



SAR EVALUATION REPORT

Applicant Name:

Samsung Electronics, Co. Ltd.
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Yeongtong-gu, Suwon-si
Gyeonggi-do 443-742, Korea

Date of Testing:

04/11/14 - 04/17/14

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

OY1404100737.A3L

FCC ID:

A3LSMG870A

APPLICANT:

SAMSUNG ELECTRONICS, CO. LTD.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SM-G870A

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.37	0.64	0.84
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.32	0.54	0.63
PCE	UMTS 850	826.40 - 846.60 MHz	0.34	0.53	0.53
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.43	0.98	0.98
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.51	1.09	1.09
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.66	1.09	1.09
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.34	0.42	0.42
PCE	LTE Band 17	706.5 - 713.5 MHz	0.19	0.38	0.38
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.29	0.37	0.37
DTS	5.8 GHz WLAN	5745 - 5825 MHz	0.26	0.31	0.46
NII	5.2 GHz WLAN	5180 - 5240 MHz	0.22	0.29	
NII	5.3 GHz WLAN	5260 - 5320 MHz	0.27	0.34	
NII	5.5 GHz WLAN	5500 - 5700 MHz	0.29	0.39	
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r02:			1.48		

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

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


Randy Ortanez
President



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
5.8 GHz WLAN	Data	5745 - 5825 MHz
5.2 GHz WLAN	Data	5180 - 5240 MHz
5.3 GHz WLAN	Data	5260 - 5320 MHz
5.5 GHz WLAN	Data	5500 - 5700 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device requires power reduction for SAR compliance. It always applies power reduction in voice or VOIP held to ear scenarios on the WIFI transmitter, and does not impact any other transmitter in the device. Therefore, WIFI Head SAR was evaluated at reduced power according to the head SAR test positions described in IEEE 1528.

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.

1.3.1 Maximum Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slot	1 TX Slots	2 TX Slots	1 TX Slots	2 TX Slots
GSM/GPRS/EDGE 850	Maximum	33.5	33.5	32.0	27.5	27.5
	Nominal	33.0	33.0	31.5	27.0	27.0
GSM/GPRS/EDGE 1900	Maximum	30.5	30.5	29.0	26.5	26.5
	Nominal	30.0	30.0	28.5	26.0	26.0

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Mode / Band		Modulated Average (dBm)		
		3GPP RMC Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
UMTS Band 5 (850 MHz)	Maximum	24.0	23.0	23.0
	Nominal	23.5	22.5	22.5
UMTS Band 2 (1900 MHz)	Maximum	23.0	22.5	22.5
	Nominal	22.5	22.0	22.0

Mode / Band		Modulated Average (dBm)
LTE Band 2 (PCS)	Maximum	23.0
	Nominal	22.5
LTE Band 4 (AWS)	Maximum	23.5
	Nominal	23.0
LTE Band 5 (Cell)	Maximum	24.5
	Nominal	24.0
LTE Band 17	Maximum	24.5
	Nominal	24.0

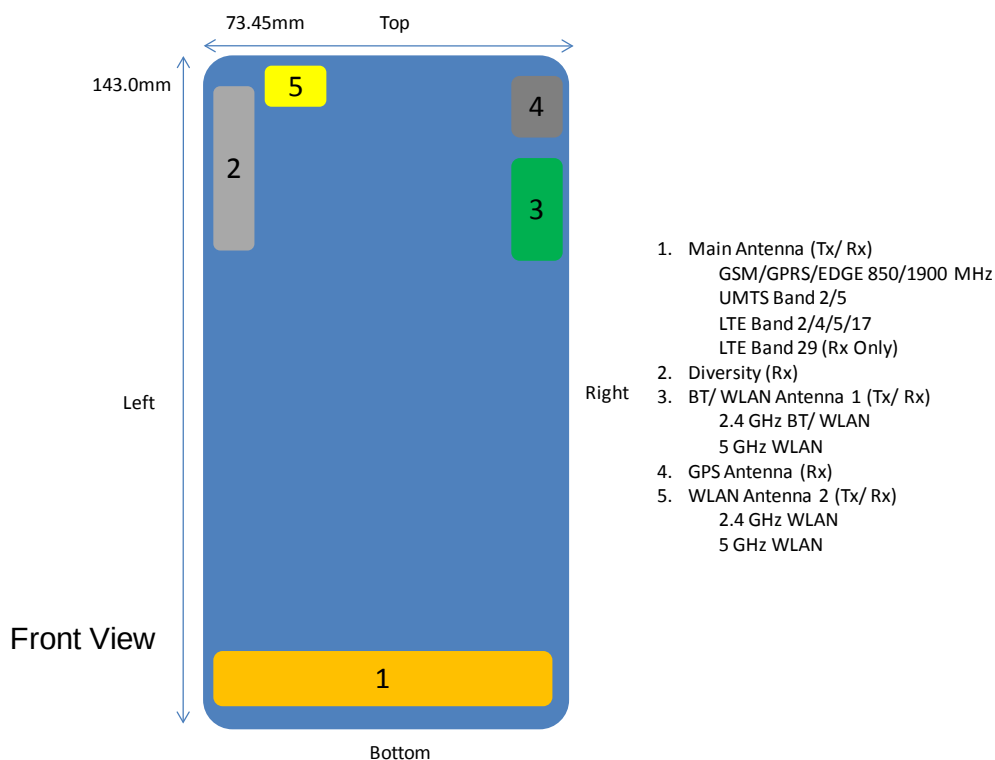
Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	17.5
	Nominal	17.0
IEEE 802.11g (2.4 GHz)	Maximum	14.5
	Nominal	14.0
IEEE 802.11n (2.4 GHz)	Maximum	12.0
	Nominal	11.5
IEEE 802.11a (5 GHz)	Maximum	14.0
	Nominal	13.5
IEEE 802.11n (5 GHz - 20 MHz Bandwidth)	Maximum	11.5
	Nominal	11.0
IEEE 802.11n (5 GHz - 40 MHz Bandwidth)	Maximum	8.5
	Nominal	8.0
IEEE 802.11ac (5 GHz - 80 MHz Bandwidth)	Maximum	8.5
	Nominal	8.0
Bluetooth	Maximum	10.0
	Nominal	9.5
Bluetooth LE	Maximum	7.0
	Nominal	6.5

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1.3.2 Reduced Power – Held-to-Ear

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	12.5
	Nominal	12.0
IEEE 802.11g (2.4 GHz)	Maximum	12.5
	Nominal	12.0
IEEE 802.11n (2.4 GHz)	Maximum	12.0
	Nominal	11.5
IEEE 802.11a (5 GHz)	Maximum	9.5
	Nominal	9.0
IEEE 802.11n (5 GHz - 20 MHz Bandwidth)	Maximum	9.5
	Nominal	9.0
IEEE 802.11n (5 GHz - 40 MHz Bandwidth)	Maximum	8.5
	Nominal	8.0
IEEE 802.11ac (5 GHz - 80 MHz Bandwidth)	Maximum	8.5
	Nominal	8.0

1.4 DUT Antenna Locations



Note: Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.

Figure 1-1
DUT Antenna Locations

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Table 1-1
Mobile Hotspot Sides for SAR Testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 17	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz Antenna 1 WLAN	Yes	Yes	Yes	No	Yes	No
2.4 GHz Antenna 2 WLAN	Yes	Yes	Yes	No	No	Yes
2.4 GHz MIMO WLAN	Yes	Yes	Yes	No	Yes	Yes
5.8 GHz Antenna 1 WLAN	Yes	Yes	Yes	No	Yes	No
5.8 GHz Antenna 2 WLAN	Yes	Yes	Yes	No	No	Yes
5.8 GHz MIMO WLAN	Yes	Yes	Yes	No	Yes	Yes

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 antenna document shows the distances between the transmit antennas and the edges of the device. Mobile hotspot for 5.2 GHz - 5.7 GHz WIFI is not supported and therefore is not considered in this section.

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the standard battery. The SAR tests were performed with the standard battery (model: EB-BG900BBU).

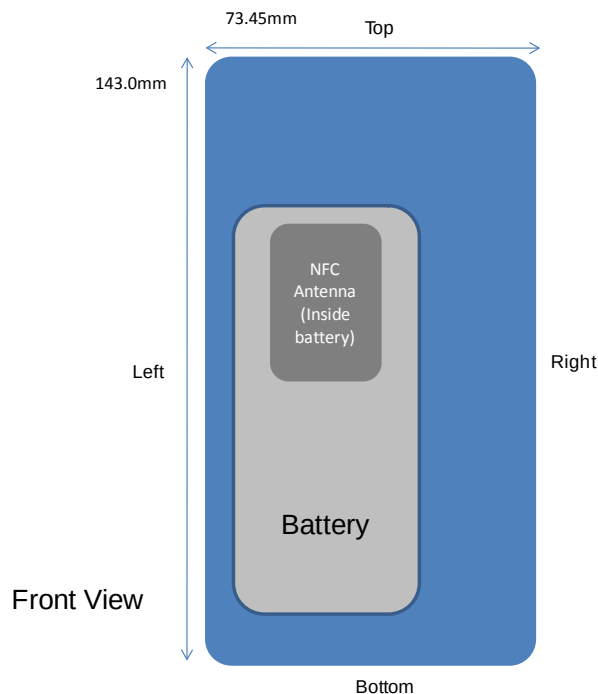


Figure 1-2
NFC Antenna Locations

FCC ID: A3LSMG870A	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
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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 1-3 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. This device supports MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.



Figure 1-3
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	GSM voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	
2	GSM voice + 5 GHz Wi-Fi	Yes	Yes	N/A	
3	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
4	UMTS + 2.4 GHz Wi-Fi	Yes	Yes	Yes	
5	UMTS + 5 GHz Wi-Fi	Yes	Yes	Yes	
6	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	
7	LTE + 2.4 GHz Wi-Fi	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
8	LTE + 5 GHz Wi-Fi	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
9	LTE + 2.4 GHz Bluetooth	N/A	Yes*	N/A	*-Pre-installed VOIP applications are considered.
10	GPRS/EDGE + 2.4 GHz Wi-Fi	N/A	N/A	Yes	
11	GPRS/EDGE + 5 GHz Wi-Fi	N/A	N/A	Yes	

Notes:

- (*) = for pre-installed VOIP applications possibly installed and used by the end-user.
- GSM/GPRS/EDGE, UMTS, and LTE share the same antenna and cannot transmit simultaneously.
- 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.
- 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.
- This device supports 2x2 MIMO Tx for WLAN 802.11n/ac. Each WLAN antenna can transmit independently or together when operating with MIMO.
- 5 GHz Wireless Router is only supported for the 5.8 GHz Band by S/W, therefore all other 5 GHz NII Bands were not evaluated for wireless router conditions.

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1.7 SAR Test Exclusions Applied

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using 5.2 GHz - 5.7 GHz WIFI, only 2.4 GHz and 5.8 GHz WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v01.

Per FCC KDB 447498 D01v05, the SAR exclusion threshold for distances <50mm is defined by the following equation:

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth SAR was not required; $[(10/10) * \sqrt{2.441}] = 1.6 < 3.0$. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

This device supports 40 MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only.

Per April 2013 TCB Workshop notes, full SAR tests for all SISO IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than SISO IEEE 802.11a mode. SISO IEEE 802.11ac was evaluated for the highest SISO IEEE 802.11a position in each 5 GHz band and exposure condition.

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) No new 5 GHz channels

(B) Licensed Transmitter(s)

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

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v02.

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 Guidance, LTE CA SAR was not needed for testing since the data sent by uplink on uplink physical channels does not change between Rel 8 and Rel 10.

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1.8 Guidance Applied

- IEEE 1528-2003
- FCC KDB Publication 941225 D01-D06 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.9 Device Serial Numbers

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

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number
GSM/GPRS/EDGE 850	FL-143-B	FL-143-B	FL-143-B
GSM/GPRS/EDGE 1900	FL-143-B	FL-143-B	FL-143-B
UMTS 850	FL-143-B	FL-143-B	FL-143-B
UMTS 1900	FL-143-B	FL-143-B	FL-143-B
LTE Band 2 (PCS)	FL-143-A	FL-143-A	FL-143-A
LTE Band 4 (AWS)	FL-143-A	FL-143-A	FL-143-A
LTE Band 5 (Cell)	FL-143-E	FL-143-E	FL-143-E
LTE Band 17	FL-143-F	FL-143-F	FL-143-F
2.4 GHz WLAN	FL-143-A	FL-143-B	FL-143-B
5 GHz WLAN	FL-143-C	FL-143-C	FL-143-C

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LTE INFORMATION

LTE Information			
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Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	LTE Band 17 (706.5 - 713.5 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 17: 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 17: 5 MHz	706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
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	4		
Modulations Supported in UL	QPSK, 16QAM		
LTE Carrier Aggregation Possible Considerations	B2 (PCC) + B17(SCC)	B2 (PCC) + B29(SCC)	B4 (PCC) + B17(SCC)
	5MHz (B2)+5MHz (B17)	5MHz (B2)+5MHz (B29)	5MHz (B4)+5MHz (B29)
	5MHz (B2)+10MHz (B17)	5MHz (B2)+10MHz (B29)	5MHz (B4)+10MHz (B17)
	10MHz (B2)+5MHz (B17)	10MHz (B2)+5MHz (B29)	10MHz (B4)+5MHz (B17)
LTE Aggregation Additional Information	10MHz (B2)+10MHz (B17)	10MHz (B2)+10MHz (B29)	10MHz (B4)+10MHz (B17)
	10MHz (B2)+10MHz (B29)	10MHz (B4)+10MHz (B29)	10MHz (B17)+10MHz (B2)
	10MHz (B17)+5MHz (B2)	10MHz (B17)+5MHz (B2)	10MHz (B17)+5MHz (B2)
	10MHz (B17)+10MHz (B2)	10MHz (B17)+10MHz (B2)	10MHz (B17)+10MHz (B2)
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		

The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WiFi offloading, MDT, eMBMA, Cross-Carrier Scheduling, SC-FDMA.

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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/m³)
- E = Total RMS electric field strength (V/m)

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

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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:

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.

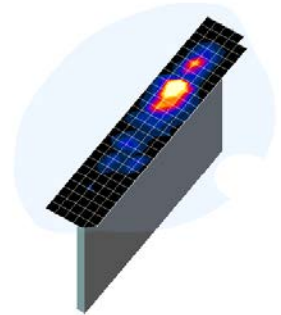


Figure 4-1
Sample SAR Area Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01*

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

*Also compliant to IEEE 1528-2013 Table 6

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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].

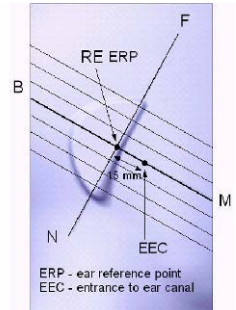


Figure 5-1
Close-Up Side view
of ERP

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 then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



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

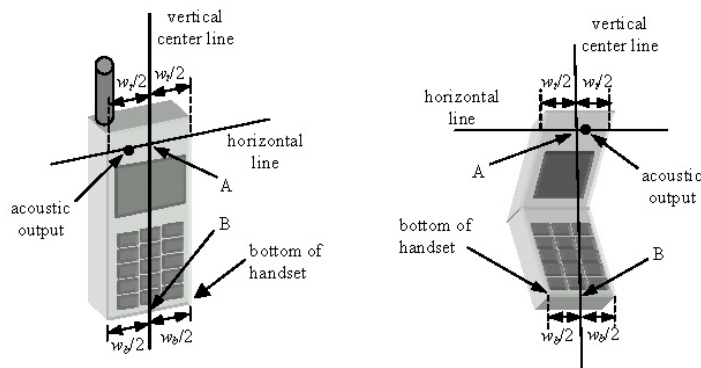


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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 $\epsilon = 3$ and loss tangent $\delta = 0.02$.

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.

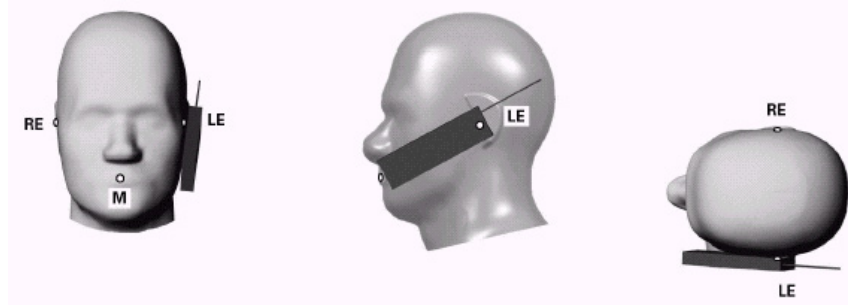


Figure 6-1 Front, Side and Top View of Cheek Position

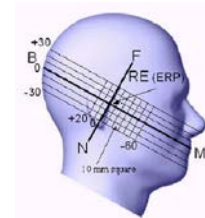
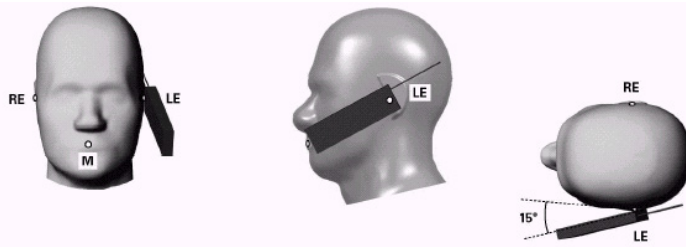
2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with 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 / 15° 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 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

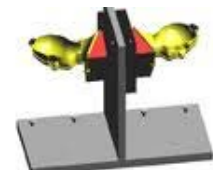
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6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

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

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04_v01. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.



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6.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-5). 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 $> 1.2 \text{ W/kg}$, 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.

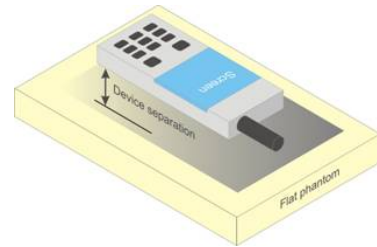


Figure 6-5
Sample Body-Worn Diagram

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

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

6.6 Extremity Exposure Configurations

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

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6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v01 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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.

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7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

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Power measurements were performed using a base station simulator under digital average power.

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 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

The device was 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 were 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 was 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 deviated by more than 5%, the SAR test and drift measurements were repeated.

8.3 SAR Measurement Conditions for UMTS

8.3.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s".

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 (release 5), 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.

8.3.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all "1s". SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a

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3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

8.3.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”.

8.3.4 SAR Measurements for Handsets with Rel 5 HSDPA

Body SAR for HSDPA is not required for handsets with HSDPA capabilities when the maximum average output power of each RF channel with HSDPA active is less than 0.25 dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is $\leq 75\%$ of the SAR limit. Otherwise, SAR is measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration measured in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that resulted in the highest SAR in 12.2 kbps RMC mode for that RF channel.

The H-set used in FRC for HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HSPDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the applicable H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the FRC for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 2 ms to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors of $\beta_c=9$ and $\beta_d=15$, and power offset parameters of $\Delta_{ACK} = \Delta_{NACK} = 5$ and $\Delta_{CQI}=2$ is used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

Sub-Test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{HS} = \beta_{HS}/\beta_c = 30/15 \Leftrightarrow \beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{HS} = 30/15$) with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{HS} = 24/15$) with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Figure 8-1
Table C.10.1.4 of TS 234.121-1

8.3.5 SAR Measurements for Handsets with Rel 6 HSUPA

Body SAR for HSUPA is not required when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 0.25 dB higher than as measured without HSUPA/HSDPA using 12.2 kbps RMC and maximum SAR for 12.2 kbps RMC is $\leq 75\%$ of the SAR limit. Otherwise SAR is measured on the maximum output channel for the body exposure configuration produced highest SAR in 12.2 kbps RMC for that RF channel, using the additional procedures under “Release 6 HSPA data devices”

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Head SAR for VOIP operations under HSPA is not required when maximum average output of each RF channel with HSPA is less than 0.25 dB higher than as measured using 12.2 kbps RMC. Otherwise SAR is measured using same HSPA configuration as used for body SAR.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{15} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2)	MPR (dB)	AG (4)	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: $\Delta_{ACK} = \Delta_{NACK}$ and $\Delta_{CQI} = 8 \Leftrightarrow A_{15} = \beta_{15}/\beta_c = 30/15 \Leftrightarrow \beta_{15} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{15}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

8.4 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).

8.4.1 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.

8.4.2 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.

8.4.3 A-MPR

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

8.4.4 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.

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- 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.

8.4.5 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.

8.5 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 D01v01r02 for more details.

8.5.1 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. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

8.5.2 Frequency Channel Configurations [24]

For 2.4 GHz, the highest average RF output power channel between the low, mid and high channel at the lowest data rate was selected for SAR evaluation in 802.11b mode. 802.11g/n modes and higher data rates for 802.11b were additionally evaluated for SAR if the output power of the respective mode was 0.25 dB or higher than the powers of the SAR configurations tested in the 802.11b mode.

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. When the adjacent channels are higher in power than the default channels, these “required channels” were considered instead of the default channels for SAR testing. 802.11n modes and higher data rates for 802.11a/n were evaluated only if

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the respective mode was higher than 0.25 dB or more than the 802.11a mode. 802.11ac SAR was evaluated for highest 802.11a configuration in each 5 GHz band and each exposure condition. 802.11ac modes were additionally evaluated for SAR if the output power for the respective mode was more than 0.25 dB higher than powers of 802.11a modes.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg and if the 1g averaged SAR was less than 0.8 W/kg, SAR testing was not required for the other test channels in the band.

8.5.3 MIMO SAR Considerations

Per KDB 248227, SAR for MIMO was measured with both transmitting simultaneously and was evaluated independently of SISO operation. For 2.4 GHz MIMO, 802.11n was evaluated. For 5 GHz MIMO, 20 MHz BW 802.11n was evaluated. Additional evaluations for 40 MHz bandwidth 802.11n and 802.11ac were not required since the maximum allowed output power was not higher than 802.11n 20 MHz Bandwidth.

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9 RF CONDUCTED POWERS

9.1 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	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	32.98	32.90	31.55	27.13	26.64
	190	32.72	32.89	31.40	27.11	26.58
	251	32.62	32.83	31.08	27.00	26.49
GSM 1900	512	30.01	30.03	28.78	26.41	26.31
	661	29.63	29.55	28.67	26.21	26.10
	810	29.74	29.70	28.51	26.22	26.15
		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	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	23.95	23.87	25.53	18.10	20.62
	190	23.69	23.86	25.38	18.08	20.56
	251	23.59	23.80	25.06	17.97	20.47
GSM 1900	512	20.98	21.00	22.76	17.38	20.29
	661	20.60	20.52	22.65	17.18	20.08
	810	20.71	20.67	22.49	17.19	20.13
GSM 850	Frame	23.97	23.97	25.48	17.97	20.98
GSM 1900	Avg.Targets:	20.97	20.97	22.48	16.97	19.98

Notes:

- 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.
- 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.
- GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
- 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: 10 (Max 2 Tx uplink slots)

EDGE Multislot class: 10 (Max 2 Tx uplink slots)

DTM Multislot Class: N/A

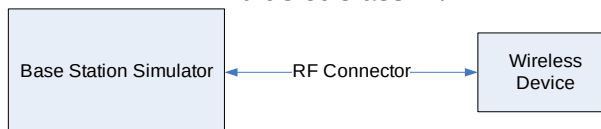


Figure 9-1
Power Measurement Setup

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9.2 UMTS Conducted 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	23.04	23.00	23.11	22.90	22.72	22.71	-
99		12.2 kbps AMR	23.06	22.98	22.91	22.86	22.56	22.67	-
6	HSDPA	Subtest 1	21.77	21.56	21.61	21.46	21.40	21.39	0
6		Subtest 2	21.78	21.66	21.57	21.47	21.38	21.46	0
6		Subtest 3	21.16	21.11	21.17	20.93	20.87	21.08	0.5
6		Subtest 4	21.25	21.12	21.04	20.97	20.96	21.03	0.5
6	HSUPA	Subtest 1	21.43	21.34	21.34	21.32	21.43	21.31	0
6		Subtest 2	20.87	20.63	20.65	20.41	20.38	20.51	2
6		Subtest 3	20.28	20.13	20.08	20.02	19.99	20.02	1
6		Subtest 4	20.85	21.13	21.16	20.90	20.86	20.92	2
6		Subtest 5	21.16	21.24	21.46	21.16	21.12	21.04	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 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.



Figure 9-2
Power Measurement Setup

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9.3 LTE Conducted Powers

9.3.1 LTE Band 2 (PCS)

Table 9-1
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	21.85	0	0
	1860	18700	20	QPSK	1	50	21.81	0	0
	1860	18700	20	QPSK	1	99	21.79	0	0
	1860	18700	20	QPSK	50	0	20.96	0-1	1
	1860	18700	20	QPSK	50	25	20.95	0-1	1
	1860	18700	20	QPSK	50	50	20.94	0-1	1
	1860	18700	20	QPSK	100	0	20.85	0-1	1
	1860	18700	20	16QAM	1	0	20.85	0-1	1
	1860	18700	20	16QAM	1	50	21.01	0-1	1
	1860	18700	20	16QAM	1	99	20.98	0-1	1
	1860	18700	20	16QAM	50	0	19.83	0-2	2
	1860	18700	20	16QAM	50	25	19.92	0-2	2
	1860	18700	20	16QAM	50	50	19.98	0-2	2
Mid	1860	18700	20	16QAM	100	0	19.84	0-2	2
	1880.0	18900	20	QPSK	1	0	21.95	0	0
	1880.0	18900	20	QPSK	1	50	21.97	0	0
	1880.0	18900	20	QPSK	1	99	21.83	0	0
	1880.0	18900	20	QPSK	50	0	20.89	0-1	1
	1880.0	18900	20	QPSK	50	25	20.82	0-1	1
	1880.0	18900	20	QPSK	50	50	20.84	0-1	1
	1880.0	18900	20	QPSK	100	0	20.89	0-1	1
	1880.0	18900	20	16QAM	1	0	20.91	0-1	1
	1880.0	18900	20	16QAM	1	50	20.87	0-1	1
	1880.0	18900	20	16QAM	1	99	20.83	0-1	1
	1880.0	18900	20	16QAM	50	0	19.89	0-2	2
	1880.0	18900	20	16QAM	50	25	19.86	0-2	2
	1880.0	18900	20	16QAM	50	50	19.84	0-2	2
	1880.0	18900	20	16QAM	100	0	19.85	0-2	2
High	1900	19100	20	QPSK	1	0	21.82	0	0
	1900	19100	20	QPSK	1	50	21.85	0	0
	1900	19100	20	QPSK	1	99	21.94	0	0
	1900	19100	20	QPSK	50	0	20.82	0-1	1
	1900	19100	20	QPSK	50	25	20.87	0-1	1
	1900	19100	20	QPSK	50	50	20.88	0-1	1
	1900	19100	20	QPSK	100	0	20.83	0-1	1
	1900	19100	20	16QAM	1	0	20.89	0-1	1
	1900	19100	20	16QAM	1	50	20.83	0-1	1
	1900	19100	20	16QAM	1	99	21.08	0-1	1
	1900	19100	20	16QAM	50	0	19.86	0-2	2
	1900	19100	20	16QAM	50	25	19.87	0-2	2
	1900	19100	20	16QAM	50	50	19.89	0-2	2
	1900	19100	20	16QAM	100	0	19.90	0-2	2

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Table 9-2
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	21.75	0	0
	1857.5	18675	15	QPSK	1	36	21.82	0	0
	1857.5	18675	15	QPSK	1	74	21.88	0	0
	1857.5	18675	15	QPSK	36	0	20.87	0-1	1
	1857.5	18675	15	QPSK	36	18	20.87	0-1	1
	1857.5	18675	15	QPSK	36	37	21.02	0-1	1
	1857.5	18675	15	QPSK	75	0	20.85	0-1	1
	1857.5	18675	15	16QAM	1	0	20.76	0-1	1
	1857.5	18675	15	16QAM	1	36	20.91	0-1	1
	1857.5	18675	15	16QAM	1	74	21.02	0-1	1
	1857.5	18675	15	16QAM	36	0	19.88	0-2	2
	1857.5	18675	15	16QAM	36	18	20.01	0-2	2
Mid	1857.5	18675	15	16QAM	36	37	19.98	0-2	2
	1857.5	18675	15	16QAM	75	0	19.93	0-2	2
	1880.0	18900	15	QPSK	1	0	21.92	0	0
	1880.0	18900	15	QPSK	1	36	21.98	0	0
	1880.0	18900	15	QPSK	1	74	21.81	0	0
	1880.0	18900	15	QPSK	36	0	20.79	0-1	1
	1880.0	18900	15	QPSK	36	18	20.87	0-1	1
	1880.0	18900	15	QPSK	36	37	20.84	0-1	1
	1880.0	18900	15	QPSK	75	0	20.87	0-1	1
	1880.0	18900	15	16QAM	1	0	20.88	0-1	1
	1880.0	18900	15	16QAM	1	36	20.88	0-1	1
	1880.0	18900	15	16QAM	1	74	20.89	0-1	1
High	1880.0	18900	15	16QAM	36	0	19.95	0-2	2
	1880.0	18900	15	16QAM	36	18	19.92	0-2	2
	1880.0	18900	15	16QAM	36	37	19.92	0-2	2
	1880.0	18900	15	16QAM	75	0	19.89	0-2	2
	1902.5	19125	15	QPSK	1	0	21.75	0	0
	1902.5	19125	15	QPSK	1	36	21.91	0	0
	1902.5	19125	15	QPSK	1	74	21.98	0	0
	1902.5	19125	15	QPSK	36	0	20.73	0-1	1
	1902.5	19125	15	QPSK	36	18	20.81	0-1	1
	1902.5	19125	15	QPSK	36	37	20.92	0-1	1
	1902.5	19125	15	QPSK	75	0	20.87	0-1	1
	1902.5	19125	15	16QAM	1	0	20.98	0-1	1
	1902.5	19125	15	16QAM	1	36	20.83	0-1	1
	1902.5	19125	15	16QAM	1	74	21.08	0-1	1
	1902.5	19125	15	16QAM	36	0	19.92	0-2	2
	1902.5	19125	15	16QAM	36	18	19.94	0-2	2
	1902.5	19125	15	16QAM	36	37	19.98	0-2	2
	1902.5	19125	15	16QAM	75	0	19.97	0-2	2

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Table 9-3
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	21.71	0	0
	1855	18650	10	QPSK	1	25	21.82	0	0
	1855	18650	10	QPSK	1	49	21.79	0	0
	1855	18650	10	QPSK	25	0	20.81	0-1	1
	1855	18650	10	QPSK	25	12	20.90	0-1	1
	1855	18650	10	QPSK	25	25	21.05	0-1	1
	1855	18650	10	QPSK	50	0	20.92	0-1	1
	1855	18650	10	16QAM	1	0	20.72	0-1	1
	1855	18650	10	16QAM	1	25	20.97	0-1	1
	1855	18650	10	16QAM	1	49	21.05	0-1	1
	1855	18650	10	16QAM	25	0	19.91	0-2	2
	1855	18650	10	16QAM	25	12	19.91	0-2	2
	1855	18650	10	16QAM	25	25	20.05	0-2	2
	1855	18650	10	16QAM	50	0	19.83	0-2	2
Mid	1880.0	18900	10	QPSK	1	0	21.99	0	0
	1880.0	18900	10	QPSK	1	25	22.05	0	0
	1880.0	18900	10	QPSK	1	49	21.88	0	0
	1880.0	18900	10	QPSK	25	0	20.79	0-1	1
	1880.0	18900	10	QPSK	25	12	20.81	0-1	1
	1880.0	18900	10	QPSK	25	25	20.94	0-1	1
	1880.0	18900	10	QPSK	50	0	20.95	0-1	1
	1880.0	18900	10	16QAM	1	0	20.96	0-1	1
	1880.0	18900	10	16QAM	1	25	20.79	0-1	1
	1880.0	18900	10	16QAM	1	49	20.91	0-1	1
	1880.0	18900	10	16QAM	25	0	19.92	0-2	2
	1880.0	18900	10	16QAM	25	12	19.93	0-2	2
	1880.0	18900	10	16QAM	25	25	19.99	0-2	2
	1880.0	18900	10	16QAM	50	0	19.91	0-2	2
High	1905	19150	10	QPSK	1	0	21.79	0	0
	1905	19150	10	QPSK	1	25	21.85	0	0
	1905	19150	10	QPSK	1	49	21.94	0	0
	1905	19150	10	QPSK	25	0	20.76	0-1	1
	1905	19150	10	QPSK	25	12	20.83	0-1	1
	1905	19150	10	QPSK	25	25	20.97	0-1	1
	1905	19150	10	QPSK	50	0	20.97	0-1	1
	1905	19150	10	16QAM	1	0	20.99	0-1	1
	1905	19150	10	16QAM	1	25	20.83	0-1	1
	1905	19150	10	16QAM	1	49	20.98	0-1	1
	1905	19150	10	16QAM	25	0	19.90	0-2	2
	1905	19150	10	16QAM	25	12	19.85	0-2	2
	1905	19150	10	16QAM	25	25	20.05	0-2	2
	1905	19150	10	16QAM	50	0	20.07	0-2	2

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Table 9-4
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	21.65	0	0
	1852.5	18625	5	QPSK	1	12	21.76	0	0
	1852.5	18625	5	QPSK	1	24	21.77	0	0
	1852.5	18625	5	QPSK	12	0	20.74	0-1	1
	1852.5	18625	5	QPSK	12	6	20.96	0-1	1
	1852.5	18625	5	QPSK	12	13	21.02	0-1	1
	1852.5	18625	5	QPSK	25	0	20.97	0-1	1
	1852.5	18625	5	16-QAM	1	0	20.75	0-1	1
	1852.5	18625	5	16-QAM	1	12	20.89	0-1	1
	1852.5	18625	5	16-QAM	1	24	20.98	0-1	1
	1852.5	18625	5	16-QAM	12	0	19.99	0-2	2
	1852.5	18625	5	16-QAM	12	6	20.01	0-2	2
	1852.5	18625	5	16-QAM	12	13	20.15	0-2	2
	1852.5	18625	5	16-QAM	25	0	19.88	0-2	2
Mid	1880.0	18900	5	QPSK	1	0	21.96	0	0
	1880.0	18900	5	QPSK	1	12	22.00	0	0
	1880.0	18900	5	QPSK	1	24	21.73	0	0
	1880.0	18900	5	QPSK	12	0	20.70	0-1	1
	1880.0	18900	5	QPSK	12	6	20.83	0-1	1
	1880.0	18900	5	QPSK	12	13	20.92	0-1	1
	1880.0	18900	5	QPSK	25	0	20.91	0-1	1
	1880.0	18900	5	16-QAM	1	0	21.00	0-1	1
	1880.0	18900	5	16-QAM	1	12	20.78	0-1	1
	1880.0	18900	5	16-QAM	1	24	20.87	0-1	1
	1880.0	18900	5	16-QAM	12	0	19.99	0-2	2
	1880.0	18900	5	16-QAM	12	6	19.87	0-2	2
	1880.0	18900	5	16-QAM	12	13	19.96	0-2	2
	1880.0	18900	5	16-QAM	25	0	19.91	0-2	2
High	1907.5	19175	5	QPSK	1	0	21.85	0	0
	1907.5	19175	5	QPSK	1	12	21.89	0	0
	1907.5	19175	5	QPSK	1	24	21.97	0	0
	1907.5	19175	5	QPSK	12	0	20.73	0-1	1
	1907.5	19175	5	QPSK	12	6	20.74	0-1	1
	1907.5	19175	5	QPSK	12	13	20.97	0-1	1
	1907.5	19175	5	QPSK	25	0	21.02	0-1	1
	1907.5	19175	5	16-QAM	1	0	20.90	0-1	1
	1907.5	19175	5	16-QAM	1	12	20.85	0-1	1
	1907.5	19175	5	16-QAM	1	24	20.88	0-1	1
	1907.5	19175	5	16-QAM	12	0	19.86	0-2	2
	1907.5	19175	5	16-QAM	12	6	19.77	0-2	2
	1907.5	19175	5	16-QAM	12	13	20.12	0-2	2
	1907.5	19175	5	16-QAM	25	0	19.99	0-2	2

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Table 9-5
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	21.68	0	0
	1851.5	18615	3	QPSK	1	7	21.70	0	0
	1851.5	18615	3	QPSK	1	14	21.79	0	0
	1851.5	18615	3	QPSK	8	0	20.74	0-1	1
	1851.5	18615	3	QPSK	8	4	21.05	0-1	1
	1851.5	18615	3	QPSK	8	7	20.98	0-1	1
	1851.5	18615	3	QPSK	15	0	21.07	0-1	1
	1851.5	18615	3	16-QAM	1	0	20.68	0-1	1
	1851.5	18615	3	16-QAM	1	7	20.84	0-1	1
	1851.5	18615	3	16-QAM	1	14	20.95	0-1	1
	1851.5	18615	3	16-QAM	8	0	19.93	0-2	2
	1851.5	18615	3	16-QAM	8	4	20.07	0-2	2
	1851.5	18615	3	16-QAM	8	7	20.16	0-2	2
	1851.5	18615	3	16-QAM	15	0	19.81	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	21.93	0	0
	1880.0	18900	3	QPSK	1	7	21.97	0	0
	1880.0	18900	3	QPSK	1	14	21.71	0	0
	1880.0	18900	3	QPSK	8	0	20.63	0-1	1
	1880.0	18900	3	QPSK	8	4	20.86	0-1	1
	1880.0	18900	3	QPSK	8	7	21.02	0-1	1
	1880.0	18900	3	QPSK	15	0	21.01	0-1	1
	1880.0	18900	3	16-QAM	1	0	21.06	0-1	1
	1880.0	18900	3	16-QAM	1	7	20.84	0-1	1
	1880.0	18900	3	16-QAM	1	14	20.93	0-1	1
	1880.0	18900	3	16-QAM	8	0	19.91	0-2	2
	1880.0	18900	3	16-QAM	8	4	19.80	0-2	2
	1880.0	18900	3	16-QAM	8	7	19.93	0-2	2
	1880.0	18900	3	16-QAM	15	0	19.81	0-2	2
High	1908.5	19185	3	QPSK	1	0	21.81	0	0
	1908.5	19185	3	QPSK	1	7	21.99	0	0
	1908.5	19185	3	QPSK	1	14	21.87	0	0
	1908.5	19185	3	QPSK	8	0	20.67	0-1	1
	1908.5	19185	3	QPSK	8	4	20.68	0-1	1
	1908.5	19185	3	QPSK	8	7	20.91	0-1	1
	1908.5	19185	3	QPSK	15	0	20.98	0-1	1
	1908.5	19185	3	16-QAM	1	0	20.95	0-1	1
	1908.5	19185	3	16-QAM	1	7	20.89	0-1	1
	1908.5	19185	3	16-QAM	1	14	20.96	0-1	1
	1908.5	19185	3	16-QAM	8	0	19.87	0-2	2
	1908.5	19185	3	16-QAM	8	4	19.83	0-2	2
	1908.5	19185	3	16-QAM	8	7	20.19	0-2	2
	1908.5	19185	3	16-QAM	15	0	19.98	0-2	2

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Table 9-6
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	21.76	0	0
	1850.7	18607	1.4	QPSK	1	2	21.60	0	0
	1850.7	18607	1.4	QPSK	1	5	21.74	0	0
	1850.7	18607	1.4	QPSK	3	0	21.77	0	0
	1850.7	18607	1.4	QPSK	3	2	21.82	0	0
	1850.7	18607	1.4	QPSK	3	3	21.80	0	0
	1850.7	18607	1.4	QPSK	6	0	20.84	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	20.63	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	20.81	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	20.91	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	20.88	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	20.84	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	20.86	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	19.80	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	22.02	0	0
	1880.0	18900	1.4	QPSK	1	2	22.03	0	0
	1880.0	18900	1.4	QPSK	1	5	21.75	0	0
	1880.0	18900	1.4	QPSK	3	0	21.55	0	0
	1880.0	18900	1.4	QPSK	3	2	21.68	0	0
	1880.0	18900	1.4	QPSK	3	3	21.85	0	0
	1880.0	18900	1.4	QPSK	6	0	20.97	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	21.15	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	20.82	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	20.95	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	20.99	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	20.84	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	20.88	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	19.76	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	21.84	0	0
	1909.3	19193	1.4	QPSK	1	2	21.90	0	0
	1909.3	19193	1.4	QPSK	1	5	21.92	0	0
	1909.3	19193	1.4	QPSK	3	0	21.66	0	0
	1909.3	19193	1.4	QPSK	3	2	21.84	0	0
	1909.3	19193	1.4	QPSK	3	3	21.90	0	0
	1909.3	19193	1.4	QPSK	6	0	20.96	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	20.91	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	20.90	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	20.88	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	20.95	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	20.79	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	20.88	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	20.03	0-2	2

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LTE Band 4 (AWS)

Table 9-7

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	22.05	0	0
	1732.5	20175	20	QPSK	1	50	21.88	0	0
	1732.5	20175	20	QPSK	1	99	21.86	0	0
	1732.5	20175	20	QPSK	50	0	20.91	0-1	1
	1732.5	20175	20	QPSK	50	25	20.89	0-1	1
	1732.5	20175	20	QPSK	50	50	20.93	0-1	1
	1732.5	20175	20	QPSK	100	0	20.92	0-1	1
	1732.5	20175	20	16QAM	1	0	21.00	0-1	1
	1732.5	20175	20	16QAM	1	50	20.84	0-1	1
	1732.5	20175	20	16QAM	1	99	20.85	0-1	1
	1732.5	20175	20	16QAM	50	0	19.83	0-2	2
	1732.5	20175	20	16QAM	50	25	19.88	0-2	2
	1732.5	20175	20	16QAM	50	50	19.88	0-2	2
	1732.5	20175	20	16QAM	100	0	19.83	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.

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Table 9-8
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	21.95	0	0
	1717.5	20025	15	QPSK	1	36	21.88	0	0
	1717.5	20025	15	QPSK	1	74	21.86	0	0
	1717.5	20025	15	QPSK	36	0	20.81	0-1	1
	1717.5	20025	15	QPSK	36	18	20.79	0-1	1
	1717.5	20025	15	QPSK	36	37	20.93	0-1	1
	1717.5	20025	15	QPSK	75	0	20.92	0-1	1
	1717.5	20025	15	16QAM	1	0	20.90	0-1	1
	1717.5	20025	15	16QAM	1	36	20.84	0-1	1
	1717.5	20025	15	16QAM	1	74	20.85	0-1	1
	1717.5	20025	15	16QAM	36	0	19.73	0-2	2
	1717.5	20025	15	16QAM	36	18	19.78	0-2	2
	1717.5	20025	15	16QAM	36	37	19.98	0-2	2
Mid	1732.5	20175	15	QPSK	1	0	22.14	0	0
	1732.5	20175	15	QPSK	1	36	22.19	0	0
	1732.5	20175	15	QPSK	1	74	22.16	0	0
	1732.5	20175	15	QPSK	36	0	21.10	0-1	1
	1732.5	20175	15	QPSK	36	18	21.17	0-1	1
	1732.5	20175	15	QPSK	36	37	21.13	0-1	1
	1732.5	20175	15	QPSK	75	0	21.16	0-1	1
	1732.5	20175	15	16QAM	1	0	21.18	0-1	1
	1732.5	20175	15	16QAM	1	36	21.17	0-1	1
	1732.5	20175	15	16QAM	1	74	21.20	0-1	1
	1732.5	20175	15	16QAM	36	0	20.05	0-2	2
	1732.5	20175	15	16QAM	36	18	20.11	0-2	2
	1732.5	20175	15	16QAM	36	37	20.07	0-2	2
	1732.5	20175	15	16QAM	75	0	20.00	0-2	2
High	1747.5	20325	15	QPSK	1	0	22.24	0	0
	1747.5	20325	15	QPSK	1	36	22.29	0	0
	1747.5	20325	15	QPSK	1	74	22.26	0	0
	1747.5	20325	15	QPSK	36	0	21.20	0-1	1
	1747.5	20325	15	QPSK	36	18	21.07	0-1	1
	1747.5	20325	15	QPSK	36	37	21.23	0-1	1
	1747.5	20325	15	QPSK	75	0	21.06	0-1	1
	1747.5	20325	15	16QAM	1	0	21.18	0-1	1
	1747.5	20325	15	16QAM	1	36	21.27	0-1	1
	1747.5	20325	15	16QAM	1	74	21.30	0-1	1
	1747.5	20325	15	16QAM	36	0	20.05	0-2	2
	1747.5	20325	15	16QAM	36	18	20.21	0-2	2
	1747.5	20325	15	16QAM	36	37	20.17	0-2	2
	1747.5	20325	15	16QAM	75	0	20.10	0-2	2

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Table 9-9
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	21.85	0	0
	1715	20000	10	QPSK	1	25	21.88	0	0
	1715	20000	10	QPSK	1	49	21.76	0	0
	1715	20000	10	QPSK	25	0	20.71	0-1	1
	1715	20000	10	QPSK	25	12	20.79	0-1	1
	1715	20000	10	QPSK	25	25	20.93	0-1	1
	1715	20000	10	QPSK	50	0	20.92	0-1	1
	1715	20000	10	16QAM	1	0	21.00	0-1	1
	1715	20000	10	16QAM	1	25	20.94	0-1	1
	1715	20000	10	16QAM	1	49	20.95	0-1	1
	1715	20000	10	16QAM	25	0	19.83	0-2	2
	1715	20000	10	16QAM	25	12	19.78	0-2	2
	1715	20000	10	16QAM	25	25	19.88	0-2	2
Mid	1732.5	20175	10	QPSK	1	0	22.14	0	0
	1732.5	20175	10	QPSK	1	25	22.09	0	0
	1732.5	20175	10	QPSK	1	49	22.26	0	0
	1732.5	20175	10	QPSK	25	0	21.20	0-1	1
	1732.5	20175	10	QPSK	25	12	21.17	0-1	1
	1732.5	20175	10	QPSK	25	25	21.23	0-1	1
	1732.5	20175	10	QPSK	50	0	21.16	0-1	1
	1732.5	20175	10	16QAM	1	0	21.28	0-1	1
	1732.5	20175	10	16QAM	1	25	21.17	0-1	1
	1732.5	20175	10	16QAM	1	49	21.20	0-1	1
	1732.5	20175	10	16QAM	25	0	20.15	0-2	2
	1732.5	20175	10	16QAM	25	12	20.21	0-2	2
	1732.5	20175	10	16QAM	25	25	19.97	0-2	2
	1732.5	20175	10	16QAM	50	0	19.90	0-2	2
High	1750	20350	10	QPSK	1	0	22.24	0	0
	1750	20350	10	QPSK	1	25	22.19	0	0
	1750	20350	10	QPSK	1	49	22.25	0	0
	1750	20350	10	QPSK	25	0	21.10	0-1	1
	1750	20350	10	QPSK	25	12	20.97	0-1	1
	1750	20350	10	QPSK	25	25	21.13	0-1	1
	1750	20350	10	QPSK	50	0	21.16	0-1	1
	1750	20350	10	16QAM	1	0	21.08	0-1	1
	1750	20350	10	16QAM	1	25	21.27	0-1	1
	1750	20350	10	16QAM	1	49	21.40	0-1	1
	1750	20350	10	16QAM	25	0	20.05	0-2	2
	1750	20350	10	16QAM	25	12	20.31	0-2	2
	1750	20350	10	16QAM	25	25	20.17	0-2	2
	1750	20350	10	16QAM	50	0	20.00	0-2	2

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Table 9-10
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	21.85	0	0
	1712.5	19975	5	QPSK	1	12	21.88	0	0
	1712.5	19975	5	QPSK	1	24	21.86	0	0
	1712.5	19975	5	QPSK	12	0	20.61	0-1	1
	1712.5	19975	5	QPSK	12	6	20.69	0-1	1
	1712.5	19975	5	QPSK	12	13	20.93	0-1	1
	1712.5	19975	5	QPSK	25	0	20.92	0-1	1
	1712.5	19975	5	16-QAM	1	0	21.00	0-1	1
	1712.5	19975	5	16-QAM	1	12	20.84	0-1	1
	1712.5	19975	5	16-QAM	1	24	20.85	0-1	1
	1712.5	19975	5	16-QAM	12	0	19.93	0-2	2
	1712.5	19975	5	16-QAM	12	6	19.78	0-2	2
	1712.5	19975	5	16-QAM	12	13	19.98	0-2	2
Mid	1732.5	20175	5	QPSK	1	0	22.14	0	0
	1732.5	20175	5	QPSK	1	12	21.99	0	0
	1732.5	20175	5	QPSK	1	24	22.25	0	0
	1732.5	20175	5	QPSK	12	0	21.30	0-1	1
	1732.5	20175	5	QPSK	12	6	21.27	0-1	1
	1732.5	20175	5	QPSK	12	13	21.33	0-1	1
	1732.5	20175	5	QPSK	25	0	21.26	0-1	1
	1732.5	20175	5	16-QAM	1	0	21.28	0-1	1
	1732.5	20175	5	16-QAM	1	12	21.07	0-1	1
	1732.5	20175	5	16-QAM	1	24	21.10	0-1	1
	1732.5	20175	5	16-QAM	12	0	20.15	0-2	2
	1732.5	20175	5	16-QAM	12	6	20.31	0-2	2
	1732.5	20175	5	16-QAM	12	13	19.87	0-2	2
	1732.5	20175	5	16-QAM	25	0	19.80	0-2	2
High	1752.5	20375	5	QPSK	1	0	22.14	0	0
	1752.5	20375	5	QPSK	1	12	22.11	0	0
	1752.5	20375	5	QPSK	1	24	22.24	0	0
	1752.5	20375	5	QPSK	12	0	21.00	0-1	1
	1752.5	20375	5	QPSK	12	6	20.97	0-1	1
	1752.5	20375	5	QPSK	12	13	21.03	0-1	1
	1752.5	20375	5	QPSK	25	0	21.26	0-1	1
	1752.5	20375	5	16-QAM	1	0	21.08	0-1	1
	1752.5	20375	5	16-QAM	1	12	21.37	0-1	1
	1752.5	20375	5	16-QAM	1	24	21.30	0-1	1
	1752.5	20375	5	16-QAM	12	0	20.05	0-2	2
	1752.5	20375	5	16-QAM	12	6	20.41	0-2	2
	1752.5	20375	5	16-QAM	12	13	20.07	0-2	2
	1752.5	20375	5	16-QAM	25	0	19.98	0-2	2

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Table 9-11
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	21.75	0	0
	1711.5	19965	3	QPSK	1	7	21.98	0	0
	1711.5	19965	3	QPSK	1	14	21.76	0	0
	1711.5	19965	3	QPSK	8	0	20.71	0-1	1
	1711.5	19965	3	QPSK	8	4	20.59	0-1	1
	1711.5	19965	3	QPSK	8	7	20.93	0-1	1
	1711.5	19965	3	QPSK	15	0	21.02	0-1	1
	1711.5	19965	3	16-QAM	1	0	20.90	0-1	1
	1711.5	19965	3	16-QAM	1	7	20.84	0-1	1
	1711.5	19965	3	16-QAM	1	14	20.75	0-1	1
	1711.5	19965	3	16-QAM	8	0	19.83	0-2	2
	1711.5	19965	3	16-QAM	8	4	19.78	0-2	2
	1711.5	19965	3	16-QAM	8	7	20.08	0-2	2
Mid	1732.5	20175	3	QPSK	1	0	22.24	0	0
	1732.5	20175	3	QPSK	1	7	22.10	0	0
	1732.5	20175	3	QPSK	1	14	22.20	0	0
	1732.5	20175	3	QPSK	8	0	21.30	0-1	1
	1732.5	20175	3	QPSK	8	4	21.37	0-1	1
	1732.5	20175	3	QPSK	8	7	21.33	0-1	1
	1732.5	20175	3	QPSK	15	0	21.16	0-1	1
	1732.5	20175	3	16-QAM	1	0	21.28	0-1	1
	1732.5	20175	3	16-QAM	1	7	20.97	0-1	1
	1732.5	20175	3	16-QAM	1	14	21.00	0-1	1
	1732.5	20175	3	16-QAM	8	0	20.25	0-2	2
	1732.5	20175	3	16-QAM	8	4	20.21	0-2	2
	1732.5	20175	3	16-QAM	8	7	19.77	0-2	2
	1732.5	20175	3	16-QAM	15	0	19.90	0-2	2
High	1753.5	20385	3	QPSK	1	0	22.14	0	0
	1753.5	20385	3	QPSK	1	7	22.09	0	0
	1753.5	20385	3	QPSK	1	14	22.25	0	0
	1753.5	20385	3	QPSK	8	0	21.00	0-1	1
	1753.5	20385	3	QPSK	8	4	20.87	0-1	1
	1753.5	20385	3	QPSK	8	7	20.93	0-1	1
	1753.5	20385	3	QPSK	15	0	21.36	0-1	1
	1753.5	20385	3	16-QAM	1	0	21.18	0-1	1
	1753.5	20385	3	16-QAM	1	7	21.47	0-1	1
	1753.5	20385	3	16-QAM	1	14	21.40	0-1	1
	1753.5	20385	3	16-QAM	8	0	19.95	0-2	2
	1753.5	20385	3	16-QAM	8	4	20.41	0-2	2
	1753.5	20385	3	16-QAM	8	7	19.97	0-2	2
	1753.5	20385	3	16-QAM	15	0	19.87	0-2	2

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Table 9-12
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	21.85	0	0
	1710.7	19957	1.4	QPSK	1	2	21.88	0	0
	1710.7	19957	1.4	QPSK	1	5	21.76	0	0
	1710.7	19957	1.4	QPSK	3	0	21.81	0	0
	1710.7	19957	1.4	QPSK	3	2	21.51	0	0
	1710.7	19957	1.4	QPSK	3	3	21.93	0	0
	1710.7	19957	1.4	QPSK	6	0	21.02	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	20.90	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	20.84	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	20.75	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	20.73	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	20.88	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	20.88	0-1	1
Mid	1710.7	19957	1.4	16-QAM	6	0	19.63	0-2	2
	1732.5	20175	1.4	QPSK	1	0	22.14	0	0
	1732.5	20175	1.4	QPSK	1	2	22.09	0	0
	1732.5	20175	1.4	QPSK	1	5	22.25	0	0
	1732.5	20175	1.4	QPSK	3	0	22.12	0	0
	1732.5	20175	1.4	QPSK	3	2	22.21	0	0
	1732.5	20175	1.4	QPSK	3	3	22.23	0	0
	1732.5	20175	1.4	QPSK	6	0	21.16	0-1	1
	1732.5	20175	1.4	16-QAM	1	0	21.28	0-1	1
	1732.5	20175	1.4	16-QAM	1	2	20.97	0-1	1
	1732.5	20175	1.4	16-QAM	1	5	21.00	0-1	1
	1732.5	20175	1.4	16-QAM	3	0	21.35	0-1	1
	1732.5	20175	1.4	16-QAM	3	2	21.11	0-1	1
High	1732.5	20175	1.4	16-QAM	3	3	20.77	0-1	1
	1732.5	20175	1.4	16-QAM	6	0	19.90	0-2	2
	1754.3	20393	1.4	QPSK	1	0	22.04	0	0
	1754.3	20393	1.4	QPSK	1	2	22.09	0	0
	1754.3	20393	1.4	QPSK	1	5	22.25	0	0
	1754.3	20393	1.4	QPSK	3	0	22.00	0	0
	1754.3	20393	1.4	QPSK	3	2	21.77	0	0
	1754.3	20393	1.4	QPSK	3	3	21.83	0	0
	1754.3	20393	1.4	QPSK	6	0	21.36	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	21.08	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	21.47	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	21.50	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	20.95	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	20.89	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	20.97	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	19.98	0-2	2

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LTE Band 5 (Cell)

Table 9-13
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	24.14	0	0
	836.5	20525	10	QPSK	1	25	24.08	0	0
	836.5	20525	10	QPSK	1	49	24.12	0	0
	836.5	20525	10	QPSK	25	0	23.21	0-1	1
	836.5	20525	10	QPSK	25	12	23.12	0-1	1
	836.5	20525	10	QPSK	25	25	23.19	0-1	1
	836.5	20525	10	QPSK	50	0	23.20	0-1	1
	836.5	20525	10	16QAM	1	0	23.50	0-1	1
	836.5	20525	10	16QAM	1	25	23.41	0-1	1
	836.5	20525	10	16QAM	1	49	23.42	0-1	1
	836.5	20525	10	16QAM	25	0	22.30	0-2	2
	836.5	20525	10	16QAM	25	12	22.25	0-2	2
	836.5	20525	10	16QAM	25	25	22.25	0-2	2
	836.5	20525	10	16QAM	50	0	22.26	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.

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Table 9-14
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	24.14	0	0
	826.5	20425	5	QPSK	1	12	24.38	0	0
	826.5	20425	5	QPSK	1	24	24.22	0	0
	826.5	20425	5	QPSK	12	0	23.31	0-1	1
	826.5	20425	5	QPSK	12	6	23.12	0-1	1
	826.5	20425	5	QPSK	12	13	23.39	0-1	1
	826.5	20425	5	QPSK	25	0	23.20	0-1	1
	826.5	20425	5	16-QAM	1	0	23.30	0-1	1
	826.5	20425	5	16-QAM	1	12	23.21	0-1	1
	826.5	20425	5	16-QAM	1	24	23.12	0-1	1
	826.5	20425	5	16-QAM	12	0	22.49	0-2	2
	826.5	20425	5	16-QAM	12	6	22.05	0-2	2
	826.5	20425	5	16-QAM	12	13	22.15	0-2	2
Mid	836.5	20525	5	QPSK	1	0	23.94	0	0
	836.5	20525	5	QPSK	1	12	24.28	0	0
	836.5	20525	5	QPSK	1	24	24.22	0	0
	836.5	20525	5	QPSK	12	0	23.21	0-1	1
	836.5	20525	5	QPSK	12	6	23.32	0-1	1
	836.5	20525	5	QPSK	12	13	23.39	0-1	1
	836.5	20525	5	QPSK	25	0	23.20	0-1	1
	836.5	20525	5	16-QAM	1	0	23.50	0-1	1
	836.5	20525	5	16-QAM	1	12	23.41	0-1	1
	836.5	20525	5	16-QAM	1	24	23.32	0-1	1
	836.5	20525	5	16-QAM	12	0	22.40	0-2	2
	836.5	20525	5	16-QAM	12	6	22.05	0-2	2
	836.5	20525	5	16-QAM	12	13	22.25	0-2	2
High	846.5	20625	5	QPSK	1	0	23.74	0	0
	846.5	20625	5	QPSK	1	12	24.48	0	0
	846.5	20625	5	QPSK	1	24	24.12	0	0
	846.5	20625	5	QPSK	12	0	23.31	0-1	1
	846.5	20625	5	QPSK	12	6	23.22	0-1	1
	846.5	20625	5	QPSK	12	13	23.39	0-1	1
	846.5	20625	5	QPSK	25	0	23.02	0-1	1
	846.5	20625	5	16-QAM	1	0	23.30	0-1	1
	846.5	20625	5	16-QAM	1	12	23.31	0-1	1
	846.5	20625	5	16-QAM	1	24	23.12	0-1	1
	846.5	20625	5	16-QAM	12	0	22.20	0-2	2
	846.5	20625	5	16-QAM	12	6	21.85	0-2	2
	846.5	20625	5	16-QAM	12	13	22.05	0-2	2
	846.5	20625	5	16-QAM	25	0	22.14	0-2	2

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Table 9-15
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	24.34	0	0
	825.5	20415	3	QPSK	1	7	24.38	0	0
	825.5	20415	3	QPSK	1	14	24.42	0	0
	825.5	20415	3	QPSK	8	0	23.11	0-1	1
	825.5	20415	3	QPSK	8	4	23.22	0-1	1
	825.5	20415	3	QPSK	8	7	23.29	0-1	1
	825.5	20415	3	QPSK	15	0	23.25	0-1	1
	825.5	20415	3	16-QAM	1	0	23.10	0-1	1
	825.5	20415	3	16-QAM	1	7	23.21	0-1	1
	825.5	20415	3	16-QAM	1	14	23.02	0-1	1
	825.5	20415	3	16-QAM	8	0	22.41	0-2	2
	825.5	20415	3	16-QAM	8	4	22.25	0-2	2
	825.5	20415	3	16-QAM	8	7	22.25	0-2	2
	825.5	20415	3	16-QAM	15	0	22.26	0-2	2
Mid	836.5	20525	3	QPSK	1	0	24.04	0	0
	836.5	20525	3	QPSK	1	7	24.48	0	0
	836.5	20525	3	QPSK	1	14	24.12	0	0
	836.5	20525	3	QPSK	8	0	23.41	0-1	1
	836.5	20525	3	QPSK	8	4	23.35	0-1	1
	836.5	20525	3	QPSK	8	7	23.29	0-1	1
	836.5	20525	3	QPSK	15	0	23.22	0-1	1
	836.5	20525	3	16-QAM	1	0	23.40	0-1	1
	836.5	20525	3	16-QAM	1	7	23.41	0-1	1
	836.5	20525	3	16-QAM	1	14	23.41	0-1	1
	836.5	20525	3	16-QAM	8	0	22.15	0-2	2
	836.5	20525	3	16-QAM	8	4	22.05	0-2	2
	836.5	20525	3	16-QAM	8	7	22.05	0-2	2
	836.5	20525	3	16-QAM	15	0	22.44	0-2	2
High	847.5	20635	3	QPSK	1	0	23.54	0	0
	847.5	20635	3	QPSK	1	7	24.28	0	0
	847.5	20635	3	QPSK	1	14	24.02	0	0
	847.5	20635	3	QPSK	8	0	23.34	0-1	1
	847.5	20635	3	QPSK	8	4	23.02	0-1	1
	847.5	20635	3	QPSK	8	7	23.29	0-1	1
	847.5	20635	3	QPSK	15	0	23.14	0-1	1
	847.5	20635	3	16-QAM	1	0	23.20	0-1	1
	847.5	20635	3	16-QAM	1	7	23.21	0-1	1
	847.5	20635	3	16-QAM	1	14	23.32	0-1	1
	847.5	20635	3	16-QAM	8	0	22.30	0-2	2
	847.5	20635	3	16-QAM	8	4	22.05	0-2	2
	847.5	20635	3	16-QAM	8	7	22.05	0-2	2
	847.5	20635	3	16-QAM	15	0	22.34	0-2	2

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Table 9-16
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	24.24	0	0
	824.7	20407	1.4	QPSK	1	2	24.48	0	0
	824.7	20407	1.4	QPSK	1	5	24.42	0	0
	824.7	20407	1.4	QPSK	3	0	24.02	0	0
	824.7	20407	1.4	QPSK	3	2	24.00	0	0
	824.7	20407	1.4	QPSK	3	3	23.61	0	0
	824.7	20407	1.4	QPSK	6	0	23.22	0-1	1
	824.7	20407	1.4	16-QAM	1	0	23.30	0-1	1
	824.7	20407	1.4	16-QAM	1	2	23.31	0-1	1
	824.7	20407	1.4	16-QAM	1	5	22.92	0-1	1
	824.7	20407	1.4	16-QAM	3	0	22.59	0-1	1
	824.7	20407	1.4	16-QAM	3	2	22.55	0-1	1
	824.7	20407	1.4	16-QAM	3	3	22.51	0-1	1
	824.7	20407	1.4	16-QAM	6	0	22.16	0-2	2
Mid	836.5	20525	1.4	QPSK	1	0	24.24	0	0
	836.5	20525	1.4	QPSK	1	2	24.28	0	0
	836.5	20525	1.4	QPSK	1	5	24.02	0	0
	836.5	20525	1.4	QPSK	3	0	24.41	0	0
	836.5	20525	1.4	QPSK	3	2	24.22	0	0
	836.5	20525	1.4	QPSK	3	3	24.35	0	0
	836.5	20525	1.4	QPSK	6	0	23.42	0-1	1
	836.5	20525	1.4	16-QAM	1	0	23.30	0-1	1
	836.5	20525	1.4	16-QAM	1	2	23.21	0-1	1
	836.5	20525	1.4	16-QAM	1	5	23.32	0-1	1
	836.5	20525	1.4	16-QAM	3	0	22.70	0-1	1
	836.5	20525	1.4	16-QAM	3	2	22.69	0-1	1
	836.5	20525	1.4	16-QAM	3	3	22.54	0-1	1
	836.5	20525	1.4	16-QAM	6	0	22.36	0-2	2
High	848.3	20643	1.4	QPSK	1	0	23.64	0	0
	848.3	20643	1.4	QPSK	1	2	24.18	0	0
	848.3	20643	1.4	QPSK	1	5	23.92	0	0
	848.3	20643	1.4	QPSK	3	0	24.21	0	0
	848.3	20643	1.4	QPSK	3	2	24.22	0	0
	848.3	20643	1.4	QPSK	3	3	24.01	0	0
	848.3	20643	1.4	QPSK	6	0	23.32	0-1	1
	848.3	20643	1.4	16-QAM	1	0	23.00	0-1	1
	848.3	20643	1.4	16-QAM	1	2	23.11	0-1	1
	848.3	20643	1.4	16-QAM	1	5	23.12	0-1	1
	848.3	20643	1.4	16-QAM	3	0	22.95	0-1	1
	848.3	20643	1.4	16-QAM	3	2	22.84	0-1	1
	848.3	20643	1.4	16-QAM	3	3	22.85	0-1	1
	848.3	20643	1.4	16-QAM	6	0	22.34	0-2	2

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LTE Band 17

Table 9-17
LTE Band 17 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	710.0	23790	10	QPSK	1	0	24.08	0	0
	710.0	23790	10	QPSK	1	25	24.03	0	0
	710.0	23790	10	QPSK	1	49	24.11	0	0
	710.0	23790	10	QPSK	25	0	23.00	0-1	1
	710.0	23790	10	QPSK	25	12	23.05	0-1	1
	710.0	23790	10	QPSK	25	25	23.01	0-1	1
	710.0	23790	10	QPSK	50	0	23.03	0-1	1
	710.0	23790	10	16QAM	1	0	23.45	0-1	1
	710.0	23790	10	16QAM	1	25	23.44	0-1	1
	710.0	23790	10	16QAM	1	49	23.41	0-1	1
	710.0	23790	10	16QAM	25	0	22.14	0-2	2
	710.0	23790	10	16QAM	25	12	22.15	0-2	2
	710.0	23790	10	16QAM	25	25	22.13	0-2	2
	710.0	23790	10	16QAM	50	0	22.10	0-2	2

Note: LTE Band 17 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-18
LTE Band 17 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	710.0	23790	5	QPSK	1	0	23.88	0	0
	710.0	23790	5	QPSK	1	12	24.09	0	0
	710.0	23790	5	QPSK	1	24	24.01	0	0
	710.0	23790	5	QPSK	12	0	23.20	0-1	1
	710.0	23790	5	QPSK	12	6	22.95	0-1	1
	710.0	23790	5	QPSK	12	13	22.81	0-1	1
	710.0	23790	5	QPSK	25	0	22.83	0-1	1
	710.0	23790	5	16-QAM	1	0	23.35	0-1	1
	710.0	23790	5	16-QAM	1	12	23.24	0-1	1
	710.0	23790	5	16-QAM	1	24	23.41	0-1	1
	710.0	23790	5	16-QAM	12	0	22.24	0-2	2
	710.0	23790	5	16-QAM	12	6	22.25	0-2	2
	710.0	23790	5	16-QAM	12	13	21.93	0-2	2
	710.0	23790	5	16-QAM	25	0	21.90	0-2	2

Note: LTE Band 17 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.

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9.4 LTE Carrier Aggregation Conducted Powers

Table 9-19

LTE Carrier Aggregation Conducted Powers - Band 2 (PCC) + Band 17 (SCC) 10 MHz BW

Band 2 (PCC) + Band 17 (SCC), 10 MHz				
1880 MHz / ch.18900 + 710 MHz / ch. 23790	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
	1	25	21.88	22.05

Table 9-20

LTE Carrier Aggregation Conducted Powers - Band 2 (PCC) + Band 29 (SCC) 10 MHz BW

Band 2 (PCC) + Band 29 (SCC), 10 MHz				
1880 MHz / ch.18900 + 722.7 MHz / ch. 9715	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
	1	25	21.93	22.05

Table 9-21

LTE Carrier Aggregation Conducted Powers - Band 4 (PCC) + Band 17 (SCC) 10 MHz BW

Band 4 (PCC) + Band 17 (SCC), 10 MHz				
1732.5 MHz / ch.20175 + 710 MHz / ch. 23790	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
	1	49	21.91	22.26

Table 9-22

LTE Carrier Aggregation Conducted Powers - Band 4 (PCC) + Band 29 (SCC) 10 MHz BW

Band 4 (PCC) + Band 29 (SCC), 10 MHz				
1732.5 MHz / ch.20175 + 722.7 MHz / ch. 9715	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
	1	49	21.97	22.26

Table 9-23

LTE Carrier Aggregation Conducted Powers - Band 17 (PCC) + Band 2 (SCC) 10 MHz BW

Band 17 (PCC) + Band 2 (SCC), 10 MHz				
710 MHz / ch.23790 + 1880 MHz / ch. 18900	PCC UL# RB	PCC UL RB Offset	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
	1	49	23.54	24.11

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 only supports inter-band CA (B2+B17, B2+B29, B4+B17, B4+B29, B17+B2) with a maximum of 10 MHz of spectrum.
4. All control and acknowledge data is sent on uplink channels that operate identical to release 8 specifications.
5. LTE B29 is only supported on the downlink for this device; LTE B2, B4, B5, B17 are supported on both the uplink and downlink for this device.

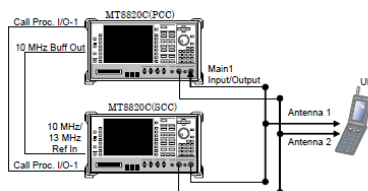


Figure 9-3
Power Measurement Setup

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9.5 WLAN Conducted Powers

9.5.1 Antenna 1 WLAN Conducted Powers

Table 9-24

IEEE 802.11b Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	17.42	16.41	16.51	16.51
802.11b	2437	6*	16.46	15.55	15.56	15.62
802.11b	2462	11*	16.62	15.79	15.89	15.88

Table 9-25

IEEE 802.11b Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	12.04	12.38	12.41	12.37
802.11b	2437	6*	12.45	12.46	12.49	12.42
802.11b	2462	11*	11.97	12.25	12.23	12.26

Table 9-26

IEEE 802.11g Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	14.31	14.15	14.18	14.40	14.27	14.32	14.41	14.40
802.11g	2437	6	13.85	13.63	13.71	14.02	13.83	13.86	13.90	13.86
802.11g	2462	11	13.55	13.37	13.41	13.62	13.54	13.47	13.65	13.69

Table 9-27

IEEE 802.11g Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	12.22	12.27	12.45	12.38	12.45	12.49	12.48	12.45
802.11g	2437	6	11.90	11.95	12.12	12.03	12.15	12.14	12.11	12.15
802.11g	2462	11	11.48	11.55	11.76	11.72	11.80	11.84	11.73	11.82

Table 9-28

IEEE 802.11n Average RF Power – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	11.51	11.42	11.55	11.52	11.49	11.49	11.65	11.65
802.11n	2437	6	11.12	11.91	11.49	11.51	11.60	11.62	11.59	11.53
802.11n	2462	11	11.62	11.00	11.49	11.69	11.67	11.69	11.93	11.81

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Table 9-29

IEEE 802.11a Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	13.58	13.36	13.22	13.47	13.31	13.30	13.47	13.45
802.11a	5200	40	13.31	13.20	12.97	13.32	13.19	13.04	13.23	13.22
802.11a	5220	44	13.08	13.00	12.81	13.07	12.93	12.95	13.08	13.06
802.11a	5240	48*	13.82	13.71	13.65	13.86	13.78	13.70	13.92	13.85
802.11a	5260	52*	13.92	13.42	13.55	13.49	13.61	13.67	13.91	13.54
802.11a	5280	56	13.45	13.00	13.07	13.07	13.15	13.25	13.48	13.03
802.11a	5300	60	13.28	12.83	12.95	12.81	12.99	13.02	13.25	12.97
802.11a	5320	64*	13.33	12.80	12.91	12.90	13.04	13.07	13.31	12.89
802.11a	5500	100	13.15	13.27	13.47	13.56	13.53	13.68	13.80	13.48
802.11a	5520	104*	13.13	13.25	13.48	13.52	13.47	13.63	13.77	13.40
802.11a	5540	108	13.27	13.40	13.57	13.76	13.65	13.76	13.96	13.61
802.11a	5560	112	13.33	13.46	13.66	13.73	13.64	13.87	13.99	13.68
802.11a	5580	116*	13.23	13.44	13.61	13.63	13.66	13.70	13.88	13.51
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	13.15	13.28	13.49	13.57	13.46	13.67	13.75	13.42
802.11a	5680	136*	13.93	13.92	13.87	13.85	13.87	13.91	13.96	13.84
802.11a	5700	140	13.89	13.94	13.87	13.85	13.84	13.84	13.71	13.69
802.11a	5745	149*	13.77	13.20	13.23	13.31	13.42	13.48	13.59	13.25
802.11a	5765	153	13.63	13.06	13.08	13.08	13.24	13.27	13.44	13.02
802.11a	5785	157*	13.69	13.64	13.71	13.79	13.77	13.83	13.08	13.79
802.11a	5805	161	13.60	13.33	13.45	13.45	13.50	13.59	13.83	13.49
802.11a	5825	165*	13.57	13.45	13.61	13.63	13.75	13.10	13.25	12.85

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power than the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-30
IEEE 802.11a Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	9.44	9.45	9.49	9.44	9.49	9.49	9.48	9.47
802.11a	5200	40	9.22	9.40	9.45	9.38	9.44	9.49	9.47	9.42
802.11a	5220	44	9.10	9.21	9.37	9.32	9.43	9.47	9.43	9.38
802.11a	5240	48*	8.81	8.99	9.12	9.24	9.38	9.42	9.35	9.31
802.11a	5260	52*	8.67	8.82	8.93	9.14	9.15	9.20	9.11	9.08
802.11a	5280	56	9.31	9.46	9.42	9.35	9.49	9.42	9.33	9.45
802.11a	5300	60	9.09	9.20	9.24	9.28	9.22	9.35	9.34	9.30
802.11a	5320	64*	9.17	9.22	9.37	9.40	9.41	9.45	9.42	9.26
802.11a	5500	100	8.95	8.99	9.05	9.06	9.15	9.18	9.12	9.09
802.11a	5520	104*	8.96	9.05	9.11	9.11	9.15	9.20	9.18	9.17
802.11a	5540	108	8.95	9.01	8.99	9.17	9.15	9.19	9.10	9.14
802.11a	5560	112	8.84	8.88	8.92	8.90	8.99	9.12	9.10	9.08
802.11a	5580	116*	8.95	8.98	9.05	9.06	9.18	9.15	9.12	9.14
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	8.61	8.78	8.72	8.88	8.98	8.99	8.82	8.85
802.11a	5680	136*	8.71	8.89	8.91	8.94	8.96	8.98	8.88	8.82
802.11a	5700	140	8.60	8.72	8.74	8.85	8.91	8.89	8.92	8.86
802.11a	5745	149*	9.12	9.15	9.11	9.26	9.22	9.35	9.36	9.32
802.11a	5765	153	9.11	9.20	9.25	9.30	9.33	9.34	9.33	9.29
802.11a	5785	157*	9.08	9.15	9.17	9.20	9.21	9.25	9.31	9.22
802.11a	5805	161	8.92	9.00	9.05	9.03	9.11	9.16	9.14	9.06
802.11a	5825	165*	8.91	8.95	8.99	9.03	9.08	9.10	9.02	9.01

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-31
IEEE 802.11n Average RF Power – 20 MHz Bandwidth – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	11.17	11.09	11.22	11.35	11.36	11.43	10.60	10.66
802.11n	5200	40	10.99	10.95	11.08	11.15	11.22	11.31	10.47	10.49
802.11n	5220	44	10.88	10.74	10.96	11.08	11.13	11.14	10.32	10.36
802.11n	5240	48	10.66	10.58	10.71	10.80	10.82	10.93	10.05	10.16
802.11n	5260	52	11.30	10.60	10.49	10.87	10.70	11.09	11.16	11.12
802.11n	5280	56	11.28	10.57	10.42	10.83	10.68	11.03	11.15	11.09
802.11n	5300	60	10.83	10.18	10.12	10.41	10.31	10.59	10.76	10.67
802.11n	5320	64	10.77	10.03	10.03	10.38	10.28	10.49	10.70	10.65
802.11n	5500	100	10.67	10.83	10.79	11.05	11.05	11.33	11.28	11.28
802.11n	5520	104	10.77	10.92	10.94	11.15	11.16	11.41	11.35	11.39
802.11n	5540	108	10.84	10.96	10.99	11.23	11.21	10.80	10.92	10.94
802.11n	5560	112	10.75	10.91	10.84	11.13	11.19	11.40	11.32	11.34
802.11n	5580	116	10.75	10.91	10.81	11.15	11.10	11.38	11.34	11.37
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	11.43	11.31	11.29	11.35	11.37	11.38	11.35	11.35
802.11n	5680	136	11.36	11.35	11.45	11.43	11.42	11.35	11.31	11.33
802.11n	5700	140	11.30	11.28	11.43	11.38	11.37	11.35	11.33	11.36
802.11n	5745	149	10.98	10.69	10.74	10.82	10.80	11.29	11.30	11.38
802.11n	5765	153	10.97	10.73	10.63	10.91	10.93	11.29	11.33	11.28
802.11n	5785	157	10.88	10.79	10.72	11.01	10.93	11.23	11.20	11.10
802.11n	5805	161	10.90	10.61	10.63	10.87	10.85	11.05	11.29	11.20
802.11n	5825	165	10.81	10.73	10.68	11.00	11.03	11.25	11.15	11.08

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

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Table 9-32
IEEE 802.11n Average RF Power – 20 MHz Bandwidth – Reduced Power – Held to Ear
Configurations

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	8.35	8.43	8.43	8.67	8.89	8.83	8.69	8.75
802.11n	5200	40	8.31	8.35	8.36	8.55	8.62	8.79	8.65	8.71
802.11n	5220	44	8.13	8.19	8.20	8.44	8.56	8.62	8.61	8.57
802.11n	5240	48	8.01	8.10	8.30	8.27	8.46	8.45	8.45	8.42
802.11n	5260	52	8.63	8.55	8.78	8.65	8.82	8.81	8.75	9.01
802.11n	5280	56	8.42	8.51	8.66	8.69	8.75	8.79	8.71	8.88
802.11n	5300	60	8.32	8.35	8.44	8.49	8.58	8.56	8.52	8.79
802.11n	5320	64	8.17	8.22	8.35	8.30	8.41	8.49	8.46	8.38
802.11n	5500	100	7.75	7.79	7.77	7.82	7.88	7.86	7.90	8.08
802.11n	5520	104	7.84	7.89	7.85	7.99	7.94	8.03	7.91	7.96
802.11n	5540	108	7.79	7.80	7.86	7.84	7.92	7.98	7.94	8.01
802.11n	5560	112	7.86	7.82	7.89	7.94	8.12	8.05	8.12	8.17
802.11n	5580	116	7.72	8.01	7.84	7.96	8.06	7.98	8.04	7.95
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	8.78	8.75	8.74	8.88	9.11	9.01	8.97	9.05
802.11n	5680	136	8.69	8.88	8.90	8.96	9.01	9.06	8.93	8.92
802.11n	5700	140	8.53	8.56	8.57	8.74	8.80	8.81	8.76	8.89
802.11n	5745	149	8.11	8.43	8.36	8.41	8.65	8.61	8.39	8.47
802.11n	5765	153	7.94	8.05	8.12	8.22	8.29	8.28	8.20	8.09
802.11n	5785	157	8.24	8.11	7.90	7.94	7.89	8.11	8.08	8.00
802.11n	5805	161	8.10	8.05	7.97	8.00	7.99	8.06	8.11	8.04
802.11n	5825	165	7.90	7.95	7.92	7.89	8.17	8.05	8.16	8.31

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

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Table 9-33
IEEE 802.11n Average RF Power – 40 MHz Bandwidth – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	8.12	8.23	8.28	7.49	7.63	7.50	7.82	7.60
802.11n	5230	46	7.83	7.91	7.98	7.16	7.39	7.27	7.49	7.30
802.11n	5270	54	7.77	7.60	7.68	7.67	7.50	7.95	7.87	7.75
802.11n	5310	62	8.01	7.82	7.94	7.84	7.77	8.18	8.14	7.99
802.11n	5510	102	7.61	7.47	7.42	7.66	7.10	6.87	6.89	7.07
802.11n	5550	110	7.68	7.47	7.47	7.80	7.21	6.98	6.91	7.19
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	7.48	7.40	7.24	7.54	7.00	6.80	6.78	6.92
802.11n	5755	151	8.28	8.24	8.22	7.55	7.58	7.71	7.75	7.53
802.11n	5795	159	7.79	7.75	7.81	7.83	7.80	7.98	8.03	7.97

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

Table 9-34
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
			Data Rate [Mbps]									
			29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
802.11ac	5210	42	8.41	8.43	8.40	8.39	8.37	8.43	8.47	8.33	8.31	8.17
802.11ac	5290	58	7.89	7.87	7.92	7.75	7.92	7.83	8.01	7.83	8.11	7.51
802.11ac	5530	106	8.01	7.89	7.77	7.79	8.15	8.12	8.15	7.91	7.79	7.83
802.11ac	5775	155	8.38	8.49	8.37	8.23	8.23	8.28	8.44	8.28	8.36	7.91

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Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
- Full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.

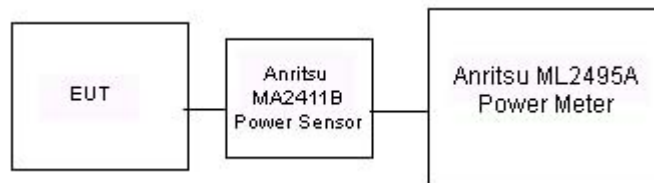


Figure 9-4
Power Measurement Setup for Bandwidths < 50 MHz

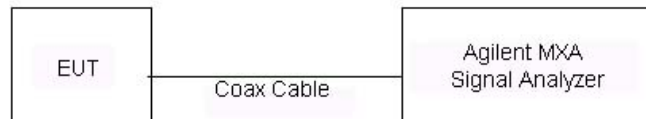


Figure 9-5
Power Measurement Setup for Bandwidths > 50 MHz

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9.5.2 Antenna 2 WLAN Conducted Powers

Table 9-35

IEEE 802.11b Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	16.92	17.31	17.35	17.24
802.11b	2437	6*	17.42	17.39	17.31	17.49
802.11b	2462	11*	16.06	16.49	16.51	16.43

Table 9-36

IEEE 802.11b Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	12.34	12.49	12.47	12.49
802.11b	2437	6*	11.80	12.17	12.19	12.08
802.11b	2462	11*	12.16	12.40	12.36	12.42

Table 9-37

IEEE 802.11g Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	13.83	13.64	13.64	13.81	13.71	13.73	13.89	13.93
802.11g	2437	6	13.41	13.24	13.19	13.39	13.23	13.34	13.43	13.57
802.11g	2462	11	12.85	12.73	12.66	12.76	12.73	12.70	12.88	12.90

Table 9-38

IEEE 802.11g Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	11.86	11.83	11.92	11.84	12.01	12.15	11.95	11.98
802.11g	2437	6	11.63	11.62	11.65	11.61	11.72	11.85	11.77	11.87
802.11g	2462	11	11.91	11.95	11.97	11.85	12.02	12.06	12.00	11.99

Table 9-39

IEEE 802.11n Average RF Power – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	11.04	10.96	11.00	11.18	11.22	11.25	11.41	11.33
802.11n	2437	6	11.73	11.68	11.65	11.83	11.89	11.89	11.85	11.98
802.11n	2462	11	11.09	10.99	11.01	11.26	11.20	11.37	11.42	11.46

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Table 9-40

IEEE 802.11a Average RF Power – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	13.99	13.15	13.04	13.13	13.17	13.01	13.10	13.12
802.11a	5200	40	13.97	13.18	13.15	13.31	13.28	13.09	13.26	13.19
802.11a	5220	44	13.20	13.33	13.33	13.43	13.44	13.23	13.29	13.36
802.11a	5240	48*	13.34	13.59	13.54	13.62	13.56	13.47	13.45	13.48
802.11a	5260	52*	13.72	13.15	13.19	13.31	13.38	13.23	13.37	13.07
802.11a	5280	56	13.77	13.16	13.22	13.32	13.39	13.31	13.38	13.08
802.11a	5300	60	13.87	13.31	13.27	13.46	13.46	13.35	13.46	13.22
802.11a	5320	64*	13.85	13.30	13.24	13.44	13.43	13.40	13.46	13.27
802.11a	5500	100	13.14	13.17	13.27	13.36	13.46	13.46	13.61	13.43
802.11a	5520	104*	13.03	13.10	13.20	13.29	13.33	13.37	13.49	13.32
802.11a	5540	108	13.94	13.92	13.90	13.89	13.87	13.91	13.92	13.90
802.11a	5560	112	13.99	13.85	13.87	13.84	13.88	13.75	13.89	13.91
802.11a	5580	116*	13.96	13.94	13.91	13.86	13.94	13.93	13.94	13.97
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	13.86	13.88	13.85	13.79	13.82	13.89	13.91	13.87
802.11a	5680	136*	13.83	13.85	13.81	13.78	13.81	13.85	13.87	13.91
802.11a	5700	140	13.67	13.71	13.90	13.87	13.85	13.92	13.94	13.95
802.11a	5745	149*	13.74	13.01	13.00	13.05	13.19	13.21	13.43	13.04
802.11a	5765	153	13.78	13.81	13.79	13.88	13.96	13.99	13.27	12.91
802.11a	5785	157*	13.65	12.75	12.91	12.88	13.03	13.06	13.30	12.95
802.11a	5805	161	13.59	12.82	12.96	12.97	13.17	13.25	13.32	13.04
802.11a	5825	165*	13.57	13.01	12.94	12.99	13.01	13.04	13.31	12.94

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power than the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-41
IEEE 802.11a Average RF Power – Reduced Power – Held to Ear Configurations

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	8.96	8.64	8.77	8.51	8.74	9.01	8.85	8.72
802.11a	5200	40	9.35	9.05	9.12	9.18	9.22	9.22	9.18	9.11
802.11a	5220	44	9.46	9.15	9.26	9.08	9.40	9.25	9.33	9.16
802.11a	5240	48*	9.49	9.40	9.44	9.46	9.48	9.47	9.36	9.36
802.11a	5260	52*	8.96	8.75	8.76	8.88	8.81	9.16	9.10	8.82
802.11a	5280	56	8.81	8.64	8.69	8.62	8.75	9.06	8.92	8.94
802.11a	5300	60	8.90	8.63	8.67	8.78	8.82	8.97	8.61	8.79
802.11a	5320	64*	8.93	8.67	8.65	8.75	8.81	9.09	8.94	8.83
802.11a	5500	100	8.94	8.38	8.46	8.52	8.58	8.75	8.64	8.53
802.11a	5520	104*	8.85	8.21	8.37	8.55	8.59	8.62	8.54	8.46
802.11a	5540	108	8.89	8.36	8.39	8.44	8.56	8.71	8.67	8.51
802.11a	5560	112	8.86	8.40	8.44	8.68	8.62	8.70	8.42	8.49
802.11a	5580	116*	8.85	8.32	8.37	8.57	8.61	8.63	8.45	8.47
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	8.82	8.44	8.46	8.45	8.47	8.62	8.42	8.61
802.11a	5680	136*	8.84	8.31	8.45	8.57	8.81	8.54	8.50	8.44
802.11a	5700	140	8.73	8.35	8.39	8.46	8.47	8.45	8.41	8.46
802.11a	5745	149*	8.90	8.35	8.36	8.47	8.57	8.57	8.45	8.42
802.11a	5765	153	8.91	8.36	8.44	8.41	8.57	8.48	8.46	8.47
802.11a	5785	157*	9.05	8.55	8.51	8.57	8.53	8.42	8.32	8.47
802.11a	5805	161	8.94	8.44	8.32	8.45	8.49	8.37	8.25	8.21
802.11a	5825	165*	8.92	8.34	8.45	8.49	8.41	8.33	8.36	8.25

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-42
IEEE 802.11n Average RF Power – 20 MHz Bandwidth – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	10.67	10.61	10.76	10.84	10.92	11.08	11.23	11.09
802.11n	5200	40	10.87	10.78	10.95	11.01	11.18	11.25	11.24	11.31
802.11n	5220	44	11.03	10.94	11.10	11.20	11.25	11.24	11.21	11.28
802.11n	5240	48	11.16	11.11	11.17	11.29	11.20	11.28	11.17	11.10
802.11n	5260	52	10.64	10.23	10.21	10.41	10.41	10.78	10.81	10.83
802.11n	5280	56	10.69	10.28	10.23	10.47	10.52	10.86	10.88	10.89
802.11n	5300	60	10.73	10.39	10.22	10.53	10.53	10.92	10.96	10.89
802.11n	5320	64	10.69	10.33	10.30	10.44	10.52	10.83	10.78	10.85
802.11n	5500	100	11.41	11.38	11.39	11.35	11.25	11.09	10.96	11.16
802.11n	5520	104	11.44	11.33	11.44	11.35	11.29	11.10	10.96	10.95
802.11n	5540	108	11.33	11.28	11.29	11.48	11.39	11.01	10.92	11.07
802.11n	5560	112	11.34	11.30	11.35	11.39	11.48	11.06	10.89	11.11
802.11n	5580	116	11.32	11.26	11.32	11.48	11.47	10.95	10.84	11.09
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	11.27	11.18	11.31	11.38	11.38	10.94	10.78	10.99
802.11n	5680	136	11.21	11.18	11.19	11.40	11.32	10.86	10.80	10.96
802.11n	5700	140	11.17	11.09	11.09	11.37	11.28	10.83	10.74	10.91
802.11n	5745	149	11.16	10.44	10.53	10.65	10.66	11.00	10.95	10.88
802.11n	5765	153	11.15	10.34	10.37	10.45	10.62	10.85	10.81	10.79
802.11n	5785	157	11.12	10.26	10.26	10.47	10.41	10.80	10.68	10.65
802.11n	5805	161	11.12	10.91	10.92	11.09	11.05	11.41	11.39	11.49
802.11n	5825	165	11.13	10.82	10.81	10.97	10.85	11.10	10.96	11.00

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

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Table 9-43
IEEE 802.11n Average RF Power – 20 MHz Bandwidth – Reduced Power – Held to Ear
Configurations

Mode	Freq [MHz]	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	8.52	8.61	8.58	8.54	8.82	8.87	8.79	8.85
802.11n	5200	40	8.74	8.64	8.61	8.75	9.00	8.92	8.91	8.91
802.11n	5220	44	8.83	8.91	8.81	8.81	9.09	9.11	9.12	9.21
802.11n	5240	48	9.00	8.23	8.11	8.24	8.34	8.31	8.37	8.32
802.11n	5260	52	8.38	8.36	8.28	8.57	8.64	8.72	8.71	8.77
802.11n	5280	56	8.49	8.63	8.54	8.47	8.75	8.95	8.84	8.89
802.11n	5300	60	8.56	8.53	8.52	8.92	8.87	8.79	8.71	8.48
802.11n	5320	64	8.57	8.63	8.60	8.57	8.89	9.00	8.96	8.85
802.11n	5500	100	8.33	8.35	8.21	8.45	8.41	8.47	8.59	8.50
802.11n	5520	104	8.26	8.28	8.04	8.36	8.41	8.39	8.52	8.53
802.11n	5540	108	8.39	8.31	8.25	8.24	8.48	8.43	8.47	8.41
802.11n	5560	112	8.29	8.20	8.16	8.21	8.39	8.38	8.36	8.53
802.11n	5580	116	8.31	8.31	8.28	8.21	8.34	8.49	8.43	8.47
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	8.17	8.10	8.07	8.27	8.37	8.31	8.27	8.33
802.11n	5680	136	8.10	8.09	8.00	8.32	8.42	8.31	8.29	8.34
802.11n	5700	140	8.09	8.08	7.98	8.29	8.37	8.39	8.37	8.34
802.11n	5745	149	8.11	7.96	7.93	8.28	8.32	8.30	8.31	8.23
802.11n	5765	153	7.97	8.13	8.06	7.88	8.21	8.24	8.10	8.25
802.11n	5785	157	7.91	7.88	7.96	8.06	8.05	8.07	8.30	8.24
802.11n	5805	161	7.94	7.79	7.92	8.03	8.06	8.00	8.09	8.01
802.11n	5825	165	7.88	7.80	8.00	8.23	8.21	8.17	8.25	8.13

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

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Table 9-44
IEEE 802.11n Average RF Power – 40 MHz Bandwidth – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	8.44	8.33	8.42	7.56	7.55	7.83	8.06	7.99
802.11n	5230	46	8.43	8.42	8.41	7.55	7.56	7.93	8.10	8.06
802.11n	5270	54	7.91	8.12	8.16	8.42	8.38	8.44	8.49	7.55
802.11n	5310	62	8.10	8.37	8.38	7.60	7.55	7.54	7.62	7.60
802.11n	5510	102	8.39	7.58	7.53	7.57	7.77	7.90	8.04	8.01
802.11n	5550	110	8.41	7.62	7.56	7.60	7.86	7.93	8.00	7.96
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	8.26	8.37	8.35	8.39	7.63	7.77	7.94	7.89
802.11n	5755	151	8.19	8.34	8.35	8.44	8.36	8.35	8.39	8.40
802.11n	5795	159	8.07	8.27	8.23	8.38	8.25	8.38	8.35	8.20

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

Table 9-45
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
			Data Rate [Mbps]									
			29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
802.11ac	5210	42	8.05	7.82	7.85	8.13	8.23	8.25	8.23	8.23	7.66	7.89
802.11ac	5290	58	8.25	8.34	8.43	8.49	8.39	7.87	8.01	7.83	8.00	8.37
802.11ac	5530	106	8.49	7.87	7.99	8.41	8.15	8.39	8.40	8.45	7.69	7.67
802.11ac	5775	155	8.44	8.32	8.16	8.47	8.45	8.39	8.44	8.49	7.65	8.13

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Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- For 5 GHz, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
- Full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.

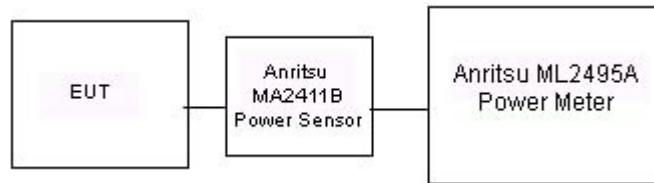


Figure 9-6
Power Measurement Setup for Bandwidths < 50 MHz

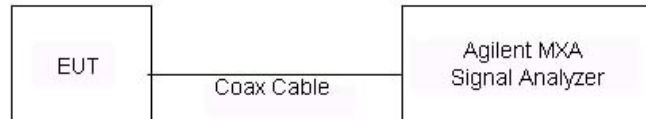


Figure 9-7
Power Measurement Setup for Bandwidths > 50 MHz

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9.5.3 MIMO WLAN Conducted Powers

Table 9-46

IEEE 802.11n Average RF Power MIMO – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	Data Rate [Mbps]
			13
802.11n	2412	1*	11.05
802.11n	2437	6*	10.76
802.11n	2462	11*	11.37

Table 9-47

IEEE 802.11n Average RF Power – 20 MHz Bandwidth MIMO – Maximum Power – Body Worn and Hotspot Configuration

Mode	Freq [MHz]	Channel	Data Rate [Mbps]
			13
802.11n	5180	36*	10.63
802.11n	5200	40	11.45
802.11n	5220	44	11.44
802.11n	5240	48*	11.46
802.11n	5260	52*	11.48
802.11n	5280	56	11.38
802.11n	5300	60	11.28
802.11n	5320	64*	11.15
802.11n	5500	100	11.49
802.11n	5520	104*	11.40
802.11n	5540	108	11.45
802.11n	5560	112	11.44
802.11n	5580	116*	11.44
802.11n	5600	120	N/A
802.11n	5620	124	N/A
802.11n	5640	128	N/A
802.11n	5660	132	11.31
802.11n	5680	136*	11.21
802.11n	5700	140	11.23
802.11n	5745	149*	10.91
802.11n	5765	153	10.87
802.11n	5785	157*	10.93
802.11n	5805	161	10.89
802.11n	5825	165*	10.68

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-48
IEEE 802.11n Average RF Power – 20 MHz Bandwidth MIMO – Reduced Power – Held to Ear
Configurations

Mode	Freq [MHz]	Channel	Data Rate [Mbps]
			13
802.11n	5180	36*	9.48
802.11n	5200	40	9.48
802.11n	5220	44	9.47
802.11n	5240	48*	9.49
802.11n	5260	52*	9.49
802.11n	5280	56	9.37
802.11n	5300	60	9.27
802.11n	5320	64*	9.30
802.11n	5500	100	9.06
802.11n	5520	104*	9.03
802.11n	5540	108	9.10
802.11n	5560	112	9.09
802.11n	5580	116*	9.07
802.11n	5600	120	N/A
802.11n	5620	124	N/A
802.11n	5640	128	N/A
802.11n	5660	132	8.93
802.11n	5680	136*	8.90
802.11n	5700	140	8.83
802.11n	5745	149*	8.77
802.11n	5765	153	8.79
802.11n	5785	157*	8.76
802.11n	5805	161	8.69
802.11n	5825	165*	8.62

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

(*) – indicates default channels per KDB Publication 248227 D01v01r02. When the adjacent channels are higher in power then the default channels, these “required channels” are considered for SAR testing instead of the default channels.

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Table 9-49
IEEE 802.11n Average RF Power – 40 MHz Bandwidth MIMO – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	Data Rate [Mbps]
			27
802.11n	5190	38	7.58
802.11n	5230	46	7.64
802.11n	5270	54	7.52
802.11n	5310	62	7.60
802.11n	5510	102	8.20
802.11n	5550	110	8.27
802.11n	5590	118	N/A
802.11n	5630	126	N/A
802.11n	5670	134	7.59
802.11n	5755	151	8.42
802.11n	5795	159	7.74

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band.

Table 9-50
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth MIMO – Maximum Power – All Exposure Configurations

Mode	Freq [MHz]	Channel	Data Rate [Mbps]
			58.5
802.11ac	5210	42	8.49
802.11ac	5290	58	8.31
802.11ac	5530	106	8.45
802.11ac	5775	155	7.80

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Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz MIMO, 802.11n was evaluated.
- For 5 GHz MIMO, 20 MHz BW 802.11n was evaluated. Additional evaluations for 40 MHz bandwidth 802.11n and 802.11ac were not required since the maximum allowed output power was not higher than 802.11n 20 MHz Bandwidth.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.
- Per KDB 662911 D01v02r01, The individual spectra for each 2x2 MIMO WIFI Antenna were summed mathematically in linear power units for the MIMO output power measurements.

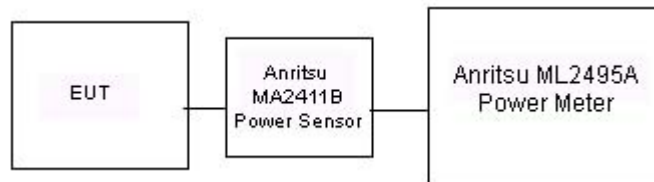


Figure 9-8
Power Measurement Setup for Bandwidths < 50 MHz

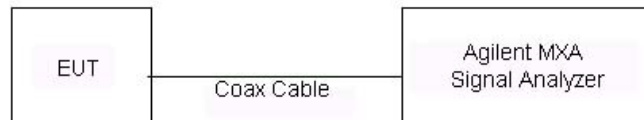


Figure 9-9
Power Measurement Setup for Bandwidths > 50 MHz

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
04/16/2014	740H	23.0	710	0.884	42.247	0.890	42.149	-0.67%	0.23%
			725	0.901	42.170	0.891	42.071	1.12%	0.24%
			740	0.915	41.995	0.893	41.994	2.46%	0.00%
			755	0.927	41.845	0.894	41.916	3.69%	-0.17%
04/17/2014	835H	23.2	820	0.894	40.846	0.899	41.578	-0.56%	-1.76%
			835	0.906	40.624	0.900	41.500	0.67%	-2.11%
			850	0.920	40.469	0.916	41.500	0.44%	-2.48%
04/17/2014	1750H	23.9	1710	1.298	40.896	1.348	40.142	-3.71%	1.88%
			1750	1.336	40.693	1.371	40.079	-2.55%	1.53%
			1790	1.381	40.548	1.394	40.016	-0.93%	1.33%
04/11/2014	1900H	22.8	1850	1.348	40.650	1.400	40.000	-3.71%	1.63%
			1880	1.385	40.622	1.400	40.000	-1.07%	1.56%
			1910	1.419	40.496	1.400	40.000	1.36%	1.24%
04/17/2014	1900H	22.8	1850	1.371	41.381	1.400	40.000	-2.07%	3.45%
			1880	1.402	41.224	1.400	40.000	0.14%	3.06%
			1910	1.437	41.115	1.400	40.000	2.64%	2.79%
04/14/2014	2450H	23.4	2401	1.720	39.335	1.756	39.287	-2.05%	0.12%
			2450	1.773	39.159	1.800	39.200	-1.50%	-0.10%
			2499	1.828	38.982	1.853	39.138	-1.35%	-0.40%
04/14/2014	5200H-5800H	22.2	5180	4.632	36.775	4.635	36.009	-0.06%	2.13%
			5200	4.648	36.736	4.655	35.986	-0.15%	2.08%
			5220	4.670	36.676	4.676	35.963	-0.13%	1.98%
			5240	4.703	36.644	4.696	35.940	0.15%	1.96%
			5260	4.717	36.678	4.717	35.917	0.00%	2.12%
			5280	4.737	36.643	4.737	35.894	0.00%	2.09%
			5300	4.746	36.582	4.758	35.871	-0.25%	1.98%
			5500	4.958	36.291	4.963	35.643	-0.10%	1.82%
			5520	4.990	36.290	4.983	35.620	0.14%	1.88%
			5540	4.998	36.264	5.004	35.597	-0.12%	1.87%
			5560	5.018	36.198	5.024	35.574	-0.12%	1.75%
			5600	5.066	36.142	5.065	35.529	0.02%	1.73%
			5680	5.136	36.051	5.147	35.437	-0.21%	1.73%
			5700	5.173	35.990	5.168	35.414	0.10%	1.63%
			5745	5.236	35.969	5.214	35.363	0.42%	1.71%
			5765	5.245	35.938	5.234	35.340	0.21%	1.69%
			5785	5.251	35.938	5.255	35.317	-0.08%	1.76%
			5800	5.264	35.891	5.270	35.300	-0.11%	1.67%

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Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
04/17/2014	740B	23.6	710	0.942	55.154	0.960	55.687	-1.88%	-0.96%
			725	0.955	55.004	0.961	55.629	-0.62%	-1.12%
			740	0.968	54.876	0.963	55.570	0.52%	-1.25%
			755	0.983	54.783	0.964	55.512	1.97%	-1.31%
04/14/2014	835B	22.2	820	0.985	53.948	0.969	55.258	1.65%	-2.37%
			835	0.999	53.799	0.970	55.200	2.99%	-2.54%
			850	1.013	53.647	0.988	55.154	2.53%	-2.73%
04/17/2014	835B	21.9	820	1.000	54.226	0.969	55.258	3.20%	-1.87%
			835	1.014	54.052	0.970	55.200	4.54%	-2.08%
			850	1.027	53.927	0.988	55.154	3.95%	-2.22%
04/16/2014	1750B	22.7	1710	1.416	51.908	1.463	53.537	-3.21%	-3.04%
			1750	1.460	51.705	1.488	53.432	-1.88%	-3.23%
			1790	1.504	51.603	1.514	53.326	-0.66%	-3.23%
04/14/2014	1900B	23.0	1850	1.522	52.517	1.520	53.300	0.13%	-1.47%
			1880	1.554	52.394	1.520	53.300	2.24%	-1.70%
			1910	1.591	52.307	1.520	53.300	4.67%	-1.86%
04/17/2014	1900B	23.4	1850	1.498	52.400	1.520	53.300	-1.45%	-1.69%
			1880	1.532	52.293	1.520	53.300	0.79%	-1.89%
			1910	1.562	52.190	1.520	53.300	2.76%	-2.08%
04/14/2014	2450B	23.1	2401	1.962	52.784	1.903	52.765	3.10%	0.04%
			2450	2.031	52.620	1.950	52.700	4.15%	-0.15%
			2499	2.097	52.430	2.019	52.638	3.86%	-0.40%
04/14/2014	5200B-5800B	23.3	5200	5.334	47.102	5.299	49.014	0.66%	-3.90%
			5220	5.368	47.023	5.323	48.987	0.85%	-4.01%
			5240	5.373	46.991	5.346	48.960	0.51%	-4.02%
			5260	5.430	46.936	5.369	48.933	1.14%	-4.08%
			5280	5.432	46.827	5.393	48.906	0.72%	-4.25%
			5300	5.469	46.859	5.416	48.879	0.98%	-4.13%
			5500	5.745	46.420	5.650	48.607	1.68%	-4.50%
			5520	5.777	46.403	5.673	48.580	1.83%	-4.48%
			5540	5.807	46.347	5.696	48.553	1.95%	-4.54%
			5560	5.844	46.316	5.720	48.526	2.17%	-4.55%
			5580	5.871	46.297	5.743	48.499	2.23%	-4.54%
			5600	5.903	46.237	5.766	48.471	2.38%	-4.61%
			5680	6.026	46.132	5.860	48.363	2.83%	-4.61%
			5700	6.044	46.109	5.883	48.336	2.74%	-4.61%
			5745	6.120	46.027	5.936	48.275	3.10%	-4.66%
			5765	6.151	46.060	5.959	48.248	3.22%	-4.53%
			5785	6.171	46.038	5.982	48.220	3.16%	-4.53%
			5800	6.202	46.030	6.000	48.200	3.37%	-4.50%
			5805	6.194	45.993	6.006	48.193	3.13%	-4.56%

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.

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10.2 Test System Verification

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

Table 10-3
System Verification Results

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} (%)
G	750	HEAD	04/16/2014	24.1	23.2	0.100	1003	3258	0.813	8.370	8.130	-2.87%
E	835	HEAD	04/17/2014	24.5	23.5	0.100	4d132	3914	0.976	9.200	9.760	6.09%
I	1750	HEAD	04/17/2014	23.8	23.8	0.100	1008	3209	3.540	36.800	35.400	-3.80%
G	1900	HEAD	04/11/2014	24.1	22.4	0.100	5d149	3258	4.040	40.400	40.400	0.00%
J	1900	HEAD	04/17/2014	23.3	21.0	0.100	5d149	3332	4.220	40.400	42.200	4.46%
K	2450	HEAD	04/14/2014	24.2	23.4	0.100	797	3287	5.450	51.800	54.500	5.21%
E	5200	HEAD	04/14/2014	23.0	21.6	0.100	1057	3914	7.140	78.000	71.400	-8.46%
E	5300	HEAD	04/14/2014	23.0	21.5	0.100	1057	3914	7.940	83.000	79.400	-4.34%
E	5500	HEAD	04/14/2014	22.9	21.5	0.100	1057	3914	7.820	84.300	78.200	-7.24%
E	5600	HEAD	04/14/2014	22.9	21.6	0.100	1057	3914	7.700	83.500	77.000	-7.78%
E	5800	HEAD	04/14/2014	22.8	21.6	0.100	1057	3914	7.700	79.300	77.000	-2.90%
K	750	BODY	04/17/2014	24.2	24.5	0.100	1003	3333	0.873	8.770	8.730	-0.46%
D	835	BODY	04/14/2014	23.0	22.1	0.100	4d132	3022	0.979	9.310	9.790	5.16%
D	835	BODY	04/17/2014	23.2	21.9	0.100	4d132	3022	0.989	9.310	9.890	6.23%
J	1750	BODY	04/16/2014	21.6	22.4	0.100	1008	3332	3.660	38.200	36.600	-4.19%
H	1900	BODY	04/14/2014	23.1	23.0	0.100	5d149	3589	4.150	40.500	41.500	2.47%
H	1900	BODY	04/17/2014	24.1	22.9	0.100	5d149	3589	4.160	40.500	41.600	2.72%
G	2450	BODY	04/14/2014	24.4	23.9	0.100	797	3258	4.890	49.400	48.900	-1.01%
A	5200	BODY	04/14/2014	24.0	23.3	0.100	1007	3920	7.820	72.600	78.200	7.71%
A	5300	BODY	04/14/2014	24.0	23.3	0.100	1007	3920	7.130	74.700	71.300	-4.55%
A	5500	BODY	04/14/2014	24.1	23.3	0.100	1007	3920	7.660	75.900	76.600	0.92%
A	5600	BODY	04/14/2014	24.1	23.3	0.100	1007	3920	7.020	77.300	70.200	-9.18%
A	5800	BODY	04/14/2014	24.1	23.3	0.100	1007	3920	6.980	72.900	69.800	-4.25%

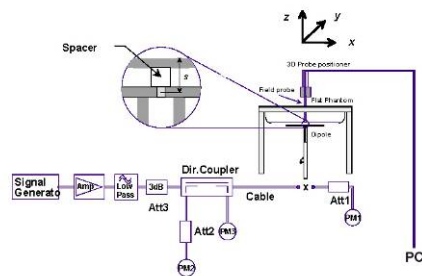


Figure 10-1
System Verification Setup Diagram



Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Serial 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	33.5	32.72	0.00	Right	Cheek	FL-143-B	1:8.3	0.297	1.197	0.356	
836.60	190	GSM 850	GSM	33.5	32.72	0.08	Right	Tilt	FL-143-B	1:8.3	0.163	1.197	0.195	
836.60	190	GSM 850	GSM	33.5	32.72	0.04	Left	Cheek	FL-143-B	1:8.3	0.308	1.197	0.369	A1
836.60	190	GSM 850	GSM	33.5	32.72	0.02	Left	Tilt	FL-143-B	1:8.3	0.177	1.197	0.212	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-2
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.5	29.63	0.13	Right	Cheek	FL-143-B	1:8.3	0.123	1.222	0.150	
1880.00	661	GSM 1900	GSM	30.5	29.63	-0.08	Right	Tilt	FL-143-B	1:8.3	0.118	1.222	0.144	
1880.00	661	GSM 1900	GSM	30.5	29.63	-0.16	Left	Cheek	FL-143-B	1:8.3	0.263	1.222	0.321	A2
1880.00	661	GSM 1900	GSM	30.5	29.63	0.17	Left	Tilt	FL-143-B	1:8.3	0.080	1.222	0.098	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	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	24.0	23.00	0.03	Right	Cheek	FL-143-B	1:1	0.253	1.259	0.319	
836.60	4183	UMTS 850	RMC	24.0	23.00	0.06	Right	Tilt	FL-143-B	1:1	0.130	1.259	0.164	
836.60	4183	UMTS 850	RMC	24.0	23.00	0.02	Left	Cheek	FL-143-B	1:1	0.271	1.259	0.341	A3
836.60	4183	UMTS 850	RMC	24.0	23.00	0.03	Left	Tilt	FL-143-B	1:1	0.154	1.259	0.194	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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Table 11-4
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	23.0	22.72	-0.10	Right	Cheek	FL-143-B	1:1	0.202	1.067	0.216	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.11	Right	Tilt	FL-143-B	1:1	0.151	1.067	0.161	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.06	Left	Cheek	FL-143-B	1:1	0.405	1.067	0.432	A4
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.10	Left	Tilt	FL-143-B	1:1	0.119	1.067	0.127	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-5
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)		
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	-0.17	0	Right	Cheek	QPSK	1	50	FL-143-A	1:1	0.216	1.268	0.274	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.04	1	Right	Cheek	QPSK	50	0	FL-143-A	1:1	0.159	1.271	0.202	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	-0.12	0	Right	Tilt	QPSK	1	50	FL-143-A	1:1	0.159	1.268	0.202	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.05	1	Right	Tilt	QPSK	50	0	FL-143-A	1:1	0.156	1.271	0.198	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.02	0	Left	Cheek	QPSK	1	50	FL-143-A	1:1	0.402	1.268	0.510	A5
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.01	1	Left	Cheek	QPSK	50	0	FL-143-A	1:1	0.351	1.271	0.446	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.11	0	Left	Tilt	QPSK	1	50	FL-143-A	1:1	0.109	1.268	0.138	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.01	1	Left	Tilt	QPSK	50	0	FL-143-A	1:1	0.085	1.271	0.108	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-6
LTE Band 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	23.5	22.05	0.19	0	Right	Cheek	QPSK	1	0	FL-143-A	1:1	0.196	1.396	0.274	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	0.06	1	Right	Cheek	QPSK	50	50	FL-143-A	1:1	0.158	1.435	0.227	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	-0.02	0	Right	Tilt	QPSK	1	0	FL-143-A	1:1	0.216	1.396	0.302	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	-0.05	1	Right	Tilt	QPSK	50	50	FL-143-A	1:1	0.162	1.435	0.232	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	0.04	0	Left	Cheek	QPSK	1	0	FL-143-A	1:1	0.469	1.396	0.655	A6
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	0.01	1	Left	Cheek	QPSK	50	50	FL-143-A	1:1	0.361	1.435	0.518	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	-0.02	0	Left	Tilt	QPSK	1	0	FL-143-A	1:1	0.184	1.396	0.257	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	-0.05	1	Left	Tilt	QPSK	50	50	FL-143-A	1:1	0.139	1.435	0.199	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

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Table 11-7
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	24.14	0.04	0	Right	Cheek	QPSK	1	0	FL-143-E	1:1	0.315	1.086	0.342	A7
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.06	1	Right	Cheek	QPSK	25	0	FL-143-E	1:1	0.252	1.069	0.269	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.05	0	Right	Tilt	QPSK	1	0	FL-143-E	1:1	0.210	1.086	0.228	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.09	1	Right	Tilt	QPSK	25	0	FL-143-E	1:1	0.163	1.069	0.174	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.06	0	Left	Cheek	QPSK	1	0	FL-143-E	1:1	0.226	1.086	0.245	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.14	1	Left	Cheek	QPSK	25	0	FL-143-E	1:1	0.169	1.069	0.181	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.10	0	Left	Tilt	QPSK	1	0	FL-143-E	1:1	0.149	1.086	0.162	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.07	1	Left	Tilt	QPSK	25	0	FL-143-E	1:1	0.109	1.069	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 11-8
LTE Band 17 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)		
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	-0.01	0	Right	Cheek	QPSK	1	49	FL-143-F	1:1	0.103	1.094	0.113	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	0.05	1	Right	Cheek	QPSK	25	12	FL-143-F	1:1	0.143	1.109	0.159	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.17	0	Right	Tilt	QPSK	1	49	FL-143-F	1:1	0.055	1.094	0.060	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	-0.02	1	Right	Tilt	QPSK	25	12	FL-143-F	1:1	0.078	1.109	0.087	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.01	0	Left	Cheek	QPSK	1	49	FL-143-F	1:1	0.129	1.094	0.141	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	0.04	1	Left	Cheek	QPSK	25	12	FL-143-F	1:1	0.167	1.109	0.185	A8
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.13	0	Left	Tilt	QPSK	1	49	FL-143-F	1:1	0.066	1.094	0.072	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	-0.11	1	Left	Tilt	QPSK	25	12	FL-143-F	1:1	0.096	1.109	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 11-9
DTS Head - Antenna 1 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	12.5	12.45	0.10	Right	Cheek	FL-143-A	1	1:1	0.076	1.012	0.077	
2437	6	IEEE 802.11b	DSSS	12.5	12.45	0.17	Right	Tilt	FL-143-A	1	1:1	0.034	1.012	0.034	
2437	6	IEEE 802.11b	DSSS	12.5	12.45	0.09	Left	Cheek	FL-143-A	1	1:1	0.225	1.012	0.228	
2437	6	IEEE 802.11b	DSSS	12.5	12.45	0.10	Left	Tilt	FL-143-A	1	1:1	0.068	1.012	0.069	
5745	149	IEEE 802.11a	OFDM	9.5	9.12	0.05	Right	Cheek	FL-143-C	6	1:1	0.060	1.091	0.065	
5745	149	IEEE 802.11a	OFDM	9.5	9.12	0.00	Right	Tilt	FL-143-C	6	1:1	0.051	1.091	0.056	
5745	149	IEEE 802.11a	OFDM	9.5	9.12	0.14	Left	Cheek	FL-143-C	6	1:1	0.235	1.091	0.256	A10
5775	155	IEEE 802.11ac	OFDM	8.5	8.38	0.19	Left	Cheek	FL-143-C	29.3	1:1	0.177	1.028	0.182	
5745	149	IEEE 802.11a	OFDM	9.5	9.12	0.07	Left	Tilt	FL-143-C	6	1:1	0.086	1.091	0.094	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-10
NII Head - Antenna 1 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5180	36	IEEE 802.11a	OFDM	9.5	9.44	-0.03	Right	Cheek	FL-143-C	6	1:1	0.057	1.014	0.058	
5180	36	IEEE 802.11a	OFDM	9.5	9.44	0.05	Right	Tilt	FL-143-C	6	1:1	0.043	1.014	0.044	
5180	36	IEEE 802.11a	OFDM	9.5	9.44	-0.10	Left	Cheek	FL-143-C	6	1:1	0.220	1.014	0.223	
5210	42	IEEE 802.11ac	OFDM	8.5	8.41	-0.12	Left	Cheek	FL-143-C	29.3	1:1	0.202	1.021	0.206	
5180	36	IEEE 802.11a	OFDM	9.5	9.44	0.05	Left	Tilt	FL-143-C	6	1:1	0.093	1.014	0.094	
5280	56	IEEE 802.11a	OFDM	9.5	9.31	0.06	Right	Cheek	FL-143-C	6	1:1	0.051	1.045	0.053	
5280	56	IEEE 802.11a	OFDM	9.5	9.31	0.17	Right	Tilt	FL-143-C	6	1:1	0.046	1.045	0.048	
5280	56	IEEE 802.11a	OFDM	9.5	9.31	-0.05	Left	Cheek	FL-143-C	6	1:1	0.255	1.045	0.266	A11
5290	58	IEEE 802.11ac	OFDM	8.5	7.89	-0.02	Left	Cheek	FL-143-C	29.3	1:1	0.228	1.151	0.262	
5280	56	IEEE 802.11a	OFDM	9.5	9.31	0.15	Left	Tilt	FL-143-C	6	1:1	0.088	1.045	0.092	
5520	104	IEEE 802.11a	OFDM	9.5	8.96	-0.16	Right	Cheek	FL-143-C	6	1:1	0.050	1.132	0.057	
5520	104	IEEE 802.11a	OFDM	9.5	8.96	0.18	Right	Tilt	FL-143-C	6	1:1	0.044	1.132	0.050	
5520	104	IEEE 802.11a	OFDM	9.5	8.96	0.18	Left	Cheek	FL-143-C	6	1:1	0.235	1.132	0.266	
5530	106	IEEE 802.11ac	OFDM	8.5	8.01	0.09	Left	Cheek	FL-143-C	29.3	1:1	0.217	1.119	0.243	
5520	104	IEEE 802.11a	OFDM	9.5	8.96	0.15	Left	Tilt	FL-143-C	6	1:1	0.075	1.132	0.085	
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 - Antenna 2 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	12.5	12.34	0.13	Right	Cheek	FL-143-A	1	1:1	0.283	1.038	0.294	A9
2412	1	IEEE 802.11b	DSSS	12.5	12.34	0.02	Right	Tilt	FL-143-A	1	1:1	0.232	1.038	0.241	
2412	1	IEEE 802.11b	DSSS	12.5	12.34	0.03	Left	Cheek	FL-143-A	1	1:1	0.186	1.038	0.193	
2412	1	IEEE 802.11b	DSSS	12.5	12.34	0.03	Left	Tilt	FL-143-A	1	1:1	0.171	1.038	0.177	
5785	157	IEEE 802.11a	OFDM	9.5	9.05	0.02	Right	Cheek	FL-143-C	6	1:1	0.185	1.109	0.205	
5785	157	IEEE 802.11a	OFDM	9.5	9.05	0.02	Right	Tilt	FL-143-C	6	1:1	0.141	1.109	0.156	
5785	157	IEEE 802.11a	OFDM	9.5	9.05	0.15	Left	Cheek	FL-143-C	6	1:1	0.198	1.109	0.220	
5775	155	IEEE 802.11ac	OFDM	8.5	8.44	-0.13	Left	Cheek	FL-143-C	29.3	1:1	0.196	1.014	0.199	
5785	157	IEEE 802.11a	OFDM	9.5	9.05	0.14	Left	Tilt	FL-143-C	6	1:1	0.156	1.109	0.173	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-12
NII Head - Antenna 2 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11a	OFDM	9.5	9.49	0.00	Right	Cheek	FL-143-C	6	1:1	0.134	1.002	0.134	
5240	48	IEEE 802.11a	OFDM	9.5	9.49	0.21	Right	Tilt	FL-143-C	6	1:1	0.103	1.002	0.103	
5240	48	IEEE 802.11a	OFDM	9.5	9.49	0.18	Left	Cheek	FL-143-C	6	1:1	0.166	1.002	0.166	
5210	42	IEEE 802.11ac	OFDM	8.5	8.05	-0.01	Left	Cheek	FL-143-C	29.3	1:1	0.136	1.109	0.151	
5240	48	IEEE 802.11a	OFDM	9.5	9.49	0.09	Left	Tilt	FL-143-C	6	1:1	0.138	1.002	0.138	
5260	52	IEEE 802.11a	OFDM	9.5	8.96	0.06	Right	Cheek	FL-143-C	6	1:1	0.123	1.132	0.139	
5260	52	IEEE 802.11a	OFDM	9.5	8.96	-0.05	Right	Tilt	FL-143-C	6	1:1	0.086	1.132	0.097	
5260	52	IEEE 802.11a	OFDM	9.5	8.96	0.09	Left	Cheek	FL-143-C	6	1:1	0.136	1.132	0.154	
5290	58	IEEE 802.11ac	OFDM	8.5	8.25	0.17	Left	Cheek	FL-143-C	29.3	1:1	0.128	1.059	0.136	
5260	52	IEEE 802.11a	OFDM	9.5	8.96	0.16	Left	Tilt	FL-143-C	6	1:1	0.125	1.132	0.142	
5500	100	IEEE 802.11a	OFDM	9.5	8.94	0.17	Right	Cheek	FL-143-C	6	1:1	0.207	1.138	0.236	
5530	106	IEEE 802.11ac	OFDM	8.5	8.49	0.13	Right	Cheek	FL-143-C	29.3	1:1	0.168	1.002	0.168	
5560	112	IEEE 802.11a	OFDM	9.5	8.86	0.01	Right	Cheek	FL-143-C	6	1:1	0.235	1.159	0.272	
5680	136	IEEE 802.11a	OFDM	9.5	8.84	0.03	Right	Cheek	FL-143-C	6	1:1	0.251	1.164	0.292	
5500	100	IEEE 802.11a	OFDM	9.5	8.94	0.17	Right	Tilt	FL-143-C	6	1:1	0.146	1.138	0.166	
5500	100	IEEE 802.11a	OFDM	9.5	8.94	0.11	Left	Cheek	FL-143-C	6	1:1	0.224	1.138	0.255	
5500	100	IEEE 802.11a	OFDM	9.5	8.94	0.14	Left	Tilt	FL-143-C	6	1:1	0.182	1.138	0.207	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-13
DTS Head - MIMO WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	-0.03	Right	Cheek	FL-143-A	13	1:1	0.153	1.156	0.177	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.05	Right	Tilt	FL-143-A	13	1:1	0.134	1.156	0.155	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	-0.06	Left	Cheek	FL-143-A	13	1:1	0.108	1.156	0.125	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.04	Left	Tilt	FL-143-A	13	1:1	0.107	1.156	0.124	
5765	153	IEEE 802.11n	OFDM	9.5	8.79	-0.16	Right	Cheek	FL-143-C	13	1:1	0.065	1.178	0.077	
5765	153	IEEE 802.11n	OFDM	9.5	8.79	0.08	Right	Tilt	FL-143-C	13	1:1	0.053	1.178	0.062	
5765	153	IEEE 802.11n	OFDM	9.5	8.79	0.19	Left	Cheek	FL-143-C	13	1:1	0.087	1.178	0.102	
5765	153	IEEE 802.11n	OFDM	9.5	8.79	-0.06	Left	Tilt	FL-143-C	13	1:1	0.061	1.178	0.072	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-14
NII Head - MIMO WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11n	OFDM	9.5	9.49	0.12	Right	Cheek	FL-143-C	13	1:1	0.042	1.002	0.042	
5240	48	IEEE 802.11n	OFDM	9.5	9.49	0.09	Right	Tilt	FL-143-C	13	1:1	0.042	1.002	0.042	
5240	48	IEEE 802.11n	OFDM	9.5	9.49	0.16	Left	Cheek	FL-143-C	13	1:1	0.121	1.002	0.121	
5240	48	IEEE 802.11n	OFDM	9.5	9.49	0.03	Left	Tilt	FL-143-C	13	1:1	0.051	1.002	0.051	
5260	52	IEEE 802.11n	OFDM	9.5	9.49	0.09	Right	Cheek	FL-143-C	13	1:1	0.044	1.002	0.044	
5260	52	IEEE 802.11n	OFDM	9.5	9.49	0.02	Right	Tilt	FL-143-C	13	1:1	0.045	1.002	0.045	
5260	52	IEEE 802.11n	OFDM	9.5	9.49	0.06	Left	Cheek	FL-143-C	13	1:1	0.106	1.002	0.106	
5260	52	IEEE 802.11n	OFDM	9.5	9.49	0.17	Left	Tilt	FL-143-C	13	1:1	0.063	1.002	0.063	
5540	108	IEEE 802.11n	OFDM	9.5	9.10	0.17	Right	Cheek	FL-143-C	13	1:1	0.073	1.096	0.080	
5540	108	IEEE 802.11n	OFDM	9.5	9.10	0.20	Right	Tilt	FL-143-C	13	1:1	0.068	1.096	0.075	
5540	108	IEEE 802.11n	OFDM	9.5	9.10	0.03	Left	Cheek	FL-143-C	13	1:1	0.122	1.096	0.134	
5540	108	IEEE 802.11n	OFDM	9.5	9.10	0.05	Left	Tilt	FL-143-C	13	1:1	0.082	1.096	0.090	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

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11.2 Standalone Body-Worn SAR Data

Table 11-15
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)	
836.60	190	GSM850	GSM	33.5	32.72	-0.03	10 mm	FL-143-B	1	1:8.3	back	0.532	1.197	0.637	A12
1880.00	661	GSM 1900	GSM	30.5	29.63	-0.02	10 mm	FL-143-B	1	1:8.3	back	0.442	1.222	0.540	A14
836.60	4183	UMTS 850	RMC	24.0	23.00	0.01	10 mm	FL-143-B	N/A	1:1	back	0.423	1.259	0.533	A16
1852.40	9262	UMTS 1900	RMC	23.0	22.90	-0.11	10 mm	FL-143-B	N/A	1:1	back	0.951	1.023	0.973	A17
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.03	10 mm	FL-143-B	N/A	1:1	back	0.914	1.067	0.975	
1907.60	9538	UMTS 1900	RMC	23.0	22.71	-0.02	10 mm	FL-143-B	N/A	1:1	back	0.909	1.069	0.972	
1852.40	9262	UMTS 1900	RMC	23.0	22.90	0.04	10 mm	FL-143-B	N/A	1:1	back	0.853	1.023	0.873	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body								
Spatial Peak							1.6 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 1 gram								

Note: Blue highlighted entry indicates variability measurement.

Table 11-16
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)		
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.85	0.03	0	FL-143-A	QPSK	1	0	10 mm	back	1:1	0.839	1.303	1.093	A18
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.01	0	FL-143-A	QPSK	1	50	10 mm	back	1:1	0.828	1.268	1.050	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	21.94	0.00	0	FL-143-A	QPSK	1	99	10 mm	back	1:1	0.779	1.276	0.994	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.03	1	FL-143-A	QPSK	50	0	10 mm	back	1:1	0.678	1.271	0.862	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.0	20.89	-0.10	1	FL-143-A	QPSK	50	0	10 mm	back	1:1	0.690	1.291	0.891	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.0	20.88	-0.05	1	FL-143-A	QPSK	50	50	10 mm	back	1:1	0.648	1.294	0.839	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.0	20.89	-0.06	1	FL-143-A	QPSK	100	0	10 mm	back	1:1	0.682	1.291	0.880	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	0.00	0	FL-143-A	QPSK	1	0	10 mm	back	1:1	0.713	1.396	0.995	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	-0.07	1	FL-143-A	QPSK	50	50	10 mm	back	1:1	0.578	1.435	0.829	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.92	0.08	1	FL-143-A	QPSK	100	0	10 mm	back	1:1	0.759	1.439	1.092	A19
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.01	0	FL-143-E	QPSK	1	0	10 mm	back	1:1	0.387	1.086	0.420	A20
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.02	1	FL-143-E	QPSK	25	0	10 mm	back	1:1	0.294	1.069	0.314	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	-0.08	0	FL-143-F	QPSK	1	49	10 mm	back	1:1	0.267	1.094	0.292	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	-0.02	1	FL-143-F	QPSK	25	12	10 mm	back	1:1	0.342	1.109	0.379	A21
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body										
Spatial Peak									1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population									averaged over 1 gram										

Table 11-17
DTS Body-Worn - Antenna 1 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	17.42	0.03	10 mm	FL-143-B	1	back	1:1	0.113	1.019	0.115	
5745	149	IEEE 802.11a	OFDM	14.0	13.77	0.10	10 mm	FL-143-C	6	back	1:1	0.289	1.054	0.305	A23
5775	155	IEEE 802.11ac	OFDM	8.5	8.38	0.02	10 mm	FL-143-C	29.3	back	1:1	0.131	1.028	0.135	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body								
Spatial Peak							1.6 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 1 gram								

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Table 11-18
NII Body-Worn - Antenna 1 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11a	OFDM	14.0	13.82	0.17	10 mm	FL-143-C	6	back	1:1	0.282	1.042	0.294	
5210	42	IEEE 802.11ac	OFDM	8.5	8.41	0.13	10 mm	FL-143-C	29.3	back	1:1	0.118	1.021	0.120	
5260	52	IEEE 802.11a	OFDM	14.0	13.92	-0.03	10 mm	FL-143-C	6	back	1:1	0.337	1.019	0.343	
5290	58	IEEE 802.11ac	OFDM	8.5	7.89	0.03	10 mm	FL-143-C	29.3	back	1:1	0.143	1.151	0.165	
5680	136	IEEE 802.11a	OFDM	14.0	13.93	-0.17	10 mm	FL-143-C	6	back	1:1	0.382	1.016	0.388	A25
5530	106	IEEE 802.11ac	OFDM	8.5	8.01	0.06	10 mm	FL-143-C	29.3	back	1:1	0.215	1.119	0.241	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-19
DTS Body-Worn - Antenna 2 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	17.5	17.42	0.01	10 mm	FL-143-B	1	back	1:1	0.364	1.019	0.371	A22
5765	153	IEEE 802.11a	OFDM	14.0	13.78	0.14	10 mm	FL-143-C	6	back	1:1	0.112	1.052	0.118	
5775	155	IEEE 802.11ac	OFDM	8.5	8.44	-0.08	10 mm	FL-143-C	29.3	back	1:1	0.103	1.014	0.104	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-20
NII Body-Worn - Antenna 2 WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5180	36	IEEE 802.11a	OFDM	14.0	13.99	0.04	10 mm	FL-143-C	6	back	1:1	0.101	1.002	0.101	
5210	42	IEEE 802.11ac	OFDM	8.5	8.05	-0.04	10 mm	FL-143-C	29.3	back	1:1	0.029	1.109	0.032	
5300	60	IEEE 802.11a	OFDM	14.0	13.87	-0.04	10 mm	FL-143-C	6	back	1:1	0.098	1.030	0.101	
5290	58	IEEE 802.11ac	OFDM	8.5	8.25	-0.17	10 mm	FL-143-C	29.3	back	1:1	0.053	1.059	0.056	
5560	112	IEEE 802.11a	OFDM	14.0	13.99	0.03	10 mm	FL-143-C	6	back	1:1	0.121	1.002	0.121	
5530	106	IEEE 802.11ac	OFDM	8.5	8.49	-0.09	10 mm	FL-143-C	29.3	back	1:1	0.082	1.002	0.082	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 11-21
DTS Body-Worn - MIMO WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.21	10 mm	FL-143-B	13	back	1:1	0.080	1.156	0.092	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.03	10 mm	FL-143-C	13	back	1:1	0.138	1.140	0.157	
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
NII Body-Worn - MIMO WLAN SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maxiumum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5240	48	IEEE 802.11n	OFDM	11.5	11.46	0.05	10 mm	FL-143-C	13	back	1:1	0.104	1.009	0.105	
5260	52	IEEE 802.11n	OFDM	11.5	11.48	-0.06	10 mm	FL-143-C	13	back	1:1	0.098	1.005	0.098	
5500	100	IEEE 802.11n	OFDM	11.5	11.49	0.17	10 mm	FL-143-C	13	back	1:1	0.151	1.002	0.151	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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11.3 Standalone Wireless Router SAR Data

Table 11-23
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)	
824.20	128	GSM 850	GPRS	32.0	31.55	-0.01	10 mm	FL-143-B	2	1:4.15	back	0.677	1.109	0.751	
836.60	190	GSM 850	GPRS	32.0	31.40	-0.01	10 mm	FL-143-B	2	1:4.15	back	0.733	1.148	0.841	A13
848.80	251	GSM 850	GPRS	32.0	31.08	-0.11	10 mm	FL-143-B	2	1:4.15	back	0.595	1.236	0.735	
836.60	190	GSM 850	GPRS	32.0	31.40	-0.09	10 mm	FL-143-B	2	1:4.15	front	0.553	1.148	0.635	
836.60	190	GSM 850	GPRS	32.0	31.40	0.06	10 mm	FL-143-B	2	1:4.15	bottom	0.151	1.148	0.173	
836.60	190	GSM 850	GPRS	32.0	31.40	-0.01	10 mm	FL-143-B	2	1:4.15	right	0.270	1.148	0.310	
836.60	190	GSM 850	GPRS	32.0	31.40	0.14	10 mm	FL-143-B	2	1:4.15	left	0.243	1.148	0.279	
1880.00	661	GSM 1900	GPRS	29.0	28.67	-0.08	10 mm	FL-143-B	2	1:4.15	back	0.585	1.079	0.631	A15
1880.00	661	GSM 1900	GPRS	29.0	28.67	-0.11	10 mm	FL-143-B	2	1:4.15	front	0.259	1.079	0.279	
1880.00	661	GSM 1900	GPRS	29.0	28.67	-0.01	10 mm	FL-143-B	2	1:4.15	bottom	0.530	1.079	0.572	
1880.00	661	GSM 1900	GPRS	29.0	28.67	-0.01	10 mm	FL-143-B	2	1:4.15	right	0.014	1.079	0.015	
1880.00	661	GSM 1900	GPRS	29.0	28.67	0.08	10 mm	FL-143-B	2	1:4.15	left	0.184	1.079	0.199	
836.60	4183	UMTS 850	RMC	24.0	23.00	0.01	10 mm	FL-143-B	N/A	1:1	back	0.423	1.259	0.533	A16
836.60	4183	UMTS 850	RMC	24.0	23.00	0.04	10 mm	FL-143-B	N/A	1:1	front	0.328	1.259	0.413	
836.60	4183	UMTS 850	RMC	24.0	23.00	0.04	10 mm	FL-143-B	N/A	1:1	bottom	0.090	1.259	0.113	
836.60	4183	UMTS 850	RMC	24.0	23.00	-0.05	10 mm	FL-143-B	N/A	1:1	right	0.146	1.259	0.184	
836.60	4183	UMTS 850	RMC	24.0	23.00	0.05	10 mm	FL-143-B	N/A	1:1	left	0.123	1.259	0.155	
1852.40	9262	UMTS 1900	RMC	23.0	22.90	-0.11	10 mm	FL-143-B	N/A	1:1	back	0.951	1.023	0.973	A17
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.03	10 mm	FL-143-B	N/A	1:1	back	0.914	1.067	0.975	
1907.60	9538	UMTS 1900	RMC	23.0	22.71	-0.02	10 mm	FL-143-B	N/A	1:1	back	0.909	1.069	0.972	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.00	10 mm	FL-143-B	N/A	1:1	front	0.494	1.067	0.527	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	-0.04	10 mm	FL-143-B	N/A	1:1	bottom	0.656	1.067	0.700	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.05	10 mm	FL-143-B	N/A	1:1	right	0.017	1.067	0.018	
1880.00	9400	UMTS 1900	RMC	23.0	22.72	0.03	10 mm	FL-143-B	N/A	1:1	left	0.216	1.067	0.230	
1852.40	9262	UMTS 1900	RMC	23.0	22.90	0.04	10 mm	FL-143-B	N/A	1:1	back	0.853	1.023	0.873	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Note: Blue highlighted entry indicates variability measurement.

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Table 11-24
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	23.0	21.85	0.03	0	FL-143-A	QPSK	1	0	10 mm	back	1:1	0.839	1.303	1.093	A18
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.01	0	FL-143-A	QPSK	1	50	10 mm	back	1:1	0.828	1.268	1.050	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	21.94	0.00	0	FL-143-A	QPSK	1	99	10 mm	back	1:1	0.779	1.276	0.994	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.03	1	FL-143-A	QPSK	50	0	10 mm	back	1:1	0.678	1.271	0.862	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.0	20.89	-0.10	1	FL-143-A	QPSK	50	0	10 mm	back	1:1	0.690	1.291	0.891	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.0	20.88	-0.05	1	FL-143-A	QPSK	50	50	10 mm	back	1:1	0.648	1.294	0.839	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.0	20.89	-0.06	1	FL-143-A	QPSK	100	0	10 mm	back	1:1	0.682	1.291	0.880	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.01	0	FL-143-A	QPSK	1	50	10 mm	front	1:1	0.415	1.268	0.526	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.03	1	FL-143-A	QPSK	50	0	10 mm	front	1:1	0.355	1.271	0.451	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	-0.01	0	FL-143-A	QPSK	1	50	10 mm	bottom	1:1	0.568	1.268	0.720	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.03	1	FL-143-A	QPSK	50	0	10 mm	bottom	1:1	0.471	1.271	0.599	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.16	0	FL-143-A	QPSK	1	50	10 mm	right	1:1	0.015	1.268	0.019	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	0.06	1	FL-143-A	QPSK	50	0	10 mm	right	1:1	0.016	1.271	0.020	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.97	0.00	0	FL-143-A	QPSK	1	50	10 mm	left	1:1	0.263	1.268	0.333	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.0	20.96	-0.01	1	FL-143-A	QPSK	50	0	10 mm	left	1:1	0.206	1.271	0.262	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-25
LTE Band 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 #
																(W/kg)		(W/kg)	
MHz	Ch.																		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	0.00	0	FL-143-A	QPSK	1	0	10 mm	back	1:1	0.713	1.396	0.995	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	-0.07	1	FL-143-A	QPSK	50	50	10 mm	back	1:1	0.578	1.435	0.829	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.92	0.08	1	FL-143-A	QPSK	100	0	10 mm	back	1:1	0.759	1.439	1.092	A19
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	0.06	0	FL-143-A	QPSK	1	0	10 mm	front	1:1	0.517	1.396	0.722	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	0.06	1	FL-143-A	QPSK	50	50	10 mm	front	1:1	0.397	1.435	0.570	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	-0.01	0	FL-143-A	QPSK	1	0	10 mm	bottom	1:1	0.535	1.396	0.747	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	-0.05	1	FL-143-A	QPSK	50	50	10 mm	bottom	1:1	0.443	1.435	0.636	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	-0.18	0	FL-143-A	QPSK	1	0	10 mm	right	1:1	0.011	1.396	0.015	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	0.16	1	FL-143-A	QPSK	50	50	10 mm	right	1:1	0.010	1.435	0.014	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.05	-0.01	0	FL-143-A	QPSK	1	0	10 mm	left	1:1	0.190	1.396	0.265	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	20.93	0.08	1	FL-143-A	QPSK	50	50	10 mm	left	1:1	0.151	1.435	0.217	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

Table 11-26
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	24.14	0.01	0	FL-143-E	QPSK	1	0	10 mm	back	1:1	0.387	1.086	0.420	A20
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.02	1	FL-143-E	QPSK	25	0	10 mm	back	1:1	0.294	1.069	0.314	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	-0.09	0	FL-143-E	QPSK	1	0	10 mm	front	1:1	0.360	1.086	0.391	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	-0.01	1	FL-143-E	QPSK	25	0	10 mm	front	1:1	0.273	1.069	0.292	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.00	0	FL-143-E	QPSK	1	0	10 mm	bottom	1:1	0.108	1.086	0.117	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	-0.01	1	FL-143-E	QPSK	25	0	10 mm	bottom	1:1	0.089	1.069	0.095	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.01	0	FL-143-E	QPSK	1	0	10 mm	right	1:1	0.198	1.086	0.215	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	0.00	1	FL-143-E	QPSK	25	0	10 mm	right	1:1	0.167	1.069	0.179	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.14	0.04	0	FL-143-E	QPSK	1	0	10 mm	left	1:1	0.204	1.086	0.222	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.5	23.21	-0.01	1	FL-143-E	QPSK	25	0	10 mm	left	1:1	0.159	1.069	0.170	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

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Table 11-27
LTE Band 17 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)		
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	-0.08	0	FL-143-F	QPSK	1	49	10 mm	back	1:1	0.267	1.094	0.292	A21
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	-0.02	1	FL-143-F	QPSK	25	12	10 mm	back	1:1	0.342	1.109	0.379	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.14	0	FL-143-F	QPSK	1	49	10 mm	front	1:1	0.205	1.094	0.224	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	0.03	1	FL-143-F	QPSK	25	12	10 mm	front	1:1	0.257	1.109	0.285	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.03	0	FL-143-F	QPSK	1	49	10 mm	bottom	1:1	0.051	1.094	0.056	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	-0.06	1	FL-143-F	QPSK	25	12	10 mm	bottom	1:1	0.053	1.109	0.059	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.09	0	FL-143-F	QPSK	1	49	10 mm	right	1:1	0.083	1.094	0.091	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	0.09	1	FL-143-F	QPSK	25	12	10 mm	right	1:1	0.098	1.109	0.109	
710.00	23790	Mid	LTE Band 17	10	24.5	24.11	0.01	0	FL-143-F	QPSK	1	49	10 mm	left	1:1	0.079	1.094	0.086	
710.00	23790	Mid	LTE Band 17	10	23.5	23.05	0.06	1	FL-143-F	QPSK	25	12	10 mm	left	1:1	0.113	1.109	0.125	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-28
Antenna 1 WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2412	1	IEEE 802.11b	DSSS	17.5	17.42	0.03	10 mm	FL-143-B	1	back	1:1	0.113	1.019	0.115	
2412	1	IEEE 802.11b	DSSS	17.5	17.42	0.20	10 mm	FL-143-B	1	front	1:1	0.106	1.019	0.108	
2412	1	IEEE 802.11b	DSSS	17.5	17.42	0.03	10 mm	FL-143-B	1	top	1:1	0.022	1.019	0.022	
2412	1	IEEE 802.11b	DSSS	17.5	17.42	-0.12	10 mm	FL-143-B	1	right	1:1	0.127	1.019	0.129	
5745	149	IEEE 802.11a	OFDM	14.0	13.77	0.10	10 mm	FL-143-C	6	back	1:1	0.289	1.054	0.305	
5745	149	IEEE 802.11a	OFDM	14.0	13.77	0.17	10 mm	FL-143-C	6	front	1:1	0.118	1.054	0.124	
5745	149	IEEE 802.11a	OFDM	14.0	13.77	-0.20	10 mm	FL-143-C	6	top	1:1	0.080	1.054	0.084	
5745	149	IEEE 802.11a	OFDM	14.0	13.77	-0.01	10 mm	FL-143-C	6	right	1:1	0.440	1.054	0.464	A24
5785	157	IEEE 802.11a	OFDM	14.0	13.69	-0.05	10 mm	FL-143-C	6	right	1:1	0.409	1.074	0.439	
5805	161	IEEE 802.11a	OFDM	14.0	13.60	-0.03	10 mm	FL-143-C	6	right	1:1	0.383	1.096	0.420	
5775	155	IEEE 802.11ac	OFDM	8.5	8.38	0.08	10 mm	FL-143-C	29.3	right	1:1	0.298	1.028	0.306	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 11-29
Antenna 2 WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	17.5	17.42	0.01	10 mm	FL-143-B	1	back	1:1	0.364	1.019	0.371	A22
2437	6	IEEE 802.11b	DSSS	17.5	17.42	-0.04	10 mm	FL-143-B	1	front	1:1	0.264	1.019	0.269	
2437	6	IEEE 802.11b	DSSS	17.5	17.42	0.05	10 mm	FL-143-B	1	top	1:1	0.310	1.019	0.316	
2437	6	IEEE 802.11b	DSSS	17.5	17.42	0.04	10 mm	FL-143-B	1	left	1:1	0.147	1.019	0.150	
5765	153	IEEE 802.11a	OFDM	14.0	13.78	0.14	10 mm	FL-143-C	6	back	1:1	0.112	1.052	0.118	
5765	153	IEEE 802.11a	OFDM	14.0	13.78	-0.03	10 mm	FL-143-C	6	front	1:1	0.102	1.052	0.107	
5765	153	IEEE 802.11a	OFDM	14.0	13.78	-0.09	10 mm	FL-143-C	6	top	1:1	0.149	1.052	0.157	
5775	155	IEEE 802.11ac	OFDM	8.5	8.44	0.00	10 mm	FL-143-C	29.3	top	1:1	0.081	1.014	0.082	
5765	153	IEEE 802.11a	OFDM	14.0	13.78	0.14	10 mm	FL-143-C	6	left	1:1	0.041	1.052	0.043	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-30
MIMO WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.21	10 mm	FL-143-B	13	back	1:1	0.080	1.156	0.092	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.08	10 mm	FL-143-B	13	front	1:1	0.068	1.156	0.079	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.14	10 mm	FL-143-B	13	top	1:1	0.049	1.156	0.057	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.19	10 mm	FL-143-B	13	right	1:1	0.064	1.156	0.074	
2462	11	IEEE 802.11n	OFDM	12.0	11.37	0.06	10 mm	FL-143-B	13	left	1:1	0.019	1.156	0.022	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.03	10 mm	FL-143-C	13	back	1:1	0.138	1.140	0.157	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.07	10 mm	FL-143-C	13	front	1:1	0.073	1.140	0.083	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.19	10 mm	FL-143-C	13	top	1:1	0.048	1.140	0.055	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.04	10 mm	FL-143-C	13	right	1:1	0.254	1.140	0.290	
5785	157	IEEE 802.11n	OFDM	11.5	10.93	0.06	10 mm	FL-143-C	13	left	1:1	0.017	1.140	0.019	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

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11.4 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. A battery with NFC embedded was used for all 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 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 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 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 6.7 for more details).

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/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 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 $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 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 $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

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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 8.4.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC Guidance, LTE CA SAR was not needed for testing since the data sent by uplink on uplink physical channels does not change between Rel 8 and Rel 10.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other SISO IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of SISO IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other SISO IEEE 802.11 modes (including 802.11n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of SISO IEEE 802.11a mode.
3. Per April 2013 TCB Workshop notes, full SAR tests for all SISO IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than SISO IEEE 802.11a mode. SISO IEEE 802.11ac was evaluated for the highest SISO IEEE 802.11a position in each 5 GHz band and exposure condition.
4. When Hotspot is enabled, 5.2 GHz - 5.7 GHz bands are disabled. Therefore, only 2.4 GHz and 5.8 GHz WIFI Wireless Router SAR Data was required.
5. WIFI transmission was verified using an uncalibrated spectrum analyzer.
6. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is >1.6 W/kg or the reported 1g averaged SAR is >0.8 W/kg, SAR testing on other default channels was required.
7. Per KDB 248227, SAR for MIMO was measured with both transmitting simultaneously and was evaluated independently of SISO operation. For 2.4 GHz MIMO, 802.11n was evaluated. For 5 GHz MIMO, 20 MHz Bandwidth 802.11n was evaluated. Additional evaluations for 40 MHz bandwidth 802.11n and 802.11ac were not required since the maximum allowed output power was not higher than 802.11n 20 MHz Bandwidth.
8. For SAR compliance, this device uses power reduction when the device is in a held-to-ear RF exposure condition with WIFI data modes. Therefore, WIFI Head SAR was evaluated at reduced power levels.

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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac 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. 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.

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

Table 12-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	10.00	10	0.208

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.

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12.3 Head SAR Simultaneous Transmission Analysis

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.077	0.433	Head SAR	Right Cheek	0.150	0.077	0.227
	Right Tilt	0.195	0.034	0.229		Right Tilt	0.144	0.034	0.178
	Left Cheek	0.369	0.228	0.597		Left Cheek	0.321	0.228	0.549
	Left Tilt	0.212	0.069	0.281		Left Tilt	0.098	0.069	0.167
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.077	0.396	Head SAR	Right Cheek	0.216	0.077	0.293
	Right Tilt	0.164	0.034	0.198		Right Tilt	0.161	0.034	0.195
	Left Cheek	0.341	0.228	0.569		Left Cheek	0.432	0.228	0.660
	Left Tilt	0.194	0.069	0.263		Left Tilt	0.127	0.069	0.196
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.077	0.236	Head SAR	Right Cheek	0.342	0.077	0.419
	Right Tilt	0.087	0.034	0.121		Right Tilt	0.228	0.034	0.262
	Left Cheek	0.185	0.228	0.413		Left Cheek	0.245	0.228	0.473
	Left Tilt	0.106	0.069	0.175		Left Tilt	0.162	0.069	0.231
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.077	0.351	Head SAR	Right Cheek	0.274	0.077	0.351
	Right Tilt	0.302	0.034	0.336		Right Tilt	0.202	0.034	0.236
	Left Cheek	0.655	0.228	0.883		Left Cheek	0.510	0.228	0.738
	Left Tilt	0.257	0.069	0.326		Left Tilt	0.138	0.069	0.207

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.294	0.650	Head SAR	Right Cheek	0.150	0.294	0.444
	Right Tilt	0.195	0.241	0.436		Right Tilt	0.144	0.241	0.385
	Left Cheek	0.369	0.193	0.562		Left Cheek	0.321	0.193	0.514
	Left Tilt	0.212	0.177	0.389		Left Tilt	0.098	0.177	0.275
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.294	0.613	Head SAR	Right Cheek	0.216	0.294	0.510
	Right Tilt	0.164	0.241	0.405		Right Tilt	0.161	0.241	0.402
	Left Cheek	0.341	0.193	0.534		Left Cheek	0.432	0.193	0.625
	Left Tilt	0.194	0.177	0.371		Left Tilt	0.127	0.177	0.304

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Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.294	0.453	Head SAR	Right Cheek	0.342	0.294	0.636
	Right Tilt	0.087	0.241	0.328		Right Tilt	0.228	0.241	0.469
	Left Cheek	0.185	0.193	0.378		Left Cheek	0.245	0.193	0.438
	Left Tilt	0.106	0.177	0.283		Left Tilt	0.162	0.177	0.339
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.294	0.568	Head SAR	Right Cheek	0.274	0.294	0.568
	Right Tilt	0.302	0.241	0.543		Right Tilt	0.202	0.241	0.443
	Left Cheek	0.655	0.193	0.848		Left Cheek	0.510	0.193	0.703
	Left Tilt	0.257	0.177	0.434		Left Tilt	0.138	0.177	0.315

Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.177	0.533	Head SAR	Right Cheek	0.150	0.177	0.327
	Right Tilt	0.195	0.155	0.350		Right Tilt	0.144	0.155	0.299
	Left Cheek	0.369	0.125	0.494		Left Cheek	0.321	0.125	0.446
	Left Tilt	0.212	0.124	0.336		Left Tilt	0.098	0.124	0.222
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.177	0.496	Head SAR	Right Cheek	0.216	0.177	0.393
	Right Tilt	0.164	0.155	0.319		Right Tilt	0.161	0.155	0.316
	Left Cheek	0.341	0.125	0.466		Left Cheek	0.432	0.125	0.557
	Left Tilt	0.194	0.124	0.318		Left Tilt	0.127	0.124	0.251
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.177	0.336	Head SAR	Right Cheek	0.342	0.177	0.519
	Right Tilt	0.087	0.155	0.242		Right Tilt	0.228	0.155	0.383
	Left Cheek	0.185	0.125	0.310		Left Cheek	0.245	0.125	0.370
	Left Tilt	0.106	0.124	0.230		Left Tilt	0.162	0.124	0.286
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.177	0.451	Head SAR	Right Cheek	0.274	0.177	0.451
	Right Tilt	0.302	0.155	0.457		Right Tilt	0.202	0.155	0.357
	Left Cheek	0.655	0.125	0.780		Left Cheek	0.510	0.125	0.635
	Left Tilt	0.257	0.124	0.381		Left Tilt	0.138	0.124	0.262

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.065	0.421	Head SAR	Right Cheek	0.150	0.065	0.215
	Right Tilt	0.195	0.056	0.251		Right Tilt	0.144	0.056	0.200
	Left Cheek	0.369	0.266	0.635		Left Cheek	0.321	0.266	0.587
	Left Tilt	0.212	0.094	0.306		Left Tilt	0.098	0.094	0.192

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Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.065	0.384	Head SAR	Right Cheek	0.216	0.065	0.281
	Right Tilt	0.164	0.056	0.220		Right Tilt	0.161	0.056	0.217
	Left Cheek	0.341	0.266	0.607		Left Cheek	0.432	0.266	0.698
	Left Tilt	0.194	0.094	0.288		Left Tilt	0.127	0.094	0.221
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.065	0.224	Head SAR	Right Cheek	0.342	0.065	0.407
	Right Tilt	0.087	0.056	0.143		Right Tilt	0.228	0.056	0.284
	Left Cheek	0.185	0.266	0.451		Left Cheek	0.245	0.266	0.511
	Left Tilt	0.106	0.094	0.200		Left Tilt	0.162	0.094	0.256
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.065	0.339	Head SAR	Right Cheek	0.274	0.065	0.339
	Right Tilt	0.302	0.056	0.358		Right Tilt	0.202	0.056	0.258
	Left Cheek	0.655	0.266	0.921		Left Cheek	0.510	0.266	0.776
	Left Tilt	0.257	0.094	0.351		Left Tilt	0.138	0.094	0.232

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

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

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.292	0.648	Head SAR	Right Cheek	0.150	0.292	0.442
	Right Tilt	0.195	0.166	0.361		Right Tilt	0.144	0.166	0.310
	Left Cheek	0.369	0.255	0.624		Left Cheek	0.321	0.255	0.576
	Left Tilt	0.212	0.207	0.419		Left Tilt	0.098	0.207	0.305
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.292	0.611	Head SAR	Right Cheek	0.216	0.292	0.508
	Right Tilt	0.164	0.166	0.330		Right Tilt	0.161	0.166	0.327
	Left Cheek	0.341	0.255	0.596		Left Cheek	0.432	0.255	0.687
	Left Tilt	0.194	0.207	0.401		Left Tilt	0.127	0.207	0.334
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.292	0.451	Head SAR	Right Cheek	0.342	0.292	0.634
	Right Tilt	0.087	0.166	0.253		Right Tilt	0.228	0.166	0.394
	Left Cheek	0.185	0.255	0.440		Left Cheek	0.245	0.255	0.500
	Left Tilt	0.106	0.207	0.313		Left Tilt	0.162	0.207	0.369
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.292	0.566	Head SAR	Right Cheek	0.274	0.292	0.566
	Right Tilt	0.302	0.166	0.468		Right Tilt	0.202	0.166	0.368
	Left Cheek	0.655	0.255	0.910		Left Cheek	0.510	0.255	0.765
	Left Tilt	0.257	0.207	0.464		Left Tilt	0.138	0.207	0.345

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

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Table 12-7
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.356	0.080	0.436	Head SAR	Right Cheek	0.150	0.080	0.230
	Right Tilt	0.195	0.075	0.270		Right Tilt	0.144	0.075	0.219
	Left Cheek	0.369	0.134	0.503		Left Cheek	0.321	0.134	0.455
	Left Tilt	0.212	0.090	0.302		Left Tilt	0.098	0.090	0.188
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.319	0.080	0.399	Head SAR	Right Cheek	0.216	0.080	0.296
	Right Tilt	0.164	0.075	0.239		Right Tilt	0.161	0.075	0.236
	Left Cheek	0.341	0.134	0.475		Left Cheek	0.432	0.134	0.566
	Left Tilt	0.194	0.090	0.284		Left Tilt	0.127	0.090	0.217
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.159	0.080	0.239	Head SAR	Right Cheek	0.342	0.080	0.422
	Right Tilt	0.087	0.075	0.162		Right Tilt	0.228	0.075	0.303
	Left Cheek	0.185	0.134	0.319		Left Cheek	0.245	0.134	0.379
	Left Tilt	0.106	0.090	0.196		Left Tilt	0.162	0.090	0.252
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.274	0.080	0.354	Head SAR	Right Cheek	0.274	0.080	0.354
	Right Tilt	0.302	0.075	0.377		Right Tilt	0.202	0.075	0.277
	Left Cheek	0.655	0.134	0.789		Left Cheek	0.510	0.134	0.644
	Left Tilt	0.257	0.090	0.347		Left Tilt	0.138	0.090	0.228

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

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12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-8

Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 1 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.115	0.752
Back Side	GSM 1900	0.540	0.115	0.655
Back Side	UMTS 850	0.533	0.115	0.648
Back Side	UMTS 1900	0.975	0.115	1.090
Back Side	LTE Band 2 (PCS)	1.093	0.115	1.208
Back Side	LTE Band 4 (AWS)	1.092	0.115	1.207
Back Side	LTE Band 5 (Cell)	0.420	0.115	0.535
Back Side	LTE Band 17	0.379	0.115	0.494

Table 12-9

Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.371	1.008
Back Side	GSM 1900	0.540	0.371	0.911
Back Side	UMTS 850	0.533	0.371	0.904
Back Side	UMTS 1900	0.975	0.371	1.346
Back Side	LTE Band 2 (PCS)	1.093	0.371	1.464
Back Side	LTE Band 4 (AWS)	1.092	0.371	1.463
Back Side	LTE Band 5 (Cell)	0.420	0.371	0.791
Back Side	LTE Band 17	0.379	0.371	0.750

Table 12-10

Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.092	0.729
Back Side	GSM 1900	0.540	0.092	0.632
Back Side	UMTS 850	0.533	0.092	0.625
Back Side	UMTS 1900	0.975	0.092	1.067
Back Side	LTE Band 2 (PCS)	1.093	0.092	1.185
Back Side	LTE Band 4 (AWS)	1.092	0.092	1.184
Back Side	LTE Band 5 (Cell)	0.420	0.092	0.512
Back Side	LTE Band 17	0.379	0.092	0.471

Table 12-11

Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 1 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.388	1.025
Back Side	GSM 1900	0.540	0.388	0.928
Back Side	UMTS 850	0.533	0.388	0.921
Back Side	UMTS 1900	0.975	0.388	1.363
Back Side	LTE Band 2 (PCS)	1.093	0.388	1.481
Back Side	LTE Band 4 (AWS)	1.092	0.388	1.480
Back Side	LTE Band 5 (Cell)	0.420	0.388	0.808
Back Side	LTE Band 17	0.379	0.388	0.767

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

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Table 12-12
Simultaneous Transmission Scenario with 5 GHz WLAN Antenna 2 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.121	0.758
Back Side	GSM 1900	0.540	0.121	0.661
Back Side	UMTS 850	0.533	0.121	0.654
Back Side	UMTS 1900	0.975	0.121	1.096
Back Side	LTE Band 2 (PCS)	1.093	0.121	1.214
Back Side	LTE Band 4 (AWS)	1.092	0.121	1.213
Back Side	LTE Band 5 (Cell)	0.420	0.121	0.541
Back Side	LTE Band 17	0.379	0.121	0.500

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

Table 12-13
Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.157	0.794
Back Side	GSM 1900	0.540	0.157	0.697
Back Side	UMTS 850	0.533	0.157	0.690
Back Side	UMTS 1900	0.975	0.157	1.132
Back Side	LTE Band 2 (PCS)	1.093	0.157	1.250
Back Side	LTE Band 4 (AWS)	1.092	0.157	1.249
Back Side	LTE Band 5 (Cell)	0.420	0.157	0.577
Back Side	LTE Band 17	0.379	0.157	0.536

Note: The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN.

Table 12-14
Simultaneous Transmission Scenario with Bluetooth Antenna 1 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.637	0.208	0.845
Back Side	GSM 1900	0.540	0.208	0.748
Back Side	UMTS 850	0.533	0.208	0.741
Back Side	UMTS 1900	0.975	0.208	1.183
Back Side	LTE Band 2 (PCS)	1.093	0.208	1.301
Back Side	LTE Band 4 (AWS)	1.092	0.208	1.300
Back Side	LTE Band 5 (Cell)	0.420	0.208	0.628
Back Side	LTE Band 17	0.379	0.208	0.587

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

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12.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

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

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.115	0.956	Body SAR	Back	0.631	0.115	0.746
	Front	0.635	0.108	0.743		Front	0.279	0.108	0.387
	Top	-	0.022	0.022		Top	-	0.022	0.022
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	0.129	0.439		Right	0.015	0.129	0.144
	Left	0.279	-	0.279		Left	0.199	-	0.199
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.115	0.648	Body SAR	Back	0.975	0.115	1.090
	Front	0.413	0.108	0.521		Front	0.527	0.108	0.635
	Top	-	0.022	0.022		Top	-	0.022	0.022
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	0.129	0.313		Right	0.018	0.129	0.147
	Left	0.155	-	0.155		Left	0.230	-	0.230
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.115	0.494	Body SAR	Back	0.420	0.115	0.535
	Front	0.285	0.108	0.393		Front	0.391	0.108	0.499
	Top	-	0.022	0.022		Top	-	0.022	0.022
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	0.129	0.238		Right	0.215	0.129	0.344
	Left	0.125	-	0.125		Left	0.222	-	0.222
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.115	1.207	Body SAR	Back	1.093	0.115	1.208
	Front	0.722	0.108	0.830		Front	0.526	0.108	0.634
	Top	-	0.022	0.022		Top	-	0.022	0.022
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	0.129	0.144		Right	0.020	0.129	0.149
	Left	0.265	-	0.265		Left	0.333	-	0.333

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

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.371	1.212	Body SAR	Back	0.631	0.371	1.002
	Front	0.635	0.269	0.904		Front	0.279	0.269	0.548
	Top	-	0.316	0.316		Top	-	0.316	0.316
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	-	0.310		Right	0.015	-	0.015
	Left	0.279	0.150	0.429		Left	0.199	0.150	0.349
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.371	0.904	Body SAR	Back	0.975	0.371	1.346
	Front	0.413	0.269	0.682		Front	0.527	0.269	0.796
	Top	-	0.316	0.316		Top	-	0.316	0.316
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	-	0.184		Right	0.018	-	0.018
	Left	0.155	0.150	0.305		Left	0.230	0.150	0.380
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.371	0.750	Body SAR	Back	0.420	0.371	0.791
	Front	0.285	0.269	0.554		Front	0.391	0.269	0.660
	Top	-	0.316	0.316		Top	-	0.316	0.316
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	-	0.109		Right	0.215	-	0.215
	Left	0.125	0.150	0.275		Left	0.222	0.150	0.372
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.371	1.463	Body SAR	Back	1.093	0.371	1.464
	Front	0.722	0.269	0.991		Front	0.526	0.269	0.795
	Top	-	0.316	0.316		Top	-	0.316	0.316
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	-	0.015		Right	0.020	-	0.020
	Left	0.265	0.150	0.415		Left	0.333	0.150	0.483

Table 12-17
Simultaneous Transmission Scenario (2.4 GHz MIMO Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.092	0.933	Body SAR	Back	0.631	0.092	0.723
	Front	0.635	0.079	0.714		Front	0.279	0.079	0.358
	Top	-	0.057	0.057		Top	-	0.057	0.057
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	0.074	0.384		Right	0.015	0.074	0.089
	Left	0.279	0.022	0.301		Left	0.199	0.022	0.221
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.092	0.625	Body SAR	Back	0.975	0.092	1.067
	Front	0.413	0.079	0.492		Front	0.527	0.079	0.606
	Top	-	0.057	0.057		Top	-	0.057	0.057
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	0.074	0.258		Right	0.018	0.074	0.092
	Left	0.155	0.022	0.177		Left	0.230	0.022	0.252

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Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.092	0.471	Body SAR	Back	0.420	0.092	0.512
	Front	0.285	0.079	0.364		Front	0.391	0.079	0.470
	Top	-	0.057	0.057		Top	-	0.057	0.057
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	0.074	0.183		Right	0.215	0.074	0.289
	Left	0.125	0.022	0.147		Left	0.222	0.022	0.244
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.092	1.184	Body SAR	Back	1.093	0.092	1.185
	Front	0.722	0.079	0.801		Front	0.526	0.079	0.605
	Top	-	0.057	0.057		Top	-	0.057	0.057
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	0.074	0.089		Right	0.020	0.074	0.094
	Left	0.265	0.022	0.287		Left	0.333	0.022	0.355

Table 12-18
Simultaneous Transmission Scenario (5.8 GHz Antenna 1 Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.305	1.146	Body SAR	Back	0.631	0.305	0.936
	Front	0.635	0.124	0.759		Front	0.279	0.124	0.403
	Top	-	0.084	0.084		Top	-	0.084	0.084
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	0.464	0.774		Right	0.015	0.464	0.479
	Left	0.279	-	0.279		Left	0.199	-	0.199
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.305	0.838	Body SAR	Back	0.975	0.305	1.280
	Front	0.413	0.124	0.537		Front	0.527	0.124	0.651
	Top	-	0.084	0.084		Top	-	0.084	0.084
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	0.464	0.648		Right	0.018	0.464	0.482
	Left	0.155	-	0.155		Left	0.230	-	0.230
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.305	0.684	Body SAR	Back	0.420	0.305	0.725
	Front	0.285	0.124	0.409		Front	0.391	0.124	0.515
	Top	-	0.084	0.084		Top	-	0.084	0.084
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	0.464	0.573		Right	0.215	0.464	0.679
	Left	0.125	-	0.125		Left	0.222	-	0.222
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.305	1.397	Body SAR	Back	1.093	0.305	1.398
	Front	0.722	0.124	0.846		Front	0.526	0.124	0.650
	Top	-	0.084	0.084		Top	-	0.084	0.084
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	0.464	0.479		Right	0.020	0.464	0.484
	Left	0.265	-	0.265		Left	0.333	-	0.333

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Table 12-19
Simultaneous Transmission Scenario (5.8 GHz Antenna 2 Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.118	0.959	Body SAR	Back	0.631	0.118	0.749
	Front	0.635	0.107	0.742		Front	0.279	0.107	0.386
	Top	-	0.157	0.157		Top	-	0.157	0.157
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	-	0.310		Right	0.015	-	0.015
	Left	0.279	0.043	0.322		Left	0.199	0.043	0.242
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.118	0.651	Body SAR	Back	0.975	0.118	1.093
	Front	0.413	0.107	0.520		Front	0.527	0.107	0.634
	Top	-	0.157	0.157		Top	-	0.157	0.157
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	-	0.184		Right	0.018	-	0.018
	Left	0.155	0.043	0.198		Left	0.230	0.043	0.273
Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.118	0.497	Body SAR	Back	0.420	0.118	0.538
	Front	0.285	0.107	0.392		Front	0.391	0.107	0.498
	Top	-	0.157	0.157		Top	-	0.157	0.157
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	-	0.109		Right	0.215	-	0.215
	Left	0.125	0.043	0.168		Left	0.222	0.043	0.265
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.118	1.210	Body SAR	Back	1.093	0.118	1.211
	Front	0.722	0.107	0.829		Front	0.526	0.107	0.633
	Top	-	0.157	0.157		Top	-	0.157	0.157
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	-	0.015		Right	0.020	-	0.020
	Left	0.265	0.043	0.308		Left	0.333	0.043	0.376

Table 12-20
Simultaneous Transmission Scenario (5.8 GHz MIMO Hotspot at 1.0 cm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.841	0.157	0.998	Body SAR	Back	0.631	0.157	0.788
	Front	0.635	0.083	0.718		Front	0.279	0.083	0.362
	Top	-	0.055	0.055		Top	-	0.055	0.055
	Bottom	0.173	-	0.173		Bottom	0.572	-	0.572
	Right	0.310	0.290	0.600		Right	0.015	0.290	0.305
	Left	0.279	0.019	0.298		Left	0.199	0.019	0.218
Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.533	0.157	0.690	Body SAR	Back	0.975	0.157	1.132
	Front	0.413	0.083	0.496		Front	0.527	0.083	0.610
	Top	-	0.055	0.055		Top	-	0.055	0.055
	Bottom	0.113	-	0.113		Bottom	0.700	-	0.700
	Right	0.184	0.290	0.474		Right	0.018	0.290	0.308
	Left	0.155	0.019	0.174		Left	0.230	0.019	0.249

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Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.379	0.157	0.536	Body SAR	Back	0.420	0.157	0.577
	Front	0.285	0.083	0.368		Front	0.391	0.083	0.474
	Top	-	0.055	0.055		Top	-	0.055	0.055
	Bottom	0.059	-	0.059		Bottom	0.117	-	0.117
	Right	0.109	0.290	0.399		Right	0.215	0.290	0.505
	Left	0.125	0.019	0.144		Left	0.222	0.019	0.241
Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.157	1.249	Body SAR	Back	1.093	0.157	1.250
	Front	0.722	0.083	0.805		Front	0.526	0.083	0.609
	Top	-	0.055	0.055		Top	-	0.055	0.055
	Bottom	0.747	-	0.747		Bottom	0.720	-	0.720
	Right	0.015	0.290	0.305		Right	0.020	0.290	0.310
	Left	0.265	0.019	0.284		Left	0.333	0.019	0.352

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.

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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 performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ 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)	
1900	1852.40	9262	UMTS 1900	RMC	back	10 mm	0.951	0.853	1.11	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT						Body							
Spatial Peak						1.6 W/kg (mW/g)							
Uncontrolled Exposure/General Population						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.

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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/30/2013	Annual	10/30/2014	1833460
Agilent	8753E	(30kHz-6GHz) Network Analyzer	7/23/2013	Annual	7/23/2014	US37390350
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	CBT	N/A	CBT	3051A00187
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2013	Annual	5/14/2014	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2013	Annual	7/22/2014	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	1/21/2014	Annual	1/21/2015	797
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/23/2013	Annual	9/23/2014	1007
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/27/2014	Annual	1/27/2015	1057
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
SPEAG	D750V3	750 MHz Dipole	1/20/2014	Annual	1/20/2015	1003
SPEAG	D835V2	835 MHz SAR Dipole	1/22/2014	Annual	1/22/2015	4d132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	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	11/18/2013	Annual	11/18/2014	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	12/12/2013	Annual	12/12/2014	649
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2014	Annual	1/22/2015	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/26/2014	Annual	2/26/2015	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/21/2014	Annual	8/21/2015	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/17/2014	Annual	3/17/2015	1334
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	5/14/2013	Annual	5/14/2014	1070
Fisher Scientific	15-077-960	Digital Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Rohde & Schwarz	NRVD	Dual Channel Power Meter	10/12/2012	Biennial	10/12/2014	101695
Fisher Scientific	S407993	Long Stem Thermometer	11/4/2013	Biennial	11/4/2015	130671821
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
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	6/6/2013	Annual	6/6/2014	111427
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Anritsu	MA2481A	Power Sensor	10/30/2013	Annual	10/30/2014	5605
Anritsu	MA2411B	Pulse Power Sensor	11/14/2013	Annual	11/14/2014	1126066
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
SPEAG	ES3DV2	SAR Probe	8/22/2013	Annual	8/22/2014	3022
SPEAG	EX3DV4	SAR Probe	10/23/2013	Annual	10/23/2014	3914
SPEAG	ES3DV3	SAR Probe	11/20/2013	Annual	11/20/2014	3287
SPEAG	ES3DV3	SAR Probe	11/25/2013	Annual	11/25/2014	3332
SPEAG	EX3DV4	SAR Probe	12/18/2013	Annual	12/18/2014	3920
SPEAG	EX3DV4	SAR Probe	1/29/2014	Annual	1/29/2015	3589
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	11/22/2013	Annual	11/22/2014	3333
Rohde & Schwarz	SMEO6	Signal Generator	10/30/2013	Annual	10/30/2014	832026
Rohde & Schwarz	NRVS	Single Channel Power Meter	10/31/2013	Annual	10/31/2014	835360/0079
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Agilent	85047A	S-Parameter Test Set	N/A	N/A	N/A	2904A00579
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	10/30/2013	Annual	10/30/2014	8650319
Anritsu	MA24106A	USB Power Sensor	12/18/2013	Annual	12/18/2014	1344555
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Biennial	8/8/2015	130477877
Agilent	E5515C	Wireless Communications Test Set	10/18/2012	Biennial	10/18/2014	GB43193563

Notes:

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.

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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
Expanded Uncertainty (95% CONFIDENCE LEVEL)							k=2	24.2	23.5
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The above measurement uncertainties are according to IEEE Std. 1528-2003

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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
Expanded Uncertainty (95% CONFIDENCE LEVEL)							k=2	24.7	24.0

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

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16 CONCLUSION

16.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and 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]

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- [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.

FCC ID: A3LSMG870A			SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Document S/N: OY1404100737.A3L	Test Dates: 04/11/14 - 04/17/14	DUT Type: Portable Handset		Page 98 of 98

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.907 \text{ S/m}$; $\epsilon_r = 40.607$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 04-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(9.34, 9.34, 9.34); Calibrated: 10/23/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

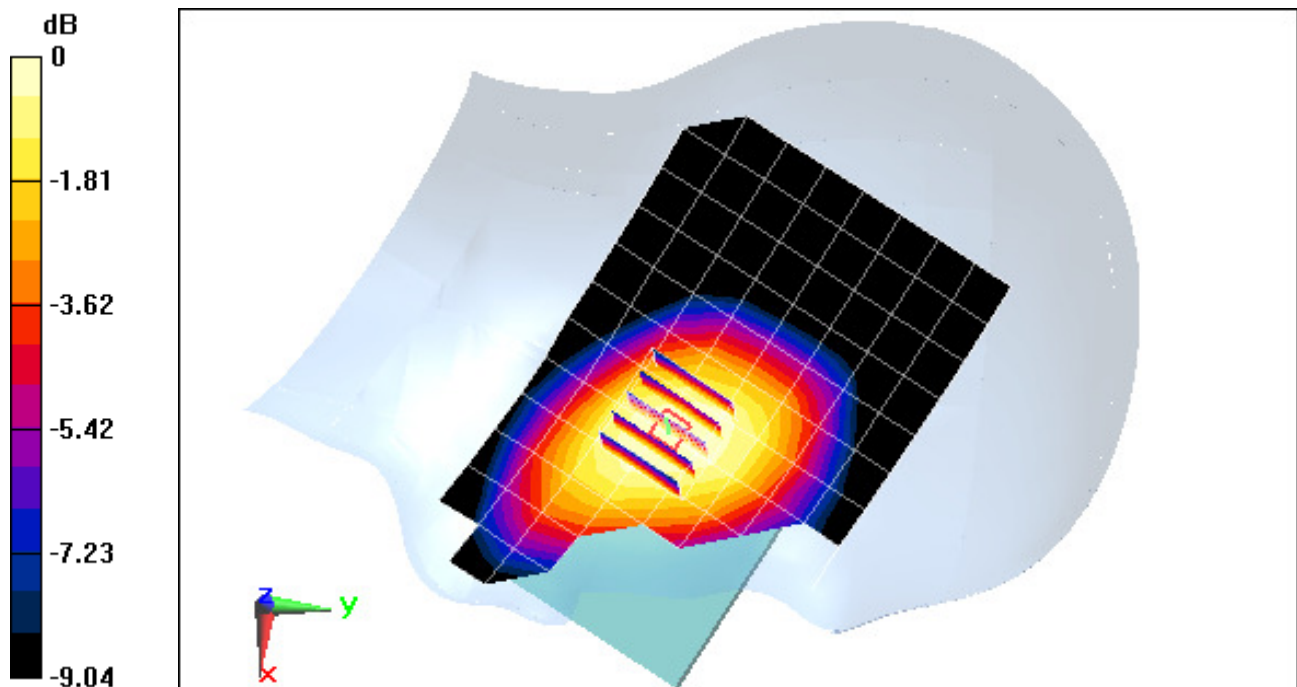
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.760 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.393 W/kg

SAR(1 g) = 0.308 W/kg



0 dB = 0.325 W/kg = -4.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$$f = 1880 \text{ MHz}; \sigma = 1.385 \text{ S/m}; \epsilon_r = 40.622; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Left Section

Test Date: 04-11-2014; Ambient Temp: 24.1°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

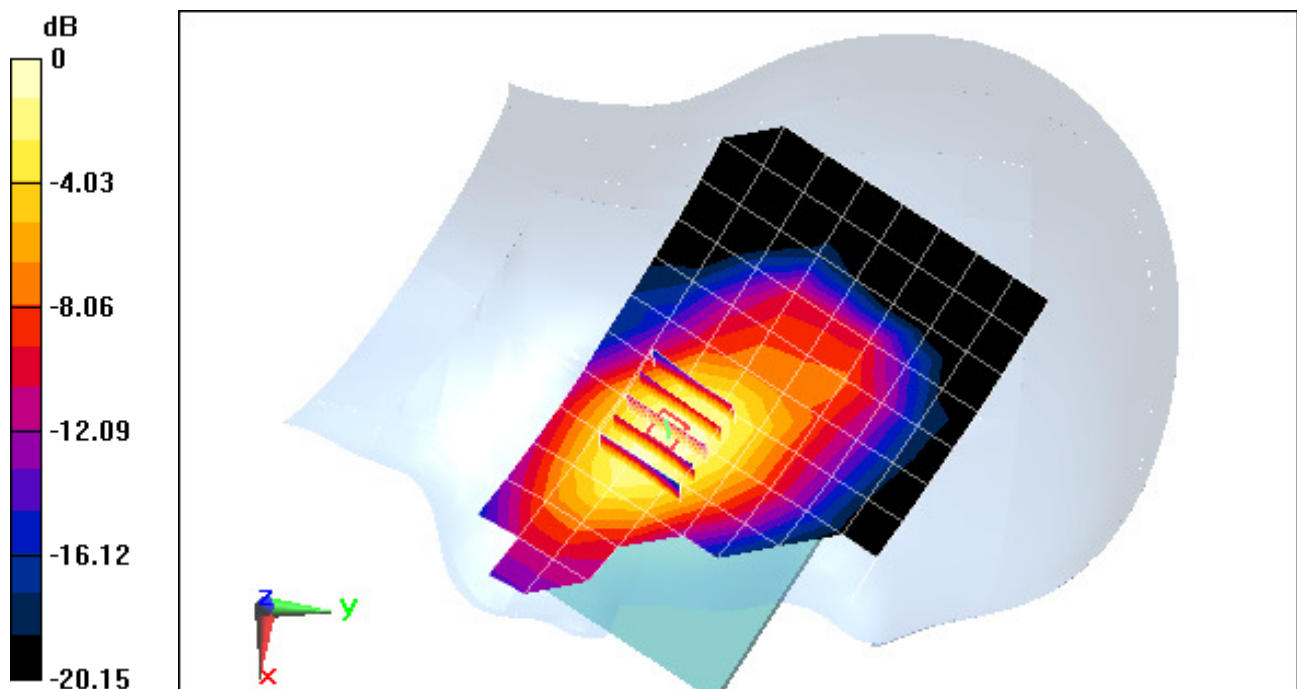
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.134 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.410 W/kg

SAR(1 g) = 0.263 W/kg



0 dB = 0.288 W/kg = -5.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.907 \text{ S/m}$; $\epsilon_r = 40.607$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 04-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(9.34, 9.34, 9.34); Calibrated: 10/23/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

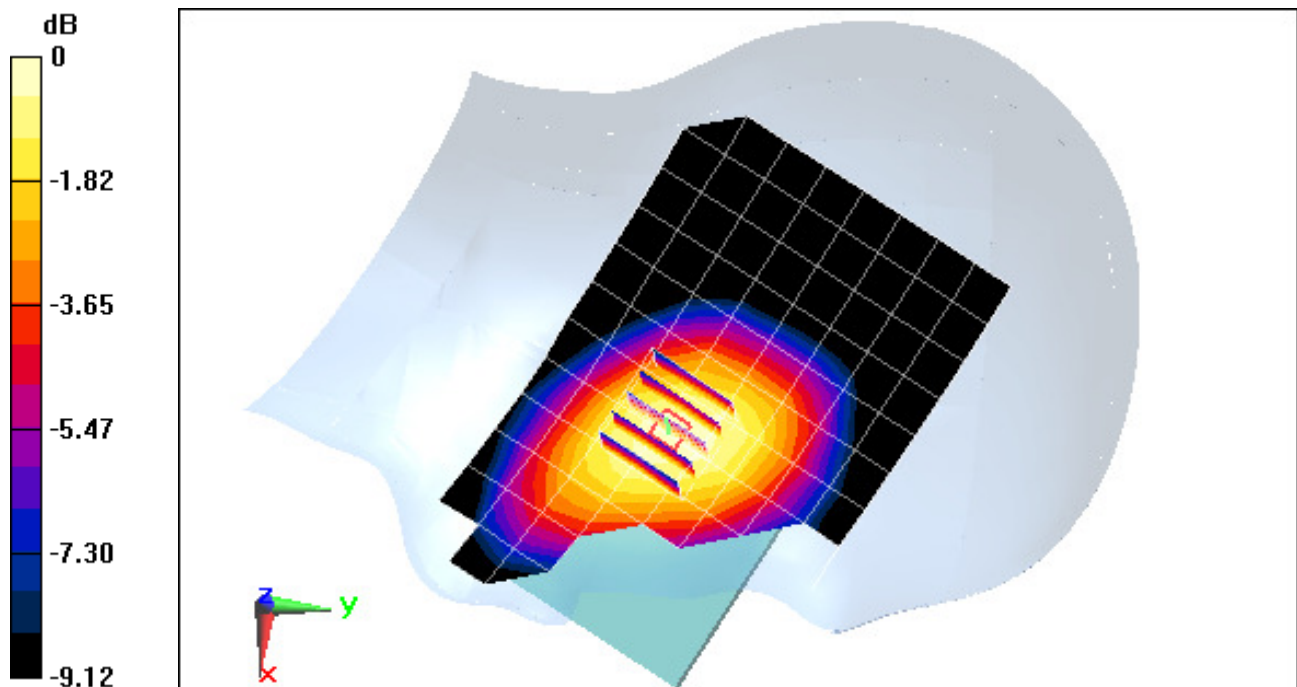
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.598 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.341 W/kg

SAR(1 g) = 0.271 W/kg



0 dB = 0.285 W/kg = -5.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$$f = 1880 \text{ MHz}; \sigma = 1.385 \text{ S/m}; \epsilon_r = 40.622; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Left Section

Test Date: 04-11-2014; Ambient Temp: 24.1°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

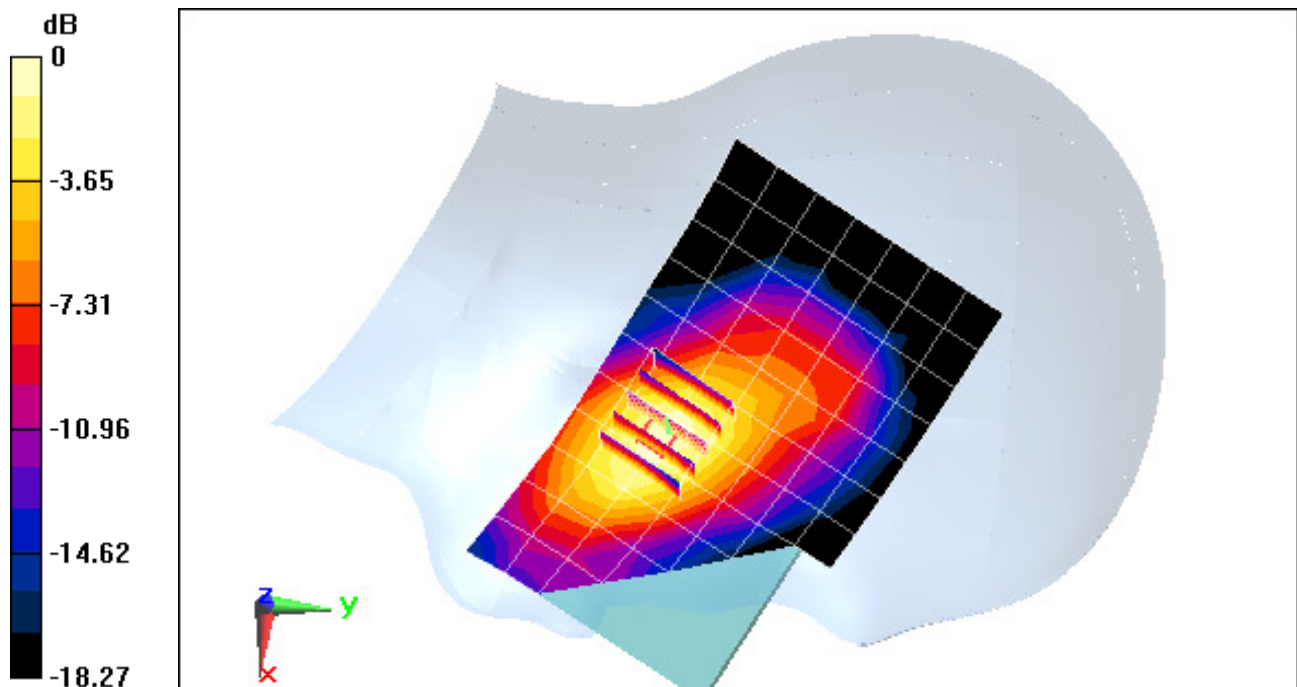
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.336 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.638 W/kg

SAR(1 g) = 0.405 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-A

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$$f = 1880 \text{ MHz}; \sigma = 1.402 \text{ S/m}; \epsilon_r = 41.224; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Left Section

Test Date: 04-17-2014; Ambient Temp: 23.3°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3332; ConvF(5.06, 5.06, 5.06); Calibrated: 11/25/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 11/18/2013

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

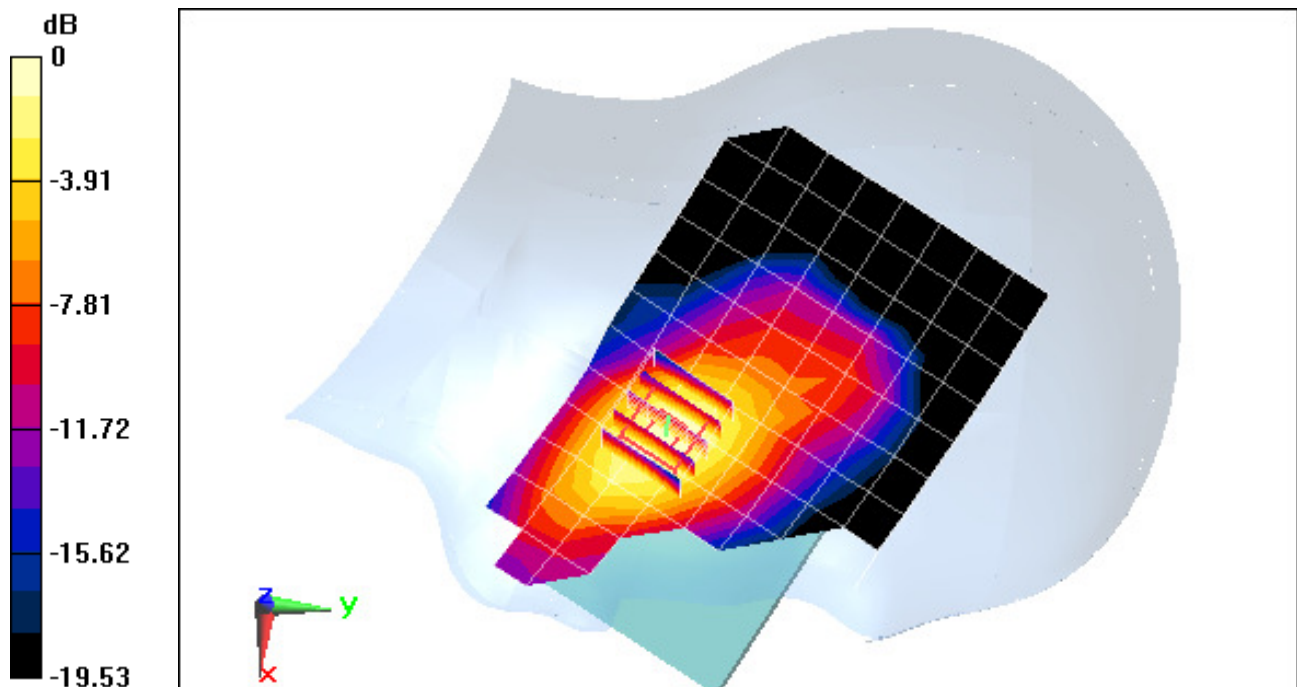
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.113 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.632 W/kg

SAR(1 g) = 0.402 W/kg



0 dB = 0.442 W/kg = -3.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-A

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.319 \text{ S/m}$; $\epsilon_r = 40.782$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 04-17-2014; Ambient Temp: 23.8°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3209; ConvF(5.24, 5.24, 5.24); Calibrated: 3/19/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 3/17/2014

Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

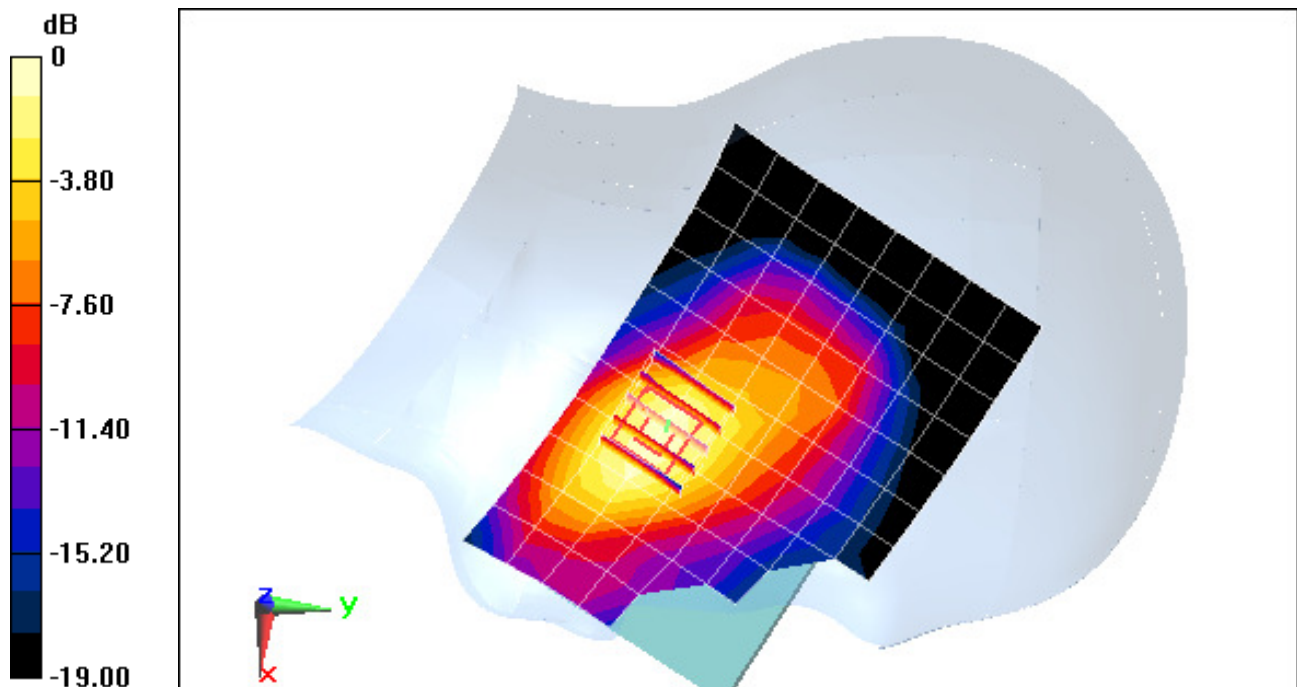
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.646 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.700 W/kg

SAR(1 g) = 0.469 W/kg



0 dB = 0.503 W/kg = -2.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-E

Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 0.907 \text{ S/m}$; $\epsilon_r = 40.608$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 04-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(9.34, 9.34, 9.34); Calibrated: 10/23/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

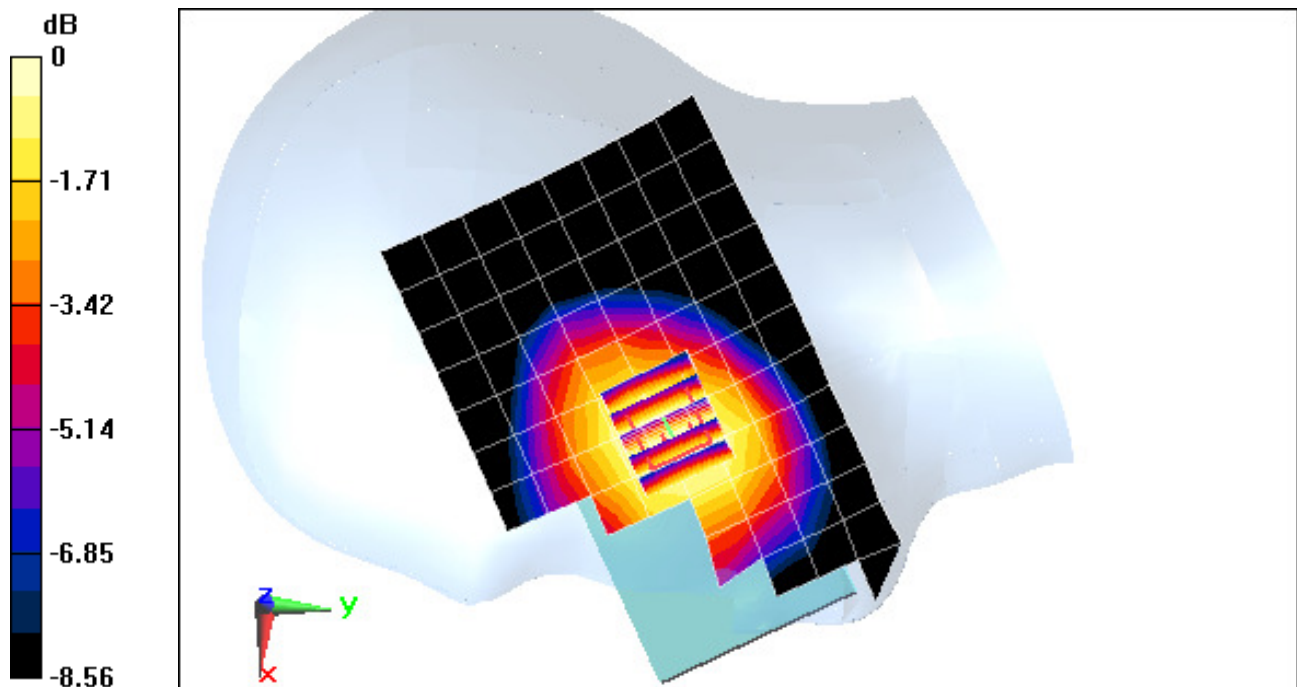
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.864 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.390 W/kg

SAR(1 g) = 0.315 W/kg



0 dB = 0.331 W/kg = -4.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-F

Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 740 Head Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.884 \text{ S/m}$; $\epsilon_r = 42.247$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 04-16-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(6.53, 6.53, 6.53); Calibrated: 2/25/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 17, Left Head, Cheek, Mid.ch,
QPSK, 10 MHz Bandwidth, 25 RB, 12 RB Offset**

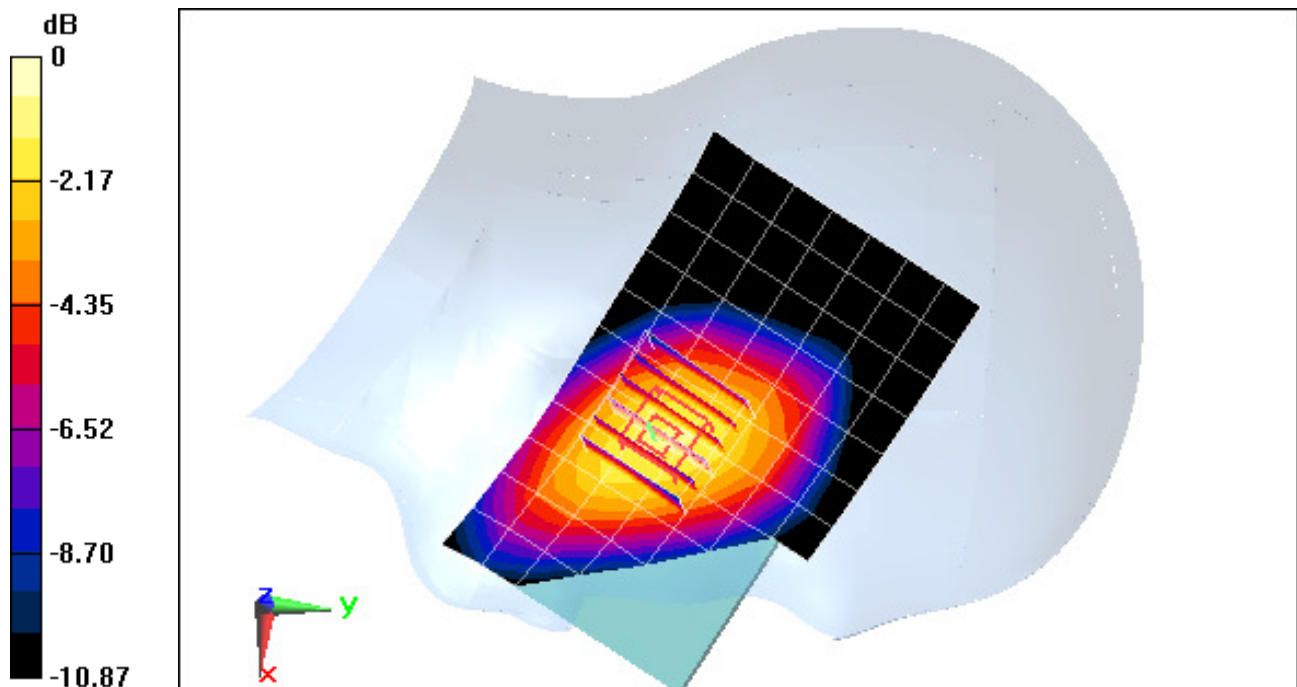
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.612 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.211 W/kg

SAR(1 g) = 0.167 W/kg



0 dB = 0.176 W/kg = -7.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-A

Communication System: UID 0, IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2450-2600 Head Medium parameters used (interpolated):

$$f = 2412 \text{ MHz}; \sigma = 1.732 \text{ S/m}; \epsilon_r = 39.295; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Right Section

Test Date: 04-14-2014; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 11/19/2013

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Right Head, Cheek, Ch 01, 1 Mbps, Antenna 2

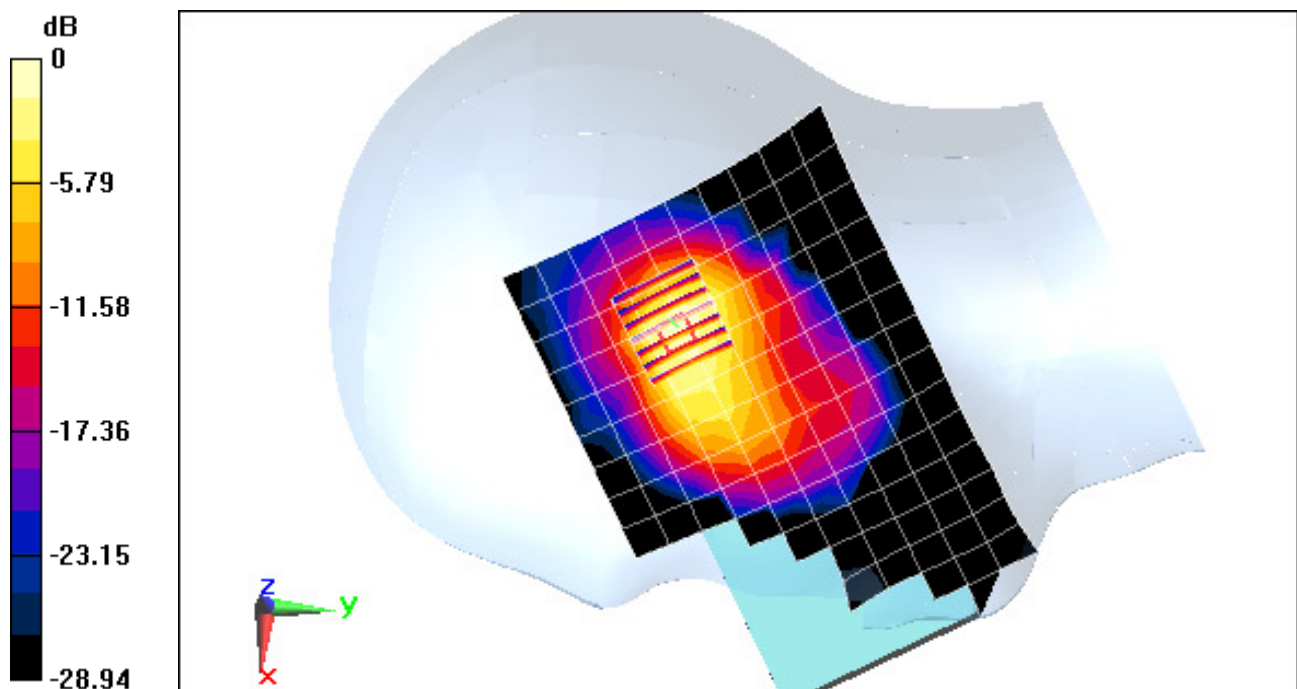
Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.126 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.517 W/kg

SAR(1 g) = 0.283 W/kg



0 dB = 0.358 W/kg = -4.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-C

Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5745 \text{ MHz}$; $\sigma = 5.236 \text{ S/m}$; $\epsilon_r = 35.969$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 04-14-2014; Ambient Temp: 22.8°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(4.52, 4.52, 4.52); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Left Head, Cheek, Ch 149, 6 Mbps, Antenna 1

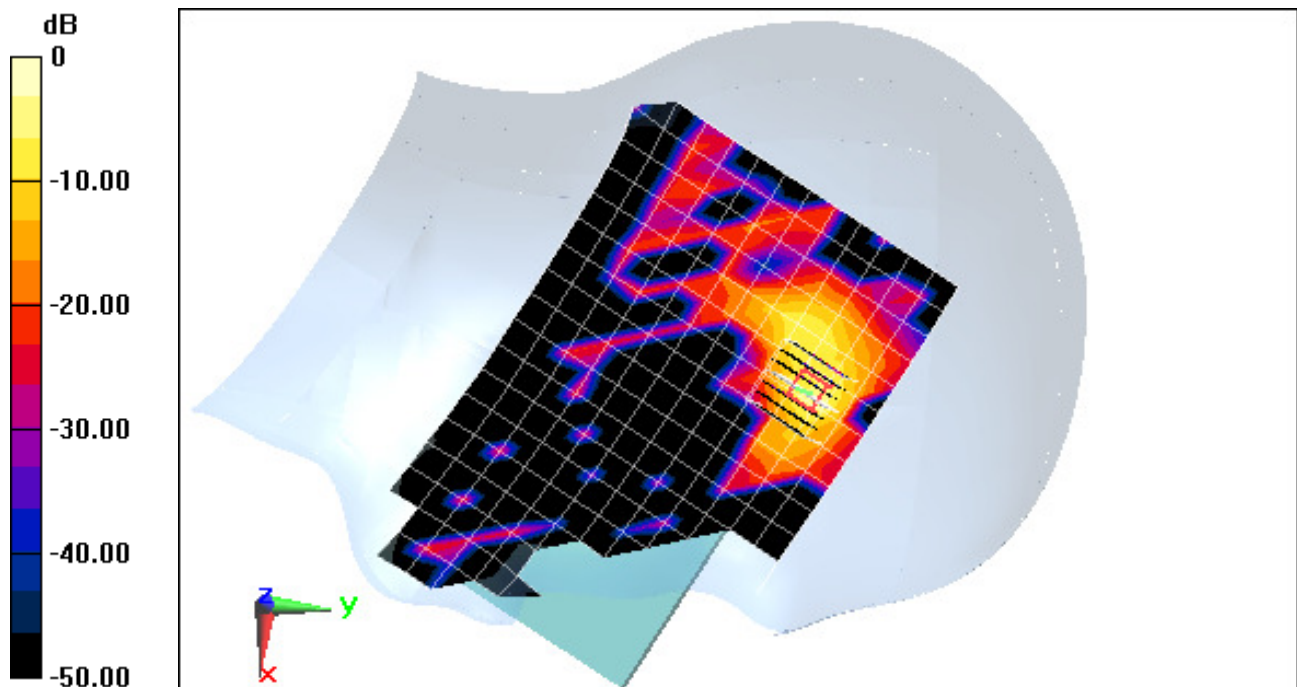
Area Scan (13x22x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 6.167 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.235 W/kg



0 dB = 0.743 W/kg = -1.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-C

Communication System: UID 0, IEEE 802.11a; Frequency: 5280 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$$f = 5280 \text{ MHz}; \sigma = 4.737 \text{ S/m}; \epsilon_r = 36.643; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Left Section

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3914; ConvF(4.82, 4.82, 4.82); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.3 GHz, Left Head, Cheek, Ch 56, 6 Mbps, Antenna 1

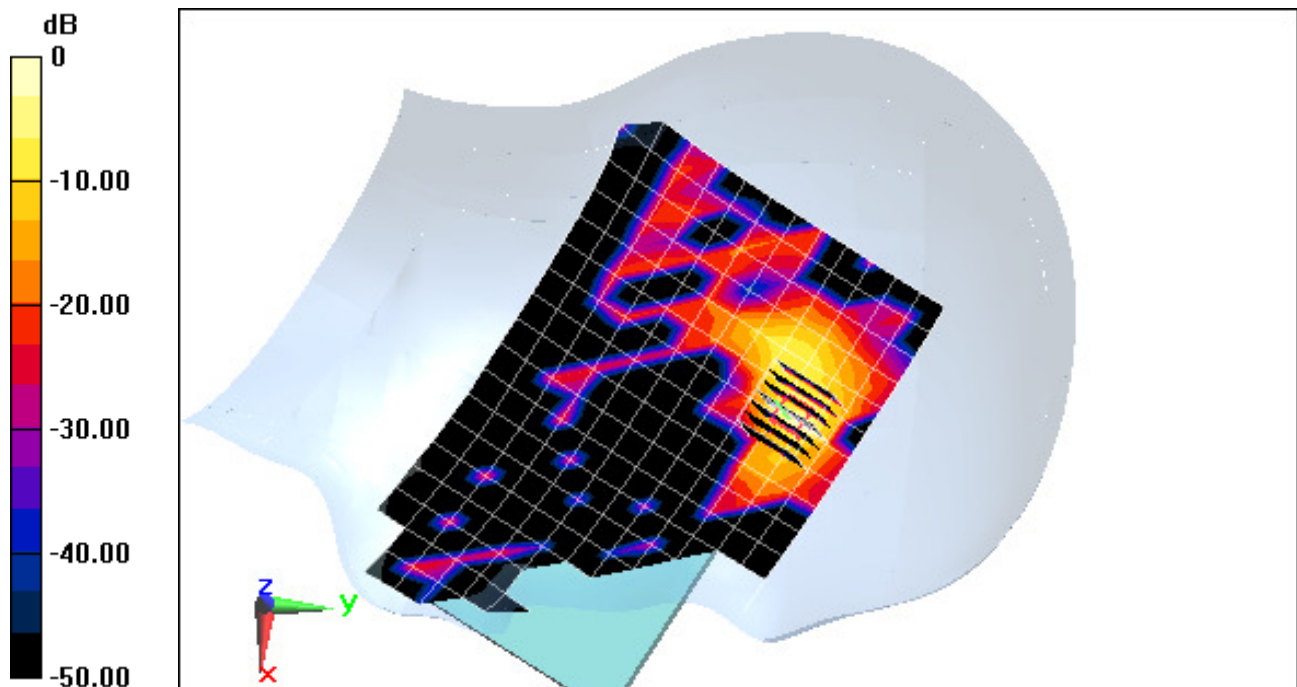
Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 8.876 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.255 W/kg



0 dB = 0.743 W/kg = -1.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1 \text{ S/m}$; $\epsilon_r = 53.783$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(5.91, 5.91, 5.91); Calibrated: 8/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/21/2013

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

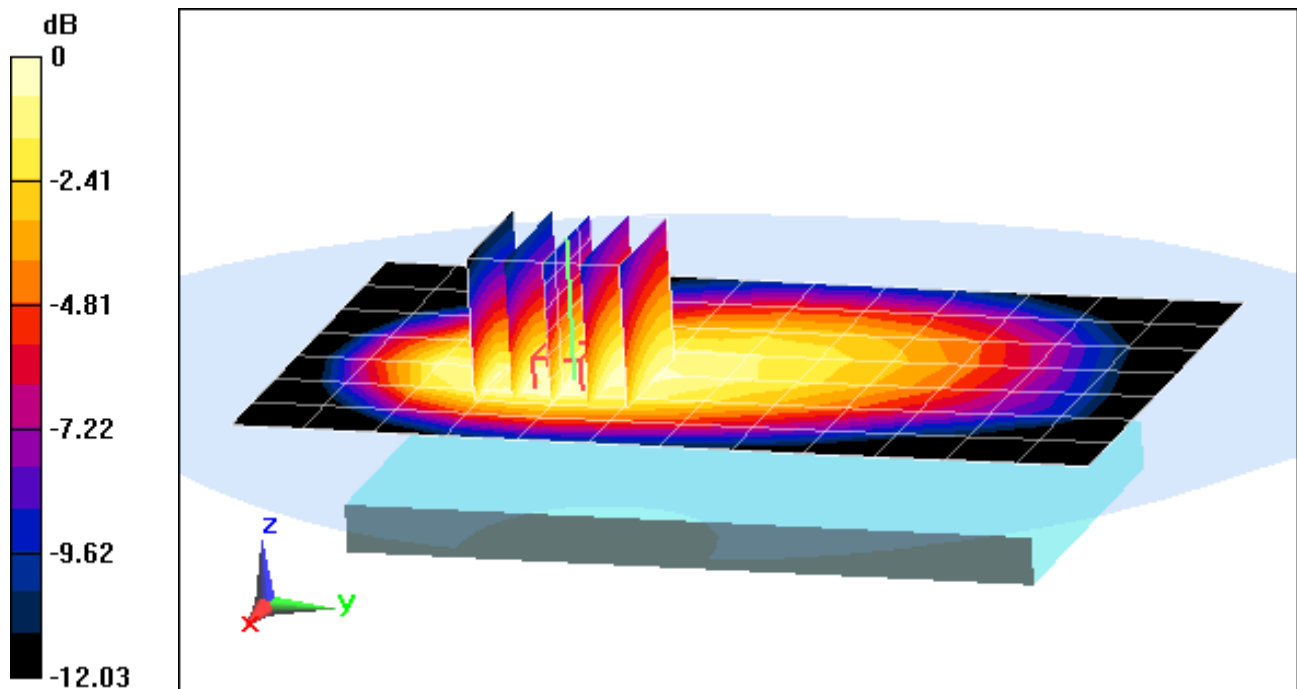
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.912 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.782 W/kg

SAR(1 g) = 0.532 W/kg



0 dB = 0.567 W/kg = -2.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1 \text{ S/m}$; $\epsilon_r = 53.783$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(5.91, 5.91, 5.91); Calibrated: 8/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/21/2013

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

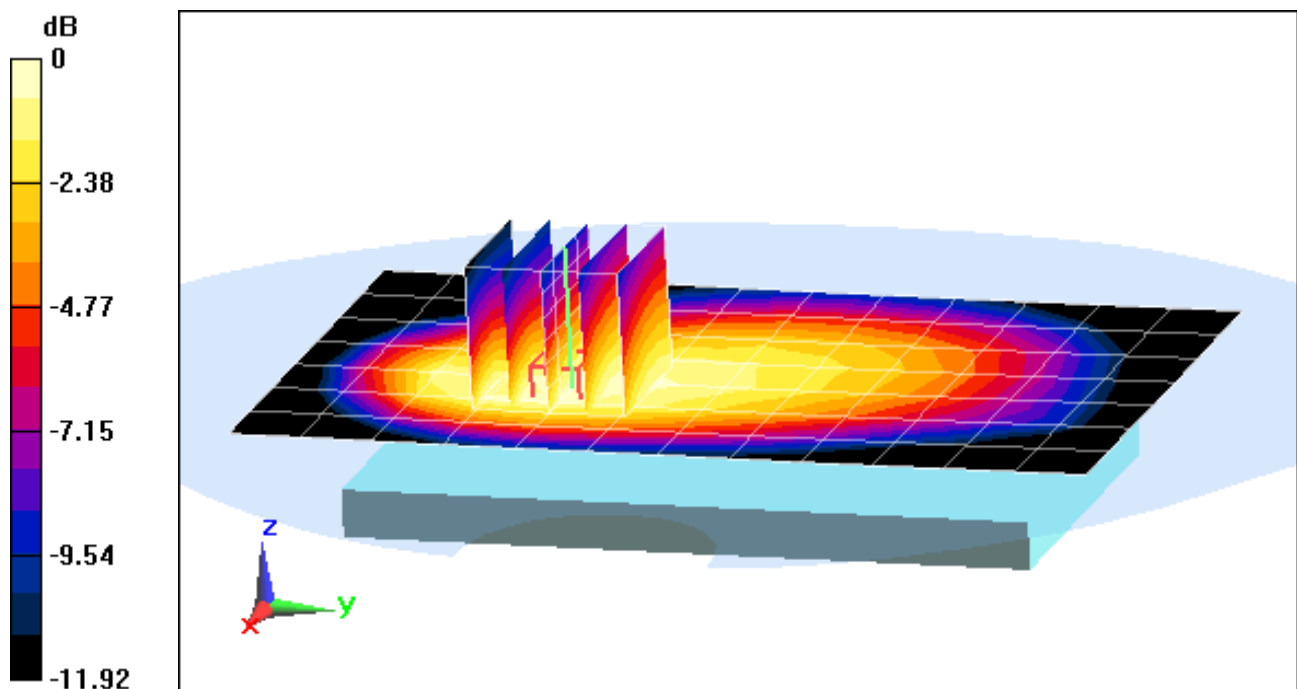
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.958 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.733 W/kg



0 dB = 0.781 W/kg = -1.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.554 \text{ S/m}$; $\epsilon_r = 52.394$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.54, 6.54, 6.54); Calibrated: 1/29/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 1/22/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

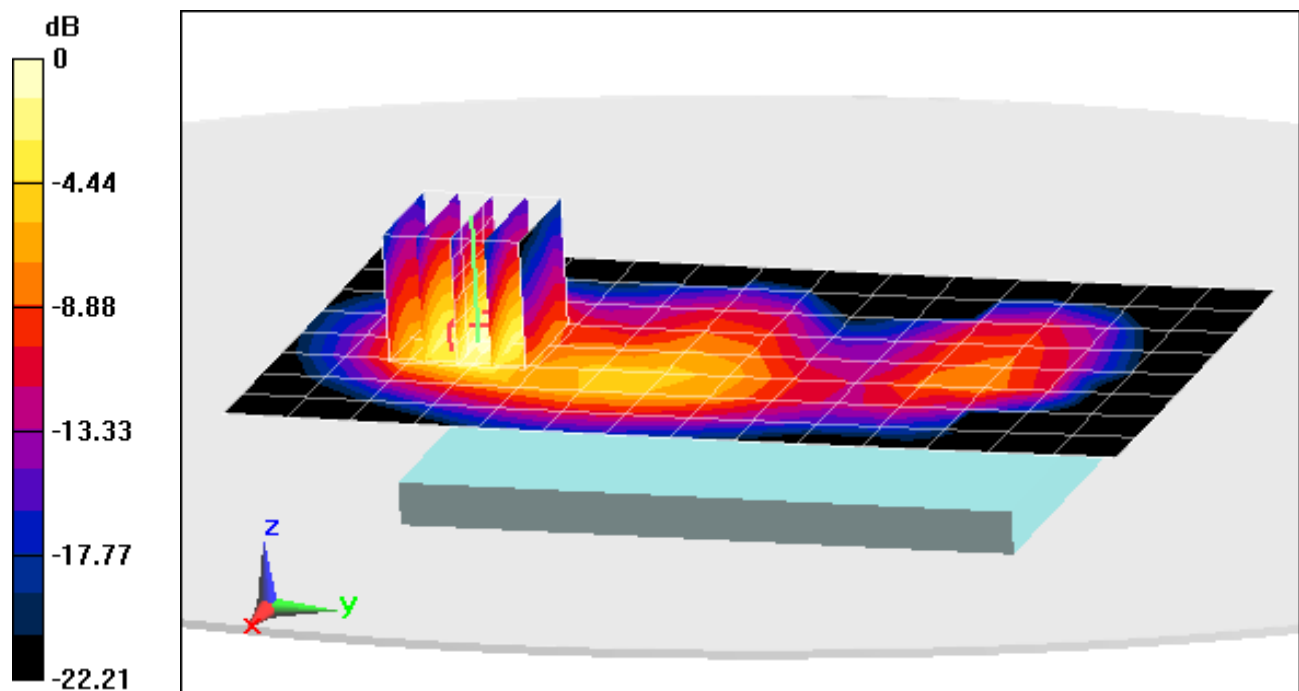
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.494 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.792 W/kg

SAR(1 g) = 0.442 W/kg



0 dB = 0.504 W/kg = -2.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body Medium parameters used:

$$f = 1880 \text{ MHz}; \sigma = 1.554 \text{ S/m}; \epsilon_r = 52.394; \rho = 1000 \text{ kg/m}^3$$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.54, 6.54, 6.54); Calibrated: 1/29/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 1/22/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 2 Tx Slots

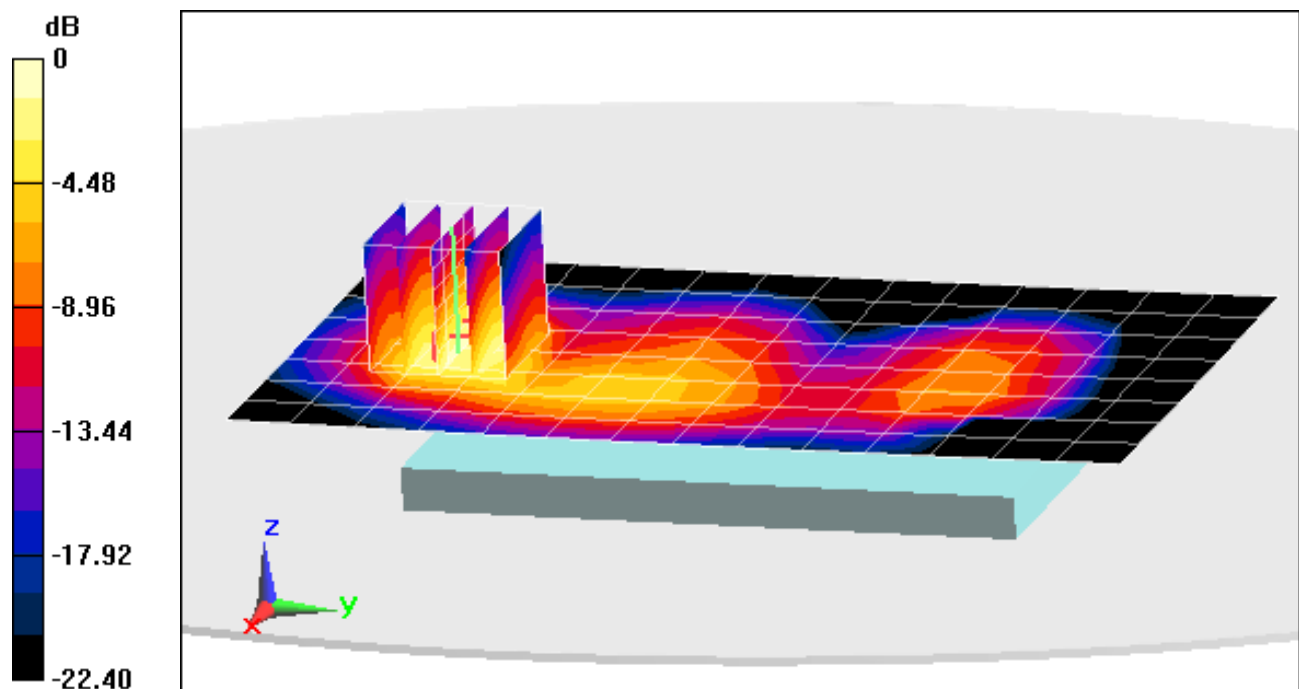
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.905 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.585 W/kg



0 dB = 0.653 W/kg = -1.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 1 \text{ S/m}$; $\epsilon_r = 53.783$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: ES3DV2 - SN3022; ConvF(5.91, 5.91, 5.91); Calibrated: 8/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/21/2013

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

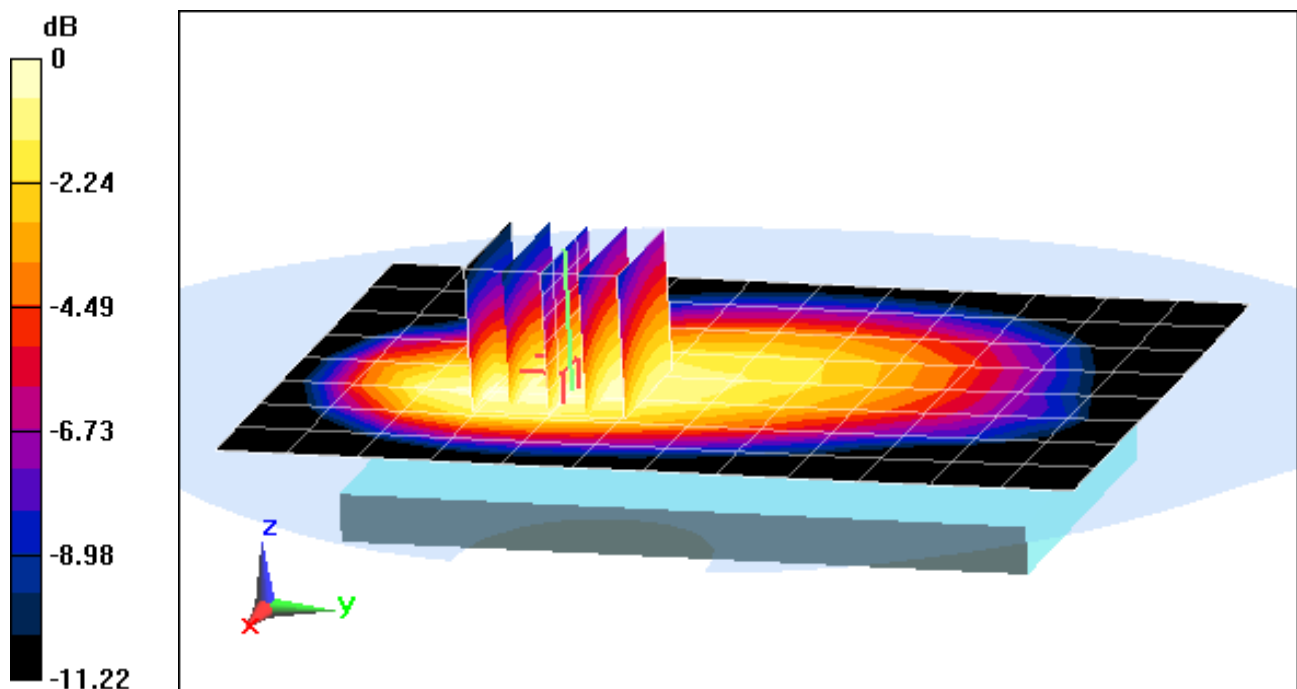
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.420 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.603 W/kg

SAR(1 g) = 0.423 W/kg



0 dB = 0.447 W/kg = -3.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, UMTS, Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1852.4 \text{ MHz}$; $\sigma = 1.525 \text{ S/m}$; $\epsilon_r = 52.507$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.54, 6.54, 6.54); Calibrated: 1/29/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 1/22/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

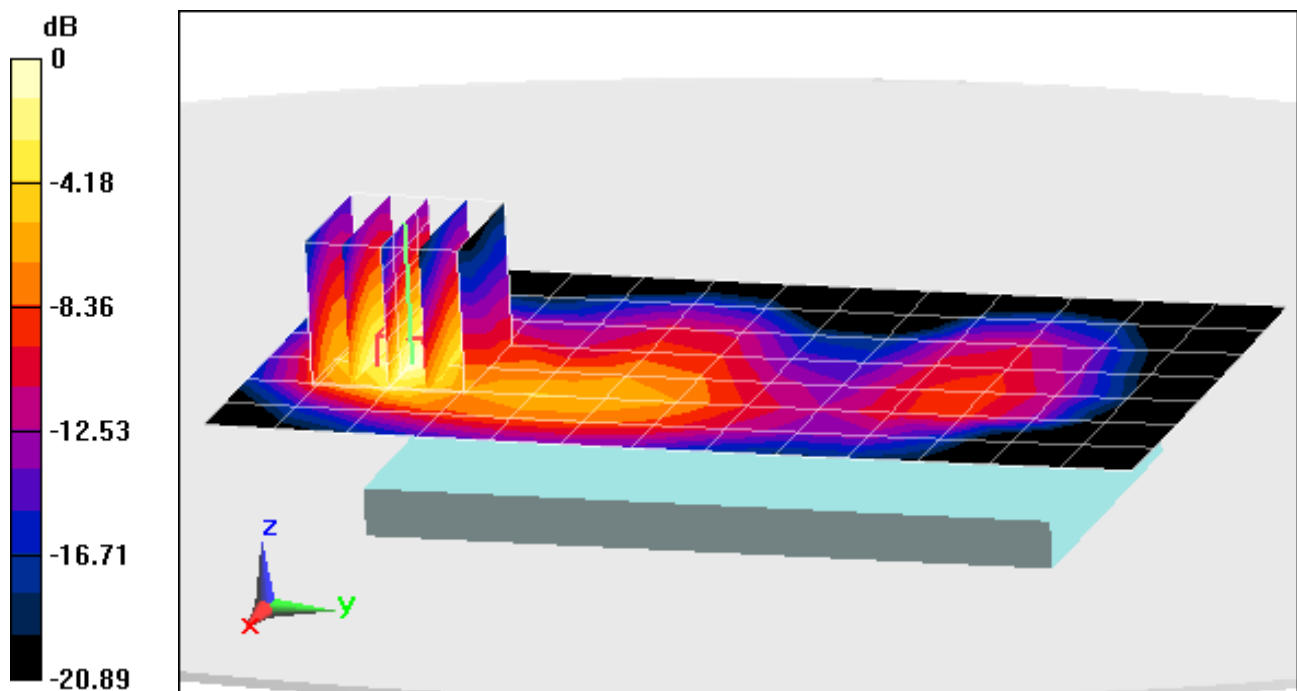
Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.263 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.74 W/kg

SAR(1 g) = 0.951 W/kg



0 dB = 1.03 W/kg = 0.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-A

Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used (interpolated):

$f = 1860 \text{ MHz}$; $\sigma = 1.533 \text{ S/m}$; $\epsilon_r = 52.476$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.1°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN3589; ConvF(6.54, 6.54, 6.54); Calibrated: 1/29/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 1/22/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

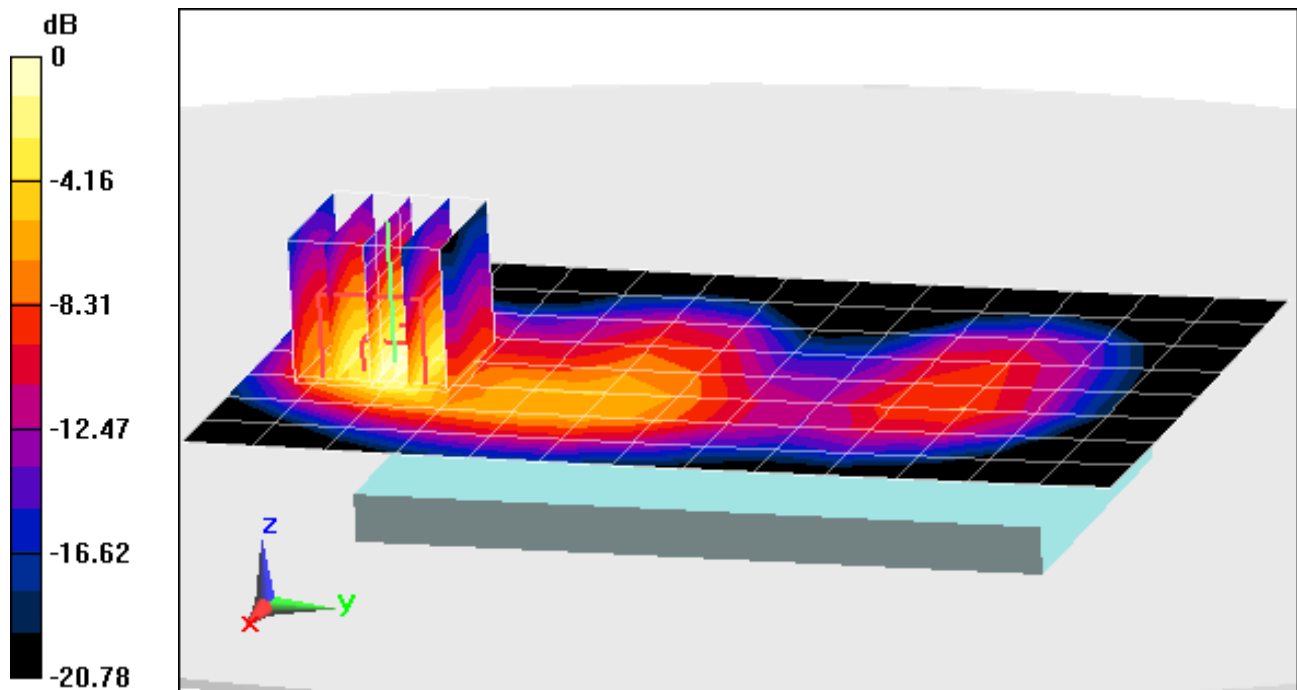
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.876 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.839 W/kg



0 dB = 0.953 W/kg = -0.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-A

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.441 \text{ S/m}$; $\epsilon_r = 51.794$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-16-2014; Ambient Temp: 21.6°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3332; ConvF(4.93, 4.93, 4.93); Calibrated: 11/25/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 11/18/2013

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch,
20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset**

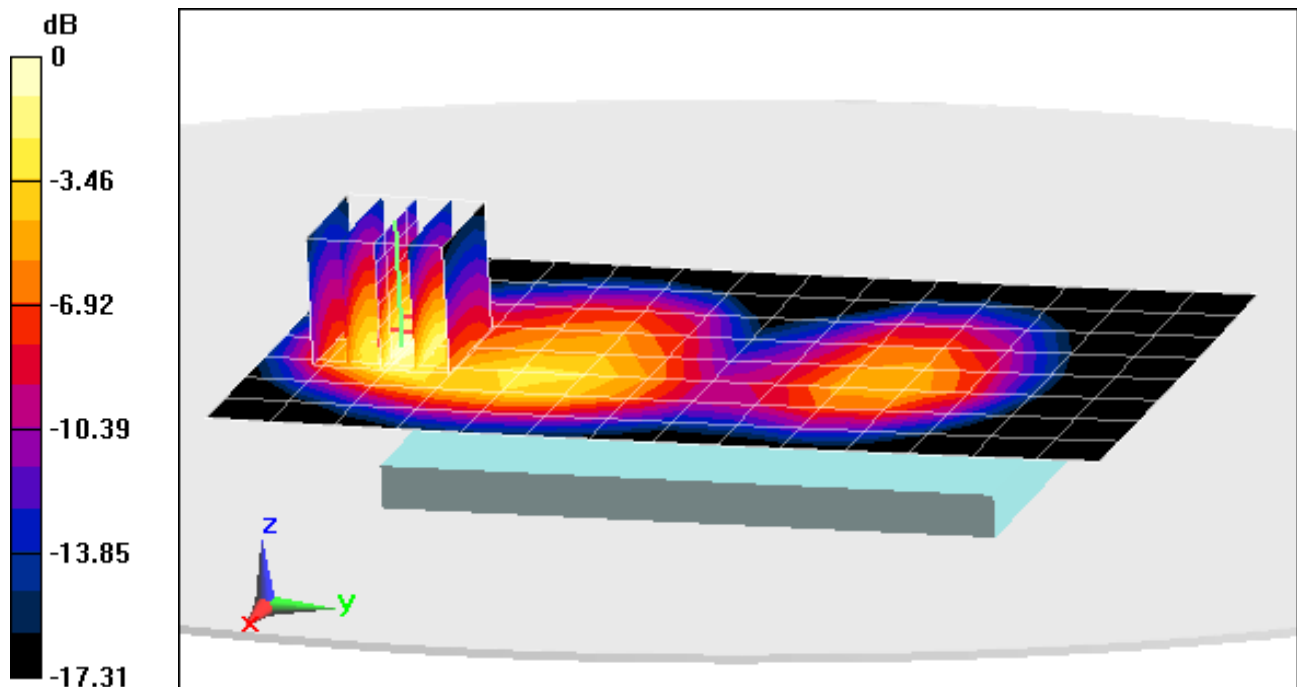
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.498 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.759 W/kg



0 dB = 0.828 W/kg = -0.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-E

Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.5 \text{ MHz}$; $\sigma = 1.015 \text{ S/m}$; $\epsilon_r = 54.039$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-17-2014; Ambient Temp: 23.2°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(5.91, 5.91, 5.91); Calibrated: 8/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/21/2013

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

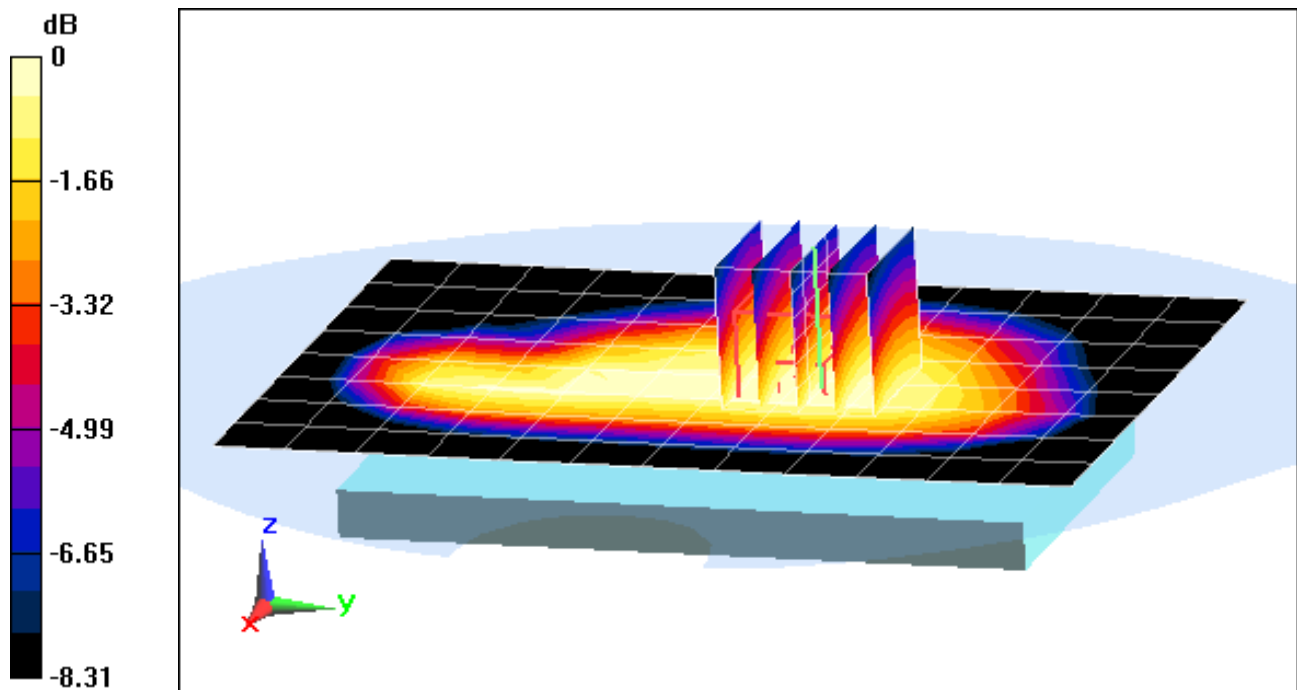
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.369 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.479 W/kg

SAR(1 g) = 0.387 W/kg



0 dB = 0.404 W/kg = -3.94 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-F

Communication System: UID 0, LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used:

$f = 710 \text{ MHz}$; $\sigma = 0.942 \text{ S/m}$; $\epsilon_r = 55.154$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-17-2014; Ambient Temp: 24.2°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(6.11, 6.11, 6.11); Calibrated: 11/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 11/19/2013

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 17, Body SAR, Back Side, Mid.ch,
10 MHz Bandwidth, QPSK, 25 RB, 12 RB Offset**

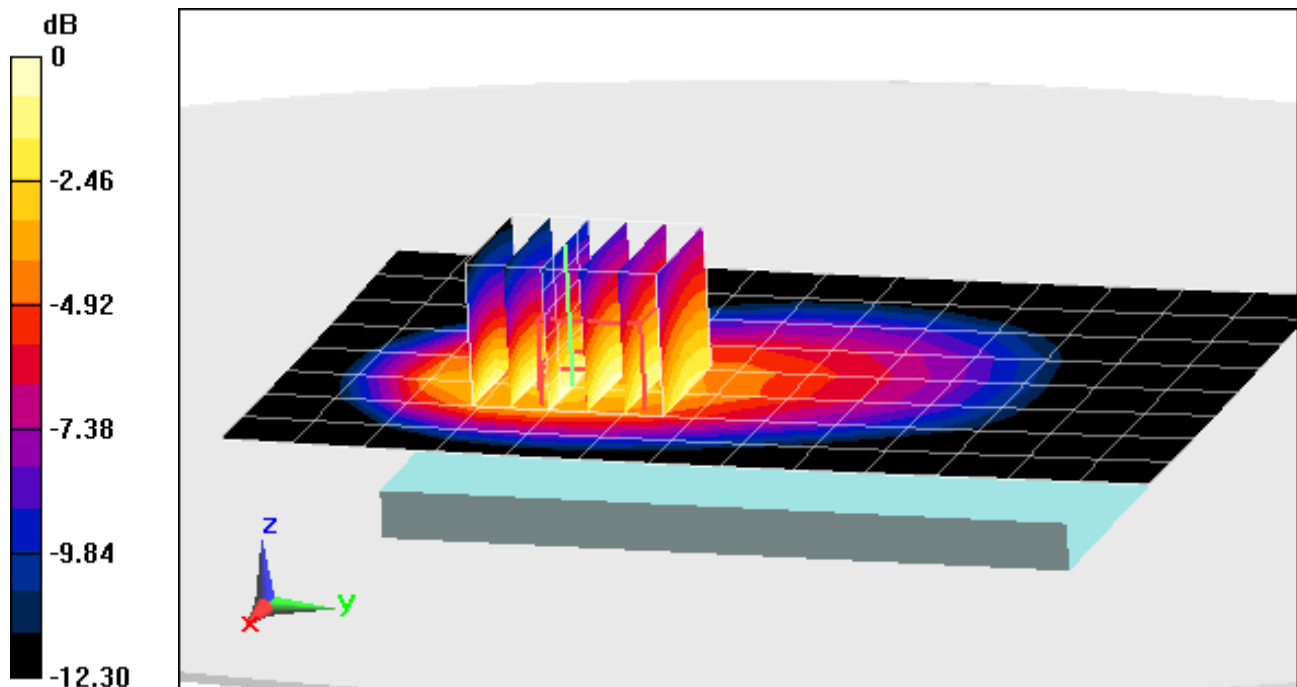
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.240 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.508 W/kg

SAR(1 g) = 0.342 W/kg



0 dB = 0.362 W/kg = -4.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-B

Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 2.013 \text{ S/m}$; $\epsilon_r = 52.664$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.4°C; Tissue Temp: 23.9°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); 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 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 06, 1 Mbps, Back Side, Antenna 2

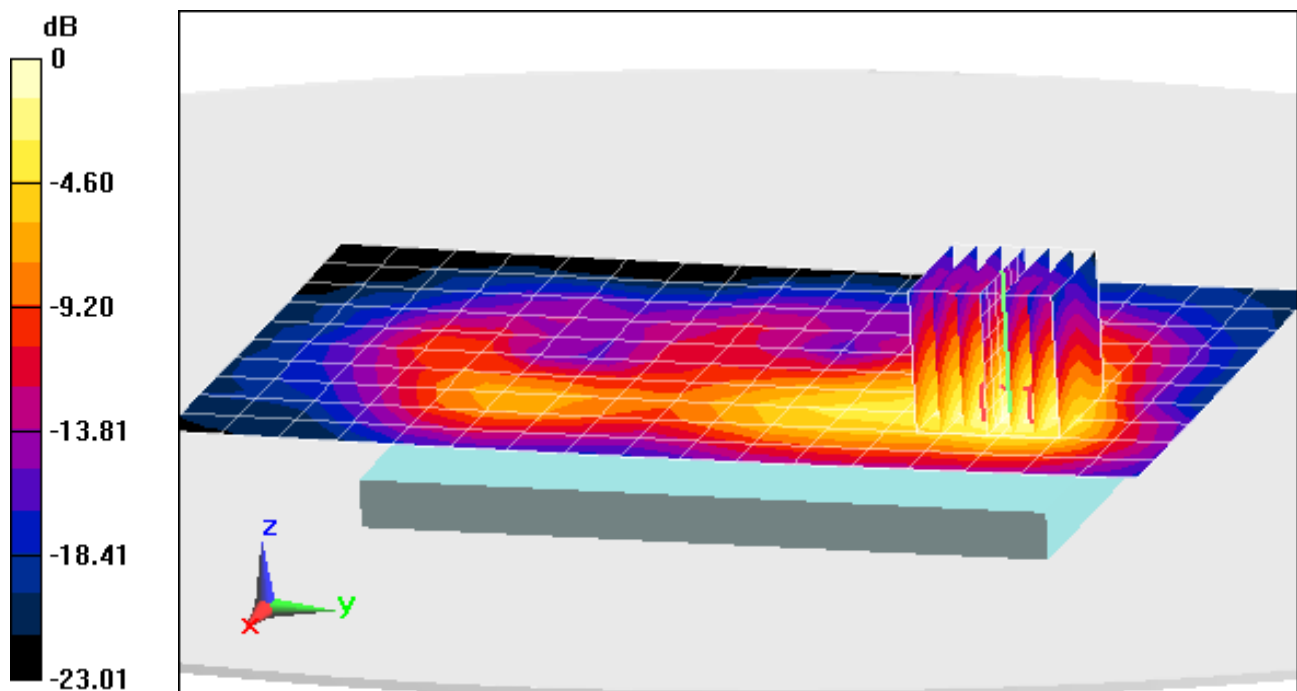
Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.380 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.696 W/kg

SAR(1 g) = 0.364 W/kg



0 dB = 0.466 W/kg = -3.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-C

Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5745 \text{ MHz}$; $\sigma = 6.12 \text{ S/m}$; $\epsilon_r = 46.027$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(4, 4, 4); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Ch 149, 6 Mbps, Back Side, Antenna 1

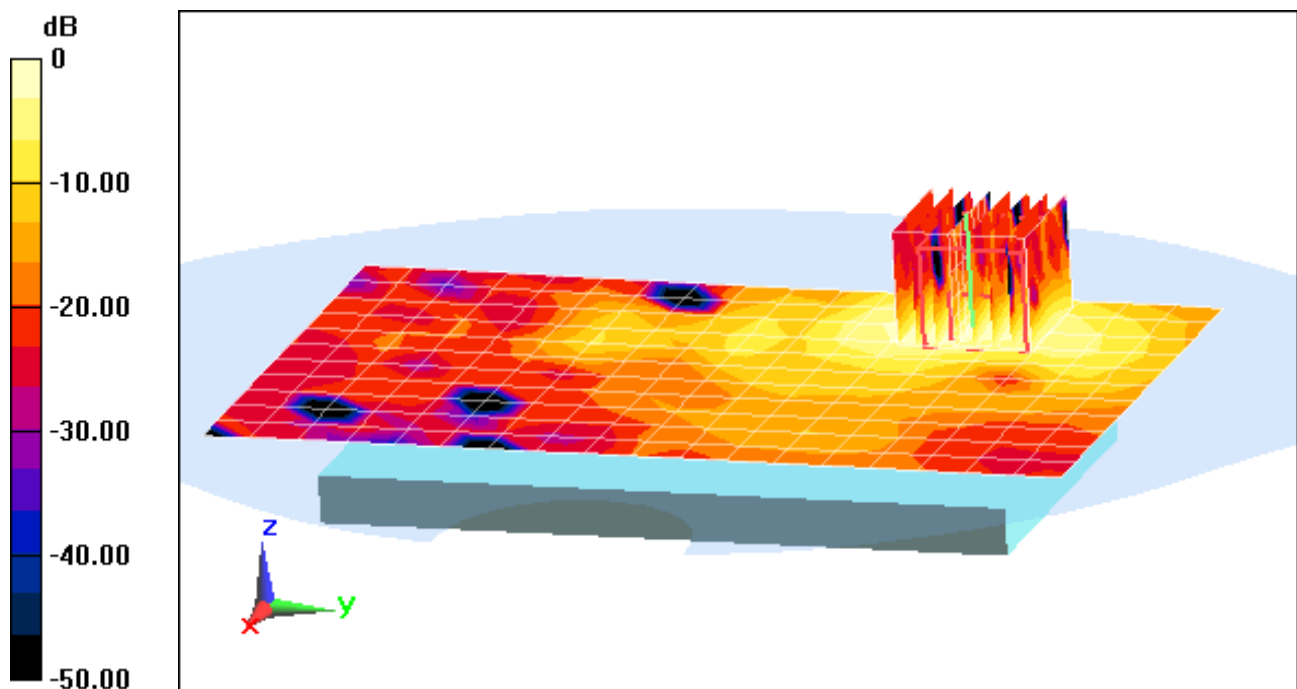
Area Scan (12x19x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 6.236 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.289 W/kg



0 dB = 0.674 W/kg = -1.71 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-C

Communication System: UID 0, IEEE 802.11a; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5745 \text{ MHz}$; $\sigma = 6.12 \text{ S/m}$; $\epsilon_r = 46.027$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(4, 4, 4); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz, Body SAR, Ch 149, 6 Mbps, Right Edge, Antenna 1

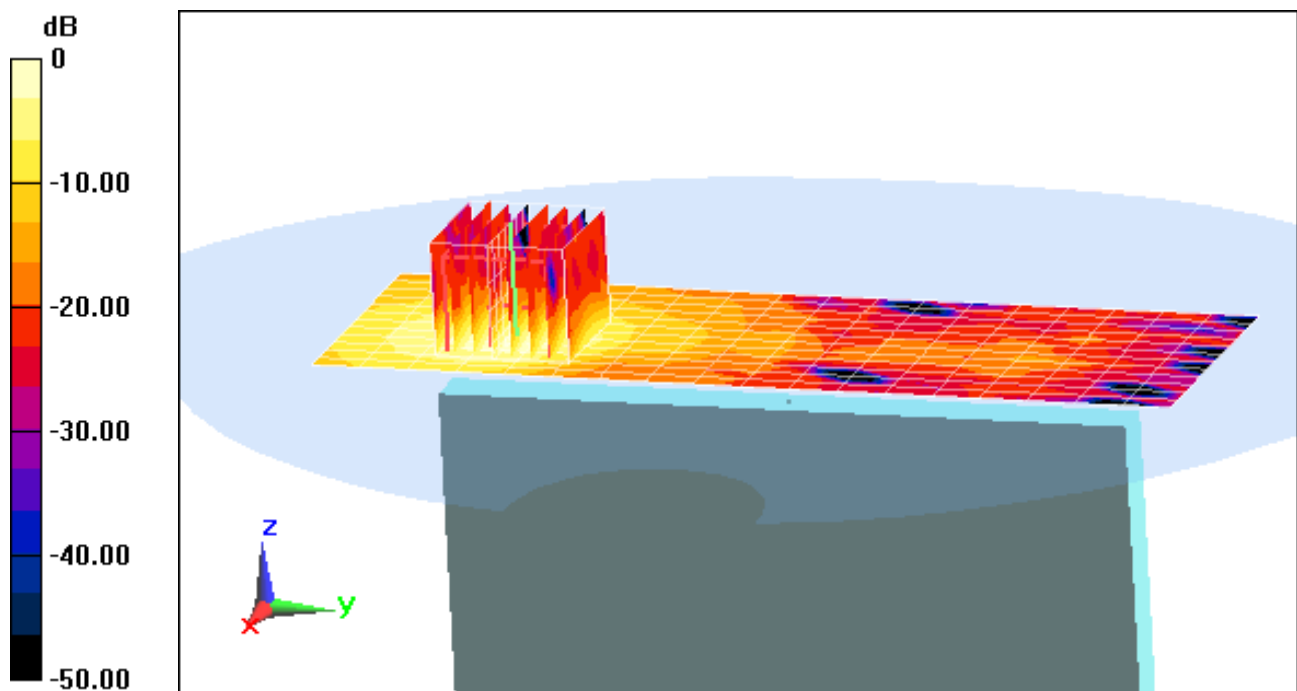
Area Scan (13x19x1): Measurement grid: dx=5mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 8.697 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.440 W/kg



0 dB = 0.996 W/kg = -0.02 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG870A; Type: Portable Handset; Serial: FL-143-C

Communication System: UID 0, IEEE 802.11a; Frequency: 5680 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5680 \text{ MHz}$; $\sigma = 6.026 \text{ S/m}$; $\epsilon_r = 46.132$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(3.62, 3.62, 3.62); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.5-5.7 GHz, Body SAR, Ch 136, 6 Mbps, Back Side, Antenna 1

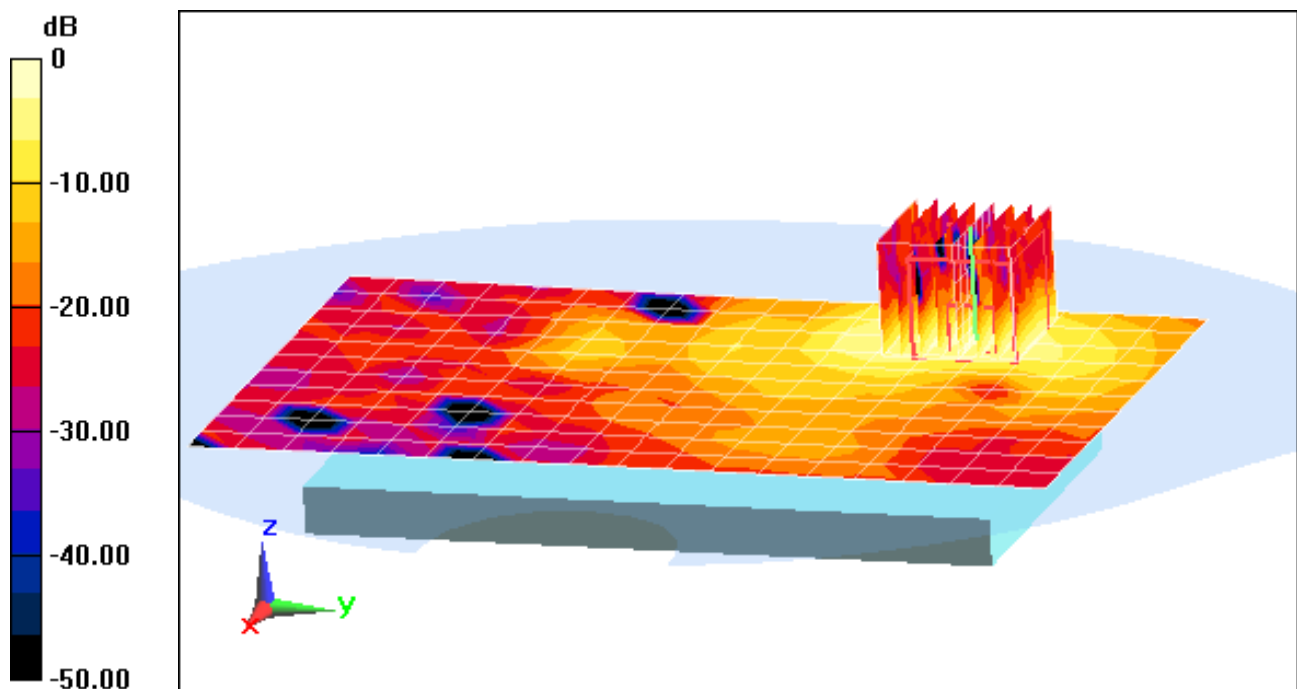
Area Scan (12x19x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 6.525 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.382 W/kg



0 dB = 0.910 W/kg = -0.41 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 750 MHz; Type: D750V3; Serial: 1003

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 740 Head Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.923 \text{ S/m}$; $\epsilon_r = 41.895$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 04-16-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3258; ConvF(6.53, 6.53, 6.53); Calibrated: 2/25/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

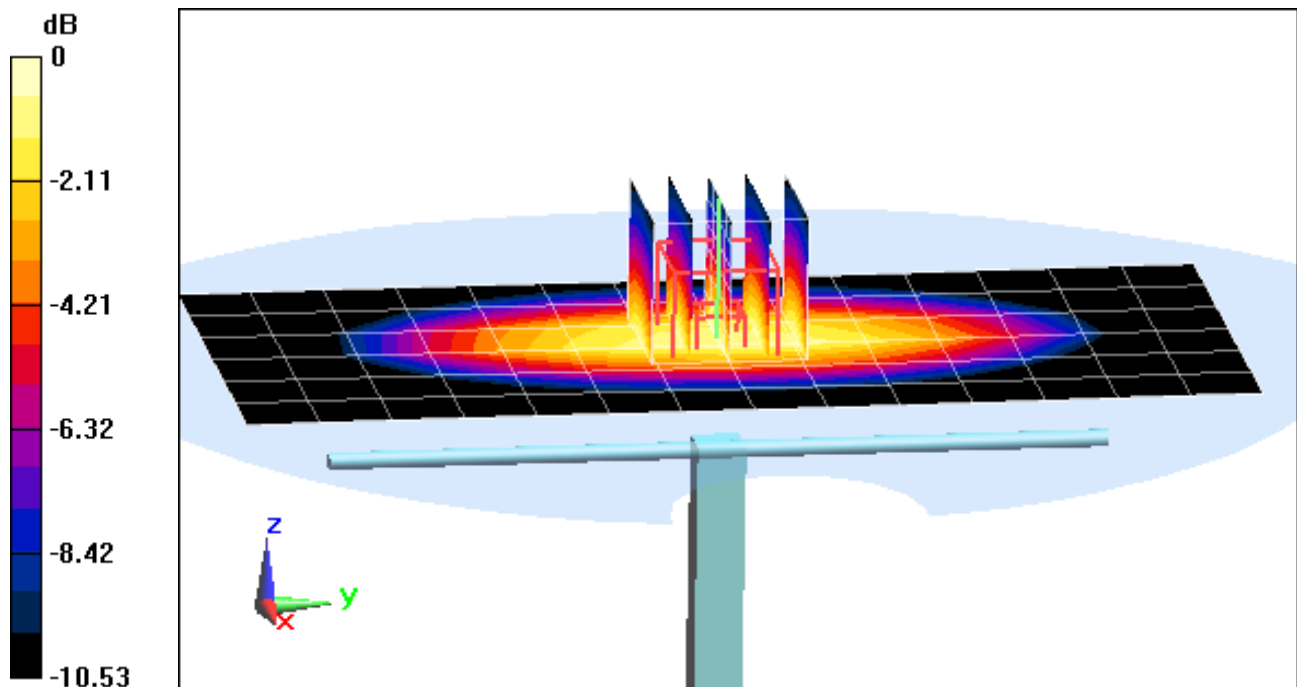
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.813 W/kg

Deviation: -2.87%



0 dB = 0.880 W/kg = -0.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.906 \text{ S/m}$; $\epsilon_r = 40.624$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 04-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3914; ConvF(9.34, 9.34, 9.34); Calibrated: 10/23/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

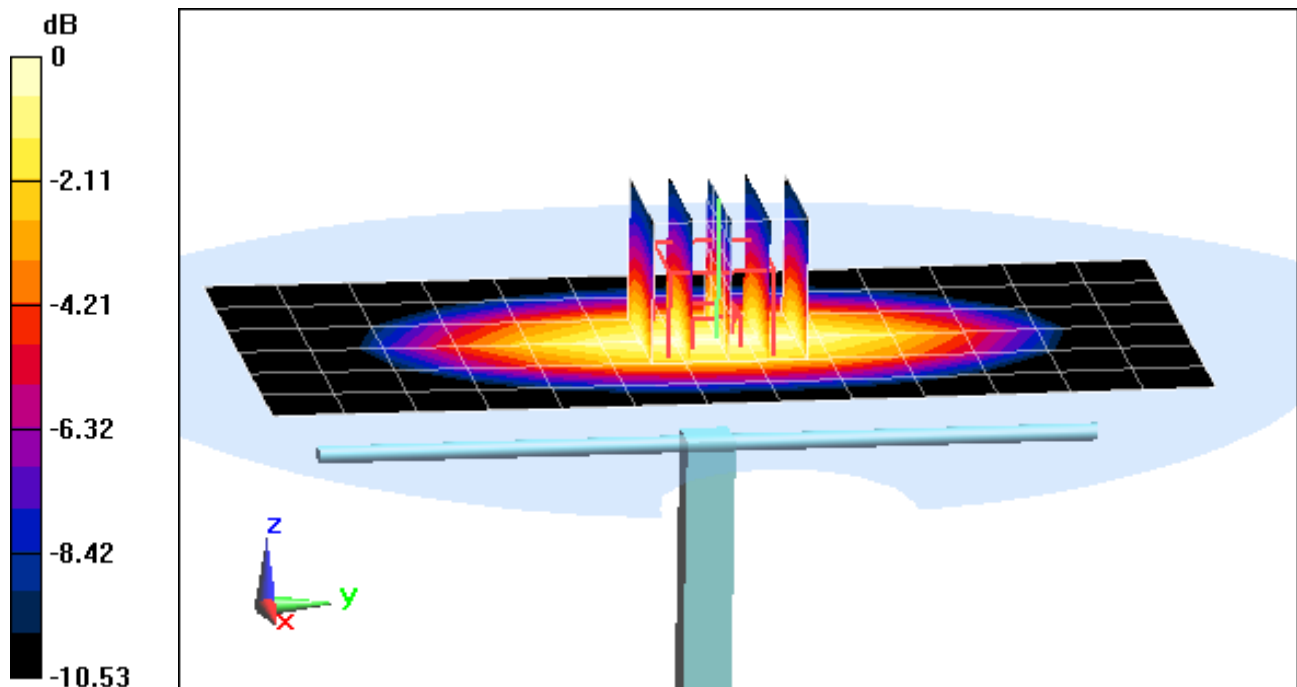
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.976 W/kg

Deviation: 6.09%



0 dB = 1.05 W/kg = 0.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR 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:

$f = 1750 \text{ MHz}$; $\sigma = 1.336 \text{ S/m}$; $\epsilon_r = 40.693$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-17-2014; Ambient Temp: 23.8°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3209; ConvF(5.24, 5.24, 5.24); Calibrated: 3/19/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 3/17/2014

Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm

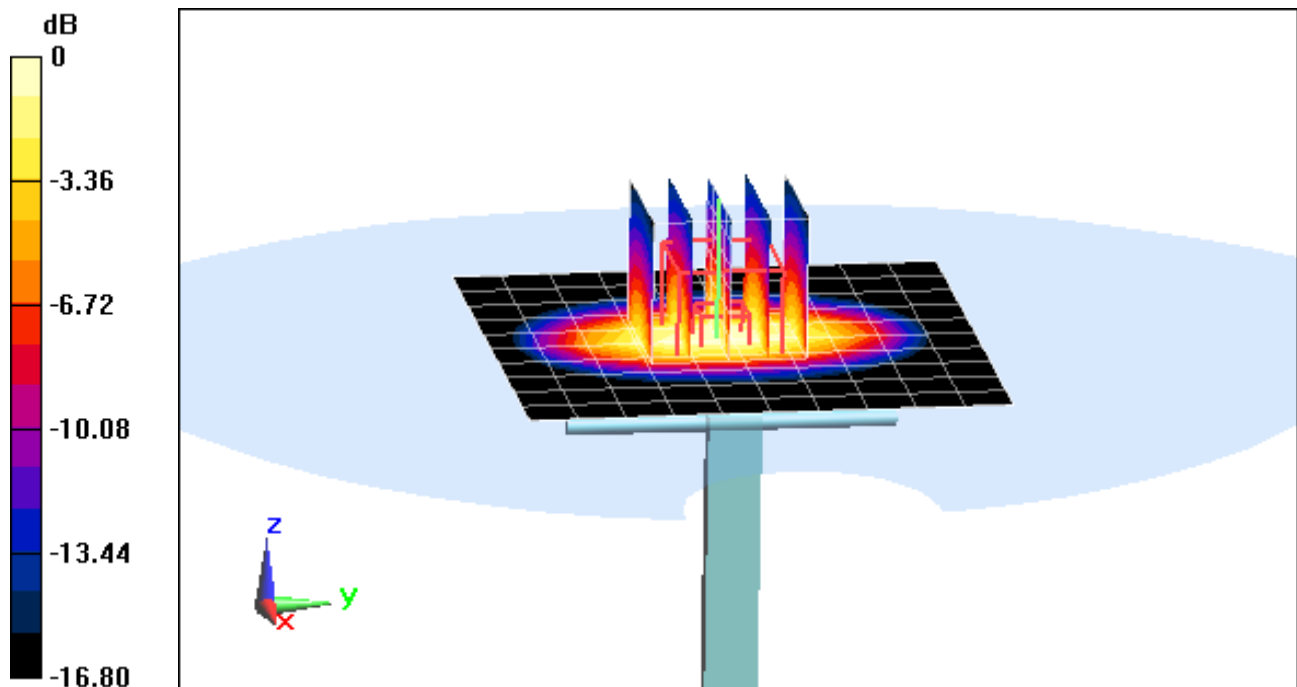
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 6.51 W/kg

SAR(1 g) = 3.54 W/kg

Deviation: -3.80%



0 dB = 3.97 W/kg = 5.99 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR 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):

$f = 1900 \text{ MHz}$; $\sigma = 1.408 \text{ S/m}$; $\epsilon_r = 40.538$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-11-2014; Ambient Temp: 24.1°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3258; ConvF(5.04, 5.04, 5.04); Calibrated: 2/25/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

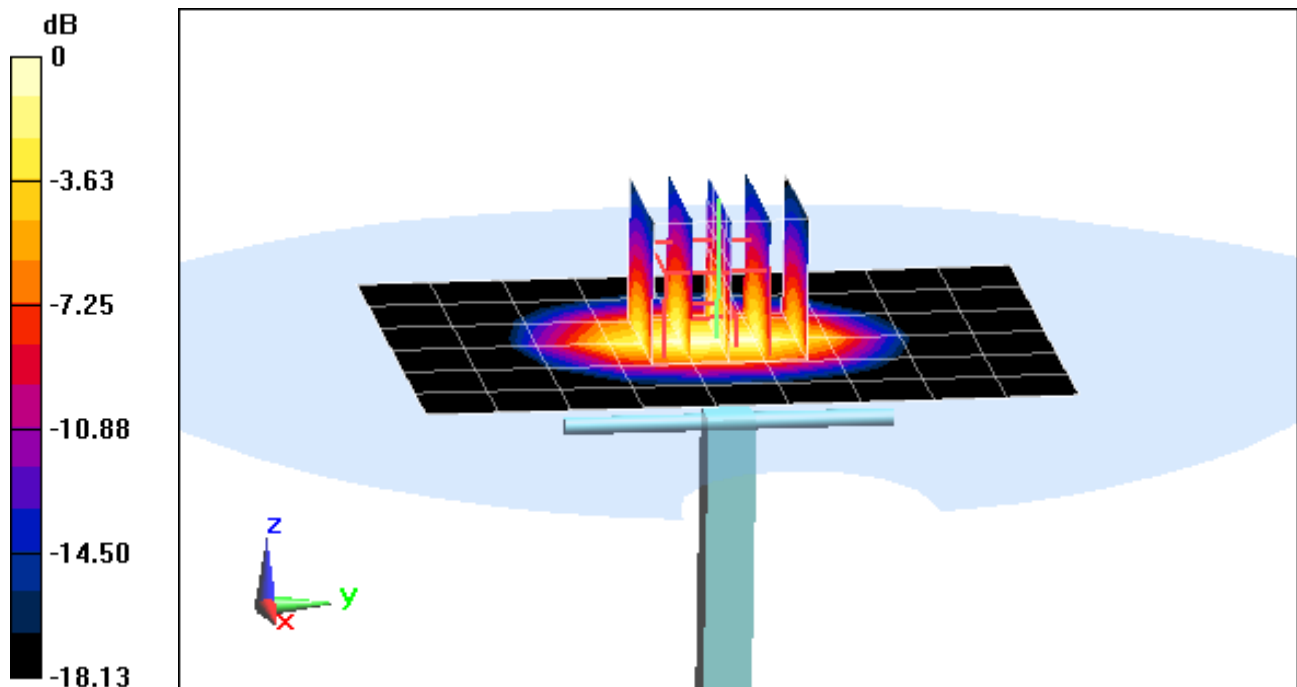
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 7.54 W/kg

SAR(1 g) = 4.04 W/kg

Deviation: 0.00%



0 dB = 4.53 W/kg = 6.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR 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):

$f = 1900 \text{ MHz}$; $\sigma = 1.425 \text{ S/m}$; $\epsilon_r = 41.151$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-17-2014; Ambient Temp: 23.3°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3332; ConvF(5.06, 5.06, 5.06); Calibrated: 11/25/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 11/18/2013

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

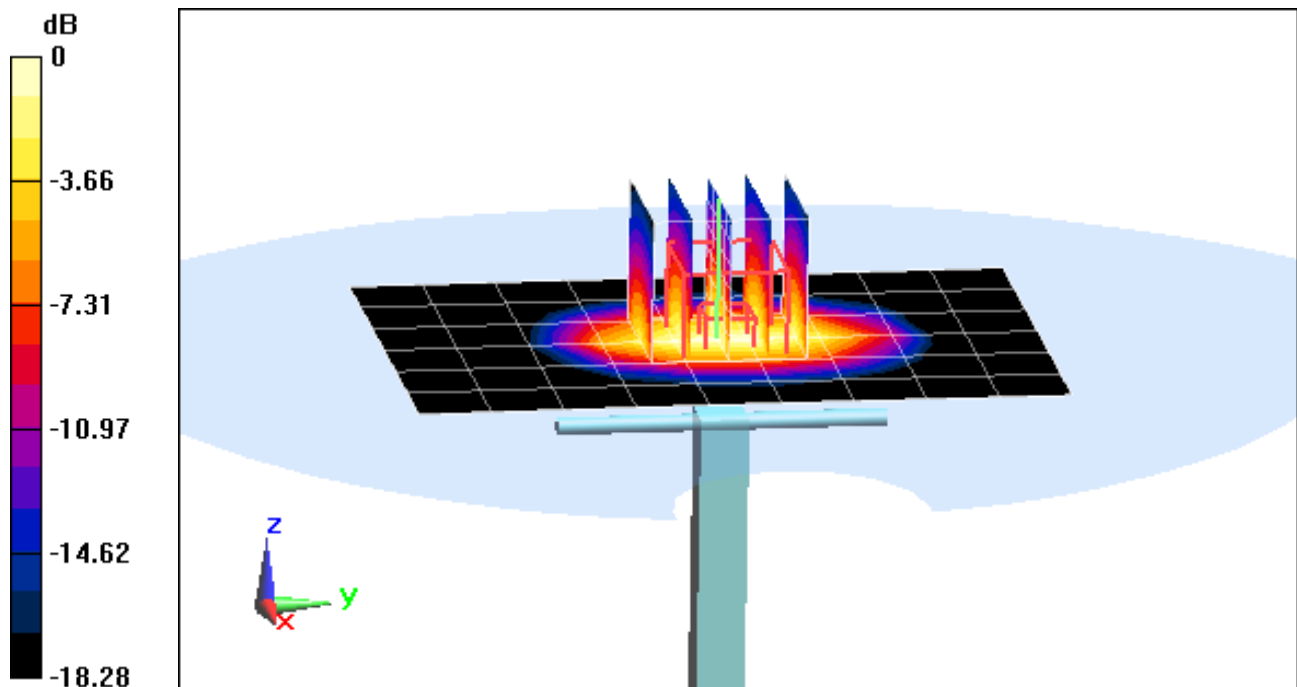
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 7.89 W/kg

SAR(1 g) = 4.22 W/kg

Deviation: 4.46%



0 dB = 4.71 W/kg = 6.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.773 \text{ S/m}$; $\epsilon_r = 39.159$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3287; ConvF(4.43, 4.43, 4.43); Calibrated: 11/20/2013;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 11/19/2013

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1797

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

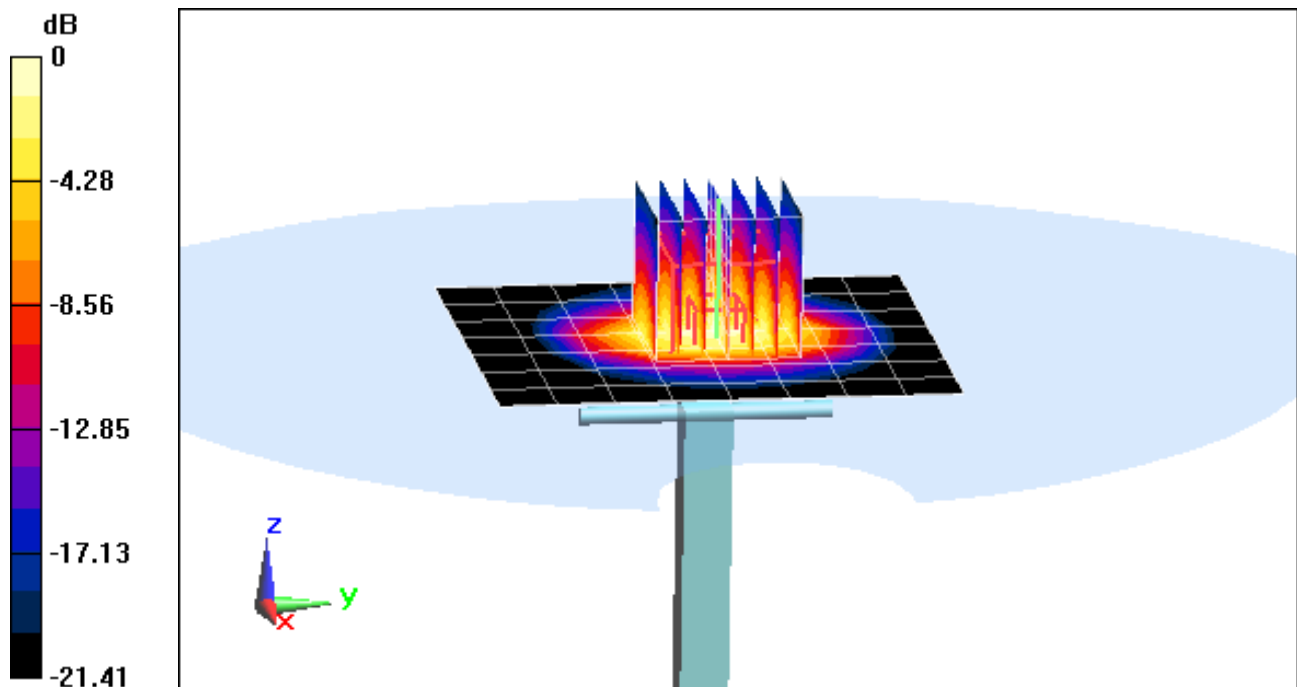
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.45 W/kg

Deviation: 5.21%



0 dB = 7.03 W/kg = 8.47 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5200 MHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5200 \text{ MHz}$; $\sigma = 4.648 \text{ S/m}$; $\epsilon_r = 36.736$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(4.99, 4.99, 4.99); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

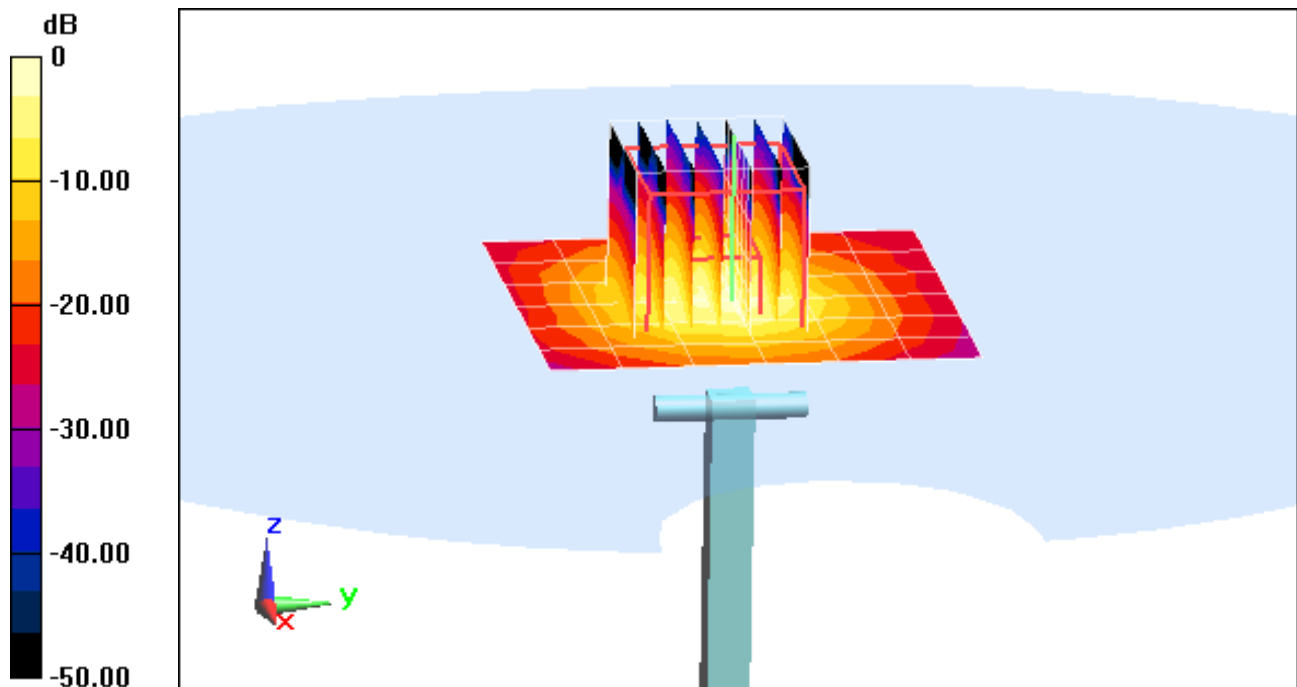
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 7.14 W/kg

Deviation: -8.46%



PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5300 MHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5300 \text{ MHz}$; $\sigma = 4.746 \text{ S/m}$; $\epsilon_r = 36.582$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 23.0°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3914; ConvF(4.82, 4.82, 4.82); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x8x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

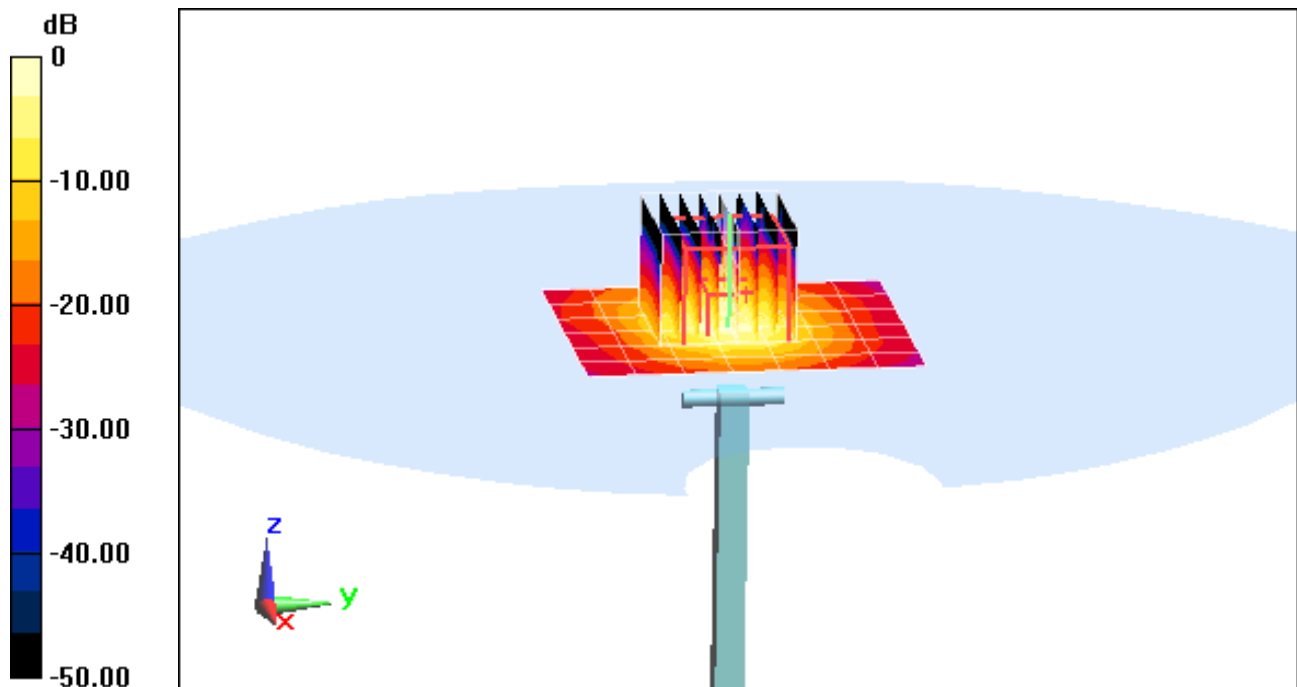
Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 34.8 W/kg

SAR(1 g) = 7.94 W/kg

Deviation: -4.34%



0 dB = 20.3 W/kg = 13.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5500 MHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5500 \text{ MHz}$; $\sigma = 4.958 \text{ S/m}$; $\epsilon_r = 36.291$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 22.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3914; ConvF(4.55, 4.55, 4.55); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

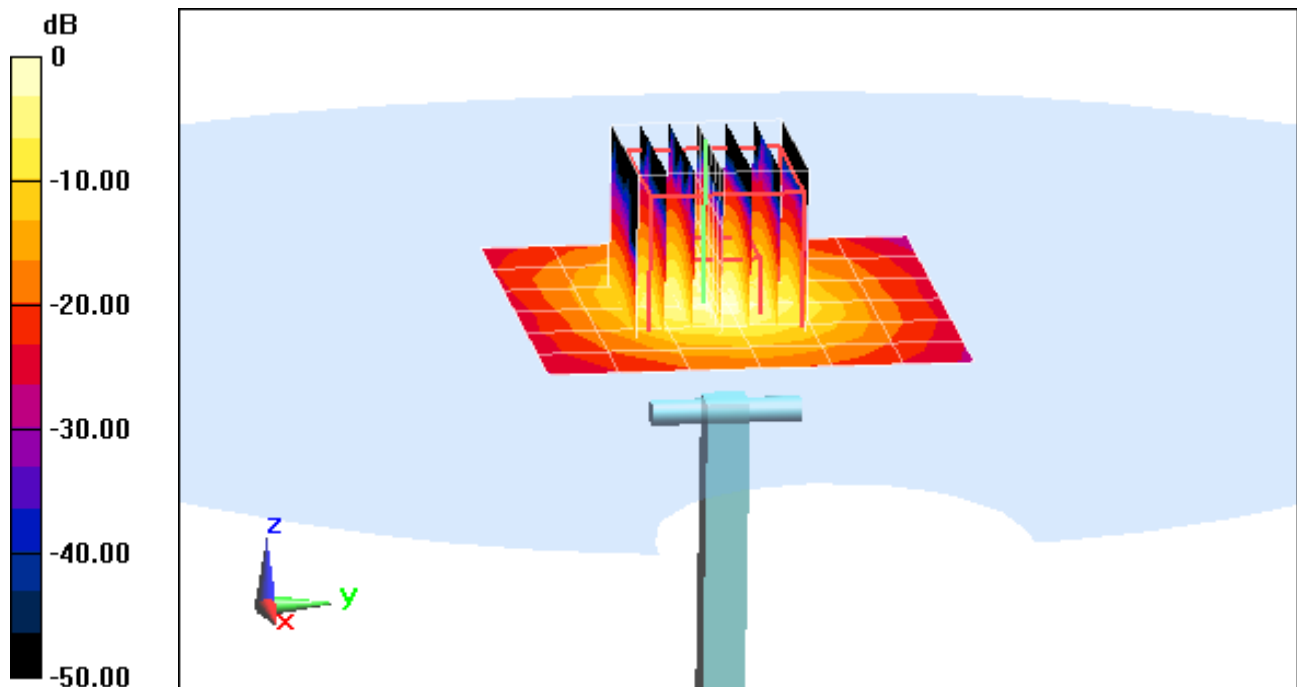
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 34.1 W/kg

SAR(1 g) = 7.82 W/kg

Deviation: -7.24%



0 dB = 18.6 W/kg = 12.70 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5600 MHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 5.066 \text{ S/m}$; $\epsilon_r = 36.142$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 22.9°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(4.37, 4.37, 4.37); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

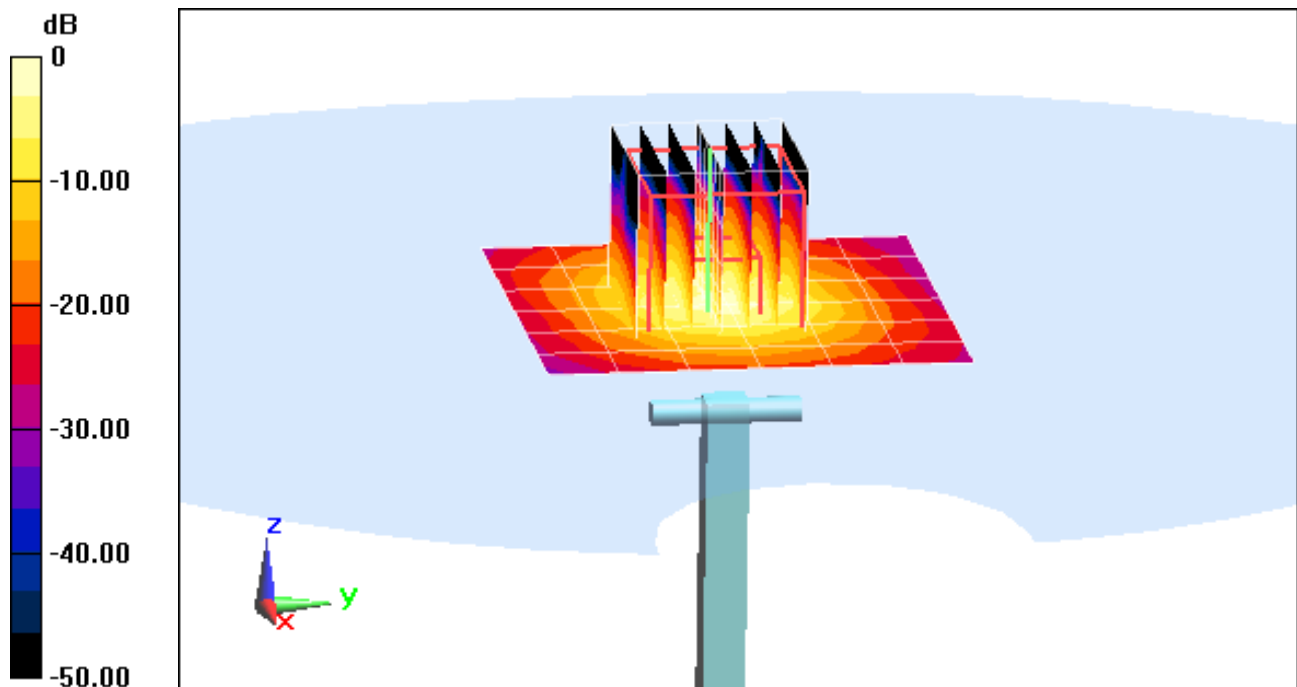
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 34.1 W/kg

SAR(1 g) = 7.7 W/kg

Deviation: -7.78%



0 dB = 18.3 W/kg = 12.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5800 MHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head Medium parameters used:

$f = 5800 \text{ MHz}$; $\sigma = 5.264 \text{ S/m}$; $\epsilon_r = 35.891$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 22.8°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3914; ConvF(4.52, 4.52, 4.52); Calibrated: 10/23/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 11/19/2013

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

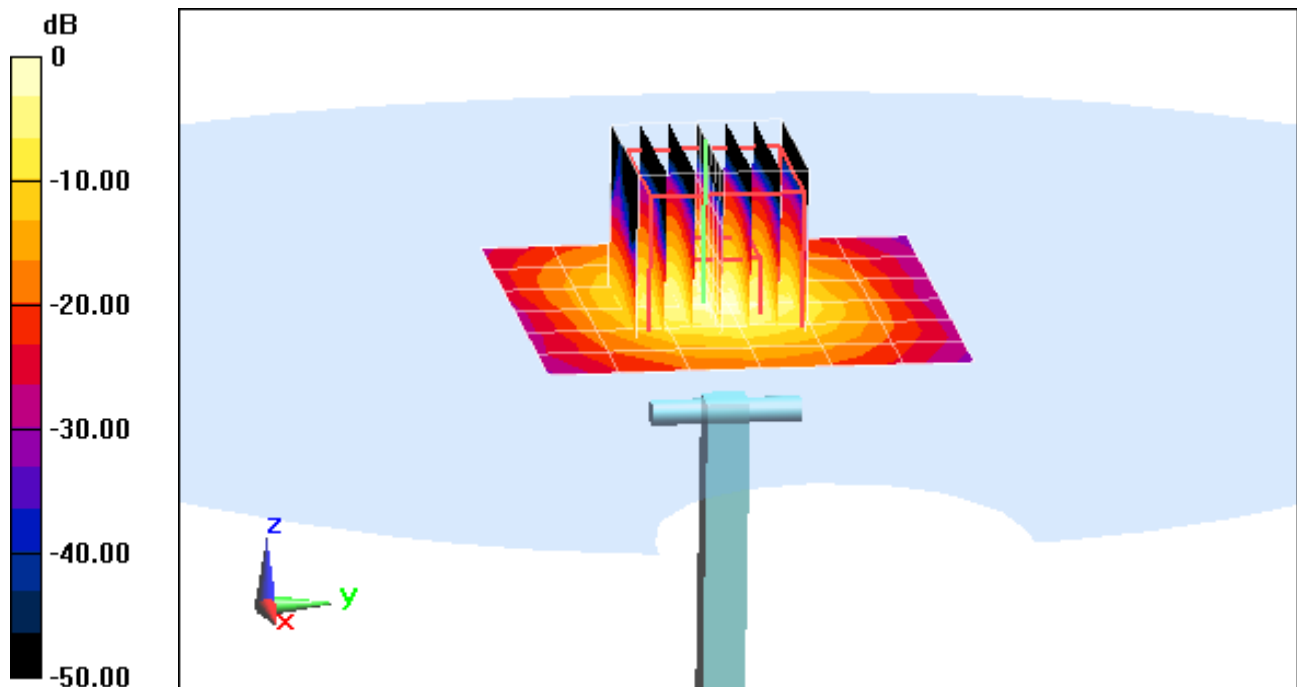
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 35.5 W/kg

SAR(1 g) = 7.7 W/kg

Deviation: -2.90%



PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 750 MHz; Type: D750V3; Serial: 1003

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.978 \text{ S/m}$; $\epsilon_r = 54.814$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 04-17-2014; Ambient Temp: 24.2°C; Tissue Temp: 24.5°C

Probe: ES3DV3 - SN3333; ConvF(6.11, 6.11, 6.11); Calibrated: 11/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 11/19/2013

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

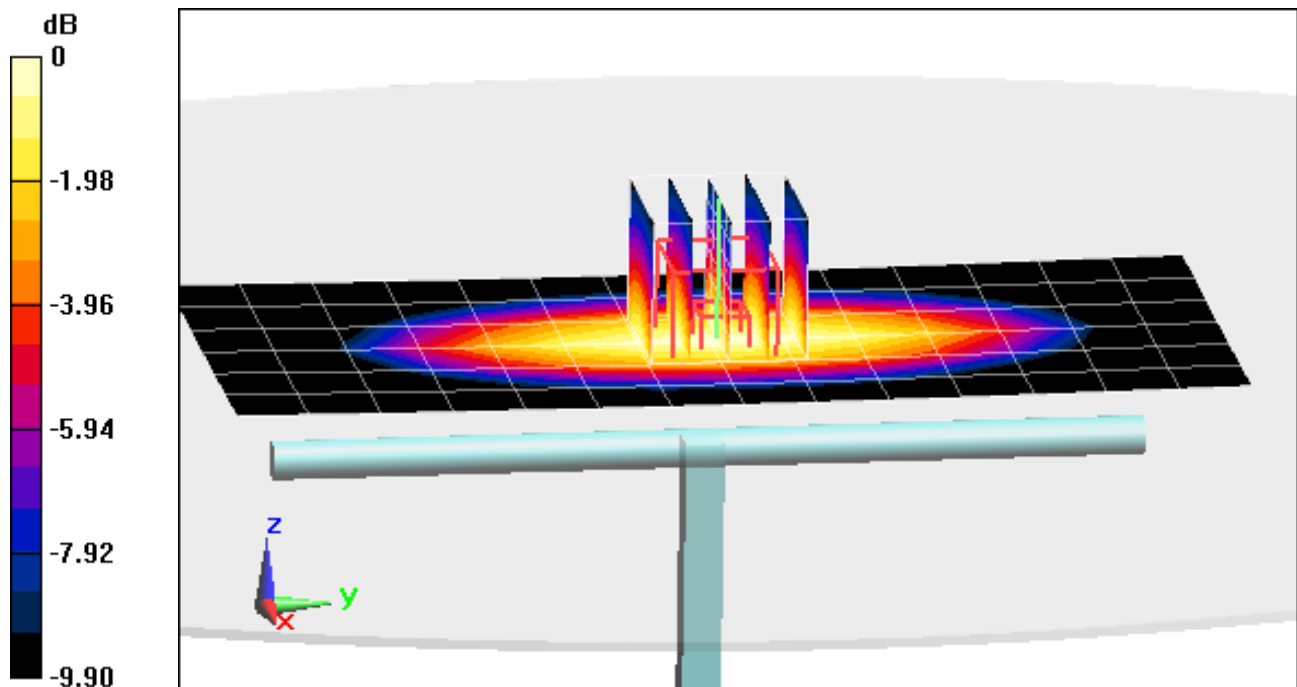
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.873 W/kg

Deviation: -0.46%



0 dB = 0.943 W/kg = -0.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 1.014 \text{ S/m}$; $\epsilon_r = 54.052$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.5 cm

Test Date: 04-17-2014; Ambient Temp: 23.2°C; Tissue Temp: 21.9°C

Probe: ES3DV2 - SN3022; ConvF(5.91, 5.91, 5.91); Calibrated: 8/22/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/21/2013

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

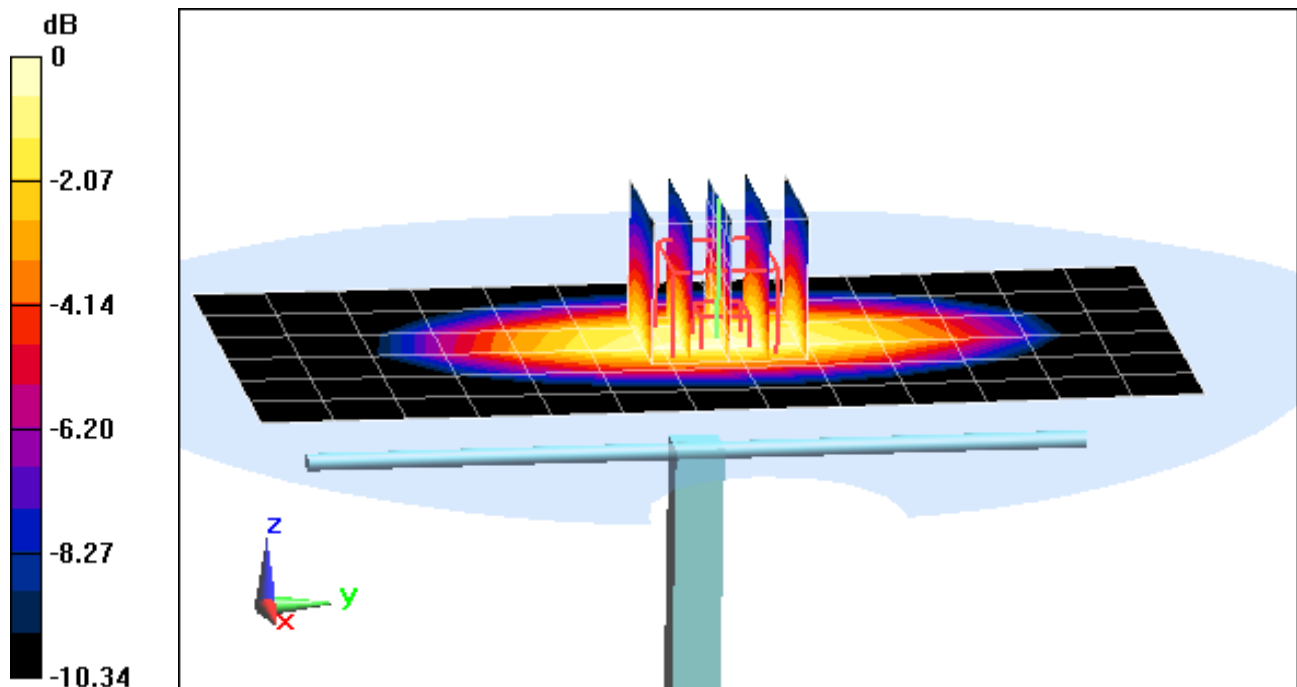
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 0.989 W/kg

Deviation: 6.23%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR 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:

$f = 1750 \text{ MHz}$; $\sigma = 1.46 \text{ S/m}$; $\epsilon_r = 51.705$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-16-2014; Ambient Temp: 21.6°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3332; ConvF(4.93, 4.93, 4.93); Calibrated: 11/25/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 11/18/2013

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

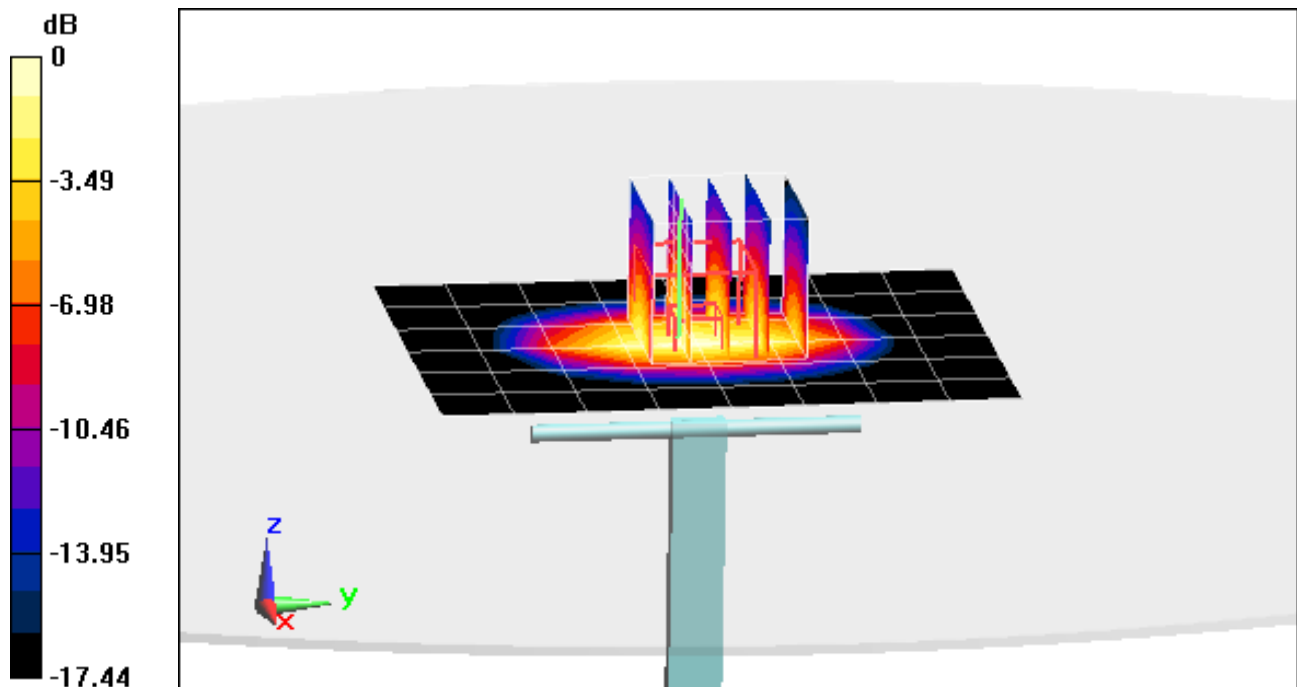
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 6.49 W/kg

SAR(1 g) = 3.66 W/kg

Deviation: -4.19%



0 dB = 4.06 W/kg = 6.09 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR 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):

$f = 1900 \text{ MHz}$; $\sigma = 1.552 \text{ S/m}$; $\epsilon_r = 52.224$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-17-2014; Ambient Temp: 24.1°C; Tissue Temp: 22.9°C

Probe: EX3DV4 - SN3589; ConvF(6.54, 6.54, 6.54); Calibrated: 1/29/2014;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 1/22/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

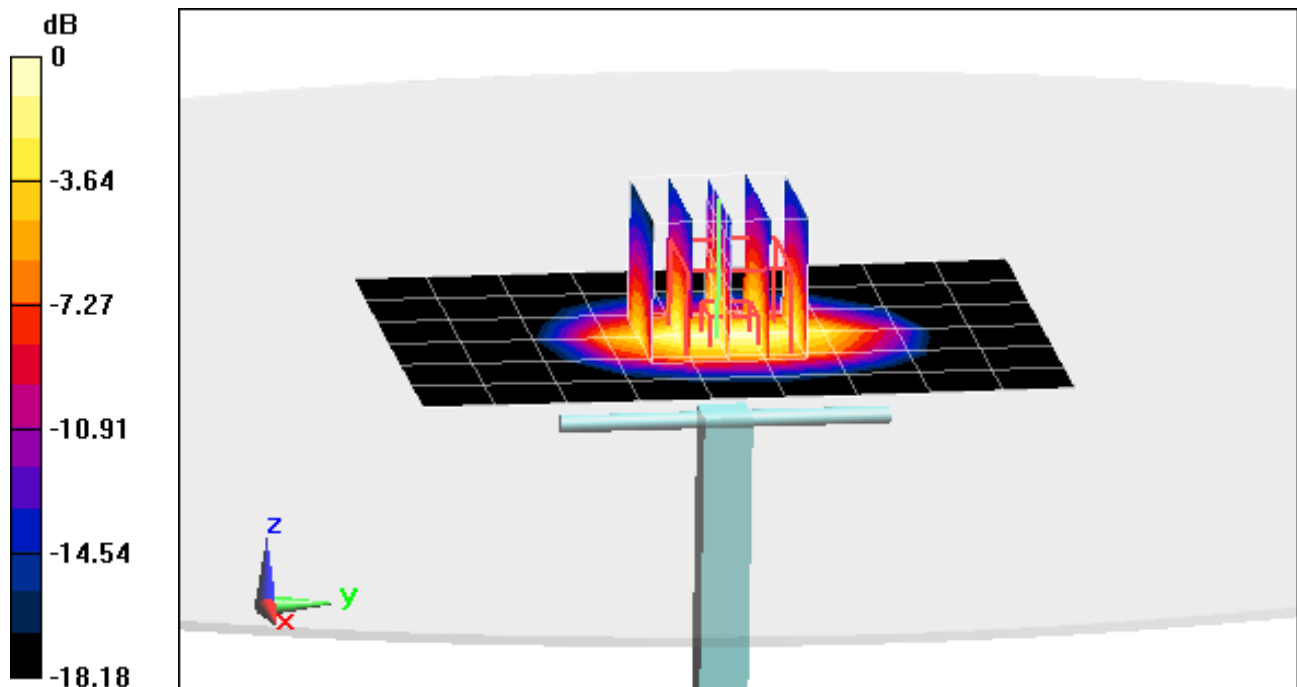
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 7.61 W/kg

SAR(1 g) = 4.16 W/kg

Deviation: 2.72%



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

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.031 \text{ S/m}$; $\epsilon_r = 52.62$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.4°C; Tissue Temp: 23.9°C

Probe: ES3DV3 - SN3258; ConvF(4.14, 4.14, 4.14); 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 (7); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

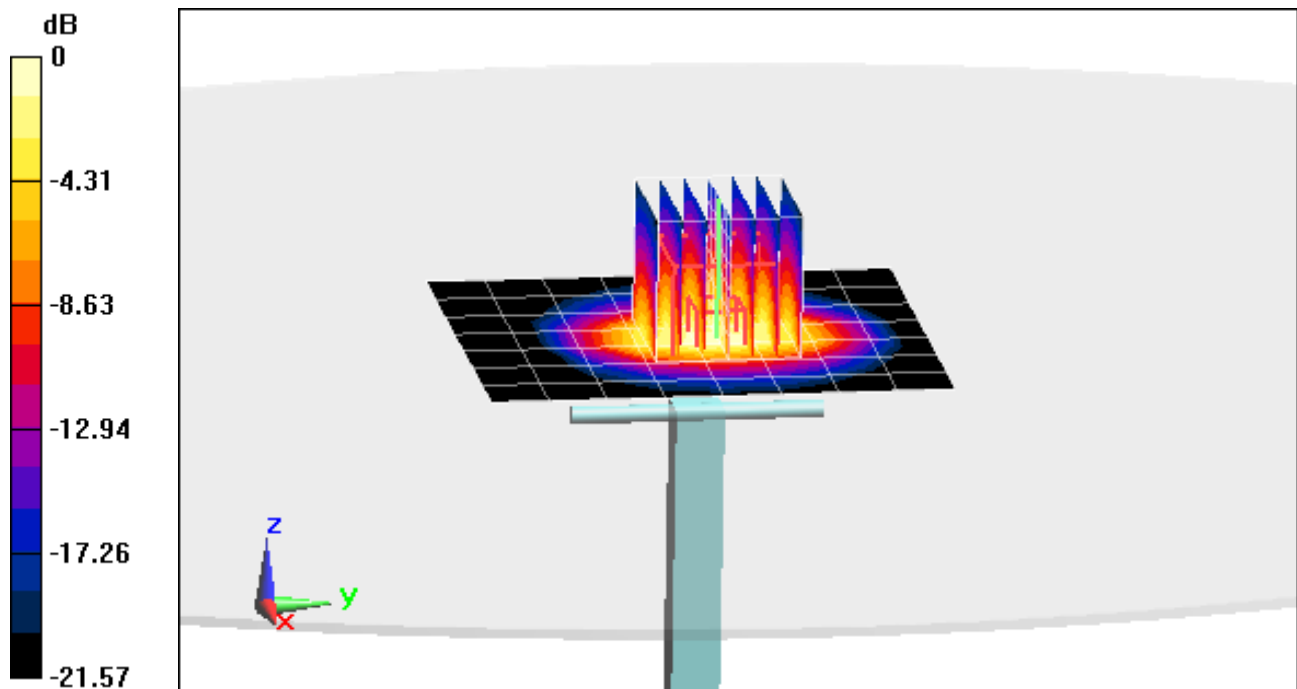
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 4.89 W/kg

Deviation: -1.01%



0 dB = 6.40 W/kg = 8.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5200 MHz; Type: D5GHzV2; Serial: 1007

Communication System: UID 0, CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5200 \text{ MHz}$; $\sigma = 5.334 \text{ S/m}$; $\epsilon_r = 47.102$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(4.23, 4.23, 4.23); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

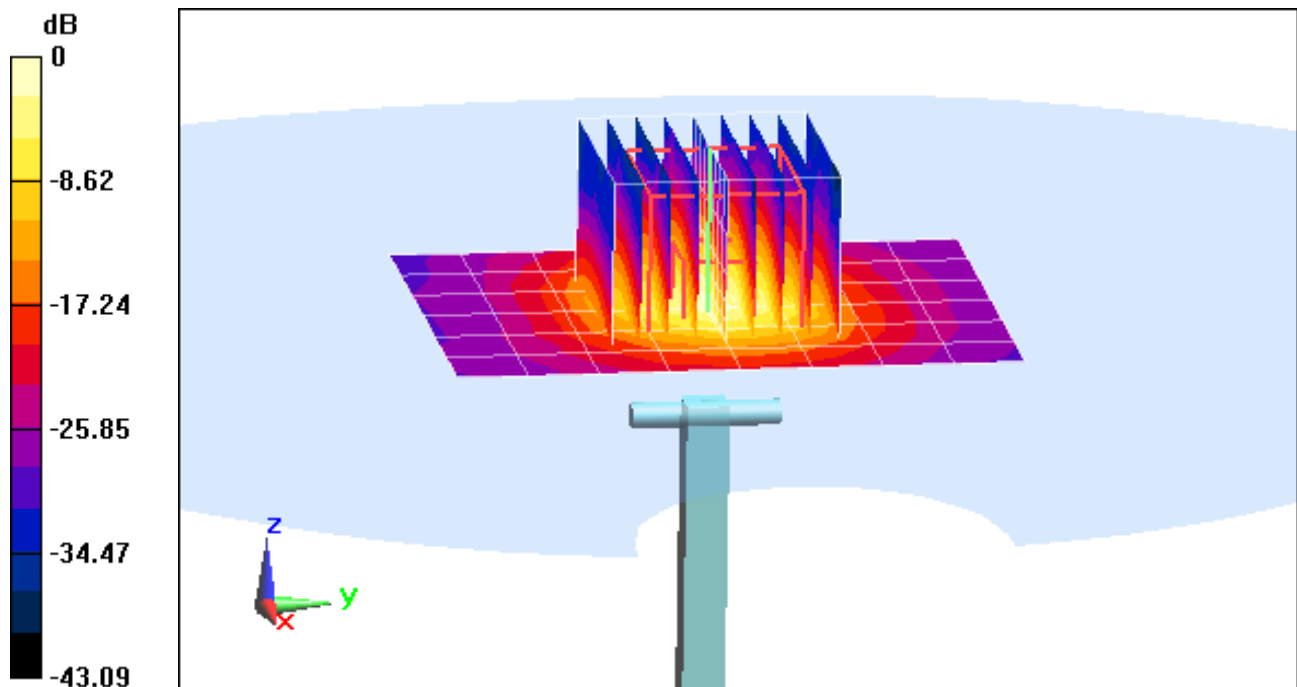
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 31.0 W/kg

SAR(1 g) = 7.82 W/kg

Deviation: 7.71%



0 dB = 19.8 W/kg = 12.97 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5300 MHz; Type: D5GHzV2; Serial: 1007

Communication System: UID 0, CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5300 \text{ MHz}$; $\sigma = 5.469 \text{ S/m}$; $\epsilon_r = 46.859$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(4.11, 4.11, 4.11); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

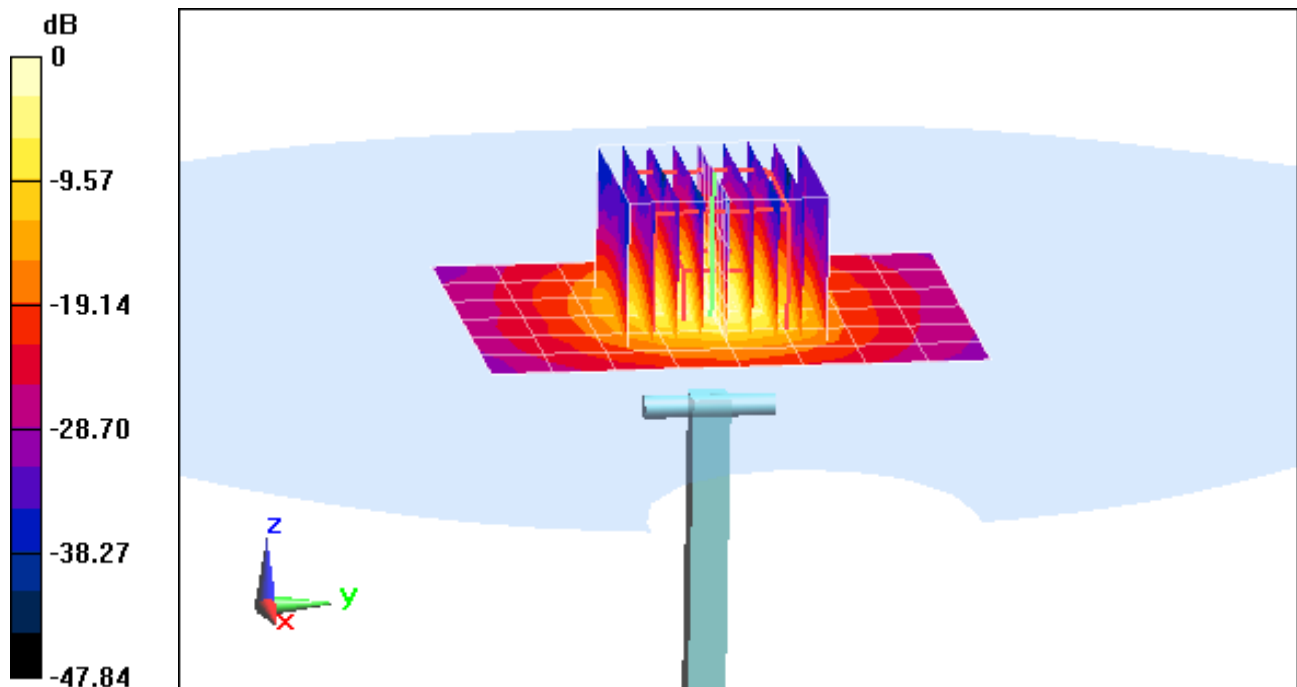
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 7.13 W/kg

Deviation: -4.55%



0 dB = 18.2 W/kg = 12.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5500 MHz; Type: D5GHzV2; Serial: 1007

Communication System: UID 0, CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5500 \text{ MHz}$; $\sigma = 5.745 \text{ S/m}$; $\epsilon_r = 46.42$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(3.8, 3.8, 3.8); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

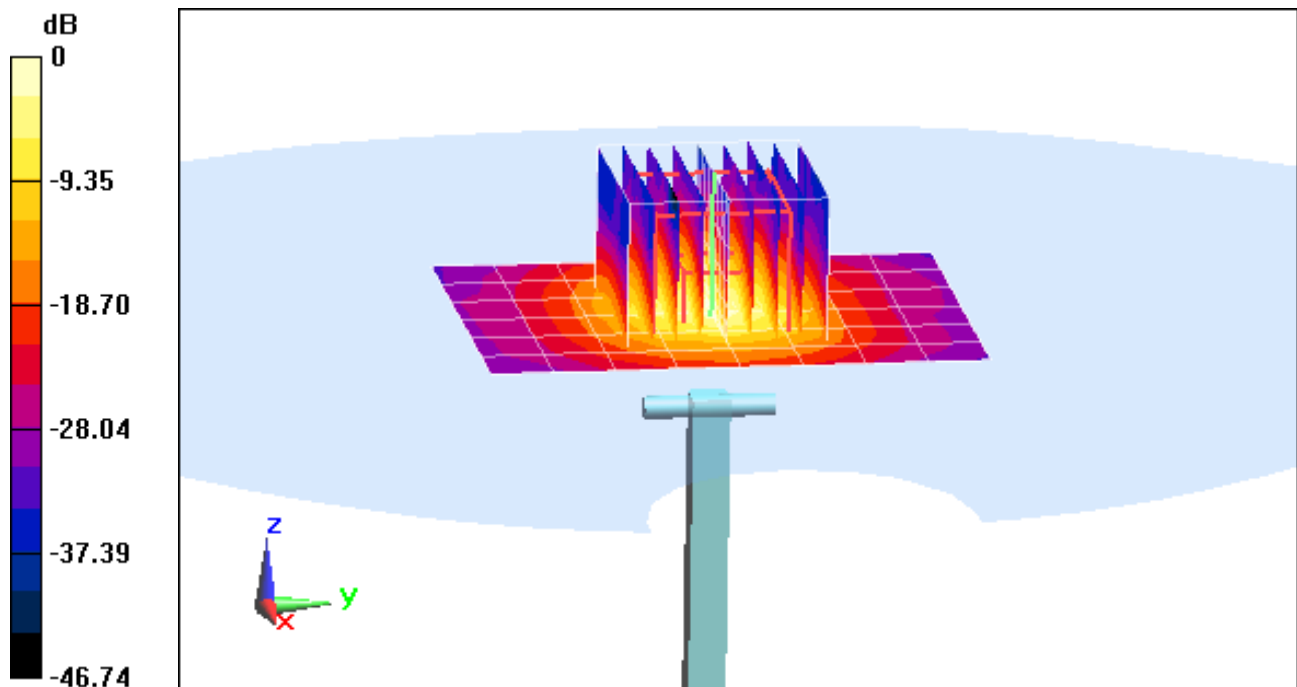
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 32.1 W/kg

SAR(1 g) = 7.66 W/kg

Deviation: 0.92%



0 dB = 20.0 W/kg = 13.01 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5600 MHz; Type: D5GHzV2; Serial: 1007

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 5.903 \text{ S/m}$; $\epsilon_r = 46.237$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(3.62, 3.62, 3.62); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600MHz System Verification

Area Scan (7x9x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

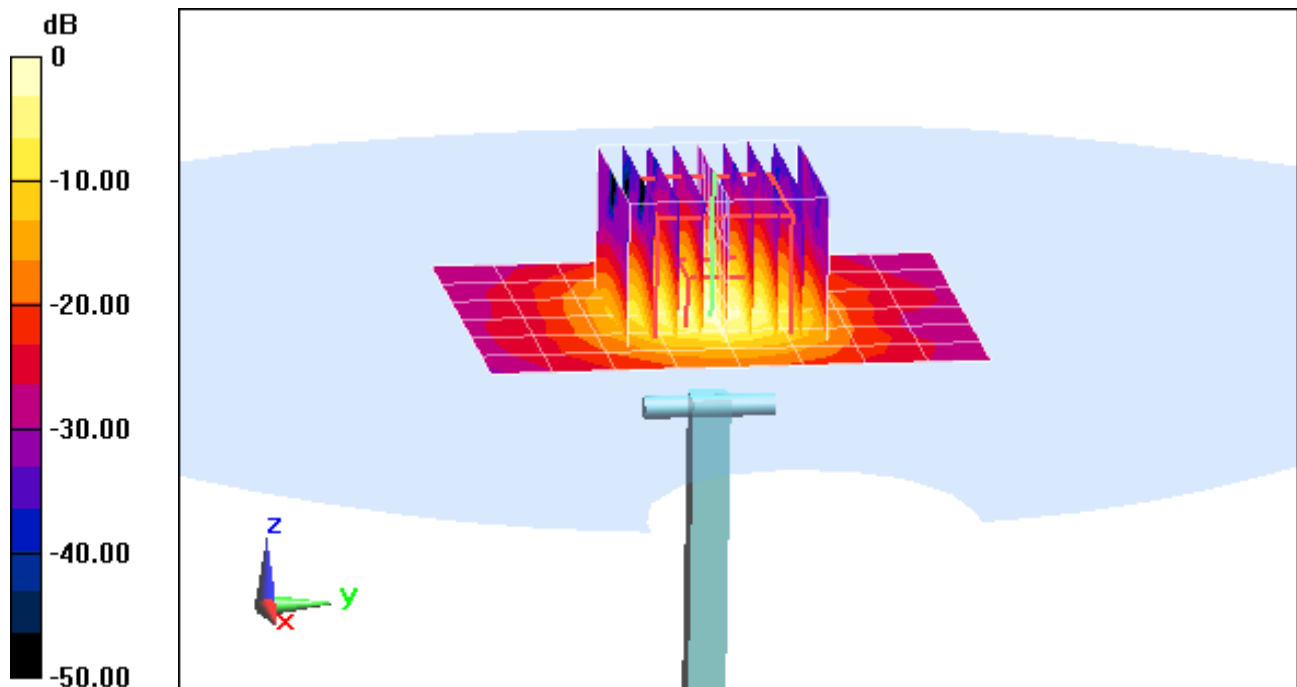
Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 33.3 W/kg

SAR(1 g) = 7.02 W/kg

Deviation: -9.18%



PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

Communication System: UID 0, CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body Medium parameters used:

$f = 5800 \text{ MHz}$; $\sigma = 6.202 \text{ S/m}$; $\epsilon_r = 46.03$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Space: 1.0 cm

Test Date: 04-14-2014; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3920; ConvF(4, 4, 4); Calibrated: 12/18/2013;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 12/12/2013

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357

Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800MHz System Verification

Area Scan (7x9x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

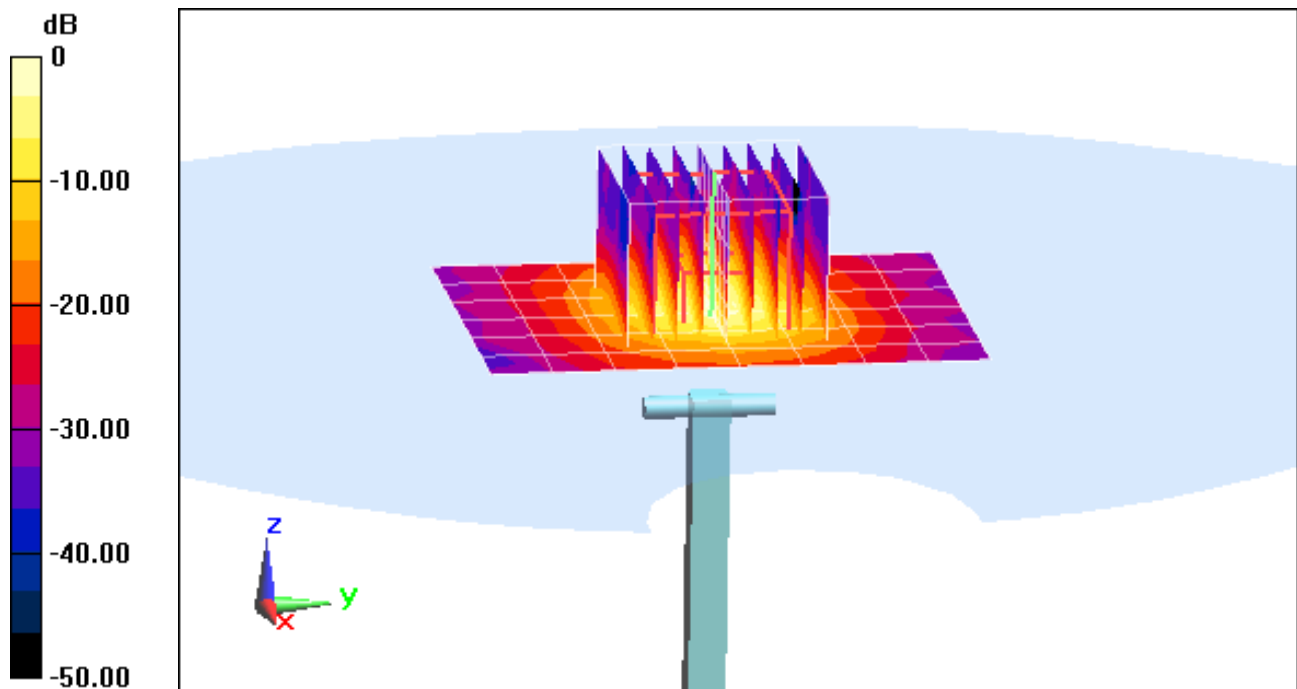
Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Input Power: 20 dBm (100 mW)

Peak SAR (extrapolated) = 35.4 W/kg

SAR(1 g) = 6.98 W/kg

Deviation: -4.25%



0 dB = 19.1 W/kg = 12.81 dBW/kg