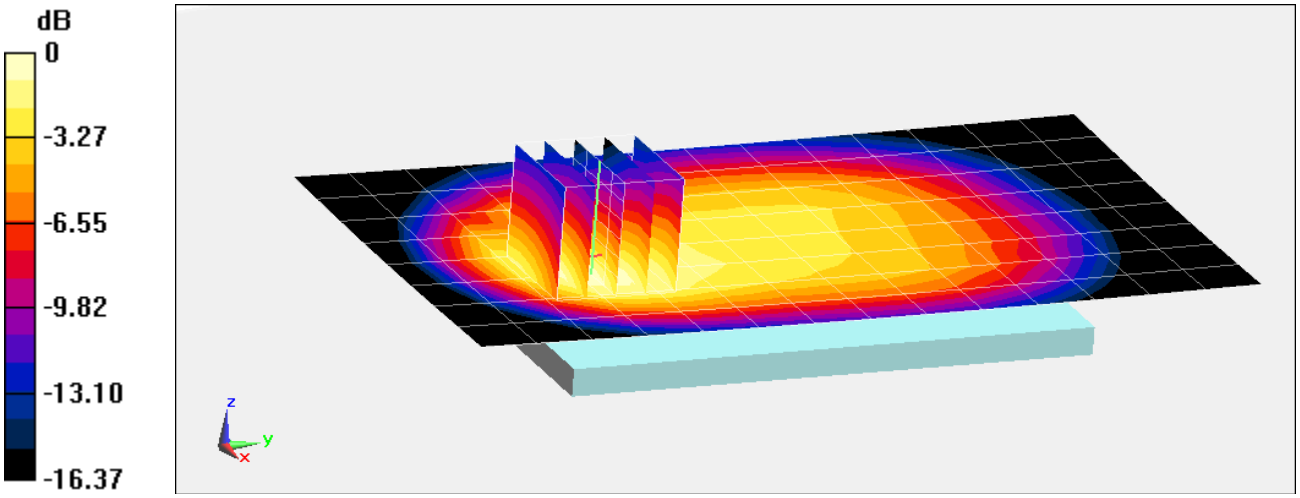
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.994 S/m; ε_r = 54.432; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.51 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.609 W/kg
SAR(1 g) = 0.339 W/kg



0 dB = 0.415 W/kg = -3.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C68

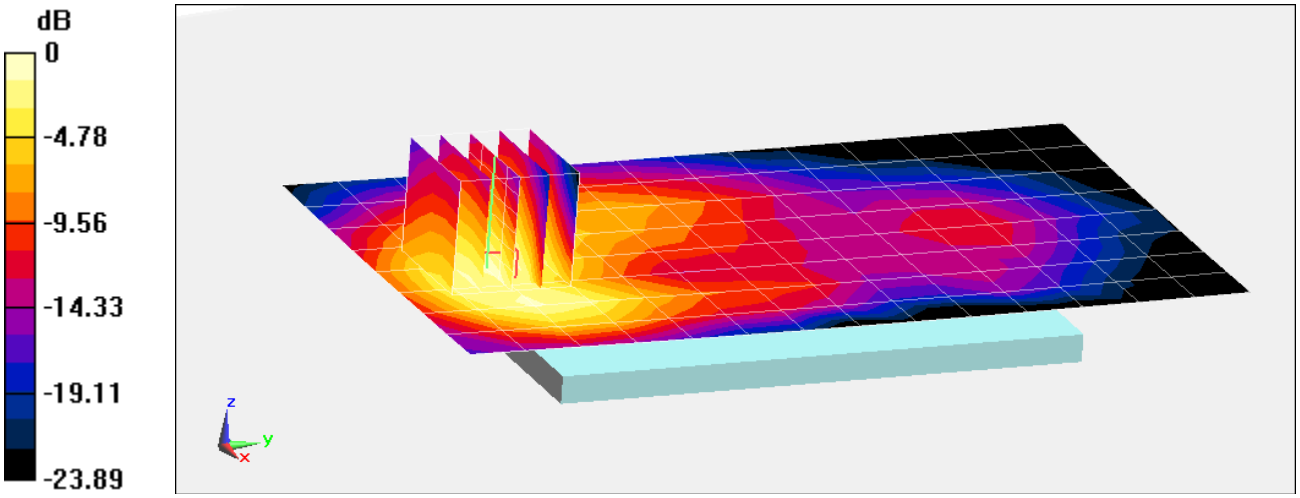
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.548 S/m; ε_r = 51.717; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.41 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.363 W/kg
SAR(1 g) = 0.218 W/kg



0 dB = 0.266 W/kg = -5.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C68

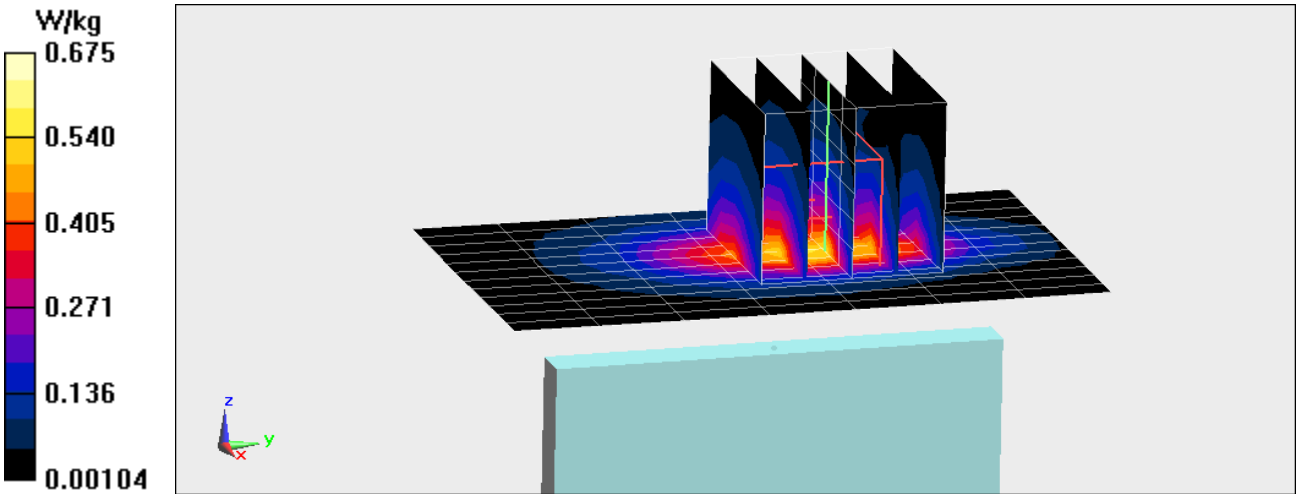
Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 1850.2 MHz; Duty Cycle: 1:2.076
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1850.2 MHz; σ = 1.518 S/m; ε_r = 51.841; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Body SAR, Bottom Edge, Low.ch, 4 Tx Slots

Area Scan (13x8x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.91 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.779 W/kg
SAR(1 g) = 0.469 W/kg



DUT: A3LSMG920V; Type: Portable Handset; Serial: 08C6B

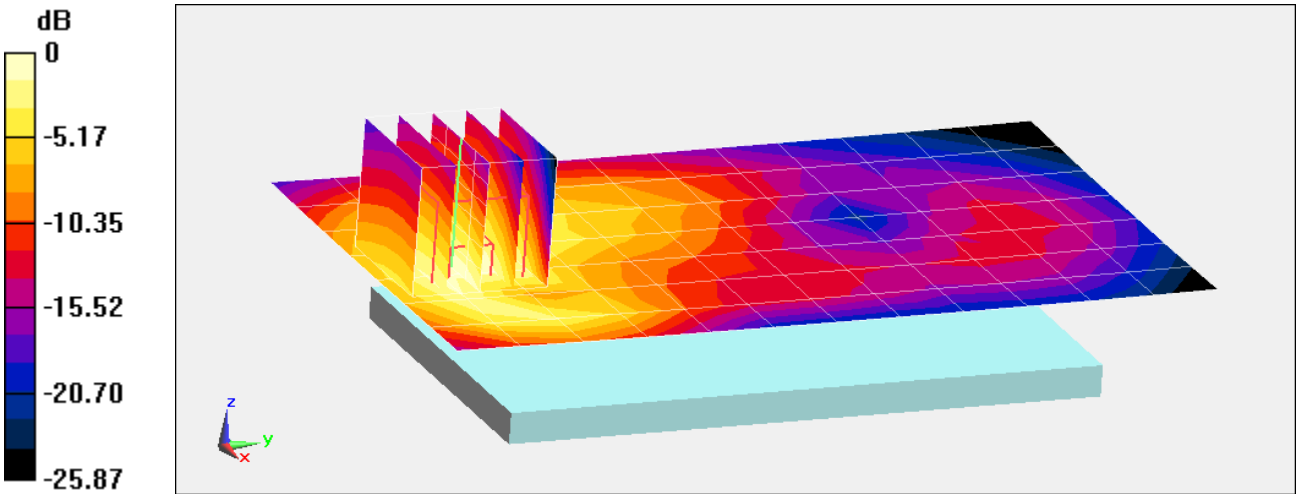
Communication System: UID 0, UMTS, Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.527 S/m; ε_r = 52.312; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-29-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.43 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.609 W/kg
SAR(1 g) = 0.384 W/kg



0 dB = 0.445 W/kg = -3.42 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FDB

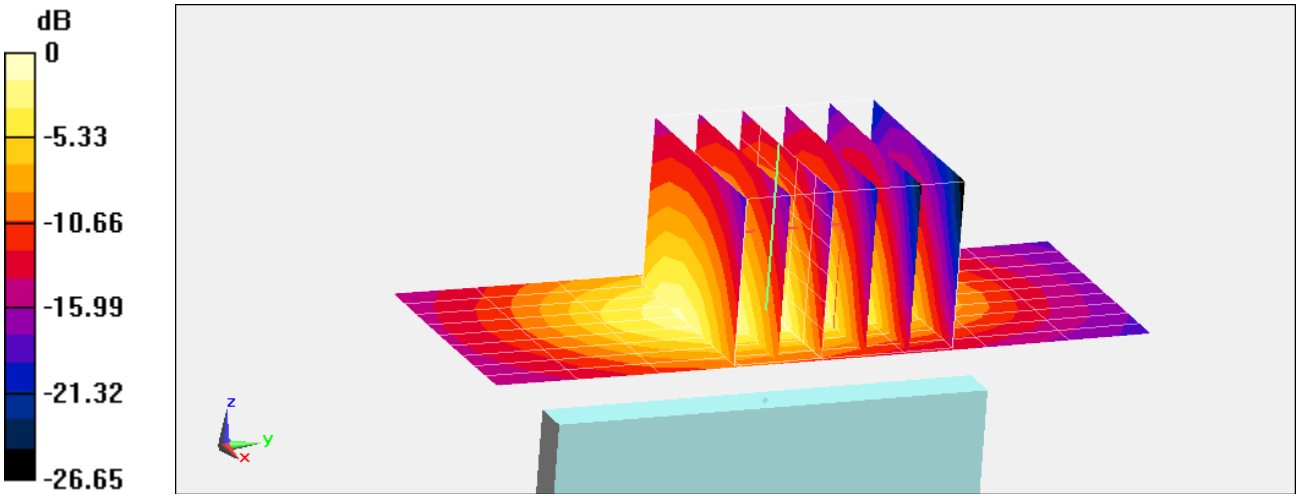
Communication System: UID 0, UMTS; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.56 S/m; ε_r = 52.227; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-29-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.24 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.721 W/kg



0 dB = 0.892 W/kg = -0.50 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FDA

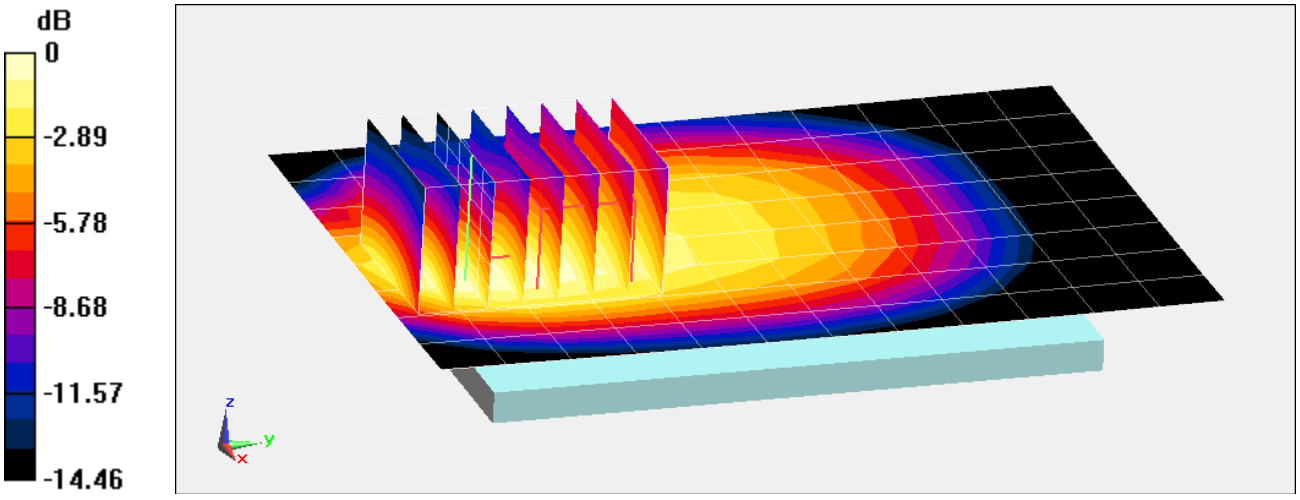
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 740 Body, Medium parameters used (interpolated):
f = 782 MHz; σ = 0.996 S/m; ε_r = 53.915; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-15-2015; Ambient Temp: 23.1°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3209; ConvF(6.16, 6.16, 6.16); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: ELI Front; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.24 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.707 W/kg
SAR(1 g) = 0.411 W/kg



0 dB = 0.489 W/kg = -3.11 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FC4

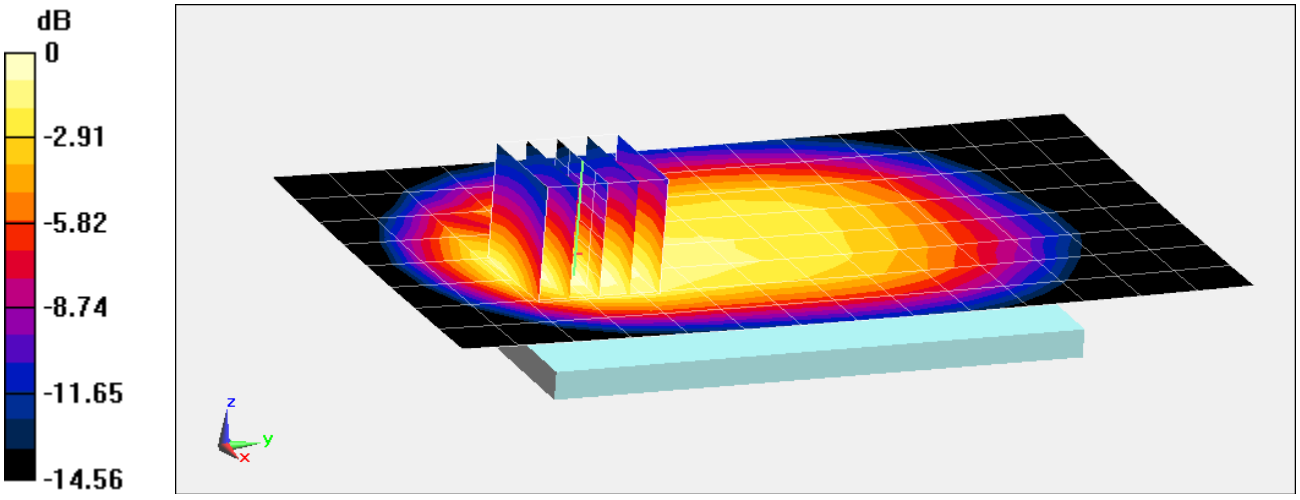
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.5 MHz; σ = 1.005 S/m; ε_r = 53.273; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-15-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.31 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.720 W/kg
SAR(1 g) = 0.414 W/kg



0 dB = 0.493 W/kg = -3.07 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA6

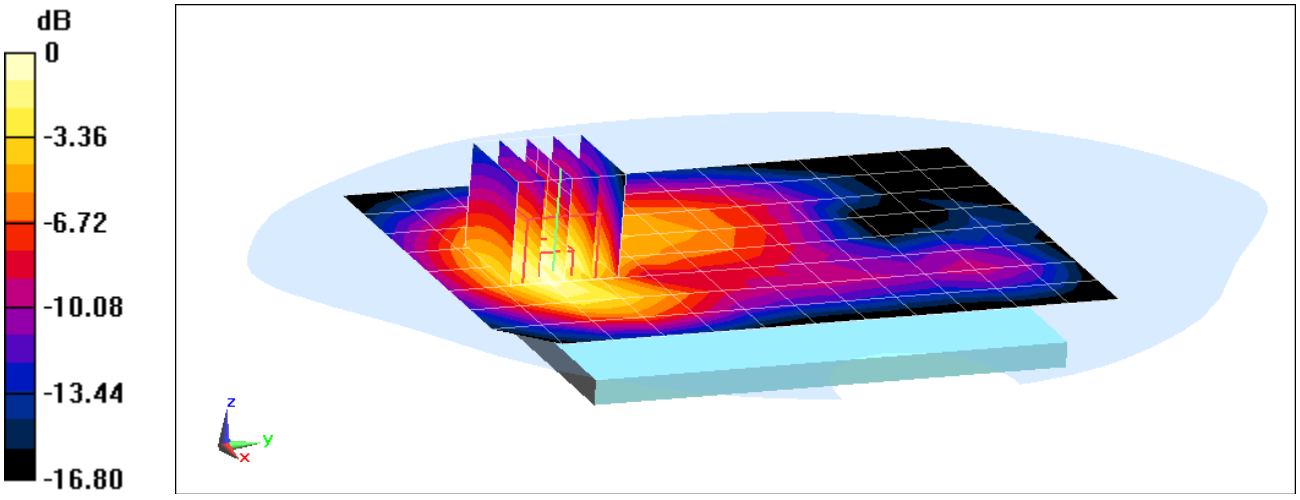
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.442 S/m; ε_r = 51.613; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(4.98, 4.98, 4.98); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.29 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.754 W/kg
SAR(1 g) = 0.485 W/kg



0 dB = 0.580 W/kg = -2.37 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FD5

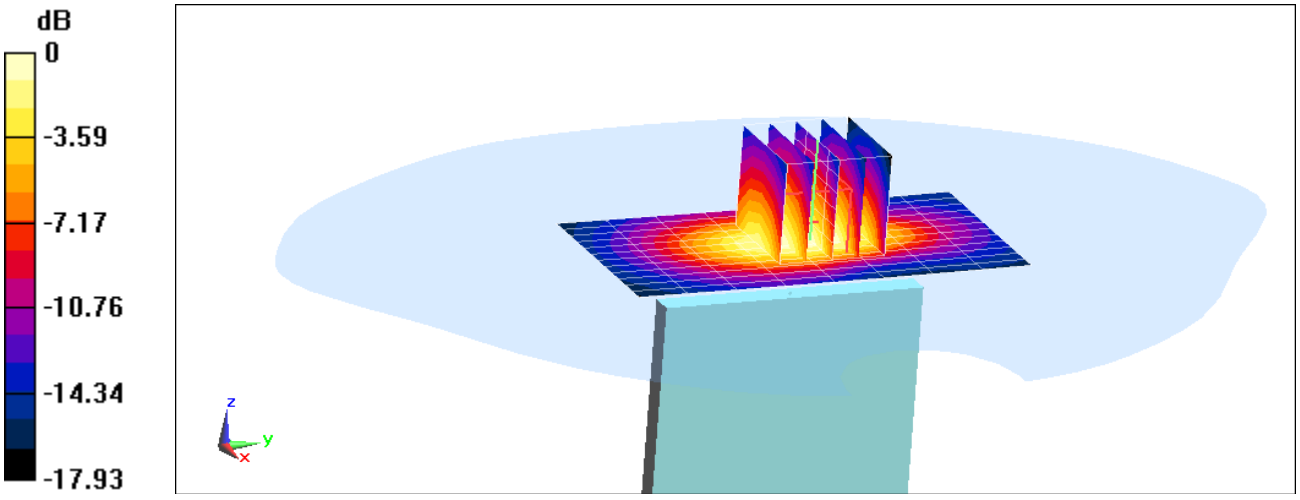
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.442 S/m; ε_r = 51.613; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(4.98, 4.98, 4.98); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 4 (AWS), Body SAR, Bottom Edge, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset**

Area Scan (13x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.96 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.834 W/kg



0 dB = 1.02 W/kg = 0.09 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08D9A

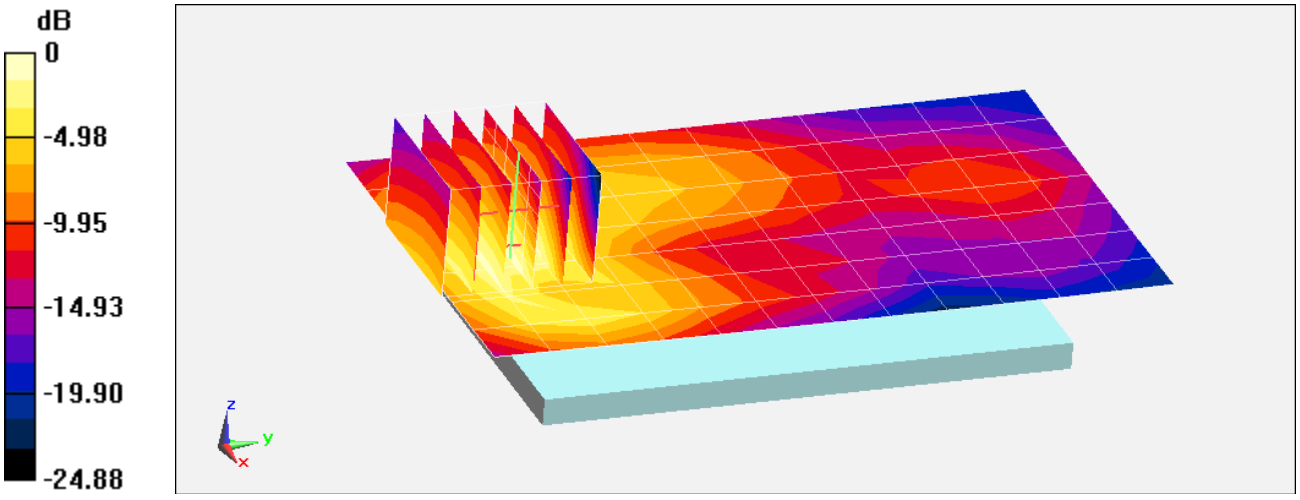
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
$f = 1860$ MHz; $\sigma = 1.528$ S/m; $\varepsilon_r = 51.8$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: LTE Band 2 (PCS), Body SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 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 = 17.57 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.745 W/kg
SAR(1 g) = 0.465 W/kg



0 dB = 0.556 W/kg = -2.55 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08DB6

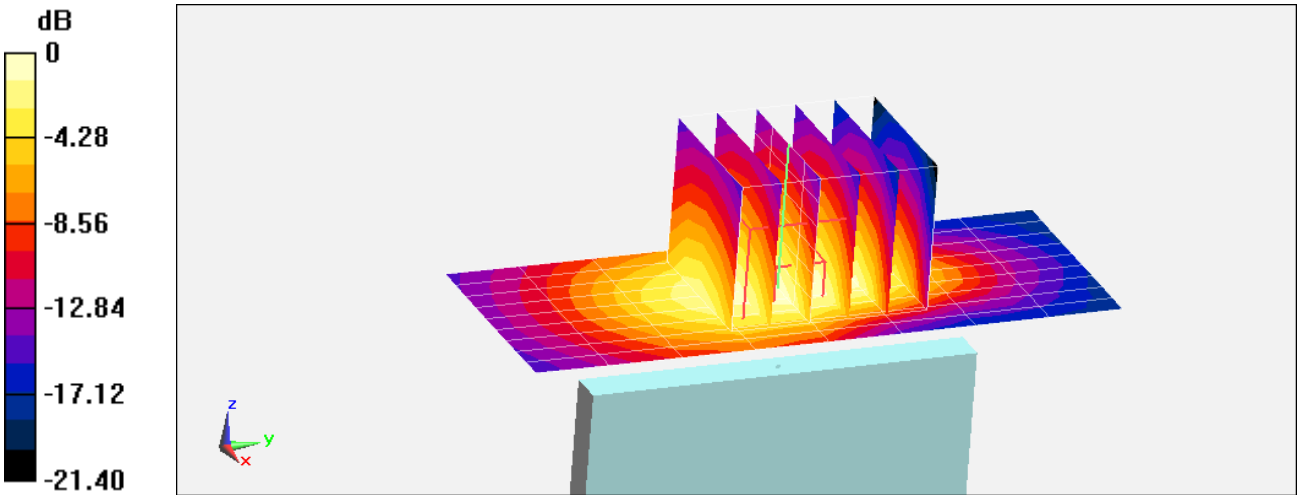
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1860 MHz; σ = 1.528 S/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Body SAR, Bottom Edge, Low.ch, 20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.51 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.748 W/kg



0 dB = 0.918 W/kg = -0.37 dBW/kg

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

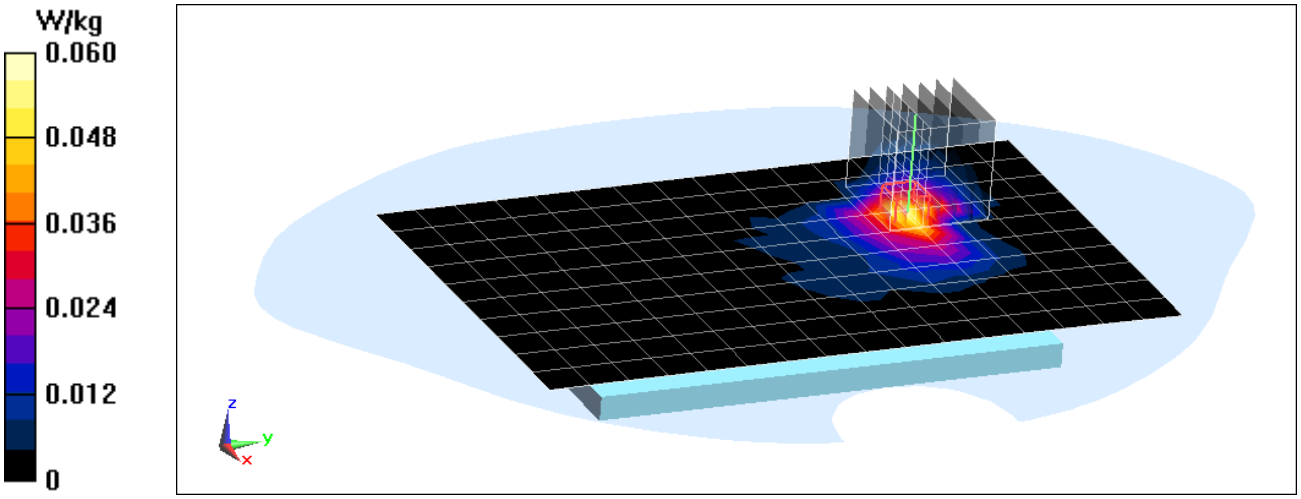
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.973 S/m; ε_r = 51.216; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3209; ConvF(4.2, 4.2, 4.2); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM left; Type: QD000P40CD; Serial: TP:1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Body SAR, Ch 01, 1 Mbps, Back Side, Antenna 2

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.256 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0890 W/kg
SAR(1 g) = 0.048 W/kg



DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

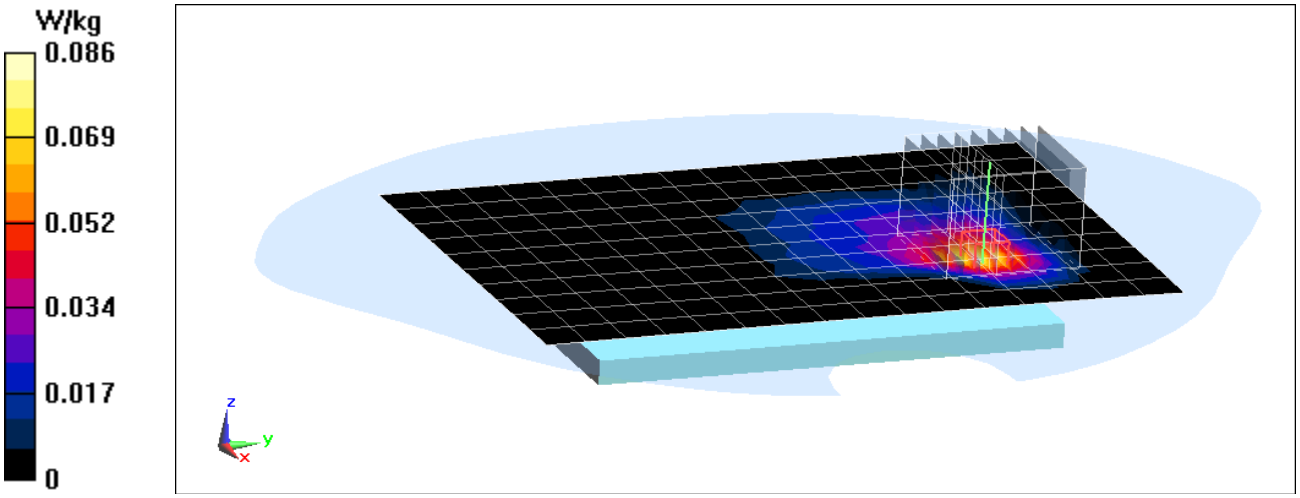
Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.973 S/m; ε_r = 51.216; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3209; ConvF(4.2, 4.2, 4.2); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM left; Type: QD000P40CD; Serial: TP:1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Body SAR, Ch 1, 1 Mbps, Front Side, Antenna 2

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.239 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.070 W/kg



DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

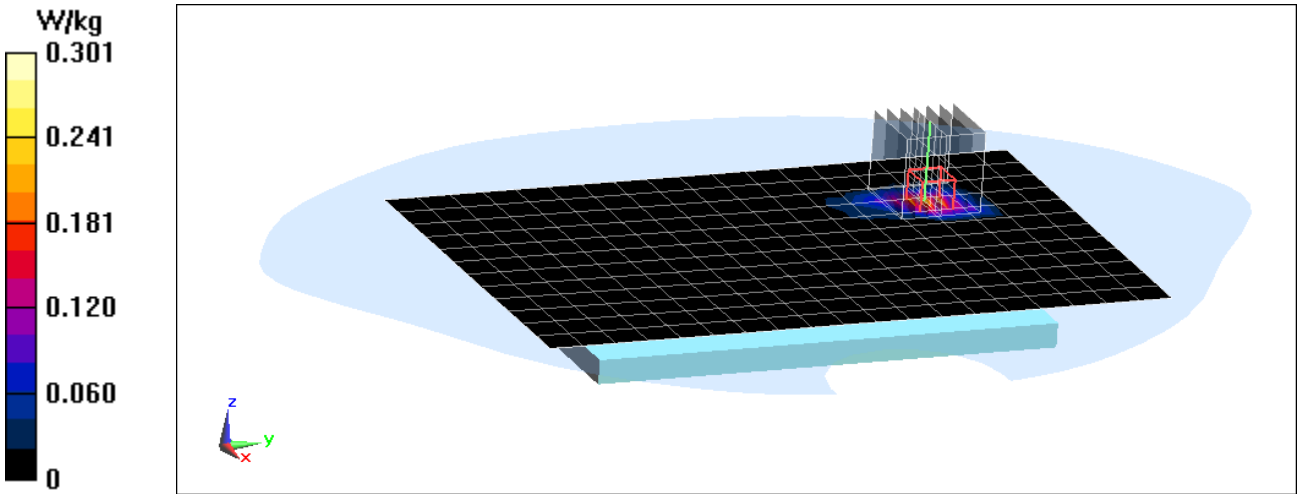
Communication System: UID 0, IEEE 802.11a; Frequency: 5580 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5580 MHz; σ = 5.899 S/m; ε_r = 47.646; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.1°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(3.66, 3.66, 3.66); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, 5.5 GHz, 20 MHz Bandwidth,
Body SAR, Ch 116, 6 Mbps, Back Side, Antenna 2

Area Scan (13x20x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 3.833 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.479 W/kg
SAR(1 g) = 0.103 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG920V; Type: Portable Handset; Serial: 08FA2

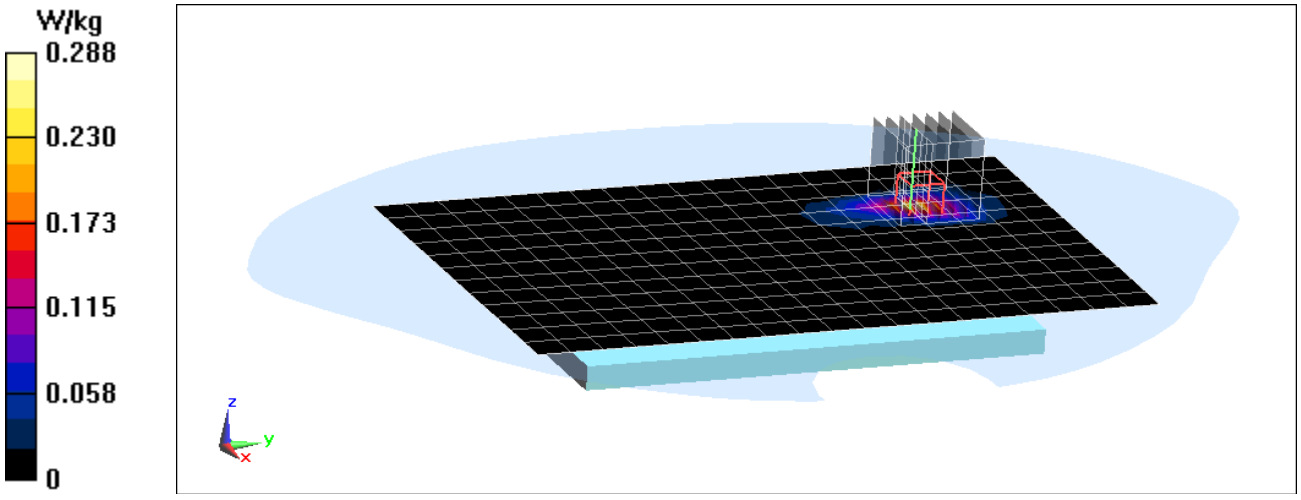
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5745 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5745 MHz; σ = 6.176 S/m; ε_r = 47.389; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.9°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(3.93, 3.93, 3.93); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11a, 5.8 GHz, 20 MHz Bandwidth,
Body SAR, Ch 149, 6 Mbps, Back Side, Antenna 2

Area Scan (13x20x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.015 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.473 W/kg
SAR(1 g) = 0.100 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

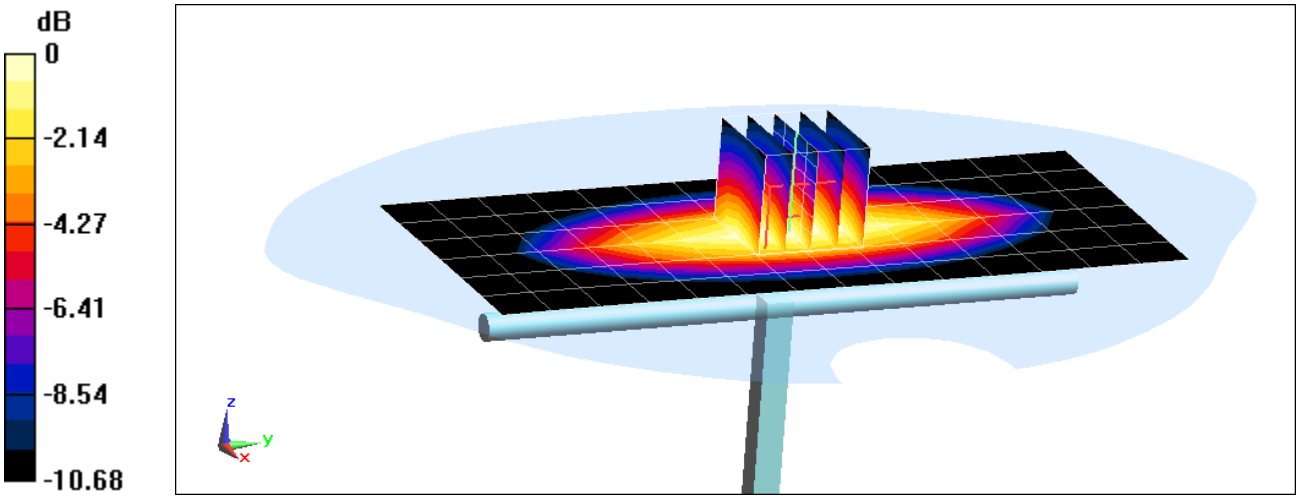
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used (interpolated):
$f = 750$ MHz; $\sigma = 0.898$ S/m; $\varepsilon_r = 40.834$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3288; ConvF(6.81, 6.81, 6.81); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.784 W/kg
Deviation = -5.88%



0 dB = 0.921 W/kg = -0.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

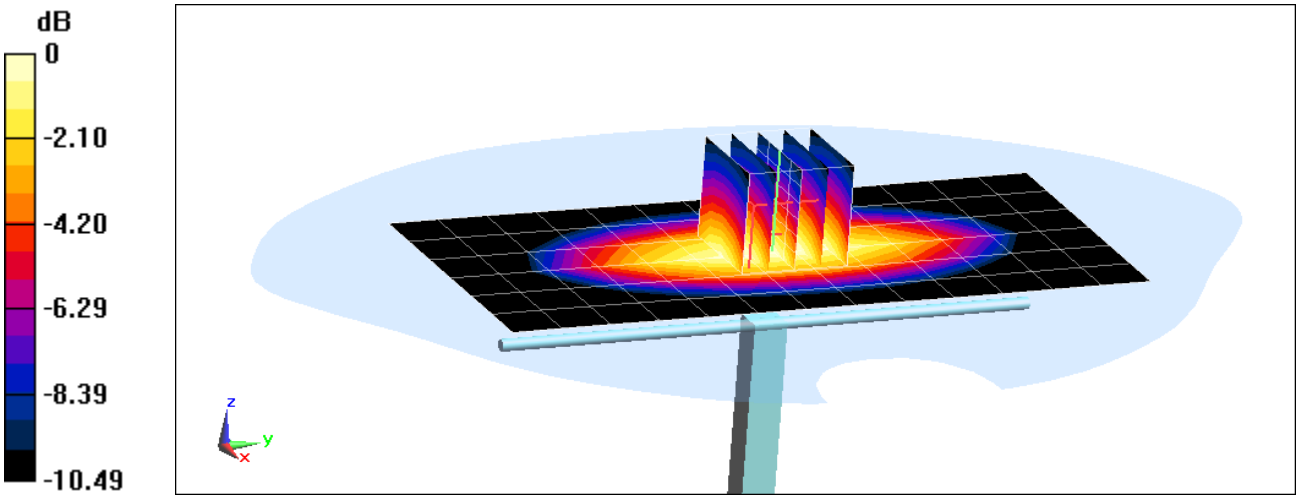
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used:
f = 835 MHz; σ = 0.897 S/m; ε_r = 40.801; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-16-2015; Ambient Temp: 23.4°C; Tissue Temp: 23.3°C

Probe: ES3DV2 - SN3022; ConvF(6.18, 6.18, 6.18); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.915 W/kg
Deviation = -0.54%



0 dB = 1.07 W/kg = 0.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

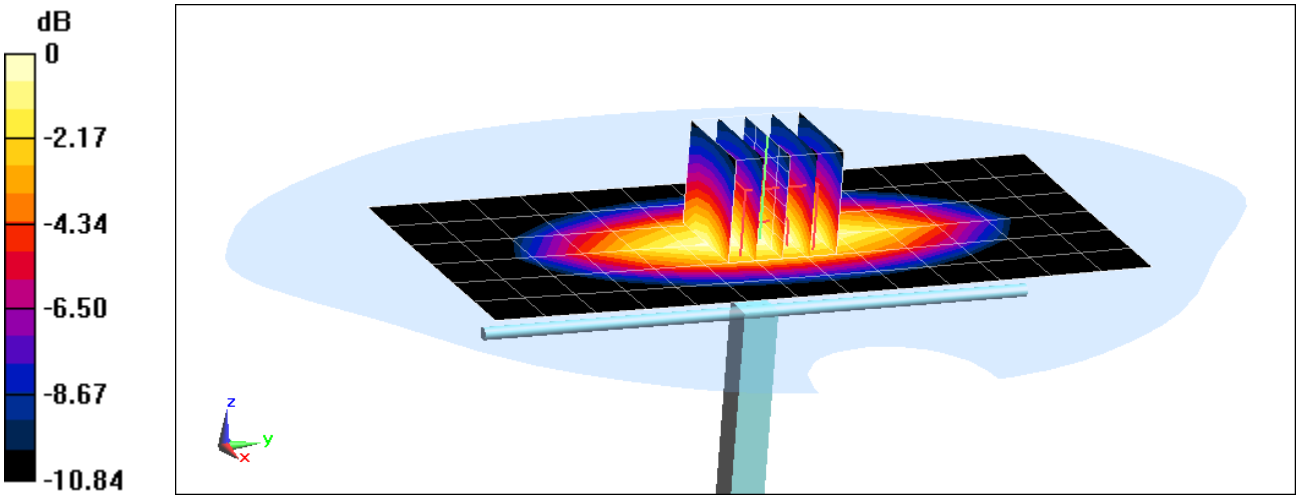
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used:
f = 835 MHz; σ = 0.933 S/m; ε_r = 43.439; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(6.23, 6.23, 6.23); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.971 W/kg
Deviation = 5.54%



0 dB = 1.14 W/kg = 0.57 dBW/kg

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

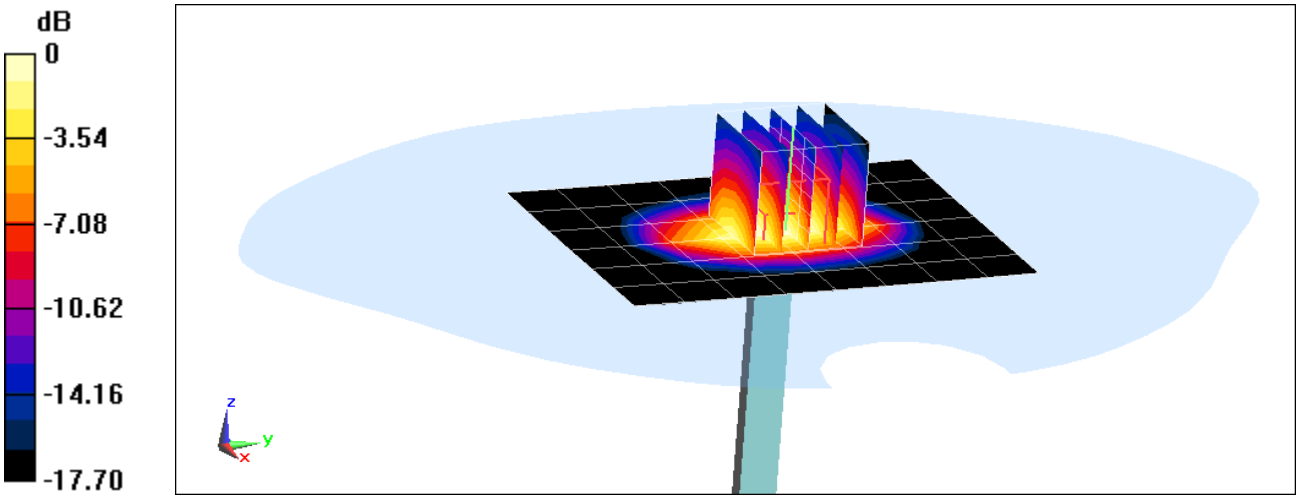
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head, Medium parameters used:
f = 1750 MHz; σ = 1.34 S/m; ε_r = 38.482; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2015; Ambient Temp: 23.3°C; Tissue Temp: 22.7°C

Probe: ES3DV3 - SN3209; ConvF(5.24, 5.24, 5.24); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.13 W/kg
SAR(1 g) = 3.37 W/kg
Deviation = -8.67%



0 dB = 4.20 W/kg = 6.23 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

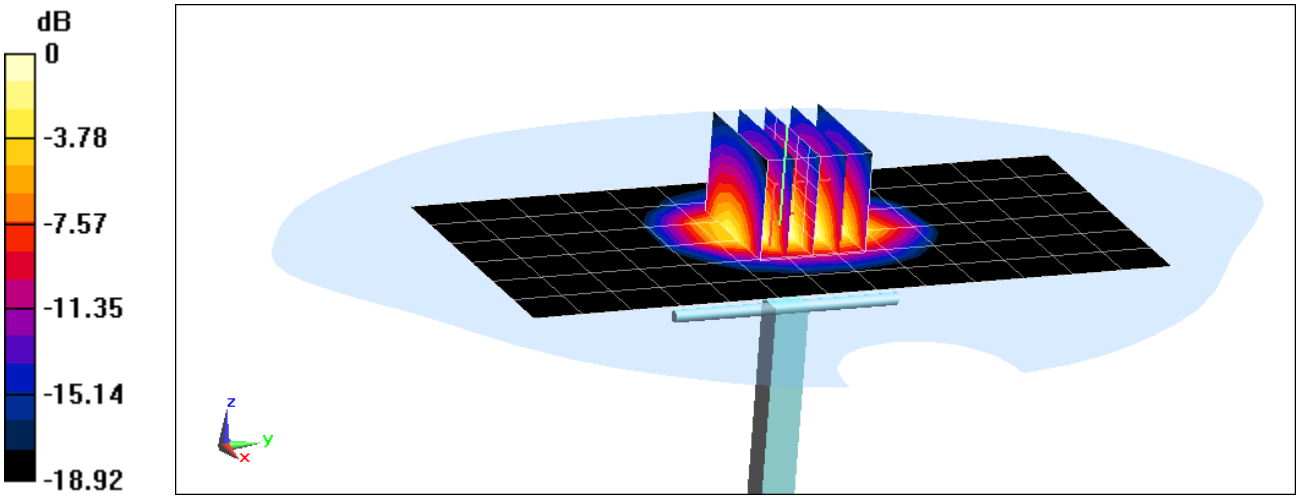
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.401 S/m; ε_r = 39.252; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Validation

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.92 W/kg
SAR(1 g) = 3.81 W/kg
Deviation = -5.22%



0 dB = 4.59 W/kg = 6.62 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

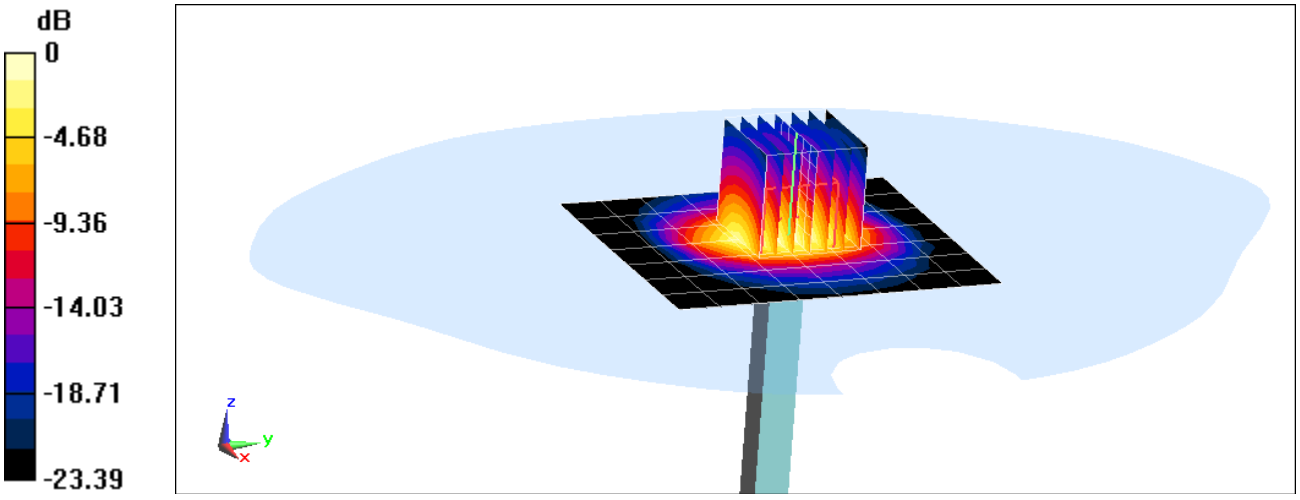
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used:
f = 2450 MHz; σ = 1.849 S/m; ε_r = 40.47; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-20-2015; Ambient Temp: 21.9°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3209; ConvF(4.54, 4.54, 4.54); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 10.3 W/kg
SAR(1 g) = 4.86 W/kg
Deviation = -6.72%



0 dB = 6.41 W/kg = 8.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1120

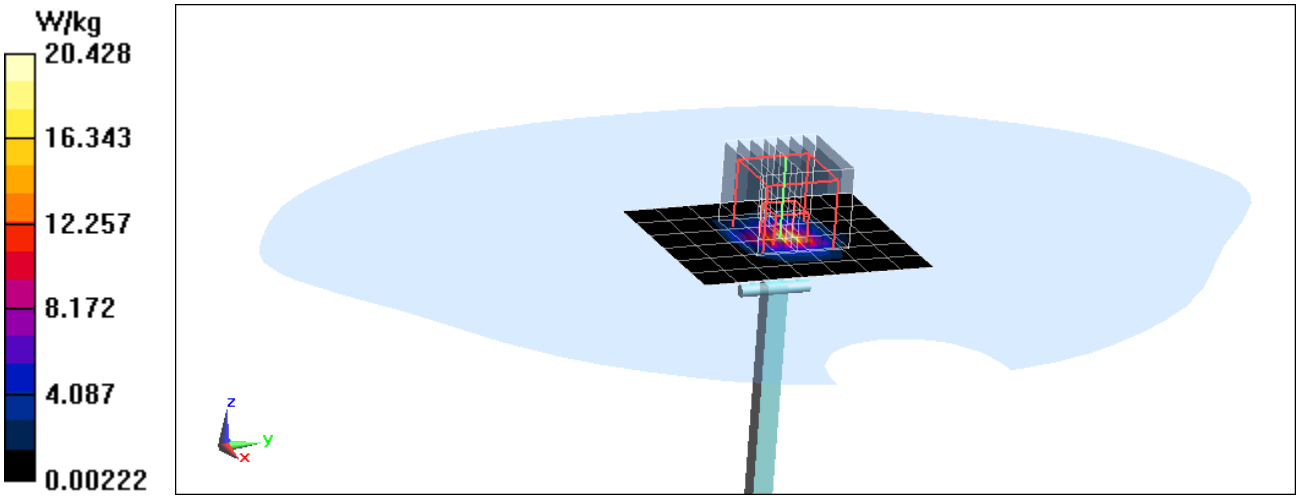
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5300 MHz; σ = 4.903 S/m; ε_r = 35.673; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-27-2015; Ambient Temp: 24.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7308; ConvF(5.37, 5.37, 5.37); Calibrated: 7/16/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.6 W/kg
SAR(1 g) = 7.91 W/kg
Deviation = -5.16%



DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1120

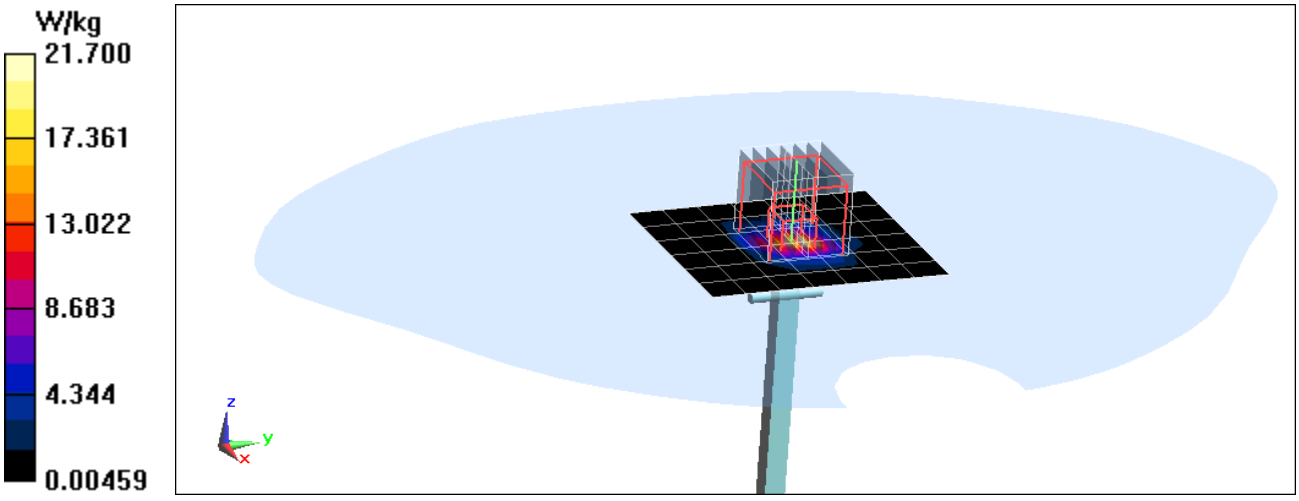
Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5500 MHz; σ = 5.129 S/m; ε_r = 35.206; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-27-2015; Ambient Temp: 24.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7308; ConvF(4.64, 4.64, 4.64); Calibrated: 7/16/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5500 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 7.95 W/kg
Deviation = -6.36%



DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1120

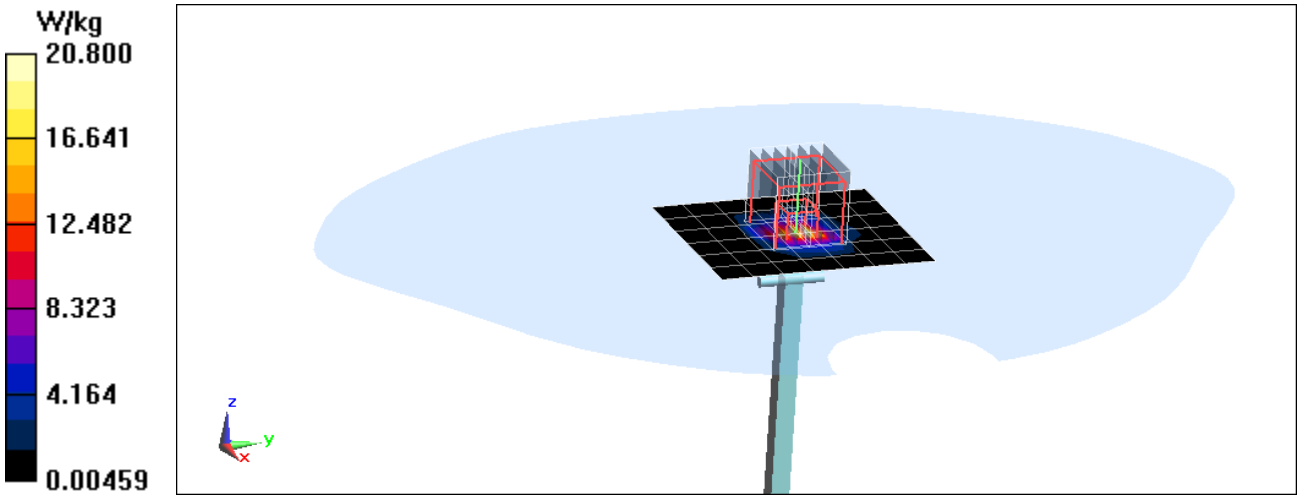
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5600 MHz; σ = 5.254 S/m; ε_r = 34.958; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-27-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7308; ConvF(4.64, 4.64, 4.64); Calibrated: 7/16/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 37.6 W/kg
SAR(1 g) = 8.15 W/kg
Deviation = -0.85%



DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1120

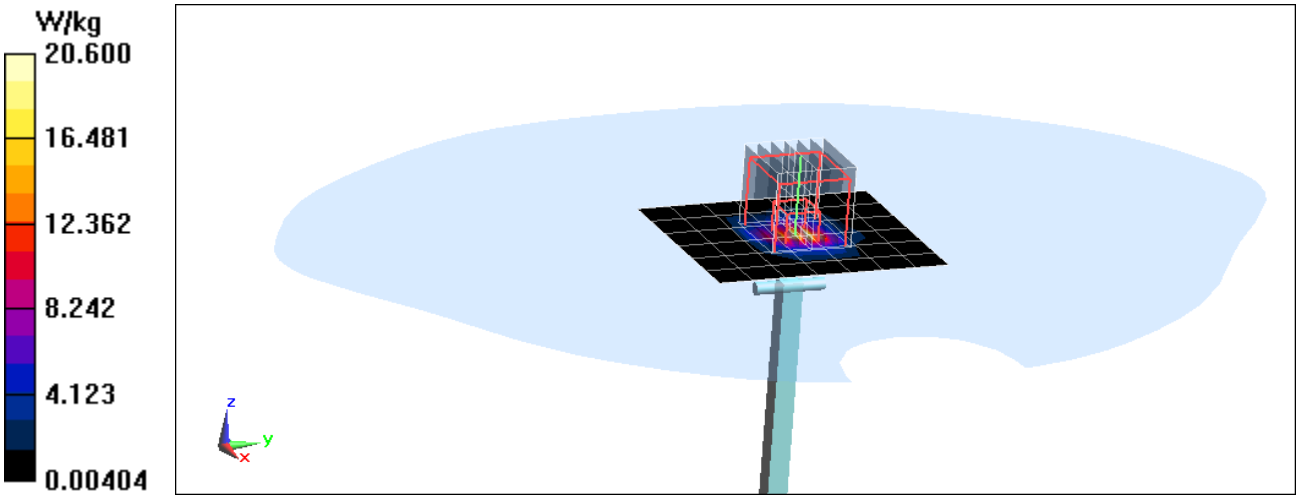
Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5800 MHz; σ = 5.496 S/m; ε_r = 34.471; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-27-2015; Ambient Temp: 24.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7308; ConvF(4.81, 4.81, 4.81); Calibrated: 7/16/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5800 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 36.7 W/kg
SAR(1 g) = 7.65 W/kg
Deviation = -3.29%



PCTEST ENGINEERING LABORATORY, INC.

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

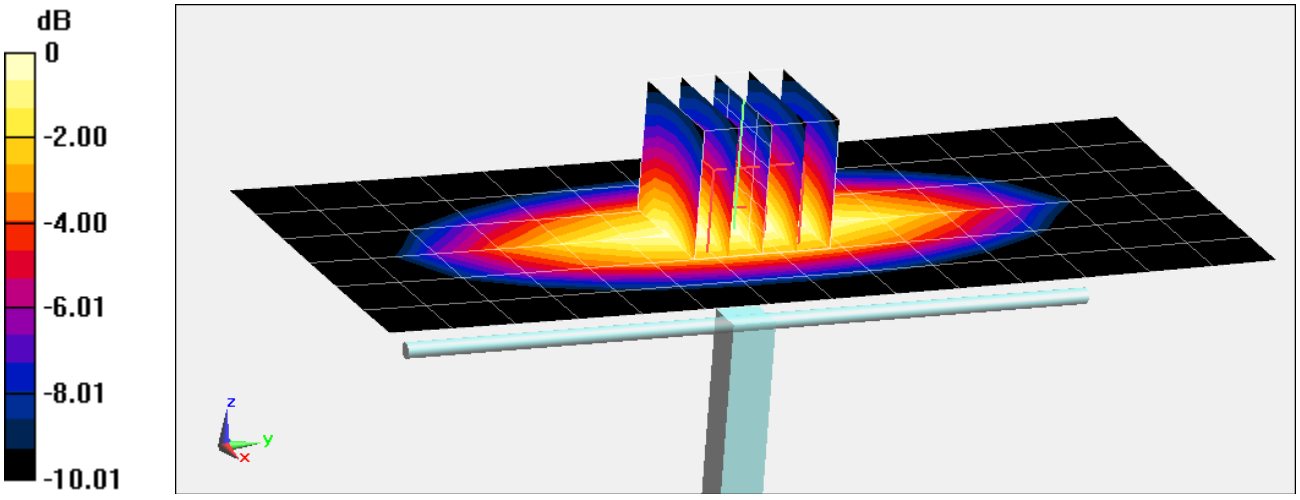
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
$f = 750$ MHz; $\sigma = 0.965$ S/m; $\varepsilon_r = 54.242$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-15-2015; Ambient Temp: 23.1°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3209; ConvF(6.16, 6.16, 6.16); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: ELI Front; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.891 W/kg
Deviation = 3.12%



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

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

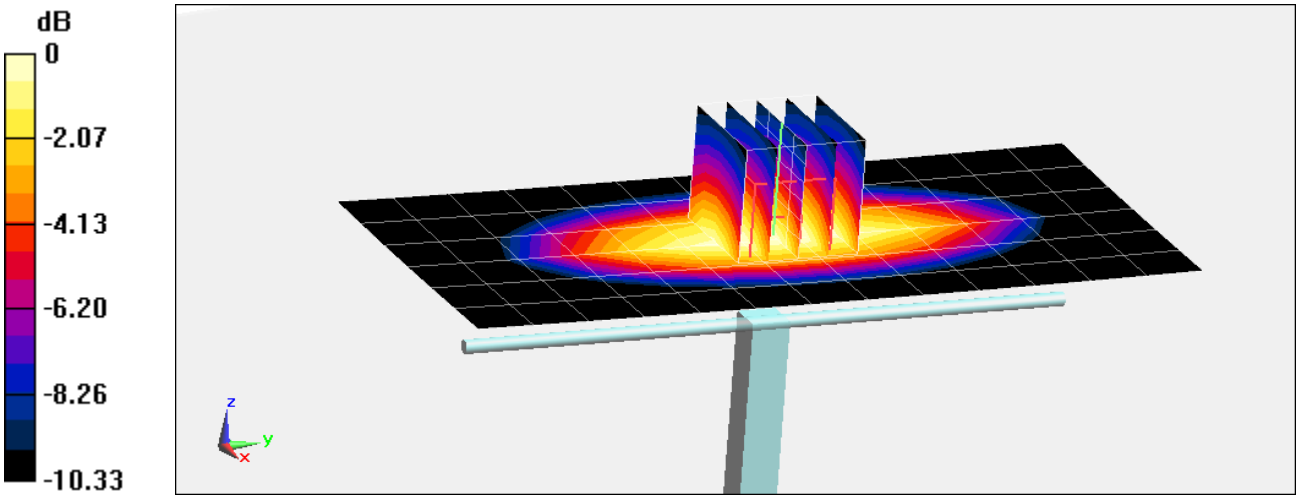
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used:
f = 835 MHz; σ = 0.993 S/m; ε_r = 54.447; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-19-2015; Ambient Temp: 24.2°C; Tissue Temp: 22.6°C

Probe: ES3DV3 - SN3288; ConvF(6.32, 6.32, 6.32); Calibrated: 9/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 9/18/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.972 W/kg
Deviation = 3.96%



0 dB = 1.14 W/kg = 0.57 dBW/kg

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

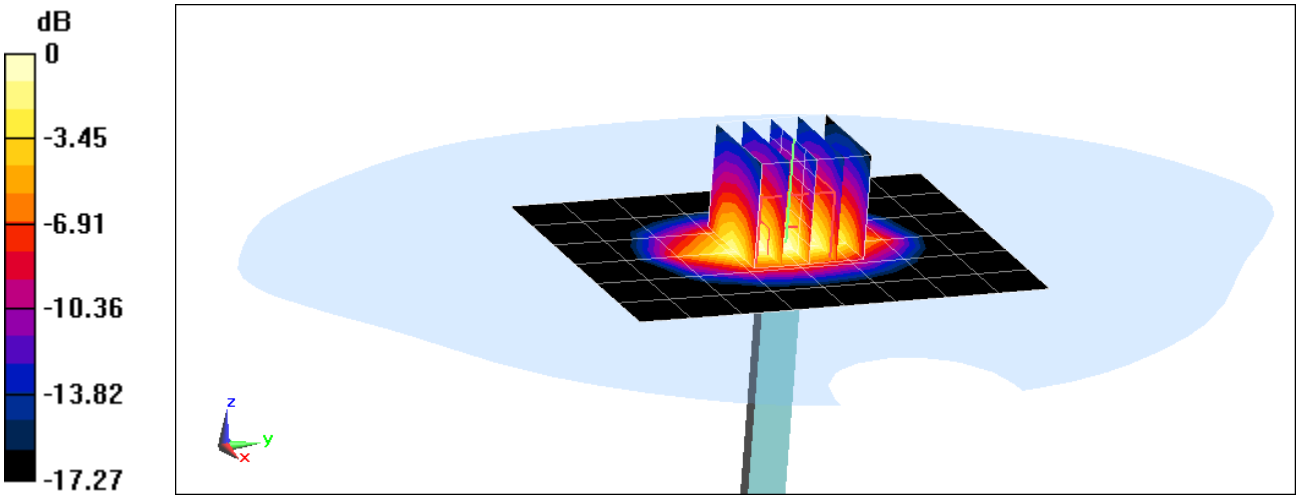
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used:
f = 1750 MHz; σ = 1.461 S/m; ε_r = 51.563; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3263; ConvF(4.98, 4.98, 4.98); Calibrated: 5/15/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/14/2014
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.40 W/kg
SAR(1 g) = 3.69 W/kg
Deviation = -1.86%



0 dB = 4.57 W/kg = 6.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

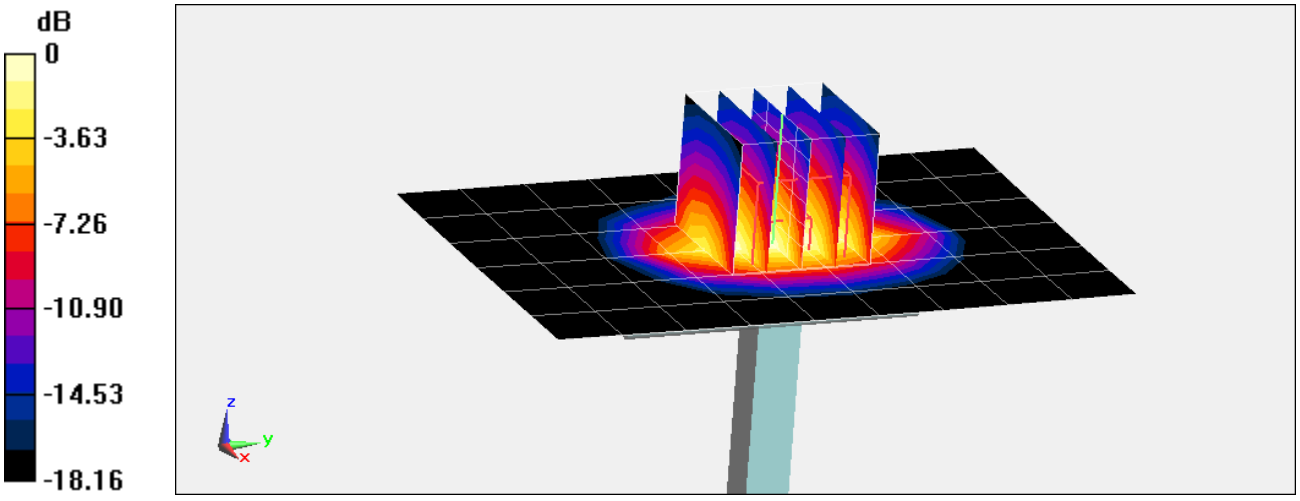
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.571 S/m; ε_r = 51.619; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.98 W/kg
SAR(1 g) = 3.95 W/kg
Deviation = -2.23%



0 dB = 4.98 W/kg = 6.97 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

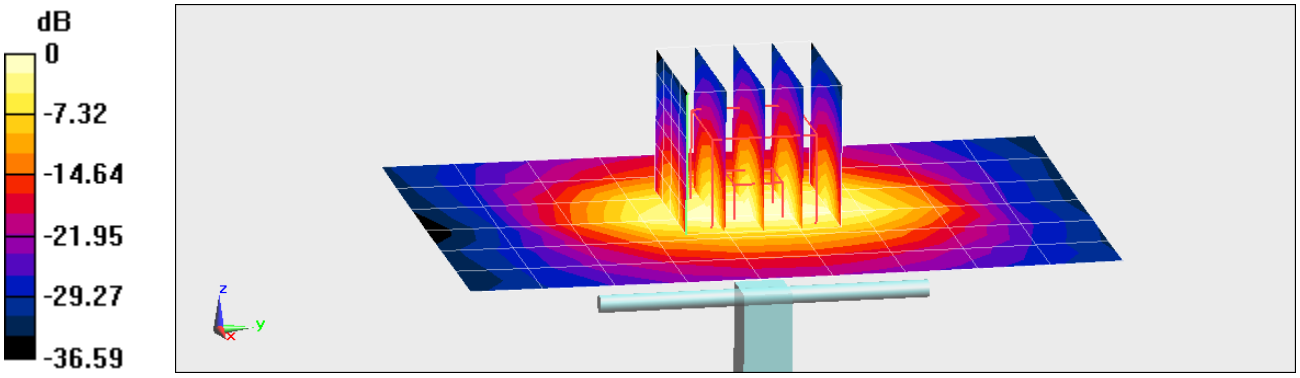
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.551 S/m; ε_r = 52.251; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-29-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3258; ConvF(4.61, 4.61, 4.61); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 7.05 W/kg
SAR(1 g) = 4.08 W/kg
Deviation = 0.49%



0 dB = 4.36 W/kg = 6.39 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

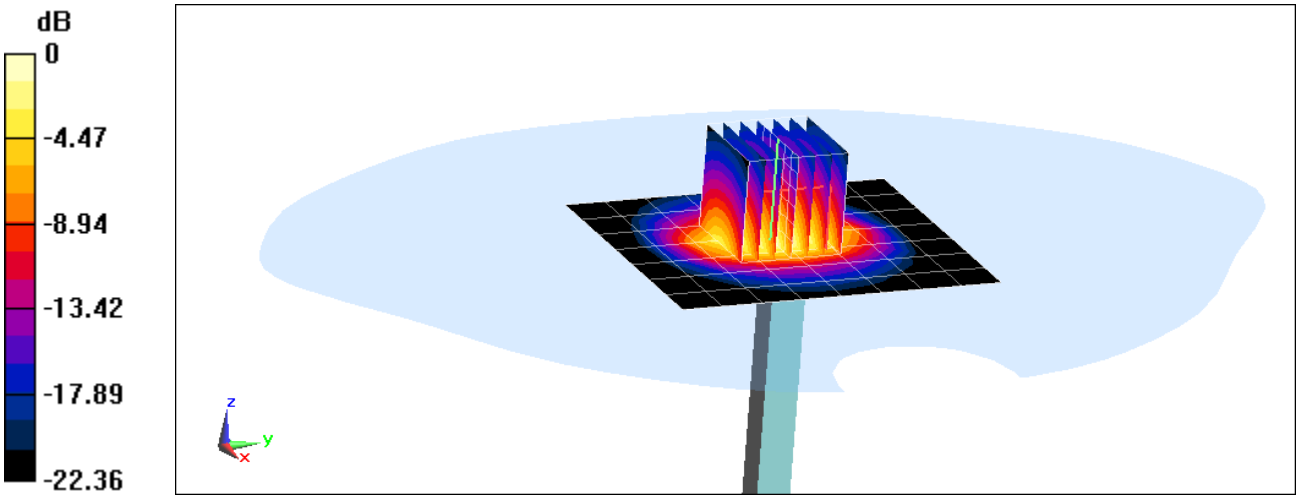
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.031 S/m; ε_r = 51.04; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.0°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3209; ConvF(4.2, 4.2, 4.2); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/17/2014
Phantom: SAM left; Type: QD000P40CD; Serial: TP:1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.2 W/kg
SAR(1 g) = 5.15 W/kg
Deviation = -0.58%



0 dB = 6.76 W/kg = 8.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5300 MHz; Type: D5GHzV2; Serial: 1191

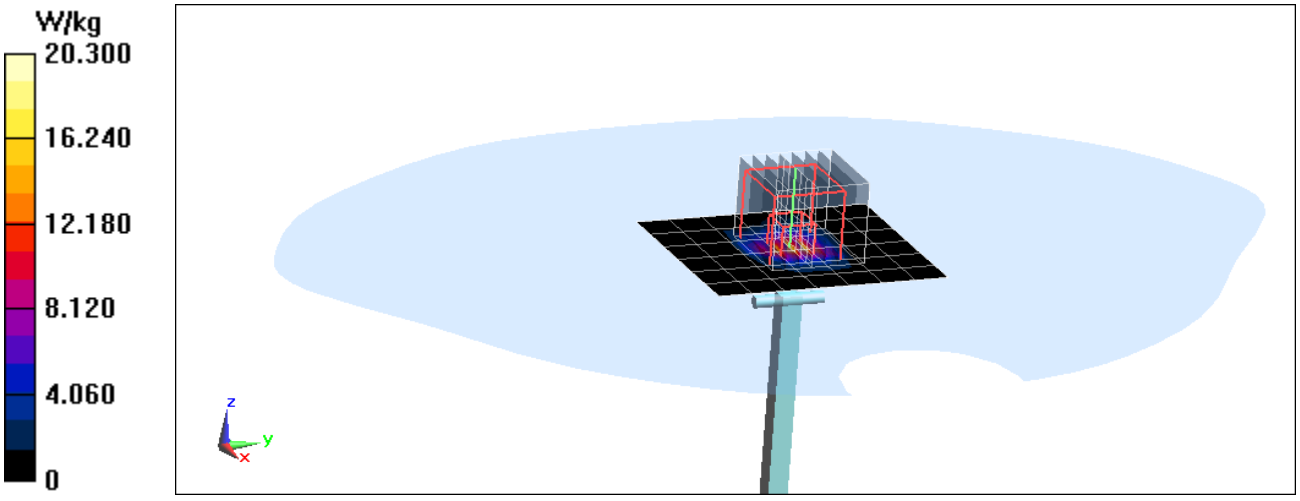
Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5300 MHz; σ = 5.542 S/m; ε_r = 48.23; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.7°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(4.16, 4.16, 4.16); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.4 W/kg
SAR(1 g) = 7.95 W/kg
Deviation = -0.50%



DUT: Dipole 5500 MHz; Type: D5GHzV2; Serial: 1191

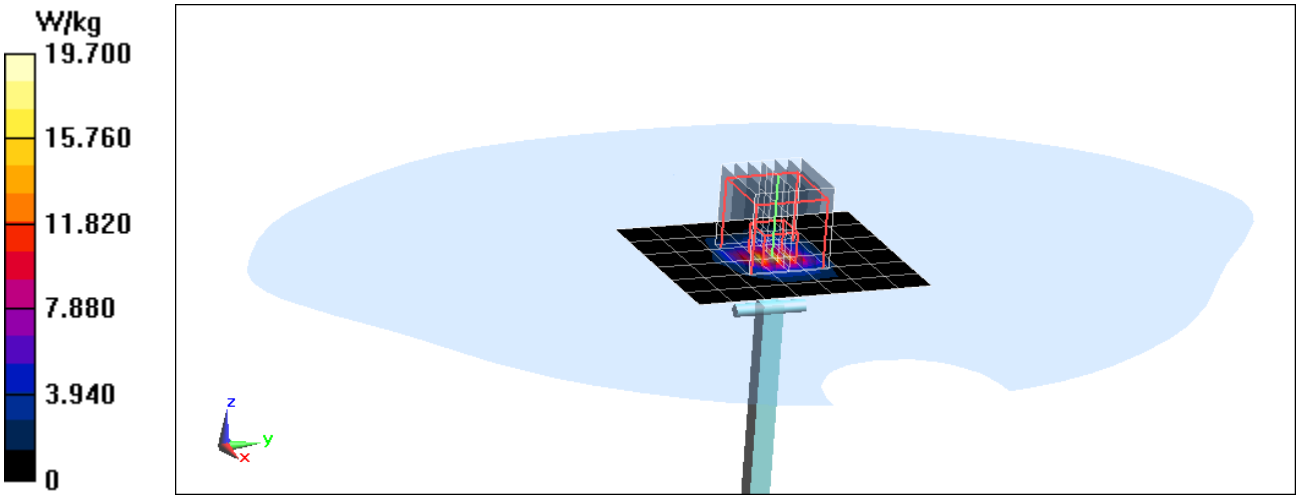
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5500 MHz; σ = 5.845 S/m; ε_r = 47.908; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.1°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(3.79, 3.79, 3.79); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5500 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.6 W/kg
Deviation = -8.54%



DUT: Dipole 5600 MHz; Type: D5GHzV2; Serial: 1191

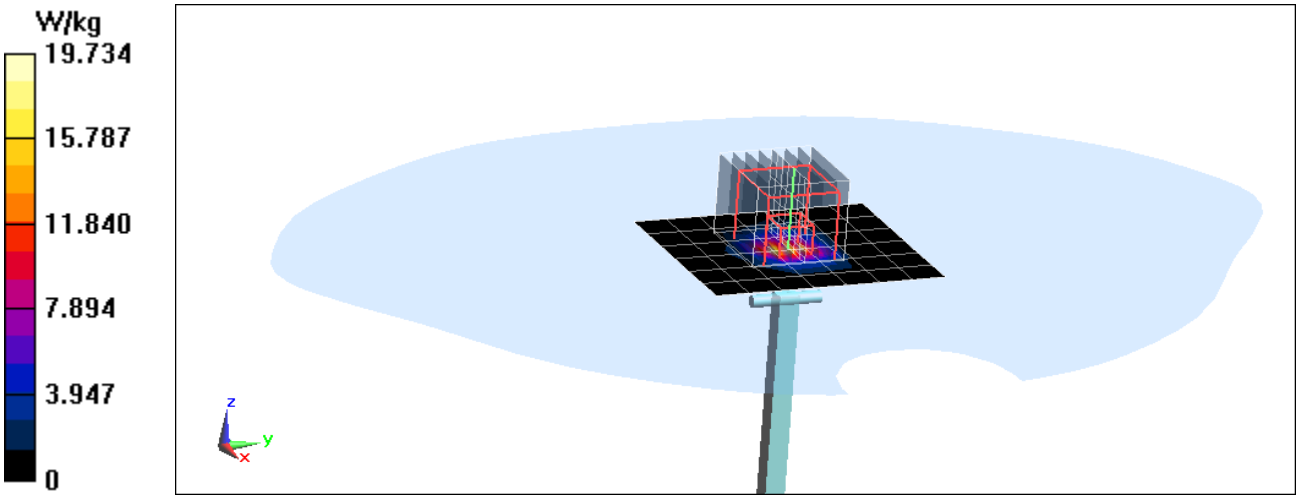
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5600 MHz; σ = 5.977 S/m; ε_r = 47.642; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 24.1°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(3.66, 3.66, 3.66); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.4 W/kg
SAR(1 g) = 7.63 W/kg
Deviation = -9.27%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body , Medium parameters used:
f = 5800 MHz; σ = 6.183 S/m; ε_r = 47.296; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-19-2015; Ambient Temp: 23.9°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3920; ConvF(3.93, 3.93, 3.93); Calibrated: 12/12/2014;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5800 MHz System Verification

Area Scan (7x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 7.09 W/kg
Deviation = -9.10%