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SAR EVALUATION REPORT

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

Date of Testing:
11/07/2016 - 11/12/2016
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1611071706-R1.ZNF

FCC ID: **ZNFW280**

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

DUT Type: Portable Wrist Device
Application Type: Class II Permissive Change
FCC Rule Part(s): CFR §2.1093
Model(s): LG-W280, LGW280, W280, LG-W280A, LGW280A, W280A, LG-W280V, LGW280V, W280V
Permissive Change(s): See FCC Document

Equipment Class	Band & Mode	Tx Frequency	SAR	
			1 gm Head (W/kg)	10 gm Extremity (W/kg)
PCT	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.48	1.99
PCT	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.56	1.53
PCT	UMTS 850	826.40 - 846.60 MHz	0.23	1.32
PCT	UMTS 1750	1712.4 - 1752.6 MHz	0.32	1.89
PCT	UMTS 1900	1852.4 - 1907.6 MHz	0.56	1.37
PCT	LTE Band 13	779.5 - 784.5 MHz	0.16	1.15
PCT	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.19	1.98
PCT	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.46	2.14
PCT	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.59	1.57
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.12	0.35
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			0.80	2.49

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.

Note: This revised Test Report (S/N: 0Y1611071706-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

Randy Ortanez
President

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

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
Bluetooth	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

There is no power reduction used for any band/mode implemented in this device for SAR purposes.

1.3 Nominal and Maximum Output Power Specifications

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

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slot	*1 TX Slot*	*2 TX Slots*	*1 TX Slot*	*2 TX Slots*
GSM/GPRS/EDGE 850	Maximum	**33.2**	**33.2**	**31.2**	**27.7**	**26.7**
	Nominal	**32.7**	**32.7**	**30.7**	**27.2**	**26.2**
GSM/GPRS/EDGE 1900	Maximum	**29.7**	**29.7**	**28.7**	**26.7**	**25.7**
	Nominal	**29.2**	**29.2**	**28.2**	**26.2**	**25.2**

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*
UMTS Band 5 (850 MHz)	Maximum	**23.2**	**23.2**	**23.2**
	Nominal	**22.7**	**22.7**	**22.7**
UMTS Band 4 (1750 MHz)	Maximum	**22.4**	**22.4**	**22.4**
	Nominal	**21.9**	**21.9**	**21.9**
UMTS Band 2 (1900 MHz)	Maximum	**22.4**	**22.4**	**22.4**
	Nominal	**21.9**	**21.9**	**21.9**

Mode / Band		Modulated Average (dBm)
LTE Band 13	Maximum	**23.7**
	Nominal	**23.2**
LTE Band 5 (Cell)	Maximum	**23.7**
	Nominal	**23.2**
LTE Band 4 (AWS)	Maximum	**22.7**
	Nominal	**22.2**
LTE Band 2 (PCS)	Maximum	**22.7**
	Nominal	**22.2**

Mode / Band		Modulated Average (dBm)		
		Ch. 1	Ch. 2-10	Ch. 11
IEEE 802.11b (2.4 GHz)	Maximum	**19.0**	**19.0**	**19.0**
	Nominal	**18.0**	**18.0**	**18.0**
IEEE 802.11g (2.4 GHz)	Maximum	**17.0**	**18.0**	**16.0**
	Nominal	**16.0**	**17.0**	**15.0**
IEEE 802.11n (2.4 GHz)	Maximum	**16.0**	**17.0**	**15.0**
	Nominal	**15.0**	**16.0**	**14.0**

Mode / Band		Modulated Average (dBm)
Bluetooth (1 Mbps)	Maximum	**10.0**
	Nominal	**9.0**
Bluetooth (2 Mbps)	Maximum	**9.0**
	Nominal	**8.0**
Bluetooth (3 Mbps)	Maximum	**9.0**
	Nominal	**8.0**
Bluetooth LE	Maximum	**1.0**

1.4 DUT Antenna Locations

A diagram showing the location of the device antennas can be found in Appendix F.

1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities

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

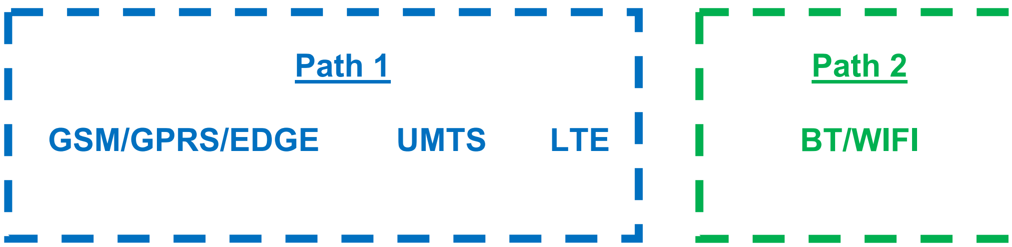

Figure 1-1
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

Table 1-1
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Extremity
1	GSM voice + 2.4 GHz WI-FI	Yes	Yes
2	GSM voice + 2.4 GHz Bluetooth	Yes	Yes
3	UMTS + 2.4 GHz WI-FI	Yes	Yes
4	UMTS + 2.4 GHz Bluetooth	Yes	Yes
5	LTE + 2.4 GHz WI-FI	Yes	Yes
6	LTE + 2.4 GHz Bluetooth	Yes	Yes
7	GPRS/EDGE + 2.4 GHz WI-FI	Yes	Yes
8	GPRS/EDGE + 2.4 GHz Bluetooth	Yes	Yes

1. 2.4 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN scenario.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Per FCC KDB 447498 D01v06, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, head Bluetooth SAR was not required; [(10/10)* √2.480] = 1.6< 3.0. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

Per FCC KDB 447498 D01v06, the 10g SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 7.5$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, extremity Bluetooth SAR was not required; [(10/ 5)* √2.480] = 3.1< 7.5. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

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

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

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

1.8 Guidance Applied

- FCC KDB Publication 941225 D01v03r01, D05v02r04 (2G/3G/4G)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- 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	Extremity Serial Number
GSM/GPRS/EDGE 850	23832	23857
GSM/GPRS/EDGE 1900	23832	23832
UMTS 850	23832	23857
UMTS 1750	23840	23840
UMTS 1900	23832	23832
LTE Band 13	23832	23832
LTE Band 5 (Cell)	23832	23857
LTE Band 4 (AWS)	23840	23840
LTE Band 2 (PCS)	23832	23832
2.4 GHz WLAN	23857	23857

2 LTE INFORMATION

LTE Information			
FCC ID	**ZNFW280**		
Form Factor	Portable Wrist Device		
Frequency Range of each LTE transmission band	LTE Band 13 (779.5 - 784.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
Channel Bandwidths	LTE Band 13: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 13: 5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
LTE Band 13: 10 MHz	N/A	782 (23230)	N/A
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
LTE Band 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	3		
Modulations Supported in UL	QPSK, 16QAM		
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES		
A-MPR (Additional MPR) disabled for SAR Testing?	YES		
LTE Release 10 Additional Information	This device does not support full CA features on 3GPP Release 10. All uplink communications are identical to the Release 8 Specifications. The following LTE Release 10 Features are not supported: Carrier Aggregation, Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS,		

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.

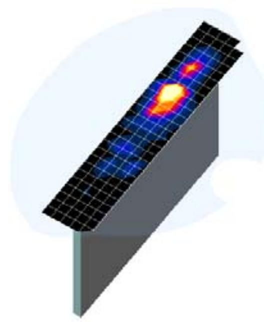

Figure 4-1
Sample SAR Area Scan

2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
    a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
    b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
    c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

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

*Also compliant to IEEE 1528-2013 Table 6

5 TEST CONFIGURATION POSITIONS FOR WRIST-WORN DEVICES

5.1 Device Holder

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

5.2 Positioning for Head

Devices that are designed to be worn on the wrist may operate in speaker mode for voice communication, with the device worn on the wrist and positioned next to the mouth. When next-to-mouth SAR evaluation is required, the device is positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium. The device is evaluated with wrist bands strapped together to represent normal use conditions. The 1-g head SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

5.3 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 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per FCC Guidance, the device was positioned with the wristband hinge of the antenna being evaluated held against the jaw of the SAM phantom, with the strap ends falling under the nose and under the ears. After positioning the DUT around the phantom, the distance between the DUT and the phantom was minimized to represent the spacing created by actual use conditions. There is a 4mm gap at the wristband hinge of DUT that reflects actual use conditions. During post-processing, the probe trajectory information and area/zoom scans were evaluated to ensure adequate probe angles were used during testing. The phantom was filled with body tissue-equivalent medium for extremity use conditions.

6 RF EXPOSURE LIMITS

6.1 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.

6.2 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 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

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

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

7 FCC MEASUREMENT PROCEDURES

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

7.1 Measured and Reported SAR

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

7.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg for 1g SAR and ≤ 3.0 W/kg for 10g SAR, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

7.3 Procedures Used to Establish RF Signal for SAR

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

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a "point SAR" at an arbitrary reference point at the start and end of the 1 gram and 10 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

7.4 SAR Measurement Conditions for UMTS

7.4.1 Output Power Verification

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

7.4.2 Head SAR Measurements

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 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.

7.4.3 Body SAR Measurements

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

7.4.4 SAR Measurements with Rel 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

7.4.5 SAR Measurements with Rel 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

7.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

7.5.1 Spectrum Plots for RB Configurations

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

7.5.2 MPR

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

7.5.3 A-MPR

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

7.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    i. The required channel and offset combination with the highest maximum output power is required for SAR.
    ii. When the reported SAR is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
    iii. When the reported SAR for a required test channel is > 1.45 W/kg for 1g SAR and >3.625 W/kg for 10g SAR, 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 for 1g SAR and < 2.0 W/kg for 10g SAR.
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 for 1g SAR and <3.625 W/kg for 10g SAR.

7.6 SAR Testing with 802.11 Transmitters

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

7.6.1 General Device Setup

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

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

7.6.2 2.4 GHz SAR Test Requirements

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

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is › 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8 RF CONDUCTED POWERS

8.1 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	33.00	33.10	**31.09**	27.58	26.70
	190	32.96	33.02	**31.18**	27.67	26.59
	251	32.99	33.06	**31.16**	27.59	26.61
GSM 1900	512	29.51	29.45	**28.32**	26.59	25.51
	661	29.46	29.50	**28.44**	26.60	25.61
	810	29.35	29.45	**28.39**	26.63	25.55
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	23.97	24.07	**25.07**	18.55	20.68
	190	23.93	23.99	**25.16**	18.64	20.57
	251	23.96	24.03	**25.14**	18.56	20.59
GSM 1900	512	20.48	20.42	**22.30**	17.56	19.49
	661	20.43	20.47	**22.42**	17.57	19.59
	810	20.32	20.42	**22.37**	17.60	19.53
GSM 850	Frame Avg.Targets:	23.67	23.67	**24.68**	18.17	20.18
GSM 1900		20.17	20.17	**22.18**	17.17	19.18

Note:

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

GSM Class: B
GPRS Multislot class: 10 (Max 2 Tx uplink slots)
EDGE Multislot class: 10 (Max 2 Tx uplink slots)
DTM Multislot Class: N/A

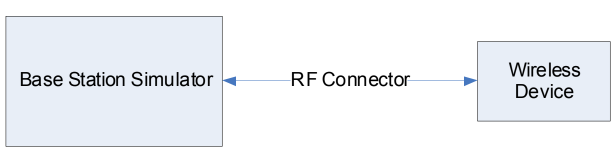

Figure 8-1
Power Measurement Setup

8.2 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.20	23.13	23.11	22.31	22.26	22.34	22.31	22.37	22.26	-
99		12.2 kbps AMR	23.11	23.15	23.10	22.25	22.26	22.15	22.40	22.31	22.26	-
6	HSDPA	Subtest 1	23.01	23.13	23.09	22.24	22.24	22.19	22.17	22.21	22.20	0
6		Subtest 2	23.09	23.20	23.10	22.16	22.21	22.23	22.25	22.18	22.22	0
6		Subtest 3	22.52	22.51	22.49	21.78	21.84	21.85	21.72	21.69	21.75	0.5
6		Subtest 4	22.53	22.67	22.60	21.63	21.76	21.66	21.78	21.69	21.72	0.5
6	HSUPA	Subtest 1	23.06	23.03	23.06	22.13	22.29	22.39	22.25	22.34	22.17	0
6		Subtest 2	21.45	21.43	21.39	20.62	20.63	20.66	20.33	20.49	20.33	2
6		Subtest 3	22.62	22.56	22.43	21.74	21.78	21.69	21.51	21.47	21.64	1
6		Subtest 4	21.70	21.63	21.59	20.82	20.86	20.82	20.90	20.84	20.77	2
6		Subtest 5	23.13	23.13	23.11	22.23	22.37	22.38	22.24	22.30	22.24	0

This device does not support DC-HSDPA.

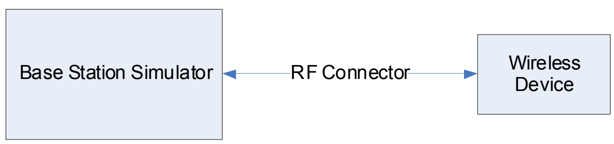

Figure 8-2
Power Measurement Setup

8.3 LTE Conducted Powers

8.3.1 LTE Band 13

Table 8-1
LTE Band 13 Conducted Powers - 10 MHz Bandwidth

LTE Band 13 10 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**23.66**	0	0
	1	25	23.65		0
	1	49	23.51		0
	25	0	22.50	0-1	1
	25	12	22.59		1
	25	25	**22.64**		1
	50	0	22.63		1
16QAM	1	0	22.54	0-1	1
	1	25	22.55		1
	1	49	22.31		1
	25	0	21.26	0-2	2
	25	12	21.56		2
	25	25	21.45		2
	50	0	21.40		2

Table 8-2
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.55	0	0
	1	12	23.65		0
	1	24	23.40		0
	12	0	22.30	0-1	1
	12	6	22.35		1
	12	13	22.46		1
	25	0	22.45		1
16QAM	1	0	22.56	0-1	1
	1	12	22.54		1
	1	24	22.24		1
	12	0	21.56	0-2	2
	12	6	21.35		2
	12	13	21.30		2
	25	0	21.35		2

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

8.3.2 LTE Band 5 (Cell)

Table 8-3
LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.50	0	0
	1	25	23.51		0
	1	49	**23.69**		0
	25	0	**22.69**	0-1	1
	25	12	22.58		1
	25	25	22.54		1
	50	0	22.60		1
16QAM	1	0	22.55	0-1	1
	1	25	22.40		1
	1	49	22.64		1
	25	0	21.60	0-2	2
	25	12	21.54		2
	25	25	21.38		2
	50	0	21.54		2

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

Table 8-4
LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.47	23.50	23.39	0	0
	1	12	23.55	23.55	23.50		0
	1	24	23.42	23.62	23.47		0
	12	0	22.69	22.61	22.60	0-1	1
	12	6	22.53	22.50	22.44		1
	12	13	22.52	22.58	22.63		1
	25	0	22.61	22.67	22.53		1
16QAM	1	0	22.61	22.67	22.41	0-1	1
	1	12	22.33	22.42	22.38		1
	1	24	22.69	22.61	22.60		1
	12	0	21.57	21.61	21.61	0-2	2
	12	6	21.48	21.56	21.55		2
	12	13	21.38	21.35	21.41		2
	25	0	21.48	21.49	21.50		2

Table 8-5
LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.35	23.48	23.45	0	0
	1	7	23.57	23.55	23.46		0
	1	14	23.48	23.70	23.46		0
	8	0	22.66	22.52	22.46	0-1	1
	8	4	22.45	22.42	22.38		1
	8	7	22.46	22.59	22.58		1
	15	0	22.48	22.70	22.37		1
16QAM	1	0	22.67	22.59	22.32	0-1	1
	1	7	22.26	22.34	22.25		1
	1	14	22.61	22.59	22.54		1
	8	0	21.50	21.49	21.65	0-2	2
	8	4	21.35	21.60	21.54		2
	8	7	21.42	21.25	21.39		2
	15	0	21.40	21.44	21.40		2

Table 8-6
LTE Band 5 (Cell) Conducted Powers - 1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.38	23.43	23.27	0	0
	1	2	23.57	23.61	23.45		0
	1	5	23.35	23.55	23.40		0
	3	0	23.70	23.54	23.55		0
	3	2	23.49	23.43	23.41		0
	3	3	23.43	23.63	23.52		0
	6	0	22.59	22.53	22.49	0-1	1
16QAM	1	0	22.70	22.61	22.37	0-1	1
	1	2	22.40	22.36	22.27		1
	1	5	22.66	22.69	22.58		1
	3	0	22.64	22.66	22.65		1
	3	2	22.40	22.50	22.53		1
	3	3	22.40	22.34	22.48		1
	6	0	21.46	21.50	21.52	0-2	2

8.3.3 LTE Band 4 (AWS)

Table 8-7
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	22.59	0	0
	1	50	**22.65**		0
	1	99	22.64		0
	50	0	21.65	0-1	1
	50	25	**21.68**		1
	50	50	21.60		1
	100	0	21.64		1
16QAM	1	0	21.66	0-1	1
	1	50	21.50		1
	1	99	21.32		1
	50	0	20.35	0-2	2
	50	25	20.24		2
	50	50	20.55		2
	100	0	20.46		2

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

Table 8-8
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.60	22.58	22.60	0	0
	1	36	22.47	22.37	22.38		0
	1	74	22.69	22.70	22.55		0
	36	0	21.48	21.48	21.58	0-1	1
	36	18	21.57	21.58	21.50		1
	36	37	21.53	21.41	21.43		1
	75	0	21.52	21.51	21.54		1
16QAM	1	0	21.59	21.45	21.61	0-1	1
	1	36	21.43	21.53	21.38		1
	1	74	21.23	21.24	21.25		1
	36	0	20.41	20.26	20.31	0-2	2
	36	18	20.22	20.50	20.31		2
	36	37	20.66	20.63	20.66		2
	75	0	20.37	20.21	20.21		2

Table 8-9
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.58	22.53	22.53	0	0
	1	25	22.46	22.39	22.42		0
	1	49	22.63	22.62	22.69		0
	25	0	21.38	21.36	21.60	0-1	1
	25	12	21.40	21.54	21.39		1
	25	25	21.51	21.40	21.31		1
	50	0	21.44	21.44	21.47		1
16QAM	1	0	21.52	21.35	21.55	0-1	1
	1	25	21.34	21.39	21.34		1
	1	49	21.50	21.44	21.26		1
	25	0	20.41	20.22	20.33	0-2	2
	25	12	20.25	20.20	20.35		2
	25	25	20.64	20.65	20.67		2
	50	0	20.42	20.20	20.27		2

Table 8-10
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.45	22.57	22.63	0	0
	1	12	22.29	22.36	22.37		0
	1	24	22.63	22.66	22.57		0
	12	0	21.52	21.58	21.50	0-1	1
	12	6	21.61	21.47	21.48		1
	12	13	21.45	21.32	21.24		1
	25	0	21.46	21.43	21.44		1
16QAM	1	0	21.64	21.52	21.47	0-1	1
	1	12	21.52	21.41	21.30		1
	1	24	21.45	21.29	21.46		1
	12	0	20.35	20.26	20.22	0-2	2
	12	6	20.23	20.44	20.26		2
	12	13	20.62	20.65	20.59		2
	25	0	20.38	20.27	20.34		2

Table 8-11
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.62	22.55	22.65	0	0
	1	7	22.50	22.42	22.44		0
	1	14	22.63	22.61	22.61		0
	8	0	21.41	21.33	21.52	0-1	1
	8	4	21.56	21.43	21.37		1
	8	7	21.42	21.29	21.43		1
	15	0	21.47	21.40	21.52		1
16QAM	1	0	21.57	21.34	21.56	0-1	1
	1	7	21.50	21.37	21.29		1
	1	14	21.35	21.46	21.26		1
	8	0	20.47	20.27	20.40	0-2	2
	8	4	20.26	20.55	20.60		2
	8	7	20.46	20.56	20.35		2
	15	0	20.46	20.25	20.29		2

Table 8-12
LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.59	22.61	22.61	0	0
	1	2	22.30	22.30	22.31		0
	1	5	22.70	22.66	22.70		0
	3	0	22.39	22.40	22.60		0
	3	2	22.56	22.61	22.37		0
	3	3	22.36	22.41	22.34		0
	6	0	21.56	21.38	21.55	0-1	1
16QAM	1	0	21.62	21.51	21.55	0-1	1
	1	2	21.43	21.40	21.31		1
	1	5	21.26	21.34	21.25		1
	3	0	21.41	21.30	21.26		1
	3	2	21.52	21.27	21.48		1
	3	3	21.67	21.63	21.67		1
	6	0	20.37	20.21	20.29	0-2	2

8.3.4 LTE Band 2 (PCS)

Table 8-13
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.55	**22.69**	22.55	0	0
	1	50	22.48	22.66	22.45		0
	1	99	22.50	22.55	22.51		0
	50	0	21.34	**21.64**	21.36	0-1	1
	50	25	21.42	21.51	21.45		1
	50	50	21.48	21.61	21.55		1
	100	0	21.41	21.60	21.50		1
16QAM	1	0	21.41	21.55	21.49	0-1	1
	1	50	21.64	21.49	21.56		1
	1	99	21.40	21.56	21.43		1
	50	0	20.69	20.70	20.60	0-2	2
	50	25	20.55	20.70	20.64		2
	50	50	20.48	20.61	20.54		2
	100	0	20.62	20.62	20.58		2

Table 8-14
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 2 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18675 (1857.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19125 (1902.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.49	22.70	22.57	0	0
	1	36	22.50	22.54	22.39		0
	1	74	22.40	22.59	22.48		0
	36	0	21.33	21.60	21.42	0-1	1
	36	18	21.38	21.59	21.39		1
	36	37	21.48	21.47	21.53		1
	75	0	21.36	21.52	21.42		1
16QAM	1	0	21.29	21.51	21.50	0-1	1
	1	36	21.68	21.54	21.53		1
	1	74	21.45	21.43	21.45		1
	36	0	20.63	20.60	20.62	0-2	2
	36	18	20.38	20.65	20.63		2
	36	37	20.45	20.59	20.51		2
	75	0	20.55	20.70	20.60		2

Table 8-15
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 2 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18650 (1855.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19150 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.55	22.63	22.48	0	0
	1	25	22.52	22.68	22.45		0
	1	49	22.47	22.49	22.40		0
	25	0	21.21	21.55	21.38	0-1	1
	25	12	21.35	21.35	21.29		1
	25	25	21.46	21.57	21.54		1
	50	0	21.24	21.58	21.42		1
16QAM	1	0	21.24	21.56	21.45	0-1	1
	1	25	21.57	21.49	21.50		1
	1	49	21.31	21.58	21.37		1
	25	0	20.70	20.68	20.53	0-2	2
	25	12	20.64	20.64	20.69		2
	25	25	20.41	20.65	20.48		2
	50	0	20.53	20.52	20.57		2

Table 8-16
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 2 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18625 (1852.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19175 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.46	22.56	22.60	0	0
	1	12	22.49	22.57	22.46		0
	1	24	22.43	22.58	22.39		0
	12	0	21.43	21.66	21.44	0-1	1
	12	6	21.34	21.43	21.32		1
	12	13	21.45	21.57	21.56		1
	25	0	21.34	21.60	21.52		1
16QAM	1	0	21.31	21.52	21.43	0-1	1
	1	12	21.66	21.37	21.57		1
	1	24	21.36	21.44	21.42		1
	12	0	20.63	20.67	20.61	0-2	2
	12	6	20.55	20.70	20.49		2
	12	13	20.50	20.54	20.43		2
	25	0	20.62	20.54	20.60		2

Table 8-17
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 2 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18615 (1851.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19185 (1908.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.39	22.54	22.54	0	0
	1	7	22.56	22.70	22.38		0
	1	14	22.54	22.40	22.53		0
	8	0	21.30	21.64	21.38	0-1	1
	8	4	21.40	21.61	21.46		1
	8	7	21.46	21.57	21.56		1
	15	0	21.38	21.59	21.33		1
16QAM	1	0	21.41	21.56	21.32	0-1	1
	1	7	21.60	21.44	21.43		1
	1	14	21.33	21.52	21.37		1
	8	0	20.70	20.70	20.60	0-2	2
	8	4	20.60	20.60	20.62		2
	8	7	20.43	20.56	20.46		2
	15	0	20.63	20.64	20.59		2

Table 8-18
LTE Band 2 (PCS) Conducted Powers - 1.4 MHz Bandwidth

LTE Band 2 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18607 (1850.7 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19193 (1909.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.57	22.70	22.49	0	0
	1	2	22.39	22.50	22.44		0
	1	5	22.43	22.49	22.45		0
	3	0	22.40	22.66	22.32		0
	3	2	22.48	22.52	22.32		0
	3	3	22.34	22.48	22.51		0
	6	0	21.50	21.67	21.43	0-1	1
16QAM	1	0	21.46	21.52	21.48	0-1	1
	1	2	21.56	21.55	21.51		1
	1	5	21.33	21.47	21.35		1
	3	0	21.67	21.70	21.58		1
	3	2	21.61	21.67	21.58		1
	3	3	21.54	21.69	21.56		1
	6	0	20.58	20.58	20.58	0-2	2

8.4 WLAN Conducted Powers

Table 8-19
2.4 GHz WLAN Average RF Power

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]	
		IEEE Transmission Mode	
		802.11b	802.11g
2412	1	18.31	16.05
2437	6	**18.69**	17.39
2462	11	18.62	15.15

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

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

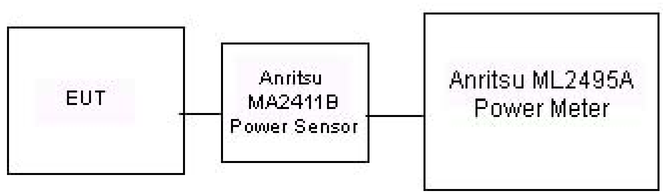

Figure 8-3
Power Measurement Setup

9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
11/8/2016	750H	20.9	740	0.894	42.045	0.893	41.994	0.11%	0.12%
			755	0.908	41.828	0.894	41.916	1.57%	-0.21%
			770	0.922	41.613	0.895	41.838	3.02%	-0.54%
			785	0.936	41.399	0.896	41.760	4.46%	-0.86%
11/9/2016	835H	22.4	820	0.900	42.420	0.899	41.578	0.11%	2.03%
			835	0.914	42.248	0.900	41.500	1.56%	1.80%
			850	0.929	42.079	0.916	41.500	1.42%	1.40%
11/7/2016	1750H	20.8	1710	1.329	40.099	1.348	40.142	-1.41%	-0.11%
			1750	1.370	39.889	1.371	40.079	-0.07%	-0.47%
			1790	1.413	39.730	1.394	40.016	1.36%	-0.71%
11/8/2016	1900H	23.0	1850	1.359	40.032	1.400	40.000	-2.93%	0.08%
			1880	1.388	39.899	1.400	40.000	-0.86%	-0.25%
			1910	1.419	39.770	1.400	40.000	1.36%	-0.57%
11/7/2016	2450H	22.4	2400	1.774	39.026	1.756	39.289	1.03%	-0.67%
			2450	1.827	38.831	1.800	39.200	1.50%	-0.94%
			2500	1.878	38.620	1.855	39.136	1.24%	-1.32%
11/7/2016	750B	22.0	740	0.957	55.419	0.963	55.570	-0.62%	-0.27%
			755	0.971	55.256	0.964	55.512	0.73%	-0.46%
			770	0.986	55.096	0.965	55.453	2.18%	-0.64%
			785	1.001	54.930	0.966	55.395	3.62%	-0.84%
11/12/2016	835B	21.0	820	0.978	53.527	0.969	55.258	0.93%	-3.13%
			835	0.993	53.388	0.970	55.200	2.37%	-3.28%
			850	1.008	53.248	0.988	55.154	2.02%	-3.46%
11/9/2016	1750B	22.2	1710	1.452	51.680	1.463	53.537	-0.75%	-3.47%
			1750	1.497	51.571	1.488	53.432	0.60%	-3.48%
			1790	1.536	51.363	1.514	53.326	1.45%	-3.68%
11/10/2016	1900B	21.8	1850	1.522	51.733	1.520	53.300	0.13%	-2.94%
			1880	1.556	51.608	1.520	53.300	2.37%	-3.17%
			1910	1.592	51.492	1.520	53.300	4.74%	-3.39%
11/7/2016	2450B	23.2	2400	1.921	52.416	1.902	52.767	1.00%	-0.67%
			2450	1.987	52.238	1.950	52.700	1.90%	-0.88%
			2500	2.052	52.048	2.021	52.636	1.53%	-1.12%

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

9.2 Test System Verification

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

Table 9-2
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
I	750	HEAD	11/08/2016	20.5	20.7	0.200	1054	3288	1.600	8.220	8.000	-2.68%
H	835	HEAD	11/09/2016	22.7	22.4	0.200	4d133	3319	1.920	9.320	9.600	3.00%
A	1750	HEAD	11/07/2016	20.7	20.8	0.100	1150	3022	3.590	36.100	35.900	-0.55%
K	1900	HEAD	11/08/2016	23.7	22.4	0.100	5d149	7409	4.060	40.100	40.600	1.25%
G	2450	HEAD	11/07/2016	21.9	22.4	0.100	981	3287	5.160	52.800	51.600	-2.27%

Table 9-3
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
K	750	BODY	11/07/2016	22.5	21.1	0.200	1161	7409	1.130	5.530	5.650	2.17%
D	835	BODY	11/12/2016	20.9	21.1	0.200	4d133	3213	1.330	6.200	6.650	7.26%
C	1750	BODY	11/09/2016	24.3	22.2	0.100	1150	7410	2.080	19.500	20.800	6.67%
H	1900	BODY	11/10/2016	22.4	21.8	0.100	5d149	3319	2.090	21.100	20.900	-0.95%
E	2450	BODY	11/07/2016	22.3	22.1	0.100	797	7406	2.270	24.200	22.700	-6.20%

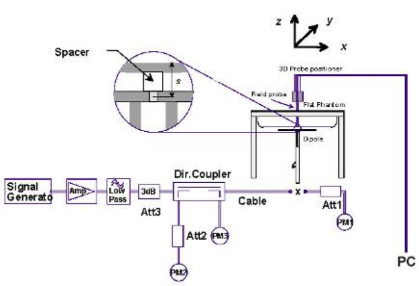

Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Head SAR Data

Table 10-1
GSM/UMTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.2	32.96	-0.13	10 mm	23832	1	1:8.3	front	0.356	1.057	0.376	
836.60	190	GSM 850	GPRS	31.2	31.18	0.13	10 mm	23832	2	1:4.15	front	0.478	1.005	0.480	A1
1880.00	661	GSM 1900	GSM	29.7	29.46	-0.13	10 mm	23832	1	1:8.3	front	0.390	1.057	0.412	
1880.00	661	GSM 1900	GPRS	28.7	28.44	-0.17	10 mm	23832	2	1:4.15	front	0.529	1.062	0.562	A2
836.60	4183	UMTS 850	RMC	23.2	23.13	0.10	10 mm	23832	N/A	1:1	front	0.230	1.016	0.234	A3
1732.40	1412	UMTS 1750	RMC	22.4	22.26	0.02	10 mm	23840	N/A	1:1	front	0.314	1.033	0.324	A4
1880.00	9400	UMTS 1900	RMC	22.4	22.37	-0.07	10 mm	23832	N/A	1:1	front	0.556	1.007	0.560	A5
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 10-2
LTE Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	23.7	23.66	-0.02	0	23832	QPSK	1	0	10 mm	front	1:1	0.160	1.009	0.161	A6
782.00	23230	Mid	LTE Band 13	10	22.7	22.64	0.04	1	23832	QPSK	25	25	10 mm	front	1:1	0.138	1.014	0.140	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.7	23.69	0.17	0	23832	QPSK	1	49	10 mm	front	1:1	0.189	1.002	0.189	A7
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.7	22.69	0.08	1	23832	QPSK	25	0	10 mm	front	1:1	0.147	1.002	0.147	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.7	22.65	-0.15	0	23840	QPSK	1	50	10 mm	front	1:1	0.453	1.012	0.458	A8
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.7	21.68	-0.18	1	23840	QPSK	50	25	10 mm	front	1:1	0.340	1.005	0.342	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.7	22.69	-0.15	0	23832	QPSK	1	0	10 mm	front	1:1	0.587	1.002	**0.588**	A9
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.64	-0.05	1	23832	QPSK	50	0	10 mm	front	1:1	0.513	1.014	0.520	
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 10-3
2.4 GHz WLAN Head SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	19.0	18.69	-0.14	10 mm	23857	1	front	99.0	0.131	0.107	1.074	1.010	**0.116**	A10
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram										

10.2 Standalone Extremity SAR Data

Table 10-4
GPRS/UMTS Extremity SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	31.2	31.18	-0.08	0 mm	23857	2	1:4.15	back	1.980	1.005	1.990	A11
1880.00	661	GSM 1900	GPRS	28.7	28.44	-0.14	0 mm	23832	2	1:4.15	back	1.440	1.062	1.529	A12
836.60	4183	UMTS 850	RMC	23.2	23.13	0.03	0 mm	23857	N/A	1:1	back	1.300	1.016	1.321	A13
1732.40	1412	UMTS 1750	RMC	22.4	22.26	-0.01	0 mm	23840	N/A	1:1	back	1.830	1.033	1.890	A14
1880.00	9400	UMTS 1900	RMC	22.4	22.37	-0.06	0 mm	23832	N/A	1:1	back	1.360	1.007	1.370	A15
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Extremity 4.0 W/kg (mW/g) averaged over 10 grams								

Table 10-5
LTE Extremity SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	23.7	23.66	0.15	0	23832	QPSK	1	0	0 mm	back	1:1	1.140	1.009	1.150	A16
782.00	23230	Mid	LTE Band 13	10	22.7	22.64	-0.13	1	23832	QPSK	25	25	0 mm	back	1:1	1.000	1.014	1.014	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.7	23.69	-0.13	0	23857	QPSK	1	49	0 mm	back	1:1	1.980	1.002	1.984	A17
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.7	22.69	0.05	1	23857	QPSK	25	0	0 mm	back	1:1	1.650	1.002	1.653	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.7	22.65	-0.14	0	23840	QPSK	1	50	0 mm	back	1:1	2.110	1.012	2.135	A18
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.7	21.68	-0.12	1	23840	QPSK	50	25	0 mm	back	1:1	1.470	1.005	1.477	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.7	21.64	-0.02	1	23840	QPSK	100	0	0 mm	back	1:1	1.740	1.014	1.764	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.7	22.65	-0.16	0	23840	QPSK	1	50	0 mm	back	1:1	2.010	1.012	2.034	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.7	22.69	-0.08	0	23832	QPSK	1	0	0 mm	back	1:1	1.570	1.002	1.573	A19
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.64	-0.07	1	23832	QPSK	50	0	0 mm	back	1:1	1.440	1.014	1.460	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Extremity 4.0 W/kg (mW/g) averaged over 10 grams										

Blue entry represents variability measurement

Table 10-6
2.4 GHz WLAN Extremity SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	19.0	18.69	-0.04	0 mm	23857	1	back	99.0	0.983	0.325	1.074	1.010	0.353	A20
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Extremity 4.0 W/kg (mW/g) averaged over 10 grams										

10.3 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg for 1g SAR and 2.0 W/kg for 10g SAR. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
7. Per FCC Guidance, the device was positioned with the wristband hinge of the antenna being evaluated held against the jaw of the SAM phantom, with the strap ends falling under the nose and under the ears for extremity SAR. After positioning the DUT around the phantom, the distance between the DUT and the phantom was minimized to represent the spacing created by actual use conditions. The probe trajectory information and area/zoom scans were evaluated to ensure adequate probe angles were used during testing.
8. There is a 4mm gap at the wristband hinge of DUT that reflects actual use conditions.

GSM Test Notes:

1. 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 extremity 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.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
3. GPRS was additionally evaluated for head exposure condition to address possible VoIP scenarios.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 7.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

WLAN Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.6.2 for more information.
2. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
3. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

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

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g or 10-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg or ≤4.0 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 b), the following equations must be used to estimate the standalone 1g and 10g SAR for simultaneous transmission assessment involving that transmitter.

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

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{18.75} * \frac{\text{(Max Power of channel, mW)}}{\text{Min. Separation Distance, mm}}$$

Table 11-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Head)	Estimated SAR (Head)	Separation Distance (Extremity)	Estimated SAR (Extremity)
	[MHz]	[dBm]	[mm]	[W/kg]	[mm]	[W/kg]
Bluetooth	2480	10.00	10	0.210	5	0.168

Note: Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation. A separation distance of 5 mm is used for distances < 5mm.

11.3 Head SAR Simultaneous Transmission Analysis

Table 11-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Head at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	GPRS 850	0.480	0.116	0.596
	GPRS 1900	0.562	0.116	0.678
	UMTS 850	0.234	0.116	0.350
	UMTS 1750	0.324	0.116	0.440
	UMTS 1900	0.560	0.116	0.676
	LTE Band 13	0.161	0.116	0.277
	LTE Band 5 (Cell)	0.189	0.116	0.305
	LTE Band 4 (AWS)	0.458	0.116	0.574
	LTE Band 2 (PCS)	0.588	0.116	**0.704**

Table 11-3
Simultaneous Transmission Scenario with Bluetooth (Head at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Head SAR	GPRS 850	0.480	0.210	0.690
	GPRS 1900	0.562	0.210	0.772
	UMTS 850	0.234	0.210	0.444
	UMTS 1750	0.324	0.210	0.534
	UMTS 1900	0.560	0.210	0.770
	LTE Band 13	0.161	0.210	0.371
	LTE Band 5 (Cell)	0.189	0.210	0.399
	LTE Band 4 (AWS)	0.458	0.210	0.668
	LTE Band 2 (PCS)	0.588	0.210	**0.798**

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.

11.4 Extremity Simultaneous Transmission Analysis

Table 11-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Extremity at 0.0 cm)

Exposure Condition	Mode	3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Extremity SAR	GSM 850	1.990	0.353	2.343
	GSM 1900	1.529	0.353	1.882
	UMTS 850	1.321	0.353	1.674
	UMTS 1750	1.890	0.353	2.243
	UMTS 1900	1.370	0.353	1.723
	LTE Band 13	1.150	0.353	1.503
	LTE Band 5 (Cell)	1.984	0.353	2.337
	LTE Band 4 (AWS)	2.135	0.353	**2.488**
	LTE Band 2 (PCS)	1.573	0.353	1.926

Table 11-5
Simultaneous Transmission Scenario with Bluetooth (Extremity at 0.0 cm)

Exposure Condition	Mode	3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Extremity SAR	GSM 850	1.990	0.168	2.158
	GSM 1900	1.529	0.168	1.697
	UMTS 850	1.321	0.168	1.489
	UMTS 1750	1.890	0.168	2.058
	UMTS 1900	1.370	0.168	1.538
	LTE Band 13	1.150	0.168	1.318
	LTE Band 5 (Cell)	1.984	0.168	2.152
	LTE Band 4 (AWS)	2.135	0.168	**2.303**
	LTE Band 2 (PCS)	1.573	0.168	1.741

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.

11.5 Simultaneous Transmission Conclusion

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

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

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

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

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

Table 12-1
Extremity SAR Measurement Variability Results

EXTREMITY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1732.50	20175	LTE Band 4 (AWS), 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	back	0 mm	2.110	2.010	1.05	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Extremity 4.0 W/kg (mW/g) averaged over 10 grams							

12.2 Measurement Uncertainty

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

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753E	(30kHz-6GHz) Network Analyzer	3/2/2016	Annual	3/2/2017	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	6/28/2016	Annual	6/28/2017	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/19/2016	Annual	8/19/2017	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	3/5/2016	Annual	3/5/2017	US40053896
Agilent	E4438C	ESG Vector Signal Generator	2/27/2016	Annual	2/27/2017	MY45091346
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/2/2016	Annual	3/2/2017	MY45470194
Agilent	N5182A	MXG Vector Signal Generator	2/27/2016	Annual	2/27/2017	MY47420651
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1231535
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1231538
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1244512
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1244515
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1126066
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1207470
Anritsu	MA2411B	Pulse Power Sensor	12/7/2015	Annual	12/7/2016	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	ML2496A	Power Meter	3/5/2016	Annual	3/5/2017	1351001
Anritsu	MT8820C	Radio Communication Analyzer	9/15/2016	Annual	9/15/2017	6200901190
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4040	Digital Thermometer	3/18/2015	Biennial	3/18/2017	150194895
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261694
Control Company	4353	Long Stem Thermometer	1/22/2015	Biennial	1/22/2017	150053029
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mitutoyo	CD-6"CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	12/2/2015	Annual	12/2/2016	833855/0010
Rohde & Schwarz	CMW500	Radio Communication Tester	3/25/2016	Annual	3/25/2017	128633
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
SPEAG	D1750V2	1750 MHz SAR Dipole	7/14/2016	Annual	7/14/2017	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	7/15/2016	Annual	7/15/2017	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	797
SPEAG	D2450V2	2450 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	981
SPEAG	D750V3	750 MHz SAR Dipole	3/16/2016	Annual	3/16/2017	1054
SPEAG	D750V3	750 MHz SAR Dipole	7/13/2016	Annual	7/13/2017	1161
SPEAG	D835V2	835 MHz SAR Dipole	7/14/2016	Annual	7/14/2017	4d133
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2016	Annual	5/11/2017	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2016	Annual	2/18/2017	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/12/2016	Annual	7/12/2017	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/22/2016	Annual	8/22/2017	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/14/2016	Annual	3/14/2017	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/14/2016	Annual	4/14/2017	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/15/2016	Annual	1/15/2017	1466
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	3/1/2016	Annual	3/1/2017	1102
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2016	Annual	5/10/2017	1070
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/19/2016	Annual	7/19/2017	1039
SPEAG	ES3DV2	SAR Probe	7/19/2016	Annual	7/19/2017	3022
SPEAG	ES3DV3	SAR Probe	2/19/2016	Annual	2/19/2017	3213
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	ES3DV3	SAR Probe	8/24/2016	Annual	8/24/2017	3288
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3319
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7406
SPEAG	EX3DV4	SAR Probe	5/17/2016	Annual	5/17/2017	7409
SPEAG	EX3DV4	SAR Probe	7/25/2016	Annual	7/25/2017	7410

Note:

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

14 MEASUREMENT UNCERTAINTIES

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

15 CONCLUSION

15.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

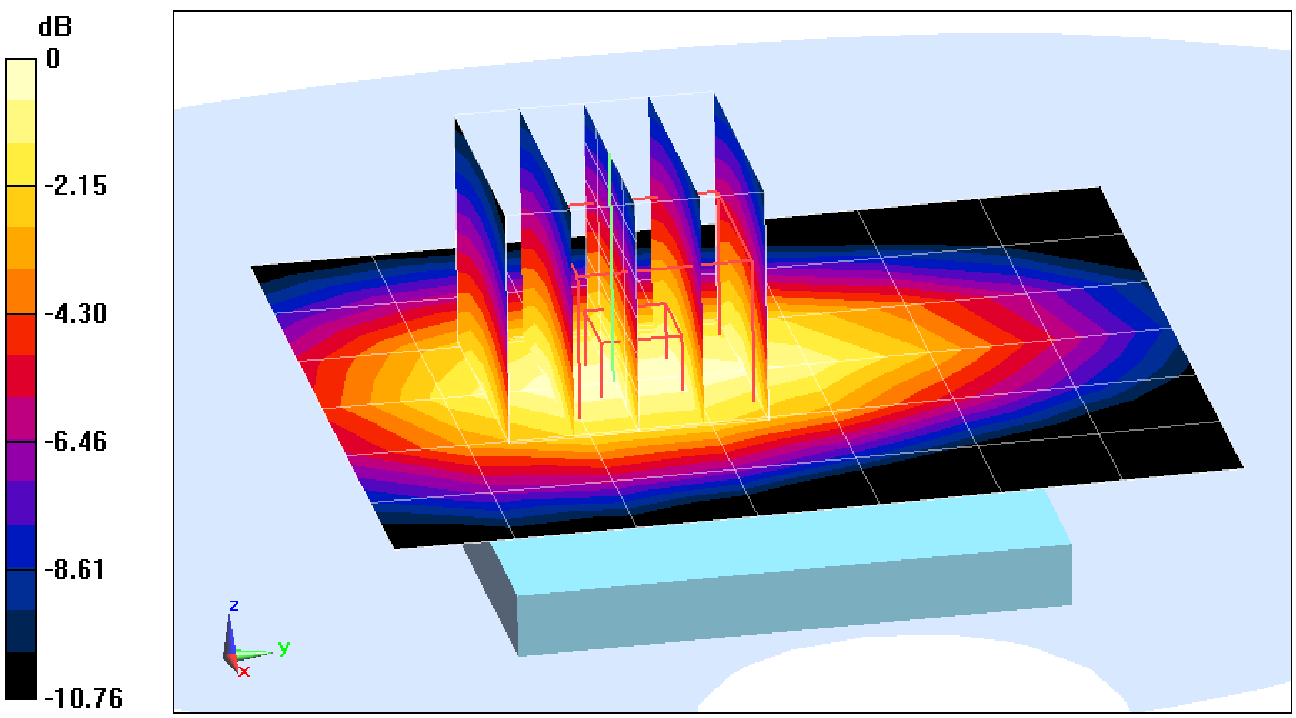
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium: 835 Head Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.916$ S/m; $\varepsilon_r = 42.23$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-09-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Head SAR, Front Side, Mid.ch, 2 Tx Slots

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.25 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.655 W/kg
SAR(1 g) = 0.478 W/kg



0 dB = 0.548 W/kg = -2.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

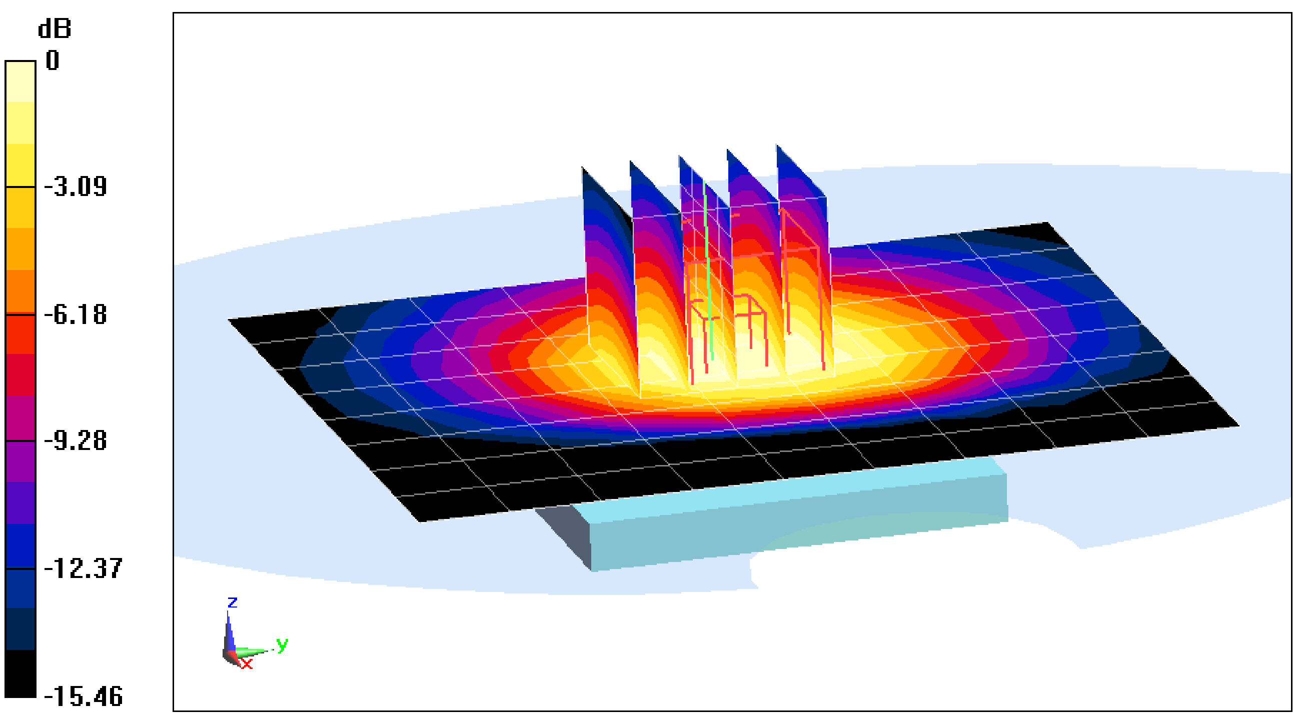
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; $\sigma = 1.388$ S/m; $\varepsilon_r = 39.899$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-08-2016; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.69, 7.69, 7.69); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Head SAR, Front Side, Mid.ch, 2 Tx Slots

Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.21 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.844 W/kg
SAR(1 g) = 0.529 W/kg



0 dB = 0.726 W/kg = -1.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

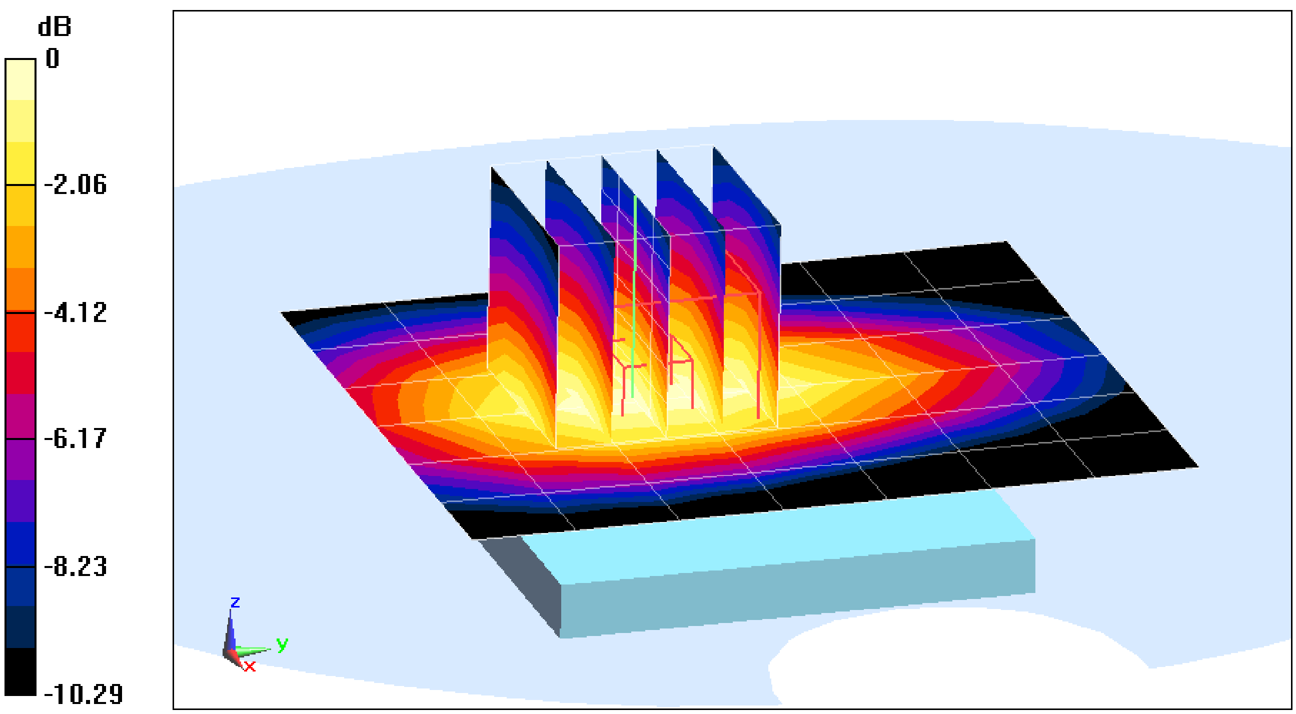
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.916 S/m; ε_r = 42.23; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-09-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Head SAR, Front Side, Mid.ch

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.67 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.312 W/kg
SAR(1 g) = 0.230 W/kg



0 dB = 0.262 W/kg = -5.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23840

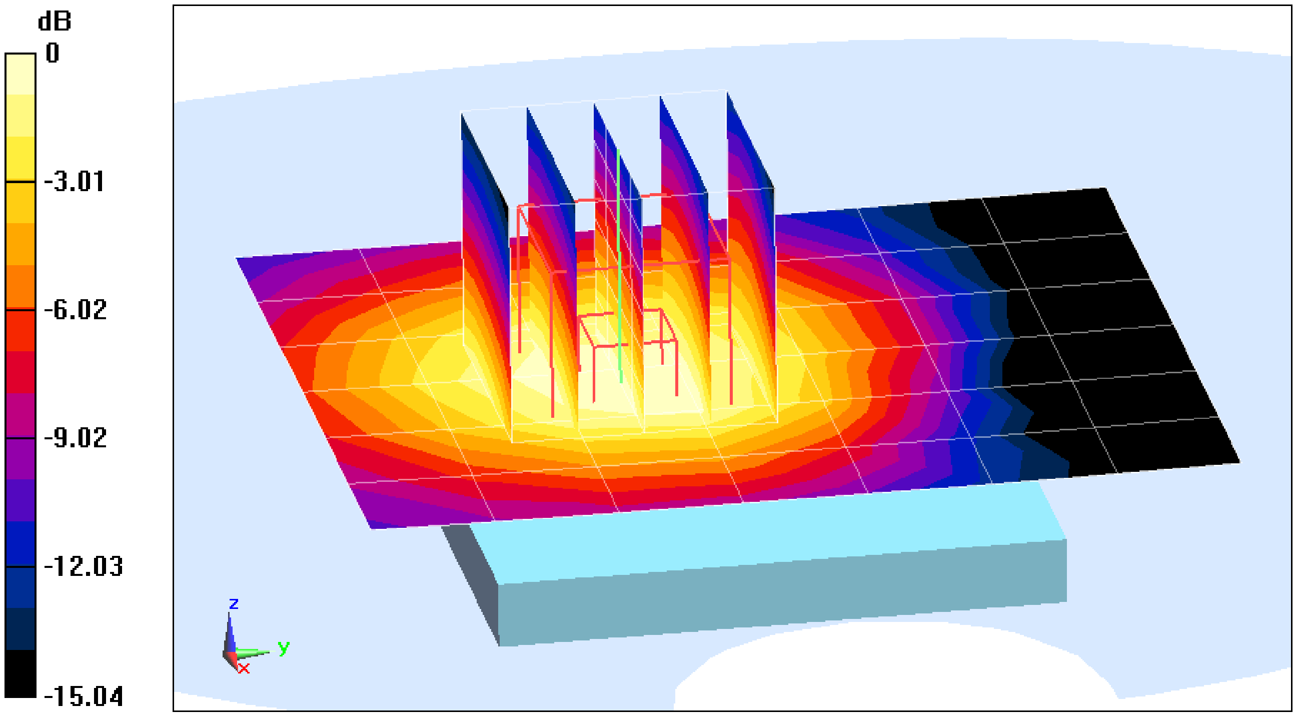
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.352 S/m; ε_r = 39.981; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 20.7°C; Tissue Temp: 20.8°C

Probe: ES3DV2 - SN3022; ConvF(5.15, 5.15, 5.15); Calibrated: 7/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/15/2016
Phantom: SAM Main; Type: QD000P40CC; Serial: TP 1114
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Head SAR, Front Side, Mid.ch

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.20 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.487 W/kg
SAR(1 g) = 0.314 W/kg



0 dB = 0.367 W/kg = -4.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

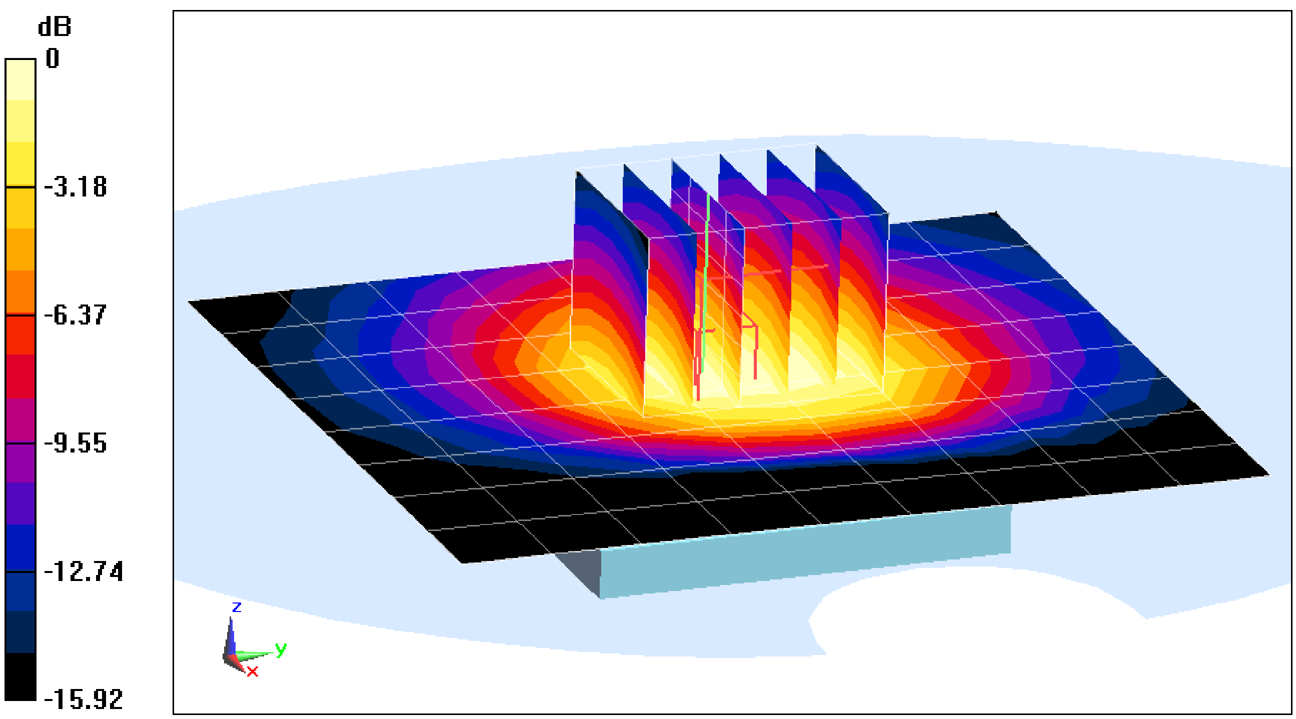
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.388 S/m; ε_r = 39.899; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-08-2016; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.69, 7.69, 7.69); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Head SAR, Front Side, Mid.ch

Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.62 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.556 W/kg



0 dB = 0.762 W/kg = -1.18 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

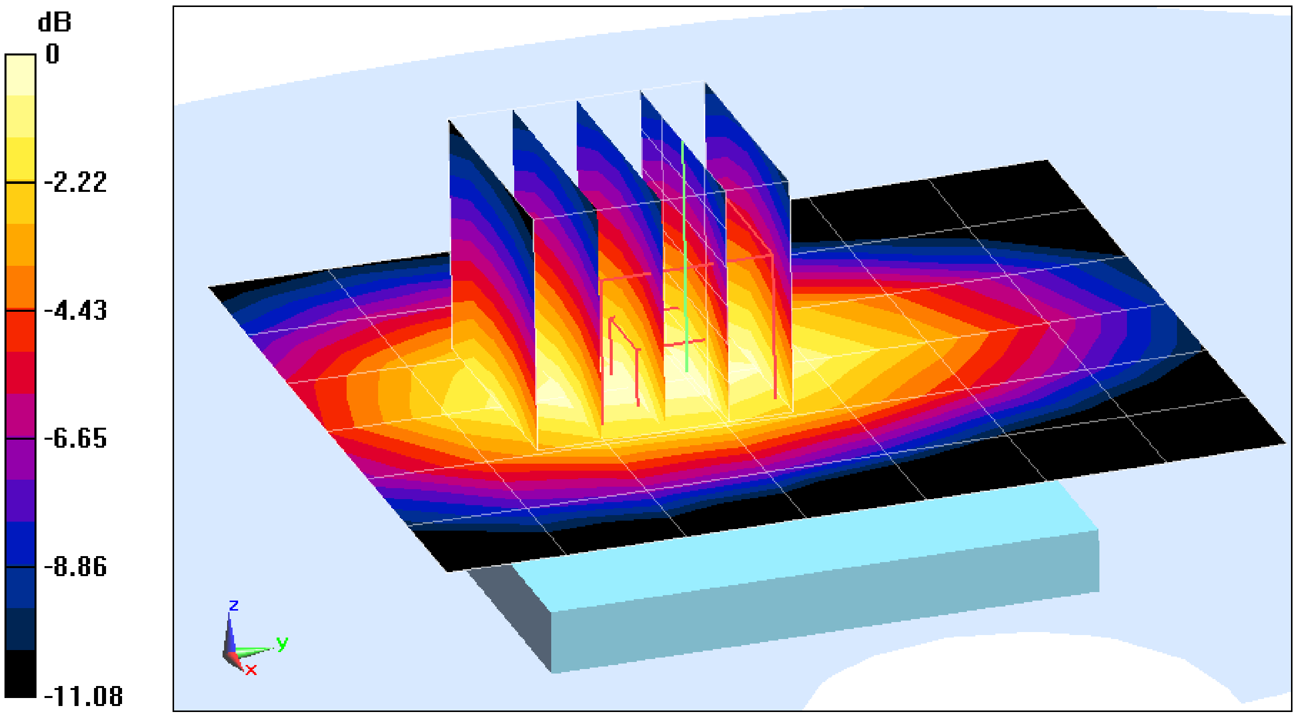
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; $\sigma = 0.933$ S/m; $\varepsilon_r = 41.442$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-08-2016; Ambient Temp: 20.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3288; ConvF(7, 7, 7); Calibrated: 8/24/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.566 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.160 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

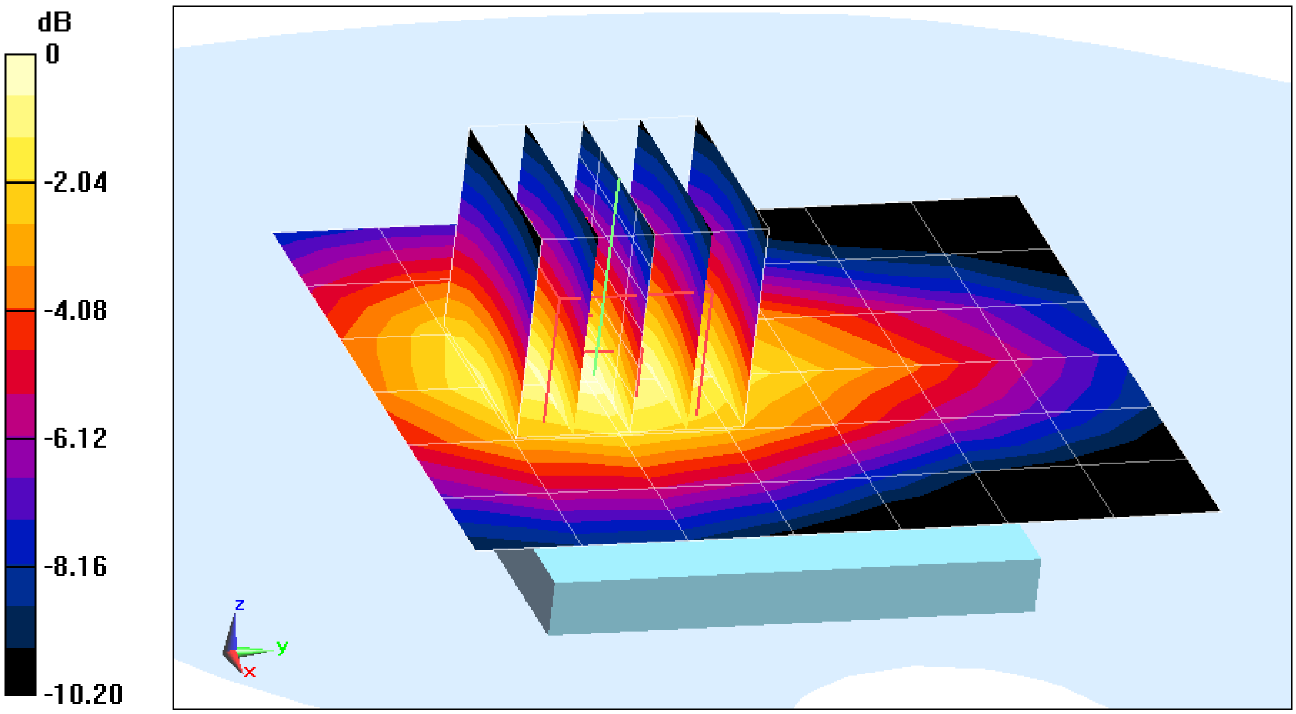
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.915 S/m; ε_r = 42.231; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-09-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell.), Head SAR, Front Side, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.94 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.189 W/kg



0 dB = 0.219 W/kg = -6.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23840

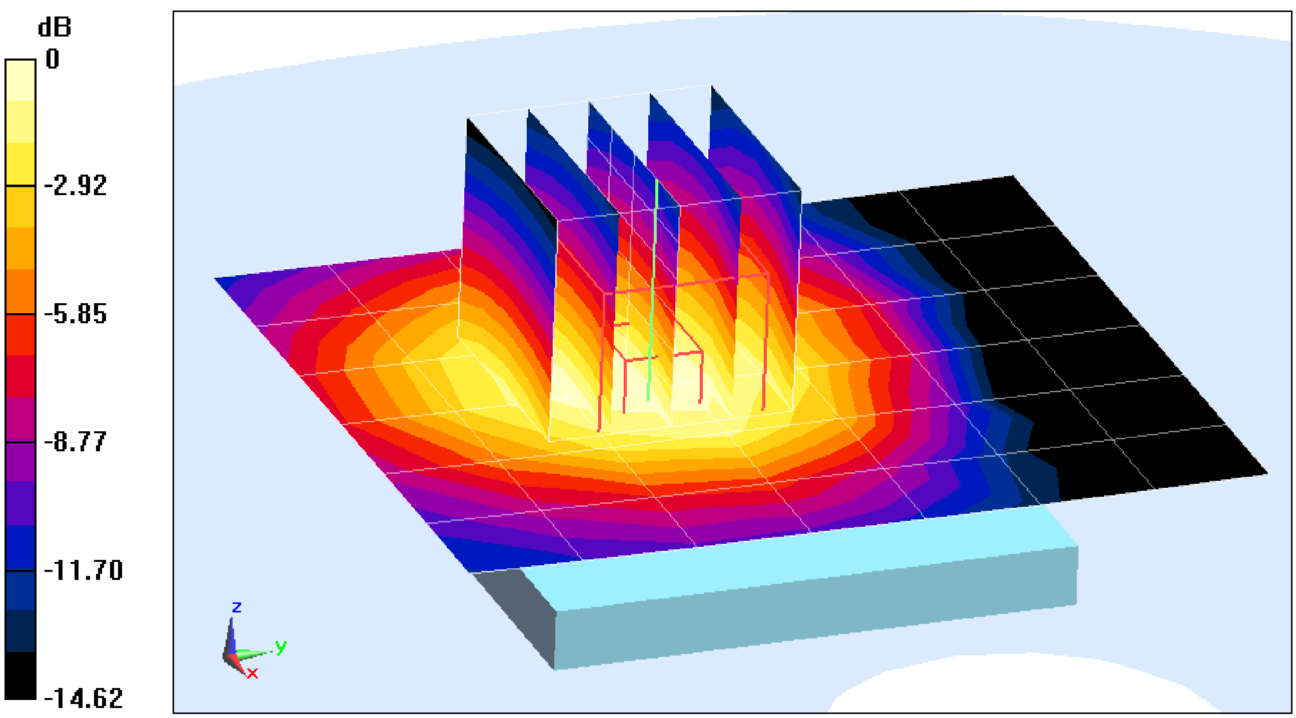
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.352 S/m; ε_r = 39.981; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 20.7°C; Tissue Temp: 20.8°C

Probe: ES3DV2 - SN3022; ConvF(5.15, 5.15, 5.15); Calibrated: 7/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/15/2016
Phantom: SAM Main; Type: QD000P40CC; Serial: TP 1114
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Head SAR, Front Side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.37 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.694 W/kg
SAR(1 g) = 0.453 W/kg



0 dB = 0.531 W/kg = -2.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

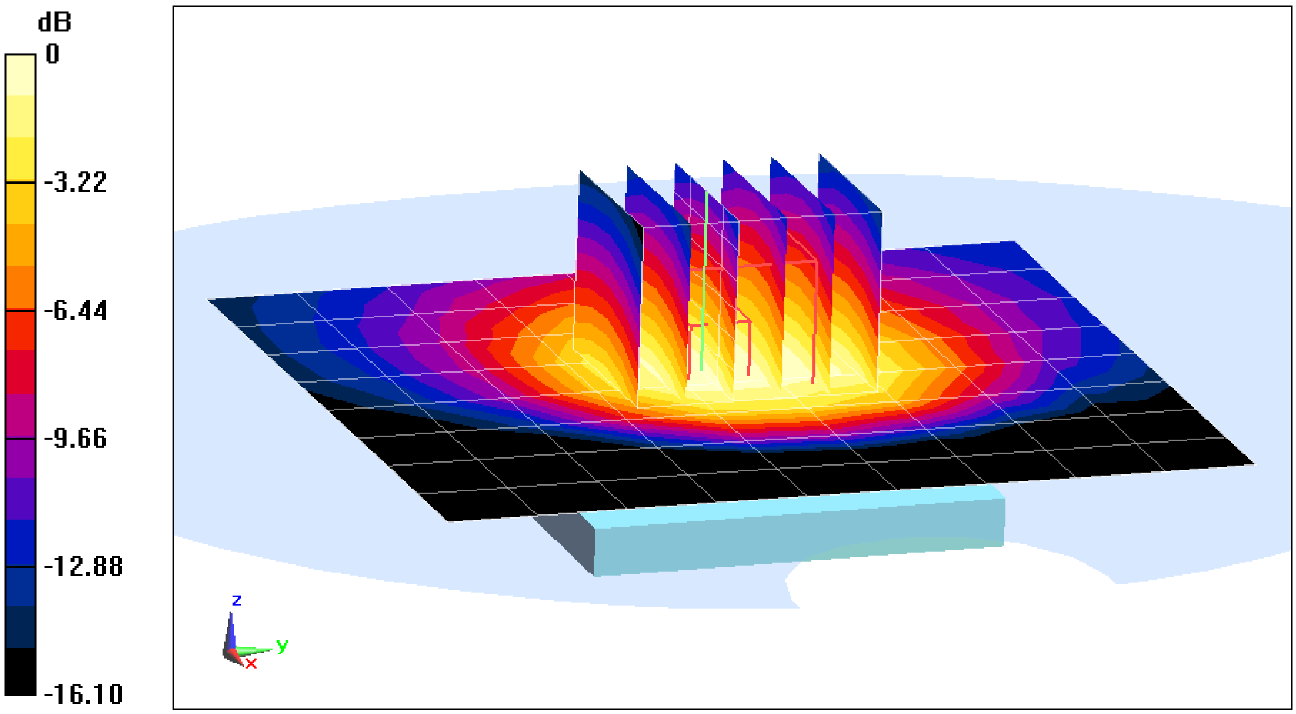
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.388 S/m; ε_r = 39.899; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-08-2016; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.69, 7.69, 7.69); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Head SAR, Front Side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.38 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.944 W/kg
SAR(1 g) = 0.587 W/kg



0 dB = 0.803 W/kg = -0.95 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23857

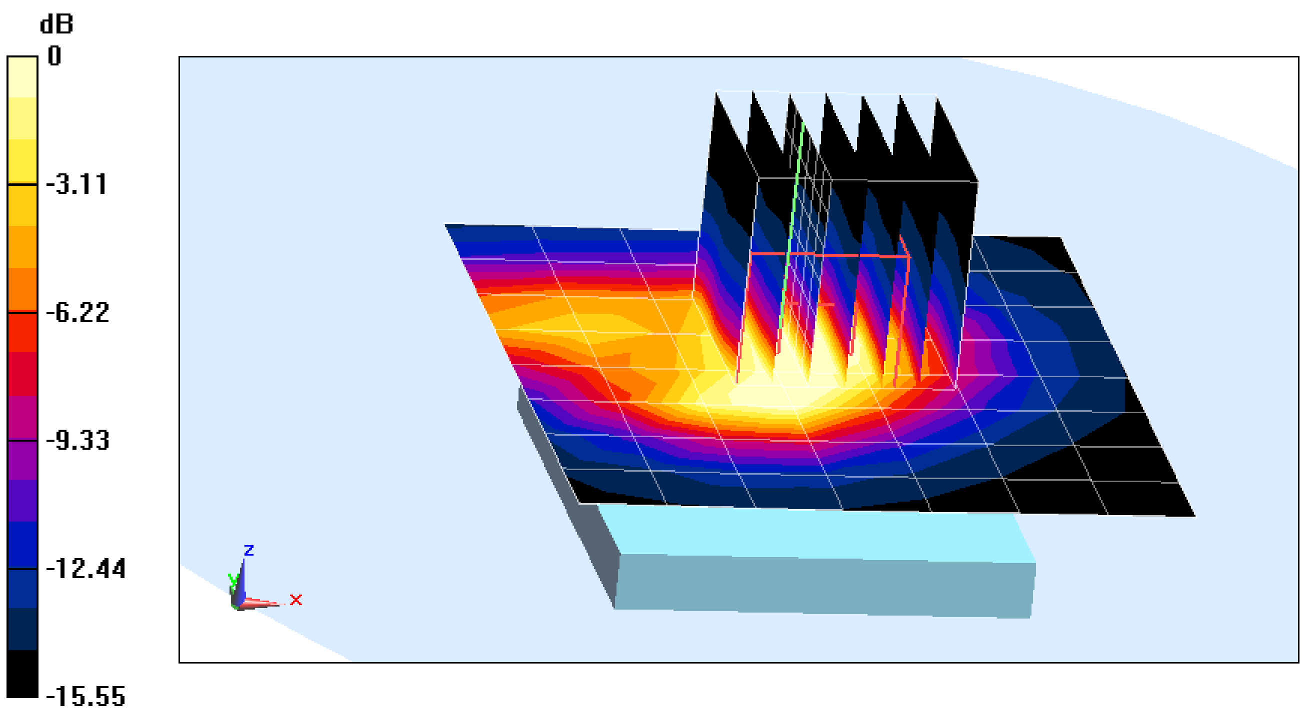
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.813 S/m; ε_r = 38.882; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 21.9°C; Tissue Temp: 22.4°C

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

Mode: IEEE 802.11b, 22 MHz Bandwidth, Head SAR, Front Side, Ch 6, 1 Mbps

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.181 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.189 W/kg
SAR(1 g) = 0.107 W/kg



0 dB = 0.130 W/kg = -8.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23857

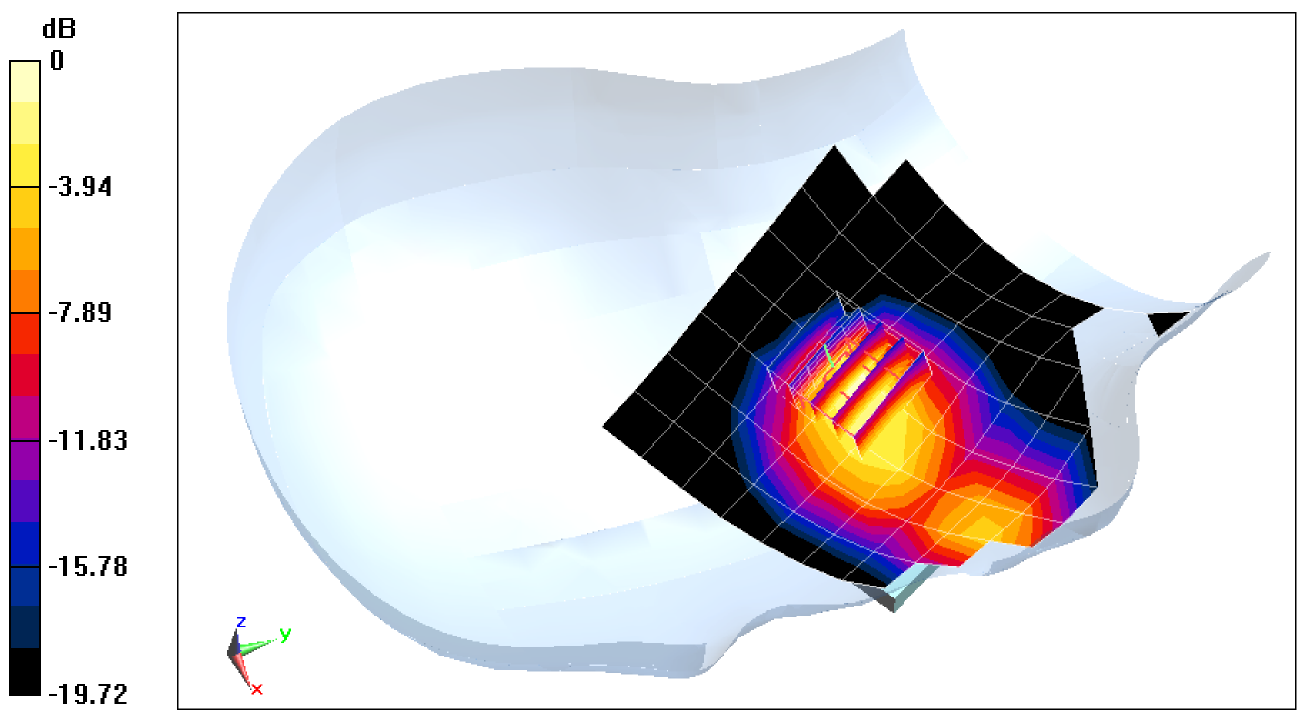
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium: 835 Body Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.995 S/m; ε_r = 53.373; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-12-2016; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6, 6, 6); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Extremity 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 = 64.05 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 12.2 W/kg
SAR(10 g) = 1.98 W/kg



0 dB = 4.81 W/kg = 6.82 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

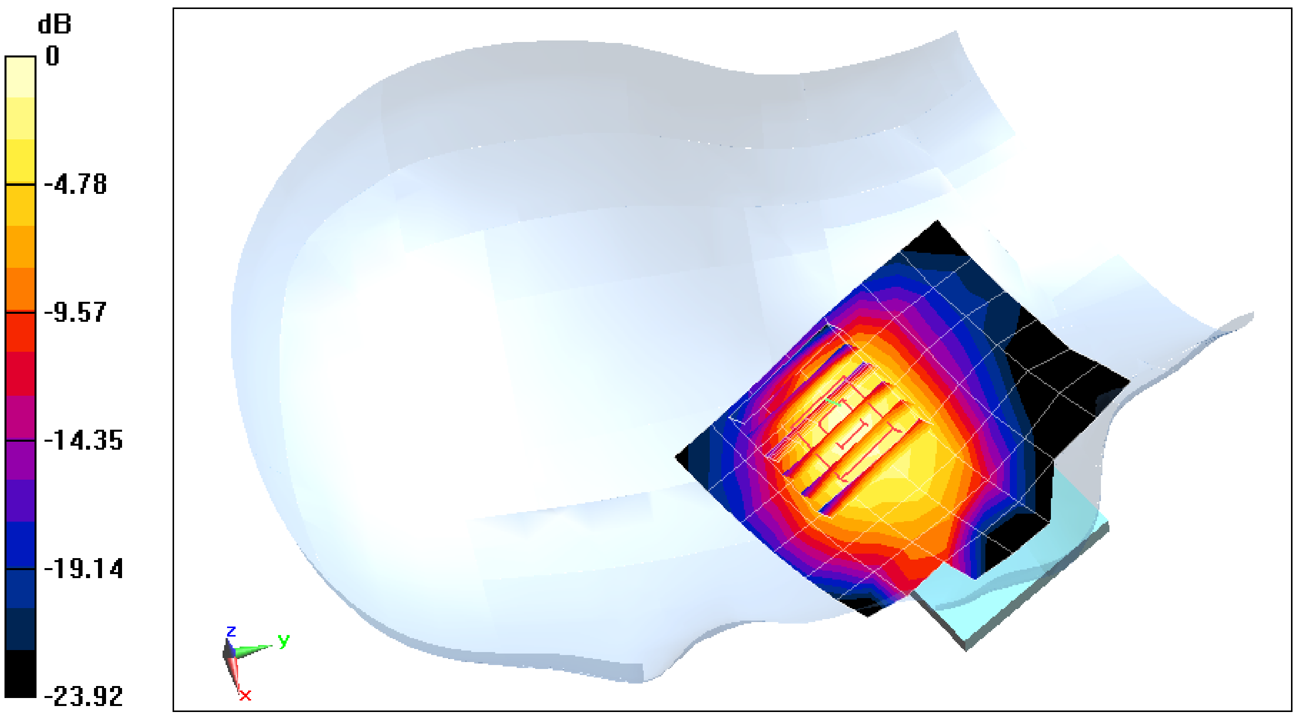
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 51.608; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-10-2016; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Extremity SAR, Back Side, Mid.ch, 2 Tx slots

Area Scan (8x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 42.57 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 4.21 W/kg
SAR(10 g) = 1.44 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23857

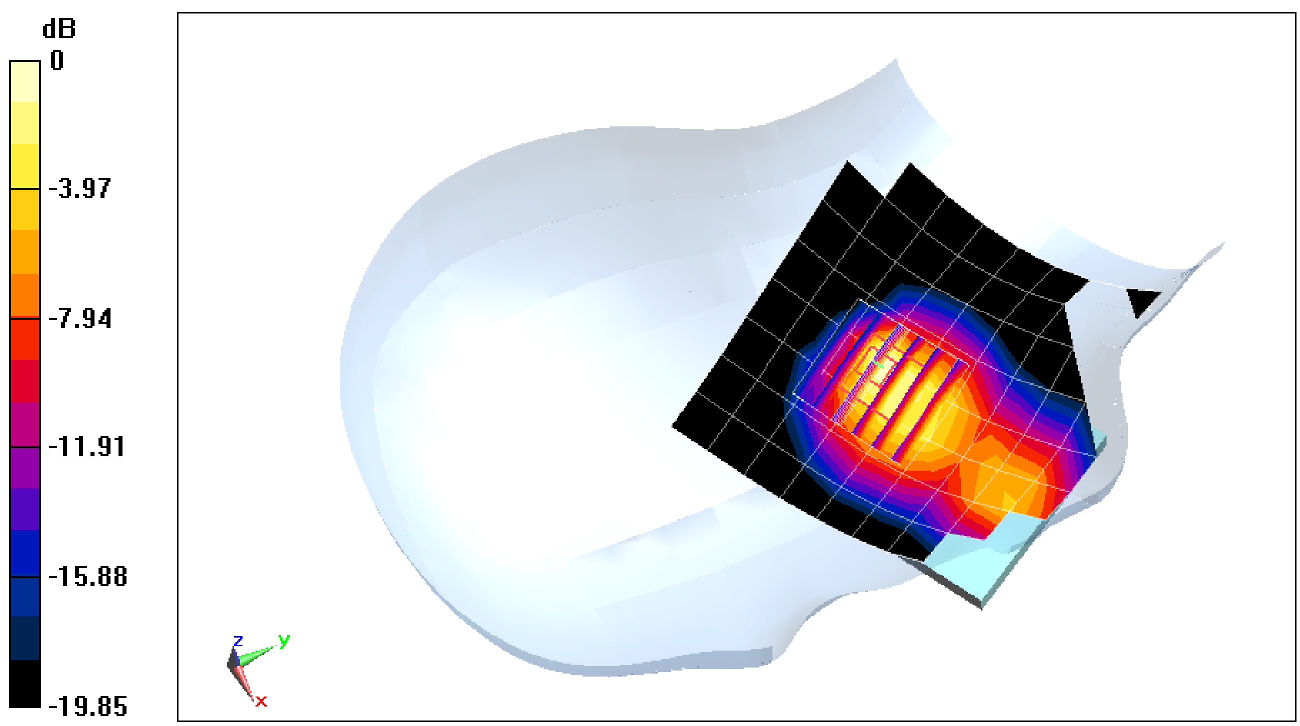
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.6$ MHz; $\sigma = 0.995$ S/m; $\varepsilon_r = 53.373$; $\rho = 1000$ kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-12-2016; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6, 6, 6); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.44 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 8.38 W/kg
SAR(10 g) = 1.3 W/kg



0 dB = 3.15 W/kg = 4.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23840

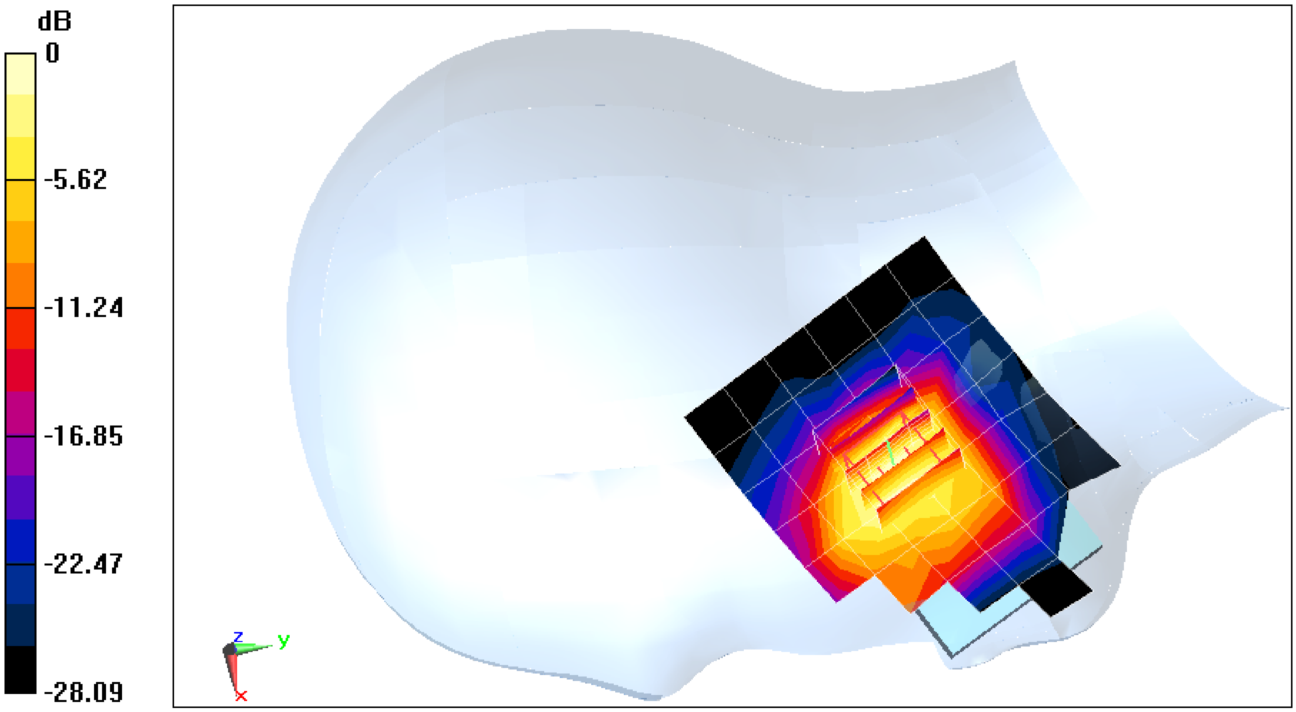
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.477 S/m; ε_r = 51.619; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-09-2016; Ambient Temp: 24.3°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7410; ConvF(7.95, 7.95, 7.95); Calibrated: 7/25/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/12/2016
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Extremity SAR, Back Side Mid.ch

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.64 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 6.60 W/kg
SAR(10 g) = 1.83 W/kg



0 dB = 4.72 W/kg = 6.74 dBW/kg

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

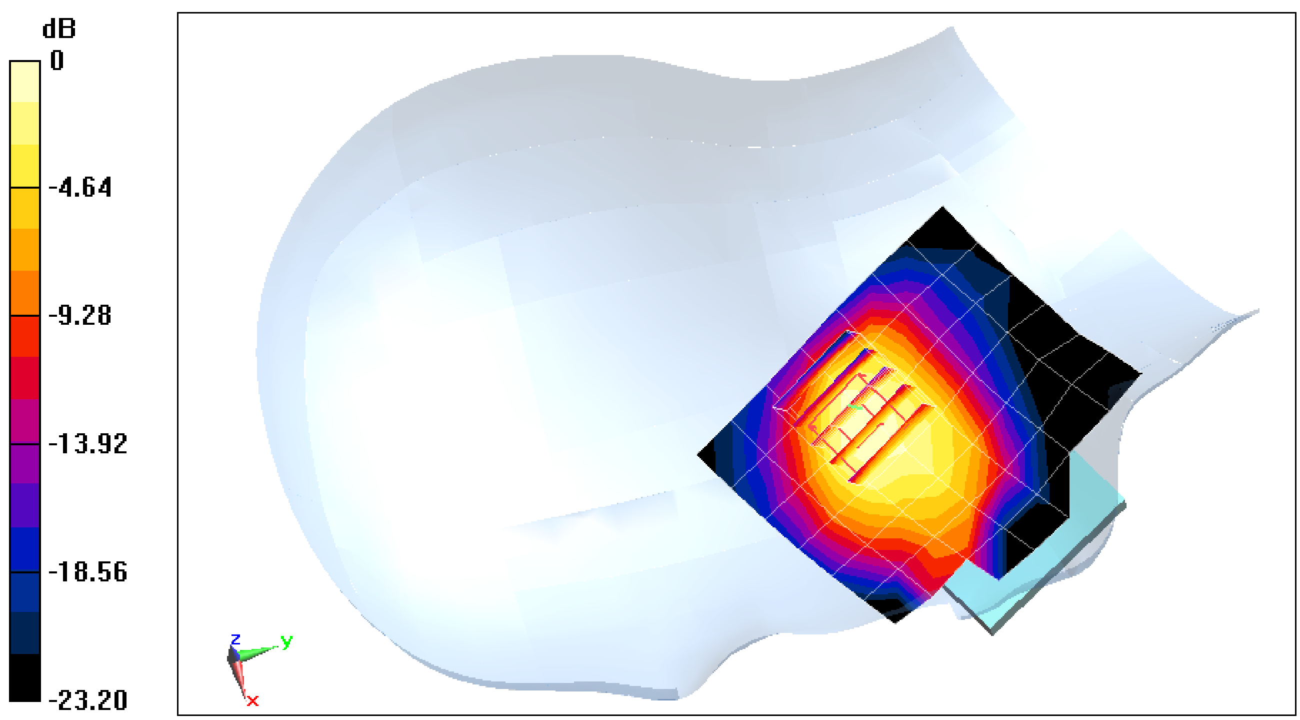
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 51.608; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-10-2016; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Extremity SAR, Back Side, Mid.ch

Area Scan (8x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 40.87 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.82 W/kg
SAR(10 g) = 1.36 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

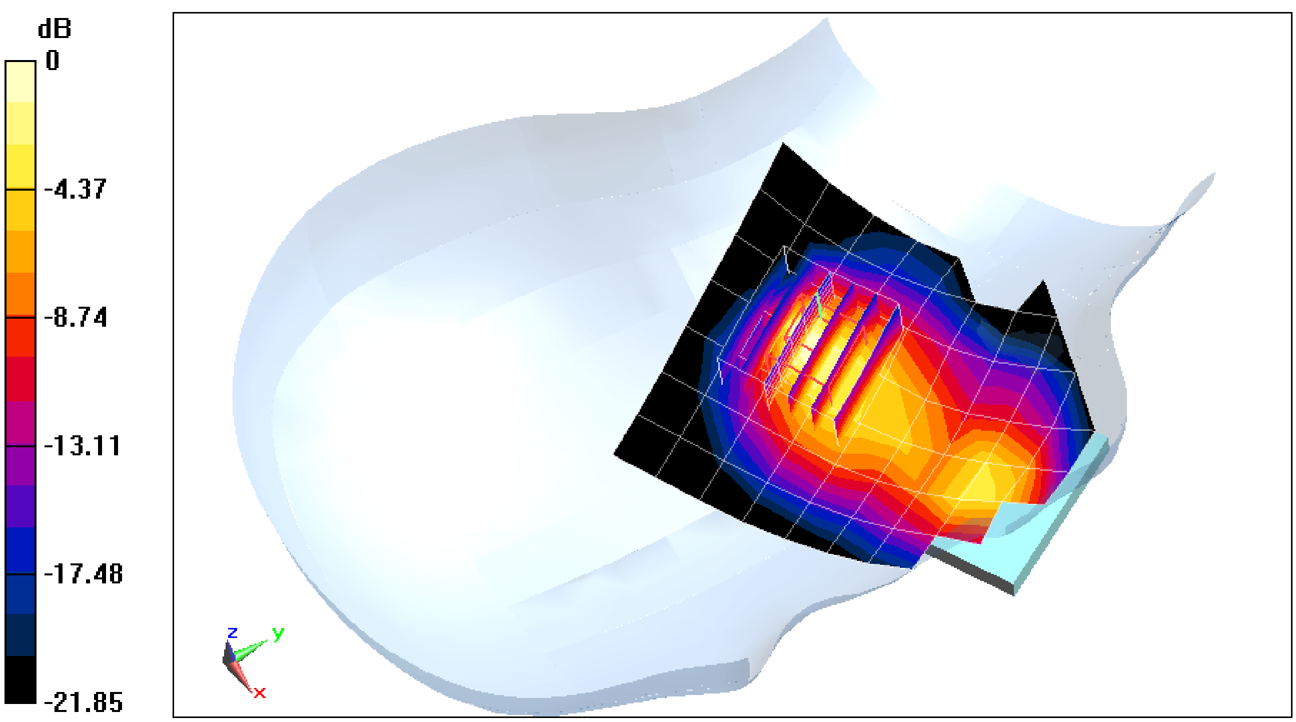
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; $\sigma = 0.998$ S/m; $\varepsilon_r = 54.963$; $\rho = 1000$ kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-07-2016; Ambient Temp: 22.5°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7409; ConvF(9.46, 9.46, 9.46); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 13, Extremity SAR, Back Side, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 0 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 = 40.55 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 7.54 W/kg
SAR(10 g) = 1.14 W/kg



0 dB = 4.21 W/kg = 6.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23857

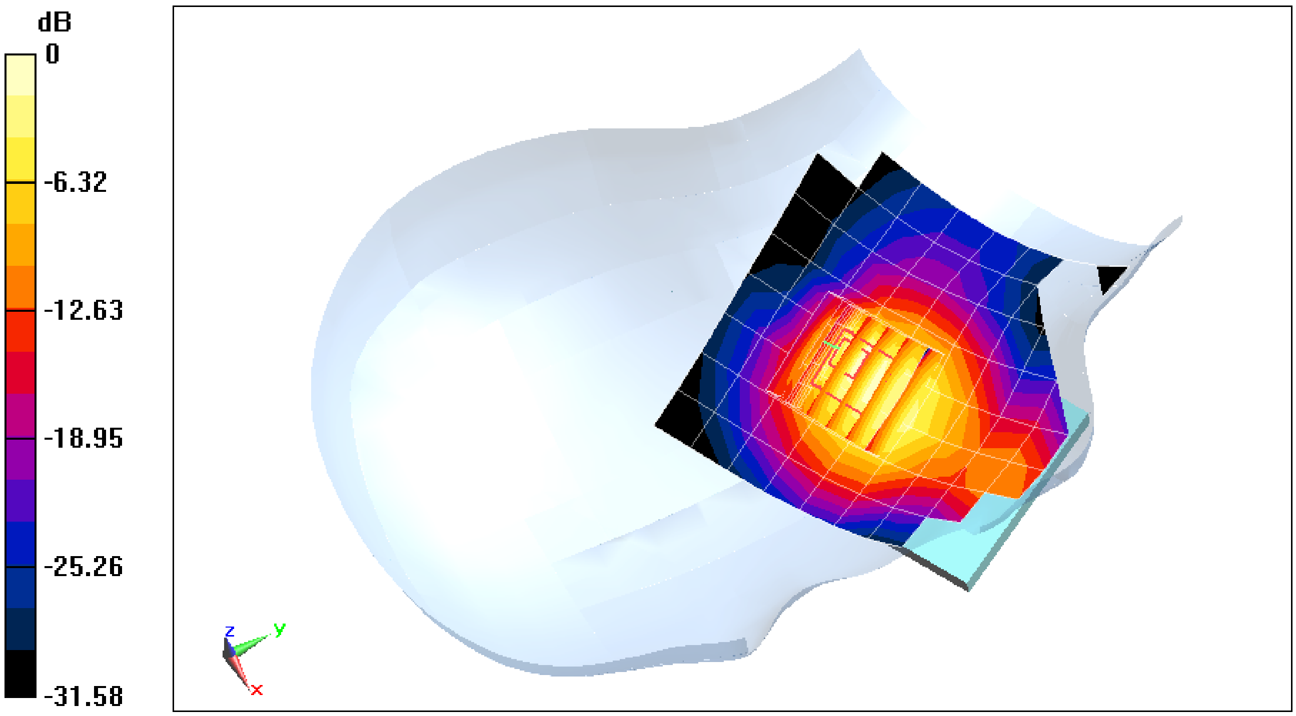
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.995 S/m; ε_r = 53.374; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-12-2016; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6, 6, 6); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 5 (Cell.), Extremity SAR, Back Side, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 49 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 69.27 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 11.3 W/kg
SAR(10 g) = 1.98 W/kg



0 dB = 4.67 W/kg = 6.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23840

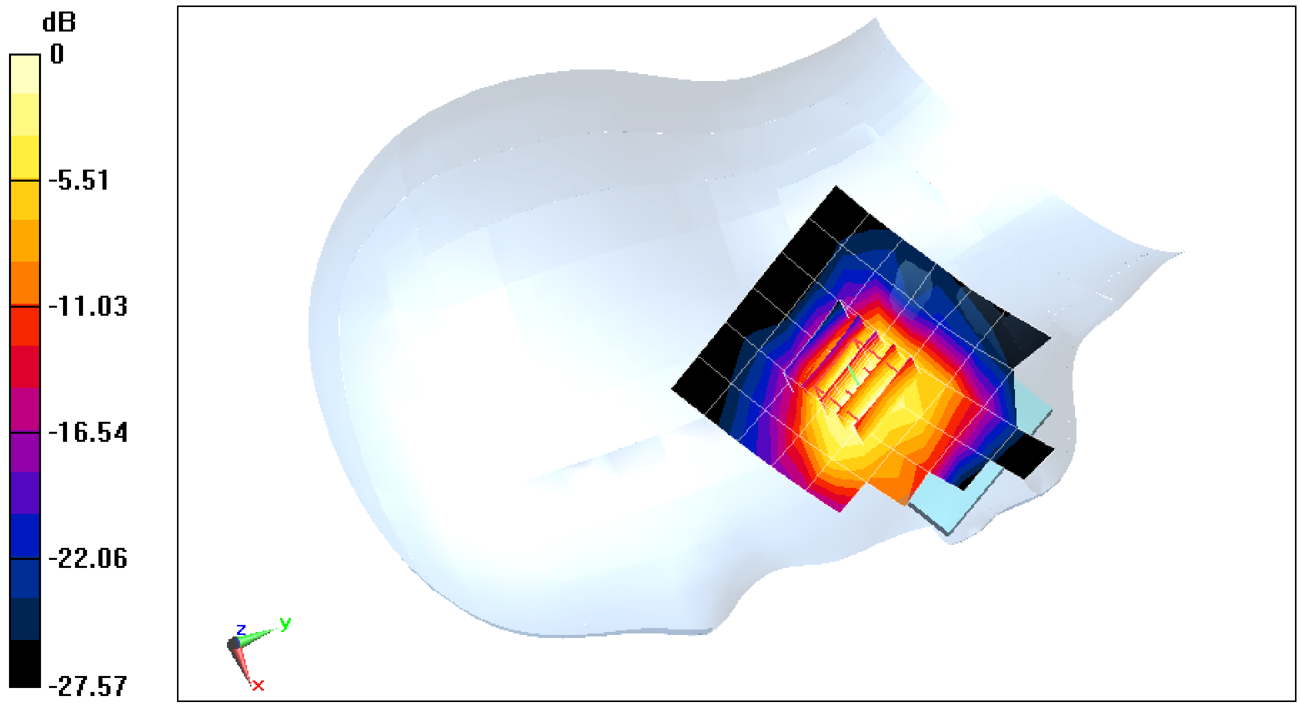
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.477 S/m; ε_r = 51.619; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-09-2016; Ambient Temp: 24.3°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7410; ConvF(7.95, 7.95, 7.95); Calibrated: 7/25/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/12/2016
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Extremity SAR, Back Side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 50 RB Offset

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.66 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 7.59 W/kg
SAR(10 g) = 2.11 W/kg



0 dB = 5.41 W/kg = 7.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23832

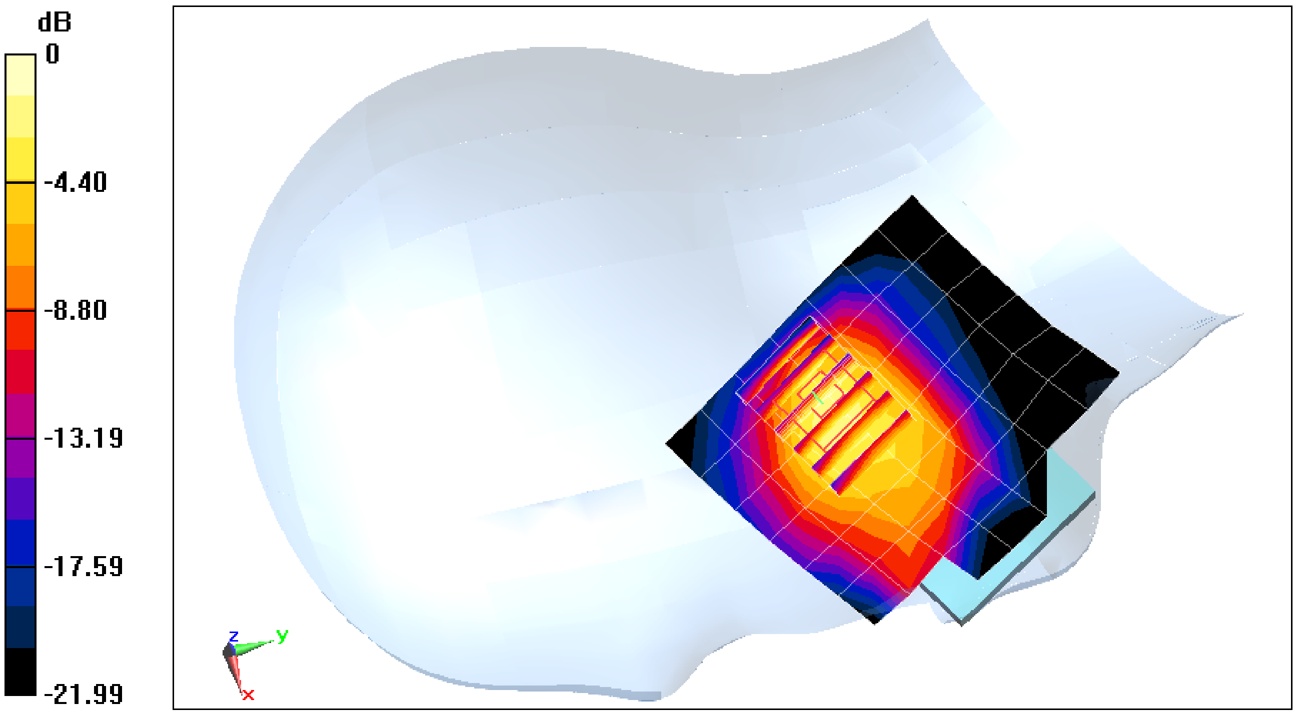
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.556 S/m; ε_r = 51.608; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-10-2016; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 2 (PCS), Extremity SAR, Back Side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (8x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 43.95 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 4.84 W/kg
SAR(10 g) = 1.57 W/kg



0 dB = 3.38 W/kg = 5.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFW280; Type: Portable Wrist Device; Serial: 23857

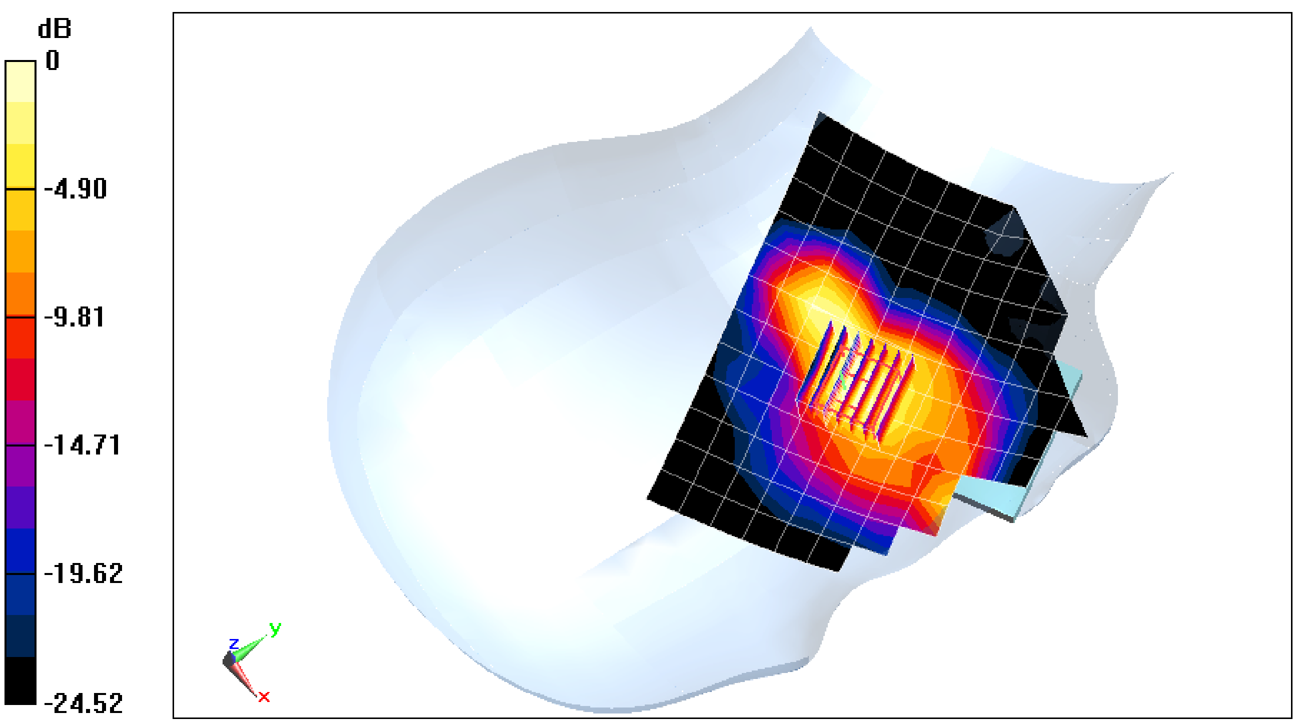
Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.97 S/m; ε_r = 52.284; ρ = 1000 kg/m^3
Phantom section: Right Section; Space: 0.0 cm

Test Date: 11-07-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

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

Mode: IEEE 802.11b, 22 MHz Bandwidth, Extremity SAR, Ch 06, 1 Mbps, Back Side

Area Scan (13x13x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.85 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(10 g) = 0.325 W/kg



0 dB = 1.10 W/kg = 0.41 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

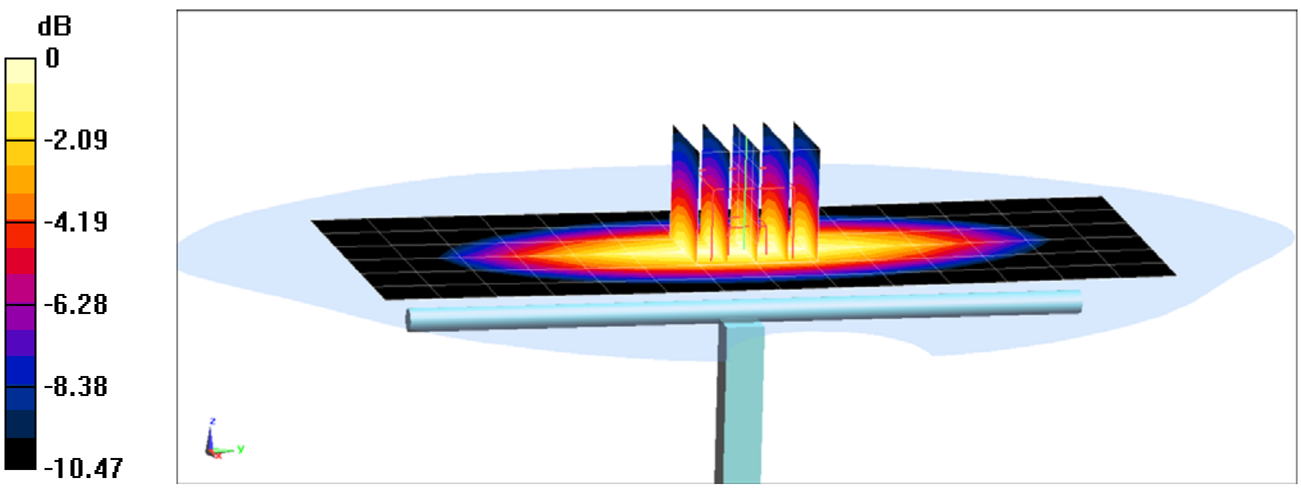
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; σ = 0.903 S/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-08-2016; Ambient Temp: 20.5°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3288; ConvF(7, 7, 7); Calibrated: 8/24/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 8/22/2016
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.35 W/kg
SAR(1 g) = 1.6 W/kg
Deviation(1 g) = -2.68%



0 dB = 1.87 W/kg = 2.72 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

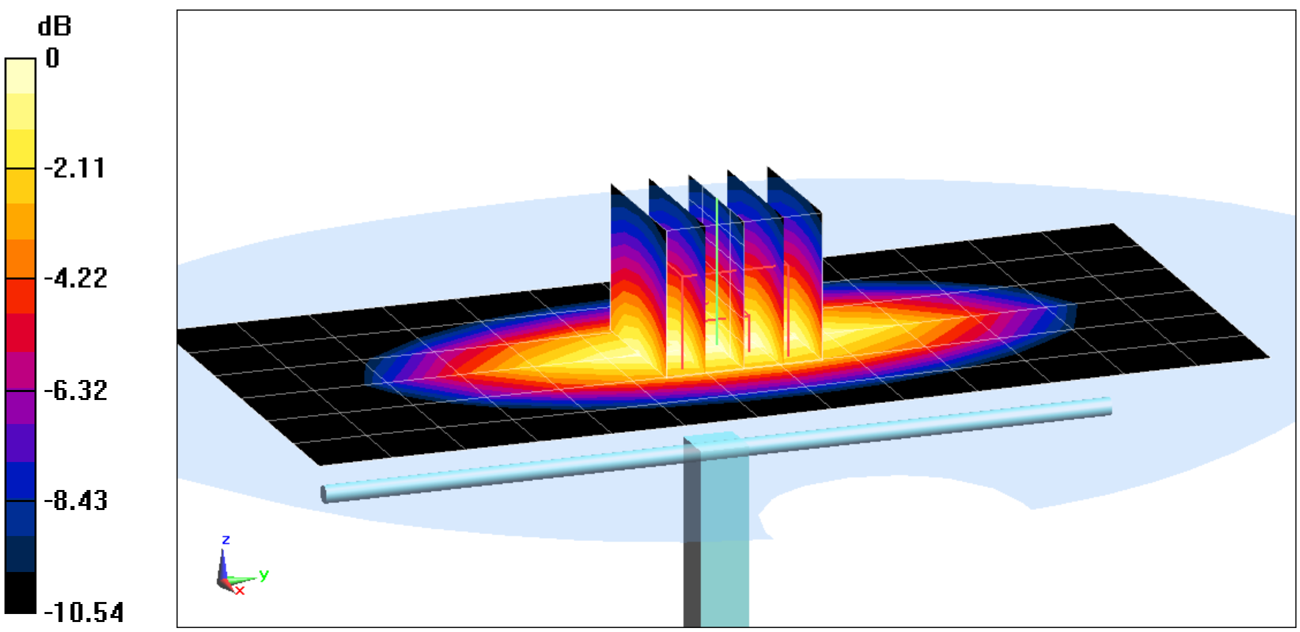
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used:
f = 835 MHz; σ = 0.914 S/m; ε_r = 42.248; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-09-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(6.16, 6.16, 6.16); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.75 W/kg
SAR(1 g) = 1.92 W/kg
Deviation(1 g) = 3.00%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

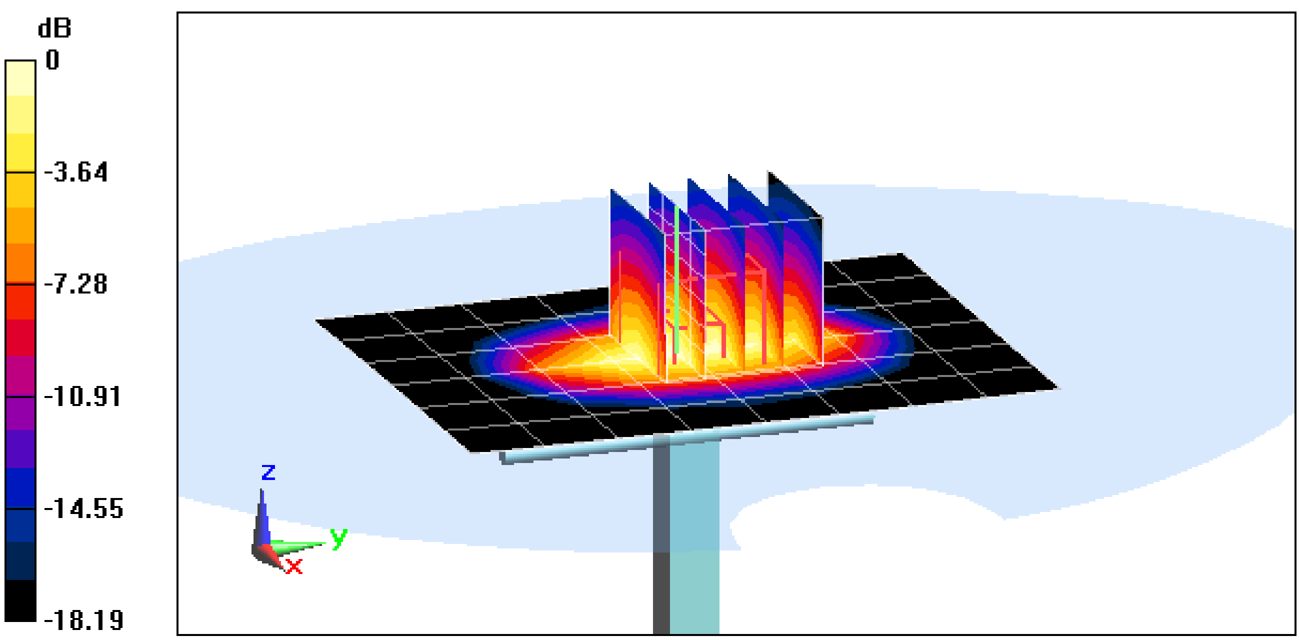
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.37 S/m; ε_r = 39.889; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 20.7°C; Tissue Temp: 20.8°C

Probe: ES3DV2 - SN3022; ConvF(5.15, 5.15, 5.15); Calibrated: 7/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1466; Calibrated: 1/15/2016
Phantom: SAM Main; Type: QD000P40CC; Serial: TP 1114
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.51 W/kg
SAR(1 g) = 3.59 W/kg
Deviation(1 g) = -0.55%



0 dB = 4.50 W/kg = 6.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

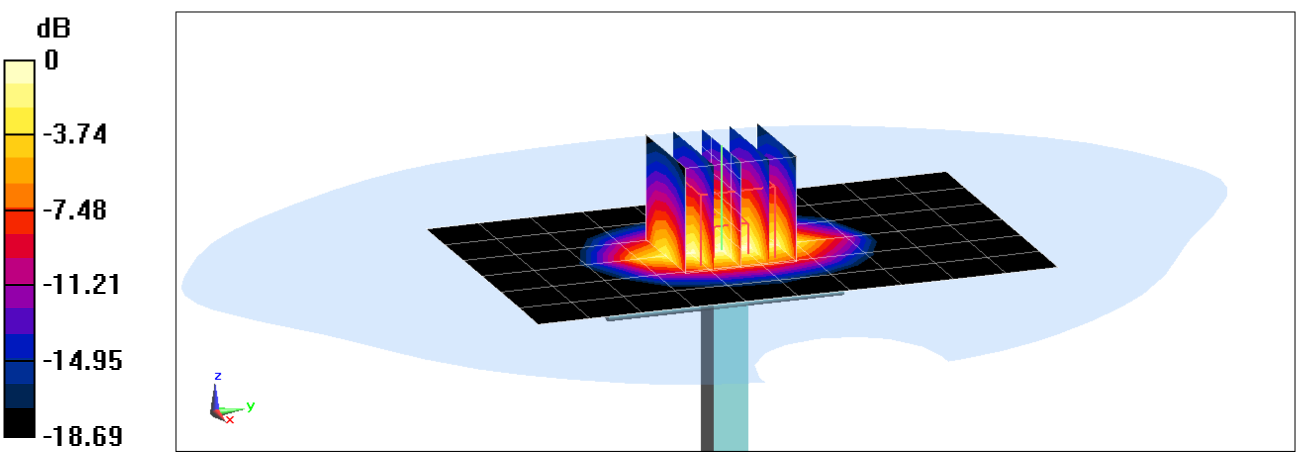
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.409 S/m; ε_r = 39.813; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-08-2016; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.69, 7.69, 7.69); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.73 W/kg
SAR(1 g) = 4.06 W/kg
Deviation(1 g) = 1.25%



0 dB = 6.43 W/kg = 8.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

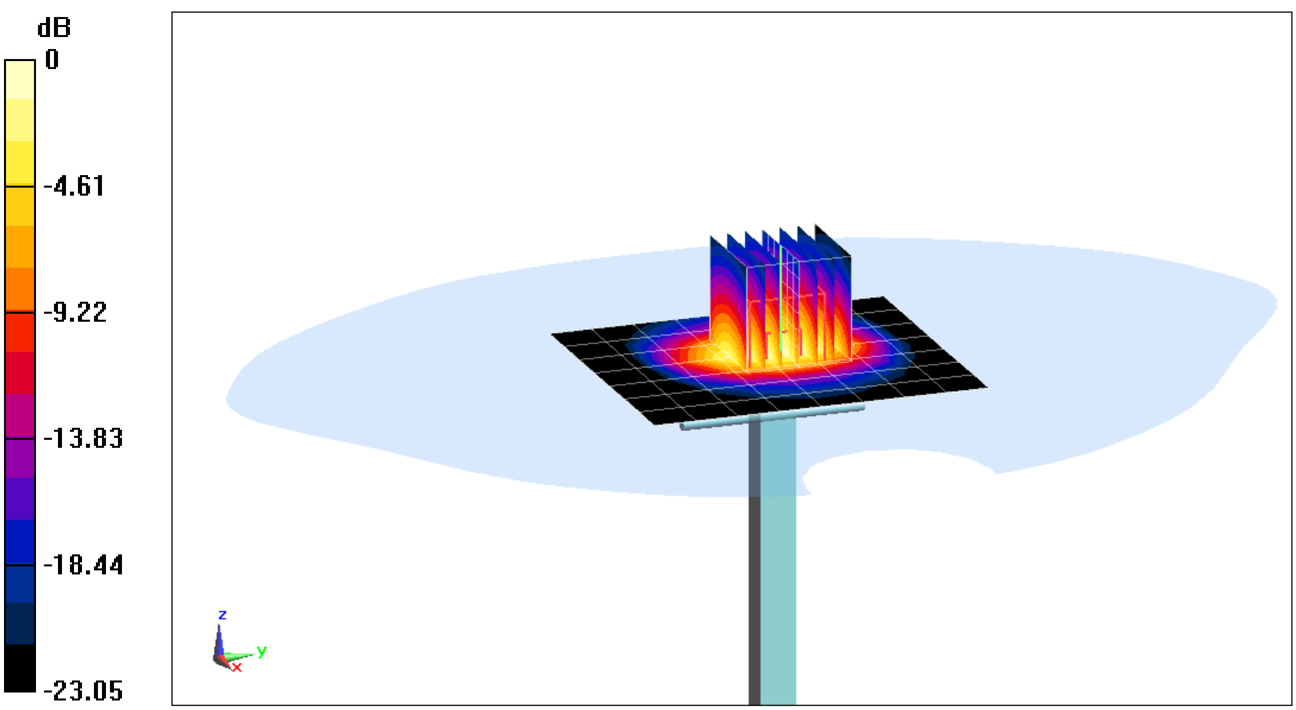
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.827 S/m; ε_r = 38.831; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 21.9°C; Tissue Temp: 22.4°C

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

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.16 W/kg
Deviation(1 g) = -2.27%



0 dB = 6.84 W/kg = 8.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

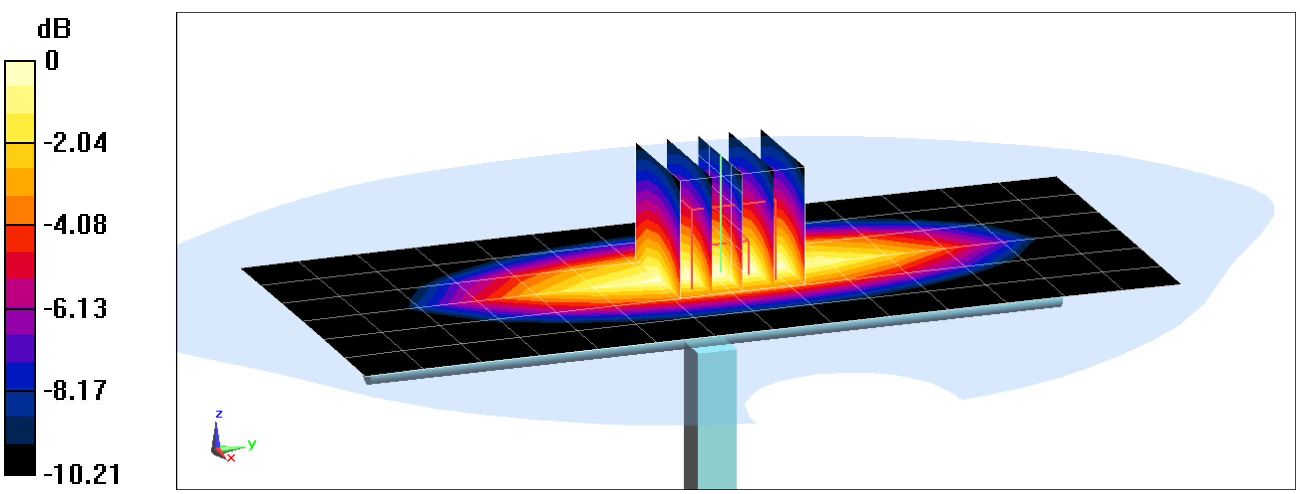
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.966 S/m; ε_r = 55.31; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-07-2016; Ambient Temp: 22.5°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7409; ConvF(9.46, 9.46, 9.46); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.54 W/kg
SAR(10 g) = 1.13 W/kg
Deviation(10 g) = 2.17%



0 dB = 2.26 W/kg = 3.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

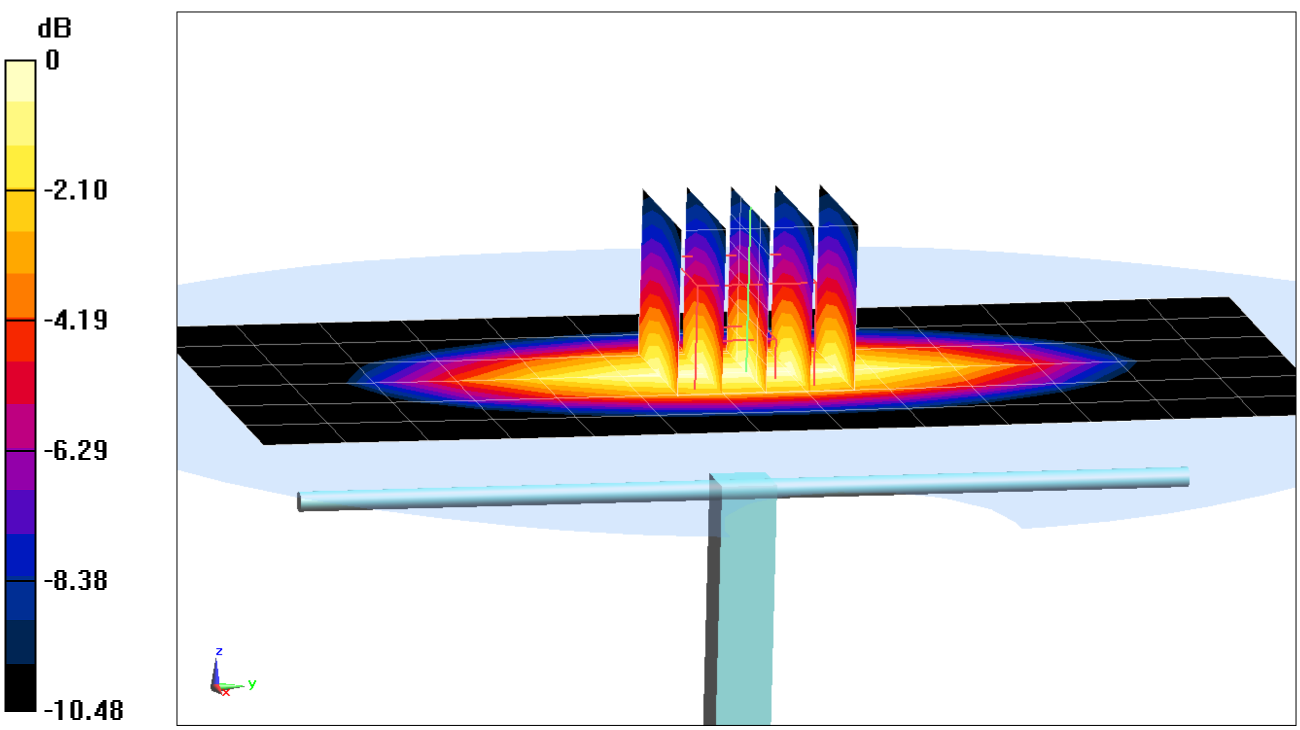
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.993 S/m; ε_r = 53.388; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-12-2016; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3213; ConvF(6, 6, 6); Calibrated: 2/19/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/18/2016
Phantom: SAM with CRP v5.0 Left; Type: QD000P40CD; Serial: 1687
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.02 W/kg
SAR(10 g) = 1.33 W/kg
Deviation(10 g) = 7.26%



0 dB = 2.38 W/kg = 3.77 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

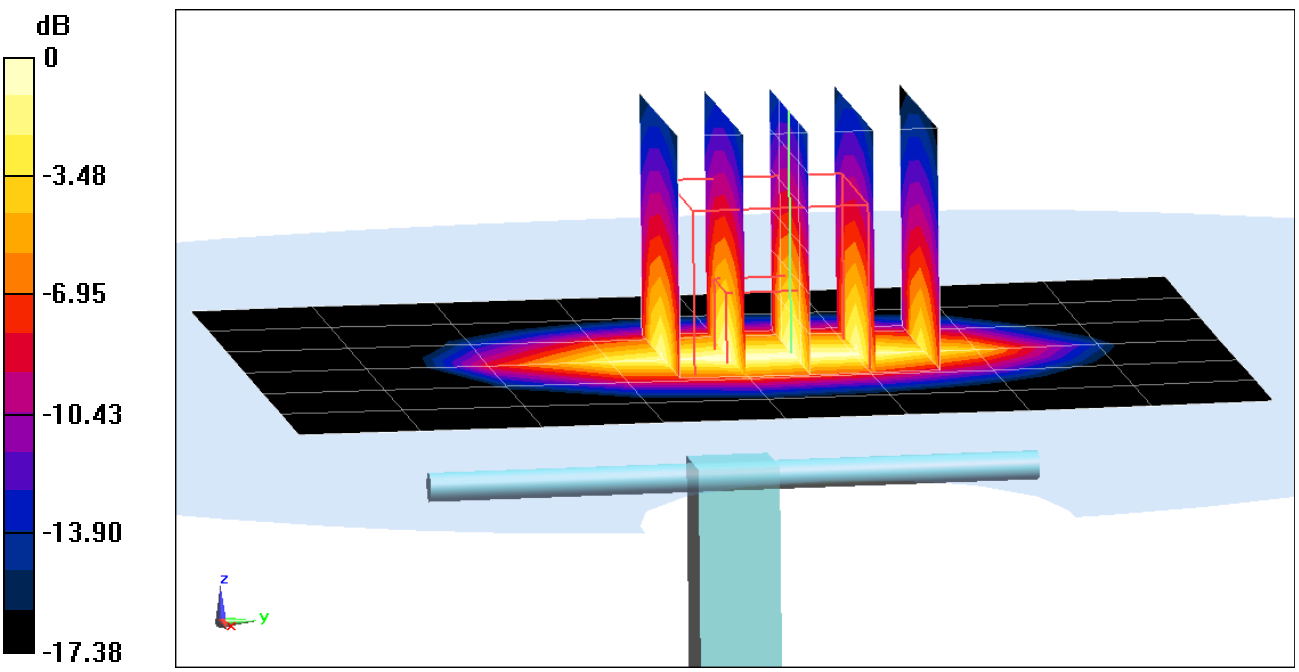
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.497 S/m; ε_r = 51.571; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-09-2016; Ambient Temp: 24.3°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7410; ConvF(7.95, 7.95, 7.95); Calibrated: 7/25/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/12/2016
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.99 W/kg
SAR(10 g) = 2.08 W/kg
Deviation(10 g) = 6.67%



0 dB = 5.85 W/kg = 7.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

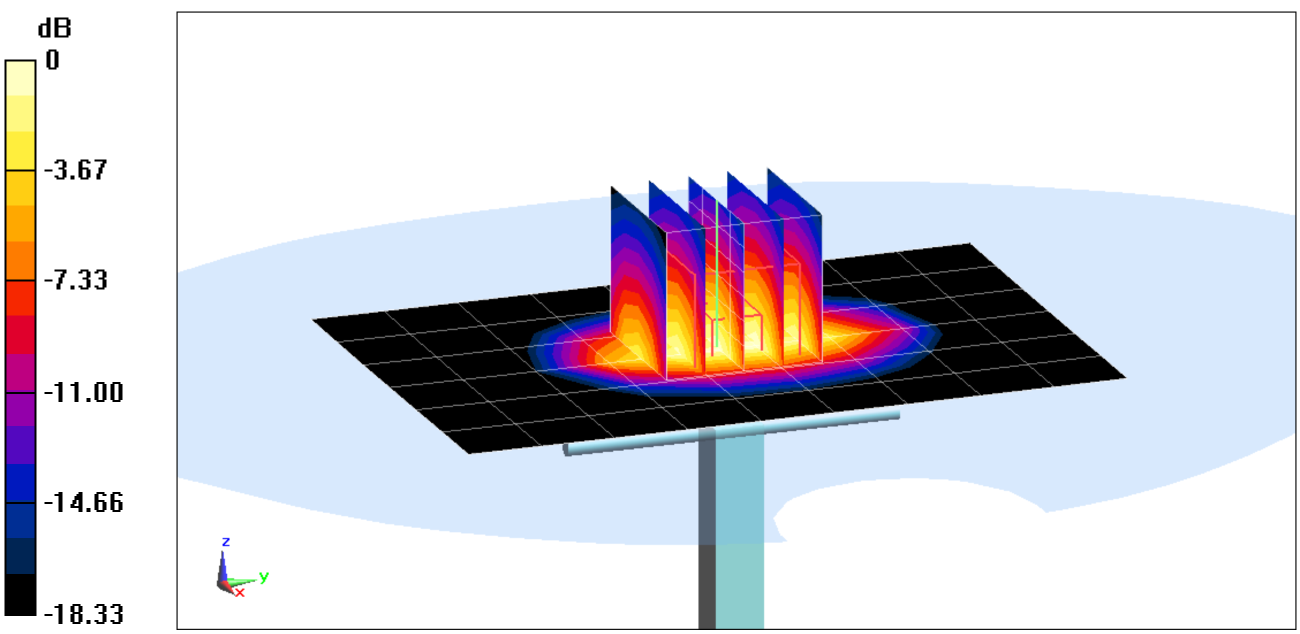
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.58 S/m; ε_r = 51.531; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-10-2016; Ambient Temp: 22.4°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/14/2016
Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.24 W/kg
SAR(10 g) = 2.09 W/kg
Deviation(10 g) = -0.95%



0 dB = 5.05 W/kg = 7.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

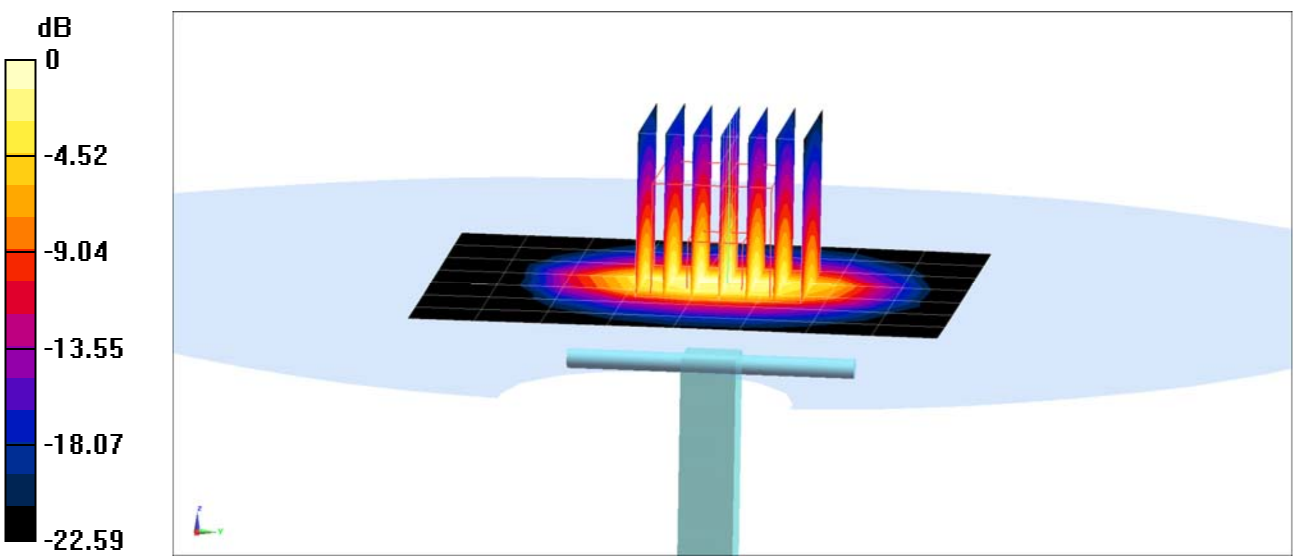
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.987 S/m; ε_r = 52.238; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-07-2016; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

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

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.5 W/kg
SAR(10 g) = 2.27 W/kg
Deviation(10 g) = -6.20%



0 dB = 8.41 W/kg = 9.25 dBW/kg